Environmental Impact Study – 74 Edwards Drive, Keene, Township of Otonabee-South Monaghan, County of Peterborough, Ontario

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Prepared for:
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1.0 Introduction

Cambium Inc. (Cambium) was retained by Yvette Johnston to conduct an Environmental Impact Study (EIS; the Study) to support a Plan of Subdivision application on a property known as 74 Edwards Drive, Keene, Township of Otonabee-South Monaghan, County of Peterborough, Ontario (Figure 1).

Based on the above-noted development, the entire property was assessed and is considered the *Site* for this Study. The Site is located within Ecoregion 6E (Crins, Gray, Uhlig, & Wester, 2009) and within the Keene settlement area.

The following EIS (the Study) has been designed to satisfy the requirements of a Plan of Subdivision application as made under the Planning Act, and more specifically, to characterize the existing form and function of natural heritage features on and adjacent to the Site, assess potential for impacts to these features, and outline strategies to facilitate compliance with respective approval authority requirements.

The wetland and watercourse on and adjacent to the Site is regulated by Ontario Regulation 41/24 – *Prohibited Activities, Exemptions and Permits* as made under the *Conservation Authorities Act, 1990* and as administered locally by the Otonabee Region Conservation Authority (ORCA). Development within or adjacent to these features are subject to review and approval by ORCA.

1.1 Terms of Reference

A Terms of Reference (TOR) was circulated to Matt Wilkinson at ORCA on September 27, 2022. A response was not received at the time of this publication. Relevant correspondence and documentation are included in Appendix A.

1.2 Summary of Proposed Development

The vacant Site is approximately 14.2 hectares [ha] in size, consisting primarily of treed habitats and trail system. A sixteen (16) lot subdivision is proposed, consisting of single-family residential dwellings to be serviced by municipal water, and individually private sewage

systems. Subdivision access will be created by way of extending Edward Drive southwesterly. The proposed development plan is provided in Appendix B.

2.0 Natural Heritage Policy Context

The evaluation of the form and function of natural heritage features present on, and adjacent to, the Site was undertaken to meet the requirements of the following legislation, plans and policies:

- Provincial Planning Statement (PPS), 2024
- Conservation Authorities Act (Ontario, 1990)
- Otonabee Conservation Watershed Planning and Regulations Policy Manual, 2012
- County of Peterborough Official Plan, 1994, with amendments consolidated to 2022
- Township of Otonabee-South Monoghan Official Plan, 2017
- Township of Otonabee-South Monoghan Zoning By-law 2010-65, 2010
- Endangered Species Act (ESA), 2007
- Fisheries Act, 2019
- Species at Risk Act (SARA), 2002
- Migratory Birds Convention Act (MBCA), 1994

This Study includes an assessment of conformity of the proposed development with relevant natural heritage policies. A summary of policy conformity is included in Section 7.0.

2.1 Provincial Planning Statement, 2024

The Provincial Planning Statement (PPS 2024) came into force on October 20, 2024, replacing *A Place to Grow: Growth Plan for the Greater Golden Horseshoe* (Ministry of Municipal Affairs and Housing, 2020b) and the *Provincial Policy Statement* (2020) (Ministry of Municipal Affairs and Housing, 2020). The following Study has been prepared to address natural heritage polices outlined in the current PPS (Ministry of Municipal Affairs and Housing, 2024).

The PPS provides direction on matters of provincial interest related to land use planning and development. Section 4.1 of the PPS (Ministry of Municipal Affairs and Housing, 2024) protects the form and function of eight types of significant natural heritage features, which include:

- significant wetlands in Ecoregions 5E, 6E, and 7E
- significant coastal wetlands
- significant woodlands in Ecoregions 6E and 7E
- significant valleylands in Ecoregions 6E and 7E
- significant wildlife habitat (SWH)
- significant areas of natural and scientific interest (ANSI)
- fish habitat
- habitat of endangered and threatened species
- coastal wetlands in Ecoregions 5E, 6E, and 7E

Given their significance, development and site alteration are prohibited within provincially significant wetlands (PSW) in Ecoregions 5E, 6E, and 7E and within significant coastal wetlands. Development and site alteration in fish habitat and the habitat of endangered and threatened species shall only be permitted in accordance with provincial and federal requirements. Development and site alteration within other natural heritage features and on lands adjacent to all natural heritage features may be permitted if it is demonstrated that there will be no negative impacts on the feature or its ecological function. The PPS defines “development” as the creation of a new lot, a change in land use, or the construction of buildings and structures requiring approval under the Planning Act. “Site alteration” means activities, such as grading, excavation and the placement of fill that would change the landform and natural vegetative characteristics of a site.

Section 4.2 of the PPS protects the quality and quantity of water, including the form and hydrologic function of sensitive surface water features and sensitive ground water features. Focus is given to maintaining hydrologic linkages and functions at the watershed scale to minimize potential negative impacts, including cross-jurisdictional and cross-watershed

impacts of development. Mitigative measures and/or alternative development approaches should be considered for development near water features.

2.2 Conservation Authority Regulation

Ontario's 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). Otonabee Region Conservation Authority (ORCA) regulates these features under Ontario Regulation 41/24: *Prohibited Activities, Exemptions and Permits under the Conservation Authorities Act*.

2.3 Official Plan and Zoning By-Law

The 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
Official Plan – County of Peterborough	Settlement Area
Official Plan – Township of Otonabee-South Monaghan	Hamlet, Hamlet Special Policy Area (5.2.10(c)), Aquifer Vulnerability
Zoning By-law – Township of Otonabee-South Monoghan	Future Development Zone 8 (FD-8), Future Development Zone 8 Source Water Protection (FD-8-SWP), Environmental Protection (EP)

2.4 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 SWH, a provincially protected natural heritage feature. Species at Risk (SAR) are discussed throughout this report, as applicable.

2.5 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*". Furthermore, any work, undertaking, or activity other than fishing that results in the death of fish is considered an offence.

As a result of amendments to the *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 the death of fish and/or 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).

2.6 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.

Known aquatic SAR populations and associated critical habitats are mapped by DFO. Critical habitat for aquatic SAR may include areas used for spawning, rearing young, feeding, overwintering, and migration.

2.7 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 afford year-round protection to 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 to 36 months.

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, 2024)
- Natural Heritage Information Center (NHIC) database: 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, 2024)
- Aquatic Resource Area Summary Data (Government of Ontario, 2024)
- Fish ON-Line (Ministry of Natural Resources and Forestry, 2024)
- County of Peterborough Official Plan, (County of Peterborough, 1994)
- Township of Otonabee-South Monoghan Official Plan (Township of Otonabee-South Monaghan, 2017)
- Township of Otonabee-South Monoghan Zoning By-law 2010-65, (Township of Otonabee-South Monoghan Official Plan, 2010)

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	Unnamed watercourse Unevaluated wetland Woodland
NHIC Database	17QK2502 17QK2503 17QK2602 17QK2603	Blanding's Turtle – THR Bobolink – THR Butternut – END Eastern Meadowlark – THR Eastern Whip-poor-will – THR Eastern Wood-pewee – SC Grasshopper Sparrow – SC Least Bittern – THR Red-headed Woodpecker – END Northern Map Turtle – SC Snapping Turtle – SC Wood Thrush – SC
Ontario Breeding Bird Atlas (OBBA)	17TQK20	Incorporated into list of species within Appendix C
Ontario Reptile and Amphibian Atlas (ORAA)	17QK20	Incorporated into list of species within Appendix C
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 C includes a list of all species within the overlapping OBBA and ORAA squares with potential policy implications.

3.2 Consultation and Agency Correspondence

Regulatory agency consultation may involve input from DFO, the Ministry of Natural Resources (MNR; formerly known as the Ministry of Natural Resources and Forestry), the Ministry of Environment, Conservation, and Parks (MECP), and/or the local Conservation Authority, as applicable. The 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.

For this Study, ORCA was consulted as part of the TOR process (Appendix A). Additionally, ORCA provided feedback during a pre-consultation meeting with the County, Township and application team on July 10, 2024. ORCA indicated policies generally advise against development within wetlands, and development near wetlands are subject to a buffer. ORCA also noted an environmental study may refine the recommendation; however, wetland encroachment would result in the requirement for compensation.

3.3 Field Investigations

Ecological investigations were completed on the Site by a team of qualified ecologists to understand potential ecological constraints to development and opportunities for restoration/enhancement. 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 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 and Vegetation Inventory

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.

Data includes the provincial status of plant species and vegetation communities, where such information exists. Sensitivity of individual vegetation species was evaluated based on the coefficient of conservatism (CC) which is a measure of the tolerance of a species to disturbance and fidelity to a specific habitat type; species with CC of 9-10 exhibit a high degree of fidelity to a narrow range of habitat parameters. The sensitivity of vegetation communities was evaluated through an assessment of various community attributes including age, habitat quality, degree of disturbance, presence of non-native/invasive species, and presence of sensitive plant species (plants with CC of 9-10). A description of CC values is provided in Table 3.

Table 3 Coefficient of Conservatism (Adapted from Oldham et al. 1995)

Coefficient of Conservatism	Rank	Description
0 to 3	Tolerant	Found in a wide variety of plant communities, including disturbed sites.
4 to 6	Moderately Conservative	Typically associated with a specific plant community but tolerate moderate disturbance.
7 to 8	Conservative	Typically associated with a plant community in an advanced successional stage that has undergone minor disturbance.
9 to 10	Highly Conservative	Typically displaying a high degree of fidelity to a specific plant community or a narrow range of synecological parameters.

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 do not score high enough to be a PSW are classified as Locally Significant Wetlands (LSW) or non-significant. The province also maps unevaluated wetlands. These mapped wetlands are approximate; as such, they require field verification in order to confirm their presence and determine their boundaries.

Wetlands on the Site were 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 (i.e., late May through October). Wetland boundaries were determined using the 50% wetland vegetation rule. In some cases, vegetation-based delineations were corroborated through soils assessment. Soils were sampled using a hand auger and moisture regime was determined based on industry standard guidance (Heck, et al., 2017).

Wetland boundaries on the Site were marked with a hand-held GPS unit and staked/flagged in the field. Where wetland communities extend off the Site, classification was done through observation from property boundaries and publicly accessible lands.

3.3.3 Aquatic Habitat Assessment

Aquatic habitat surveys were completed to identify and map all aquatic features on Site, including waterbodies, watercourses (permanent and intermittent), seeps, springs, and overland drainage paths. Orthoimagery and topographical mapping were reviewed to identify hydrologically connected aquatic features on adjacent lands that were inaccessible during the field assessments. On-site features were characterized based on in-stream and riparian cover, channel structure/morphology, substrates, flow, and hydrologic characteristics, as well as general documentation of channel instability, erosion/sedimentation, groundwater, and flow permanency indicators. If present, crossing features including bridges, culverts, and bed-level

crossings were noted and georeferenced in the field. Standard assessment methods and technical criteria referenced in the Ontario Stream Assessment Protocol (Ministry of Natural Resources and Forestry, 2017) were applied to wadeable streams. All identified aquatic features were assessed to determine their potential function as fish habitat, with consideration for sensitive, limiting, or critical habitat, such as spawning locations, overwintering habitat, and migratory corridors. Fish observations, habitat connectivity, and barriers to fish movement were documented, when present, to provide regional context to their function within the general aquatic network and sub-watershed.

3.3.4 Fish Community Sampling

Sampling methodologies for determining the presence, abundance, and distribution of fish within aquatic habitats vary depending on study objectives, habitat conditions, and target species. For all aquatic habitat sampling, Cambium employs sampling techniques in alignment with industry standards, based on guidance provided by applicable government agencies and ministries, and in accordance with manufacturers instructions for field equipment usage. All aquatic sampling was carried out by qualified Cambium staff, under the supervision of a qualified aquatic ecologist.

Fish community sampling was carried out a single representative site within aquatic features downstream of the Site. Community sampling on Site proved to be non-feasible due to dense vegetation limiting access, as well as shallow waters limiting the use of sampling equipment. In lieu of sampling equipment, Cambium ecologists walked the aquatic habitats to observe any frightened fish. The off-Site sampling occurred within a downstream portion of the same watercourse that flows through the Site. This location was the closest to the Site that permitted safe and legal access, as well as sufficient water depths to utilize sampling equipment.

3.3.5 Breeding Bird Surveys

Two breeding bird surveys were carried out during the peak breeding season between May 25 and June 1, 2023, the minimum of seven days apart. Point counts were completed using the OBBA Guide for Participants (Ontario Breeding Bird Atlas, 2001). Point count stations were

established in various habitat types and were combined with incidental observations to determine the presence, variety, abundance, and breeding evidence of species. As outlined in the OBBA protocol, point counts are to be done between dawn and five hours after dawn, when wind speed is low (<19 km/h) and in the absence of rain or thick fog. Surveys conducted outside of this five-hour window remain valid, provided that the protocol adjustment is documented and justifiable. All species observations (visual and auditory) were recorded at predetermined point count stations during a five-minute period. Observations were also documented between point count stations and were tabulated with the nearest station. Each species observed was classified and assigned a code based on the highest level of breeding evidence, as defined by the protocol: Confirmed, Probable, Possible or Observed. A description of breeding evidence classes is included in Table 4.

Table 4 OBBA Breeding Evidence Codes and Classes

Code	Description
CONFIRMED	
NB	Nest-building or excavation of nest hole by a species other than a wren or a woodpecker
DD	Distraction display or injury feigning
NU	Used nest or egg shells found (occupied or laid within the period of the survey)
FY	Recently fledged young (nidicolous species) or downy young (nidifugous species) incapable of sustained flight
AE	Adult leaving or entering nest site in circumstances indicating occupied nest
FS	Adult carrying fecal sac
CF	Adult carrying food for young
NE	Nest containing eggs
NY	Nest with young seen or heard
PROBABLE	
M	At least 7 individuals singing or producing other sounds associated with breeding (e.g., calls or drumming), heard during the same visit to a single square and in suitable nesting habitat during the species' breeding season.
P	Pair observed in suitable nesting habitat in nesting season
T	Permanent territory presumed through registration of territorial song, or the occurrence of an adult bird, at the same place, in breeding habitat, on at least two days a week or more apart, during its breeding season. Use discretion when using

Code	Description
	this code. “T” is not to be used for colonial birds, or species that might forage or loaf a long distance from their nesting site e.g., Kingfisher, Turkey Vulture, and male waterfowl
D	Courtship or display, including interaction between a male and a female or two males, including courtship feeding or copulation
V	Visiting probable nest site
A	Agitated behaviour or anxiety calls of an adult
B	Brood Patch on adult female or cloacal protuberance on adult male
N	Nest-building or excavation of nest hole, by a wren or a woodpecker
POSSIBLE	
H	Species observed in its breeding season in suitable nesting habitat
S	Singing male(s) present, or breeding calls heard, in suitable nesting habitat in breeding season
OBSERVED	
X	Species observed in its breeding season (no breeding evidence)

Source: Ontario Breeding Bird Atlas: Instructions for General Atlassing (Birds Canada, April 2021)

The NHIC database and SARO list were reviewed to determine the current provincial status for each bird species.

3.3.6 Winter Raptor and Stick Nest Survey

Visual surveys for winter use of the property by raptors were completed in accordance with a modified version of the Hawk Migration Association of North America (HMANA) protocol. A single survey was conducted during leaf-off conditions. The HMANA protocol was developed for long-term monitoring, and is not fully compatible with a site specific, short-term evaluation of use of a particular area. As such, the data collected by Cambium should be viewed as a snapshot in time, and not a reflection of overall or long-term migration patterns of raptors in the area. Sightings of raptors and habitat were noted, if applicable.

3.3.7 Amphibian Breeding Surveys

The presence of frog and toad breeding habitat was determined using auditory surveys following the Marsh Monitoring Program Participant’s Handbook for Surveying Amphibians

(Bird Studies Canada, 2008). According to the protocol, three amphibian surveys should be conducted between April and July, at least 15 days apart, in order to span the breeding seasons of all species that may be present in an area. Air temperature is the primary factor in determining survey dates, as different species call when air and water temperatures reach certain levels; therefore, nighttime air temperature should be greater than 5°C for the first survey, greater than 10°C for the second survey and greater than 17°C for the third survey. Other weather conditions are also taken into consideration. Conditions are considered appropriate when wind speed is low (<19 km/h; Beaufort Wind Scale of 3 or lower) and there is light or no precipitation occurring (high humidity is ideal but heavier rain can impact ability to hear and differentiate calls). Sample points are established during the first survey and re-visited during following surveys. At each sample point, calls from all species are aurally surveyed for three minutes and noted to the greatest extent possible, on a 100 m semi-circular area in front of the sampling station using call intensity codes established by the protocol:

- Code 0: No calls heard
- Code 1: Calls can be counted individually (calls do not overlap)
- Code 2: Calls overlap, but numbers of individuals can be estimated
- Code 3: Calls overlap and are continuous (full chorus); therefore, a count estimate is unreliable

Recommended monitoring windows for the Site (located between the 43rd and 47th parallels) are April 15-30, May 15-30, and June 15-30.

3.3.8 Wildlife Tree Surveys

Snag and cavity trees provide habitat for wildlife including a range of bird and mammal species. A snag or cavity tree is defined as a standing live or dead tree ≥10 cm diameter at breast height (DBH), with cracks, crevices, hollows, cavities and/or loose or naturally exfoliating bark appropriate for bat roosting. According to MNRF guidance, high quality or Maternity Roost Colony SWH is defined as woodlands with greater than 10 roost trees per hectare.

To determine if suitable habitat for bats existed on/or adjacent to the Site, Cambium staff conducted a bat maternity roost survey using the methods detailed in the *Bat and Bat Habitats: Guidelines for Wind Power Projects* (Ontario Ministry of Natural Resources, 2011) and the 2022 Update (MNRF, 2022). The protocol requires that for sites with ≤10 ha of deciduous or mixed treed forest or swamp ELC community types (i.e., FOD, FOM, SWD, SWM), a minimum of 10 randomly selected plots are to be surveyed, with an additional plot added per hectare, to a maximum of 35 plots for the project area. At each plot, the number of snag/cavity trees ≥10 cm DBH within a 12.6 m radius (0.05 ha) is to be recorded. A calculation is then made to determine the snag density and if the number of cavity trees found meets the criteria for maternity surveys.

3.3.9 Bat Acoustic Monitoring

Bat acoustic monitoring surveys were completed to determine, with reasonable certainty, the bat species present in the immediate area of the Site. Bat species were identified using analysis of sonographic characteristics from recordings of ultrasonic calls emitted by bats for echolocation. Survey methods were developed based on the MNR survey guidelines outlined in Bat and Bat Habitats: Guidelines for Wind Power Projects (2011) and current guidance provided by MECP for surveying SAR bats in Ontario (MNRF, 2022). Surveys were conducted using broadband bat detectors (Wildlife Acoustics Song Meters) appropriately placed in target habitats. Passive acoustic recorders were programmed to begin recording 30 minutes before sunset through 30 minutes after sunrise. Surveys were carried out in the month of June for 10 consectutive nights. Data was processed using equipment specific software to identify bats to species, to the extent possible. All calls, including unidentifiable calls, are reported in the survey data. The NHIC database and SARO list were reviewed to determine the current provincial status for all bat species identified.

3.3.10 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. Cambium staff actively searched for features that may provide specialized habitat for wildlife. These searches included inspecting tree cavities, overturning logs, rocks and debris, and scanning for scat, browse, sheds, fur, etc. Any evidence of breeding, forage, shelter, or nesting was noted. Species habitat and nesting observations were documented and photographed.

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 protected 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 5. Representative Site photos are included within the Photo Log in Appendix D. Survey stations/areas are shown on Figure 2.

Table 5 Summary of Field Investigations

Date	Time On Site	Atmospheric Conditions	Observer	Activities
2022-08-16	08:30-12:30	Air Temp: 20-28°C Wind: 1 Noise: 0 Sky: Clear	T. Jamieson	• ELC • Vegetation Inventory #1 • Wetland Delineation • Aquatic Habitat Assessment
2022-11-11	09:00-11:45	Air Temp: 9°C Wind: 0 Noise: 0 Sky: Clear	T. Jamieson	• Wildlife Tree and Snag-density Survey • Winter Raptor and Stick Nest Survey
2023-04-21	20:30-21:30	Air Temp: 14°C Wind: 2 Noise: 0, 2 Sky: Cloudy	C. Johnson	• Amphibian Breeding Survey
2023-05-16	17:00-22:00	Air Temp: 8°C Wind: 3 Noise: 1, 2 Sky: Clear	C. Johnson	• Amphibian Breeding Survey • Shoreline and Waterbody Assessment
2023-05-25	07:00-11:00	Air Temp: 4-13°C Wind: 1 Noise: 1 Sky: Clear	E. Silhanek	• Breeding Bird Survey #1 • ELC • Vegetation Inventory #2

2023-06-01	07:00-08:45	Air Temp: 18-24°C Wind: 0 Noise: 1 Sky: Clear	E. Silhanek	• Breeding Bird Survey #2 • Vegetation Inventory #3
2023-06-20	21:15-22:15	Air Temp: 18-20°C Wind: 0 Noise: 0 Sky: Clear	C. Johnson	• Amphibian Breeding Survey
2024-06-10 and 2024-06-21		Variable	T. Jamieson and B. Hnatiw	• Check for sensitive features along road • Set up Bat Monitors • Retrieve Bat Monitors
2024-09-23	10:00-18:00	Air Temp: 18-22°C Wind: 2-3 Noise: 1 Sky: Cloudy	A. Alaimo and C. Johnson	• Rapid Aquatics • Fish Community Sampling • Wetland Delineation

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 elevation on Site ranges from 215 - 240 masl, with a steep slope towards the middle of the Site. The Site gently slopes downward to the southeast towards the areas with the wetland and watercourses, and to the southwest within an upland wooded area.

4.1.1 Historical Land Use

A review of historical aerial imagery for the Site area indicates in 1964 approximately 50% of the Site was cleared and used for agricultural purposes (Trent University Library & Archives, 1959). Community 4, 5 and 6 were completely cleared and most of 3 was cleared. Only the northeast portion of community 6 was cleared with the western and southwest corner of Site forested. Imagery from 2006 shows the Site entirely forest and represents current imagery.

4.2 Surface Water and Drainage Features

Field investigations confirmed the presence of two surface water features on Site; a unnamed watercourse and an unmapped drainage feature.

The unnamed watercourse originates from 3 ditches on adjacent lands to the north of Site. This watercourse enters the Site from the northeast corner in community 5, flows southwards through the wetland associated with community 4, and exits the Site towards the southeast corner through a subsurface culvert (Figure 2). The watercourse continues southeast at both surface level and subsurface for approximately 1 km until it discharges into the Indian River.

The substrates of the three ditches north of the Site consisted of approximately 90% detritus and 10% silt. Shore cover was minimal with in-water habitat consisting of woody debris, organic debris or no functional habitat present. The vegetation predominantly consisted of wetland species such as cattails, Reed Canarygrass (*Phalaris arundinacea*), Red-osier Dogwood (*Cornus sericea*), and various willow species.

Throughout the Site, the watercourse can be generally characterized as having shallow depths and minimal flows. At the upstream limits in community 5, the watercourse was well defined and notably wider than other sections. The watercourse was approximately 2.5 m wide, with depths ranging from 2-6cm, with minimal flow, substrates of sand, silt, and organic detritus. Banks were vegetated with woodland and common riparian species, whereas the watercourse remained open.

Within community 4, the watercourse becomes less defined with no defining channel in many areas. The watercourse here is characterized by very dense wetland vegetation growth

covering most of the watercourse. By the time of the September 2024 visit, most of the watercourse was noted as being covered by vegetation overhang. Open water and channel definition were more present towards the southern limits of the watercourse on Site. Early season visits post-snow melt and prior to new growth may determine more areas of channel definition. Water depth ranged from 0 – 10 cm, with minimal flow. Many areas were noted as being almost stagnant. At the downstream culvert where the watercourse exits the site, stagnant water of 2 – 4 cm deep was noted within the culvert, but no water was present in the watercourse in the immediate area.

The unmapped drainage feature was found in community 3 (Figure 2). This feature runs parallel to the east side of an existing trail extending north-south before outletting into community 3 and its associated watercourse. This feature drains in a southernly/easternly direction. Based on the earthen berms and banks, the drainage feature is likely anthropogenic in nature likely originally serving as a dug drainage ditch. A field visit on August 16, 2022, confirmed that this drainage feature was dry, whereas the visit on September 23, 2024, identified flowing and stagnant water. Water within the feature was noted as 2 – 6 cm deep, 1.5 – 2 m wide, with very slow flows. Substrates were mostly comprised of fines and organics. Steep banks were vegetated with woodland and common riparian species, whereas the watercourse remained open. It is worth noting that during the September 2024 visit, heavy rain occurred prior to arrival on Site, but did not rain during the field visit. It was observed that the flow and depth within the drainage feature were notably shallower and slower towards the end of field visit.

The watercourse was investigated off Site and downstream of the property, as part of the Fish Habitat Assessment portion of the field studies. Through this, a perched culvert (20 cm) was identified where the watercourse passes under Pinecrest Avenue, approximately 220 m southeast of Site. The watercourse was further identified at surface level where it passes through a culvert under Regional Road 2, just west of Regional Road 34, in Town of Keene. The ditch upstream of the culvert was noted as being densely vegetated, similar to the watercourse on Site. At the input of the culvert, water was noted as being approximately 10 – 15 cm deep with a steady flow.

A field visit on August 16, 2022, confirmed that the watercourse and drainage feature on Site to be dry, whereas the field visit on September 23, 2024, confirmed the presence of surface water (standing and flowing) throughout. As such, these features are likely functioning as intermittent features driven by snowmelt and precipitation. Two local residents encountered in passing during the September visit mentioned that the watercourse *on Site* is generally known to dry up most years, whereas a local resident downstream of the Site noted that water continuously flows year-round in the watercourse where it passes under Regional Road 2 in the Town of Keene.

These findings collectively suggest that surface water features on Site are more likely influenced by precipitation events rather than groundwater inputs. Additional surface and groundwater inputs outside of the study area are likely contributing more heavily to downstream flows than the on-Site features.

4.3 Wetlands

Provincial mapping depicts an unevaluated wetland among the eastern portion of the Site, situated east of the new roadway (Figure 2).

The wetland on Site consisted of two different wetland community types - White Cedar Mineral Coniferous Swamp (community 3 – SWC) and Red-osier Mineral Thicket Swamp (community 4 – SWT2-5). The coniferous swamp occupies the majority of the eastern half of the Site, confined between the new roadway to the west and the thicket swamp to the east. The thicket swamp is situated towards the eastern extents of the Site and is directly associated with the unnamed watercourse, as previously described.

Field verified wetlands are relatively consistent with mapped wetlands with some discrepancies towards its western and southern boundaries.

The majority of the discrepancies were associated with the coniferous swamp (community 3). The field investigation determined that the wetland boundary extends further to the west, generally present within 3 m of the new roadway. Upland areas were identified towards the south of community 3, in sections mapped as wetland. These new upland areas were noted as

being at higher elevations, with soil profiles and vegetation reflective of upland communities, and are represented by communities 7, 8, and 9.

The field investigation determined that the thicket swamp (community 4) extends all the way to the southern property line whereas the mapping shows it ending approximately 56 m north of the property lines.

The wetland boundary was ground-truthed concurrent with ELC surveys, and then refined on subsequent visits targeting wetland delineations. Vegetation was the determining feature for marking the wetland boundary, supported by soil profile analysis. Further community descriptions are provided below in Section 4.4. The wetland boundary was GPS-marked (Figure 2 and Figure 3).

4.4 Vegetation Communities and Species

The vegetation communities on the Site are summarized in Table 6 and are mapped on Figure 2. A list of identified species and representative photos for each community are provided in Appendix E.

Table 6 Vegetation Communities

No.	ELC Code	Community Description	Community Type	S -Rank
1	FOD5-2	Fresh Sugar Maple-Beech Deciduous Forest	Terrestrial	S5
2	CUM1	Mineral Cultural Meadow	Cultural	SNA
3	SWC1-1	White Cedar Mineral Coniferous Swamp	Wetland	S5
4	SWT2-5	Red-osier Mineral Thicket Swamp	Wetland	S5
5	CUW	Cultural Woodland	Cultural	SNA
6	FOM4-2	Dry-Fresh White Cedar-Aspen Mixed Forest	Terrestrial	S5
7	FOM7-1	Moist-Fresh White Cedar – Sugar Maple Mixed Forest	Terrestrial	S5

8	FOM2-2	Dry-Fresh White Pine – Sugar Maple Mixed Forest	Terrestrial	S5
9	CUM	Cultural Meadow	Cultural	SNA

Community 1 is a forested community dominated by Sugar Maple (*Acer saccharum*) and to a lesser extent, Eastern Hop-Hornbeam (*Ostrya virginiana*) and American Beech (*Fagus grandifolia*). Associates included Northern Red Oak (*Quercus rubra*) and White Ash (*Fraxinus americana*). Understory was minimal but when present included Alternate Leaved Dogwood (*Cornus alternifolia*), and Eastern Prickly Gooseberry (*Ribes cynosbat*). Groundcover species included Poison Ivy (*Toxicodendron radicans*), White Trillium (*Trillium grandiflorum*), Red Raspberry (*Rubus idaeus*) and Large False Solomon's Seal (*Maianthemum racemosum*). Invasive species were identified throughout the community and included European Buckthorn (*Rhamnus cathartica*) and European Swallowwort (*Vincetoxicum rossicum*). This community slopes gently to the southeast with a steep slope along the eastern limit. There were old trails throughout this community.

Community 2 is a cultural meadow dominated by grass species which included Smooth Brome (*Bromus inermis*) and Orchard Grass (*Dactylis glomerata*). This community contained a lot of European Swallowwort and some Tatarian Honeysuckle (*Lonicera tatarica*), both of which are invasive species. This community occurs within the northern limit of Site and continues onto adjacent lands.

Community 3 is a swamp community dominated by Eastern White Cedar (*Thuja occidentalis*) with Balsam Poplar (*Populus balsamifera*), Trembling Aspen (*Populus tremuloides*) and White Elm (*Ulmus americana*) associates. Understory was dense, mainly with young Eastern White Cedar and to a lesser extent Red-osier Dogwood (*Cornus sericea*). Ground cover was minimal but when present, included Purple-veined Willowherb (*Epilobium coloratum*), Sensitive Fern (*Onoclea sensibilis*), Spotted Jewelweed (*Impatiens capensis*) and American Water-horehound (*Lycopus americanus*). Black Ash (*Fraxinus* nigra), an Endangered tree species were identified in this swamp. Black Ash specimens were noted to be in generally poor health, impacted by Emeral Ash Borer (EAB), an invasive pest known to target Ash trees. Small hummocks of

upland species were present throughout this community. Two dug ponds were present in the southern portion of this community, with spoil piles from excavation creating an upland berm. The previously described drainage feature is present in this community.

Community 4 is a swamp thicket community dominated by Red-osier dogwood and to a lesser extent Bebb's Willow (*Salix bebbiana*), Pussy Willow (*Salix discolor*) and Meadow Willow (*Salix petiolaris*). Tree species included Eastern White Cedar and White Elm when present. Groundcover was dominated by Broad-leaved Cattail (*Typha latifolia*), Tall Goldenrod (*Solidago altissima*), Grass-leaved Goldenrod (*Euthamia graminifolia*) and to a lesser extent Purple Loosestrife (*Lythrum salicaria*). Purple Loosestrife is an invasive species. This community was mainly dominated by shrub species, but with less shrub cover among the northern extent. The previously described unnamed watercourse is present within this community. Vegetation within the watercourse is also reflective of the general vegetation found elsewhere in the community.

Community 5 is a forested community that is cultural in nature. The community is a mix of tree species with equal proportions of Eastern White Cedar, Paper Birch (*Betula papyrifera*), Eastern Red Cedar (*Juniperus virginiana*), and Trembling Aspen (*Populus tremuloides*). Understory was dense dominated by Eastern White Cedar saplings and Grey Dogwood (*Cornus racemosa*), with few Staghorn Sumac (*Rhus typhina*) present. Groundcover was sparse due to the density of the understory but when present included Virginia Creeper (*Parthenocissus quinquefolia*), Poison Ivy, Common Self-heal (*Prunella vulgaris*) and Tall Goldenrod.

Community 6 is a mixed forest community dominated by Eastern White Cedar and to a lesser extent Trembling Aspen, Sugar Maple, Black Cherry (*Prunus serotina*) and White Ash. Understory was minimal but when present included European Buckthorn and Grey Dogwood (*Cornus racemosa*). The groundcover was sparse but was mainly Riverbank Grape (*Vitis riparia*) and Virginia Creeper. This community is present towards the north of the Site on a steep slope, as well as a thin band along the eastern side of the new roadway.

Community 7 is an upland mixed forest community dominated by Eastern White Cedar and Sugar Maple. Other tree constituents include White Ash, Green Ash (*Fraxinus pennsylvanica*) Paper Birch, White Elm, and White Pine. The shrub layer is dominated by European Buckthorn. Ground cover vegetation in this community is sparse, mostly consisting of saplings of the identified tree species.

Community 8 is an upland mixed forest community dominated by White Pine, and Sugar Maple to a lesser extent. The understory is dominated by Eastern White Cedar, with White Ash and Black Cherry occupying the remainder of the shrub layer. Ground cover in this community is sparse. This community is located in a thin band towards the south of the Site, and is characterized by a notable increase in elevation from the adjacent communities.

Community 9 is an open cultural meadow, dominated by a variety of grasses. Trees are absent from this community. Where present, shrubs include White Pine, American Beech, and Apple (*Malus sp.).*

No provincially rare vegetation communities were observed on the Site and adjacent lands. No at-risk or provincially rare (S1, S2, S3) vegetation communities were identified on the Site. A search for Butternut (*Juglans cinerea*; provincially endangered) was completed as part of the vegetation survey; no Butternut trees were identified. As previously mentioned, a single provincially endangered tree species was identified on Site, Black Ash. Vegetation species of conservation concern are discussed further in Section 4.10.

4.4.1 Soil Characterization

A summary of the soils conditions on the Site is provided in Table 7.

Table 7 Summary of Soil Conditions

Station	Community No. and ELC Code	Soil Description	Effective Texture	Moisture Regime
1 (November 11, 2022)	Community 3 (SWC1-1)	Sampled to a depth of 85 cm. Silty very fine sand to 43 cm over silty clay loam. Horizon appeared brown to 20 cm and then soil appeared red for remainder of the horizon. Mottles encountered at 25 cm. No gleying observed. Water table not encountered. Less than 5 cm organics.	Silty very fine sand (3)	Moist (5)
2 (November 11, 2022)	Community 3 (SWC1-1)	Sampled to a depth of 90 cm. Organics to 25 cm over very fine sandy loam. Mottles encountered at 0 cm. No gleying observed. Water table not encountered.	Very fine sandy loam (3)	Very Moist (6)
1 (September 23, 2024)	Community 7 (FOM7-1)	Sampled to a depth of 120 cm. Sandy loam to 26 cm, over loamy sand to 55 cm, over silty clay to 120 cm. Mottles appear at 35 cm, gleys appear at 58 cm. Water table at 100 cm.	Loamy Sand (2)	Moist (5)
2 (September 23, 2024)	Community 3 (SWC1-1)	Sampled to a depth of 36 cm, refusal at till/loose substrate. Silty clay loam to 25 cm, over silty clay to 36 cm. Upper layer noted as dark black and very wet. Mottles and gleys appear at 27 cm. Water table at 29 cm, noted to be rising throughout sampling.	Silty Clay (5)	Very Moist (6)
3 (September 23, 2024)	Community 3 (SWC1-1)	Sample to a depth of 65 cm, refusal at cobble. Silty clay loam to 30 cm, over sand to 65 cm. Upper layer noted as dark black and very wet. Mottles at 31. Gleys not observed. Water table at 30 cm. Similar characteristics to soil sample 5.	Intermediate	Moist (5)

4 (September 23, 2024)	Community 8 (FOM2-2)	Sampled to a depth of 120 cm. Sandy loam to 25 cm, over silty sand to 58 cm, over coarse sand to 120 cm. B horizon divided into two subsections based on differences in colour, still have same properties. Mottles at 56 cm. Gleys not present. Water table not present.	Silty Sand (2)	Moderately Moist (4)
5 (September 23, 2024)	Community 3 (SWC1-1)	Sample to a depth of 65 cm, refusal at cobble. Silty clay loam to 30 cm, over sand to 65 cm. Upper layer noted as dark black and very wet. Mottles at 31. Gleys not observed. Water table at 25 cm. Similar characteristics to soil sample 3.	Intermediate	Moist (5)
6 (September 23, 2024)	Community 7 (FOM7-1)	Sample to a depth of 60 cm, refusal at tree roots. Silt to 43 cm over sandy loam to 60 cm. Mottles at 59 cm, minimal, very faint. No gleys or water table encountered.	Intermediate	Moderately Mosit (4)
7 (September 23, 2024)	Community 7 (FOM7-1)	Sample to depth of 100 cm. Silty loam to 18 cm, over silt to 58 cm, over silty clay loam to 100 cm. Mottles at 58 cm. No gleys or water table present.	Silt (5)	Moderately Moist (4)
8 (September 23, 2024)	Community 3 (SWC1-1)	Sample to depth of 100 cm, no refusal, difficult to turn auger. Silty loam to 20 cm, over silty clay to 100 cm. Mottles at 21 cm, gleys at 50 cm. Water table not encountered.	Silty Clay (5)	Very Moist (6)

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). Planning authorities are

responsible for protecting significant woodlands within Ecoregions 6E and 7E in accordance with policies 2.1.4(b) and 2.1.6 of the PPS.

4.5.1 Evaluation of Local Criteria

The Township of Otonabee-South Monaghan does not currently map significant woodlands. Section 3.7.3.7 of Official Plan (OP) states:

> "*Wooded areas within the Township have not yet been evaluated to determine their significance. This Plan may be amended accordingly to recognize significant woodlands when mapping of these features is available. Once identified, development and/or site alteration shall not be permitted in or adjacent to (within 120 metres) of significant woodlands unless it has been demonstrated that there will be no negative impacts on the woodland or its ecological functions* (Township of Otonabee-South Monaghan, 2017)*."*

The County of Peterborough Official Plan does not map significant woodlands. The OP states:

> "*Local Plans may permit development and Site alteration in significant woodlands south and east of the Canadian Shield"* (County of Peterborough, 1994).

In the absence of municipal significant woodland mapping and evaluation criteria, the Natural Heritage Reference Manual (NHRM) (Ministry of Natural Resources, 2010) was guided an assessment of Significance for the woodland on Site.

4.5.2 Evaluation of NHRM Criteria

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. In the absence of local criteria for evaluating woodlands, the 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 8. To be considered significant, a

woodland must meet the minimum standard for any one of the criteria listed in Table 8 *and* 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 the County of Peterborough is comprised of woodland cover; the column in Table 8 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 8 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	**Yes**
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	**Yes**
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	N/A

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

4.5.2.1 Woodland Size Criteria

The woodland size criterion is based on the scarcity of woodlands within the planning region, with different thresholds for significance depending on the percent cover of woodlands. Woodlands on Site do not meet defining criteria but contribute to contiguous woodlands. The

contiguous woodlands that cover the Site and surrounding area is approximately 48 ha. The woodlands that covers the Site do not meet the minimum 50 ha threshold to be considered significant.

4.5.2.2 Ecological Functions Criteria

There are five sub-criteria included under the ecological functions, each with a set of recommendations. A minimum size threshold is also applied to some of these criteria, which can range from 0.5-20 ha.

a) Woodland interior

Woodland interior habitat is defined as habitat that is more than 100 m from an edge and meeting the relevant area threshold for the planning area. The approximate interior habitat for the contiguous woodlands that cover the Site was 4.78 ha. The woodlands that cover the Site do not meet the minimum 8 ha threshold to be considered significant.

b) Proximity to other woodlands or other habitats

This criterion refers to the proximity of the woodlands to other significant natural heritage features or to fish habitat. The woodlands on Site contained a watercourse and an unevaluated wetland. There were no other significant natural heritage features with 30 m of these woodlands. The woodlands contain potential fish habitat and are greater than the minimum size threshold of 10 ha. Therefore, the woodlands are considered significant based on this criterion.

c) Linkages

This criterion recognizes the importance of connecting features within a natural heritage system. The woodland does not provide a connecting link to any significant features within 120 m of the contiguous woodlands that cover the Site. Based on this criterion, the woodlands would not be considered significant.

d) Water protection

This criterion seeks to protect woodlands that provide water quality benefits by being located on or within 50 m of a sensitive or threatened watershed, groundwater discharge/recharge, headwater areas, watercourses, and fish habitat. The County of Peterborough GIS maps the east portion of Site (covers most of community 1) as source water protection. Map 12 from the Township of Otonabee-South Monaghan OP maps the same area as wellhead and wellhead protection areas. The contiguous woodlands also contained multiple watercourses on Site and > 120 m away from Site. The woodlands exceed the minimum threshold of 4 ha and are considered significant under this criterion.

e) Woodland diversity

This criterion seeks to identify woodlands with rare or uncommon species or community composition or woodlands with high native diversity. No uncommon or rare species were observed in the portions of woodlands that cover the Site. The woodlands on Site were young to mid-aged and show past signs of disturbance. There were invasive species present including European Buckthorn, European Swallowwort, and Tartarian Honeysuckle present throughout the woodlands on the Site. Based on this criterion, the woodlands would not be considered significant. A full vegetation list for the communities present in the woodlands on Site are available in Appendix E.

4.5.2.3 Uncommon Characteristics Criteria

The recommendations of the uncommon characteristics criterion were reviewed. The vegetation communities present on Site were neither rare or uncommon. The woodlands on Site show signs of past disturbance and range from young to mid age. No uncommon characteristics were found within the woodlands on the Site. Based on this criterion, the woodlands would not be considered significant.

4.5.2.4 Economic and Social Functional Values Criteria

The recommendations of the economic and social functional values criterion were reviewed; no economic value for the contiguous woodlands that cover Site are known to exist. There is a

trail that transverses community 5 in the northwest corner of Site. This property is privately owned and presumed that the trail does not provide social value beyond the owner's current use. Based on this criterion, the woodlands would not be considered significant.

4.5.2.5 Summary

Based on the NHRM criteria for determining significant woodlands; the contiguous woodland that covers the Site (Communities 1, 3, 6, 7 and 8) is considered significant because it meets the criteria for proximity to other woodlands or other habitats and water protection.

4.6 Wildlife and Wildlife Habitat

A preliminary assessment of the site was undertaken to establish a suitable field program, followed by subsequent appropriate wildlife surveys. Targeted surveys included breeding birds, amphibian surveys, bat acoustic surveys, and a fish habitat assessment, in addition to incidental wildlife observations. The following sections describe key findings during the each of the respective surveys.

4.6.1 Birds

Breeding bird surveys were completed at three stations, with the intent to sample species within the woodland, wetland and open communities.

The bird species detected, in addition to observed breeding evidence, and respective protection statuses are provided in Appendix F. A total of seven had probable or confirmed breeding evidence (shaded cells in Appendix F). Species with probable or confirmed breeding evidence **on the Site** included:

- American Goldfinch (*Spinus tristis*);
- Eastern Wood-pewee (*Contopus virens*);
- Great Crested Flycatcher (*Myiarchus crinitus*);
- Northern Cardinal (*Cardinalis cardinalis*);
- Northern Flicker (*Colaptes auratus*);

- Red-eyed Vireo (*Vireo olivaceus*); and,
- Red-winged Blackbird (*Agelaius phoeniceus*)

Tree cavity nesting surveys were completed as a part of the Study to determine whether nest protections outlined in the MBR apply to the Site. A total of three candidate cavity trees were identified and further considered. The absence of repeat occurrence during both breeding bird surveys indicate that these cavities do not support *probable* or *confirmed* nesting habitat.

Visual surveys for winter use of the property by raptors were completed in accordance with a modified version of the Hawk Migration Association of North America (HMANA) protocol. No evidence was observed suggesting the winter use of the woodlands on Site by raptor species.

Two species of Special Concern were detected during surveys, namely, Eastern Wood-pewee and Wood Thrush (*Hylocichla mustelina*). Wood Thrush was considered unlikely to be breeding on site given the single occurrence, whereas Eastern Wood-pewee was confirmed on two occasions, suggesting nesting potential within the woodland and/or treed swamp.

Details on species of conservation concern and their protected habitats are provided in Section 4.10.

4.6.2 Amphibians

Amphibian breeding surveys were completed at three survey stations (Figure 2). While surveys were completed in accordance with the protocol described in Section 3.3.7, no individuals were heard calling. It does remain possible that individuals may utilize the wetland community for breeding; however, the presence of large populations is unlikely.

4.6.3 Mammals

Mammals were detected during both targeted bat habitat assessment and incidental observations. Incidental observations included: Eastern Gray Squirrel (*Sciurus carolinensis*), Deer (*Odocoileus virginianus*) Scat, and Racoon (*Procyon lotor*) tracks. Targeted surveys are discussed below.

4.6.3.1 Bat Habitat Assessment

Snag Density Surveys

Bat habitat was assessed in accordance with methodologies to satisfy review for SWH.

The treed habitats on Site were assessed for habitat suitability. A total of ten plots were selected within Community 1. Ecosites sampled correspond to those identified as candidate SWH ecosites (Ministry of Natural Resources and Forestry, 2015) including deciduous and mixed treed communities. Each plot is 0.05 ha in size, covering a total area surveyed of 0.5 ha. Field investigation observed 3 candidate roost trees. Individual trees that met the criteria were marked with a hand-held GPS unit (Figure 2). The number of potential bat maternity roost trees observed at the Site was then divided by the area surveyed. The density of candidate bat maternity roost trees was 6 trees/ha. Community 1 did not meet the provincial threshold of 10 trees/ha and did not qualify as SWH for bat maternity roosting. Bat maternity SWH will not be discussed further.

Bat Acoustic Surveys

To assess the site for SAR bats and candidate habitat, acoustic monitoring was undertaken in June 2024.

A total of 6 acoustic monitoring stations were placed throughout Community 1 (Figure 2). Table 9, below, provides a summary of geographic coordinates, installation dates, and retrieval dates, for all stations.

Table 9 Bat Acoustic Monitoring Station Summary

Survey Station	Date Installed	Date Retrieved	UTM Coordinates	
			Easting	Northing
AD1	June 11, 2024	June 21, 2024	725973.842	4902865
AD2	June 11, 2024	June 21, 2024	725972.61	4902805
AD3	June 11, 2024	June 21, 2024	725896.307	4902785
AD4	June 11, 2024	June 21, 2024	725913.039	4902680
AD5	June 11, 2024	June 21, 2024	725953.11	4902627
AD6	June 11, 2024	June 21, 2024	725901.618	4902610

Passive acoustic monitoring on the Site occurred between June 11, 2024, and June 21, 2024. Recordings were made using 6 Wildlife Acoustics Song Meter Mini Bat Ultrasonic Recorders. Devices were deployed at a given monitoring station for at least 10 days/nights, prior to being retrieved. Acoustic monitoring devices were configured to begin recording 30 minutes prior sunset and end recording 6 hours after the start of recording.

Cambium used the automatic species identification feature of the Wildlife Acoustics Kaleidoscope Pro Version 5.6.8 software package to analyze all ultrasonic recordings. The data was analyzed using the Auto ID for Bats of North America 5.4.0 Ontario feature, and the batch processing option. Auto ID feature settings were selected as follows:

- Bats of North America 5.4.0 (Ontario Region)
- Minimum to Maximum Frequency Range = 8-120 kHz
- Minimum and Maximum length of detected pulses = 2-500 ms
- Maximum inter-syllable gap = 500 ms
- Minimum number of pulse = 2

The Kaleidoscope Pro Auto ID feature assigns p-values to each group of species-assigned recording events. These p-values provide a measure of the likelihood that a specific bat species was present in the recording area. A p-value <0.05 indicates a high probability of species presence. A p-value >0.05 and <0.1 indicates a medium probability of species

presence. According to the software developer/publisher, a p-value >0.1 is indicative of a false positive.

A total of 1135 events (i.e., acoustic recordings) were documented on the Site during the monitoring period. Of these, 925 events (81.5%) were linked to specific bat species by the Auto ID feature. The remaining 210 events (18.5%) were not successfully linked to a specific bat species (e.g. incomplete recording, recording interference) and were therefore not considered further.

Based on the positive Auto ID results, a total of seven bat species were identified on the Site over the course of the monitoring period. Four species not afforded protection under the ESA were documented, namely, Big Brown Bat, Eastern Red Bat, Hoary Bat and Silver-haired Bat.

Three of the bat species confirmed, including, Little Brown Myotis, Northern Myotis and Tricolored Bat, are provincially listed as ‘endangered’ and are afforded protection under the ESA.

It is noted that while Eastern Red Bat, Hoary Bat and Silver-haired Bat are not currently provincially listed, the Committee on the Status of Species at Risk in Ontario (COSSARO) issued an annual report in 2023, suggesting a future endangered designation for these three species.

A summary of the 925 species-linked events documented through the assessment is appended (Appendix F). Of these events, 680 (73.5%) were identified as Big Brown Bat, 132 (14%) as Hoary Bat, 69 (7.5%) as Little Brown Myotis, 34 (4%) as Silver-haired Bat, 4 (0.4%) as Eastern Red Bat, 4 (0.4%) as Northen Myotis and 2 (0.2%) as Tri-colored Bat. Overall, 8% of the acoustic events identified to species were associated with SAR that are afforded protection under the ESA.

It is important to recognize that the number of events recorded for each species does not necessarily correlate with individual bat numbers. A single individual could pass by a given acoustic monitoring device multiple times in one evening, resulting in numerous “events”.

Based on these results, bat activity on the Site appears to be dominated by a common species, Big Brown Bat, with Hoary Bat as the second highest.

Low p values were found for Tri-coloured Bat for all occurrences, and Northern Myotis and Little Brown Myotis at some of the stations. The station with the highest confidence includes:

- Northern Myotis at AD1 and AD6; and,
- Little Brown Myotis at AD4 and AD5.

Little Brown Myotis detections at AD4 represents only a small percentage (30%), while stations among the periphery of the woodland (AD1, AD5 and AD6) represent the highest activity. It is anticipated that most of the detections at the periphery stations represent foraging activity among the adjacent open areas. As previously noted, the same individual may be detected by the same or nearby unit on multiple occasions, so it's difficult to say with confidence the abundance of any one species.

4.7 Fish and Fish Habitat

Aquatic habitat surveys were carried out on August 16, 2022, May 16, 2023, and September 23, 2024, to determine if the surface water features in the Study Area had potential to support fish and fish habitat.

As discussed in Section 4.2, the field visit on August 16, 2022, confirmed the watercourse and drainage feature on Site to be dry, whereas the field visit on September 23, 2024, confirmed the presence of surface water (standing and flowing) throughout. The field visit on May 16, 2023, found shallow water (approximately 10 cm) in the ditches that discharge into the watercourse upstream of the Site, but did not assess any features on Site. As previously mentioned in Section 4.2, heavy rain occurred prior to arrival on Site, but did not rain during the September 2024 field visit. It was observed that the flow and depth within the drainage feature were notably shallower and slower towards the end of field visit. As such, surface water features on Site are likely functioning as intermittent features driven by snowmelt and precipitation.

Targeted fish presence/absence surveys were conducted during the September 23, 2024, visit. As previously mentioned in Section 3.3.4, fish sampling within the Site was not feasible due to dense vegetation and shallow waters. Based on previous visits, it was theorized that the observed small pockets of standing water may dry between trap placement and retrieval, with the potential of causing fish mortality. In lieu of on Site sampling, Cambium ecologists walked the on Site aquatic habitats to observe any frightened fish. No fish were observed during this visit, and none were noted during any of the previous aquatic surveys.

In absence of sampling locations on Site, the watercourse downstream of the Site was investigated for suitable fish sampling locations. A single location that was accessible, with enough open water and sufficient depths, was identified at a culvert passing under Regional Road 2, just west of Regional Road 34, in Town of Keene A baited minnow trap was deployed at this location from 13:15-18:00 (4.75 hours). No fish or other bycatch (invertebrates, crustaceans, amphibians, etc.) were captured.

The downstream assessment also identified a perched culvert (20 cm) under Pinecrest Avenue, approximately 220 m downstream of Site and 170 m upstream of the fish sampling location. This barrier to fish passage is likely to limit the possibility of fish accessing and utilizing the watercourse on Site for potential habitat and providing a disconnect between the watercourse on Site and Indian River.

The lack of confirmed fish presence based on challenging sampling habitat does not preclude the presence of fish. However, based on the collective observations including lack of water permanency, dense vegetation, general lack of habitat, and barriers to fish passage, suggests that surface water features on Site are unlikely to provide direct permanent year-round fish habitat. Features on Site may contribute to indirect fish habitat providing additional flows for downstream habitats.

4.8 Significant Wildlife Habitat

The NHRM includes high level guidance for identifying SWH, which is further refined in the Significant Wildlife Habitat Technical Guide (SWHTG) and the Significant Wildlife Habitat Criteria Schedules (SWHCS) (MNRF, 2000; MNRF, 2015a). These documents are the basis

for identifying areas and features that are considered SWH by the province and were used in this study to determine SWH at the Site and on adjacent lands.

There are four general categories of significant wildlife habitat: seasonal concentration areas, rare vegetation communities or specialized habitats for wildlife, species of conservation concern, and animal movement corridors. Each category includes several different types of SWH.

The table provided in Appendix G outlines all the types of SWH that are to be considered in ecoregion 6E according to the SWHCS, and includes an assessment of whether or not the criteria for ‘candidate’ SWH is present at the Site for each type (i.e., presence/absence of listed ELC ecosite codes and/or habitat criteria). Where ‘candidate’ SWH is present at the Site, the table goes on to compare the habitats and results of field surveys at the Site to the defining criteria as listed in the SWHCS to determine presence/absence of ‘confirmed’ SWH. Where ‘confirmed’ SWH is identified through the analysis presented in Appendix G, those types of SWH are discussed below in the context of the proposed development. Where presence of ‘confirmed’ SWH can not be ruled out, a conservative approach has been implemented by identifying ‘candidate’ SWH.

4.8.1 Seasonal Concentration Areas

Seasonal concentration areas are areas where wildlife occur in aggregations at certain times of year. Examples include concentrations of wildlife during migration, hibernation, wintering areas or specialized breeding areas for colonial species.

The SWHCS for ecoregion 6E identifies the following types of seasonal concentrations of animals that may be considered significant wildlife habitat:

- Waterfowl stopover and staging areas (aquatic and/or terrestrial)
- Shorebird migratory stopover areas
- Raptor wintering areas
- Bat hibernacula

- Bat maternity roost colonies
- Turtle wintering areas
- Reptile hibernaculum
- Colonially nesting bird breeding habitat (bank / cliff)
- Colonially nesting bird breeding habitat (tree / shrub)
- Colonially nesting bird breeding habitat (ground)
- Migratory butterfly stopover areas
- Landbird migratory stopover areas
- Deer yarding and winter congregation areas

The following text provides a discussion of the ‘candidate’ or ‘confirmed’ types of seasonal concentration area SWH from the above list that have been identified at the Site or on adjacent lands based on the analysis presented in Appendix G.

Bat Maternity Roost Colonies

While the snag density survey did not satisfy the threshold to suggest SWH, acoustic surveys completed as part of the SAR assessment did confirm the presence of Big Brown Bat and Silver-haired Bat, both indicator species of SWH. Only a few passes represent Silver-haired bat occurrence, while Big Brown Bat represent most passes. As mentioned above, the number of passes or unique detections by an acoustic unit does not necessarily relate to the number of individuals.

The minimum threshold to confirm bat maternity colony SWH requires confirmation of use of more than 10 Big Brown Bats or more than five Adult Female Silver-haired bats. Given the absence of snags and low acoustic detection of Silver-haired bats, it is anticipated SWH criteria for this species would not be satisfied. However, the Big Brown Bat activity attributed to open and foraging areas, may presumably attract bats from nearby roosting habitats on and off site. As such, the presence of Big Brown Bat may suggest the potential for candidate maternity colony SWH.

Candidate Bat Maternity Colonies SWH is present on and adjacent to the site.

A discussion of impacts as it relates to the proposed development is detailed in Section 5.0.

4.8.2 Rare Vegetation Communities or Specialized Habitats for Wildlife

4.8.2.1 Rare Vegetation Communities

Rare vegetation communities are those that are considered rare in the province (communities assigned an SRANK of S1 to S3 (extremely rare to rare-uncommon) by the NHIC) as well as vegetation communities that may be rare in a planning area. Such habitats are considered more likely to support rare species of plants or wildlife. Rare vegetation communities to be considered in ecoregion 6E are:

- Cliffs and talus slopes
- Sand barren
- Alvar
- Savannah
- Tallgrass prairie
- Other communities considered provincially rare
- Old growth forests

No types of rare vegetation community SWH from the above list have been identified at the Site based on the analysis presented in Appendix G.

4.8.2.2 Specialized Habitats for Wildlife

Specialized habitats are those habitats that support wildlife during a critical part of the life processes, primarily during breeding, but also includes specific features or micro-habitats, such as seeps. Specialized habitats that are to be considered in ecoregion 6E are:

- Waterfowl nesting areas
- Bald eagle (*Haliaeetus leucocephalus*) and osprey (*Pandion haliaetus*) nesting, foraging and perching habitat
- Woodland raptor nesting habitat
- Turtle nesting areas
- Seeps and springs
- Amphibian breeding habitat (woodland / wetland)
- Woodland area sensitive bird breeding habitat

No specialized habitats for wildlife SWH from the above list have been identified at the Site based on the analysis presented in Appendix G.

4.8.3 Habitat for Species of Conservation Concern

Habitat for species of conservation concern (SCC) includes certain habitats for groups of species that are declining provincially, as well as individual species that are considered rare. The types of habitat for SCC to be considered in ecoregion 6E are:

- Marsh bird breeding habitat
- Open country bird breeding habitat
- Shrub / early successional bird breeding habitat
- Terrestrial crayfish
- Special concern or rare wildlife species, including:
    - Species that are ranked S1-S3 by the NHIC and/or are provincially tracked
    - Species with populations that are significantly declining or have a high percentage of their global population in Ontario
    - Species listed as special concern under the ESA

- Species listed as threatened or endangered under SARA only
- Regionally or locally rare species, where lists are available

The following text provides a discussion of the 'candidate' or 'confirmed' types of habitat for species of conservation concern SWH from the above list that have been identified at the Site or on adjacent lands based on the analysis presented in Appendix G.

Special concern or rare wildlife species

Two species confirmed on site - Eastern Wood-pewee and Wood Thrush, are designated provincially as Special Concern. As mentioned above, Wood Thrush was only confirmed on one occasion and within a vegetation community and although evidence doesn't confirm nesting. The species was detected in a coniferous swamp, while the species has an affinity to upland deciduous or mixed forest types. Both swamp and upland areas have been identified as candidate habitat for this species.

Eastern Wood-pewee was confirmed during both bird surveys within the woodland habitat. Eastern Wood-pewee is known to occur in the mid-canopy layer of forests across Southern Ontario. This species maintains a subnational rank of S4B, indicating that breeding habitat is secure in the province, with COSSARO reporting that the species has displayed an overall shift from southern to northern shield regions.

Review of eBird (eBird, 2024), a public reporting database, confirms species along the shoreline of Indian River and other publicly accessible areas. Aerial imagery suggests treed habitats extending within private and less accessible lands, suggesting likelihood of further occurrence of this species.

It is anticipated that the habitat on site, while suitable for nesting, is not limited or unique to the Township.

The woodland located adjacent to the Site appears of similar structure and presumed to also support this species.

Mitigation measures to protect individual wildlife are discussed in Section 5.0.

4.8.4 Animal Movement Corridors

Animal movement corridors are naturally vegetated parts of the landscape used by animals to move from one habitat to another, typically in response to different seasonal habitat requirements. The SWHCS indicates that movement corridors are to be identified only where certain types of SWH have been identified according to the SWHCS, including:

- Amphibian movement corridors: to be identified when significant amphibian breeding habitat (wetland) is present.
- Deer movement corridors: to be identified when deer wintering habitat is present.

Animal movement corridors are not present on site given the absence of breeding amphibians and mapped deer wintering habitat.

4.9 Significant Areas of Natural and Scientific Interest

Areas of Natural and Scientific Interest (ANSI) are natural heritage features identified by the MNR. There are two types of ANSIs: Life Science and Earth Science. ANSIs represent important natural features that are not found in protected areas. The Natural Heritage Reference Manual provides the following definitions for ANSIs (Ministry of Natural Resources, 2010):

> Life science ANSIs are significant representative segments of Ontario's biodiversity and natural landscapes, including specific types of forests, valleys, prairies, savannahs, alvars and wetlands, their native plants and animals, and their supporting environments. They contain relatively undisturbed vegetation and landforms, and their associated species and communities. Provincially significant life science ANSIs include the most significant and best examples of the natural heritage features in the province, and many will correspond to other significant features and areas such as wetlands, valleylands and woodlands. Earth science ANSIs are geological in nature, consist of some of the most significant representative examples of the bedrock, fossils and landforms in Ontario, and include examples of ongoing geological processes.

The MNR does not have any mapped ANSI's and therefore is not discussed further.

4.10 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. Cambium has employed a habitat-based screening, supplemented with targeted field surveys when necessary, in order to identify suitable habitat for species located on or adjacent to the Site. A detailed habitat suitability analysis is provided in Appendix C and a discussion of the results is provided below.

4.10.1 Endangered and Threatened Species

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 was determined to support either confirmed or candidate habitat. Accordingly, a detailed evaluation of habitat type, size, and availability was completed, supplemented by targeted surveys where required, to assess whether the Site is actively used by any of the species listed below.

The result of the evaluation is contained within Appendix G, and the species determined to have occurrence potential discussed further below.

<u>Species at Risk Bats (END)</u>

Of the four species of bats listed in Ontario as endangered, two were confirmed on site - Little Brown Myotis and Northern Myotis. It is believed that Tri-coloured Bat was falsely detected by the recorder, while Eastern Small-footed Myotis was not confirmed. In most cases, where acoustic surveys are completed in areas of treed habitat, SAR bats are detected. Snags density was determined to be low to suggest suboptimal roosting habitat; however, given detection of the species by the acoustic monitors, roost habitat cannot be ruled out. It is

believed that the species detected could either represent species roosting on site, on nearby sites, or both. The shortcoming of the survey acoustic protocol is the inability to say with confidence if roosting activity is taking place within a given habitat. Data interpretation and assumptions must be made. In this case, it is believed that roosting may be taking place on site; however, the low snag count suggests suboptimal habitat. It is believed that this habitat type is not limiting in the area, and the Site does not offer unique treed habitat.

Further consideration was given to species that may will soon be listed as Endangered, including Eastern Red Bat, Hoary Bat and Silver-haired bat. These three species were detected on Site. Hoary bat represented the greatest detections (14%), while Eastern Red Bat and Silver-haired Bat detections were considered rare (0.4% each). Eastern Red Bat and Hoary bat are known to roost in tree foliage which is plentiful in most deciduous forests.

SAR Trees (END)

Butternut was not confirmed on Site; however, are commonly observed on sites across Southern Ontario and therefore cannot be ruled out within areas adjacent to the site and those not actively searched as part of the field program. In general, the habitat for Butternut trees includes the tree and adjacent 30 m offset.

Black Ash was identified on Site, limited to isolated locations centrally within the coniferous swamp (community 3). The identified Black Ash were noted as being in generally poor conditions with evidence of infection from Emerald Ash Borer. Black Ash and regulated habitat (30 m) occurs outside of the development limit.

Avoidance and mitigation measures relating to the general protection of bats are provided in Section 5.7.

4.10.2 Special Concern Species

Two species of Special Concern were confirmed on Site, Eastern Wood-pewee and Wood Thrush. Section 4.8.3 provides some context as it relates to Eastern Wood-pewee and Wood Thrush habitat on site.

Eastern Wood-pewee habitat may be considered the entirely of the woodland (Community 1 and 6) and adjacent wooded areas.

Two additional species, while not confirmed on site, are believed to have potential.

- Monarch Butterfly (SC) – This species was not observed on site in Communities 2, 5 and 6; however, a common plant and habitat indicator - Common Milkweed (*Asclepias syriaca*) was. Lack of species observations does not serve as confirmation of absence from the site, but does suggest the area does not serve as an area of key habitat.
- Yellow-banded Bumble Bee (SC) – This species was not observed on site. 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 and coniferous 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. Their nest sites are often found underground in abandoned burrows or decomposing logs. Communities 2, 5 and 6 could provide habitat for this species.

The site does not offer any unique habitat features or characteristics to suggest a key habitat area.

5.0 Impact Assessment and Mitigation Measures

5.1 Proposed Development

The proposed development involves the construction of a 16-lot residential subdivision serviced by municipal water and private septic systems.

A Stormwater Management Report (Jewell Engineering, 2024) documents site conditions and plan to achieve quantity, quality and erosion and sediment control provincial targets. Drainage will be captured by roadside ditches and conveyed to an underground storage facility under the road right of way, with the eventual discharge to the wetland to the east. Understanding that post-development flows will be greater than pre-development, quality and quantity controls with consideration of Low Impact Development (LID) methods have been incorporated into the site design. This includes enhanced grass swales with check dams, strategic grading of roadside ditches, oil and grit separators, and an underground storage facility. Discharge from the underground storage facility will be controlled and maintain pre-development conditions as based on 100-year 12-hour storm event.

5.2 Impact Assessment

In summary, the following protected features were identified on and adjacent to the Site:

- Unevaluated wetland
- Significant Woodlands
- Significant Wildlife Habitat
- Unnamed watercourse and potential fish habitat
- Habitat of endangered and threatened species

No other natural heritage features protected by provincial policy were confirmed on or adjacent to the Site.

The following sections address potential impacts to protected features identified on and adjacent to the Site that may result from the proposed development and Site alteration.

Mitigation measures and best management practices have been recommended to ensure that the integrity of the existing natural features is protected and/or enhanced and that the associated functions are not negatively impacted during or following construction.

5.3 Unevaluated Wetlands

An unevaluated wetland, also zoned as Environmental Protection, encompasses a significant portion of the Site. While development has generally been directed outside of the wetland, minor encroachment is required to facilitate road access from Edwards Drive. Approximately 580 m^2 of wetland will be filled. Additionally, while stormwater will be captured and directed along the northern edge of the roadway, opposite the wetland, it will be discharged to the wetland via a storm outlet. It is anticipated some minor disturbance in this area will occur as part of construction. It is recommended this area is stabilized immediately following construction through temporary measures, and site-appropriate native seedmix is applied.

In many cases, wetlands are observed to support a diversity of flora and fauna; however, this wetland community does not appear to provide unique habitat features. The wetland consisted of two units, coniferous swamp, and thicket swamp associated with the watercourse. The wetland contained species common throughout Southern Ontario (S5), with invasive Purple Loosestrife and Common Reed, and no calling amphibians. While Black Ash (endangered tree species) was identified in coniferous swamp, occurrences were towards in the internal areas and not along the boundary lines or in areas of proposed encroachment. Eastern Wood-pewee, a species of special concern, was confirmed calling within the wetland and adjacent forest community, while nesting was believed to be in the adjacent upland habitat unit (Community 1 and 6).

To offset for direct wetland loss, a 1,742m^2 wetland area will be created, equating to 3:1 creation to loss ratio. This will result in a net gain of wetland area, and through incorporation of enhancement features, may serve to improve wildlife habitat opportunities of the wetland community.

Development will extend to the limit of the wetland and new wetland creation area.

Fencing will be placed along the wetland limit to both protect the feature from unintended encroachment and erosion. The fencing shall consist of a combination of temporary construction fencing, such as chain-link, to provide both rigidity and clear visibility for machinery operators. Siltation fencing shall be installed outside of the construction fencing to allow for easy maintenance (e.g. removal of accumulated sediment).

A permanent, natural barrier following construction should be created between the wetland and new roadway. This may consist of native trees and shrubs to act as a barrier for road lighting, noise, and aid in the attenuation of runoff.

Former provincial direction included establishment of a 30 m wetland buffer; whereas the new PPS recognizes non-Significant Wetlands and unevaluated wetlands as a *surface water feature*, not requiring any specific setbacks or buffers. A wetland buffer isn't used as a measure to protect the wetland and rather, it is anticipated that through enhancements and offsetting described above and in Section 6.0, there is opportunity to improve the overall form and function of the wetland.

Preliminary restoration recommendations are provided in Section 6.0.

5.4 Significant Woodlands

The woodland on Site was determined to be Significant (see Section 4.5). The development is proposed within the woodland community and will include both permanent impacts associated with home and lot creation, and temporary impacts associated with grading.

The periphery of the site development will require grading in addition to the slope adjacent to the road access. The permanent limit of disturbance within the Significant Woodland, including the new road access, area of residential development (e.g. house, septic, driveway and surrounding lawnspace) and small area of treed swamp equates to 4.2 ha or 8.9% of the Significant Woodland.

Loss of woodland as it pertains to the development should considered the outtermost limit of the residential lots, particularly if no provisions are in place to prevent the landowners from future woodland removal. This value represents 4.6 ha woodland loss.

Grading works north of the road access and outside of the private lots is considered a temporary impact and equate to an area of 0.7 ha. This area will be reestablished as a woodland by way of native plantings. Additionally, the wetland creation area (1742 m^2) discussed above will be planted with trees, contributing the Significant Woodland on site.

Community 2 (CUM1) will be planted with trees similar to Community 1, the adjacent woodland. Establishment of a new, approximately 2,570m^2 woodland area, aims to both improve wildlife habitat connectivity across the northern portion of the Site, but also provide opportunity to improve habitat through strategic selection of species (e.g. native, without biological threat (Ash)).

While considering the subdivision lots and driveway footprint within the woodland (4.6 ha), establishment of new woodland areas (wetland creation area: 1,742 m^2 [0.17 ha] and Community 2: 2,570 m^2 [0.26 ha]), development will result in a net loss of 8.8% or 4.2 ha of Significant Woodland.

Section 4.1.3.4 County of Peterborough Official Plan (2014) and Section 3.7.3.7 of the Township Official Plan (Township of Otonabee South Monagan 2017) infers development adjacent to and within Significant Woodlands may be permitted where *no negative impact* is identified.

Based on the NHRM criteria for determining significant woodlands; the contiguous woodland that covers the Site is considered significant because it meets the criteria for proximity to other woodlands or other habitats and water protection. One of the defining characteristics of the woodland its large size and proximity to fish habitat and groundwater features. The closest portion of the woodland (Community 3) to the watercourse will be retained and maintain its contributing function to fish habitat. The stormwater design includes collection and conveyances of stormflows in a manner that will protect any groundwater source.

The balance of the woodland area will continue to provide a similar function as pre-development conditions. It is noted that the form or size of the woodland will result in a net loss of 4.6 ha.

Effort has been made to preserve, re-establish and create new woodland areas within the Site.

5.5 Fish Habitat

The unnamed watercourse on Site was determined to be intermittent, with a perched culvert identified downstream, suggesting no direct connection to the Indian River. This feature appears to be driven by snowmelt and precipitation. Development will occur more than 30 m from the watercourse.

5.6 Significant Wildlife Habitat

The Eastern wood Pewee and candidate bat maternity roost habitat was identified in communities 1 and 3. Approximately 4.6 ha of the contiguous woodland will be removed to facilitate the development, while 0.7 ha will be temporarily disturbed to allow for grading. A new woodland area will be created among the northern limit of Site to provide long-term habitat, while artificial bat roosting structures (see Section 6.0) will serve to provide interim habitat.

Areas temporarily impacted will be restored to support both nesting and bat roosting upon maturation. Artificial bat roosting habitat (see Section 6.0) will support interim habitat conditions, during the period of forest maturation, while the retained portion on Site and woodland extending onto adjacent lands will continue to provide habitat for these species.

While considering the subdivision and driveway footprint within the woodland and woodland creation areas, 4.2 ha of Eastern Wood-pewee, candidate Wood Thrush, and candidate bat roosting habitat.

As mentioned above, Eastern Wood-pewee, although Special Concern, is also noted as secure within Southern Ontario. The site does not provide a unique habitat features for bat maternity colonies, and rather, based on the snag density survey, suggests the site to be poor quality.

Protection of bird and bat individuals will be achieved through construction timing considerations.

5.7 Habitat of Endangered and Threatened Species

The Site was screened for habitat of the following endangered and threatened species that may occur in the vicinity of the Site:

- SAR Bats (Little Brown Myotis and Northern Myotis)
- SAR Trees (Black Ash and Butternut)

In following in provincial guidance, bat acoustic surveys were carried out to confirm the presence of SAR bat. The protocol does not allow for confirmation of roosting absence or presence. Two species at risk bats were confirmed on Site. The absence of a high density of snag trees suggests poor habitat quality when compared to mature forests, and unlikely to provide any unique habitat qualities when compared to nearby tree cover. The treed swamp on site, does maintain some characteristics to suggest bat roosting. Incidental wildlife tree observations within the swamp community, and proximity of the swamp to watercourse to suggest insect foraging opportunity, suggests the majority of the candidate roosting habitat will remain intact on site.

Treed habitats on site will be partly removed to allow for development, established in areas requiring grading, and a new woodland area created among the northern limit. It is recommended that artificial bat roosting structures (see Section 6.0) form a condition of development, with the intent of providing interim roosting habitat opportunities for SAR and common bat species.

While considering the subdivision and driveway footprint within the woodland and woodland creation areas, 4.2 ha of candidate bat roosting habitat.

In accordance with provincial guidance, activities that will damage or destroy habitat may result in a contravention of the ESA. *Damaging* habitat includes impairment of habitat where it may not longer be useful, while *destroying* habitat includes elimination of the habitat (MNRF 2012). The guidance document recognizes that minor habitat alteration does not necessarily indicate the activity will damage or destroy habitat. Only a small percentage of the woodland will be removed, maintaining habitat both on and off site. The activities will not *destroy* SAR bat

habitat. Development is unlikely to damage or impair the habitat given that the on Site habitat was determined to be subpar with only few snags noted.

While it is believed the development, with consideration of mitigation measures described herein, will not result in a contravention of the ESA, it is recommended that the MECP is consulted to confirm they concur with the above-noted assessment.

Butternut were not observed on site. Black Ash were identified on Site within the coniferous swamp. Treed areas within 30 m of the development limit were assessed. All occurrences of Black Ash occurred within the wetland, well beyond 30 m from the development limit and outside of potential *direct* impacts. Indirect impacts associated with changes to wetland hydrology and moisture conditions required of Black Ash was also considered. Hydrology within the wetland will be maintained through strategic stormwater management design. No impact the species is expected.

5.8 Mitigation Measures and Best Management Practices

The mitigation measures and best management practices outlined in Table 10 should be implemented on the Site, to minimize the potential for adverse impacts to natural heritage features and functions on and adjacent to the Site.

Table 10 Mitigation Measures and Best Management Practice Recommendations

Potential Impact	Recommended Best Practice
Erosion and Sedimentation	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.

	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.
Increase in Runoff - Impervious Surfaces	Runoff from the Site is expected to increase with the introduction of impermeable surfaces (i.e., building roofs, roadways, and walkways) and compacted surfaces with reduced infiltration capacity. Measures to increase infiltration of run-off from these surfaces should be encouraged and, where possible, included in the Site Plan for the development. Eavestrough downspouts should be directed to vegetated areas (such as lawn, or gardens) and not onto hardened surfaces, to encourage infiltration.
Changes to Water Quality and Quantity	The Stormwater Management Plan prepared for the Site should specifically address potential stormwater-related impacts to water quality and quantity of the surrounding wetlands and watercourse, through quality control measures and a feature-based water balance study.
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 1 to August 31 in the local area (as per Environment and Climate Change Canada Guidelines). If vegetation clearing or construction is to occur between April 1 and August 31, the vegetation should be investigated by a qualified biologist to confirm if any active nests are present, prior to site alteration. Vegetation clearing can proceed provided there are no active nests. If active nests are confirmed, the nests should be left undisturbed until young have fledged or the nest is determined to be inactive. Note that some birds nest on the ground and in low-lying vegetation and shrubs; therefore, all habitat types should be inspected prior to ground disturbance if removals are to occur during the breeding season.
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). If vegetation clearing or construction is to occur between April 1 and September 30, the vegetation should be investigated by a qualified biologist to confirm whether SAR bat habitat may be present. Presence or absence of habitat should be confirmed through acoustic monitoring following industry standard protocols prior to any tree

	removal during the active season for bats. Vegetation clearing can proceed provided absence is confirmed.
Wildlife: Reptiles (Disturbance and Harm)	Snakes are particularly vulnerable to construction-related impacts on sites adjacent to wetlands, watercourses, and waterbodies. 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 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 surface of the 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. The construction area should also be actively inspected for snakes each day prior to the start of work throughout the duration of construction. If any individuals are encountered, they should be photographed and allowed time to move out of harm's way.
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). 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.
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: 1. Revegetate with species native to the local area. 2. Request fill and compost from reputable sources that are conscious of the potential for the spread of invasive species via these media. 3. Get to know the most common invasive species in the area. 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) 5. Immediately eradicate invasive species if they are observed on the property. 6. Do not compost invasive species; put them in plastic bags and dispose of them in the garbage. 7. Do not dispose of lawn or garden clippings in the forest or wetlands to avoid species introductions. 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 the natural features on the Site will serve to buffer wildlife within the natural areas from noise-related impacts. 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.

6.0 Opportunities for Restoration and Enhancement

The unevaluated wetland, intermittent watercourse and associated drainage feature are expected to remain intact following the proposed development. Due to the proposed reduction in the buffer to the wetland community, Cambium recommends that additional enhancement measures be incorporated in the site plans. Planting of native trees, shrubs and herbaceous plants in previously disturbed areas, particularly adjacent to the wetland, would provide increased bank stability and infiltration of run-off, while increasing visual appeal. Plantings adjacent to and within disturbances will improve species diversity and provide cover, shelter and nesting habitat for bird species.

6.1 Planting Plan Recommendations

Recommendations for vegetation enhancements are outlined in Table 11. Theses robust recommendations have been intentionally designed to enhance or replicate functional ecological attributes that are currently degraded in the system. The focus is toward two objectives: maintaining/improving water quality and providing better quality habitat for terrestrial species.

Table 11 Planting Plan Recommendations

Planting Location	Species	Size	Instructions
Wetland Edge	Trees: Balsam Popular (*Populus balsamifera*) Eastern Hop-Hornbeam (*Ostyra virginiana*) Eastern White Cedar (*Thuja occidentalis*) Northern Red Oak (*Quercus rubra*) Paper Birch (*Betula papyrifera*) Trembling Aspen (*Populus tremuloides*) Eastern White Pine (*Pinus strobus*) Sugar Maple (*Acer saccharum*) Large-toothed Aspen (*Eurybia macrophylla*)	2 m height	Trees should be distributed throughout the available area between the wetland and driveway. Trees should be randomly spaced between 2 m and 4 m to replicate natural conditions.

Planting Location	Species	Size	Instructions
	Black Cherry (*Prunus serotina*)		
Wetland Edge	Shrubs: Alternate-leaved Dogwood (*Cornus alternifolia*) Red Elderberry (*Sambucus racemosa*) Red Raspberry (*Rubus ideaus*) Chokeberry (*Aronia melanocarpa*) Tartarian Honeysuckle (*Lonicera tatarica*) Northern Bush Honeysuckle (*Diervilla lonicera*) Nannyberry (*Viburnum lentago*)	8-10” container stock	Shrubs should be distributed throughout the available area between the wetland and driveway. 3 clusters of 5-6 potted shrubs, offset by 1 m or less. Clusters should include 2 of the listed species or other locally native species, with plants in random assemblages spaced 2-5 m apart.
Wetland Edge	Groundcover: Native grass and wildflower seed mixture (i.e., OSC Rural Ontario Roadside Mixture 8145)	N/A	Application rates as per manufacturers instructions. All exposed soils at top of bank up to the edge of the development footprint should be seeded.
Temporary Woodland Removal	Refer to the ‘Wetland Edge’ tree, shrub and groundcover recommendations.		
New Woodland Area	Refer to the ‘Wetland Edge’ tree, shrub and groundcover recommendations.		
Wetland Creation Area	Eastern White Cedar Eastern Hemlock (*Tsuga canadensis*) Paper Birch Red Maple (*Acer rubra*)	8-10” container stock	Trees should be randomly spaced between 2 m and 4 m to replicate natural conditions.
Wetland Creation Area	Red-osier Dogwood Highbush Cranberry (*Viburnum opulus*)	8-10” container stock	3 clusters of 5-6 potted shrubs, offset by 1 m or less.

Planting Location	Species	Size	Instructions
			3 clusters of 5-6 potted shrubs, offset by 1 m or less. Clusters should include 2 of the listed species or other locally native species, with plants in random assemblages spaced 2-5 m apart.
Wetland Creation Area	Groundcover: OSC8145 (as above), or OSC Creek Bank Mixture (OSC8215)	N/A	Application rates as per manufacturers instructions. All exposed soils on the slope, extending 0.5 m upgradient of the top of slope position should be seeded.
Additional Notes:			
Timing:	Planting should occur in the autumn, ideally between October 15 – November 15		
Stock:	Container stock is preferred, but bare root stock can be used if planting occurs within 24 hours of collecting materials from the source.		
Species Selection:	Listed species have been selected based on growth characteristics, soil and topography conditions of the Site, and restoration objectives. Other species may be considered, provided that the selected species are native to the local area.		
Wildlife Value:	Clusters of trees and shrubs provide diverse sheltering habitat for a variety of wildlife and are preferred over individual plantings. Planting a variety of species increases the ecological value for wildlife.		
Compost / Mulch	If compost or mulch is applied at the Site, these media should be obtained from a reputable source and be heat treated to prevent spread of invasive species.		

6.2 Wildlife Habitat Enhancement

It is recognized that any created forest or woodland will take time to establish. While newly planted trees may not serve to provide wildlife habitat in the same capacity as a mature

woodland, they do still offer opportunities to a variety of species, including nesting birds. For species that require mature trees, such as roosting bats, an interim habitat solution is recommended – an artificial bat roosting structure.

A variety of bat roosting structures have been created and employed across the province, typically consisting of a single or multi-chambered bat box. It is understood that while the *box* design has failed to attract some bat species, a structure known as BrandenBark™ has proven successful in attracting Little Brown Myotis, Northern Myotis and Big Brown Bat. The artificial exfoliating bark appearance is intended to mimic natural habitat conditions.

It is recommended that BrandenBark™ or a comparable product is utilized on Site to create interim bat roosting habitat. A minimum of three units are recommended. They should be placed within the restored woodland area northwest of the new driveway.

7.0 Policy Conformity

7.1 Provincial Policies

Based on the key natural heritage and/or hydrologic features identified on or adjacent to the Site and the findings of the field investigations detailed herein, the proposed development of the Site is in conformity with the PPS. Conformity with applicable natural heritage policy is summarized in Table 12. The Site is within a designated settlement area and natural heritage policies of the PPS apply. The PPS has been used to demonstrate policy conformity.

Table 12 PPS Policy Conformity Summary

Natural Heritage / Hydrologic Feature	On Site	On Adjacent Lands	Meets Associated Policy
Significant Wetland in Ecoregions 5E, 6E and 7E or in the Canadian Shield north of Ecoregions 5E, 6E and 7E	No	No	Yes
	Explanation: The wetland on Site is unevaluated and not designated significant. It currently receives no protection under the PPS. Minor wetland encroachment will be offset at a 3:1 ratio.		
Significant Woodlands in Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Marys River)	Yes	Yes	No
	Explanation: The woodlands on Site are considered significant. Following restoration work, there will be a net loss of 4.6 ha therefore not maintaining the form of the woodland. Currently the proposed development does not comply with this policy.		
Significant Wildlife Habitat (including habitat of special concern species)	No	Yes	Yes
	Explanation: The Eastern Wood-pewee was observed in community 1 and 3 and the Wood Thrush was observed in community 1. Additionally, bat maternity roost indicator species were detected on site. The woodland will be restored outside of the development limit and a new woodland area created in the area of Community 2. Interim bat roosting habitat structures will be installed. While considering the local area and availability of treed habitats		

Natural Heritage / Hydrologic Feature	On Site	On Adjacent Lands	Meets Associated Policy
	adjacent to the Site, the Site does not offer unique habitat to suggest partial removal will eliminate or destroy habitat.		
Habitat of Threatened and Endangered Species	Yes	Potentially	2.1.7
	Explanation: SAR bats and Black Ash were confirmed on Site.		
Fish Habitat	Yes	Yes	Yes
	Explanation: The unnamed watercourse on Site was determined to be intermittent. While fish habitat was not confirmed, there remains potential for the Site to support fish habitat seasonally.		

8.0 Summary of Recommendations

The following recommendations are provided for the proposed development:

1. All required approvals and permits should be obtained prior to the commencement of any Site alteration / construction activities.
2. Wetland loss shall be compensated in a manner that achieves a net gain. A 1,742m^2 wetland area shall be created on Site, equating to 3:1 creation to loss ratio.
3. The outer extent of development should be staked in field to reduce opportunity for woodland and wetland encroachment beyond that discussed herein.
4. Vegetation removal or alteration should take place outside the breeding bird season (April 1 to August 31) and the active roosting period for bats (April 1 to September 30). As such, clearing should take place between October 1st and March 31st of any calendar year. Should any clearing be required during the breeding bird season, nest searches conducted by a qualified person must be completed within 48 hours prior to clearing activities. If nests are found, work within the area must cease until the nest has fledged, as per the federal *Migratory Birds Convention Act*. Should any clearing be required during the active roosting period for bats, please contact the Ministry of Environment, Conservation and Parks for further direction (e.g. acoustic monitoring, exit surveys) to ensure conformity with the *Endangered Species Act.*
5. An Erosion and Sediment Control (ESC) Plan that includes perimeter light duty sediment fencing should be implemented along the watercourse side of the construction area prior to the commencement of any Site alteration.
6. 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.
7. 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 of May 1 or commencement of Site preparation to keep wildlife from entering the construction area. This fencing should be made of light-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.

8. The construction area should also be actively inspected each day prior to the start of work throughout the duration of construction.
9. SAR observations, including most species of snakes and turtles, should be reported to the Natural Heritage Information Centre (NHIC). 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.
10. Spread of invasives should be actively managed. Further recommendations are available in Section 5.8.
11. The MECP should be contacted as it relates to SAR bats and confirm compliance with the ESA.
12. Communities 1, 3, 6, 7 and 8 form the onsite portion of the Significant Woodland, while Community 1 serves as Significant Wildlife Habitat for Eastern Wood-pewee, Wood Thrush and candidate bat maternity roost habitat.
13. Woodland restoration and creation areas within the Site, have been recommended to reduce net loss of woodland to 4.2 ha. Loss of woodland directly relates to SWH and SAR.

9.0 Closing

In closing, potential negative impacts associated with the proposed development and site alteration can be appropriately minimized, provided that the recommendations outlined in Section 6.0 are followed. The information presented herein demonstrates that the proposed development can be carried out in a way that will not adversely impact natural heritage and hydrologic features and function identified on or adjacent to the subject Site. Furthermore, the proposed development complies with applicable provincial policy.

Respectfully submitted,

Cambium Inc.

Signed by:
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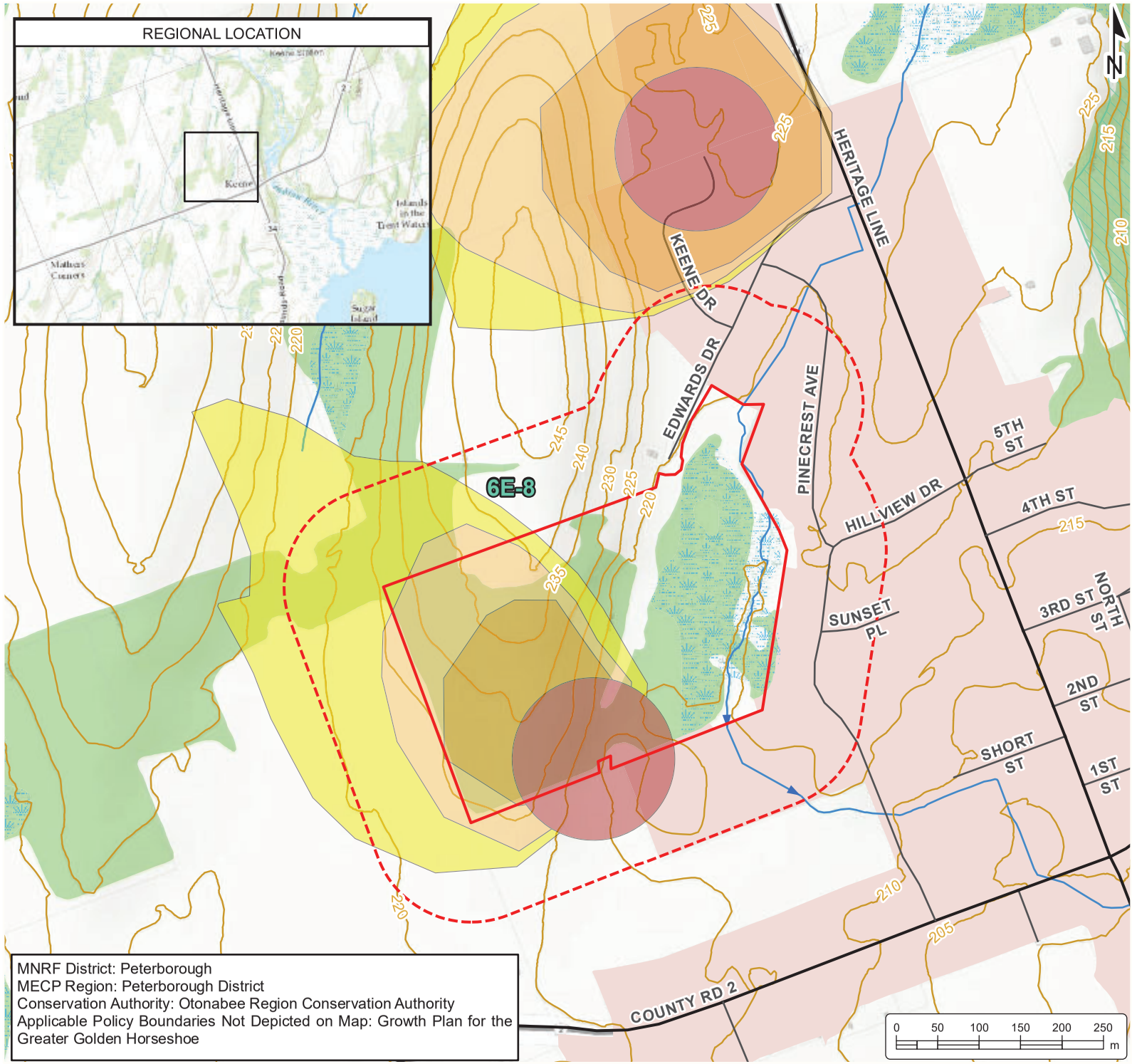
11.0 Glossary of Terms

ANSI: Area of Natural and Scientific Interest
ARA: Aquatic Resources Area
ARA: Aggregate Resources Act
AS: Agricultural System
ATK: Aboriginal Traditional Knowledge
BMA: Bear Management Area
BMP: Best Management Practice
CA: Conservation Authority
CEAA: Canadian Environmental Assessment Act/Agency
CFA: Canadian Forestry Association
CFIP: Community Fisheries Involvement Program
CFS: Canadian Forestry Service
CHU: Critical Habitat Unit
CH: Cultural Heritage
CLI: Canada Land Inventory
CLU: Crown Land Use
COSSARO: Committee on the Status of Species at Risk in Ontario
CR: Conservation Reserve
CWIP: Community Wildlife Involvement Program
CWS: Canadian Wildlife Service
DFO: Fisheries and Oceans Canada
EA: Environmental Assessment
EAA: Environmental Assessment Act
EAB: Emerald Ash Borer
EBR: Environmental Bill of Rights
EIA: Environmental Impact Assessment
EIS: Environmental Impact Study/Statement
ELC: Ecological Land Classification System
ELUP: Ecological Land Use Plan
END: Endangered species
EPA: Environmental Protection Act
ER: Environmental Registry
ESA: Endangered Species Act (2007)
ESA: Environmentally Sensitive Area
ESC: Erosion and Sediment Control
GIS: Geographic Information System
GLSL: Great Lakes – St. Lawrence
GPGGH: Growth Plan for the Greater Golden Horseshoe
GPS: Global Positioning System
HSA: Habitat Suitability Analysis
HIS: Habitat Suitability Index
KHA: Key Hydrologic Areas
KHF: Key Hydrologic Features
KNHF: Key Natural Heritage Features
LCFSP: Licence to Collect Fish for Scientific Purposes
LIO: Land Information Ontario
LRIA: Lake and Rivers Improvement Act
LUP: Land Use Permit or Plan
MA: Management Area
MAFA: Moose Aquatic Feeding Area
MCEA: Municipal Class Environmental Assessment
MECP: Ontario Ministry of Environment, Conservation and Parks
MNDMRF: Ontario Ministry of Natural Resources and Forestry
NER: Natural Environment Report
NHIC: Natural Heritage Information Centre
NHIS: Natural Heritage Information System
NHS: Natural Heritage System
OBM: Ontario Base Map
OFIS: Ontario Fisheries Information System
OLI: Ontario Land Inventory
OMAFRA: Ontario Ministry of Agriculture, Food and Rural Affairs
OWES: Ontario Wetland Evaluation System
PPS: Provincial Policy Statement (2014)
PSW: Provincially Significant Wetland
RLUP: Regional Land Use Plan
RMP: Regional Management Plan
R.P.F.: Registered Professional Forester
SAR: Species at Risk
SARO: Species at Risk in Ontario
SC: Special Concern species

F&W: Fish and Wildlife
FA: Fisheries Act (Federal)
FEC: Forest Ecosystem Classification
FMP: Forest Management Plan
FRI: Forest Resources Inventory
FWCA: Fish and Wildlife Conservation Act
GGH: Greater Golden Horseshoe
GHP: General Habitat Protection
SWH: Significant Wildlife Habitat
SWM: Stormwater Management
THR: Threatened species
TOR: Terms of Reference
TPP: Tree Preservation Plan
WIA: Woodlands Improvement Act
WMU: Wildlife Management Unit

Appended Figures



ENVIRONMENTAL IMPACT STUDY

YVETTE JOHNSTON
74 Edwards Drive
Keene, Township of Otonabee-South Monaghan,
County of Peterborough, Ontario

LEGEND

- Major Road
- Minor Road
- Contours (5m Interval)
- Watercourse, Permanent
- Wetland Unevaluated
- Provincially Significant Wetlands
- Wooded Area
- Built Up Area
- Ecodistrict
- 120m Adjacent Lands
- Site (13.91 ha, approximate)

Wellhead Protection Area:

- A
- B
- C
- D

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LANDSCAPE SETTING AND POLICY AREAS

Project No.: 15831-001		Date: October 2024	Rev.:
Scale: 1:6,500		Projection: NAD 1983 UTM Zone 17N	
Created by: MAT	Checked by: MW	Figure: 1	

Community Number	Description
1	FOD5-2 Fresh Sugar Maple - Beech Deciduous Forest Type
2	CUM1 Mineral Cultural Meadow
3	SWC Coniferous Swamp
4	SWT2-5 Red-osier Mineral Thicket Swamp Type
5	CUW Cultural Woodland
6	FOM4-2 Dry - Fresh White Cedar - Aspen Mixed Forest Type
7	FOM7-1 Moist - Fresh White Cedar - Sugar Maple Mixed Forest Type
8	FOM2-2 Dry - Fresh White Pine - Sugar Maple Mixed Forest Type
9	CUM Cultural Meadow
10	FOM Mixed Forest

ENVIRONMENTAL IMPACT STUDY

YVETTE JOHNSTON
74 Edwards Drive
Keene, Township of Otonabee-South Monaghan,
County of Peterborough, Ontario

LEGEND

- Breeding Bird Survey Station
- Bat Monitoring Station
- Minnow Trap 1
- Amphibian Survey Station
- Contours (5m Interval)
- Drainage feature
- New Roadway
- Trail
- Watercourse, Permanent
- Field Verified Wetland
- Vegetation Community
- 120m Adjacent Lands
- Site (13.91 ha, approximate)

Notes:
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NATURAL HERITAGE FEATURES AND ECOLOGICAL SURVEY STATOINS

Project No.: 15831-001		Date: October 2024	Rev.:
Scale: 1:5,500		Projection: NAD 1983 UTM Zone 17N	
Created by: MAT	Checked by: MW	Figure: 2	

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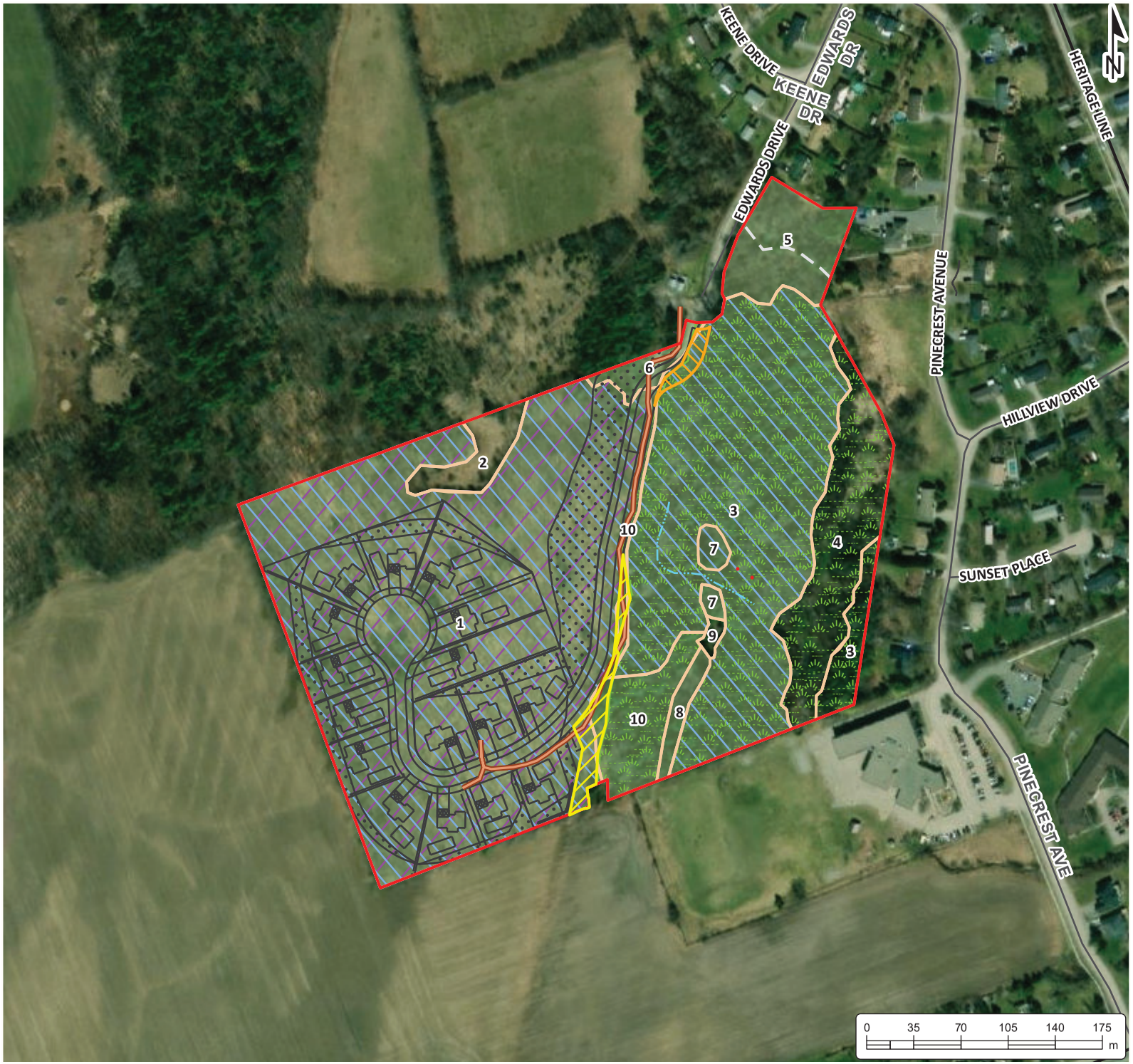

ENVIRONMENTAL IMPACT STUDY

YVETTE JOHNSTON
74 Edwards Drive
Keene, Township of Otonabee-South Monaghan,
County of Peterborough, Ontario

LEGEND

- Proposed Development
- Drainage feature
- New Roadway
- Trail
- Significant Wildlife Habitat Eastern Wood-peewe
- Significant Wildlife Habitat Wood Thrush
- Field Verified Wetland
- Significant Woodlands
- Wetland Removal Area (580m^2)
- Wetland Compensation Area (1742m^2)
- Vegetation Community
- Site (13.91 ha, approximate)

Notes:
- Map contains information licensed under the Open Government License - Ontario.
- 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
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www.cambium-inc.com

NATURAL HERITAGE CONSTRAINTS

Project No.: 15831-001		Date: October 2024	Rev.:
Scale: 1:4,000		Projection: NAD 1983 UTM Zone 17N	
Created by: MAT	Checked by: MW	Figure: 3	

O:\GIS\MXDs\15800-15899\15831-001 Yvette Johnston - EIS - 74 Edwards Drive\2023-11-14 EIS.aprx

Appendix A
Correspondence

Courtney Stadtke

From: Matthew Wheeler
Sent: September 27, 2022 1:06 PM
To: Matt Wilkinson
Cc: Cambium Admin
Subject: EIS Terms of Reference--74 Edwards Drive, Keene, Ontario (Cambium File 15831-001)
Attachments: 74 Edwards Drive Keene_Ontario.pdf; Record of Preconsultation - 74 Edward Street Keene.pdf

Hi Matt,

Yvette Johnston (the Client) has retained Cambium Inc. to conduct an Environmental Impact Study (EIS) at 74 Edwards Drive, Keene, Ontario (see attached map with approximate property boundaries). The property is located within the Keene Settlement area. The proposed development includes an application for a plan of subdivision to support the development of rural estate lots (7 to 16 single family estate lots) on the property. The entire property will be considered the Site for this study. Potential impacts of the proposed development will be considered on the Site and within 120 m of the Site.

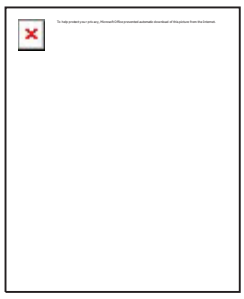
Cambium provides the following Terms of Reference for your review and input:

- Consult with the Conservation Authority to determine their interest, concerns and considerations regarding the proposed works and scope the work requirements.
- Compile and review applicable background information and environmental mapping of the Site, including the adjacent lands (120 m).
- Cambium has completed some of the field investigation(s) on the Site;
    - Classify existing vegetation communities on the Site according to the Ecological Land Classification (ELC) System for Southern Ontario (Lee et al., 1998), and evaluate them for sensitivity, rarity, and botanical quality. This work includes a 2-season vegetation inventory.
    - Delineate wetland boundary following the Ontario Wetland Evaluation System (OWES) for Southern Ontario (Ministry of Natural Resources, 2013).
    - Record observations of wildlife occurrences and assess wildlife habitat function, including species at risk (SAR) habitat. Any evidence of breeding, forage, shelter or nesting sites, and/or travel corridors will be noted.
    - Undertake a Species at Risk (SAR) screening to assess for potential SAR habitat and evaluate compliance with the provincial *Endangered Species Act* (ESA).
    - Undertake a review of candidate and confirmed Significant Wildlife Habitat on the Site.
    - Complete a survey of the property during leaf-off conditions to determine if the forested habitat contains bat maternity roost habitat or raptor nests.
- Identify, assess, and include detailed descriptions of the natural features and functions identified on the Site and adjacent lands.
- Map natural heritage and hydrologic features, vegetation communities, other environmental features (watercourses, wetlands, groundwater discharge areas, wildlife habitat, etc.), and development setbacks on current high-quality aerial imagery.
- Provide an assessment of the potential impacts of the proposed development on natural features and their related ecological functions.
- Demonstrate conformity with the applicable policies within the GPGGH, *Provincial Policy Statement*, 2020; *Endangered Species Act*, 2007; and the local Official Plan.
- Develop and provide an appropriate avoidance, mitigation, restoration, and offsetting strategy, as applicable, to address the potential impacts identified.

- Complete one (1) final EIS report for circulation for approval to the municipality and the CA.

An EIS report that meets the *GPGGH and PPS* requirements and the local Official Plan will be provided based on information collected through the background review and field studies. If you have any questions or wish to discuss any aspect of this ToR, please feel free to contact me by phone (613-876-1515) or email.

Kind regards, Matt Wheeler



Matthew Wheeler
Project Manager/Senior Ecologist
Cambium - Kingston
613.876.1515
866.217.7900
cambium-inc.com

Environmental | Building Sciences | Geotechnical | Construction Quality Verification

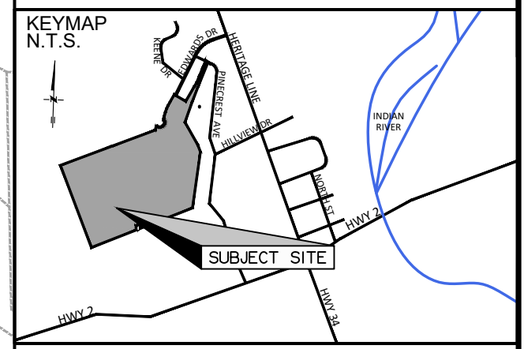
Appendix B
Site Plan

DEVELOPMENT SITE PLAN

PART OF LOT13 & 14, CONCESSION 7
(GEOGRAPHIC TOWNSHIP OF OTONABEE)
PART 4, PLAN 45R-6864 & PARTS 1, 2, 3, 4 & 5 PLAN 45R-14319
SAVE AND EXCEPT PART 2 45R-16688 & PART 1 PLAN 45R-16795
SUBJECT TO AN EASEMENT AS IN LT21491, TOGETHER WITH AN EASEMENT OVER PARTS 1 & 2 PLAN 45R-6864
TOWNSHIP OF OTONABEE-SOUTH MONAGHAN
COUNTY OF PETERBOROUGH

SCALE = 1:2,000 METRIC
0 40 80m

KEYMAP
N.T.S.



LEGEND

- MINERAL CULTURAL MEADOW (CUM1) VEGETATIVE COMMUNITY- TO BE VEGETATED - CAMBIUM 2024
- TEMPORARY TREE REMOVAL AREA TO BE RE-VEGETATED - CAMBIUM 2024
- SURVEYED EXISTING WETLAND - CAMBIUM, 2022
- WETLAND REMOVAL AREA (580m²)
- 3:1 WETLAND COMPENSATION AREA (1,742m²)
- POTENTIAL PRIMARY SEPTIC LOCATION - CAMBIUM, 2024
- POTENTIAL SINGLE-DETACHED DWELLING
- POTENTIAL DRIVEWAY LOCATION
- TIMMINS FLOODLINE - JEWELL, 2024
- EXISTING NATURAL TRAIL
- 15m FLOODLINE SETBACK
- 30m WETLAND SETBACK
- WATERCOURSE
- EXISTING EASEMENT LINES
- PROPOSED RETAINING WALL
- TOP OF SLOPE - CAMBIUM, 2022
- BOTTOM OF SLOPE - CAMBIUM, 2022
- POTENTIAL SEPTIC RESERVE LOCATION - CAMBIUM, 2024

LAND USE SUMMARY

	AREA(ha.)	AREA%	UNITS
SINGLE-DETACHED RESIDENTIAL LOTS	3.78	26.9	16
MUNICIPAL ROAD ALLOWANCE	1.27	9.0	
PASSIVE PARKLAND WITHIN WETLAND	5.93	42.1	
PASSIVE PARKLAND OUTSIDE OF WETLAND	3.12	22.0	
TOTAL	14.10ha	100.0%	16

PARKLAND SUMMARY

PASSIVE PARKLAND WITHIN WETLAND	5.93
PASSIVE PARKLAND OUTSIDE OF WETLAND	0.62
WILDLIFE CORRIDOR - OUTSIDE WETLAND	2.5
PARKLAND TOTAL	9.05ha

NOTE:

METRIC NOTE:
DISTANCES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO BY DIVIDING BY 0.3048.

BUILDING NOTE:
BUILDING FOOTPRINTS, LANDSCAPED OPEN SPACE AND DRIVEWAYS ARE CONCEPTUAL AND SUBJECT TO CHANGE.

SURVEY NOTE:
DRAWING CREATED USING DATA FROM PLAN 45R-14319 BY BENINGER SURVEYING LTD. DATED FEBRUARY 12 2008
CONTOUR DATA PROVIDED BY JEWEL ENGINEERING.

ZONING ANALYSIS

PROPOSED SPECIAL PROVISIONS

OTONABEE-SOUTH MONAGHAN COMPREHENSIVE ZONING BY-LAW No. 2010-65	SINGLE DETACHED DWELLING	
ZONE PROVISION - SECTION 8.2	'HR' ZONE	PROPOSED
MINIMUM LOT AREA PUBLIC WATER SUPPLY & PRIVATE SEWAGE DISPOSAL	1,800m²	1,709m²
MINIMUM LOT FRONTAGE: PUBLIC WATER SUPPLY & PRIVATE SEWAGE DISPOSAL	30m	30m
MINIMUM FRONT YARD DEPTH	7.5m	6m
MINIMUM EXTERIOR SIDE YARD	7.5m	6m
MINIMUM INTERIOR SIDE YARD	3.0m	3.0m
MINIMUM REAR YARD	7.5m	7.5m
MINIMUM DWELLING FLOOR AREA	93m²	266m²
MAXIMUM BUILDING HEIGHT	11m	11m
MAXIMUM LOT COVERAGE OF ALL BUILDINGS	40%	15.5%
MINIMUM LANDSCAPED OPEN SPACE	30.0%	77.8%
MAXIMUM DWELLING UNIT PER LOT	1	1
MAXIMUM NUMBER OF DWELLING UNITS PER LOT	2	1

No.	REVISION	DATE	APPR'D

DRAWN BY: F.M. | CHECKED BY: S.L. | DATE: JANUARY 23, 2025 | SCALE: 1:2,000

JAN 23, 2025

JOB No. 888

RFA PLANNING CONSULTANT INC
211 Dundas Street East, Suite 202,
Belleville, Ontario, K8N 1E2

Appendix C

Species of Conservation Concern Screening

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				
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	Not observed during targeted surveys; unlikely to occur on Site	No further consideration required
Barn Swallow	*Hirundo rustica*	THR	THR	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	Not observed during targeted surveys; unlikely to occur on Site	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).	No	Known to occur in the general area	No further consideration required
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).	No	Known to occur in the general area	No further consideration required
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	Not observed during targeted surveys; unlikely to occur on Site	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	Not observed during targeted surveys; unlikely to occur on Site	No further consideration required

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				
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
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).	No	Known to occur in the general area	No further consideration required
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	Confirmed habitat on-site through targeted surveys	Confirmed 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	Not observed during targeted surveys; unlikely to occur on Site	No further consideration required

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				
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	Not observed during targeted surveys; unlikely to occur on Site	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).	No	Not observed during targeted surveys; unlikely to occur on Site	No further consideration required
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 ha) and swamps dominated by emergent vegetation, preferably cattails, interspersed with patches of woody vegetation and open water. Although Least Bitterns usually nest in larger marshes territorial individuals have been found in marshes as small as 0.4 ha. They require dense vegetation and open water with stable levels within 10 m for nesting, and access to clear, open water for foraging (3).	No	Known to occur in the general area	No further consideration required
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	Not observed during targeted surveys; unlikely to occur on Site	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	Not observed during targeted surveys; unlikely to occur on Site	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	Not observed during targeted surveys; unlikely to occur on Site	No further consideration required

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				
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).	No	Known to occur in the general area	No further consideration required
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).	Yes: on-site	Confirmed habitat on-site through targeted surveys	Confirmed 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				
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
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).	No	Known to occur in the general area	No further consideration required
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).	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	Provincial		SPECIES DESCRIPTION AND HABITAT REQUIREMENTS	SUITABLE HABITAT	SPECIES OBSERVATIONS	ASSESSMENT
		SARA	SARO	S-RANK				
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).	No	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
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).	No	Known to occur in the general area	No further consideration required
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).	No	Known to occur in the general area	No further consideration required
Wood Turtle	*Glyptemys insculpta*	THR	END	S2	The Wood Turtle has orange coloured front legs, neck and chin and a sculpted carapace with raised, pyramidal scutes (5). They prefer clear rivers and streams that have moderate current, and sandy or gravelly substrates. This species spends more time on land than other turtle species including in meadows, swamps and fields. Wooded areas are an essential habitat component, and the species uses aquatic habitats for hibernation and mating. Nesting occurs in areas with sandy soil and abundant light (1).	No	Known to occur in the general area	No further consideration required
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: adjacent lands only	Known to occur in the general area	Consideration required under local/regional conservation objectives

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				
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).	No	Known to occur in the general area	No further consideration required
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	Not observed during targeted surveys; unlikely to occur on Site	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
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 and coniferous 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). Their nest sites are often found underground in abandoned burrows or decomposing logs.	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				
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

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				
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
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).	Yes: adjacent lands only	Not observed during targeted surveys; unlikely to occur on Site	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: adjacent lands only	Not observed during targeted surveys; unlikely to occur on Site	No further consideration required

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				
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: adjacent lands only	Not observed during targeted surveys; unlikely to occur on Site	No further consideration required
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).	Yes: adjacent lands only	Not observed during targeted surveys; unlikely to occur on Site	No further consideration required

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Appendix D
Photographic Log

Photo 1 Community 1, Sugar Maple-Beech Deciduous Forest (FOD5-2), View looking North. May, 2023.

Photo 2 Community 2, Mineral Cultural Meadow (CUM1); View looking northeast, May 2023.

Photo 3 Community 3 – White Cedar – Hardwood Mineral Mixed Swamp (SWM1-1), View looking northeast, May 2023.

Photo 4 Community 4 – Red-osier Dogwood Mineral Thicket Swamp (SWT2-5), View looking southwest, May 2023

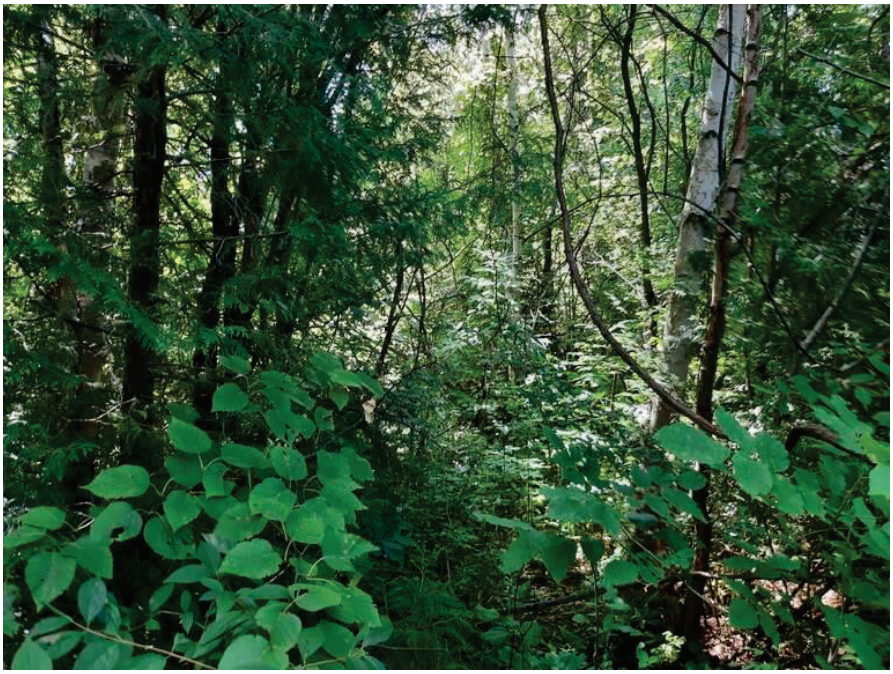

Photo 5 Community 5 – Cultural Woodland (CUW), August 2022

Photo 6 Community 6 – Dry-Fresh White Cedar-Aspen Mixed Forest (FOM4-2), August 2022

Photo 7 View of newly created access roadway and entrance gate; View looking northeast, May 2023

Photo 8 View of newly created access roadway, view looking Southwest, May 2023

Appendix E
Vegetation Species List

Appendix - Vegetation Community and Inventory

#	Common Name (Latin Name)	Vegetation Community										CoW
		1	2	3	4	5	6	7	8	9	10	
1	Alternate-leaved Dogwood (Cornus alternifolia)	X										3
2	American Beech (Fagus grandifolia)	A										3
3	American Water-horehound (Lycopus americanus)			X								-5
4	Balsam Poplar (Populus balsamifera)			X		X						-3
5	Basswood (Tilia americana)	X					A					3
6	Bebb's Willow (Salix bebbiana)				A							-3
7	Bittersweet Nightshade (Solanum dulcamara)			X								0
8	Black Cherry (Prunus serotina)						A					3
9	Blue-beech (Carpinus caroliniana)	X										0
10	Blue-stemmed Goldenrod (Solidago caesia)	X										3
11	Broad-leaved Cattail (Typha latifolia)				X							-5
12	Bull Thistle (Cirsium vulgare)		X									3
13	Calico Aster (Symphyotrichum lateriflorum)	X				X						0
14	Canada Wood Nettle (Laportea canadensis)			X								-3
15	Common Dandelion (Taraxacum officinale)	X	X			X						3
16	Common Milkweed (Asclepias syriaca)		X			X	X					5
17	Common Oak Fern (Gymnocarpium dryopteris)			X								3
18	Common Prickly-ash (Zanthoxylum americanum)	X										3
19	Common Self-heal (Prunella vulgaris)					X						0
20	Common Timothy (Phleum pratense)					X						3
21	Cottony Willow (Salix eriocephala)				A							-3
22	Crack Willow (Salix euxina)			X		X						0
23	Dwarf Raspberry (Rubus pubescens)				X							-3
24	Eastern Hemlock (Tsuga canadensis)	X										3
25	Eastern Hop-hornbeam (Ostrya virginiana)	X										3
26	Eastern Prickly Gooseberry (Ribes cynosbati)	X					X					3
27	Eastern Red Cedar (Juniperus virginiana)		X			X	D					3
28	Eastern White Cedar (Thuja occidentalis)	X		D	X	X	D					-3
29	Eastern White Pine (Pinus strobus)	X	X	X			X					3
30	European Buckthorn (Rhamnus cathartica)	X					X					0
31	European Swallowwort (Vincetoxicum rossicum)	X	X									5
32	Field Horsetail (Equisetum arvense)				X	X						0
33	Grass-leaved Goldenrod (Euthamia graminifolia)				X							0
34	Grey Dogwood (Cornus racemosa)					X				0		0
35	Highbush Cranberry (Viburnum opulus ssp. trilobum)					X						-3
36	Large False Solomon's Seal (Maianthemum racemosum)	X										3
37	Large Tick-trefoil (Hylodesmum glutinosum)	X										5
38	Large-leaved Aster (Eurybia macrophylla)	X	X									5
39	Large-toothed Aspen (Populus grandidentata)	X	X									5

Appendix - Vegetation Community and Inventory

#	Common Name (Latin Name)	Vegetation Community										CoW
		1	2	3	4	5	6	7	8	9	10	
40	May-apple (Podophyllum peltatum)	X										3
41	Meadow Willow (Salix petiolaris)				A	X						-3
42	Nannyberry (Viburnum lentago)				X							0
43	New England Aster (Symphyotrichum novae-angliae)				X							-3
44	Northern Bush-honeysuckle (Diervilla lonicera)	X										5
45	Northern Red Oak (Quercus rubra)	X										3
46	Orchard Grass (Dactylis glomerata)		X			X						3
47	Ostrich Fern (Matteuccia struthiopteris)			X								0
48	Panicled Aster (Symphyotrichum lanceolatum)			X								-3
49	Paper Birch (Betula papyrifera)	X		X		X	A					3
50	Pennsylvania Sedge (Carex pensylvanica)	X					X					5
51	Pin Cherry (Prunus pensylvanica)		X									3
52	Poison Ivy (Toxicodendron radicans)	X	X			X	X					0
53	Purple Loosestrife (Lythrum salicaria)				X							-5
54	Purple-stemmed Aster (Symphyotrichum puniceum)			X	X							-5
55	Purple-veined Willowherb (Epilobium coloratum)			X								-5
56	Pussy Willow (Salix discolor)				A							-3
57	Red Ash (Fraxinus pennsylvanica)			X		X						-3
58	Red Columbine (Aquilegia canadensis)	X										3
59	Red Elderberry (Sambucus racemosa)	X										3
60	Red Maple (Acer rubrum)	X		X								0
61	Red Raspberry (Rubus idaeus)	X										3
62	Red-osier Dogwood (Cornus sericea)			X	D							-3
63	Riverbank Grape (Vitis riparia)	X	X			X	X					0
64	Rose Twisted-stalk (Streptopus lanceolatus)	X										3
65	Round-leaved Dogwood (Cornus rugosa)						X					5
66	Scots Pine (Pinus sylvestris)		X									3
67	Sensitive Fern (Onoclea sensibilis)			X								-3
68	Sheep Sorrel (Rumex acetosella)	X										3
69	Smooth Bedstraw (Galium mollugo)	X										5
70	Smooth Brome (Bromus inermis)		X									5
71	Spinulose Wood Fern (Dryopteris carthusiana)	X										-3
72	Spotted Geranium (Geranium maculatum)			X								3
73	Spotted Jewelweed (Impatiens capensis)			X	X							-3
74	Spotted Joe Pye Weed (Eutrochium maculatum)			X								-5
75	Staghorn Sumac (Rhus typhina)					X						3
76	Sugar Maple (Acer saccharum)	D					A					3
77	Swamp Red Currant (Ribes triste)			X								-5
78	Tall Goldenrod (Solidago altissima)		X		X	X						3

Appendix - Vegetation Community and Inventory

#	Common Name (Latin Name)	Vegetation Community										CoW
		1	2	3	4	5	6	7	8	9	10	
79	Tatarian Honeysuckle (Lonicera tatarica)		X				X					3
80	Trembling Aspen (Populus tremuloides)			X		X	A					0
81	Tufted Vetch (Vicia cracca)		X			X						5
82	Virginia Creeper (Parthenocissus quinquefolia)	X			X	X	X					3
83	Water Horsetail (Equisetum fluviatile)	X		X								-5
84	White Ash (Fraxinus americana)	X	X				A					3
85	White Elm (Ulmus americana)			X	X	X						-3
86	White Trillium (Trillium grandiflorum)	X										3
87	Wild Carrot (Daucus carota)		X			X						5
88	Wild Lily-of-the-valley (Maianthemum canadense)	X										3
89	Wild Strawberry (Fragaria virginiana)		X				X					3
90	Woodland Strawberry (Fragaria vesca)	X										3
91	Yellow Birch (Betula alleghaniensis)	X										0
92	Yellow Marsh Marigold (Caltha palustris)				X							-5
93	Zigzag Goldenrod (Solidago flexicaulis)	X										3

Appendix - Vegetation Species Significance and Status

#	Common Name (Scientific Name)	Rarity/Status[2]			CoC
		Federal	Provincial		
		SARA	SARO	S-Rank	
1	Alternate-leaved Dogwood (Cornus alternifolia)			S5	6
2	American Beech (Fagus grandifolia)			S4	6
3	American Water-horehound (Lycopus americanus)			S5	4
4	Balsam Poplar (Populus balsamifera)			S5	4
5	Basswood (Tilia americana)			S5	4
6	Bebb's Willow (Salix bebbiana)			S5	4
7	Bittersweet Nightshade (Solanum dulcamara)			SNA	0
8	Black Cherry (Prunus serotina)			S5	3
9	Blue-beech (Carpinus caroliniana)			S5	6
10	Blue-stemmed Goldenrod (Solidago caesia)			S5	5
11	Broad-leaved Cattail (Typha latifolia)			S5	1
12	Bull Thistle (Cirsium vulgare)			SNA	0
13	Calico Aster (Symphyotrichum lateriflorum)			S5	3
14	Canada Wood Nettle (Laportea canadensis)			S5	6
15	Common Dandelion (Taraxacum officinale)			SNA	0
16	Common Milkweed (Asclepias syriaca)			S5	0
17	Common Oak Fern (Gymnocarpium dryopteris)			S5	7
18	Common Prickly-ash (Zanthoxylum americanum)			S5	3
19	Common Self-heal (Prunella vulgaris)			S5	0
20	Common Timothy (Phleum pratense)			SNA	0
21	Cottony Willow (Salix eriocephala)			S5	4
22	Crack Willow (Salix euxina)			SNA	0
23	Dwarf Raspberry (Rubus pubescens)			S5	4
24	Eastern Hemlock (Tsuga canadensis)			S5	7
25	Eastern Hop-hornbeam (Ostrya virginiana)			S5	4
26	Eastern Prickly Gooseberry (Ribes cynosbati)			S5	4
27	Eastern Red Cedar (Juniperus virginiana)			S5	4
28	Eastern White Cedar (Thuja occidentalis)			S5	4
29	Eastern White Pine (Pinus strobus)			S5	4
30	European Buckthorn (Rhamnus cathartica)			SNA	0
31	European Swallowwort (Vincetoxicum rossicum)			SNA	0
32	Field Horsetail (Equisetum arvense)			S5	0
33	Grass-leaved Goldenrod (Euthamia graminifolia)			S5	2
34	Grey Dogwood (Cornus racemosa)			S5	2
35	Highbush Cranberry (Viburnum opulus ssp. trilobum)			S5	5
36	Large False Solomon's Seal (Maianthemum racemosum)			S5	4
37	Large Tick-trefoil (Hylodesmum glutinosum)			S4	6
38	Large-leaved Aster (Eurybia macrophylla)			S5	5
39	Large-toothed Aspen (Populus grandidentata)			S5	5

Appendix - Vegetation Species Significance and Status

#	Common Name (Scientific Name)	Rarity/Status[2]			CoC
		Federal	Provincial		
		SARA	SARO	S-Rank	
40	May-apple (Podophyllum peltatum)			S5	5
41	Meadow Willow (Salix petiolaris)			S5	3
42	Nannyberry (Viburnum lentago)			S5	4
43	New England Aster (Symphyotrichum novae-angliae)			S5	2
44	Northern Bush-honeysuckle (Diervilla lonicera)			S5	5
45	Northern Red Oak (Quercus rubra)			S5	6
46	Orchard Grass (Dactylis glomerata)			SNA	0
47	Ostrich Fern (Matteuccia struthiopteris)			S5	5
48	Panicled Aster (Symphyotrichum lanceolatum)			S5	3
49	Paper Birch (Betula papyrifera)			S5	2
50	Pennsylvania Sedge (Carex pensylvanica)			S5	5
51	Pin Cherry (Prunus pensylvanica)			S5	3
52	Poison Ivy (Toxicodendron radicans)			S5	2
53	Purple Loosestrife (Lythrum salicaria)			SNA	0
54	Purple-stemmed Aster (Symphyotrichum puniceum)			S5	6
55	Purple-veined Willowherb (Epilobium coloratum)			S5	3
56	Pussy Willow (Salix discolor)			S5	3
57	Red Ash (Fraxinus pennsylvanica)			S4	3
58	Red Columbine (Aquilegia canadensis)			S5	5
59	Red Elderberry (Sambucus racemosa)			S5	5
60	Red Maple (Acer rubrum)			S5	4
61	Red Raspberry (Rubus idaeus)			S5	2
62	Red-osier Dogwood (Cornus sericea)			S5	2
63	Riverbank Grape (Vitis riparia)			S5	0
64	Rose Twisted-stalk (Streptopus lanceolatus)			S5	7
65	Round-leaved Dogwood (Cornus rugosa)			S5	6
66	Scots Pine (Pinus sylvestris)			SNA	0
67	Sensitive Fern (Onoclea sensibilis)			S5	4
68	Sheep Sorrel (Rumex acetosella)			SNA	0
69	Smooth Bedstraw (Galium mollugo)			SNA	0
70	Smooth Brome (Bromus inermis)			SNA	0
71	Spinulose Wood Fern (Dryopteris carthusiana)			S5	5
72	Spotted Geranium (Geranium maculatum)			S5	6
73	Spotted Jewelweed (Impatiens capensis)			S5	4
74	Spotted Joe Pye Weed (Eutrochium maculatum)			S5	3
75	Staghorn Sumac (Rhus typhina)			S5	1
76	Sugar Maple (Acer saccharum)			S5	4
77	Swamp Red Currant (Ribes triste)			S5	6
78	Tall Goldenrod (Solidago altissima)			S5	1

Appendix - Vegetation Species Significance and Status

#	Common Name (Scientific Name)	Rarity/Status[2]			CoC
		Federal	Provincial		
		SARA	SARO	S-Rank	
79	Tatarian Honeysuckle (Lonicera tatarica)			SNA	0
80	Trembling Aspen (Populus tremuloides)			S5	2
81	Tufted Vetch (Vicia cracca)			SNA	0
82	Virginia Creeper (Parthenocissus quinquefolia)			S4?	6
83	Water Horsetail (Equisetum fluviatile)			S5	7
84	White Ash (Fraxinus americana)			S4	4
85	White Elm (Ulmus americana)			S5	3
86	White Trillium (Trillium grandiflorum)			S5	5
87	Wild Carrot (Daucus carota)			SNA	0
88	Wild Lily-of-the-valley (Maianthemum canadense)			S5	5
89	Wild Strawberry (Fragaria virginiana)			S5	2
90	Woodland Strawberry (Fragaria vesca)			S5	4
91	Yellow Birch (Betula alleghaniensis)			S5	6
92	Yellow Marsh Marigold (Caltha palustris)			S5	5
93	Zigzag Goldenrod (Solidago flexicaulis)			S5	6

Notes:

CC - Coefficient of Conservatism. Assigned on a a scale of 1-10, with 0 being the least conservative and 10 being the most conservative.

CW - Coefficient of Wetness. Assigned on a scale of 5 to -5, with 5 indicating a preference for upland habitats and -5 indicating a preference for wetland habitats.

SARA - Species at Risk Act

SARO - Species at Risk in Ontario

SC - Special Concern

THR - Threatened

END - Endangered

NAR - Not at risk

S-Rank - Provincial rank used by the Natural Heritage Information Centre to prioritize protection efforts

S1 - Extremely rare in Ontario

S2 - Very rare in Ontario

S3 - Rare to uncommon in Ontario

S4 - Considered to be common in Ontario

S5 - Species is widespread in Ontario

SNA - Not Applicable (typically introduced species)

"?" - Indicates uncertainty in classification due to lack of information

Appendix F

Bird Species List

Appendix E - Avifauna Observations

Common name	Scientific name	Station	Breeding Code	COSEWIC	SARO	S-Rank	Date
American Crow	Corvus brachyrhynchos	1	H	0	0	S5B	2023-05-25
American Robin	Turdus migratorius	1	S	0	0	S5B	2023-05-25
Black-capped Chickadee	Poecile atricapillus	1	H	0	0	S5	2023-05-25
Blue Jay	Cyanocitta cristata	1	H	0	0	S5	2023-05-25
Eastern Wood-pewee	Contopus virens	1	S	SC	SC	S4B	2023-05-25
Great Crested Flycatcher	Myiarchus crinitus	1	S	0	0	S4B	2023-05-25
Northern Cardinal	Cardinalis cardinalis	1	S	0	0	S5	2023-05-25
Red-eyed Vireo	Vireo olivaceus	1	S	0	0	S5B	2023-05-25
Song Sparrow	Melospiza melodia	1	S	0	0	S5B	2023-05-25
Wood Thrush	Hylocichla mustelina	1	S	THR	SC	S4B	2023-05-25
American Crow	Corvus brachyrhynchos	2	H	0	0	S5B	2023-05-25
American Goldfinch	Spinus tristis	2	FY	0	0	S5B	2023-05-25
Black-capped Chickadee	Poecile atricapillus	2	H	0	0	S5	2023-05-25
Blue Jay	Cyanocitta cristata	2	H	0	0	S5	2023-05-25
Downy Woodpecker	Picoides pubescens	2	H	0	0	S5	2023-05-25
Eastern Wood-pewee	Contopus virens	2	S	SC	SC	S4B	2023-05-25
Red-eyed Vireo	Vireo olivaceus	2	S	0	0	S5B	2023-05-25
American Crow	Corvus brachyrhynchos	3	H	0	0	S5B	2023-05-25
American Robin	Turdus migratorius	3	H	0	0	S5B	2023-05-25
Black-and-white Warbler	Mniotilta varia	3	S	0	0	S5B	2023-05-25
Blue Jay	Cyanocitta cristata	3	H	0	0	S5	2023-05-25
Cooper's Hawk	Accipiter cooperii	3	X	NAR	NAR	S4	2023-05-25
Mourning Dove	Zenaida macroura	3	S	0	0	S5	2023-05-25
Red-eyed Vireo	Vireo olivaceus	3	S	0	0	S5B	2023-05-25
Rose-breasted Grosbeak	Pheucticus ludovicianus	3	S	0	0	S4B	2023-05-25
American Crow	Corvus brachyrhynchos	1	H	0	0	S5B	2023-06-01
Black-capped Chickadee	Poecile atricapillus	1	H	0	0	S5	2023-06-01

Appendix E - Avifauna Observations

Common name	Scientific name	Station	Breeding Code	COSEWIC	SARO	S-Rank	Date
Blue Jay	Cyanocitta cristata	1	H	0	0	S5	2023-06-01
Eastern Wood-pewee	Contopus virens	1	T	SC	SC	S4B	2023-06-01
Great Crested Flycatcher	Myiarchus crinitus	1	T	0	0	S4B	2023-06-01
Northern Cardinal	Cardinalis cardinalis	1	T	0	0	S5	2023-06-01
Northern Flicker	Colaptes auratus	1	T	0	0	S4B	2023-06-01
Red-eyed Vireo	Vireo olivaceus	1	T	0	0	S5B	2023-06-01
Red-winged Blackbird	Agelaius phoeniceus	1	T	0	0	S4	2023-06-01
American Crow	Corvus brachyrhynchos	2	H	0	0	S5B	2023-06-01
American Robin	Turdus migratorius	2	H	0	0	S5B	2023-06-01
Blue Jay	Cyanocitta cristata	2	H	0	0	S5	2023-06-01
Eastern Wood-pewee	Contopus virens	2	T	SC	SC	S4B	2023-06-01
Mourning Dove	Zenaida macroura	2	H	0	0	S5	2023-06-01
Red-eyed Vireo	Vireo olivaceus	2	T	0	0	S5B	2023-06-01
American Crow	Corvus brachyrhynchos	3	H	0	0	S5B	2023-06-01
Black-and-white Warbler	Mniotilta varia	3	S	0	0	S5B	2023-06-01
Black-capped Chickadee	Poecile atricapillus	3	H	0	0	S5	2023-06-01
Blue Jay	Cyanocitta cristata	3	H	0	0	S5	2023-06-01
Eastern Wood-pewee	Contopus virens	3	S	SC	SC	S4B	2023-06-01
Northern Cardinal	Cardinalis cardinalis	3	S	0	0	S5	2023-06-01
Pine Warbler	Setophaga pinus	3	S	0	0	S5B	2023-06-01
Red-bellied Woodpecker	Melanerpes carolinus	3	S	0	0	S4	2023-06-01
Red-eyed Vireo	Vireo olivaceus	3	S	0	0	S5B	2023-06-01
Rose-breasted Grosbeak	Pheucticus ludovicianus	3	S	0	0	S4B	2023-06-01

Appendix G

Significant Wildlife Habitat Assessment

APPENDIX G: Significant Wildlife Habitat 6E

SWH Type	Associated Species	Associated ELC Ecosites	Habitat Criteria	Presence (Y/N)	Additional 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).	N	Not suitable habitat
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.	N	Not suitable habitat
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.	N	Habitat not present
Raptor Wintering Area	Eagles, Hawks, Owls	Hawks/Owls - Combination of Forest and Cultural Ecosites: FOD, FOM, FOC, CUM, CUT, CUS, CUW 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. Eagle sites: open water, large trees and snags for roosting.	N	No species observed during field investigations
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	Habitat not present
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.	Y	Density of candiates trees was <10 trees/ha, however, species confirmed 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.	N	Not suitable habitat
Reptile Hibernaculum	Snakes	Habitat may be found in any ecosite other than very wet ones. 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.	N	Not suitable habitat
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	Not suitable habitat
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.	N	Habitat not present
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	Habitat not present
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	Not within 5km on Lake Ontario.
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	Not within 5km on Lake Ontario.
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	None mapped on Site.

SWH Type	Associated Species	Associated ELC Ecosites	Habitat Criteria	Presence (Y/N)	Additional Notes
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	Not suitable habitat
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	Habitat not present
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	Habitat not present
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	Habitat not present
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	Habitat not present
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	Habitat not present
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	Habitat not present
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	Habitat not present
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.	N	No species observed during field investigations
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.	N	Not suitable habitat
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	Not enough interior habitat and No species observed during field investigations
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.	N	Habitat not present
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.	N	None observed during field investigations
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 amphbian species observed during targeted surveys.
Amphibian Breeding Habitat (Wetlands)	Toads, Frogs, and Salamanders	SW, MA, FE, BO, OA and SA. Typically isolated (>120m) from woodland ecosites, however larger wetlands may be adjacent to woodlands.	Wetlands >500m^2 isolated from woodland ecosites with high species diversity. Permanent water bodies with abundant vegetation for bullfrogs.	N	No amphbian species observed during targeted surveys.

SWH Type	Associated Species	Associated ELC Ecosites	Habitat Criteria	Presence (Y/N)	Additional 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	Not suitable habitat and no indicator species observed during targeted surveys.
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.	N	Not suitable habitat
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.	N	Not suitable habitat
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	Not suitable habitat
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	N	No species or structures observed during field investigations
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	See Section 4.10