Natural Environment Report

6059 Pearl Carrick Road
Township of Ramara
County of Simcoe
Submitted to Brand X Materials and Supply Inc.
May 2026

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23 HERRELL AVENUE, BARRIE ON L4N 6T5
WWW.BIRKSNHC.CA

BIRKS
NATURAL HERITAGE CONSULTANTS

23 Herrell Ave
Barrie, Ontario
L4N 6T5

May 5, 2026

Brand X Materials and Supply Inc.
15 Sarjeant Drive
Barrie, Ontario
L4N 4V9

Attention: Michael MacMillan, Assistant General Manager

RE: Natural Environment Report
Proposed Quarry – 6059 Pearl Carrick Road, Township of Ramara, County of Simcoe
Birks NHC File No. 02-014-2023

Dear Mr. MacMillan,

Thank you for retaining Birks Natural Heritage Consultants, Inc. to prepare a Natural Environment Report for the application being made under the *Aggregate Resources Act* (1990) for the property identified as 6059 Pearl Carrick Road in the Township of Ramara, County of Simcoe.

Birks NHC completed comprehensive field surveys running from 2023 through 2025 to review the existing conditions of the property and demarcate significant natural heritage features and functions as defined under the *Aggregate Resources Act* (1990) and Provincial Policy Statement (2024).

This Natural Environment Report outlines the process by which features are considered for their natural heritage function and provides an assessment of potential impacts associated with the proposed activity. Where potential impacts are identified, mitigation measures are proposed with the intention of reducing or eliminating those potential impacts. Where mitigation is not sufficient to remove all potential impacts, offsetting may be required to ensure the long-term maintenance of natural heritage features and functions. For this application, recommended mitigation measures and offsetting are necessary to ensure that natural heritage features and functions will continue to be maintained in the area into the future.

This Natural Environment Report is intended to contain the information required by the Aggregate Resources of Ontario standards applied by the Ministry of Natural Resources to accompany the application for license expansion. If you have any questions or concerns regarding this report, please do not hesitate to contact the undersigned.

Birks Natural Heritage Consultants, Inc.

B Baker
Brad Baker, H.B.Sc.
Ecologist

S Brady
Stephanie Brady, HBES
Ecologist

Melissa Fuller, H.B.Sc.
Fisheries Ecologist

Table of Contents

page

Tables

Figures

Appendices

Appendix A: County of Simcoe Official Plan
Appendix B: Township of Ramara Official Plan
Appendix C: Vascular Plant Data
Appendix D: Amphibian Calling Data
Appendix E: Bat Habitat Survey Data
Appendix F: Bat Acoustic Data Summary
Appendix G: Significant Wildlife Habitat Assessment
Appendix H: Species at Risk Assessment
Appendix I: Terrestrial Photographic Appendix
Appendix J: Dawn Breeding Bird Data
Appendix K: Fish Habitat Photos and Thermal Data
Appendix L: Significant Woodland Assessment

1 INTRODUCTION

Birks Natural Heritage Consultants, Inc. ('Birks NHC') was retained as part of a multi-disciplinary team by Brand X Materials and Supply Inc. to undertake a Natural Environment Report ('NER') to accompany the application for a Class A quarry Below the Groundwater Table under the *Aggregate Resources Act*, 1990 ('ARA'). Furthermore, this report has been prepared for the *Planning Act,* 1990 application, including Official Plan Amendment and Zoning By-law Amendment. The proposed quarry is to be developed on the property identified as 6059 Pearl Carrick, in the Township of Ramara ('Township'), County of Simcoe ('County') and will be herein referred to as the subject property (Figure 1).

1.1 PURPOSE

The purpose of this NER is to provide an assessment and characterization of the natural features and ecological functions identified on the site and within 120 metres ('m') of the subject property boundary, and evaluate for potential negative impacts of the proposed aggregate activities to those natural features and functions with respect to the following:

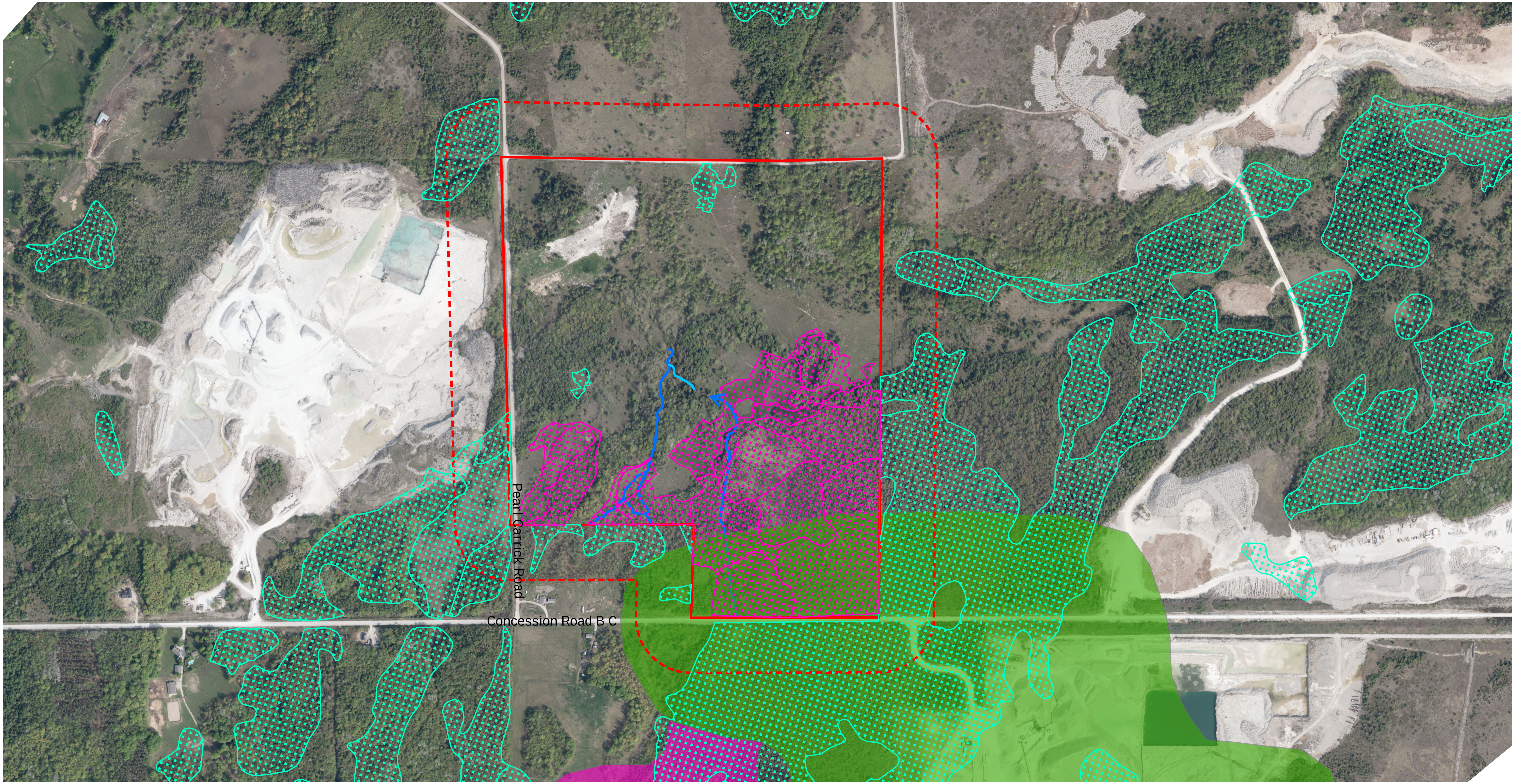
- Significant Wetlands;
- Other coastal wetlands in Ecoregions 5E, 6E, and 7E;
- Fish habitat;
- Significant Woodlands and Significant Valleylands in Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Mary's River);
- Habitat of Protected Species (Endangered and Threatened species);
- Significant Wildlife Habitat ('SWH'); and,
- Significant Areas of Natural and Scientific Interest ('ANSI').

This report specifically addresses the NER requirements set out in the *Aggregate Resources of Ontario: Technical Reports and Information Standards* document (MNRF, 2023). The NER is intended to satisfy policies of provincial plans and local Official Plans. Where required, preventative, mitigative or remedial measures are recommended later in this NER to safeguard the long-term health and viability of the natural heritage features present in the area.

The potential impacts of the extraction on groundwater and surface water resources are included in the accompanying Level 1 and 2 Hydrogeological Assessment (Tatham, 2026) and results are summarized where appropriate in the NER.

1.2 STUDY AREA

For the purpose of this NER, the 'Study Area' is focused within the subject property and adjacent lands (approximately 120 m surrounding the subject property), as illustrated in Figure 1. The Ministry of Natural Resources ('MNR') published the Natural Heritage Reference Manual (MNR, 2010) to provide technical guidance for the implementation of the natural heritage policies of the Provincial Planning



6059 Pearl Carrick Road

Township of Ramara

🟥 Property Limit (Approximate)

▭ 120m Study Area

Wetland (Ontario GeoHub)

▨ Un-evaluated

▨ Evaluated - Other

Fish Habitat

— Seasonal Direct

— Permanent Direct

🟪 Waterfowl Nursery Area (GeoHub)

🟩 White-tailed Deer Wintering Area (Stratum 2; GeoHub)

Figure 1:
Study Area

MAP DRAWING INFORMATION:
DATA PROVIDED BY: ESRI CANADA, Ontario GeoHub,
SIMCOE OPEN DATA

MAP CREATED BY: SB
MAP CHECKED BY: BB
MAP PROJECTION: NAD 1983 UTM ZONE 17N

N W E S

0 100 200 400 600 800 Meters

FILE LOCATION:

Path: C:\Users\S_Brady\BirksNHC\Birks NHC Team for all - Documents\Project Folders\04 - SBrady Projects\ArcGIS - Projects here\Projects - here\02-014-2023 Pearl Carrick

PROJECT: 02-014-2023 STATUS: **ISSUED** DATE: **5/05/2026**

Statement ('PPS'), which outlines a distance of 120 m for use in consideration of impacts to adjacent features.

The *Aggregate Resources of Ontario: Technical Reports and Information Standards* document echo's this requirement stating that natural features are to be identified and considered on the site and within 120 m of the site (MNRF, 2023).

1.3 SUBJECT PROPERTY DESCRIPTION

The subject property, identified as 6059 Pearl Carrick Road, measures approximately 73.5 hectares ('ha') and is located within the eastern portion of the Severn River-Lake Simcoe (Head River) subwatershed. It is accessed via Pearl Carrick Road with entrances situated approximately 250 m and 700 m north from Concession Road B C. The subject property is bound to the north by Donald Carrick Lane and to the west by Pearl Carrick Road. A portion of the southern limit is bound by Concession Road B C. The subject property is undeveloped, with its current land-use predominately agricultural/pasture in nature due to cattle grazing.

The subject property contains a mix of upland and wetland habitats, including deciduous and coniferous forest, open, shrub and treed alvar, meadow marsh, and deciduous, coniferous, and thicket swamps. An area of disturbed land, open rock, is present in the northwestern portion of the subject property. Access trails are present throughout the subject property.

1.4 ADJACENT LAND USE

Adjacent lands contain a mix of active quarries to the west, southeast, and east of the subject property, and natural lands. Few rural and farm properties are present in the area. The Sweetwater Nature Reserve (6263 Pearl Carrick Road), acquired by the Couchiching Conservancy in 2019, is present to the north of the subject property, which is managed for recreational, and conservation purposes and contains reaches of the Stickleback Creek.

2 ENVIRONMENTAL POLICY FRAMEWORK

The MNR licenses and regulates mineral aggregate operations under the ARA. Accordingly, applications for proposed new or expanded mineral aggregate operations must satisfy the requirements of the ARA. Supporting studies assess potential effects on people and the environment and are evaluated in accordance with provincial policies and standards, regulations, and guidelines.

Environmental policy and legislation reviewed for this Natural Environmental Report, specifically related to natural heritage features, are as follows:

- The ARA (1990) *Aggregate Resources of Ontario: Technical Reports and Information Standards* document (MNRF 2023)
- The Provincial Planning Statement (PPS 2024) including:

    - Significant Wildlife Habitat Technical Guide (MNR 2000)
    - Natural Heritage Reference Manual for Natural Heritage Policies of the Provincial Policy Statement, 2005 (MNR 2010)
    - Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E (MNR 2015)
    - Significant Wildlife Habitat Mitigation Support Tool (MNR 2014).
- The *Fisheries Act* (1985)
- The *Migratory Birds Convention Act* (1994)
- The *Species at Risk Act* (2002)
- Ontario's *Species Conservation Act* (2025)
- The Township of Ramara Official Plan (2025)
- The County of Simcoe Official Plan (2026) Office Consolidation 2023

The following sections summarize the planning policies and regulations related to natural heritage that apply to the proposed aggregate operation.

2.1 AGGREGATE RESOURCES ACT, 1990

Applicants are required under *the Aggregate Resources of Ontario: Technical Reports and Information Standards* (MNRF, 2023) to prepare a NER that must identify significant natural heritage features that occur on, or in proximity (*i.e.,* within 120 m) to the proposed activity. Significant natural heritage features are defined in the Provincial Planning Statement ('PPS') with guidance from supporting technical manuals prepared by the MNR. Where any significant natural heritage features have been identified, the NER must identify and evaluate any potential negative ecological impacts on the features, including their ecological functions, and identify where required any preventative, mitigative, or remedial measures.

2.2 PROVINCIAL PLANNING STATEMENT, 2024

The Provincial Planning Statement (PPS, 2024) is a policy statement issued under the authority of Section 3 of the *Planning Act* and came into effect on October 20, 2024. The PPS provides overall policy directions on matters of provincial interest related to land use planning and development in Ontario. The 2024 PPS is a streamlined province-wide land use planning policy framework that replaces both the Provincial Policy Statement, 2020 and A Place to Grow: Growth Plan for the Greater Golden Horseshoe, 2019. For the purpose of these policies, the Study Area falls within Ecoregion 6E.

Section 4.1 of the PPS (2024) specifies policy related to protection of natural heritage features and functions.

According to Section 4.1.4 of the PPS, development and site alteration shall not be permitted in the following features:

a) Significant wetlands in Ecoregions 5E, 6E, and 7E; and,
b) Significant coastal wetlands.

Section 4.1.5 of the PPS states that, unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions, development and site alteration shall not be permitted in:

a) Significant wetlands in the Canadian Shield north of Ecoregions 5E, 6E and 7E;
b) Significant woodlands in Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Marys River);
c) Significant valleylands in Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Marys River);
d) Significant wildlife habitat ('SWH');
e) Significant areas of natural and scientific interest ('ANSI'); and,
f) Coastal wetlands in Ecoregions 5E, 6E, and 7E that are not subject to policy 4.1.4(b).

While many of these features are mapped and direction is available to allow for candidate features and functions to be identified, it remains the responsibility of the province and/or the municipality to designate areas identified within Section 4.1.4 and 4.1.5 of the PPS as significant. The Natural Heritage Reference Manual (MNR, 2010) and Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E (MNRF, 2015) were used within this report to identify candidate features and functions not currently identified by the province and/or municipality.

Sections 4.1.6 and 4.1.7 state that development and site alteration is not permitted in fish habitat or habitat of endangered and threatened species except in accordance with federal and provincial requirements.

Section 4.1.8 extends protection of those features defined above to adjacent lands, typically those within 120 m of the potential impact. Section 4.1.8 states that development and site alteration shall not be permitted on adjacent lands to natural heritage features identified in policies 4.1.4, 4.1.5, and 4.1.6 unless the ecological function of the adjacent lands has been evaluated and it has been demonstrated that there will be no negative impacts on the natural features or on their ecological function.

It is important to note that Sections 4.1.4, 4.1.5, 4.1.6, 4.1.7, and 4.1.8 specifically regulate 'development' and 'site alteration'. These terms are defined within the PPS. These sections provide a relevant summary of natural heritage features and functions generally considered through environmental policy in Ontario. Natural heritage features and functions are considered through this report following the features and functions as laid out within the PPS for uniformity.

Section 4.5.2 (2) states that extraction shall be undertaken in a manner which minimizes social, economic, and environmental impacts.

Section 4.5.2 (4) states that mineral aggregate operations shall be protected from development and activities that would preclude or hinder their expansion or continued use or which would be incompatible for reasons of public health, public safety or environmental impact. Existing mineral aggregate operations shall be permitted to continue without the need for official plan amendment, rezoning or development permit under the *Planning Act*. Where the Aggregate Resources Act applies, only processes under the Aggregate Resources Act shall address the depth of extraction of new or existing mineral aggregate operations. When a license for extraction or operation ceases to exist, policy 4.5.2.5 continues to apply.

2.3 SPECIES CONSERVATION ACT, 2025

As of March 30, 2026, Ontario's *Species Conservation Act*, 2025 ('SCA') came into force and the provincial *Endangered Species Act*, 2007 was repealed. The SCA provides regulatory protection to Endangered and Threatened species as listed within Ontario Regulation ('O. Reg.') 60/26 Protected Species in Ontario List.

Section 16 of the SCA prohibits activities which would result in killing or harming a protected species, damaging or destroying their habitat, and possessing, transporting, buying, or selling protected species. The activities described in Section 16 may proceed through a registration, permit or exemption mechanism provided that the requirements as described in O. Reg. 75/26, O. Reg. 74/26 and O. Reg. 61/26 respectively are implemented prior to initiation of that activity.

As noted above, only species listed as Endangered and Threatened on the Protected Species in Ontario List receive species and habitat protection through the SCA. Special Concern species do not receive protection under the SCA. Further, aquatic species and migratory bird species listed as either Threatened, Endangered or Extirpated under the federal *Species at Risk Act,* 2002 are not eligible for protection under the SCA. Activities impacting aquatic and migratory bird species not listed in the Protected Species in Ontario List must comply with federal legislation including the *Species at Risk Act,* 2002, the *Fisheries Act*, 1985, and the *Migratory Birds Convention Act*, 1994.

2.4 SPECIES AT RISK ACT, 2002

At a federal level, Species at Risk designations for species occurring in Canada are assessed by the Committee on the Status of Endangered Wildlife in Canada ('COSEWIC'). If approved by the federal Minister of Environment and Climate Change, species are added to Schedule 1, the federal list of wildlife Species at Risk.

Sections 32 and 33 of the *Species at Risk Act* ('SARA') are vital for protection of wildlife Species at Risk in Canada.

Section 32(1) says *"No person shall kill, harm, harass, capture or take an individual of a wildlife species that is listed as an extirpated species, an endangered species or a threatened species."*

Section 32(2) "*No person shall possess, collect, buy, sell or trade an individual of a wildlife species that is listed as an extirpated species, an endangered species or a threatened species, or any part or derivative of such an individual."*

Section 33 states that *"No person shall damage or destroy the residence of one or more individuals of a wildlife species that is listed as an endangered species or a threatened species, or that is listed as an extirpated species if a recovery strategy has recommended the reintroduction of the species into the wild in Canada."*

Section 34(1) says *"With respect to individuals of a listed wildlife species that is not an aquatic species or a species of birds that are migratory birds protected by the Migratory Birds Convention Act, 1994, sections 32 and 33 do not apply in lands in a province that are not federal lands unless an order is made under subsection (2) to provide that they apply."*

For aquatic species and migratory bird species protected under the *Migratory Birds Convention Act. 1994*, Section 32 applies to all lands in Canada. However, Section 34(1) says *"With respect to individuals of a listed wildlife species that is not an aquatic species or a species of birds that are migratory birds protected by the Migratory Birds Convention Act, 1994, sections 32 and 33 do not apply in lands in a province that are not federal lands unless an order is made under subsection (2) to provide that they apply."*

Species listed on Schedule 1 as Endangered or Threatened are afforded protection of critical habitat on federal lands under the SARA. This habitat protection extends to all lands regardless of ownership where the habitat of a species listed in Schedule 1 is also protected by the *Migratory Breeding Birds Convention Act*, 1994 or the *Fisheries Act*, 1985 and in certain circumstances where provincial laws do not effectively protect the species or its residence, through an order issued by the Minister. The critical habitat protection afforded migratory birds extends only to the habitat protection provided by the *Migratory Birds Convention Act*, *1994 (Sections 58(5.1, 5.2).* The Protection Statement for the habitat to which the *Migratory Birds Convention Act, 1994* applies for migratory birds listed under the *Species at Risk Act says* that the habitat to which the *Migratory Birds Convention Act, 1994* applies refers to the nest only.

2.5 MIGRATORY BIRDS CONVENTION ACT, 1994

The *Migratory Birds Convention Act*, 1994 protects migratory birds, their nests, and eggs anywhere they are found in Canada and prohibits the dumping of harmful substances to birds in water or areas that they frequent. The *Migratory Birds Convention Act*, 1994 is implemented through two regulations: Migratory Birds Regulations and Migratory Bird Sanctuary Regulations.

The Migratory Birds Regulations (ECCC, 2022) prohibits the following (unless a person possesses authorization to do so):

- capture, kill, take, injure or harass a migratory bird or attempt to do so;
- destroy, take or disturb an egg; and,
- damage, destroy, remove or disturb a nest, nest shelter, eider duck shelter or duck box.

Exceptions include a nest that was built by a species not listed in Schedule 1 that does not contain a live bird or viable egg; a nest shelter, eider duck shelter or duck box that does not contain a live bird or a viable egg; and, a nest that has not been used by migratory birds for a number of months beforehand that corresponds to the number of months set out in the relevant Table to that Schedule for the species.

The Migratory Bird Sanctuary Regulations (ECCC, 2022) provides protection in a migratory bird sanctuary. In a bird sanctuary, no personal shall hunt migratory birds, destroy, damage or take the nests of migratory birds, or, have in possession a live migratory bird, or a carcass, nest or egg of a migratory bird. Further, no dog or cat shall be permitted to run “at large” in a migratory bird sanctuary.

Recent changes to the regulations associated with the *Migratory Birds Convention Act*, 1994 have added eighteen species of birds that are protected by the act year-round. There are certain conditions that must be met prior to destroying or disturbing a nest of these species.

2.6 FISHERIES ACT, 1985

The purpose of the federal *Fisheries Act*, 1985 is in part, to provide a framework for the conservation and protection of fish and fish habitat through the various regulations that protect against serious harm to fish by death or any permanent or temporary harmful alteration, disruption or destruction (‘HADD’) to their habitat. Fish habitat is defined within the *Fisheries Act,* 1985 as “spawning grounds and any 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”. The fish and fish habitat protection provisions of the *Fisheries Act, 1985* include:

- A prohibition against causing the death of fish, by means other than fishing (Section 34.4);
- A prohibition against causing the harmful alteration, disruption or destruction of fish habitat (Section 35);
- Establishment of standards and codes of practice in relation to works, undertakings and activities during any phase of their construction, operation, modification, decommissioning or abandonment for the avoidance of death to fish, HADD, and for the prevention of pollution (Section 34.2); and,
- Ministerial powers to ensure the free passage of fish or the protection of fish or fish habitat with respect to existing obstructions (Section 34.3).

The interpretation and application of the regulations of the *Fisheries Act,* 1985 is overseen by Fisheries and Oceans Canada (‘DFO’). Under the direction of DFO, projects that have potential to affect fish and fish habitat are to be screened using their online guidance platform, 'Projects Near Water' to determine if the project will require review under the *Fisheries Act,* 1985. Projects that can not implement measures to mitigate impact to fish and fish habitat, and do not qualify under current Standards and Codes of Practice, require review by DFO prior to any site disturbance or alteration, including vegetation removal and grading.

2.7 SIMCOE COUNTY OFFICIAL PLAN (2016) OFFICE CONSOLIDATION 2023

The Study Area is mapped by the Couty of Simcoe's Official Plan as being located within a High Potential Mineral Aggregate Resource Area ('HPMARA') containing Bedrock Aggregate Resources (Appendix A). Additionally, the Study Area is mapped within the County of Simcoe's Greenlands System (Appendix A). All applications for new or expanded mineral aggregate operations shall satisfy the requirements of the *Aggregate Resources Act* and meet all applicable policies of the Simcoe County's Official Plan, including the Greenlands and Natural Heritage policies.

Outside of settlement areas, and subject to Section 3.3.15 (other than for 3.8.15 vi. which is subject to policy 4.4.1), the following uses may be permitted in the Greenlands designation or on adjacent lands as described in Section 3.3.15:

i. Agricultural uses;
ii. Agriculture-related uses;
iii. On-farm diversified uses;
iv. Forestry on public lands or in County forests in accordance with an approved management plan and sustainable forest practices;
v. Forestry on private lands as permitted by the County's Forest Conservation Bylaw or by a local municipality's tree bylaw under the Municipal Act, 2001;
vi. Mineral aggregate operations, if approved through a local Official Plan amendment;
vii. Outdoor passive recreational uses; and
viii. Subject to demonstrating that the lands are not within a prime agricultural area, residential dwelling units on lots which were approved prior to the approval date of this policy (May 9, 2016).

Mineral aggregate operations shall not be permitted in Significant Wetlands or Significant Coastal Wetlands; and are not to be permitted in Significant Woodlands, Significant Valleylands, SWH, or ANSI unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions (County of Simcoe, 2016, Section 4.4.1). Impacts on adjacent lands to the natural heritage features must also be identified and demonstrated that there will be no negative impacts on the natural features or their ecological functions.

2.8 TOWNSHIP OF RAMARA OFFICIAL PLAN (2025)

The Study Area is mapped by the Township of Ramara Schedule D as High Potential Mineral Aggregate Resources Areas ('HPMARA'; Appendix B). HPMARAS are the identified primary sand and gravel resources and the bedrock resourced in the Township (Township of Ramara, 2025, Section 6.5.4 (4)). The HPMARAS and areas adjacent to HPMARAS are protected from development and/or site alteration that would preclude or hinder the establishment of new or expanded aggregate operations or access to the resource, according to the PPS. The land uses in HPMARAS that are acceptable include existing uses, farming, agricultural uses, forest resources, natural heritage protection and utilities (Township of Ramara, 2025, Section 6.5.4 (7)).

The Township may require aggregate impact study, noise study, traffic study and/or other studies for new development adjacent to lands designated for Mineral Aggregate Resources (Township of Ramara, 2025, Section 6.5.4 (10)). Owners and operators of licensed pits and quarries are encouraged to ensure that planned expansions of licensed areas and increased extraction of the resource are compatible with existing and planned land use in the Township (Township of Ramara, 2025, Section 6.5.4 (11)).

The Township will ensure that the extraction of aggregate resources is undertaken in a balanced manner which adheres to the environmental planning principles of this Plan, which will recognize the community's character and social values over the short and long-term (Township of Ramara, 2025, Section 6.5.4 (13)).

The Study Area is also mapped by the Township of Ramara's Official Plan Schedule A1 – Land Use as 'Greenlands' and Schedule A2 – Natural Heritage as containing 'Wetlands' and 'Woodlands' (Appendix B). The Greenlands designation identifies the Natural Heritage System of the Township on Schedule 'A1'. The purpose of the Greenlands Designation is to protect, conserve and enhance natural heritage features and functions (Township of Ramara, 2025, Section 7.2.1). Permitted uses within the 'Greenlands' designation include:

- agricultural uses
- agricultural-related uses
- on-farm diversified uses
- management of natural areas, including buildings and structures for environmental management purposes
- low intensity recreation, excluding buildings
- Single detached dwelling on existing lots, where zoning permits
- additional residential unit on existing lots, where zoning permits
- public and private infrastructure
- utilities

(Township of Ramara, 2025, Section 7.2.2)

3 METHODOLOGY & STUDY APPROACH

The following activities were completed to fulfill the objectives of this study.

3.1 BACKGROUND REVIEW AND DATA SOURCES

Background documents provide information on site characteristics, habitat, wildlife, rare species and communities, and other aspects of the Study Area. For the purpose of this NER, the following sources were considered:

- Ontario GeoHub for provincial mapping of natural heritage features. Accessed March 2025 at: https://geohub.lio.gov.on.ca/
- Natural Heritage Information Centre ('NHIC') database (squares 17PK4050, 17PK4150, 17PK4049, 17PK4149) accessed March 2025 at: https://www.lioapplications.lrc.gov.on.ca/Natural_Heritage/index.html
- Ontario Reptile and Amphibian Atlas database (squares 17PK45, 17PK35, 17PK34, 17PK44) accessed March 2025 at: https://ontarionature.org/programs/community-science/reptile-amphibian-atlas/species/
- Species at Risk in Ontario List and range maps at https://www.ontario.ca/page/species-risk-ontario
- Aquatic Species at Risk Maps (Fisheries and Oceans Canada) accessed March 2025 at: https://www.dfo-mpo.gc.ca/species-especes/sara-lep/map-carte/index-eng.html
- Ontario Breeding Bird Atlas 2 ('OBBA'; squares 17PK45, 17PK35, 17PK34, 17PK44) accessed March 2025 at: https://www.birdsontario.org/atlas-2/
- Atlas of the Mammals of Ontario (Dobbyn 1994) regarding mammals recorded in the Study Area
- Federation of Ontario Naturalists (2000) Great Lakes Alvars available at https://catalog.ontarionature.org/great-lakes-alvars-publication/page/1

In addition to the above background information sources, Birks NHC also reviewed the following technical reports and incorporated results that were deemed appropriate into the NER:

- Level 1 and 2 Hydrogeological Assessment (Tatham, 2026)
- Groundwater Modelling Assessment – Brand X Materials and Supply Inc. Ramara Quarry (Equilibrium Mining, 2026)
- Stage 1-2 Archaeological Assessment (Stantec Consulting Ltd., 2026)
- Blast Impact Analysis (Explotech, 2026)
- Noise Impact Assessment (HGC, 2026).

3.2 FIELD SURVEYS

Natural heritage features and functions were characterized within the Study Area through the completion of comprehensive field surveys during the appropriate timing window for each targeted feature. Consideration was also given to the presence or absence of suitable Species at Risk habitat, based on habitat requirements of Threatened or Endangered species with habitat ranges that may overlap the Study Area.

The following sections outline the methods and protocols used for each of the surveys conducted to characterize natural heritage features and functions of the Study Area, including the provincial protocols that were followed during the field program. Incidental wildlife, plant and habitat observations were considered during all surveys.

A summary of the field surveys, dates, times, and Birks NHC ecologists that completed each survey is provided in Table 1 below.

Table 1: Summary of Field Surveys Conducted by Birks NHC

Date(s)	Start/End Time	Type of Survey/Key Task(s)	Birks NHC Ecologist(s)
April 22, 2024 May 16, 2024 June 17, 2024	20:46 – 22:40 21:06 – 22:59 21:35 – 24:00	Amphibian Evening Call Surveys	Brad Baker, H.B.Sc. Heather Marcks, H.B.Sc, M.F.C. Ken Tuininga, H.B.Sc. Stephanie Brady, HBES
May 30, 2024 June 11, 2024 June 27, 2024	6:33 – 9:33 6:25 – 9:29 7:05 – 10:42	Dawn Breeding Bird Surveys	Brad Baker, H.B.Sc. Ken Tuininga, H.B.Sc. Stephanie Brady, HBES
May 16, 2024 June 17, 2024 June 18, 2024	21:06 – 22:59 21:35 – 24:00 21:10 – 21:46	Nocturnal Bird Evening Call Surveys	Brad Baker, H.B.Sc. Heather Marcks, H.B.Sc., M.F.C. Ken Tuininga, H.B.Sc. Stephanie Brady, HBES
April 1, 2024 April 3, 2024 April 15, 2024	10:00 – 15:00 10:30 – 14:30	Bat Habitat Assessment Snag Density Survey Visual Encounter Surveys for reptiles	Brad Baker, H.B.Sc. Stephanie Brady, HBES
June 10, 2024 – June 20, 2024	30min before Sunset – 30m after sunrise	Bat Habitat Assessment Acoustic Monitoring	Brad Baker, H.B.Sc. Stephanie Brady, HBES
April 15, 2024 July 31, 2024 October 11, 2024	10:30 – 14:30	Fish Habitat Assessment	Melissa Fuller, H.B.Sc. Brad Baker, H.B.Sc.
July 31, 2024	10:30 – 12:00pm	Fish Community Sampling	Ken Tuininga, H.B.Sc. Melissa Fuller, H.B.Sc.
September 19, 2023 May 30, 2024 July 23, 2024	9:30 – 16:00 9:30 – 15:30pm 9:00 – 14:00pm	Ecological Land Classification / Vegetation Surveys Visual Encounter Surveys for reptiles	Brad Baker, H.B.Sc. Heather Marcks, H.B.Sc., M.F.C. Ken Tuininga, H.B.Sc. Melissa Fuller, H.B.Sc. Stephanie Brady, HBES
July 17, 2024 July 23, 2024	9:30 – 14:00	Wetland Delineation and Connectivity Review	Brad Baker, H.B.Sc. Ken Tuininga, H.B.Sc.

Table 1: Summary of Field Surveys Conducted by Birks NHC

Date(s)	Start/End Time	Type of Survey/Key Task(s)	Birks NHC Ecologist(s)
October 11, 2024			Stephanie Brady, HBES
April 17, 2025	9:30-15:00	Detailed Mapping of Snag Trees within Identified Potential Habitat Visual Encounter Surveys for reptiles	Stephanie Brad, HBES Ken Tuininga, H.B.Sc. Brad Baker, H.B.Sc.

3.2.1 Vegetation Community Mapping and Surveys

The Ecological Land Classification ('ELC') system for Southern Ontario (Lee *et al.,* 1998) was used with modifications. The ecological community boundaries were determined through a review of aerial photography and then further refined during several site visits. In early 2007, the MNR refined their original vegetation type codes to encompass the vast range of natural and cultural communities across Southern Ontario. These updated ELC codes have also been used for reporting purposes in this study.

Vegetative communities are illustrated on Figure 2; a list of vegetative species identified in each of the communities has been compiled for inclusion in this report (Appendix C).

Wetland Delineation and Evaluation of Significance

Wetland boundaries were established in the field using the Ontario Wetland Evaluation System ('OWES') to identify a boundary between upland and wetland habitat based on vegetation cover. Where the transition point was difficult to establish, a soil assessment was completed using a hand auger to confirm the wetland boundary. The wetland boundary indicated on Figure 2 was marked July 17 and July 23, 2024 by Birks NHC ecologists utilizing a hand-held GPS unit. A follow-up visit on October 11, 2024 occurred to review wetland features and connectivity.

The wetlands were further evaluated for significance utilizing the OWES Manual for Southern Ontario (MNR, 2022) which provides the evaluation procedures to determine wetland significance, as referred to in Section 4.1 the PPS. Those that are evaluated as "significant wetlands" are referred to as Provincially Significant Wetlands ('PSW'). The wetland evaluation was carried out by qualified Birks NHC wetland evaluators who have successfully completed the OWES course.

3.2.2 Amphibian Call Surveys

Surveys were conducted following the Marsh Monitoring Program standards (Bird Studies Canada, revised 2008) to assess the function of wetland habitats as amphibian breeding habitat. According to this protocol, surveys are to be conducted between the months of April and July, at least 15 days apart, at the onset of three overnight temperature thresholds; 5°C for the first survey, 10°C for the second survey, and 17°C for the third survey. Each temperature threshold is designed to detect a variety of frog species during their 'optimum' breeding window, including early breeders (*i.e.,* Chorus Frog, Spring Peeper, Wood Frog), and late-season breeders (*i.e.,* American Toad, Northern Leopard Frog, Gray Treefrog, Green Frog, *etc*.).

Nine stations were established throughout the subject property which corresponded to locations in proximity to features that were identified as potential amphibian breeding habitat. The location of each amphibian call survey station is illustrated on Figure 2. Each station was surveyed on April 22, May 16, and June 17, 2024 during evening hours, after sunset, and within the minimum temperature thresholds. Weather conditions were also taken into consideration for each survey; surveys were not performed during periods of intense rain and high winds.

The calling activity of individuals estimated to be within 100 m of the monitoring station was documented during each survey. For each species heard, call activity was ranked using one of the three call level code categories:

- Call code 1 - Individuals can be counted, calls not simultaneous;
- Call code 2 - Calls distinguishable, some simultaneous calling; or,
- Call code 3 - Full chorus, calls simultaneous and overlapping.

Results of the amphibian call surveys can be found in Appendix D and discussed in Section 4.2.3 of this report.

3.2.3 Dawn Breeding Bird Surveys

Dawn breeding bird surveys were conducted following the methods outlined in the Ontario Breeding Bird Atlas Guide for Participants (Cadman *et al*., 2001). Specifically, breeding bird surveys consisted of ten-minute point counts that were used to establish qualitative estimates of bird abundance, species presence, and breeding activity in all habitat types on the subject property. Twenty bird survey stations were established throughout the subject property which corresponded to the various habitat types that were identified on the subject property during the preliminary site assessment. Each of the 20 stations were surveyed on May 30 and June 11, 2024. As per the protocol, point counts were completed between dawn and five hours after dawn, during periods of low wind and little to no rain or fog. A third breeding bird survey was conducted on June 27, 2024 which targeted at-risk bird species recorded during the previous breeding bird surveys, in particular Golden-winged Warbler (Not Listed [SCA]/Threatened [SARA]).

3.2.4 Nocturnal Bird Evening Surveys

Based on the preliminary identification of potential habitat, species specific surveys for Eastern Whip-poor-will (Special Concern) and Common Nighthawk (Special Concern) were carried out by Birks NHC to determine presence of the two species within the subject property limits and Study Area. A modified version of Bird Studies Canada survey protocol for Eastern Whip-poor-will (Bird Studies Canada, 2019) was used for the purpose of this assessment. Timing was based on the lunar cycle as Eastern Whip-poor-will surveys are to be conducted during periods where 50% or more of the visible moon will be illuminated. The amphibian survey stations were utilized for the assessment (Figure 2). As noted within the protocol, surveys are ideally undertaken on calm clear nights with the following conditions: at least 50% of the visible moon surface illuminated; little or no cloud cover; calm to light winds; no precipitation; and, temperatures above 10°C.

Nocturnal bird surveys were conducted May 16, June 17, and June 18, 2024. A known calling location in the area was used as a control site to demonstrate that any negative identification was not due to poor weather conditions.

Eastern Whip-poor-will was listed provincially and federally as a Threatened species at the time the surveys were completed and has since been provincially downlisted to Special Concern in January 2025 (federal status remains Threatened).

3.2.5 Bat Habitat Assessment

Snag Density Survey

To assess potential for bat maternity roosting habitat, the methods described in the Maternity Roost Surveys (Forests/Woodlands) document provided by the MNR (2022) were utilized. These methods are largely based on Appendix A: Methods for Evaluating Bat Significant Wildlife Habitat in the *Bats and Bat Habitats: Guidelines for Wind Power Projects* document (MNR, 2011). According to the protocol, maternity roosting habitat may include forest or swamp communities dominated by coniferous, deciduous or mixed woods.

Forest and swamp communities were identified on the subject property, and 31 survey plots were surveyed for candidate roost trees (Appendix E). These surveys took place while the trees were still in leaf-off conditions (early spring; April 2024), so the view of tree cavities and crevices are not obscured by foliage. All trees with a Diameter at Breast Height (‘DBH’) of ≥ 25 centimeters (‘cm’) were identified within each of the 31 plots. Information related to the species of tree, DBH, decay class, and presence of snag features *(i.e.*, loose bark, cavities, cracks) was recorded for each tree. Snag density per plot was then calculated and extrapolated upon to obtain a value for the number of snags per hectare for each vegetation community.

Snag density data for each qualifying vegetation community is presented in Appendix E and the results of which are discussed in Section 5 of this report.

Acoustic Monitoring

Passive acoustic monitoring is a widely used and accepted method of detecting the presence of bats within a specific area. These methods are largely based on the Survey Protocol for Species at Risk Bats within Treed Habitats (MECP, 2022), with some modifications given site conditions (*e.g.,* small habitat ELC units) and study objectives.

Wildlife Acoustics SM4BAT FS Bat Acoustic Monitors were deployed at ten locations in June 2024 following the snag density survey and habitat assessment within the forested portions of the subject property. The location of each Bat Acoustic Monitor was generally selected based on proximity to snag density plots with a higher relative number of candidate roost trees, with the lowest amount of clutter possible and in consideration of anticipated future tree removals within the subject property. Given the diversity of potential foraging habitat, effort was also made to capture areas that offered various foraging opportunities (*i.e.,* under canopy, open meadow marsh, forest openings, forest edges, corridors). Each Bat Acoustic Monitor was configured to begin recording 30 minutes before sunset and cease recording 30 minutes after sunrise. The location of each bat acoustic monitor deployed on the subject property in June 2024 can be found on Figure 2.

Wildlife Acoustics Kaleidoscope Pro 3 Analysis Software was used to process the sound files recorded during the sampling event. The Kaleidoscope program converted call data into individual files and was used to filter out false trigger noise such as rain and wind. Each file (or pass) which was confirmed as a bat call was automatically classified with species identification using the Kaleidoscope software's bat classifiers. Calls were then manually vetted by Birks NHC ecologists to confirm or change the bat classifier.

A conservative approach was used in the manual vetting of the recorded call files; where call quality was reduced and a definitive species identifier could not be assigned, then a larger category is assigned (classifier group), such as MYOTIS (meaning calls could be of *Myotis lucifugus, Myotis leibeii,* or *Myotis septentrionalis*), HighF (calls can be assigned to a high frequency calling species such as *Myotis lucifugus*, *Myotis septentrionalis*, *Perimyotis subflavus, Myotis leibeii,* or *Lasiurus borealis*), EPFULANO (call can be assigned to either *Eptesicus fuscus* or *Lasionycteris noctivagans*), or LowF (call can be assigned to *Eptesicus fuscus*, *Lasionycteris noctivagans*, or *Lasiurus cinereus*).
All call files were categorized by 30-minute intervals starting at sunset and ending at sunrise. The results can be found in Appendix F and are discussed in Section 5.

Detailed Mapping

Following completion of the bat snag and acoustic surveys, it was determined that Step 5 of the protocol be completed within the FODR2-1 (north) and FODM8-1 vegetation communities, in proximity of acoustic monitor 22041 (Figure 2). The survey was completed on April 17, 2025, and consisted of mapping the location of the highest quality habitat by recording the location of candidate roost trees utilizing a handheld GPS.

3.2.6 Fish and Fish Habitat Assessment

A characterization of fish habitat was completed through assessment of the following parameters: type of fish habitat present; thermal regime; and fish species observed/known to be present based on field data and available background information in April and July 2024. Fish community information for the

Study Area was obtained through background information sources including the Ontario GeoHub, DFO Species at Risk mapping and direct community sampling undertaken by Birks NHC staff.

All fish habitat identified within the Study Area was assigned one of the following designations based on inferred permanency of the feature, as determined during site visits in the spring, summer and fall:

- Permanent direct fish habitat: a feature where flowing or standing water is present year-round and connected to known fish habitat;
- Seasonal direct fish habitat: a feature that provides direct habitat for fish under elevated water levels (during spring freshet and large storm events), but not under low water conditions, due to insufficient open water and refuge habitat or anoxic water quality conditions; and
- Indirect fish habitat: a feature where there is sufficient water to sustain aquatic invertebrates and plants and discharges to direct habitat downstream, however, fish cannot directly access the area as a result of a barrier to upstream fish movement (*i.e.*, steep channel grade, low water levels, perched culvert, flashy systems).

Fish community sampling (minnow traps and electrofishing) was completed on July 31, 2024, to characterize the fish communities present within the aquatic features of the subject property. The location of the minnow traps and electrofishing transect are indicated in Figure 2. The minnow traps were set overnight for a maximum period of 22.5 hours. The electrofishing transect was approximately 50 m in length and was shocked for a period of 380 secs (with a Smith Root LR-24) to ensure that the variable habitat within the watercourse was properly targeted. Fish species captured were identified to species and measured to fork length. All specimens were live released in the location of capture.

Thermal regime of the watercourses was determined through analysis of data logger temperature data (date range = July 1 - Sept 18, 2024; July 1 – September 18, 2025) obtained from Tatham Engineering, following the Ontario Stream Assessment Protocol (OSAP) for determining thermal regime of a watercourse (Standfield, 2017).

Results of the fish habitat and community assessment are presented in Section 4.2.4 and Appendix K. Figures 2 and 3 illustrate the location of each assessed drainage feature and sample stations relating to the assessment of fish and fish habitat.

3.2.7 General Wildlife Surveys

A wildlife assessment within the Study Area was completed through incidental observations while on site. Any incidental observations of wildlife were noted, as well as other wildlife evidence such as dens, tracks, and scat. These observations helped validate our conclusions on the ecological function of the ecosystems identified within the Study Area.

Wildlife habitat functions were evaluated according to provincial criteria outlined in the Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E (MNRF, 2015). SWH functions were assessed utilizing expert knowledge of the site; habitat and species data sources were reviewed in addition to field data gathered by Birks NHC. The SWH assessment is included as Appendix G and discussed in Section 5.6 of this report.

3.3 SPECIES AT RISK ASSESSMENT

The Species at Risk assessment included an analysis of the habitat requirements of Species at Risk reported to occur in the region to identify those having potential to occur within the Study Area (Appendix H). Birks NHC staff reviewed data obtained through desktop review and the field surveys related to potential habitat for provincially designated species, notably Protected Species listed under O. Reg. 60/26 of the SCA as Threatened or Endangered and Schedule 1 of the SARA.

Habitat requirements of Threatened or Endangered species with habitat ranges overlapping the subject property were considered to document the presence or absence of suitable habitat. Species specific surveys were undertaken where habitat availability and the proposed activity would interact with that habitat in a manner that could reasonably be expected to result in potential for accidental contravention of the SCA.

Technical details pertaining to the assessment of the habitat of Endangered and Threatened species is provided in Appendix H.

4 EXISTING CONDITIONS

4.1 VEGETATION COMMUNITIES AND PLANTS

4.1.1 Vegetation Communities

The subject property consists of a mosaic of upland and lowland communities. Wetlands are predominantly in the southern, south-eastern portion of the subject property, comprised of swamp and meadow marsh communities while the northern and north-western portion of the subject property is comprised of open bedrock/alvar and forest (Figure 2). A photographic appendix is provided in Appendix I.

The following ELC communities were identified on the subject property; community size and percentage of coverage is provided in parenthesis:

<u>Woodland Communities</u>

- FOCM2-2 Dry – Fresh White Cedar Coniferous Forest (0.4 ha/0.6%)
- FOCM4-1 Fresh – Moist White Cedar Coniferous Forest (0.5 ha/0.7%)
- FOCS2-2 Dry White Pine Non-Calcareous Bedrock Coniferous Forest (3.8 ha/5.4%)
- FODM1-4 Dry – Fresh Mixed Oak Deciduous Forest (1.7 ha/2.4%)
- FODR2-1 Dry – Fresh Oak – Hardwood Non-Calcareous Shallow Deciduous Forest (2.3 ha/3.2%)
- FODM8-1 Fresh-Moist Poplar Deciduous Forest (1.7 ha/2.4%)

- FOMM2-1 Dry – Fresh White Pine – Oak Mixed Forest (1.4 ha/2%)
- FOMM4-2 Dry – Fresh White Cedar – Poplar Mixed Forest (3.2 ha/4.5%)
- WOMM1-1 Dry – Fresh White Pine – Oak Tallgrass Mixed Woodland (4.8 ha/6.8%)

Meadow

- MEGM3/Disturbed Dry-Fresh Graminoid Meadow (1.8 ha/2.5%)

Alvar

- RBSA1-1 Common Juniper Shrub Alvar (13.1 ha/18.5%)
- RBTA1-6 Bur Oak Treed Alvar (2.5. ha/3.5%)
- RBOB2-2 Non-Calcareous Open Rock Barren Meadow (4.3 ha/6.1%)

Wetland Communities – Marsh

- MAMM1-2 Cattail Graminoid Mineral Meadow Marsh (1.5 ha/2.1%)
- MAMM1-9 Narrow-leaved Sedge Graminoid Mineral Meadow Marsh (1.7 ha/2.4%)
- MASR1-1 Graminoid Bedrock Shallow Marsh (2.5 ha/3.5%)

Wetland Communities – Aquatic

- OAW Open Water (0.2 ha/0.3%)
- SAF_1-3 Duckweed Floating-leaved Shallow Aquatic (0.5 ha/0.7%)

Wetland Communities – Swamp

- SWCM1-1 White Cedar Mineral Coniferous Swamp (5.6 ha/7.9%)
- SWDM3-1 Red Maple Mineral Deciduous Swamp (2.8 ha/3.9%)
- SWDM3-2 Silver Maple Mineral Deciduous Swamp (2.4 ha/3.4%)
- SWMM1-1 White Cedar – Hardwood Mineral Mixed Swamp (0.9 ha/1.3%)
- SWTM1-1 Speckled Alder Mineral Deciduous Thicket Swamp (7 ha/9.9%)
- SWTM3-6 Mixed Willow Mineral Deciduous Thicket Swamp (1.2 ha/1.7%)

4.1.2 Vascular Plants

Species recorded in the swamp and marsh communities were indicative of the wet soil conditions and contained the following wetland indicators (as per the OWES Southern Manual, MNR 2022) in varying abundance: Southern Water-plantain, Grey Alder, Swamp Milkweed, Red-osier Dogwood, Spotted Joe Pye Weed, Common Marsh Bedstraw, Fowl Mannagrass, Harlequin Blue Flag, Square-stemmed Monkeyflower, American Water-horehound, Shining Willow, Meadow Willow, Common Woolly Bulrush, White Meadowsweet, Narrow-leaved Cattail, Bebb's Sedge, Fringed Sedge, Crested Sedge, Porcupine Sedge, Woolly-fruit Sedge, and Fox Sedge.

The vegetative species observed in the alvar, and upland forest communities were reflective of the upland conditions in the northern and north-western portion of the subject property (such as Common Juniper, Oaks (Red Oak, Bur Oak, White Oak), Eastern White Pine, Sugar Maple, Red Raspberry, Bracken Fern, Wild Bergamot, and Wild Strawberry). As seen in the above identified ELC communities, Eastern White Cedar was the dominant species overall, followed by Oak.

Non-native 'exotic' species were predominantly herbaceous and in the upland communities. These included species such as Wild Carrot, Tufted Vetch, Red Clover, and English Plantain. All species identified are considered provincially common; no rare (S1, S2, S3) or at-risk species were noted during vascular plant field surveys.

The locations of the vegetation communities are illustrated on Figure 2; vegetative species list per community is provided in Appendix C.

4.2 WILDLIFE AND WILDLIFE HABITAT

4.2.1 Breeding Birds

Through the completion of targeted dawn breeding bird surveys and incidental observations during other field surveys, a total of 74 bird species were documented within the subject property and adjacent lands in 2024. Appendix J provides a full list of species observed and defines the level of breeding evidence documented.

Forest dwelling and breeding species were documented at survey stations situated within those habitats. These includes species not limited to: Black-and-White Warbler, Eastern Wood-pewee, Northern Waterthrush, Ovenbird, Pileated Woodpecker, Red-breasted Nuthatch, Red-eyed Vireo, Veery, and White-breasted Nuthatch. Forest edge, successional habitats, and open habitats contained species such as Common Yellowthroat, Eastern Towhee, Field Sparrow, Gray Catbird, Indigo Bunting, Killdeer, Vesper Sparrow, Wild Turkey, and Wilson's Snipe. Wetland species were observed at survey stations within wetland communities, included species such as Alder Flycatcher, Great Blue Heron, Green Heron, Mallard, Sora, Swamp Sparrow, Viriginia Rail, and Wood Duck.

Of the 74 documented birds, 6 are considered as Species of Conservation Concern, including Barn Swallow (Not Listed [SCA]/Threatened [SARA]), Eastern Whip-poor-will (Not Listed [SCA]/Threatened [SARA]), Eastern Wood-pewee (Not Listed [SCA & SARA]), Golden-winged Warbler (Not Listed [SCA]/Threatened [SARA]), Common Nighthawk (Not Listed [SCA & SARA]; observed off-property only), and Red-shouldered Hawk (Not Listed [SCA]/Special Concern [SARA]; observed off-property only). Probable breeding evidence for Eastern Whip-poor-will and Golden-winged Warbler was recorded, while Eastern Wood-pewee has recorded possible breeding. Barn Swallow, Common Nighthawk, and Red-shouldered Hawk observations were not sufficient in assigning breeding evidence, as the species were only observed once, flying over the subject property or incidentally during other targeted surveys.

4.2.2 Mammals

Mammals expected or identified within the natural environments found in the Study Area include Black Bear, White-tailed Deer, Raccoon, Mink, Porcupine, Red Squirrel, Gray Squirrel, Eastern Chipmunk, and a number of small rodents. Abundant Beaver activity was noted in the south-eastern area including several dam and lodge structures and active creation of open water flooding and canals within Wetland Unit 4. Based on available background mapping from Ontario GeoHub, deer wintering habitat (Stratum II) is present within the southern portion of the Study Area, primarily within Wetland Unit 4 and to the south-east outside of the Study Area (Figure 1).

Bats

Suitable habitat for bats is present within the subject property and Study Area, including roosting and foraging habitats. Both habitat assessments and targeted species surveys, outlined in Section 3 of this NER were undertaken to determine the function of forest communities. Discussions relating to the results of those surveys are provided in Section 5.

4.2.3 Amphibians and Reptiles

Amphibians

During spring, amphibians gather to mate and lay eggs in water. Once hatched and grown, the amphibians emerge as adults. Some adult amphibians will remain in or near the water, while others will move to terrestrial habitats. Potential amphibian habitat was recognized to be present in the Study Area due to the presence of drainage features and wetlands. As discussed in Section 3 of this NER, amphibian call surveys were completed following the identification of potential breeding habitat conditions.

Survey Call data is outlined in Appendix D of this NER. American Toad, Gray Treefrog, Spring Peeper, Green Frog, and Northern Leopard Frog were recorded calling during the evening amphibian call surveys. American Bullfrog, and Wood Frog were encountered incidentally though the course of other survey efforts. Amphibian call survey stations 1, 2, 3, 4, and 7 recorded a full chorus (L3) of more than one species (*i.e.,* Gray Treefrog, Spring Peeper, Green Frog), in addition to other species calling at lower numbers (L1 or L2). Given the call intensity and species diversity, Amphibian Breeding SWH was confirmed to be present at those locations, in accordance with the Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E (MNRF, 2015). A full chorus of Spring Peepers was heard at Station 8, and a chorus of American Toad was heard from Station 9, however calling intensity of other species at those locations were below the criteria for SWH. Station 6 recorded simultaneous calling (L2) of Spring Peepers, and individuals of Gray Treefrog. No amphibians were heard calling from Station 5, which corresponds with Wetland Unit 2.

Reptiles

Targeted reptile surveys were conducted in 2024 and 2025 within the subject property. Eastern Gartersnake (Not Listed) and Eastern Ribbonsnake (Not Listed [SCA]/Special Concern [SARA]) were observed on the subject property by Birks NHC staff, with spring emergence activity observed within the FODR2-1 (north) and FODM8-1 vegetation communities, both situated within the northeast forest area that is higher and rockier than the surrounding lands. Basking Midland Painted Turtles (Not Listed [SCA]/Special Concern [SARA]) were documented within the Open Water (OAW) pond and SAF_1-3 aquatic community. Approximately 20 Midland Painted turtle individuals were observed basking within the SAF_1-3 aquatic community in 2025. All active turtle habitat use was situated within Wetland Unit 4 in the southeast of the subject property and corresponded with open water areas created and maintained through beaver activity.

Given the habitats present, species range maps, and observations in the general area (Ontario Nature, 2025), the following additional reptiles may be present in the Study Area: Eastern Milksnake, Smooth Greensnake, and Snapping Turtle (Not Listed [SCA]/Special Concern [SARA]).

4.2.4 Fish and Fish Habitat

The Study Area is located within the Black River Subwatershed which is a tributary of Lake St. John. The Black River originates in the Township of Algonquin Highlands, flowing south-westerly through Minden Hills, Kawartha Lakes, and Ramara before entering Lake St. John. The Black River flows primarily though Crown land, rural residential areas and agricultural areas (MWC, 2025).

The drainage feature associated with the subject property has been identified as Stickleback Creek, flowing northerly across the subject property (Figure 3). In the southern half of the subject property, two tributaries enter from the east and the west within defined drainage channels. The western tributary was smaller, with wetted width ranging from 1-2 m and depths 10 – 50 cm under low flow conditions (Appendix K, Photos 2, 3, 5). The feature enters the subject property via a cattail-graminoid marsh (MAMM1-2; WU-4), then passes through upland deciduous and coniferous forest communities (Figure 2). The eastern tributary was larger with wetted width being 5 m where it entered the subject property (Appendix K, Photo 7 and 8), and approximately 1 m in depth, under low flow summer conditions. The eastern drainage is entirely contained within a large wetland feature (WU-4; Figure 2). During spring freshet and storm events, the tributaries flood the adjacent vegetation communities, creating a direct connection between the two channels within the WU-4 unit. Both features had variable substrate, with rocks, boulders, silt and organics documented at various points within the subject property limits.

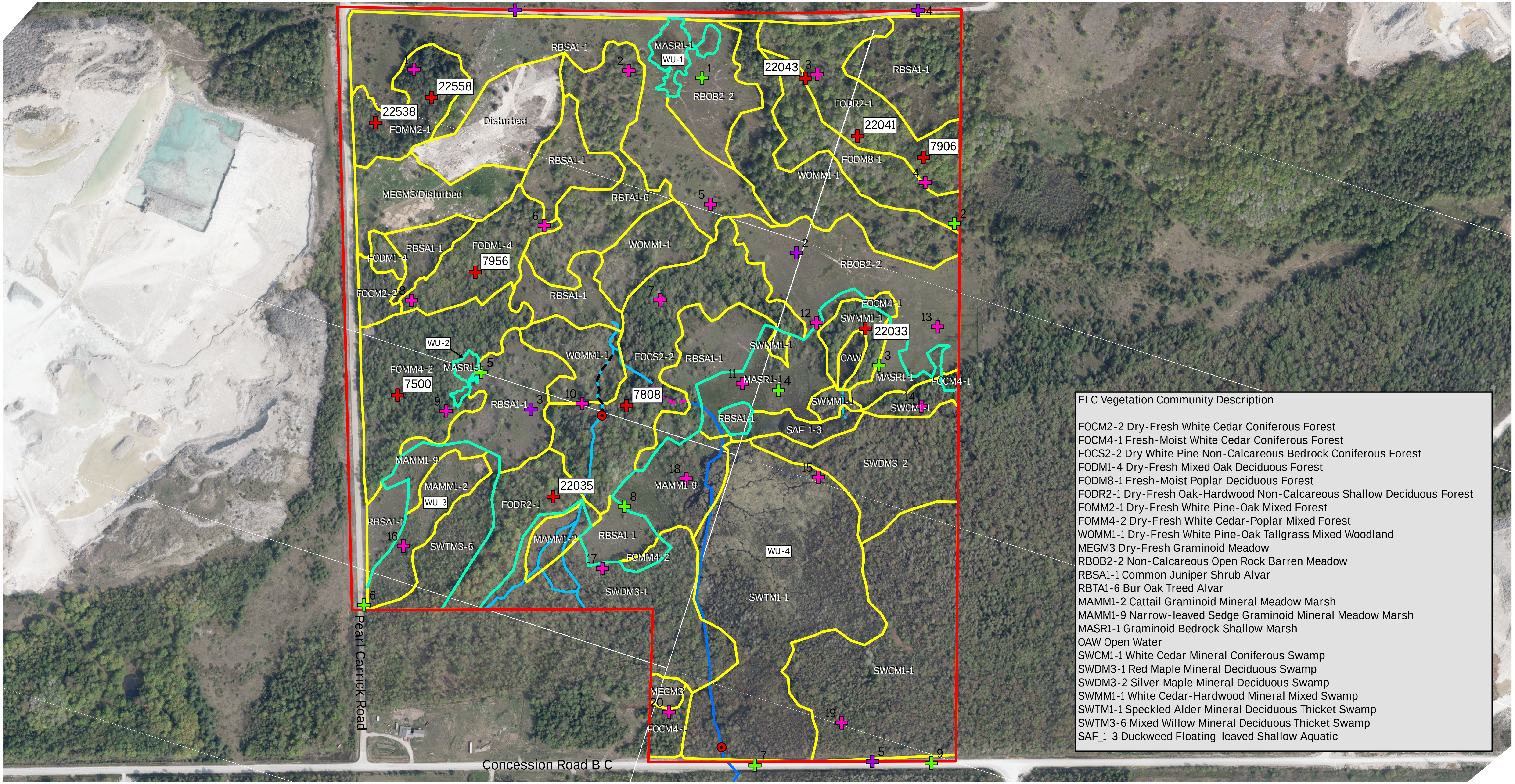
Within the central portion of the subject property, the eastern tributary feeds into a shallow marsh (MASR1-1) that has been created by beaver activity. A spillway is present (Appendix K, Photograph 1) which is briefly conveyed through shallow bedrock before daylighting and joining with the western tributary, where both features re-enter the shallow bedrock (Figure 2). From here, drainage generally flows towards the northern property limit (Tatham, 2026) through fractures in the bedrock (Tatham, 2026). The feature re-emerges approximately 250 m north of the subject property limit (Appendix K, Photo 6) and eventually drains to Head Creek, Black River and Lake St. John.

A query of Ontario GeoHub failed to provide details regarding the fish community associated with the tributary of the subject property. As such, fish community sampling was conducted by Birks NHC ecologists on July 31, 2024, through both passive (minnow traps) and active (Smith-Root LR24 backpack electrofisher) methods (Water Quality: Air temperature: 24^{0}C, Water temperature: 20.5; Conductivity 372 μS/s; pH: 7.13). Survey locations are illustrated in Figure 3. Species captured included Northern Redbelly Dace, Brook Stickleback, Finescale Dace, and Central Mudminnow. These species are typical of Central Ontario tributaries, common in the area and are all considered to prefer a coolwater thermal regime (Eakins R.G, 2025).

In accordance with the OSAP protocol, days with temperatures $>24.5^{O}$C with no proceeding precipitation were identified in 2024 and 2025, utilizing historical weather data available from the “Orillia Brain” weather station. Water temperature of the feature was recorded at 16:15 hours on those days at three locations SW1, SW2 and SW3 (Appendix K). Note, that SW3 was established in 2025 near SW1 to ensure consistent data recording – failure of SW1 had been observed in 2024 (Tatham, 2026). It was determined that the average summer temperature of the feature was 19^{0}C in 2024 and 19.71^{0}C in 2025 before entering into surface rock fractures where the stream water was conveyed subsurface (SW1/SW3), daylighting off of the subject property to the north. Station SW2 was installed immediately downstream of the re-emergence point of the feature (Appendix K). Average summer temperature was determined to be 18^{0}C in both 2024 and 2025. These temperatures, and the temperature ranges observed in consideration of the maximum air temperature, has led to the identification of the feature as a coolwater creek. Please see Appendix K for specific data relating to determination of thermal regime.

4.3 SITE DRAINAGE

The majority of the surface water on the subject property is reported to flow towards wetland unit 4 which overflows to the drainage feature and eventually entering shallow bedrock fractures conveying water to the Head River tributary to the north of the subject property, within the Sweetwater Nature Reserve. The total drainage area to the drainage feature is 409 ha (Tatham, 2026). The surface water entering the shallow bedrock fractures reappears downstream on the north adjacent property where it is joined by runoff from adjacent quarry operations and surrounding area (Tatham, 2026).



ELC Vegetation Community Description

FOCM2-2	Dry-Fresh White Cedar Coniferous Forest
FOCM4-1	Fresh-Moist White Cedar Coniferous Forest
FOCS2-2	Dry White Pine Non-Calcareous Bedrock Coniferous Forest
FODM1-4	Dry-Fresh Mixed Oak Deciduous Forest
FODM8-1	Fresh-Moist Poplar Deciduous Forest
FODR2-1	Dry-Fresh Oak-Hardwood Non-Calcareous Shallow Deciduous Forest
FOMM2-1	Dry-Fresh White Pine-Oak Mixed Forest
FOMM4-2	Dry-Fresh White Cedar-Poplar Mixed Forest
WOMM1-1	Dry-Fresh White Pine-Oak Tallgrass Mixed Woodland
MEGM3	Dry-Fresh Graminoid Meadow
RBOB2-2	Non-Calcareous Open Rock Barren Meadow
RBSA1-1	Common Juniper Shrub Alvar
RBTA1-6	Bur Oak Treed Alvar
MAMM1-2	Cattail Graminoid Mineral Meadow Marsh
MAMM1-9	Narrow-leaved Sedge Graminoid Mineral Meadow Marsh
MASR1-1	Graminoid Bedrock Shallow Marsh
OAW	Open Water
SWCM1-1	White Cedar Mineral Coniferous Swamp
SWDM3-1	Red Maple Mineral Deciduous Swamp
SWDM3-2	Silver Maple Mineral Deciduous Swamp
SWMM1-1	White Cedar-Hardwood Mineral Mixed Swamp
SWTM1-1	Speckled Alder Mineral Deciduous Thicket Swamp
SWTM3-6	Mixed Willow Mineral Deciduous Thicket Swamp
SAF_1-3	Duckweed Floating-leaved Shallow Aquatic

6059 Pearl Carrick Road
Township of Ramara

Property Limit (Approximate)
Watercourse (Birks NHC)
Watercourse (GeoHub/Birks NHC)
Underground Flow (approx.)
Drainage Connection

Survey Locations
✚ Dawn BBS
✚ Amphibian Breeding
✚ Nocturnal Bird

✚ Bat Acoustic
Electrofishing
● Minnow Trap Location

Delineated Wetland Limit (Birks NHC; July 2024)
ELC Vegetation Community

Figure 2.
Existing Conditions & Survey Locations

MAP DRAWING INFORMATION:
DATA PROVIDED BY: ESRI CANADA, Ontario GeoHub, SIMCOE OPEN DATA

MAP CREATED BY: SB
MAP CHECKED BY: BB
MAP PROJECTION: NAD 1983 UTM ZONE 17N

N
W
E
S

0 62.5 125 250 375 500 Meters

FILE LOCATION:
Path: C:\Users\S_Brady\BirksNHC\Birks NHC Team for all - Documents\Project Folders\04 - SBrady Projects\ArcGIS - Projects here\Projects - here\02-014-2023 Pearl Carrick

PROJECT: 02-014-2023 STATUS: **ISSUED** DATE: **5/05/2026**

5 NATURAL HERITAGE FEATURES AND FUNCTIONS

In the following sections we summarize the range of natural heritage features and functions attributable to the Study Area. This assessment considers both observed and assumed designations/delineations of the existing conditions of the Study Area framed in the context of the application of local, provincial and federal guidelines for identification of significant natural heritage features and functions. The Summary of this assessment is included in Section 5.8 of this NER.

5.1 PROVINCIALLY SIGNIFICANT WETLAND (PSW)

There are no mapped PSW areas within the subject property and Study Area. Existing wetland habitats within the subject property were reviewed for candidacy for evaluating significance utilizing the OWES Manual for Southern Ontario (MNR, 2022). Two wetland units were deemed candidates for evaluation and were subsequently evaluated for significance by Birks NHC certified wetland evaluators utilizing site specific data collected during the comprehensive field surveys and through other technical studies being undertaken including water resources and archaeology data. Final scoring for the evaluated wetlands concluded that wetland units are non-significant. The final wetland evaluation has been submitted via the Natural Resources Information Portal for inclusion within the provincial wetland database.

Therefore, based on the results of the evaluation, all wetlands within the subject property will be considered further as “Other Wetlands” as per the PPS (2024).

5.2 OTHER WETLANDS

Wetland habitats on the subject property are present within four (4) separate units, labelled as follows and illustrated in Figure 2:

- WU-1: small, isolated wetland unit in the northern most portion of the subject property;
- WU-2: small, isolated wetland unit in the central-eastern portion of the subject property;
- WU-3: part of the larger wetland complex which extends beyond the subject property limits to the south, this wetland unit is located in the south-west corner of the subject property; and,
- WU-4: largest wetland unit that encompasses the majority of the southern portion of the property and extends east beyond the subject property onto adjacent lands.

Wetland vegetation communities are as follows (total ecosite area/percent of subject property):

- MAMM1-2 Cattail Graminoid Mineral Meadow Marsh (1.5 ha/2.1%)
- MAMM1-9 Narrow-leaved Sedge Graminoid Mineral Meadow Marsh (1.7 ha/2.4%)
- MASR1-1 Graminoid Bedrock Shallow Marsh (2.5 ha/3.5%)
- OAW Open Water (0.2 ha/0.3%)
- SAF_1-3 Duckweed Floating-leaved Shallow Aquatic (0.5 ha/0.7%)
- SWCM1-1 White Cedar Mineral Coniferous Swamp (5.6 ha/7.9%)
- SWDM3-1 Red Maple Mineral Deciduous Swamp (0.4 ha/0.6%)
- SWDM3-2 Silver Maple Mineral Deciduous Swamp (2.4 ha/3.4%)

- SWMM1-1 White Cedar – Hardwood Mineral Mixed Swamp (0.9 ha/1.3%)
- SWTM1-1 Speckled Alder Mineral Deciduous Thicket Swamp (9.4 ha/13.2%)
- SWTM3-6 Mixed Willow Mineral Deciduous Thicket Swamp (1.2 ha/1.7%)

The two small, isolated wetland units, WU-1 and WU-2 (MASR1-1), measuring a combined 0.58 ha, are hydrologically separated from the larger WU-3 and WU-4 wetland units in the southern portion of the subject property and thus did not meet the standard requirements of 2 ha or more to be considered for evaluation. Notwithstanding, those two smaller wetlands, along with the larger units, will be considered further as they have been determined to provide some wildlife habitat function.

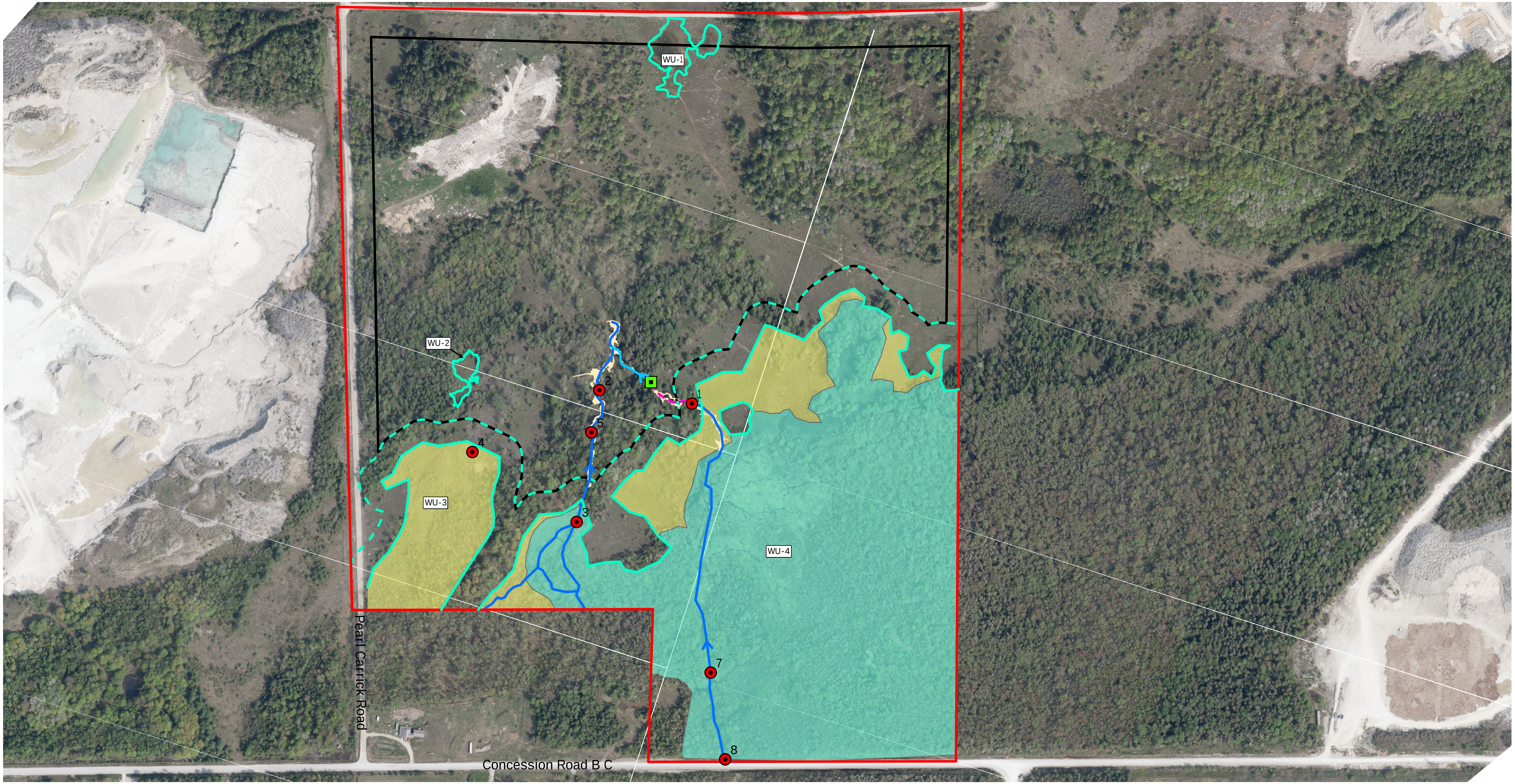
The two larger wetland units, WU-3 and WU-4, within the southern portion of the subject property are composed of 11 distinct ELC communities, 17 separate polygons (Figure 2) and extend onto adjacent lands to the east, and also to the south where the two units appear to converge. Within the subject property limits, the two units are separated via an upland forested ridge (FODR2-1). Portions of open water and aquatic habitats were noted throughout the WU-4 unit, where beaver activity and flooding is extensive and watercourses are present, providing habitat for fish and other aquatic species.

The total area of wetland habitat within the subject property has been calculated at 26.3 ha, roughly 37% of the subject property.

5.3 FISH & FISH HABITAT

The drainage feature is identified as Stickleback Creek, part of the Head Creek and Black Creek watersheds. Drainage flows `northerly across the subject property (Figure 3). In the southern half of the property, two tributaries enter from the east and the west within defined drainage channels. Significant flooding is observed during spring freshet and storm events during which the tributaries flood the adjacent vegetation communities, at times creating a direct connection between the two channels within the WU-4 unit. The fish community observed within the feature is typical of Central Ontario tributaries and common in the area. The species observed are all considered to prefer a coolwater thermal regime and thermal data acquired from the drainage feature supports the assignment of the drainage as a coolwater feature.

The two tributaries have been identified as providing permanent direct fish habitat (Figure 3). Direct fish habitat (or the highwater mark) identification outside of the wetland units was also determined through evaluation of the 1:2-year flood elevation (Tatham, 2026), as required by DFO. Seasonal direct habitat was identified as being present within wetland communities where extended inundation was documented and thus the habitat likely supports spawning and nursery habitat for the local fish community (Figure 3). The final daylighted reach of the eastern drainage also represents seasonal direct habitat; under low-flow conditions water depth is not sufficient to provide habitat for fish. Perimeter wetland units not directly connected to the drainage features were identified as indirect fish habitat (Figure 3).



6059 Pearl Carrick Road
Township of Ramara

▭	Property Limit (Approximate)
—	Delineated Wetland Limit (Birks NHC; July 2024)
- -	30m Wetland Setback
- -	Underground Flow (approx.)
▭	Proposed Extraction Limit

Fish Habitat

—	Permanent Direct
▨	Permanent Direct (2Yr Floodplain Tatham)
—	Seasonal Direct
▨	Indirect
▨	Seasonal Direct
●	Fish Photo Location
🟩	Surface Water Monitoring Well SW1 (Tatham)

Figure 3.
Fish Habitat Mapping

MAP DRAWING INFORMATION:
DATA PROVIDED BY: ESRI CANADA, Ontario GeoHub,
SIMCOE OPEN DATA

MAP CREATED BY: SB
MAP CHECKED BY: MMF
MAP PROJECTION: NAD 1983 UTM ZONE 17N

FILE LOCATION:
Path: C:\Users\S_Brady\BirksNHC\Birks NHC Team for all - Documents\Project Folders\04 - SBrady Projects\ArcGIS - Projects here\Projects - here\02-014-2023 Pearl Carrick

PROJECT: 02-014-2023 STATUS: ISSUED DATE: 5/05/2026

Periodic inundation within these lands was observed in 2024 and 2025 which was highly dependent upon both the amount of precipitation received during storm events, snow accumulation and the rate at which surface water was able to infiltrate into the shallow bedrock system. Fish may occur within these areas, and the adjacent direct fish habitat is supported by these periphery areas, however they are not considered to provide direct fish habitat due to the temporary, and sometimes flashy, nature of ponding water.

5.4 SIGNIFICANT WOODLAND

A portion of the subject property is mapped as being within the 'Greenlands' designation of the County of Simcoe's Official Plan (Appendix A) and mapped by the Township of Ramara's Official Plan as containing 'Supportive and Complimentary Areas and Corridors' (Appendix B). This is attributable to the presence of naturalized lands, including forested areas.

Birks NHC has undertaken a woodland mapping exercise as part of this NER. This exercise mapped woodland habitat within the Study Area and contiguous woodland habitat extending beyond the Study Area boundary illustrated in Figure 1. Woodland habitat is represented within the subject property within four (4) general areas; one of which is part of a large contiguous woodland unit that extends beyond the property limit to the north, forming an extensive woodland unit, measured at approximately 6,600 ha and containing portions of the Canadian Shield.

The two woodland areas in the central and western portions of the subject property are generally separated by the existing municipal roads including Pearl Carrick Road and Concession Road B and C which create gaps larger than 20m. The woodland habitat as mapped within the woodland mapping exercise is illustrated within Appendix L of this NER.

The significance of the woodland features in the Study Area was assessed by Birks NHC according to the Natural Heritage Reference Manual recommended criteria and standards for determining significant woodlands (MNR, 2010, Section 7.3.1, Table 7-1). The assessment table is also included in Appendix L of this NER.

The total area of each woodland feature was measured (1.4 ha, 23.2 ha, 48 ha, and 6,600 ha; Appendix L). In accordance with the Natural Heritage Reference Manual (MNR, 2010), the 6,600 ha woodland feature within the northern portion of the subject property would be considered Candidate Significant Woodland, based on the following criteria: a) size; b) woodland interior; c) proximity to other woodlands or other habitats; d) linkages, and, e) water protection. Following the Natural Heritage Reference Manual recommended criteria and standards, the remaining woodland features are not of sufficient size to be considered significant within the context of the watershed area (MNR, 2010).

5.5 HABITAT OF THREATENED AND ENDANGERED SPECIES

Ontario's SCA identifies Protected Species through O. Reg. 60/26, and which includes species listed as Extirpated, Endangered, and Threatened. At a federal level, Species at Risk are listed under the SARA, Schedule 1 List of Wildlife Species at Risk. For the purpose of this assessment, the habitat requirements of those species listed as Threatened and/or Endangered for both the SCA and SARA were considered in relation to the habitat features noted within the property limits and the adjacent lands (*i.e.,* within 120m). Species designated as Special Concern are addressed in our discussion in Section 5.6 below.

Based on habitat use, site knowledge and background data available, it was determined that potential habitat for the following species may be present in the Study Area and have the potential to be impacted by the proposed activity:

- Amphibians and Reptiles: Eastern Hog-nosed Snake, Blanding's Turtle
- Birds: Eastern Meadowlark, Bobolink, Loggerhead Shrike, Eastern Whip-poor-will, Golden-winged Warbler
- Mammals: Endangered bat species (Little Brown Myotis, Northern Myotis, Hoary Bat, Eastern Red Bat, Silver-haired Bat)

5.5.1 Eastern Hog-nosed Snake (Threatened [SCA&SARA])

The Eastern Hog-nosed Snake (Threatened [SCA& SARA]) occurs in both Canada and the United States, but less than 10% of its global range is in Canada. In Canada, the Eastern Hog-nosed Snake is restricted to southern and south-central Ontario and is found in two geographically distinct areas: the Carolinian Region of southwestern Ontario and the Great Lakes/St. Lawrence Region of central Ontario south of the French River and Lake Nipissing and east of Georgian Bay (COSEWIC, 2007). Preferred habitat of the Eastern Hog-nosed Snake has been described as areas consisting of loose sandy soils in proximity to water, and containing an abundance of amphibians (Platt 1969, COSEWIC 2007). Throughout Ontario, this snake is present in Oak-Hickory forest, Oak savannah, and Maple-Beach forest near the Great Lakes, as well as sandy areas and flood plains (COSEWIC 2007).

Eastern Hog-nosed Snake are oviparous (they lay eggs). When selecting nesting sites, Eastern Hog-nosed Snakes demonstrate a preference for open habitats (*i.e*., areas that lack tree and shrub cover, such as early successional habitat, forest clearings, forest edge, rock outcrops and shorelines), which receive full sun for most of the day and are warmer than the surrounding environment (Robson 2011, Peet-Paré and Blouin-Demers 2012). The species is known to prefer sandy well-drained soils. The subject property would therefore lack that habitat requirement needed for successful nesting.

The known range of this species includes two areas, one being in southern Ontario Carolinian region and one in the Great Lakes-St. Lawrence region that encompasses a band across the province; the Study Area lands are situated within the southern edge of that band (Ontario Nature, 2025). The Ontario Reptile and Amphibian Atlas has reported occurrences of the Eastern Hog-nosed Snake in squares 17PK45 and 17PK44 that contain the Study Area (Ontario Nature, 2025). Eastern hog-nosed Snake population within Ramara Township is not well know, however data suggests that population density is low.

As a Threatened species under both the SCA and SARA Eastern Hog-nosed Snake is afforded protection. Under the SCA, activities that may harm Eastern Hog-nosed Snake and impact habitat are regulated under Section 16 and may require registration or a permit. SARA protects this species only when it is occurring on federal lands, unless an order by the Minister of Environment and Climate Change is issued for lands in a province that are not federal lands (Section 58(4)). The subject property is not mapped as being within critical habitat for the species under SARA.

Eastern Hog-nosed Snake is not expected to be present within the subject property or Study Area. Notwithstanding, given the cryptic nature of the species and low detectability, further consideration for Eastern Hog-nosed Snake will be provided within this report. For the purpose of this NER, impacts will be considered on the basis that the species could be encountered incidentally.

5.5.2 Blanding's Turtle (Great Lakes / St. Lawrence Population – Threatened [SCA]/Endangered [SARA])

Blanding's Turtle is a Threatened species under the SCA (St. Lawrence Population) and Endangered under SARA and thus is afforded protection. Under the SCA, activities that may harm Blanding's Turtle and impact habitat are regulated under Section 16 and may require registration or a permit.

This species of turtle can be found in shallow waters of lakes, ponds and wetlands with clean water and mucky, soft bottom substrates. Blanding's Turtles are also known for their movements over land, travelling several kms to nesting and overwintering sites. Wetlands provide numerous functions within the context of the Blanding's Turtle's life history including opportunities for feeding, mating, thermoregulation, movement and protection from predators. Individuals will regularly move between wetland units that are within 500 m of each other (MECP, 2021).

Ontario's General Habitat Description for Blanding's Turtle (MECP, 2021) identifies and categorizes the critical habitats for the species. Category 2 habitat is the wetland complex that extends up to 2 km of a Blanding's Turtle sighting, as well as a 30 m setback to the wetland limit. Category 1 habitat is closely associated with Category 2 habitat and is comprised of both overwintering and nesting sites for the turtle. A General Habitat Description exists for Blanding's Turtle (https://www.ontario.ca/page/blandings-turtle-general-habitat-description) as published by the Province of Ontario. SARA protects this species only when it is occurring on federal lands, unless an order by the Minister of Environment and Climate Change is issued for lands in a province that are not federal lands (Section 58(4)). The subject property is mapped as being within critical habitat for the species under SARA.

Through background review and field surveys no confirmed instances of this species were obtained within 2km of the property limits. An incidental observation was reported in November 2025 of one individual Blanding's Turtle within the WU-4 wetland unit. As such, consideration for the protection of habitat and individuals of the species is warranted. Furthermore, the range of Blanding's Turtle overlaps with the subject property and there is suitable habitat present within the Study Area. Potentially suitable habitat is generally associated with beaver lodges and pools present within the WU-4 wetland unit which contains suitable water levels to support overwintering. Nesting habitat is generally limited due to the shallow soils on the subject property and adjacent lands. Further discussion related to Blanding's Turtle is provided in sections below.

5.5.3 Eastern Meadowlark and Bobolink (Not Listed [SCA]/(Threatened SARA])

Bobolink and Eastern Meadowlark are both medium sized grassland breeding birds that are commonly encountered in Ontario. Historically these species nested in native prairies and grasslands in Ontario, however they also benefitted from land clearing for agriculture associated with European settlement. Today they are most common in areas of agricultural grasslands such as hay and pasture farm fields. The potential suitable habitat for these species within the subject property corresponds to the open alvar communities found in a mosaic pattern throughout the northern portion of the subject property. Typically, Eastern Meadowlark and Bobolink prefer large tracts of grasslands over smaller fragments (Herkert 1991, Vickery *et al.*, 1994). Minimum patch area requirements to support breeding habitat for the species have been reported at 5 ha (Herkert, 1994) for Eastern Meadowlark and 5 ha up to 50 ha for Bobolink (Bollinger and Gavin, 1992, Herkert, 1991, Herkert, 1994, Helzer and Jelinski, 1999). These larger habitat sizes are required to reduce edge effects such as predation and brood parasitism (Johnson and Temple, 1990, Renfrew and Ribic, 2003, Bollinger and Gavin, 2004) and maintain good quality interior grassland habitat for breeding.

Eastern Meadowlark and Bobolink are not listed as Protected Species under O. Reg. 60/26 of the SCA. Both species are listed as Threatened under SARA and thus are afforded protection under Section 32(1) and 32(2) of the SARA being a species protected by the *Migratory Birds Convention Act,* 1994. General Habitat Descriptions were developed by the Province of Ontario for both species (https://www.ontario.ca/page/eastern-meadowlark-general-habitat-description, https://www.ontario.ca/page/bobolink-general-habitat-description. The subject property is identified as being within the critical habitat grid squares for Bobolink and Eastern Meadowlark under SARA (ECCC, 2022b, ECCC, 2022c).

The Ontario Breeding Bird Atlas reports confirmed breeding for both species in the area (Birds Canada, 2025; squares 17TPK45 and 17TPK44) and the open habitats on the subject property represent potential habitat for these species. The open habitats however are primarily treed or shrub rock barren communities; open rock barren meadow habitat was considered marginal potential habitat for Bobolink and Eastern Meadowlark.

Bobolink and Eastern Meadowlark were not recorded during dawn breeding bird surveys conducted by Birks NHC ecologists in 2024 on site. However, given the prevalence of these species in the area, future establishment of Bobolink and Eastern Meadowlark in the Study Area may occur, particularly if the Study Area habitat changes to become more suitable. Thus, these species are further considered within this report. For the purpose of this NER, impacts will be considered on the basis that the species could be encountered incidentally.

5.5.4 Loggerhead Shrike (Not Listed [SCA]/Endangered [SARA])

Loggerhead Shrike is a medium sized predatory bird with a relatively small range in Ontario. This species prefers large, open pasture or other grasslands with scattered low trees and shrubs and can be found in fields or alvars (areas of exposed bedrock) with short grass, which makes it easier to spot prey.

Loggerhead Shrike habitat generally includes large, open, frequently grazed alvar areas. In Ontario, the mean defended Loggerhead Shrike breeding territory size during nesting is 12.6 ha (*i.e.*, the area within 200 m of a nesting tree) (Glynn-Morris, 2010). Loggerhead Shrikes generally nest in Hawthorn or in Eastern Red Cedar which offer protection to nesting shrikes due to their dense and thorny of prickly nature (MNRF, 2016). Other habitat requirements for Loggerhead Shrike include areas for impalement of prey, typically provided by Hawthorn sp. and man-made barb-wire fencing. Perches are also very important features and may include utility wires, fences/posts, trees, brush piles, and rocks (Chalbot *et al*. 2001, Glynn-Morris, 2010). Suitable habitat is created and maintained by a balance between successional processes that create habitat structure (*i.e*., perch and nest trees) and disturbances, such as periodic grassland fires, cattle grazing, or even mowing, that prevent encroachment of woody vegetation (MNRF, 2016).

Loggerhead Shrike is not listed as Protected Species under O. Reg. 60/26 of the SCA. It is listed as Endangered under SARA and thus are afforded protection under Section 32(1) and 32(2) of the SARA being a species protected by the *Migratory Birds Convention Act,* 1994. Loggerhead Shrike (Eastern subspecies) is not listed as Protected Species under O. Reg. 60/26 of the SCA. The species is listed as Endangered under SARA. A General Habitat Description was developed by the Province of Ontario for the species (https://www.ontario.ca/page/loggerhead-shrike-general-habitat-description).

NHIC has a historical (1988) reported occurrence of this species in square 17PK4049, at the southwestern corner of the Study Area and potential habitat was identified in the Study Area (*i.e.* treed and shrub alvar habitats with Common Juniper and hawthorn). Open alvar habitats on the subject property represent marginal habitat for the species, however, given their small size and presence of mature forest conditions in proximity this habitat is considered to be of limited value to this species currently.

Loggerhead Shrike was not recorded during dawn breeding bird surveys conducted by Birks NHC ecologists in 2024 on site. Notwithstanding, consideration for the species remains a requirement should future establishment of the species occur in the Study Area or habitat become more suitable. Thus, these species are further considered within this report. For the purpose of this NER, impacts will be considered on the basis that the species could be encountered incidentally.

5.5.5 Eastern Whip-poor-will (Not Listed [SCA]/Threatened [SARA])

The Eastern Whip-poor-will is a medium sized bird usually found in areas with a mix of open and forested areas. Nesting habitat can include young woodlands, rock or sand barrens with scattered trees, and sparse plantations of coniferous trees (MECP, 2020). This species is most vocal during bright, moonlit nights when they can be heard singing their name “Whip-poor-will”, often repeatedly. The highest Canadian concentration of the species is thought to occur in Ontario where it breeds from southern Ontario to as far north as the southern boreal forest (MECP, 2020). Probable breeding evidence for Eastern Whip-poor-will was recorded during nocturnal bird surveys. Specifically, Eastern Whip-poor-will was recorded in a total of six separate areas, with one calling location being situated in the north-west portion of the subject property that is characterized as ‘Disturbed’ and ‘MEGM3’ (Figure 2) in proximity to survey location 1. The other five locations were within adjacent lands to the north, east and south. Therefore, the northern portions of the subject property are expected to contribute to the habitat requirements for the species, however adjacent lands within the Study Area represent the high-quality habitat potential where the species was primarily documented. Furthermore, through consultation with the Couchiching Conservancy staff, it is our understanding that staff have several years of documentation of Eastern Whip-poor-will within the Sweetwater Nature Reserve north of the subject property.

Eastern Whip-poor-will is not listed as Protected Species under O. Reg. 60/26 of the SCA. It is listed as Threatened under SARA and thus are afforded protection under Section 32(1) and 32(2) of the SARA being a species protected by the *Migratory Birds Convention Act,* 1994. The subject property is not identified as critical habitat for the species under SARA. A General Habitat Description was created for Whip-poor-will (https://www.ontario.ca/page/eastern-whip-poor-will-general-habitat-description), before it was removed from the Protected Species. The General Habitat Description provided guidance on determining important habitat features and sensitivity for the species.

Eastern Whip-poor-will has occurrence records reported in NHIC squares 17PK4050, 17PK4150, and 17PK4049 which encompass the Study Area, with detailed NHIC information indicating records from 2019 and 2020 at the northeastern, northwestern and southwestern portions of the Study Area. Birks NHC recorded Eastern Whip-poor-will at multiple locations during nocturnal surveys (Probable Breeding evidence) within the subject property and Study Area.

While specific nests could not be identified, call monitoring and triangulation was used by Birks NHC staff to determine the approximate center of the defended territory for each calling individual. Prior to the changes to habitat protection of the SCA, the center of territory was used as an alternative to the nesting location to determine the sensitivity of the habitat. The closest territory was present approximately 150 m to the northwest of the subject property. It remains unlikely that nesting is occurring on the subject property. Given the prevalence of this species in the Study Area, consideration for the species is warranted. While there is no direct protection for the species under the SCA, the SARA still protects nests and individuals of the species. For the purpose of this NER, impacts will be considered on the basis that active nesting areas are protected and the species proper is known to be present.

5.5.6 Golden-winged Warbler (Not Listed [SCA]/Threatened [SARA])

Golden-winged Warbler is not listed as Protected Species under O. Reg. 60/26 of the SCA. While it is not afforded protection under the SCA some protection exists provincially under SWH provisions of the PPS. Federally, the species is protected by the *Migratory Birds Convention Act,* 1994, Section 32(1) and 32(2) of the SARA where habitat protection extends to cover all lands regardless of ownership where the habitat of a species listed in Schedule 1 is also protected by the *Migratory Breeding Birds Convention Act*, 1994. The subject property is included within the critical habitat grid squares for the species (ECCC, 2016).

Similar to Whip-poor-will, SARA Section 33 protects the residences of Species at Risk, and Section 58 protects critical habitat, which for migratory birds according to the SARA Migratory Birds Protection Statement is the nest. No residence description for the species is available on the Species at Risk Registry (https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry.html) Confer *et al*. (2020) suggest the following with respect to Golden-winged Warbler. The species returns to the Great Lakes area (Michigan) in early May. Nest building typically begins shortly after arrival, and egg laying occurs in the second half of May to early June. The species frequently renests after the loss of the first clutch. Golden-winged Warblers' fall migration occurs in mid-August – September. (Confer *et al*. 2020).

Golden-winged Warblers tend to nest in groups of up to ten pairs of breeding birds and often return to the same areas to nest year after year (MECP, 2021b). This species prefers to nest in areas with young shrubs surrounded by mature forest – areas that have recently been disturbed, such as field edges, hydro or utility right-of-ways, and logged areas (MECP, 2021b). Golden-winged Warbler has occurrence reported for NHIC grid square 17PK4050 and Ontario Breeding Bird Atlas reports confirmed breeding evidence in survey square 17TPK45, and probable breeding in square 17TPK44, which encompass portions of the Study Area. Suitable habitat was presumed present in the Study Area and Golden-winged Warbler was recorded (probable breeding evidence survey location 5) during Birks NHC dawn breeding bird surveys at the following breeding bird survey locations: 1, 5, 13, 16, 17. While confirmed breeding was not recorded for the species, survey location 5 did record the species on two separate occasions, therefore probable breeding for the species is expected within the RBSA1-1 surrounding this survey location. It is our understanding that Golden-winged Warbler has also been recorded within the Sweetwater Nature Reserve (Couchiching Conservancy, pers. comm.).

Given the prevalence of this species in the Study Area, consideration for the species is warranted. While there is no direct protection for the species under the SCA, the SARA still protects nests and individuals of the species. Impacts will be considered on the basis that potential nesting areas are protected and the species proper is known to be present.

5.5.7 Endangered Bat Species

Eight species of bats live in Ontario, seven of which are currently listed as Endangered in Ontario. Eastern Red Bat, Hoary Bat and Silver-haired Bat were recently added provincially as Endangered species in January of 2025 by the Committee on the Status of Species at Risk in Ontario and in 2023 by COSEWIC, along with Eastern Small-footed Myotis, Little Brown Myotis, Northern Myotis, and Tri-colored bat which have been listed as Endangered since 2013. Federally, only three of those species are listed as Species at Risk (Little Brown Myotis, Northern Myotis, and Tri-colored bat). The main threats to populations of these bat species are wind energy turbines (for migratory bat species - Hoary Bat, Eastern Red Bat, and Silver-haired Bat), White Nose Syndrome (a fungal disease), and loss of forested roosting habitats.

Important habitat functions for these species include hibernacula, foraging habitat, day roosts, and maternity roosts. Hibernacula for bats in Ontario are often found in caves, abandoned mine shafts, underground foundations, and karst. These features were not documented within the subject property in any form that would be usable for overwintering bats and are unlikely to be present in adjacent lands within the Study Area. Potential foraging habitat would be associated with woodland and wetland areas that provide an abundance of flying insects. Foraging habitat is widely available within wetland and wooded areas common throughout the Township. Day roosts are those that are used by males and non-reproductive females as they move across the landscape and can take the form of any tree with appropriate snag features such as loose bark, cracks or crevices. There is no indication that there is any fidelity to specific day roost sites. Among the four non-migratory Endangered bat species, three are known to form maternity roosting colonies in forested habitats, utilizing mature trees in the early stages of decay with features such as cracks, crevices, and loose bark (Little Brown Myotis, Northern Myotis) or clusters of tree leaves/needles (Tri-colored Bat). Silver-haired Bats also are known to roost in a variety of large diameter trees; reproductive Silver-haired Bat females generally roost in small groups within tree cavities or under bark (COSEWIC, 2023). Hoary Bats and Eastern Red Bats are known to roost alone, or with their pups and do not form maternity colonies with other females. However, trees used as roosts by Hoary Bats and Eastern Red Bats are similar to those utilized by other bat species, including tall, large diameter trees (*i.e.,* super canopy trees). Therefore, generally speaking, for most of Ontario's bat species, maternity roosting habitat has potential to occur within woodlands providing a relatively high density of larger diameter wildlife cavity trees.

Thirty-one plots (1.55 ha) were surveyed for potential bat roost trees to assess for maternity bat roost habitat. A total of 304 trees greater or equal to 25 cm DBH were identified within the survey plots, with 115 of those containing snag features, including 31 being 'high quality' candidate roost trees (in early stages of decay [decay class 1-3] and cavity or crevice high in tree [>10 m]). Overall, the survey data resulted in an average of 20 'high quality' candidate roost trees per ha. As per MNR survey methodology, if snag density is calculated to be equal to or greater than 10 snags per hectare, the community should be considered high quality potential maternity roost habitat.

Acoustic recorders were deployed within those vegetation communities that contained high quality potential maternity roost habitat to obtain additional information for use in determining what bat species were present in those areas and how those species are using potential maternity roost habitat on the subject property. A total of 10 Wildlife Acoustic ultrasonic recorders were deployed for a period of 10 days at the locations illustrated in Figure 2. The following provides a summary of the acoustic data analysis, with additional discussion provided in Section 7 below. For ease of review, the total number of bat passes are provided as *Non-migratory Bat Species Passes/Migratory Bat Species Passes.* Note that a conservative approach was taken in the totals where 'High Frequency' passes were counted for both non-migratory (*i.e.,* Myotis sp.) and migratory (*i.e.,* Eastern Red Bat) species. The 'EPFULANO' passes were also counted toward Silver-haired bat passes.

- S4U22033 – Total of 1244 bat passes; 50/1160
- S4U22035 – Total of 496 bat passes; 39/269
- S4U22041 – Total of 1733 bat passes; 654/93
- S4U22043 – Total of 561 bat passes; 174/158
- S4U22558 – Total of 1071 bat passes; 980/349
- S4U22538 – Total of 1297 bat passes; 1126/859
- S4U7906 – Total of 233 bat passes; 76/115
- S4U7956 – Total of 79 bat passes; 18/63
- S4U7500 – Total of 337; 136/154
- S4U7808 – Total of 1510; 97/508

The detailed results of the acoustic surveys are included in Appendix F.

Acoustic monitoring surveys confirmed the presence of Little Brown Myotis, Big Brown Bat, Silver-haired Bat, Hoary Bat, and Eastern Red Bat. Data also suggests that other Myotis species may be present, specifically Northern Myotis, however data could not be used to confirm to the species level in every instance. One Tri-colored Bat call was recorded at S4U7500; however, this is considered very low detectability and unlikely to be present within the subject property. A total of 23 confirmed Eastern Red Bat passes were recorded for the entire property suggesting that habitat use of the subject property would be limited to foraging and day roosting. Based on the activity levels in relation to the timing of exiting and entering a maternity roost, it was determined that S4U22041 and the FODR2-1/FODM8-1 vegetation communities have the highest likelihood of containing a maternity colony for Little Brown Myotis, with a total of 442 confirmed passes, representing approximately 44 bat passes, on average, over the course of the 10-day period at this location. Detailed mapping of candidate roost trees identified 41 suitable trees within those two communities.

S4U22033 was placed in an area where increased activity was predicted based on the habitat type present, specifically suitable foraging conditions with open water conditions and wetlands. As predicted, S4U22033 recorded the highest activity levels for Hoary Bat with a total confirmed 904 Hoary Bat passes (Appendix F). Since migratory species do not form large maternity colonies similar to Little

Brown Myotis, activity levels are less important in identifying important habitat functions. However, the increased activity documented at this survey location may indicate an area where foraging is occurring. Existing conditions within the area of S4U22033 would also indicate suitable conditions for foraging, wetland conditions and open water present.

S4U7500 recorded the highest activity level for Silver-haired Bat with a total confirmed 81 Silver-haired Bat passes (Appendix F). However, recordings for Silver-haired Bat at this location does not indicate that maternity colony roosting is occurring where female bats would be exiting at sunset (± 30 min) and returning at sunrise (± 30 min). Highest activity levels recorded for this species at S4U7500 is between 21:30-22:00 (12 passes), 23:30-00:00 (11 passes), and 00:00-00:30 (11 passes). This represents on average 1 bat pass per night. No activity increase was observed during sunrise time (± 30 min) suggesting bats are not returning to the area to roost. As discussed above, S4U22033 placed as a control site, recorded a total of 57 confirmed Silver-haired Bat passes, with increased activity levels at both sunset (± 30 min; 22 passes) and sunrise times (± 30 min; 14 passes). This suggests that although foraging is expected to be occurring similarly to the Hoary Bat observations, maternity roosting may also be occurring in proximity to this recorder.

Based on this information two areas were identified for potential bat maternity roosting within the subject property. The northeastern forest communities (FODR2-1 and FODM8-1) were characterized as providing potential bat maternity colony roosting for Little Brown Myotis. Forest and wetland habitat surrounding acoustic monitor S4U22033 may also provide maternity roosting habitat for Silver-haired Bat and Hoary Bat as well as foraging habitat in the open water associated with the wetland.

Little Brown Myotis is an Endangered species under the SCA and SARA and thus is afforded protection under both acts. SARA protects the species only when it is occurring on federal lands, unless an order by the Minister of Environment and Climate Change is issued for lands in a province that are not federal lands. Hoary Bat and Silver-haired Bat have been assessed under COSEWIC as Endangered, however have not been added to Schedule 1 of SARA. Both species are listed as Endangered under the SCA. The subject property is not identified as critical habitat for either of the species under SARA.

The Preliminary Technical Habitat Summary for Bats (MECP, 2025) was reviewed in order to appropriately characterize the habitat and determine whether the proposed extraction activity would have an adverse impact on habitat. Based on this guidance, Maternity roosting habitat *(for Resident and Migratory Bats)* generally includes:

- as a dwelling place, the natural roost feature (*e.g.*, tree, snag, rock) or entire anthropogenic structure (*e.g.*, entire bridge, barn, or rock pile) occupied for breeding (gestation, birth) and rearing pups (hereafter, “maternity roost”); and,
- the portion of the area required by the species for breeding and rearing pups, up to a 1000 m radius from the maternity roost.

Based on the above description of habitat, it is expected that the two areas identified as potential maternity roosting habitat and adjacent natural lands within 1000m would receive protection under the SCA. In addition, the individual bats are protected under the SCA. Impacts will be considered on the basis of the removal of potential maternity roost habitat and potential harm to individual bats present in the Study Area.

5.6 SIGNIFICANT WILDLIFE HABITAT (SWH)

The Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E (MNRF, 2015) document was reviewed by Birks NHC as part of this study to determine whether any portion of the Study Area would meet the criteria for candidate or confirmed SWH. SWH functions were assessed utilizing expert knowledge of the site; habitat and species data sources were reviewed in addition to field data gathered by Birks NHC. The SWH assessment is included as Appendix G of this report. Based on that assessment, the following SWH functions have been carried forward for consideration:

5.6.1 Bat Maternity Colonies

Bat Maternity Colonies for Silver-haired Bat and Big Brown Bat are identified as candidate SWH because known locations of forested bat maternity colonies are extremely rare in Ontario. According to Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E (MNRF, 2015), maternity colonies located in mature deciduous or mixed forest stands with more than ten large diameter (greater than 25 cm DBH) wildlife trees per hectare are candidates for SWH designation.

As discussed, the woodlands present within and adjacent to the Study Area contain standing dead and dying mature trees with suitable bat roost features. Birks NHC undertook a bat snag density survey within suitable areas of the subject property. Overall, the survey data resulted in an average of 20 ‘high quality’ candidate roost trees per ha. As per MNR survey methodology, if snag density is calculated to be equal to or greater than 10 snags per hectare, the community should be considered potential maternity roost habitat.

Acoustic monitoring indicated bat activity within the subject property. Both species listed in the Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E (MNRF, 2015) document (Silver-haired Bat and Big Brown Bat) were documented at all 10 monitoring locations, with S4U22041 recording the highest activity of Big Brown Bat passes (1013 passes) and S4U7500 recording the highest activity of Silver-haired Bat passes (81 passes).

Activity levels at S4U22041 for Big Brown Bat are representative of the suitable habitat features where similar activity levels for Little Brown Myotis were recorded. Therefore, Candidate SWH for Bat Maternity Colonies (Big Brown Bat) may be present within the FODR2-1/FODM8-1 vegetation communities or the Northwest forest Unit.

5.6.2 Turtle Wintering Area

For most turtles, overwintering occurs in the same general area as their core habitat. The water must also be deep enough not to freeze and have soft mud substrates. Conditions within the WU-4 wetland unit are suitable and may provide turtle wintering habitat. Water depths and substrate would be appropriate to provide this function. The WU-3 wetland unit did not contain standing water that would be required to provide this function. The small, isolated WU-1 and WU-2 wetland units did not contain appropriate substrate and depth of standing water to provide this function. Approximately 20 Midland Painted Turtles were observed basking within the SAF_1-3 open water feature of the WU-4 wetland unit on April 17, 2025, which may indicate overwintering function in the area.

5.6.3 Reptile Hibernaculum

Some snake species overwinter in Ontario by accessing underground hibernation sites below the frost line. Hibernacula are occasionally used by large congregations of individuals that will utilize rock crevices, rodent burrows, tree root systems and structures such as old building foundations to get below ground deep enough so they will not freeze. Because of the variability in features that snakes will use for hibernation, snake hibernaculum may be found in almost any habitat (except for very wet ones). Within the Study Area reptiles may gain access to below the frost line for hibernation through rodent burrows, tree root systems and rock crevices. This SWH function is intended to protect areas where large congregations of reptiles overwinter. Reptile activity which could be attributed to communal hibernaculum was noted within the northeast forest in the FODR2-1 vegetation community. In this location, Birks NHC staff noted observation of both Eastern Gartersnake and Eastern Ribbonsnake (Not Listed [SCA]/Threatened [SARA]) emerging in the spring of 2024 and 2025. Further consideration for potential impacts to potential Reptile Hibernaculum as a SWH function is required.

5.6.4 Deer Wintering Areas and Movement Corridors

Deer wintering areas are areas that deer move to in response to the onset of winter. Deer yarding habitat consists of two areas referred to as Stratum I and Stratum II. Stratum II would cover the entirety of winter yard area and is usually a mixed or deciduous forest with sufficient availability of browse for food. The core of a deer yard (Stratum I) is generally located within the Stratum II area and is critical for deer survival in areas where winters become severe. The core is primarily comprised of coniferous trees with a canopy cover of more than 60% (MNR, 2015). Deer movement in the southern areas of Ecoregion 6E are not constrained by snow depth, however deer will congregate annually in suitable woodlands. Deer wintering habitats are mapped by the MNR and locations of Deer Yarding and Winter Congregation Areas considered significant by MNR are available via Ontario GeoHub. Based on available background mapping, Deer Yarding Areas is associated with the southern portion of the Study Area and to the south-east of the Study Area (Figure 1).

White-tailed Deer typically travel through forest habitats to migrate seasonally between their summer and winter range. Woodlands present in the south portion of the Study Area are mapped as deer wintering habitat by MNR, therefore, consideration for deer movement corridors SWH has been provided. The Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E (MNRF, 2015) indicates that corridors leading to deer wintering habitat should be at least 200 m wide and unbroken by roads and residential areas. Corridors typically follow riparian areas, woodlots, ravines, and ridges.

5.6.5 Amphibian Breeding Habitat and Movement Corridors

Amphibian call surveys were completed following the identification of potential breeding habitat conditions. Nine stations were established throughout the subject property which corresponded to locations in proximity to features that were identified as potential amphibian breeding habitat (Figure 2). American Toad, Gray Treefrog, Spring Peeper, Green Frog, and Northern Leopard Frog were recorded calling during the evening amphibian call surveys. American Bullfrog, and Wood Frog were encountered incidentally though the course of other survey efforts. Amphibian call survey stations 1, 2, 3, 4, and 7 recorded a full chorus (L3) of more than one species (*i.e.,* Gray Treefrog, Spring Peeper, Green Frog), in addition to other species calling at lower numbers (L1 or L2).

Per the Significant Wildlife Habitat Criteria Schedule for Ecoregion 6E: *Wetlands>500m2 (about 25m diameter), supporting high species diversity are significant.* Given the call intensity and species diversity, Amphibian Breeding SWH was confirmed to be present at those locations, in accordance with the Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E (MNRF, 2015). Calling intensity of amphibian species at the remaining locations (stations 5,6,8,9) were below the criteria for SWH. These calling stations correspond with wetland units WU-1 and WU-4 within the subject property which will be considered further as functioning for Amphibian Breeding SWH. Adjacent wetland habitat to the north and east (survey station 2) is also being considered as functioning for Amphibian Breeding SWH and will be assessed for indirect impacts to the proposed activity.

Similarly to WU-1, the WU-2 unit is hydrologically isolated from the larger WU-3 and WU-4 wetland units. No amphibian breeding was documented within this unit (survey station 5), as no standing water was documented within this unit at any time during the year, including in spring. This unit is too small to qualify as any other candidate SWH functions.

For amphibians, movement corridors between terrestrial and aquatic breeding habitats are important for local populations. The Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E (MNRF, 2015) indicate that corridors may be found in all ecosites associated with water. Corridors unbroken by roads, waterways or bodies and undeveloped areas are most significant, and should have at least 15 m of vegetation on both sides of waterway or up to 200 m of woodland habitat (MNRF, 2015). Amphibians in the Study Area likely utilize the matrix of creek, swamp and marsh wetlands identified within the south-eastern portion of the Study Area and other components of the wetland feature beyond the subject property boundaries to the north-east and south of the property as a movement corridor.

5.6.6 Woodland Area-Sensitive Bird Breeding Habitat

Woodland Area-Sensitive Breeding Bird Habitat generally requires that large mature trees, typically greater than 60 years in age, are present in contiguous forest communities greater than 30 ha with interior forest habitat at least 200 m from the forest edge. The woodlands in the south-eastern portion of the Study Area contribute to interior habitat (100 m from forest edge) within the contiguous woodland feature, however no interior habitat 200 m from the forest edge is present within the subject property.

Five of the species listed in the SWH Criteria Schedules for Ecoregion 6E (MNRF, 2015) as area-sensitive birds were recorded on site [Yellow-bellied Sapsucker (possible breeding), Red-breasted Nuthatch (possible breeding), Veery (possible breeding), Black-throated Green Warbler (probable breeding), and Ovenbird (probable breeding)]. While habitat associated with Areas Sensitive bird breeding is not directly associated with the subject property, appropriate habitat is available in the Study Area. This is assumed given species presence. While breeding on the subject property was not confirmed, candidate Woodland Area-Sensitive Breeding Bird SWH is associated with the woodlands within the Study Area and surrounding lands.

5.6.7 Marsh Breeding Bird Habitat

This SWH type refers to species that nest in marshes, fens or bogs. According to the SWH Criteria Schedules for Ecoregion 6E (MNRF, 2015), all wetland habitat is to be considered if there is shallow water with emergent aquatic vegetation. Therefore, the marshes within the Study Area were considered potential Marsh Breeding Bird Habitat. Virginia Rail was recorded during the first breeding bird survey in the south-eastern wetlands of the subject property (breeding bird survey station 18; Figure 2); Sora was noted during the third breeding bird survey, at the northern end of the subject property (near breeding bird survey station 2). While no probable or confirmed breeding evidence was noted, two indicator species were identified within the WU-4 wetland unit, specifically within the meadow marsh associated with beaver activity. It is assumed that this habitat function would be associated with that area and impacts are considered as they may apply to candidate marsh breeding bird habitat.

5.6.8 Shrub/Early Successional Bird Breeding Habitat

Bird species nesting in shrubland or successional fields that are not being actively farmed have specific habitat requirements which limit their distribution. Large fields greater than 10 ha in size succeeding to shrub and thicket habitats are listed as Candidate SWH Shrub/Early Successional Bird Breeding Habitat in the Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E (MNRF, 2015). Shrub and thicket habitat sites considered significant should have a history of longevity, either abandoned fields or pasturelands.

Four of the species listed as early successional breeding birds in the Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E (MNRF, 2015) were observed in the Study Area (Brown Thrasher, Eastern

Towhee, Golden-winged Warbler, and Field Sparrow). Brown Thrasher is listed as an indicator species, whereas Eastern Towhee and Field Sparrow are listed as common species (MNRF, 2015). Golden-winged Warbler is listed as a Provincial Special Concern species. Brown Thrasher was recorded at breeding bird survey Stations 1, 2, 5, 6, and 8; Eastern Towhee was recorded at breeding bird stations 1, 2, 5, 12, and 13; Field Sparrow was recorded at breeding bird stations 1, 2, 5, 6, 8 12, and 13. Candidate SWH Shrub/Early Successional Bird Breeding Habitat is therefore considered to be present in proximity to these breeding bird stations. Furthermore, adjacent lands, specifically lands to the north of the subject property, are expected to provide this function based on the habitat present and incidental observations during surveys.

5.6.9 Special Concern and Rare Wildlife Species

Only species listed as Endangered and Threatened receive species and habitat protection through the provincial SCA and federal SARA, however habitat of provincially Rare (S1-S3, SH) and Special Concern plant and animal species, not including Endangered or Threatened species, is considered SWH. When an element occurrence is identified within a survey grid square for a Special Concern or provincially rare species, consideration for candidate habitat associated with the subject property is required. Note: to avoid duplication some provincially rare species are not duplicated here because they are covered by other portions of the SWH assessment.

Eastern Wood-pewee (Not Listed [SCA&SARA])

The Eastern Wood-pewee is a small forest bird that lives in the mid-canopy layer of forest clearings and edges of deciduous and mixed forests. It is most abundant in intermediate-aged forest stands with little understory vegetation (MECP, 2021a). NHIC squares 17PK4050 and 17PK4049 report occurrence records of Eastern Wood-pewee, with detailed NHIC information indicating 2004 and 2021 records in the southwestern area of the Study Area. Eastern Wood-pewee was documented in the southern portion of the Study Area, heard calling in the area of survey station 17 and survey station 20 during the first breeding bird survey. Therefore, possible breeding evidence was recorded by Birks NHC.

Barn Swallow (Not Listed [SCA&SARA])

Before European colonization, Barn Swallows nested mostly in caves, holes, crevices and ledges in cliff faces. Following European settlement, they shifted largely to nesting in and on artificial structures, including barns and other outbuildings, garages, houses, bridges, and road culverts. The subject property does not contain potential Barn Swallow nesting habitat however adjacent lands outside of the 120m Study Area may contain suitable habitats. The species were documented flying over the subject property at breeding bird station 11 and therefore no breeding evidence was recorded for the species. Due to the lack of habitat availability within the Study Area, no further consideration for this species is warranted.

Common Nighthawk (Not Listed [SCA&SARA])

Common Nighthawk breeds in a wide variety of habitats that provide open areas for foraging in flight, and bare ground with nearby shade for nesting (COSSARO, 2020). Specifically, traditional habitat consists of open areas with little to no ground vegetation, such as logged or burned-over areas, forest clearings, rock barrens, peat bogs, lakeshores, and mine tailings. Although the species also nests in cultivated fields, orchards, urban parks, mine tailings and along gravel roads and railways, they tend to occupy natural sites. Common Nighthawk (2 individuals) was documented within the Study Area, adjacent to the subject property during nocturnal bird surveys on June 18, 2024 at survey station 4 (Figure 2). No breeding evidence was recorded for the subject property, however given the presence of suitable habitat within adjacent lands it is expected that breeding may be occurring in the area.

Snapping Turtle (Not Listed [SCA&SARA])

The Snapping Turtle occurs in almost any freshwater habitat including small wetlands, ponds, and ditches. The Ontario Reptile and Amphibian Atlas has reported occurrences of this species in squares 17PK45 and 17PK44 that encompass the Study Area (Ontario Nature, 2025) and NHIC data indicates occurrence reported in grid square 17PK4049. Given the habitats present, species range maps, and observations in the general area, Snapping Turtle is expected to utilize wetland and drainage features in the Study Area. Although the species was not observed during the completion of the field program habitat is considered within the Significant wildlife habitat assessment under turtle wintering habitat, Section 6.6.2.

Midland Painted Turtle (Not Listed [SCA]/Special Concern [SARA])

The Midland Painted Turtle has an 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. Midland Painted turtles were documented basking within the Open Water (OAW) and Duckweed Floating-leaved Shallow Aquatic (SAF_1-3) vegetation communities on April 17, 2025 by Birks NHC Ecologists. Habitat for this species is considered within the Significant wildlife habitat assessment under turtle wintering habitat, Section 6.6.2.

Eastern Ribbonsnake (Not Listed [SCA&SARA])

The Eastern Ribbonsnake is not listed as Protected Species under O. Reg. 60/26 of the SCA. It is listed as a Threatened species under the federal SARA. As such it is afforded protection provincially under SWH provisions of the PPS. Reptile species federally listed as Threatened are only afforded protection of critical habitat on federal lands under the SARA and therefore protection of Eastern Ribbonsnake habitat via the SARA does not apply to the subject lands.

The Eastern Ribbonsnake is very similar in appearance to the Eastern Gartersnake with yellow and black stripes running down its back and sides. In comparison, the Eastern Ribbonsnake is slender, has a white crescent in front of the eye, and is typically found near water where it hunts for amphibians. In Ontario, this species is common in parts of the Bruce Peninsula, Georgian Bay and eastern Ontario. The Ontario Reptile and Amphibian Atlas square 17PK45 indicates six records from 2003 to 2018 of this species in the area (Ontario Nature, 2025). Eastern Ribbonsnake was observed on the subject property in the spring of 2025. Habitat for this species is considered within the Significant wildlife habitat assessment under Reptile Hibernaculum Habitat, Section 6.6.3.

Five-lined Skink (Southern Shield/Great Lakes-St. Lawrence Population – Not Listed [SCA]/Special Concern [SARA])
The Five-lined Skink is Ontario's only native species of lizard. The known range of this species includes two areas, one being in southern Ontario Carolinian region and one in the Great Lakes-St. Lawrence region that encompasses a band along the western edge of Georgian Bay and across the province to Frontenac County, along the southern margin of the Canadian Shield. The Five-lined Skink is typically found in forest openings and rock outcrops. For a woodland area to function as skink habitat, it must have a moist understory and forest openings. Nesting occurs in downed woody debris, under logs, in stumps, or under loose rock in partially wooded areas (MNRF, 2015). Suitable Five-lined Skink habitat is present in the Study Area and records of this species has been recorded by the Ontario Reptile and Amphibian Atlas for the area (Ontario Nature, 2025). Although the species was not observed during the completion of the field program. Habitat for this species is considered within the Significant wildlife habitat assessment under Reptile Hibernaculum habitat, Section 6.6.3.

5.6.10 Rare Vegetation Communities

Alvars are naturally open areas of thin soil over essentially flat limestone, dolostone, or marble bedrock. In spring, alvars may have standing water while in summer the soils may become very hot and dry. Alvar vegetation is adapted to these extreme variations in temperature and moisture (OMNR, 2000). Three general types of alvars are recognized in Ontario in the ELC system for southern Ontario (Lee *et al*. 1998). These include open alvars, shrubland alvars, and treed alvars. Alvar communities within the subject property include Non-Calcareous Open Rock Barren Meadow (RB02-2), Common Juniper Shrub Alvar (RBSA1-1), and Bur Oak Treed Alvar (RBTA1-6). The total area of Alvar communities on the subject property has been measured at approximately 20 ha, with RBSA1-1 community being the dominant Alvar community, representing 13 ha on the property.

Vascular plant surveys for the subject property did not identify 4 out of the 5 indicator species and demonstrate a high composition of non-native species within these communities. Notwithstanding, one species, Prairie Smoke (*Geum triflorum*), documented within the subject property, is listed as an indicator species within Appendix N of the Significant Wildlife Habitat Technical Guide (OMNR, 2000).

A number of non-native/exotic plant species were also documented within the Alvar communities, including Common Yarrow, Common Burdock, Common Barberry, Smooth Brome, Bull Thistle, Wild Carrot, Deptford Pink, Common Viper's Bugloss, and Sulphur Cinquefoil.

Neither Alvar communities meet the defining criteria under the Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E (MNRF, 2015). In order to be considered candidate significant wildlife habitat 4 out of the 5 species listed under the defining criteria of the Significant Wildlife Habitat Criteria Schedules need to be documented within an ecosite sites need to have a low composition of introduced or non-native species. Therefore, due to the prevalence of non-native, exotic species, and general lack of indicator species, the Alvar habitats on the subject property are not being considered further as SWH for rare vegetation communities. Notwithstanding, given the overall rarity of Alvar habitats in Ontario, and the presence of karst and Prairie Smoke, consideration for the presence of Alvar conditions and impacts to Alvar conditions will be undertaken as part of the NER.

5.7 AREAS OF NATURAL AND SCIENTIFIC INTEREST (ANSI)

No ANSIs are mapped by MNR in the Study Area.

5.8 NATURAL HERITAGE FEATURES SUMMARY

The results of field surveys, review of background information and analysis indicate that candidate significant natural heritage features and functions are associated with the Study Area. Our impact assessment will consider potential impacts only to features and functions summarized in Table 2.

Table 2: Natural Heritage Features and Functions Summary -

Natural Heritage Feature and Function[1]	Within the Subject Property	Within Proposed Licenced/Extraction Area	Within 120 of the Subject Property	Actions Required
Provincially Significant Wetland	None. Evaluated non-Provincially Significant		None	No actions required.
Other Wetland	• Swamp, Marsh, and Aquatic Wetland Communities • Total Wetland Area of 26.3 ha	• MASR1-1 Community (WU-1 & WU-2) • Total Wetland Area in Proposed Extraction Area 0.55ha	Mapped un-evaluated	**Evaluation for potential impacts required.**
Fish Habitat	• Permanent Direct Fish Habitat • Seasonal Direct Fish Habitat • Contributing/Indirect fish habitat	• Permanent Direct Fish Habitat • Seasonal Direct Fish Habitat	Direct Fish Habitat	**Evaluation for potential impacts required.**
Significant Woodlands	• Greenlands Designation (County of Simcoe) • Supportive and Complimentary Areas and Corridors (Township of Ramara OP) • Northeastern woodland area contiguous with larger woodlands meet minimum size threshold to be considered significant		Contiguous woodlands – Canadian Shield (measuring ~6,600 ha)	**Evaluation for potential impacts required.**
Habitat of Threatened or Endangered Species	<u>Potential:</u> • Eastern Hog-nosed Snake • Eastern Meadowlark and Bobolink • Loggerhead Shrike <u>Confirmed:</u> • Habitat for Endangered Bats • Black Ash (not considered further due to its location within the property and extraction area) • Golden-Winged Warbler • Eastern Whip-poor-will • Blanding's Turtle	<u>Potential:</u> • Eastern Hog-nosed Snake • Eastern Meadowlark and Bobolink • Loggerhead Shrike <u>Confirmed:</u> • Habitat for Endangered Bats • Eastern Whip-poor-will • Golden-Winged Warbler	<u>Potential:</u> • Blanding's Turtle • Eastern Hog-nosed Snake • Eastern Meadowlark and Bobolink • Loggerhead Shrike • Habitat for Endangered Bats • Eastern Whip-poor-will • Golden-Winged Warbler	**Evaluation for potential impacts required.**

Table 2: Natural Heritage Features and Functions Summary -

Natural Heritage Feature and Function[1]	Within the Subject Property	Within Proposed Licenced/Extraction Area	Within 120 of the Subject Property	Actions Required
Significant Wildlife Habitat	Confirmed/Mapped • Deer Wintering Areas and Movement Corridors Candidate • Bat Maternity Colonies • Turtle Wintering Area • Reptile Hibernaculum • Rare Vegetation Community (Alvar) • Amphibian Breeding Habitat and Movement Corridors • Woodland Area-Sensitive Bird Breeding Habitat • Marsh Breeding Bird Habitat • Shrub/Early Successional Bird Breeding Habitat • Special Concern and Rare Wildlife Species (Eastern Wood-pewee, Snapping Turtle, Midland Painted Turtle, Eastern Ribbonsnake, Five-lined Skink)	Candidate • Bat Maternity Colonies • Reptile Hibernaculum • Rare Vegetation Community (Alvars) • Amphibian Breeding Habitat and Movement Corridors • Woodland Area-Sensitive Bird Breeding Habitat • Shrub/Early Successional Bird Breeding Habitat • Special Concern and Rare Wildlife Species (Eastern Wood-pewee, Eastern Ribbonsnake, Five-lined Skink)	Confirmed/Mapped • Deer Wintering Areas and Movement Corridors Candidate • Bat Maternity Colonies • Reptile Hibernaculum • Rare Vegetation Community (Alvars) • Amphibian Breeding Habitat and Movement Corridors • Woodland Area-Sensitive Bird Breeding Habitat • Shrub/Early Successional Bird Breeding Habitat • Special Concern and Rare Wildlife Species (Common Nighthawk)	**Evaluation for potential impacts required.**
Provincial Areas of Natural and Scientific Interest	None			No actions required.

[1] As defined within Aggregate Resources of Ontario: Technical Reports and Information Standards (2023)

6 IMPACT ASSESSMENT

The intent of this NER is to identify natural heritage features and functions associated with the Study Area and determine if potential impacts could arise from the proposed extraction plan and associated activities. It is our intent for this NER to meet the technical requirements of the ARA in assessing potential negative impacts and developing appropriate preventative and mitigative measures for the features.

The Aggregate Resources of Ontario: Technical Reports and Information Standards (2020) states that: *"where any of the above features or areas have been identified, the report must identify and evaluate any negative impacts on the natural features or areas, including their ecological functions, and identify any proposed preventative, mitigative or remedial measures."*

The major natural heritage constraints identified during this study that occur within the subject property or Study Area are listed in Table 2 and Section 5, and include the following:

(a) Evaluated non-significant Wetlands
(b) Candidate Significant Woodland
(c) Candidate Significant Wildlife Habitat
(d) Fish and Fish Habitat
(e) Habitat for Threatened and Endangered Species

The following sections lay out a high-level overview of the proposed operations and extraction plan and evaluate the potential for negative impacts resulting from the extraction activities proposed as part of the ARA application for each feature identified.

6.1 OPERATIONS AND EXTRACTION PLAN

Brand X Materials and Supply Inc. is applying for a Class A quarry below the water table, with a proposed licenced area of 43.3 ha, 34.4 ha would be in the extraction area as depicted in the site plan prepared by MHBC (2026). The proposed annual tonnage limit is 500,000 tonnes.

Phasing will occur within 3 separate areas as illustrated in Figure 4. Phase 1 is proposed in the north-east portion of the subject property, and subsequent phases (Phase 2 and Phase 3) will move progressively west. The proposed quarry is expected to be developed in one lift, with site plans providing two lifts for flexibility. The quarry floor elevation will be 230m above-sea-level (masl). Phasing will allow the vegetation communities in the later phases to remain largely intact during the extraction of Phase 1 with clearing occurring only when necessary to move to the next phase of extraction. This was intentionally incorporated into the extraction plan to ensure that the north/south natural connectivity will be maintained through the life of the quarry.

Access to the quarry is proposed on Pearl Carrick Road, is proposed approximately 250 m north of Concession Road B and C along the western property boundary between the WU-3 wetland unit and Pearl Carrick Road. The proposed entrance was situated to take advantage of an existing entrance. The proximity to the main sideroad will reduce the need for alterations and/or widening to the existing external road infrastructure. A 3-metre berm will be constructed in the southwest portion of the extraction area along the limits of Phases 2 and 3. The berm is to be located within the 30m wetland setback, which will also accommodate the area for the proposed new cutoff swale. The total length of the berm has been measured at 725m. Details associated with the operations and extraction plan can be found on the site plans prepared by MHBC.

A 30m setback to the WU-3 and WU-4 delineated wetland units along the southern boundary will be protected from extraction activities and will be maintained and enhanced except where berms and the cutoff swale may be required. This wetland setback area will account for approximately 5.5 ha. Approximately 25.8 ha of retained natural heritage feature (WU- 3 and WU-4 wetland units and 30m setback) will be protected for the long-term on the subject property throughout the operational life of the quarry.

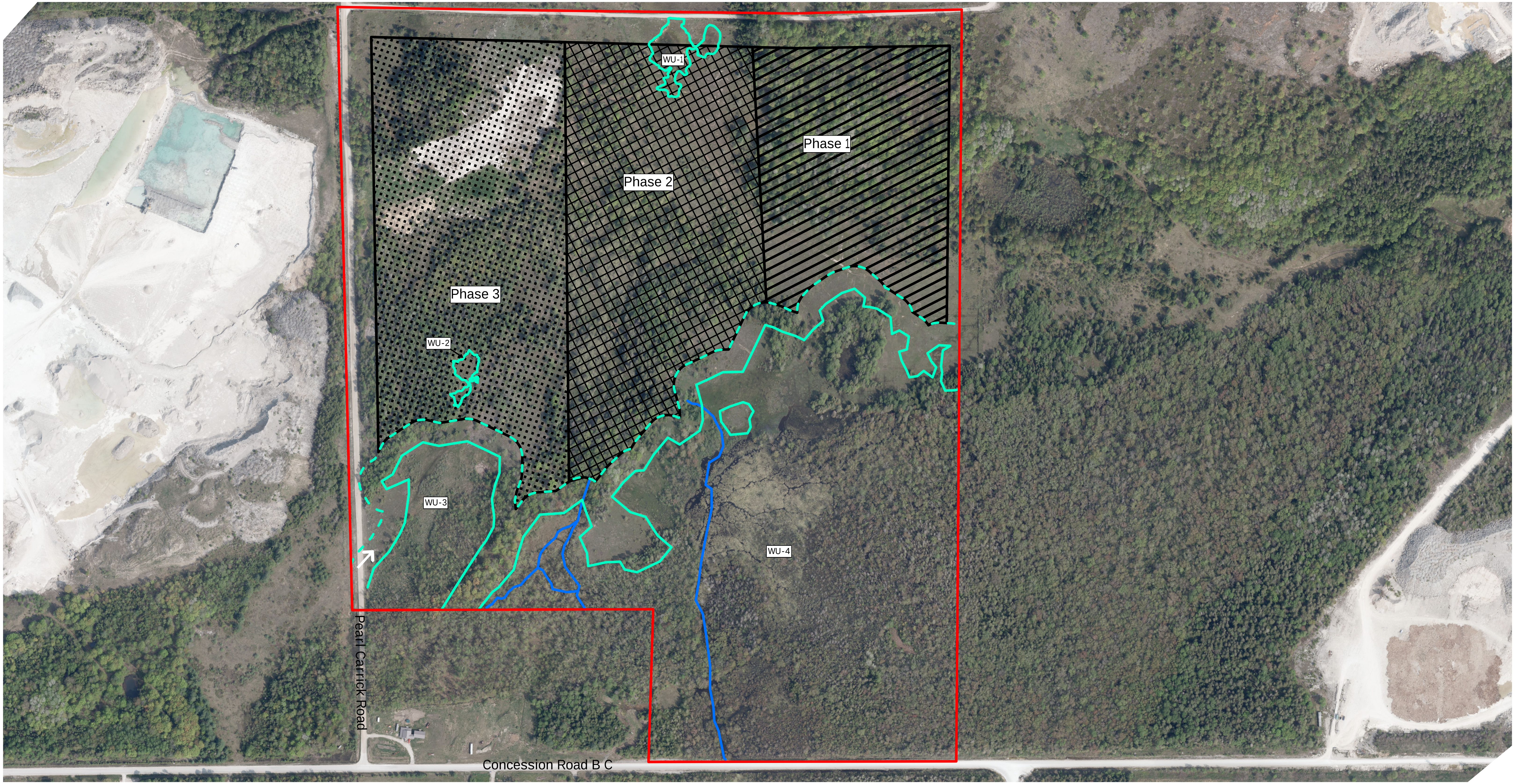
The total area to be licenced, extracted, and rehabilitated is as follows:

- Total area to be licenced: 43.3 ha
- Total area to be extracted: 34.4 ha
- Total area to be rehabilitated: 34.4 ha

Surface water flowing towards the extraction area from the wetland on the south half of the site is proposed to be collected at the extraction limit south boundary and diverted around the extraction area (Tatham, 2026). This water will be discharged to a stone infiltration feature to be constructed along the north limit of the subject property where it will be connected into the shallow fractured bedrock system. This will ensure surface water will continue to feed the shallow bedrock system contributing flow to the Head River tributary downstream of the site. To ensure the rate of discharge to the shallow bedrock system matches existing conditions storage of water will be provided on-site via storage ponds to allow for the control and steady release of flows to the downstream system to match existing conditions (Tatham, 2026). A cutoff swale will be constructed along the south limit of the Phase 2 and 3 extraction areas to redirect external runoff from the upstream wetland and tributaries west towards Pearl Carrick Road. From this location, water will be pumped north to the proposed infiltration feature to be constructed along the north property boundary (Tatham, 2026).

Similar to existing quarries on adjacent lands to the west, east, and south, operations will include:

1. Site preparation and stripping activities;
2. Drilling and blasting;
3. Extraction and processing;
4. Shipping and loading; and
5. Progressive and final rehabilitation activities.



6059 Pearl Carrick Road
Township of Ramara

🟥 Property Limit (Approximate)
— Permanent Direct Fish Habitat
— Delineated Wetland Limit (Birks NHC; July 2024)
- - 30m Wetland Setback

Site Phasing
▨ Phase1
▩ Phase2
⬚ Phase3

→ Site Access
☐ Proposed Extraction Limit

Figure 4.
Phasing Plan

MAP DRAWING INFORMATION:
DATA PROVIDED BY: ESRI CANADA, Ontario GeoHub,
SIMCOE OPEN DATA

MAP CREATED BY: SB
MAP CHECKED BY: BB
MAP PROJECTION: NAD 1983 UTM ZONE 17N

N W E S

0 62.5 125 250 375 500 Meters

FILE LOCATION:
Path: C:\Users\S_Brady\BirksNHC\Birks NHC Team for all - Documents\Project Folders\04 - SBrady Projects\ArcGIS - Projects here\Projects - here\02-014-2023 Pearl Carrick

PROJECT: 02-014-2023 STATUS: ISSUED DATE: 5/05/2026

6.2 OTHER WETLANDS

6.2.1 Loss Wetland Habitat

Of the four wetland units identified on the subject property, removals are proposed only within the WU- 1 and WU-2 wetland units. These removals will result in a total area of 0.55 ha of wetland habitat proposed for removal. The removals would be required to facilitate extraction due to their location being within the proposed limit of extraction for Phases 2 & 3 (Figure 4). These wetland units are hydrologically disconnected from the larger WU-3 and WU-4 wetland units, that are contiguous to lands off property. WU-1 and WU-2 units were determined to be too small (less than 2ha) to qualify for evaluation under the OWES (2022) which states that:

> *"In general, wetlands smaller than 2 ha (5 acres) are not evaluated. However very small wetlands can provide habitat for wildlife or serve other ecological, hydrological, hydrogeological or social functions."*

Consideration for other ecological functions, including wildlife habitat associated with the WU-1 and WU-2 wetland units is incorporated within Section 6.6 of this NER.

The loss of 0.55 ha of wetland habitat will not have a negative ecological impact on the overall availability of wetland habitat within the subject property and Study Area. Approximately 25.7 ha of wetland habitat will be retained on the subject property, which will continue to provide wildlife habitat as discussed later in this NER. Compensation is proposed in Section 7 to ensure that the lost wetland habitat will be effectively replaced through the life of the quarry. Further, through progressive rehabilitation, a 3.2 ha wetland feature will be created on the subject property to be maintained into the future (Figure 5).

6.2.2 Impairment of adjacent wetland habitat

Consideration was also given to potential impacts to wetlands on adjacent lands, specifically two wetland units within the subject property (WU-3 and WU-4) as well as wetland unit located direct adjacent to the northern property limit, were assessed for potential impacts from the proposed aggregate extraction as part of the NER and Hydrogeological Assessment (Tatham, 2026). Much of this assessment is reliant on information contained within the Hydrogeological Impact Assessment (Tatham, 2026).

A review of aerial imagery indicates that WU-1 may extend, in part, onto lands present to the north, including in part within Sweetwater Nature Reserve. However, due to the presence of Donald Carrick Lane, hydrological connectivity is impaired, restricting nutrient and sediment transport. Thus, these are considered separate wetland units. The adjacent lands wetland unit is fed seasonally by flooding from the property and movement of water through the shallow bedrock system (Tatham, 2026). Therefore, alteration to the surface water pattern on the subject property has the potential to impact this feature. The decrease in drainage to this feature will be mitigated through the use of the proposed infiltration feature along the north edge of the property which will constantly be fed with discharge from the quarry and recharge the shallow bedrock system connected to this feature. Therefore, any potential impacts to this adjacent wetland unit can be mitigated through appropriate infiltration measures.

WU-3 is surface fed by external runoff from the southwest (Tatham, 2026) and as such the proposed extraction area remains outside of WU-3 drainage area. Therefore, no change in runoff volume to this wetland unit is expected. Furthermore, the WU-3 unit receives minimal input from groundwater and thus no reduction in groundwater recharge is expected.

A review of the Hydrogeological Assessment (Tatham, 2026) as well as the integrated surface water-groundwater model (Equilibrium, 2026) indicates that the total drainage area to WU-4 wetland unit will be reduced by 0.6% or 1.8 ha which appears to have a negligible effect on the water level and hydroperiod.

A 30m setback has been incorporated into the Site Plan, representing an area of approximately 9 ha. This setback area will remain undisturbed from extraction activities however will contain a constructed swale and berm. Currently, the setback area is in a naturalized state, with alvar, mixed, coniferous, and deciduous forest.

Extraction activities can increase the availability of sediment for erosion and transport by surface drainage. In order to mitigate the adverse environmental impacts caused by the release of sediment-laden runoff into the receiving WU-4 and WU-3 wetland units, measures for erosion and sediment control are required throughout the site preparation and stripping activities. Erosion and sediment control measures are recommended to be implemented prior to and throughout the stripping operations and maintained until the disturbed areas of the site have been stabilized. Mitigation measures are included in Section 8 to address this concern.

6.3 FISH AND FISH HABITAT

6.3.1 Alteration of Permanent Direct Fish Habitat

The proposed extraction plan will result in the alteration of 234m of permanent fish habitat and 80m of seasonal direct fish habitat before the commencement of Phase 2 extraction. In order to determine the area of fish habitat associated with the affected drainage features, the 1:2 year flood elevation was established and received from Tatham Engineering (Figure 3). The proposed extraction will result in the alteration of 0.18ha of direct fish habitat. Therefore, the proposed extraction has the potential to injure or kill fish, can be classified as a HADD and will require review and approval under the regulations of the *Fisheries Act*, 1985, as outlined within the ‘Projects Near Water’ recommendations found on the DFO website.

The Hydrogeological Assessment (Tatham, 2026) identifies the significant accumulation of water within the southern portion of the subject property; this area is closely tied to the areas that provide fish habitat. It is our understanding that prior to the Phase 2 extraction, surface flows will be directed westerly along the wetland limit to the property limit, where the water will then be pumped to an infiltration gallery along the northern property limit (Tatham, 2026). Based on the Hydrogeological and hydrological assessments (Tatham, 2026), it is our understanding that approximately 493m of constructed drainage will be installed, resulting in a net positive gain of 179m of linear drainage available for fish use. There is opportunity to utilize this created drainage cutoff swale system to maintain and potentially improve upon fish habitat outside of the extraction area, through the construction of a drainage channel and potentially improving connectivity and accessibility to both direct and indirect fish habitat present within the WU-3 and WU-4 wetland units. Given the expected lifespan of the quarry (50+ years) it is recommended that the drainage cutoff swale be designed with consideration of natural channel design principles, to ensure that fish habitat protection is appropriately accomplished. Design of the new drainage cutoff swale shall consider the existing fish community, the form and function of the existing drainage features, and the permanency of the features with the ultimate goal to replicate existing habitat conditions. The proposal shall be reviewed by the DFO to determine if an Authorization under the federal *Fisheries Act,* 1985 for the activity would be required.

Once the quarry ceases operation, the rehabilitation plan includes recreation of drainage channels in the original locations. At that time, fisheries protection regulations should be reviewed to ensure that the construction of these features and decommissioning of the created features, if warranted, considers protection of fish and fish habitats at the time that the alteration is contemplated.

Mitigation measures relating to the protection of fish during construction of the cutoff swale are provided in Section 7 below and should be considered as the project moves through design and buildout.

6.3.2 Mechanical Shock from Ground Vibrations

There is potential for fish to be harmed through blasting activity within the quarry. The shockwaves created by the detonation of explosives in or adjacent to fish habitat is known to rupture the swimbladder and other organs, as well as killing or injuring eggs or larvae (Wright and Hopky, 1998). As such, the DFO has provided direction which identifies various setbacks from the centre of detonation to reduce the pressure below the acceptable level of 100 kPa. It is our understanding that a Blast Impact Analysis Report (Explotech, 2026) is being prepared for the application. This should be reviewed by a person knowledgeable in the protection of fish and fish habitats to ensure that the proposed blasting arrangement will sufficiently fish and both existing and constructed fish habitat.

6.3.3 Alteration of Downstream Receiving Habitats

The proposed quarrying activity has the potential to alter the baseflow and thermal regime of Stickleback Creek given the proposed channel diversion and the excavation of the bedrock fracture system that conveys water to the off-property emergence point.

Baseflow to Stickleback Creek is proposed to be maintained through an infiltration gallery located along the northern property limit (Tatham, 2026). The gallery will receive inputs from a channel cutoff swale system as well as through discharge from onsite storage ponds (Tatham, 2026; Figure 3). The infiltration gallery is proposed to be 2 m in depth and will be connected to the shallow bedrock fracture system, feeding water to the existing system and thus maintaining baseflow of Stickleback Creek (Tatham, 2026). In addition to volume control, the infiltration gallery will provide thermal mitigation to prevent warming of the downstream receiver. To ensure that baseflow and thermal regime are maintained within Stickleback Creek, regular monitoring of the feature will occur as part of the quarry's regular monitoring program. Significant alteration of the thermal regime of the receiving body could be considered a HADD to fish, and as such the project shall be reviewed under the regulations of the *Fisheries Act,* 1985, as outlined within the 'Projects Near Water' recommendations found on the DFO website.

6.3.4 Entry of Deleterious Substances to Downstream Receiving Habitats

The proposed quarrying activity has the potential to introduce deleterious substances to water resources through numerous points of contamination including introduction of sediments through discharge of turbid water and fuel spills. The potential for such events can be mitigated through the implementation of settling ponds for pumped water, confining and controlling sediment release and movement through a sediment and erosion control plan (see Section 6.3.5 below) and through implementation of a spill response plan. Both the sediment and erosion control plan and the spill response plan should be undertaken in consultation with a person knowledgeable in fish and fish impacts and incorporate recommendations provided by approval agencies, including but not limited to the DFO and MECP.

6.3.5 Erosion and Sedimentation into Sensitive Features

Relocation of the existing drainages has significant potential for release of sediment to connected fish habitat, should appropriate mitigation measures not be implemented during construction. In order to avoid detrimental release of sediment, the new alignment should be constructed under dry conditions and connected to the retained portion of the feature only after the banks and setback areas of the new alignment have been stabilized. Stabilization should occur though revegetation with native species and placement of biodegradable sediment and erosion blankets. Further, decommissioning of the existing alignment shall not occur until the new alignment has been connected.

6.4 CANDIDATE SIGNIFICANT WOODLAND

6.4.1 Loss of Woodland Habitat

The proposed aggregate application would require the removal of 7 ha of Candidate Significant Woodland and 12.8 ha of non-significant woodland as identified through the completion of the Significant Woodland Assessment and further discussed in Section 5.4. Approximate woodland removals are estimated to be:

- 7 ha in the Northern Woodland Unit
- 12.8 ha in the Central Woodland Unit

- 0 ha in the Southern Woodland Unit

Northern Woodland Unit

As outlined within Appendix L, the northern most unit meets the size criteria to be considered Significant Woodland. The proposed extraction would result in the loss of 7 ha of the northern most unit, representing approximately 0.1% of the contiguous woodland feature.

This woodland loss is not expected to result in any loss of the functions for which the woodland was assessed as candidate Significant Woodland. The overall contiguous woodland feature will continue to meet the criteria to be considered Significant Woodland and will maintain the functions associated with woodland habitat.

Central Woodland Unit

Approximately 12.8 ha of woodland will be lost within the central woodland unit, reducing the overall unit to 10.4 ha. As part of the extraction activities, re-alignment of the existing channels will occur in accordance with federal legislation to ensure no Harmful, Alteration, Disruption or Destruction of fish habitat occurs. Therefore, fish habitat will continue to be present within the subject property. Furthermore, recommendations are provided in Section 8 for the re-naturalization of disturbed areas within the 30m setback as a result of the construction of the cut-off swale, including tree and/or shrub planting. This will mitigate for thermal impacts as well as maintain ecological contributions from woodland habitat to the swale and fish habitats. The central woodland unit, measuring at 23.2 ha, and southern woodland unit, measuring at 48 ha, was determined to meet the *Proximity to Other Woodlands or Other Habitats c*riteria (Appendix L) due to the presence of both wetland habitat and watercourses.

Southern Woodland Unit

The proposed aggregate extraction will not result in any loss of the southern woodland unit, therefore maintaining that function, including contribution to wetland habitat.

The loss of woodland habitat required as part of the proposed aggregate extraction is not expected to result in negative ecological impact on the contiguous Significant Woodland features. Notwithstanding, removals are required. As such, mitigation measures are provided in Section 8 to minimize the effects of the operations. Further, a progressive rehabilitation plan is proposed which will incorporate replanting of woodland habitat through the infilling of the resulting quarry and tree planting of the site.

6.4.2 Impairment of Retained Woodland Features

Impairment of the retained woodland features has been considered as it may occur through the extraction activities. Extraction activities, including pumping and the creation of dust during drilling and blasting, extraction and processing, and shipping and loading activities were considered specifically.

Pumping Activity

A hydrogeological assessment was undertaken as part of this ARA application, which included a feature-based water balance and a detailed groundwater model (Tatham, 2026 & Equilibrium Mining, 2026). Based on the findings of this assessment, no adverse effects to the groundwater and surface water resources and their users are anticipated as a result of the proposed quarry operations and rehabilitation. As such, there is no expectation that the proposed aggregate extraction activities will have a negative ecological impact on contiguous woodland features.

Creation of Dust

Adjacent woodland habitat has the potential to sustain indirect impacts from the creation of dust. The ARA (1990) O. Reg. 466/20 Section 0.12(2) states:

(2) A licence, aggregate permit or wayside permit is subject to the following conditions:

1. *The licensee or permittee shall apply water or another provincially approved dust suppressant to internal haul roads and processing areas, as necessary to mitigate dust, if the pit or quarry is located within 1,000 metres of a sensitive receptor.*
2. *The licensee or permittee shall equip any processing equipment that creates dust with dust suppressing or collection devices if it is located within 300 metres of a sensitive receptor.*
3. *The licensee or permittee shall obtain an environmental compliance approval under the Environmental Protection Act where required to carry out operations at the pit or quarry.*
4. *The licensee or permittee shall obtain a permit to take water under the Ontario Water Resources Act where required to carry out operations at the pit or quarry.*

As such, in order to remain in compliance with the above, all extraction activities must adhere to those conditions to suppress dust accordingly. Assuming that the quarry is permitted, the requirement for dust control will be legislated by the ARA. Contraventions of that legislation are governed by the MNR.

Noise

Extraction activities have the potential to disrupt the ability of woodland wildlife to carry out their life processes through the introduction of noise pollution within the retained woodland habitats. A Noise Impact Assessment (HGC, 2026) has been completed as part of the ARA (1990) and *Planning Act* applications and has incorporated the construction of a 3-metre berm along the south-western limit of the extraction area associated with Phase 2 and Phase 3. This berm is expected to mitigate the potential impacts to the retained natural lands in the southern portion of the subject property, including woodland and wetland habitats. Standard best management practices for noise mitigation will be employed to reduce impacts on adjacent lands, and the wildlife habitats they provide.

6.5 HABITAT FOR THREATENED AND ENDANGERED SPECIES

As discussed in Section 5.5, potential habitat for Threatened and Endangered Species was identified within the Study Area. The following species were confirmed as being present within the Study Area and are being considered further for potential impacts resulting from the proposed aggregate extraction: Eastern Whip-poor-will, Golden-winged Warbler, Little Brown Myotis, Hoary Bat, and Silver-haired Bat. In addition, the following species have the potential to be present based on the presence of suitable habitat and/or being within the known range of the species: Eastern Hog-nosed Snake, Blanding's Turtle, Eastern Meadowlark, Bobolink, and Loggerhead Shrike and are being considered in the following sections.

6.5.1 Eastern Hog-nosed Snake

Eastern Hog-nosed Snake was not documented within the subject property during the field program. However, due to the cryptic nature of the species, knowledge of ecology and habitat requirements (*i.e.,* habitat generalist) as well as the low density of this species within the Ramara Township, further consideration for the species and assessment of potential impacts was warranted.

Given the subject property being within the northern range for Eastern Hog-nosed Snake and the lack of suitable nesting habitat required by the species, there is no expectation that the proposed aggregate extraction of the subject property would constitute contravention of the SCA for Eastern Hog-nosed Snake. As previously noted, this species could be encountered incidentally throughout daily operations of the proposed quarry. Mitigation measures are provided in Section 7 to ensure no accidental harm to the species occurs during the operation of the quarry, should it be present within the Study Area.

6.5.2 Blanding's Turtle

As discussed in Section 5.5.2 above, a single individual Blanding's Turtle was reported in November 2025 within the WU-4 wetland unit, suggesting that wetland unit provides suitable overwintering habitat for the species. Background information received from both the NHIC and MECP does not indicate a known record within 2km of the subject property. Notwithstanding, due to the presence of the species and suitable habitat, consideration for the species and assessment of potential impacts was warranted. Consideration will be given to potential habitat impacts and the potential for encounters that may occur throughout the daily operation of the quarry.

The proposed extraction will occur outside of the WU-4 wetland and a 30m wetland setback will be applied (Figure 4). A 30m radius (average tree height) buffer around suitable wetlands helps to maintain microclimate conditions. Buffers of 30m are widely recognized as providing a range of functional benefits to aquatic features and wetlands such as maintaining water quality by filtering sediment and nutrients, input of woody debris, and cooling water temperatures by shading and infiltrating surface runoff (OMNR 2010). Blanding's Turtles have also been shown to generally bask within 30m of wetlands (Joyal *et al*. 2001).

Although no extraction activities will occur within the 30m setback to WU-4, the construction of the cutoff swale and berm along a portion of the 30m setback (725m) will require some vegetation clearing and dredging within this setback area to re-create the existing drainage conditions of the subject property and maintain fish habitat. This work can occur in a manner that avoids any accidental harm to potential individuals, through the diligent exclusion of the construction site by utilizing reptile exclusion fencing. Furthermore, the works associated with the cutoff swale are temporary in nature and post-construction, this area will be providing additional habitat functions that the species may utilize in the future. Re-naturalization of the areas that are disturbed during the construction activities is recommended and additional details are provided in Section 7.

A hydrogeological assessment was undertaken as part of this ARA application, which included a feature-based water balance and a detailed groundwater model (Tatham, 2026 & Equilibrium Mining, 2026). Based on the findings of this assessment, no adverse effects to the groundwater and surface water resources and their users are anticipated as a result of the proposed quarry operations and rehabilitation. As such, there is no expectation that the proposed aggregate extraction activities will have a negative ecological impact on the overwintering functionality of the WU-4 wetland unit.

The SCA provides an exception under Section 16 that allows for the registration of an activity that results in or is likely to result in damage to or destruction of the habitat of a species that is listed on the Protected Species in Ontario List (O. Reg. 60/26). Although currently there is no expectation that the aggregate extraction as proposed within the subject property would constitute damage to or destruction of the habitat for Blanding's Turtle, the construction of the cutoff swale and the loss of a portion of the watercourses could be considered damage or destruction of habitat for the species. Therefore, it is recommended that registration be completed in accordance with O. Reg. 75/26 which outlines all requirements for the registration, including the preparation of a Mitigation Plan and Conservation Plan. The registration shall be completed prior to any site works that involve the alteration of the watercourses and works within the 30m wetland setback, which are scheduled as part of the Phase 2 operations. There is no expectation that works within Phase 1 would constitute damage to or destruction of the habitat and as such registration for Phase 1 is not required.

Mitigation measures are provided in Section 7 to ensure no accidental harm to the species will occur during the operation of the quarry, should it be identified within the Study Area.

6.5.3 Eastern Meadowlark, Bobolink, and Loggerhead Shrike

As previously discussed, Eastern Meadowlark, Bobolink, and Loggerhead Shrike were not documented within the Study Area during the completion of the field program. Notwithstanding, as a conservative approach given the known population of all three species in the Carden Alvar area, consideration for the potential impacts to these species was deemed warranted.

The largest track of open alvar habitats within the subject property have been measured at 7.8 ha (RBSA1-1 & RBOB2-2; Figure 2). Therefore, although the size of alvar could support Eastern Meadowlark, it is unlikely that it provides sufficient suitable conditions for Bobolink or Loggerhead Shrike which also corresponds with the lack of documentation during targeted dawn breeding bird surveys. There is no expectation that the proposed aggregate extraction will contravene the SCA or

Section 33 and 58 of SARA. Mitigation measures are provided in Section 7 to ensure no accidental harm of these species occurs during the creation or operation of the quarry, should they be identified within the Study Area.

6.5.4 Eastern Whip-poor-will

As discussed in Section 5.5.5 above, probable breeding evidence for Eastern Whip-poor-will was recorded during nocturnal bird surveys. The northern portions of the subject property are expected to contribute to the habitat requirements for the species, but the habitat with nesting potential is primarily situated on adjacent properties within the Study Area. As such, activities that would disturb nesting could be considered an impact through the removal of active nests or those activities that create excessive noise or light at night during the nesting season which could result in females abandoning nests.

Based on the current survey data, there is no expectation that nesting has been occurring on the subject property. Notwithstanding, it will remain important to ensure that no future removals of vegetation occur during the nesting season without appropriately screening the subject property for nesting activity Mitigation measures are provided in Section 7 to ensure no accidental harm of the species occurs during the creation or operation of the quarry, should it be identified within the Study Area.

Operations plans for the proposed aggregate extraction will not involve any overnight extraction activities. The following represent the proposed hours of operation:

- Extraction, including drilling and primary crushing, and processing is permitted Monday to Saturday between 7:00 am and 7:00 pm.
- Loading and shipping is permitted Monday to Saturday between 6:00 am and 8:00 pm.
- Blasting is permitted Monday to Friday, excluding holidays, between 8:00am and 6:00pm during daylight hours.
- Operations on Sundays and Holidays are not permitted except in response to an emergency

All proposed operations will occur outside of the active period for Eastern Whip-poor-will, thus assuming no changes to the proposed activities there is no expectation that the quarry will result in contraventions of the SARA. Further, because of the phasing of the extraction and the progressive rehabilitation, suitable habitat will remain throughout the life of the quarry.

6.5.5 Golden-winged Warbler

Extraction during Phase 2 would result in the loss of vegetation community where nesting is potentially occurring with the proposed removal of approximately 1.5 ha of habitat. Based on the proposed extraction limit, an area of approximately 3.3 ha of suitable habitat, including areas where possible breeding was recorded for the species, will be retained and protected from extraction activities. Through the application of mitigation measures (Section 7), the retained habitat is expected to continue to provide suitable habitat in order for the species to continue occupying the subject property.

Potential impacts to adjacent lands from the extraction activities, specifically dust and noise, has the potential to impact this species. A Noise Impact Assessment has been completed (HGC, 2026) which considers the impacts of noise. Dust management will be completed as per the requirements under the ARA (1990) O. Reg. 466/20 Section 0.12(2) as discussed in Section 6.4.2 above.

Mitigation measures are provided in Section 7 to ensure no accidental harm of the species occurs during the creation or operation of the quarry, should it be identified within the Study Area. Potential contraventions of SARA Sections 33 and 58 can be avoided by ensuring no impacts to the species residence/nest between early May through August. Further, through the maintenance of suitable habitat within the retained lands on the subject property, and the application of mitigation measures to avoid impacts to adjacent lands where the species is known to occupy, no negative ecological impact to Golden-winged Warbler and associated habitat is expected to occur as part of the proposed aggregate extraction plan.

6.5.6 Endangered Bats

Two areas were identified for potential bat maternity roosting within the subject property. The northeastern forest communities (FODR2-1 and FODM8-1) were characterized as providing potential bat maternity colony roosting for Little Brown Myotis. Forest and wetland habitat surrounding acoustic monitor S4U22033 may also provide maternity roosting habitat for Silver-haired Bat and Hoary Bat as well as foraging habitat in the open water associated with the wetland.

Given that there is no identified overwintering habitat present on the subject property, potential for injury to bats would be limited to the active season when they move to the forests to breed. Harm would be possible if vegetation removals occurred during this window. Mitigation is proposed to ensure that no harm will occur to bats during the active season. Assuming that mitigation is followed, there is no expectation that contraventions of the SCA would occur as a result of this application.

Based on the description of habitat, it is expected that the two areas identified as potential maternity roosting habitat and adjacent natural lands within 1000m may receive protection under the SCA. The phased nature of extraction will ensure that forest roosting and supporting habitat will remain present within the subject property through the lifetime of the quarry. Further, over one third of the forested habitat present within the wetland areas will remain undisturbed through the life of the quarry. While maternity roosting may be associated with the forested areas proposed for removal, it remains difficult to dictate the exact trees being used for roosting. It is expected that female bats returning to the Study Area to form maternity roosts will find abundant forested areas present upon their return every year through the life of the quarry.

The SCA provides an exception under Section 16 that allows for the registration of an activity that results in or is likely to result in damage to or destruction of the habitat of a species that is listed on the Protected Species in Ontario List (O. Reg. 60/26). Although currently there is no expectation that the aggregate extraction as proposed within the subject property would constitute damage to or destruction of the habitat for Little Brown Myotis, Hoary Bat, and Silver-haired Bat, the removal of candidate roosting trees could be considered damage or destruction of habitat for those species.

Therefore, it is recommended that registration be completed in accordance with O. Reg. 75/26 which outlines all requirements for the registration, including the preparation of a Mitigation Plan and Conservation Plan.

The registration shall be completed prior to any site works that involve the removal of trees within the Phase 1 extraction lands. Mitigation measures are provided in Section 7 to ensure no accidental harm to the species will occur during the operation of the quarry, should it be identified within the Study Area.

6.6 CANDIDATE SIGNIFICANT WILDLIFE HABITAT

6.6.1 Bat Maternity Colonies

Similar to the Endangered Bats, two areas were identified for potential bat maternity roosting within the subject property, specifically within the northeastern forest communities (FODR2-1 and FODM8-1). Known maternity colonies for these species in Ontario are extremely rare. The intent of maintaining this function as significant wildlife habitat is to protect large colonies or congregations of bats in sensitive habitat. Impact to the significant wildlife habitat function can occur if large stands of appropriate trees were to be removed in a way that would cause mortality when the bats are roosting, or when they return to the roost habitat in the spring and are unable to find appropriate habitat in which to carry out this life function. The phased nature of extraction was situated in a manner that was intended to ensure that forest roosting and supporting habitat will remain present within the subject property through the lifetime of the quarry. Further, over one third of the forested habitat present within the wetland areas will remain undisturbed through the life of the quarry.

It is expected that female bats returning to the Study Area to form maternity roosts will find abundant forested areas present upon their return every year through the life of the quarry. As such, there is no expectation that this proposed activity would result in negative impacts to the function within the landscape. Abundant trees will remain on the subject property and any roost colonies that may be present for non-SAR bat species will continue to persist in the Study Area.

6.6.2 Turtle Wintering Area

Negative impacts to Turtle Wintering Areas could be expected to result from removal of the habitat reductions to the wetland size or lowering of water levels in the wetland such that the overwintering habitat was reduced or removed. Based on the proposed extraction plan, the main wetland unit where this function was identified was the WU-4 Wetland Unit. Through the extraction plan, this habitat area is intended to be maintained with an appropriate naturalized buffer.

Potential reductions to the water levels in the wetland units has already been discussed in Section 6.2. As previously discussed, we understand that there is no concern related to new or increased drawdown to the wetland resulting from the proposed activities.

Based on the fact that potential habitat will not be removed, and no impairments to the wetland habitat are expected, there are no negative impacts expected to result to identified Turtle Wintering habitat.

6.6.3 Reptile Hibernaculum Habitat

Potential Reptile Hibernaculum Habitat was identified in the northeast forest community. A small congregation of snakes, roughly 12 individuals were identified moving among the rocky areas and basking on a south facing slope. This location will be removed in Phase 1 of the extraction plan. Abundant areas of rocky habitat with access to groundwater which would allow snakes to overwinter were identified on the subject property. The phasing plan will allow individuals to move and find alternative habitat through the life of the quarry. Mitigation including timing windows and creation of new Hibernaculum in closed phases of the extraction are recommended in Section 7 to ensure that this remains true. Assuming that the recommended mitigation and restoration are completed there is no expectation that the proposed extraction plan would result in negative impacts to the long-term viability of reptile hibernaculum habitat present on the subject property.

6.6.4 Deer Wintering Areas and Movement Corridors

Mapped Deer Wintering Areas are associated with the WU-4 wetland unit in the southeast of the subject property and extend south across Concession Road B-C. Negative impacts would be considered if removal of these areas was proposed in a manner that would limit the habitat function on the landscape, reduce the functionality of the feature containing the habitat function, or fragment the landscape in manner that would reduce the ability of deer to move between this feature and other supporting features on the landscape.

As proposed, the extraction plan will retain all mapped Deer Wintering Areas on the landscape. As previously discussed, there is no expectation that the proposed extraction will impact the WU-4 wetland unit or the forest habitat that envelopes it. The Phasing of the extraction plan and progressive rehabilitation plan was created in a manner that will ensure that the north to south connectivity will remain through the life of the quarry. As such, no negative impacts are expected to result from the proposed quarry.

6.6.5 Amphibian Breeding Habitat

As discussed in Section 5.6, wetland units WU-1 and WU-4 within the subject property appear to provide function for Amphibian Breeding. Adjacent lands to the north and east of the subject property are also considered as functioning for Amphibian Breeding Habitat. Those habitats associated with Wetland Unit WU-1 and the adjacent lands are expected to be retained on the landscape.

The proposed extraction limit (Phase 2) will include the removal of WU-1 wetland unit and associated functions. Negative impacts are considered as they relate to the removal of wetland unit WU-1 and potential disturbance or degradation of the retained habitats. Fracturing the landscape in a manner that would make movement between wetland communities impossible could also be considered a potential impact, thus disturbance within movement corridors for amphibians is considered.

As with other significant wildlife habitat functions, removal of a unit could be considered a negative impact if it were to limit or remove this function from an area, or if it was to be removed during a sensitive time for the function. For amphibian breeding habitat this is during the spring, when large congregations of amphibians move to the wetland pockets to reproduce. Removal of the WU-1 wetland unit in Phase 2 of the extraction plan will not remove amphibian breeding habitat in a manner that will limit this function on the landscape, and the phasing was situated in a manner that should allow for continued movement between the retained function areas. Negative impacts are not expected to occur assuming mitigation measures are followed to ensure that removal of the WU-1 wetland unit and other potentially functional areas created through the process are not removed at sensitive times for the breeding individuals.

Wetland habitat will also be created through the progressive rehabilitation plan (Phase 2) that will encourage creation of new amphibian habitat functions on the landscape post extraction. Mitigation measures are provided in Section 7 to avoid impacts to wildlife that may be utilizing the wetland units at the time of site works.

6.6.6 Woodland Area-Sensitive Bird Breeding Habitat

Negative impacts to Area-sensitive Bird Breeding Habitat could be expected to result from removal of the habitat, or reductions to the woodland size such that the interior habitat, habitat more than 100m from an edge was reduced or removed. Based on the proposed extraction plan there will be no reduction in woodlands that would remove interior habitat or reduce the interior habitat available in the Study Area. Interior habitat is illustrated in the woodland assessment found in Appendix L.

Increases in noise could also contribute to an indirect negative impact to habitat if a newly introduced noise source was presented in a manner that would impact the ability Woodland Area-Sensitive Bird Breeding habitat to function. Based on our understanding of the Study Area and the proposed activity, there is no expectation that the activity will impact this function. Noise levels have been reviewed as appropriate (HGC, 2026) and the current bird populations demonstrate that they continue to frequent an area where extraction and other activities similar to those proposed in this application are occurring. It is our understanding that blasts will be infrequent in nature occurring on average 5 to 8 blasts per year, with an increase in blasts likely occurring during the sinking cut. There is no expectation that these activities would result in negative impacts to the Woodland Area-sensitive Bird Breeding habitat.

6.6.7 Marsh Breeding Bird Habitat

Similar to other functions above, negative impacts could be expected to result from the removal of features supporting candidate marsh breeding bird habitat or potential disturbance or degradation of the retained habitats. Within the Study Area, this was associated with the WU-4 wetland unit which is to be retained on the subject property.

As previously discussed, there is no expectation that the proposed extraction will impact the WU-4 wetland unit or the forest habitat that envelopes it. Potential reductions to the water levels in the wetland units has already been discussed in Section 6.2. As previously discussed, we understand that there is no concern related to new or increased drawdown to the wetland resulting from the proposed activities.

Based on the fact that the identified habitat will not be removed, and no impairments to the wetland habitat are expected, there are no negative impacts expected to result to identified Marsh Breeding Bird habitat.

Wetland habitat will also be created through the progressive rehabilitation plan (Phase 2) that will encourage creation of new habitat functions, including marsh breeding bird habitat on the landscape post extraction.

6.6.8 Shrub/Early Successional Bird Breeding Habitat

As outlined in Section 5.6.8, Shrub/Early Successional Bird Breeding habitat is located within the larger pasture areas associated with the subject property in addition to some habitat use which extends down into the WU-4 wetland unit. In the Study Area and broader landscape, this habitat function remains very well distributed and is common on the landscape. Given the scale of this habitat function within the region, negative impacts could be expected to result from the removal of large areas of habitat supporting candidate Shrub/Early Successional Bird breeding habitat or potential disturbance or degradation of the retained habitats in a manner that would significantly reduce the long-term health and viability of the dependant species.

On the scale of the subject property this habitat will be removed at various phases during the life of the quarry. Notwithstanding, this habitat function is much easier to replicate on the landscape, and the progressive rehabilitation plan will ensure that new habitat will be functional on the subject property prior to the extraction of Phase 3 which encompasses a large portion of the habitat. On a larger regional scale, this habitat function is widely available throughout the Township. As such, this habitat function will be retained on the subject property through the life of the quarry, and there will be no appreciable change in the availability of this habitat function on the regional scale. Assuming mitigation outlined in Section 7 of this report are followed, and progressive rehabilitation proceeds as outlined, there is no expectation that negative impacts would result to Shrub/Early Successional Bird Breeding Habitat in the Study Area.

6.6.9 Special Concern Species Habitat

As previously noted, impacts to many of the observed or expected species of special concern are closely related to sections above including Turtle Overwintering and Reptile Hibernaculum habitat. As a result, Midland Painted Turtle, Snapping Turtle, Eastern Five-lined Skink and Eastern Ribbonsnake will not be reiterated here.

Eastern Wood Pewee (Not Listed [SCA]/Special Concern [SARA])
Similar to Shrub/Early Successional Bird Breeding Habitat, the habitat for Eastern Wood-pewee is associated with open woodlands and edge habitat which is very common within the Study Area and broader landscape. This habitat function remains very well distributed and is common on the landscape. Given the scale of this habitat function within the region, negative impacts would be expected to result if the removal of large areas of habitat supporting Eastern Wood Pewee or potential disturbance or degradation of the retained habitats was proposed in a manner that would significantly reduce the long-term health and viability of the dependant species.

On the scale of the subject property this habitat will be removed at various phases during the life of the quarry. Notwithstanding, this habitat function will be retained through one third of the subject property indefinitely and will be created through the phased extraction and rehabilitation. On a larger regional scale, this habitat function is widely available throughout the Township. As such, this habitat function will be retained on the subject property through the life of the quarry, and there will be no appreciable change in the availability of this habitat function on the regional scale. Assuming mitigation outlined in Section 7 of this report are followed, and progressive rehabilitation proceeds as outlined, there is no expectation that negative impacts would result to habitat for Eastern Wood-pewee.

Common Nighthawk (Not Listed [SCA]/Special Concern [SARA])
As previously noted, Common Nighthawk breeds in a wide variety of habitats and is reliant on disturbances such as forest fires for habitat. This species is regularly associated with quarries which provide excellent nesting habitat for the species. No negative impacts are expected to occur to Common Nighthawk habitat which has been identified within adjacent lands. Mitigation related to timing windows and nesting birds is still expected to be beneficial in protecting this species.

6.6.10 Treed and Meadow Alvar Habitat

As discussed in Section 5.6, neither Alvar communities meet the defining criteria under the Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E (MNRF, 2015) due to the prevalence of non-native, exotic species, and general lack of indicator species. Notwithstanding, due to the presence of karst and Prairie Smoke, consideration for impacts to Alvar conditions is warranted.

The proposed extraction activity will result in the loss of approximately 16 ha of alvar vegetation community including RBSA1-1, RBTA1-6, and RBOB2-2. A total area of 4 ha of alvar community will be retained from the proposed extraction activities.

Alvar habitat is extensive throughout the Carden Plains area, with large and high-quality habitats supporting unique species. These habitats are largely found in areas located to the east of the Study Area, where the Carden Alvar Provincial Park, covering an area of 1917 ha is located. The loss of 16 ha of alvar vegetation communities would therefore not be considered a negative impact on the overall availability of high- quality habitats located within protected areas beyond the Study Area.

Through stripping activities, the seedbank found within these communities can be stored within the proposed 725m berm and utilized through progressive rehabilitation in the creation of meadow habitats. Although meadow habitat is not expected to truly replace the alvar-like conditions currently present within the subject property, similar species that are utilizing the subject property currently would be expected to utilize meadow habitat, including Field Sparrow and Golden-winged Warbler. Meadow habitat can also be restored in a manner to target certain species, including Eastern Meadowlark and Bobolink which are not currently utilizing the habitats within the subject property. Therefore, it is recognized that through progressive rehabilitation, an opportunity exists to enhance the functionality of the subject property and specialized species.

Furthermore, there would be no expected negative impact to Alvar habitat as it would not be evaluated to be Significant Wildlife Habitat within the Province of Ontario.
Mitigation measures are provided in Section 7 to ensure the retained alvar vegetation communities are protected from indirect impacts and progressive rehabilitation considers the use of the existing seedbank found within these communities.

7 MITIGATION MEASURES AND SITE PLAN RECOMMENDATIONS

The following mitigation measures were prepared on the basis of the above listed potential impacts of the identified natural heritage features and functions. Summary Site Plan recommendations are provided in each section to capture the entirety of the listed mitigation measures with the expectation that these will be included within the operational site plans. The mitigation measures and site plan recommendations are provided in order of each identified natural heritage feature and function as identified within Table 2 of this NER.

7.1 OTHER WETLAND

7.1.1 Mitigation Measures

- Proposed extraction activities shall be setback a minimum of 30 m from the boundary of the delineated wetlands WU-3 and WU-4 as shown on Figure 2. The 30 m setback should be well-marked prior to the onset of site preparation.
- The established 30m setback to the WU-4 and WU-3 wetland units shall be established in the field and clearly delineated to ensure no accidental encroachments into the protected setback areas. Re-naturalization of the 30m setback area that will be disturbed for the construction of

the cutoff swale shall occur with the planting of shrubs and live stakes to increase ecological function of the setback area.

- While it is recognized that the site access location will be located along the western boundary of the WU-3 wetland unit, this shall be designed to minimize impacts to the WU-3 wetland unit and maintain setback area.
- Re-naturalization of the 30m setback area that will be disturbed for the construction of the cutoff swale shall occur with the planting of shrubs and live stakes to increase ecological function of the setback area.
- Whan at grade, all stockpiled aggregates shall be stored in a location that will prevent the movement of sediment-laden runoff into the WU-3 and WU-4 wetland units and their setbacks.
- All extraction activities shall comply with minimizing erosion and sedimentation and be contained within the licenced extraction area. Sediment and erosion controls along the limits of the extraction limit shall be installed prior to all construction activities, including vegetation clearing and grubbing.
- Sediment fencing must be constructed of heavy material and solid posts and be properly installed (trenched in) to maintain its integrity during inclement weather events. Once installed, sediment fencing shall be monitored on a weekly basis during spring freshet and bi-weekly afterwards. The fencing shall be maintained when deficiencies are observed.
- No development activities (*i.e.,* material and equipment storage, grading, equipment activity) are permitted within the adjacent retained natural areas.
- All machinery on site is to be maintained in a clean condition and free of fluid leaks to prevent any deleterious substances from entering sensitive habitats. Washing, refueling and servicing machinery and storage of fuel and other materials for the machinery should occur in such a way as to prevent any deleterious substances from entering retained natural areas, a minimum of 30 m.

7.1.2 Site Plan Recommendations

- Extraction activities shall be setback 30m from the delineated WU-3 and WU-4 wetland units as illustrated on Figure 2.
- For the purpose of this NER a Qualified Professional (‘QP’) means a person that has the education, training experience and expertise to undertake the requirements that are to be overseen by that person.
- The established 30m setback to the WU-4 and WU-3 wetland units shall be established in the field and clearly delineated by a QP.
- Sediment and erosion controls/fencing along the limits of the extraction limit shall be installed under the supervision of a QP prior to all construction activities, including vegetation clearing and grubbing. Regular monitoring of the fencing shall be undertaken. Following rehabilitation of Phase I the wildlife fencing along the southern and eastern boundaries of Phase I shall be removed. Additional wildlife fencing may be prescribed by the QP at that time.

- Re-vegetation shall occur immediately following completion of any works taking place within the retained 30m setback area.
- Site access shall be designed to minimize impacts to the WU-3 wetland unit and maintain the remaining setback area.
- Where stockpiling of materials occurs at ground level, sediment and erosion control measures shall be implemented to ensure that no deposition of materials occurs within the WU-3 and WU-4 wetland units.
- Where machinery is stored at ground level, it shall be maintained in a manner that will ensure soils, seeds and other deleterious substances will not enter sensitive habitats.

7.2 FISH HABITAT

7.2.1 Mitigation Measures

- The activity involving alteration of the identified fish habitat features as outlined in Figure 3 of the NER shall be submitted to DFO through the appropriate permitting process and DFO requirements shall be complied with.
- A QP that is knowledgeable in fish and fish habitat shall be assigned to oversee fish habitat creation related components of construction and operational monitoring. This person would be tasked with ensuring that all operations are proceeding in accordance with the proposed plan and fisheries related recommendations.
- All work should be completed in the dry and shall occur outside of the established in-water work window for this location. For this project, work the repair works must occur between June and September 30 of any given year, unless otherwise indicated through the DFO approval.
- The blasting plan shall be in accordance with DFO Guidelines for the use of explosives in or near Canadian fisheries waters.
- Construction of the cutoff swale shall incorporate natural channel design principles to the satisfaction of the DFO. The constructed cutoff swale shall be re-naturalized with native herbaceous and woody plants, to maximize fish habitat benefits and reduce potential thermal impacts.
- Prior to dewatering of isolated areas, the QP shall attend the site and remove wildlife (fish, turtles, amphibians) from the isolated area, in order to ensure that the dewatering and repair works do not interfere with those individuals. The following DFO Interim Standards are relevant to the operational phase and shall be considered appropriately:
    - DFO Interim Standard: In-Water Site Isolation (https://www.dfo-mpo.gc.ca/pnw-ppe/codes/interim-provisoire/site-isolation-confinement-aire-travail-eng.html).
    - DFO Interim code of practice: end-of-pipe fish protection screens for small water intakes in freshwater (https://www.dfo-mpo.gc.ca/pnw-ppe/codes/screen-ecran-eng.html), specifically as it relates to maintenance of maximum flow rate and employing filter screens such that impingement and entrainment of fish is prevented during dewatering.
- Construction of the berm within the southwestern extraction limit shall incorporate the natural channel design cutoff swale and the constructed berm within the 30m wetland setback.

- Sediment and erosion controls shall be implemented as per the sediment and erosion control plan for the project. The sediment and erosion control plan shall, at a minimum, consider the DFO's measures to protect fish and fish habitat recommendations (https://www.dfo-mpo.gc.ca/pnw-ppe/measures-mesures-eng.html).
- Deleterious substances shall be prevented from entering fish habitats. The control of deleterious substances should, at a minimum, consider the DFO's measures to protect fish and fish habitat (https://www.dfo-mpo.gc.ca/pnw-ppe/measures-mesures-eng.html).
- Reflooding of the created cutoff swale channel shall occur as follows:
    - Ensure all bed and banks within the footprint of the disturbed area have been stabilized
    - Partially reflood the dewatered areas in order to re-suspend remaining deposits and pump any residual sediment-laden water from the site
    - Gradually remove the cofferdams to ensure equalization of water levels inside and outside of the isolated area to allow suspended sediments to settle

7.2.2 Site Plan Recommendations

- Throughout the operation of the quarry, compliance shall be maintained with the federal *Fisheries Act,* 1985 and any permits or authorizations obtained under that legislation for the subject property.
- A QP shall be retained to prepare a blasting plan that is compliant with DFO guidelines and regulations.
- A QP shall be retained to oversee the implementation of mitigation measures and habitat creation as determined by the DFO permitting process.

7.3 SIGNIFICANT WOODLAND

7.3.1 Mitigation Measures

- Where possible, maximize the distance of heavy equipment used from the woodland and edge to avoid disturbing wildlife.
- Standard best management practices shall be implemented to reduce dust and noise impacts at the quarry and shall be continued throughout the operation of the project.

7.3.2 Site Plan Recommendations

- Operations of the site shall ensure that dust is managed in accordance with the ARA O. Reg. 244/97.
- The operation of the quarry shall comply with the recommendations outlined within the Noise Impact Assessment (HGC, 2026).
- Best management practices shall be followed to ensure that light disturbance is limited in proximity to the adjacent retained candidate significant woodlands.
- Monitoring of invasive species establishment shall be required and shall include the preparation of an invasive species management plan to be implemented prior to the start of operations.

7.4 HABITAT FOR THREATENED AND ENDANGERED SPECIES

7.4.1 Mitigation Measures

- Tree removals, specifically within forest communities, is to be scheduled such that they occur outside of the bat active season. Therefore, tree removals should occur between November 1 and March 31. No cutting activities in forested areas should occur outside that period.
- Reptile exclusion fencing surrounding the permitter of the extraction phase, along the WU-3 and WU-4 wetland unit shall be installed in order to exclude snakes and other wildlife to enter the active extraction phase. Fencing is to be monitored for damage or gaps and regularly maintained. Fencing is to be inspected three times each year during the active season (March 1 to October 31) as follows:
    - prior to the beginning of the active season (before March 1)
    - during the active season (early June), and late fall (mid-October)
- Any wildlife encountered on the site should remain undisturbed and be allowed to leave on their own. If possible, photographs for identification purposes should be taken of any animal observed onsite
- If an active Species at Risk bird nest is identified during site operations, the MECP shall be consulted immediately to determine any requirements under the *Species Conservation Act, 2025.*
- If Blanding's Turtle is identified within the subject property, all work occurring within 30 m of the individual shall stop and the species shall be protected from harm. MECP shall be notified immediately to seek guidance on ways to avoid impacts under the *Species Conservation Act,* 2025 prior to resuming work.
- An information panel shall be designed and erected at the site entrance to alert all staff entering the site to the potential presence of Species at Risk and their habitat. The panel shall include:
    - Notification of worker obligations, liabilities and responsibilities under Ontario's *Species Conservation Act,* 2025;
    - Photographs of Species at Risk that have potential to be present, to assist in identification; and,
    - Explanation of the appropriate procedure to follow should the species be observed or injured on the project location.
- Registration under the *Species Conservation Act,* 2025 for Blanding's Turtle and Little Brown Myotis is required prior to any site works. Registration will require the preparation of a Mitigation Plan and Conservation Plan in accordance with O. Reg. 75/26.

7.4.2 Site Plan Recommendations

- Throughout the operation of the quarry, compliance shall be maintained with the provincial *Species Conservation Act,* 2025, and any requirements of registration and/or permits obtained under that legislation for the subject property.
- A QP shall be retained, where necessary, to provide guidance as it relates to the legislative requirements under the *Species Conservation Act,* 2025.

- No tree removal shall be permitted between March 31 and November 1.
- Reptile exclusion fencing shall be incorporated into portions of the south and east perimeter fencing in the form of galvanised wire mesh affixed to the lower portion of the post and wire fencing.
- Reptile exclusion fencing shall be inspected weekly following spring freshet during the reptile active season (April-October) while the site is operation. A logbook shall be kept on site documenting this activity.
- In cooperation with a QP, an information panel shall be designed, erected and maintained at the site entrance to alert staff entering the site to the potential presence of Species at Risk and their habitat.

7.5 SIGNIFICANT WILDLIFE HABITAT

7.5.1 Mitigation Measures

- All necessary removal of natural vegetation (*i.e.,* tree/shrub clearing, open meadows) are to be completed outside of the primary breeding bird nesting window (between April 1 and August 31).
- The use of artificial lighting should be limited within the Study Area to the extent possible.
- The WU-1 wetland unit is to be protected during the extraction of Phase 1, including vegetation clearing and grubbing to ensure amphibians can continue to utilize the habitat.

7.5.2 Site Plan Recommendations

- Operations of the site shall ensure that dust is managed in accordance with the ARA O. Reg. 244/97.
- The operation of the quarry shall comply with the recommendations outlined within the Noise Impact Assessment (HGC, 2026).
- Best management practices shall be followed to ensure that light disturbance is limited in proximity to the retained natural areas.
- Monitoring of invasive species establishment shall be required and shall include the preparation of an invasive species management plan to be implemented prior to the start of operations.
- Permanent perimeter fencing shall be constructed with post and wire fence to allow for wildlife movement through the north-south corridor.
- Following internal road design, consideration shall be given to the protection of the WU-1 wetland unit in cooperation with the QP.

7.6 SUMMARY OF MITIGATION PLAN

Mitigation of potential impacts to identified natural features and functions during construction are as follows:

Table 3: Summary of Impact Assessment and Mitigation

Natural Heritage Feature and Function[1]	Potential Impacts Identified	Recommended Mitigation / Rehabilitation Actions[1]	Permitting Requirements	Progressive Rehabilitation Measures	Negative Impacts with Application of Recommended Mitigation / Rehabilitation Actions
Provincially Significant Wetland	Not applicable	None required	None	None required	None
Other Wetland	• Loss of MASR1-1 small, isolated wetland units (WU-1 and WU2 Total: 0.55 ha) • Loss and disturbance to wildlife and wildlife habitat (amphibian breeding habitat) • Changes to the hydrology / water quality entering sensitive features • Erosion and Sedimentation into retained sensitive features • Impairment of adjacent and retained wetland habitat - Indirect impacts to retained wetland habitats from extraction activities (*i.e.,* dust, noise, anthropogenic disturbance)	• Erosion and Sediment Control Measures along 30m wetland setback • 30m setback area to remain undisturbed • Amphibian / reptile exclusion fencing installed along the length of the licenced boundary • Vegetation removal timing windows to be completed outside of breeding bird nesting window (*i.e.,* between April 1 – August 31) • Minimize the use of lighting, where possible • Rehabilitation measures should involve some form of wetland habitat creation	None	Creation of 3.2 ha of wetland/pond habitat will occur through progressive rehabilitation	Long term loss of Wetland habitat will not occur, temporary changes in associated wildlife habitat function can be mitigated. No residual impacts are expected assuming mitigation and rehabilitation measures are implemented.
Fish Habitat	• Alteration of 0.18 ha and 234 m of permanent direct fish habitat • Alteration of 80 m of seasonal direct fish habitat • Mechanical shock from ground vibrations	• Natural channel design (habitat creation and offsetting) • Comply with cool-water timing window for in-water work, to be confirmed with MNR • Limit duration of in-water work	DFO Request for Review or Authorization for proposed permanent and temporary alteration of fish habitat	Habitat creation at a minimum 1:1 to demonstrate no Harmful Alteration, Disruption or Destruction of Fish Habitat (HADD)	Long term loss of fish habitat will not occur, and temporary impacts are to be mitigated. No residual impacts are expected provided habitat can be recreated on site and baseflow conditions can be maintained.

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[1] The listed recommended mitigation / rehabilitation actions is not to be considered as an exhaustive list and do not represent the entirety of the Site Plan recommendations as outlined within Section 7.1 of this NER

Table 3: Summary of Impact Assessment and Mitigation

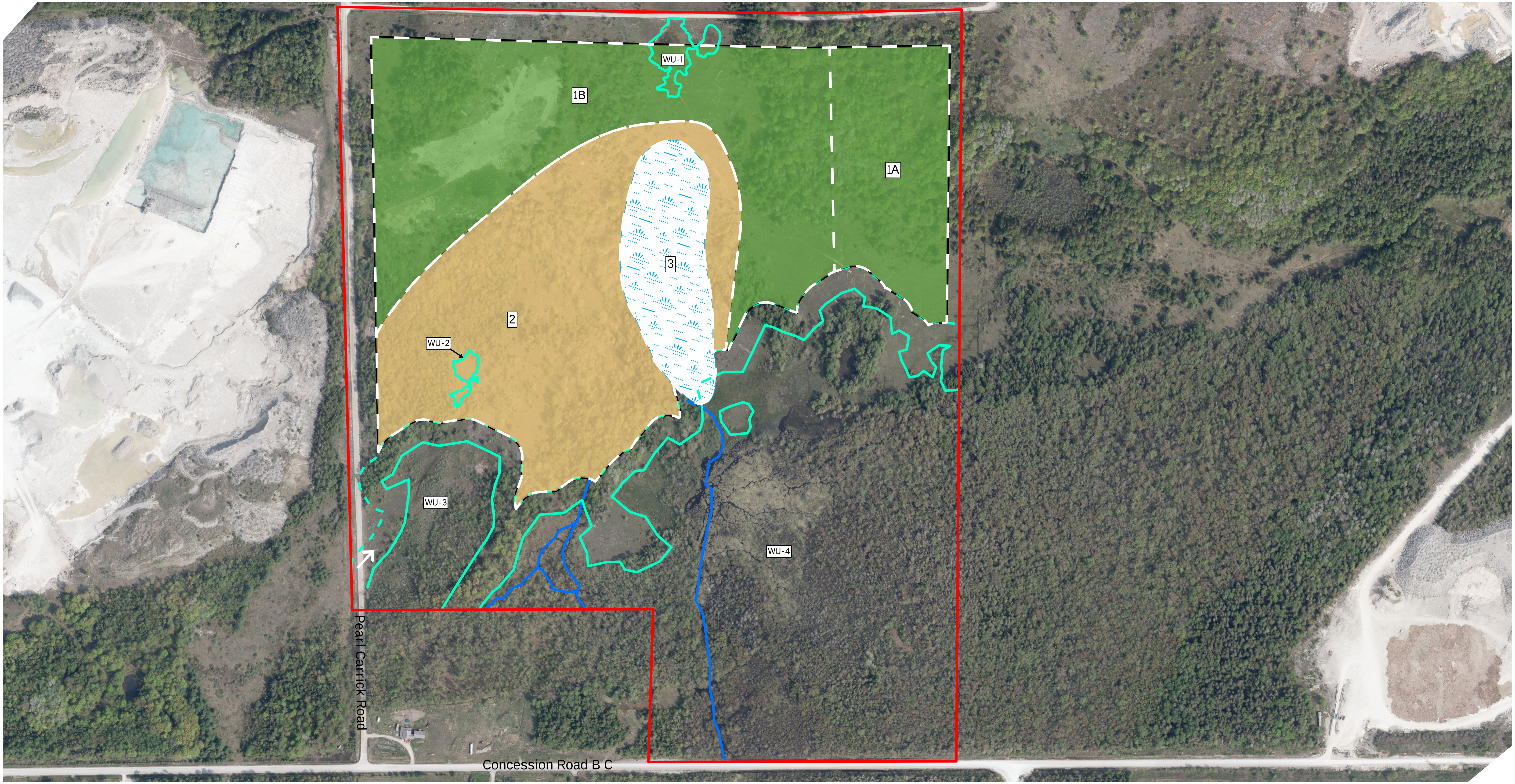
Natural Heritage Feature and Function[1]	Potential Impacts Identified	Recommended Mitigation / Rehabilitation Actions[1]	Permitting Requirements	Progressive Rehabilitation Measures	Negative Impacts with Application of Recommended Mitigation / Rehabilitation Actions
	• Changes to the hydrology / water quality entering sensitive features • Alteration of thermal regime of downstream receiving habitats • Change in nutrient inputs to downstream receiving habitats • Entry of deleterious substances to downstream receiving habitats • Erosion and Sedimentation into sensitive features	• Conduct instream work during periods of low flow conditions • Thermal mitigation measures (*i.e.,* groundwater interaction, natural riparian corridor, underground reservoir, bottom draw outlet) • Implement a Blasting Plan for the Project to reduce risk of lethal or sub-lethal effects on fish • Maintaining existing baseflow condition to downstream habitats • Erosion and Sediment Control measures • Fish relocation to avoid death during dewatering activities • Re-naturalization and tree planting of the area that is to be disturbed for the construction of the cut-off swale			
Significant Woodlands	• Loss of 7ha of Candidate Significant Woodland (contiguous with Canadian Shield) • Loss of 14.2ha of non-Significant Woodland • Impairment of Retained Woodland Features	• Progressive Rehabilitation measures should incorporate tree plantings / woodland creation, where possible • Standard best management practices shall be implemented to reduce dust and noise impacts at the quarry and shall be continued throughout the operation of the project. Compliance with O. Reg. 466/20	None	Through Progressive Rehabilitation a total of 18.6 ha of forest habitat will be created on the subject property.	Age structure of the resulting forest area will be reduced and the is a potential reduction in woodland size. Mitigation and rehabilitation will reduce the magnitude of residual impacts. Contiguous woodland will continue to meet size threshold to be considered Significant Woodland post-extraction

Table 3: Summary of Impact Assessment and Mitigation

Natural Heritage Feature and Function[1]	Potential Impacts Identified	Recommended Mitigation / Rehabilitation Actions[1]	Permitting Requirements	Progressive Rehabilitation Measures	Negative Impacts with Application of Recommended Mitigation / Rehabilitation Actions
Habitat of Threatened or Endangered Species	• Loss of 1.9ha of bat summer roosting habitat • Indirect impacts to retained natural areas from extraction activities (*i.e.,* dust, noise, anthropogenic disturbance) • Loss and disturbance to wildlife and wildlife habitat	• Vegetation removal timing windows to be completed outside of breeding bird nesting window (*i.e.,* between April 1 – August 31) and bat summer roosting window (*i.e.,* between April 1 – November 30 • Worker training of Species at Risk in the area • Permanent signage erected at the site entrance to notify staff of the potential presence of Species at Risk • 30m setback to wetland area to remain undisturbed • Amphibian / reptile exclusion fencing installed along the length of the licence boundary • Minimize the use of artificial lighting, where possible	Registration in accordance with O. Reg. 75/26 of the SCA for Blanding's Turtle, Little Brown Myotis, Hoary Bat, and Silver-haired Bat.	Registration would involve the development of a Mitigation Plan and Conservation Plan for the species. Creation of 18.6 ha of forest habitat through Progressive Rehabilitation. Creation of 3.2 ha of wetland habitat through Progressive Rehabilitation.	Mitigation and progressive rehabilitation will reduce the magnitude of residual impacts. Implementation of Mitigation Plan and Conservation Plan for the species will ensure habitat availability and quality is not impacted for the species.
Significant Wildlife Habitat	• Loss of 2.3ha of Reptile Hibernaculum Habitat • Loss of 0.43ha of Amphibian Breeding Habitat • Loss of 1.9ha of habitat for Bat Maternity Colonies • Loss of 16ha of Treed and Meadow Alvar habitat • Loss of 11.3ha of Shrub/Early Successional Bird Breeding Habitat • Indirect disturbance or degradation of retained habitat types	• Vegetation removal timing windows to be completed outside of breeding bird nesting window (*i.e.,* between April 1 – August 31) and bat summer roosting window (*i.e.,* between April 1 – November 30 • Erosion and Sediment Control Measures along 30m wetland setback • Amphibian / reptile exclusion fencing installed along the length of the licence boundary • Minimize the use of artificial lighting, where possible	None	In addition to the 18.6 ha of woodland habitat created progressive rehabilitation work will result in the creation of 12.6 ha of grassland/meadow habitat	Long term loss of significant wildlife habitat will not occur, temporary changes in associated wildlife habitat function can be mitigated. No residual impacts are expected assuming mitigation and rehabilitation measures are implemented.

Table 3: Summary of Impact Assessment and Mitigation

Natural Heritage Feature and Function[1]	Potential Impacts Identified	Recommended Mitigation / Rehabilitation Actions[1]	Permitting Requirements	Progressive Rehabilitation Measures	Negative Impacts with Application of Recommended Mitigation / Rehabilitation Actions
Provincial Areas of Natural and Scientific Interest	Not applicable	None required	None	None required	None



6059 Pearl Carrick Road
Township of Ramara

- 🟥 Property Limit (Approximate)
- Permanent Direct Fish Habitat
- Delineated Wetland Limit (Birks NHC; July 2024)
- 30m Wetland Setback

Rehabilitation Plan

- 🟧 Upland - Meadow/Shrubland (12.6ha)
- ▨ Wetland/Pond (3.2ha)
- 🟩 Upland - Forest (18.6ha)

- → Site Access
- ☐ Proposed Extraction Limit
- ⌜⌟ Rehabilitation Phase (see NER)

Figure 5.
Progressive Rehabilitation Plan

BIRKS
NATURAL HERITAGE CONSULTANTS

MAP DRAWING INFORMATION:
DATA PROVIDED BY: ESRI CANADA, Ontario GeoHub,
SIMCOE OPEN DATA

MAP CREATED BY: SB
MAP CHECKED BY: BB
MAP PROJECTION: NAD 1983 UTM ZONE 17N

N W E S

0 62.5 125 250 375 500 Meters

FILE LOCATION:
Path: C:\Users\S_Brady\BirksNHC\Birks NHC Team for all - Documents\Project Folders\04 - SBrady Projects\ArcGIS - Projects here\Projects - here\02-014-2023 Pearl Carrick

PROJECT: 02-014-2023 STATUS: ISSUED DATE: 5/05/2026

8 PROGRESSIVE REHABILITATION PLAN

The rehabilitation plan for the proposed quarry recognizes aggregate extraction as a temporary land use. To ensure maintenance of natural heritage features and functions within the Study Area, progressive rehabilitation was recommended. The *Best Practices Guidelines for Aggregate Rehabilitation Projects* (Savanta, 2008) was reviewed in the development of the progressive restoration plan for this proposed quarry. The progressive rehabilitation plan considered the restoration of natural heritage features and functions present within the areas proposed to be extracted as identified in Section 6 of this NER. Figure 5 is provided to illustrate areas and features identified for progressive rehabilitation.

Progressive Rehabilitation shall be initiated once extraction of Phase 1 is complete and the extraction of Phase 2 has begun. The quarry will be rehabilitated on a progressive basis, corresponding to the operational progression of the quarry excavation, to form forest, wetland, and meadow habitat at final rehabilitation. As discussed, this phasing was developed from north to south to allow for continuity of the natural vegetation in Phase 2 and Phase 3 in the early stages of extraction with the intent to have Phase 1 re- naturalized before moving to Phase 3 extraction.

The following represents the progressive rehabilitation measures required based upon the findings of the NER.

8.1 PHASING AND INFILL

- The infilling of extracted lands shall prioritize the maintenance of a north-south movement corridor throughout all phases. The endpoint grades are reflected in the Site Plan prepared by MHBC (MHBC, 2026).
- The quarry is intended to be infilled through the importation of excess soils to the extraction area (34.4 ha). Importation is required to comply with the ARA O. Reg. 406-19: On-site and Excess Soil Management. This includes the requirement that a description will be included on the site plan indicating whether soil, topsoil or fill material is to be imported for the purpose of rehabilitation.
- Specifically related to natural heritage matters, the Best Management Practices for Aggregate Pit and Quarry Rehabilitation in Ontario (OSPE, 2021) shall be incorporated to mitigate/avoid impacts from invasive species,

8.2 RE-NATURALIZATION

- For each phase, a rehabilitation plan specific to each created feature shall be completed that details the rehabilitation measures required. This shall be completed by a QP with experience undertaking complex ecological restoration projects and shall incorporate the recommendation provided throughout Section 7 and Section 8 of this report.

- Once the extracted area has been filled to reach the endpoint surface level within Phase 1, vegetation communities shall be established roughly following the vegetation community plan outlined in Figure 5.
- Rehabilitation shall occur in an East-West direction following extraction and shall provide forest, meadow, and wetland habitats.
- '1A – Forest Corridor':
    - A minimum area of 5 ha shall be rehabilitated with forest habitat for the 1A – Forest Corridor and shall include the upland tree species native to ecoregion 6E-9.
    - Rehabilitation of the 1A – Forest Corridor, a 120m forest strip, shall be initiated prior to the beginning of extraction activities for Phase 2 to maintain a North-South wildlife movement corridor. Plantings shall be completed in its entirety.
    - Trees shall not be placed in rows but instead shall be incorporated in a more natural density with a spacing of 4mx4m. This can be managed through the incorporation of open woodland canopy conditions by planting in areas at lower density (*i.e.*, 10mx10m spacing for trees) within portions of the woodland planting area.
- '1B – Remaining Forest':
    - A minimum area of 13 ha shall be rehabilitated with forest habitat and shall include the upland tree species native to ecoregion 6E-9.
    - Trees shall not be placed in rows but instead shall be incorporated in a more natural density with a spacing of 4mx4m. This can be managed through the incorporation of open woodland canopy conditions by planting in areas at lower density (*i.e.*, 10mx10m spacing for trees) within portions of the woodland planting area.
- '3 – Wetland':
    - A minimum area of 3ha shall be rehabilitated with wetland habitat. Plantings shall occur along the wetland edge areas with shrub species and seed mix native to ecoregion 6E-9.
    - A wetland seed mix with native species shall be utilized and installed at a minimum density of 25kg/ha or otherwise directed by the selected seed mix.
    - A maximum depth of 3m of the wetland feature shall be established, while also creating a "pit-and-mound" microtopography throughout. Key depth considerations within the created wetland feature shall be as follows:
        - Shallow areas: 0 -0.5m
        - Deep Areas: 0.5-1.5m
        - Deep Pocket: 2-3m
    - The wetland substrate shall contain varying soil permeability:
        - Fill soil in this area shall ensure that subsurface soils are low permeability to ensure water retention within the wetland pocket.
        - Imported surface soils shall be rich in organic matter, preferably a good quality loam that also has a rich microbial diversity.
    - Soil containing seed stock from the WU-1 and WU-2 wetland units shall be incorporated into the wetland rehabilitation.
- '2 – Meadow':

    - The remainder of the site/an approximate area of 12 ha shall be rehabilitated with meadow habitat and shall include suitable upland native seed mix with species native to ecoregion 6E-9 and installed at a minimum density of 25kg/ha or otherwise directed by the selected seed mix.
- General rehabilitation notes:
    - Rehabilitation shall incorporate other habitat enhancement measures, including the construction of reptile hibernaculum (1A – Forest), placement of stumps (2 – Meadow), construction of turtle basking logs (3 – Wetland), and native grasses and ferns for Eastern Whip-poor-will (2 – Meadow), and artificial bat roosting structures (Forest – 1A & 1B).
    - Soil substrate shall contain a high organic matter and moderate water holding capacity.
    - Adequate site preparation shall be undertaken in order to ensure a successful establishment of planted species.
    - Seed mix and species selection shall be determined based on moisture content of the soil and approved by a QP.
    - Transplanting of salvaged trees, shrubs and herbaceous material within other phases shall be considered in order to provide a source of more mature species.
    - Varying topography within restored woodlands, including "pit-and-mound" to promote water infiltration and vernal pooling shall be incorporated in restoration plans.
    - Seedbank from existing landscape shall be incorporated through the movement of topsoil from the phase being cleared for extraction at the time of habitat creation. For Phase 1 this would be soil from Phase 2 during site preparation stages.
    - The created wetland feature shall maintain a hydrological connection to the retained WU-4 wetland.
    - For all habitat restoration activities, vegetation shall be monitored following an established regular schedule to determine if invasive species are becoming established so that corrective action may be taken.
    - A survival rate of 80% of the original number of planted stems is the target after two years for each planting area.
    - Creation of drainage channels in the original locations shall be reviewed by DFO to ensure that decommissioning of the created features considers the ongoing protection of fish and fish habitat. Natural design principles shall be applied to the reconstruction of the drainage channels and shall consider the habitat requirements of the local fish community at the time that reinstatement of the drainage features us contemplated.

9 POLICY CONFORMITY

The following section is intended to provide a review of the applicable Federal, Provincial, and Municipal legislation and policies that are applicable to this ARA, as provided within Section 2 of this report. It further considers how, through the applicable recommendations and mitigation measures, the ARA application will demonstrate conformity with those policies.

Conformity with applicable natural heritage legislation and policies is summarized in Table 4 below.

Table 4: Summary of Policy Conformity

Section No.	Policy/Legislation Text	Discussion
Aggregate Resources Act, 1990		
2.2.1	Natural Environment Level 1: determine whether any of the following features exist on and within 120 metres of the site: significant wetland, significant portions of the habitat of endangered or threatened species, fish habitat, significant woodlands (south and east of the Canadian Shield), significant valley lands (south and east of the Canadian Shield), significant wildlife habitat and significant areas of natural and scientific interest	The following natural heritage features of interest as per the ARA policies were identified within the subject property and/or Study Area: • Habitat of Endangered and Threatened Species • Fish Habitat • Significant Woodland • Significant Wildlife Habitat Thus, the NER provided conforms with ARA policy 2.2.1
2.2.2	Natural Environment Level 2: impact assessment where the Level 1 identified any features on and within 120 metres of the site in order to determine any negative impacts on the natural features or ecological functions for which the area is identified, and any proposed preventative, mitigative or remedial measures.	The NER provides a comprehensive impact assessment to identify the potential for ecological impacts to identified natural heritage features. Preventative measures were developed, including the avoidance of wetland removal within WU-3 and WU-4 wetland units. Mitigative measures and site plan recommendations were developed specifically to reduce and mitigate any potential ecological impacts. A progressive rehabilitation plan was developed based upon the findings of the NER. Thus, the NER provided conforms with ARA policy 2.2.2
Provincial Planning Statement, 2024		
4.1.4	Development and site alteration shall not be permitted in the following features: a) Significant wetlands in Ecoregions 5E, 6E, and 7E; and, b) Significant coastal wetlands.	No Significant Wetlands and/or Significant coastal wetlands are present within the subject property and/or Study Area.

Table 4: Summary of Policy Conformity

Section No.	Policy/Legislation Text	Discussion
		Thus, the NER provided conforms with PPS policy 4.1.4
4.1.5	Unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions, development and site alteration shall not be permitted in: a) Significant wetlands in the Canadian Shield north of Ecoregions 5E, 6E and 7E; b) Significant woodlands in Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Marys River); c) Significant valleylands in Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Marys River); d) Significant wildlife habitat ('SWH'); e) Significant areas of natural and scientific interest ('ANSI'); and, f) Coastal wetlands in Ecoregions 5E, 6E, and 7E that are not subject to policy 4.1.4(b).	The following natural heritage features of interest as per the PPS policies were identified within the subject property and/or Study Area: <u>Significant woodlands</u> The Township of Ramara and County of Simcoe do not identify woodland habitat within the subject property as 'Significant'. A Significant Woodland assessment was completed as part of this NER using criteria from the NHRM. A contiguous woodland feature was identified which meets criteria to be considered Significant under the definition of the PPS. The proposed aggregate application would require the removal of 7 ha of Candidate Significant Woodland and 14.2 ha of non-significant woodland. Woodland removal will not have a negative ecological impact on the contiguous Significant Woodland feature. Mitigation measures are provided in Section 7 to minimize the effects of the operations. The progressive rehabilitation plan incorporates the re-instatement of woodland habitat through the infilling and planting of the site. In total, approximately 18.6 ha of woodland habitat will be created at final rehabilitation. <u>Significant wildlife habitat</u> The Township of Ramara and County of Simcoe do not identify Significant Wildlife Habitat within the subject property. The Province maps Deer Wintering Areas as being in part within the subject property limit. The NER completed a Significant Wildlife Habitat assessment as per

Table 4: Summary of Policy Conformity

Section No.	Policy/Legislation Text	Discussion
		the Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E (MNRF, 2015). Candidate Significant Wildlife Habitat was identified and characterized based on field data collected as part of the NER and suitable habitat being present within the Study Area. As outlined through Section 6.6 of this NER, no negative impacts were expected to the identified Significant Wildlife Habitat Functions assuming that the recommended mitigation was followed and progressive rehabilitation works are completed. The Study Area is located within Ecoregion 6E. No ANSIs, Significant Valley Lands, or Coastal Wetlands were identified on the subject property. Thus, the NER provided conforms with PPS policy 4.1.5.
4.1.6 and 4.1.7	Development and site alteration is not permitted in fish habitat or habitat of endangered and threatened species except in accordance with federal and provincial requirements.	Fish Habitat The subject property is within the Black Creek Watershed and contains two defined drainage channels that have been confirmed to provide permanent fish habitat. The ARA application has the potential to impact fish habitat, and it has been recommended that a 'Request for Review' under the *Fisheries Act,* 1985 be submitted. The Request for Review will determine if the activity can proceed in compliance with the *Fisheries Act*, or if a permit would be required to allow works to proceed. In either circumstance, the development would be able to proceed in accordance with federal requirements. Thus, the NER provided conforms with PPS policy 4.1.6 as it relates to fish habitat.

Table 4: Summary of Policy Conformity

Section No.	Policy/Legislation Text	Discussion
		Habitat of Endangered and Threatened Species Potential and confirmed habitat for species listed as Endangered and Threatened under Ontario's SCA and the Federal SARA was identified within the Study Area. The ARA application has the potential to impact habitat for Endangered Bats (Little Brown Myotis, Hoary Bat, and Silver-haired Bats) and Blanding's Turtle. Registration in accordance with the requirements of O. Reg. 75/26 of the SCA shall occur for the listed species. The ARA application can proceed in a manner that is consistent with Provincial legislation. The project will be able to proceed in compliance with both federal and provincial Species at Risk legislation. Thus, the NER provided conforms with PPS policy 4.1.7 as it relates to Habitat of Endangered and Threatened Species.
4.1.8	Development and site alteration shall not be permitted on adjacent lands to natural heritage features identified in policies 4.1.4, 4.1.5, and 4.1.6 unless the ecological function of the adjacent lands has been evaluated and it has been demonstrated that there will be no negative impacts on the natural features or on their ecological function.	Potential impacts to natural heritage features identified on adjacent lands was considered. Based on the information available at this time there is no expectation that negative impacts would result to the natural heritage features on adjacent lands, or their ecological function. Thus, the activity would conform to Policy 4.1.8 of the PPS.
Species Conservation Act, 2025		
Section 2	(1) "section 16 activity" means, (a) any activity that results or is likely to result in, (i) the killing, harming, capturing or taking of a member of a species that is listed on the Protected Species in Ontario List, or	Protected Species listed under O. Reg 60/26 as Threatened and/or Endangered under Ontario's SCA were considered within the NER. Mitigation measures were developed in order to avoid accidental harm to those species that

Table 4: Summary of Policy Conformity

Section No.	Policy/Legislation Text	Discussion
	(ii) damage to or destruction of the habitat of a species that is listed on the Protected Species in Ontario List, (b) possessing, transporting, collecting, buying, selling, leasing, trading or offering to buy, sell, lease or trade, (i) a living or dead member of a species that is listed on the Protected Species in Ontario List, (ii) any part of a living or dead member of a species referred to in subclause (i), or (iii) anything derived from a living or dead member of a species referred to in subclause (i), or (c) selling, leasing, trading or offering to sell, lease or trade anything that a person represents to be a thing described in subclause (b) (i), (ii) or (iii)	have the potential to be encountered within the proposed aggregate extraction boundary. Thus, the NER provided complies with Section (1) (a) (i) of the SCA. Where deemed necessary by the QP, compliance with Section (1) (a) (ii) Habitat will be demonstrated through the registration under O. Reg. 75/26 of the SCA. This report was produced based on the most up-to-date policy information however, it is not intended to act as a long-term assessment of potential Species at Risk. The SCA is recognized as being 'proponent-driven' legislation and therefore it is the responsibility of the landowner/developer to ensure compliance with the regulations made under this act. Should a considerable length of time and/or sudden change in policy occur prior to construction, it is recommended that a review of the assessment provided within this report be undertaken by a QP to ensure compliance with the SCA at that time. All current Threatened or Endangered species listed under O. Reg. 60/26 made under the SCA with a currency date of April 10, 2026, have been considered within this report.
Section 16	(1) No person shall engage in a registerable activity unless, (a) the person has registered the activity in the Registry in accordance with the regulations; (b) the Minister has provided the person with a confirmation of registration in respect of the activity;	Potential and confirmed habitat for species listed as Endangered and Threatened under Ontario's SCA was identified within the Study Area. The ARA application has the potential to impact habitat for Endangered Bats (Little Brown Myotis, Hoary Bat, and Silver-haired Bat) and Blanding's Turtle. Consultation with MECP

Table 4: Summary of Policy Conformity

Section No.	Policy/Legislation Text	Discussion
	(c) the person engages in the activity in accordance with the regulations; and (d) the registration is not suspended and has not been removed from the Registry. (2) No person shall, except under and in accordance with a permit, engage in a permit activity.	was initiated through the completion of an Information Gathering Form under the previous guidance of the now revoked *Endangered Species Act,* 2007. Registration in accordance with the requirements of O. Reg. 75/26 of the SCA will occur for the listed species. The ARA application can proceed in a manner that is consistent with Provincial legislation. The project will be able to proceed in compliance with both federal and provincial Species at Risk legislation Thus, the NER provided has demonstrated that the project can proceed in a manner that complies with the SCA and regulations made within.
Species at Risk Act, 2002		
32(1)	No person shall kill, harm, harass, capture or take an individual of a wildlife species that is listed as an extirpated species, an endangered species or a threatened species.	As per Section 34(1), this Section is not applicable to privately owned lands, with the exception of migratory birds protected under the *Migratory Bird Convention Act, 1994* and aquatic species. No aquatic species at risk and associated habitat have been identified within the Study Area. Mitigation measures were developed in order to avoid accidental harm to those species listed as an extirpated species, an endangered species or a threatened species that have the potential to be encountered within the proposed aggregate extraction boundary. Thus, the application can proceed in compliance with Section 32(1) of the SARA.

Table 4: Summary of Policy Conformity

Section No.	Policy/Legislation Text	Discussion
33	No person shall damage or destroy the residence of one or more individuals of a wildlife species that is listed as an endangered species or a threatened species, or that is listed as an extirpated species if a recovery strategy has recommended the reintroduction of the species into the wild in Canada.	While a number of bird species protected under Section 33 of the SARA were identified, mitigation measures have been recommended that will allow the application to proceed in compliance with Section 33 of the SARA.
34(1)	With respect to individuals of a listed wildlife species that is not an aquatic species or a species of birds that are migratory birds protected by the *Migratory Birds Convention Act, 1994*, sections 32 and 33 do not apply in lands in a province that are not federal lands unless an order is made under subsection (2) to provide that they apply.	No protected wildlife species were identified that are currently affected by an order made under Section 34(1) of the SARA.
58(1)	Subject to this section, no person shall destroy any part of the critical habitat of any listed endangered species or of any listed threatened species — or of any listed extirpated species if a recovery strategy has recommended the reintroduction of the species into the wild in Canada — if a) the critical habitat is on federal land, in the exclusive economic zone of Canada or on the continental shelf of Canada; b) the listed species is an aquatic species; or c) the listed species is a species of migratory birds protected by the *Migratory Birds Convention Act, 1994.*	Golden-winged Warbler was documented as probable breeding within the subject property. The species is protected under the *Migratory Birds Convention Act, 1994* and the subject property is included within the critical habitat grid squares for the species (ECCC, 2016). Contravention of SARA Sections 33 and 58 for Golden-winged Warbler can be avoided by ensuring no impacts to the species residence/nest between early May through August. Thus, the NER provided conforms with Section 58(1) of the SARA.
Migratory Birds Convention Act, 1994		
Migratory Birds Regulations, 2022 Section 5	A person must not engage in any of the following activities unless they have a permit that authorizes them to do so, or they are authorized by these Regulations to do so: (b) capture, kill, take, injure or harass a migratory bird or attempt to do so; (c) destroy, take or disturb an egg; and (d) damage, destroy, remove or disturb a nest, nest shelter, eider duck shelter or duck box.	As recommended in Section 7, all clearing of vegetation required to implement the proposed extraction plan shall be restricted to times outside of the period of April 1 to August 31 inclusive. If a nest is located or evidence of breeding noted, then a mitigation plan should be developed to address any potential impacts on migratory birds or their active nests. Mitigation may require establishing appropriate

Table 4: Summary of Policy Conformity

Section No.	Policy/Legislation Text	Discussion
		buffers around active nests until the conclusion of the nesting season.
	Fisheries Act, 1985	
34.4 (1)	No person shall carry on any work, undertaking or activity, other than fishing, that results in the death of fish.	The proposed aggregate application requires the alteration of direct fish habitat which may result in the death of fish. Mitigation measures provided in Section 7 provide methods by which death to fish can be avoided during site alteration. Thus, the NER conforms to Section 34.4 of the *Fisheries Act*, 1985.
35	(1) No person shall carry on any work, undertaking or activity that results in harmful alteration, disruption or destruction of fish habitat (2) A person may carry on a work, undertaking or activity without contravening [35] (1) if (f) the work, undertaking or activity is a prescribed work, undertaking or activity or belongs to a prescribed class of works, undertakings or activities, as the case may be, or is carried on in or around prescribed Canadian fisheries waters, and the work, undertaking or activity is carried on in accordance with the prescribed conditions; (g) the carrying on of the work, undertaking or activity is authorized by the Minister and the work, undertaking or activity is carried on in accordance with the conditions established by the Minister; (h) the carrying on of the work, undertaking or activity is authorized by a prescribed person or prescribed entity and the work, undertaking or activity is carried on in accordance with the conditions set out in the authorization; (i) the harmful alteration, disruption or destruction results from the doing of anything that is authorized, permitted or required under this Act; (j) the work, undertaking or activity is carried on in accordance with the regulations;	The proposed aggregate application will require the alteration of seasonal and permanent fish habitat. The proposed operational design and mitigation measures provided in Section 7 include methods by which habitat alteration can both be avoided and compensated for. Given the proposed alteration of direct fish habitat, it is recommended that the project be reviewed by DFO, to ensure conformity to Section 35 of the *Fisheries Act*, 1985. It is anticipated that the proposed habitat compensation could be supported by the DFO either through a Letter of Advice, or an Authorization and thus conformity with the *Fisheries Act*, 1985 would be achieved.

Table 4: Summary of Policy Conformity

Section No.	Policy/Legislation Text	Discussion
	(k) the work, undertaking or activity is carried on in accordance with a permit issued under subsection 35.1(3), in the case of a work, undertaking or activity that is part of a designated project and that is designated by the Minister under subsection 35.1(2); or (l) the work, undertaking or activity is a prescribed work, undertaking or activity under paragraph 35.2(10)(a) or belongs to a prescribed class of works, undertakings or activities under that paragraph, as the case may be, and is carried on in an ecologically significant area in accordance with an authorization issued under subsection 35.2(7).	
35.2 (7)	If the Minister is satisfied, after having reviewed any document and other information provided under subsection (3) or (4), that avoidance and mitigation measures may be implemented to achieve the prescribed objectives for the conservation and protection of fish and fish habitat, he or she may authorize, subject to the regulations made under subsection (10), the carrying on of the work, undertaking or activity referred to in subsection (1) in an ecologically significant area, on any conditions that he or she considers appropriate.	The aggregate application includes activities that are expected to result in the alteration of seasonal and permanent fish habitat. The proposed operational design and mitigation measures provided in Section 7 provide methods by which habitat alteration can both be avoided and compensated for. It is anticipated that the proposed habitat compensation would be supported by the DFO either through a Letter of Advice, or an Authorization and thus conformity with the *Fisheries Act*, 1985 would be achieved.
Simcoe County Official Plan, 2016		
3.8.15 (vi)	Outside of settlement areas, and subject to Section 3.3.15 (other than for 3.8.15 vi. which is subject to policy 4.4.1), the following uses may be permitted in the Greenlands designation or on adjacent lands as described in Section 3.3.15: i. Agricultural uses; ii. Agriculture-related uses; iii. On-farm diversified uses; iv. Forestry on public lands or in County forests in accordance with an approved management plan and sustainable forest practices;	The subject property is mapped as being within the County of Simcoe ‘Greenlands’ designation. The NER has demonstrated no negative ecological impacts to identified natural heritage features. Mineral aggregate operations are permitted in the County's Greenlands designation (County OP Section 3.8.15.vi.), subject to approval of a local Official Plan Amendment.

Table 4: Summary of Policy Conformity

Section No.	Policy/Legislation Text	Discussion
	v. Forestry on private lands as permitted by the County's Forest Conservation Bylaw or by a local municipality's tree bylaw under the Municipal Act, 2001; vi. Mineral aggregate operations, if approved through a local Official Plan amendment; vii. Outdoor passive recreational uses; and viii. Subject to demonstrating that the lands are not within a prime agricultural area, residential dwelling units on lots which were approved prior to the approval date of this policy (May 9, 2016).	
4.4.1	Mineral aggregate operations shall not be permitted in Significant Wetlands or Significant Coastal Wetlands; and are not to be permitted in Significant Woodlands, Significant Valleylands, SWH, or ANSI unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions.	The proposed aggregate extraction is not within Significant Wetlands or Significant Coastal Wetlands. The NER has demonstrated no negative ecological impacts to Significant Woodlands and Significant Wildlife Habitat. Thus, the NER provided conforms with the County of Simcoe policy 4.4.1.
Township of Ramara Official Plan, 2025		
7.2.1 and 7.2.2	• 7.2.1 The Greenlands designation identifies the Natural Heritage System of the Township on Schedule 'A1'. The purpose of the Greenlands Designation is to protect, conserve and enhance natural heritage features and functions. 7.2.2 Permitted Land Uses • agricultural uses • agricultural-related uses • on-farm diversified uses • management of natural areas, including buildings and structures for environmental management purposes • low intensity recreation, excluding buildings	The *Planning Act* application being prepared for this proposed quarry will include an Official Plan Amendment to redesignate the subject property from the Greenlands designation to the Mineral Aggregate Extraction Area designation (Section 7.13 of the 2025 adopted Official Plan) as aggregate extraction is a permitted use in that designation.

Table 4: Summary of Policy Conformity

Section No.	Policy/Legislation Text	Discussion
	• Single detached dwelling on existing lots, where zoning permits • additional residential unit on existing lots, where zoning permits • public and private infrastructure • utilities	
6.2.12 (c)	Development and/or site alteration will not be permitted within significant woodlands outside of the LSPP jurisdiction or on adjacent lands (within 120 metres) to any significant woodlands unless it has been demonstrated through the completion of an EIS in accordance with the requirements of Section 6.2.7 of this Plan that there will be no negative impacts on the woodland or its ecological functions and/or it has been demonstrated that the proposal meets the policies of the LSPP, where applicable.	The subject property is not within the LSPP jurisdiction. The NER has demonstrated that the loss of Significant Woodland proposed will not have a negative ecological impact upon the overall contiguous Significant Woodland feature. Thus, the NER demonstrates conformity with the Township of Ramara Official Plan (2025) Section 6.2.12 (c).
6.2.11 (c)	Development and site alteration shall not be permitted in habitat of endangered species and threatened species, except in accordance with provincial and federal requirements.	The NER has provided detailed characterization of potential habitat for Threatened and Endangered species in accordance with provincial guidance and legislation. Registration in accordance with the requirements of O. Reg. 75/26 of the SCA will occur for Little Brown Myotis, Hoary Bat, Silver-haired Bat, and Blanding's Turtle. The ARA application can proceed in a manner that is consistent with Provincial legislation. The project will be able to proceed in compliance with both federal and provincial Species at Risk legislation. Thus, the NER demonstrates conformity with the Township of Ramara Official Plan (2025) Section 6.2.11 (c).
6.2.10 (f)	Development and/or site alteration shall not be permitted in or on the adjacent lands to (within 120 metres) significant wildlife habitat unless it has been demonstrated through the completion of an EIS in accordance with the requirements of Section 6.2.7 of this	The NER has provided detailed characterization of potential Significant Wildlife Habitat in accordance with provincial guidance and legislation. Through the implementation of the Site Plan recommendations and Progressive

Table 4: Summary of Policy Conformity

Section No.	Policy/Legislation Text	Discussion
	Plan that there will be no negative impacts on the habitat or its ecological functions, in accordance with policies of the PPS.	Rehabilitation (Section 7), the proposed quarry can proceed in a manner that does not result in a negative ecological impact to the identified Significant Wildlife Habitat. Thus, the NER demonstrates conformity with the Township of Ramara Official Plan (2025) Section 6.2.10 (f).
6.2.8.2	a. When development or site alteration is proposed in an identified unevaluated wetland, or on lands within 120 metres of those features, the Township may require that an evaluation of the wetland be undertaken to determine its significance and boundaries. b. Development and site alteration shall be restricted in or near sensitive surface water features and sensitive ground water features such that these features and their related hydrologic functions will be protected, improved or restored, which may require mitigative measures and/or alternative development approaches.	a. The NER incorporated a Wetland Evaluation for the wetland units identified within the subject property. The final scoring for the evaluated wetlands concluded that wetland units are non-significant. b. The NER has demonstrated that the loss of the small WU-1 and WU-2 wetland units will not have an overall negative ecological impact on the availability of wetland habitats within the subject property. Through Site Plan Recommendations and Progressive Rehabilitation (Section 7) wetland habitat will be maintained within the subject property and additional wetland habitat will be recreated through progressive rehabilitation. The alteration of the watercourse and associated fish habitat will occur in accordance with federal legislation through consultation and approval of the DFO. Thus, the NER demonstrates conformity with the Township of Ramara Official Plan (2025) Section 6.2.8.2.

10 CONCLUSIONS

This NER was prepared for the proposed ARA and *Planning Act* applications for the subject property identified as 6059 Pearl Carrick Road, in the Township of Ramara, County of Simcoe. The NER is a requirement under the ARA and *Planning Act* applications for new aggregate extraction operations. The NER was completed following technical guidance provided under ARA, including the Aggregate Resources of Ontario: Technical Reports and Information Standards (MNR, 2020).

The NER provides a detailed characterization of the natural heritage features and functions occurring within and adjacent to the subject property, as well as within the proposed licenced boundary. This report details a comprehensive approach to confirming the presence and absence of natural heritage features and functions that are afforded protection under the ARA and applicable legislation and policies at the municipal, provincial and federal levels. Potential negative ecological impacts were assessed with recommendations for preventive, mitigative and rehabilitation measures where appropriate.

Based on the findings presented herein, Birks NHC has determined that the proposed ARA licence and *Planning Act* applications address the applicable policies and legislation, provided that the recommendations and permitting requirements are addressed accordingly.

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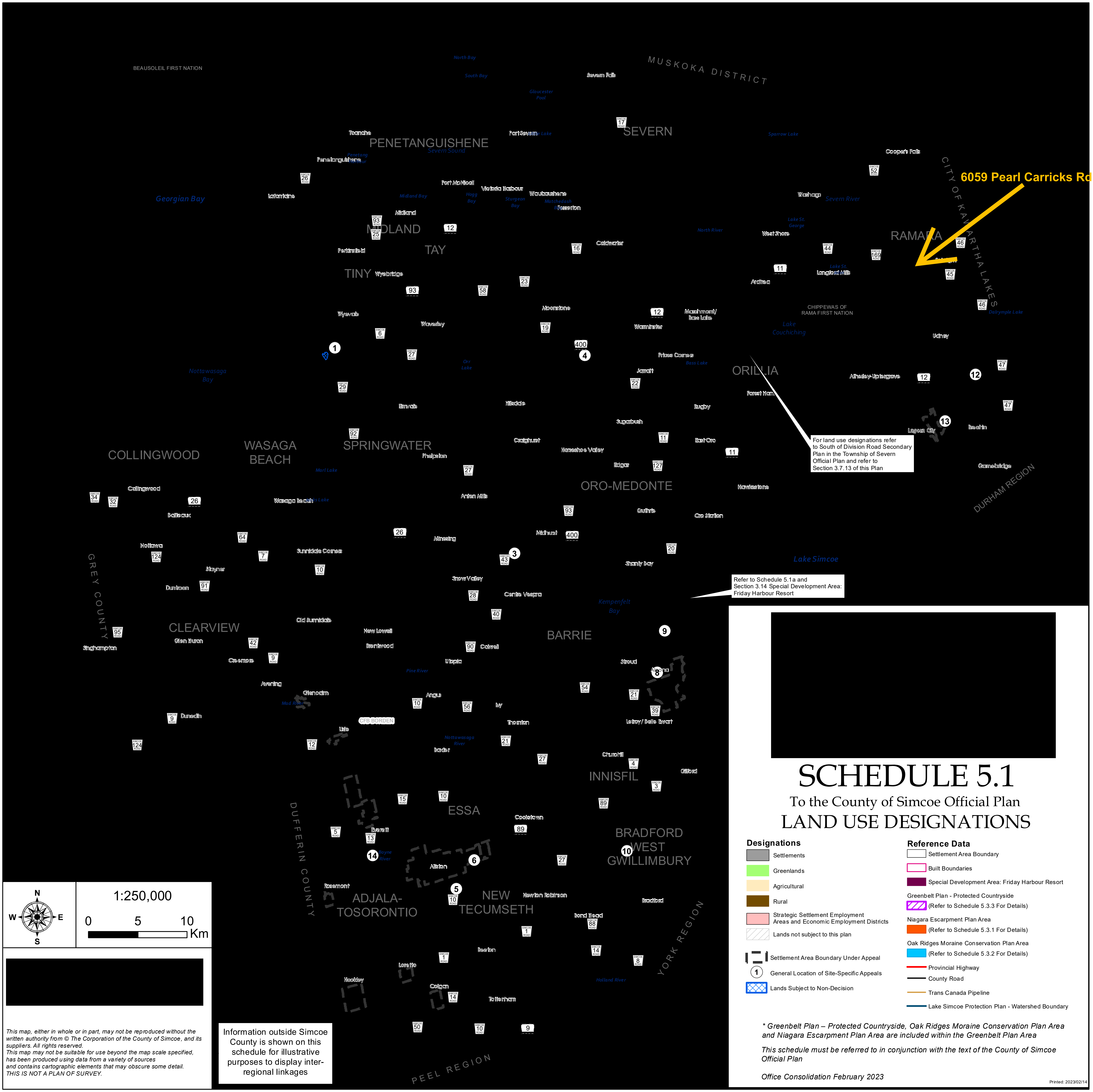
APPENDIX A

Simcoe County Official Plan



For land use designations refer to South of Division Road Secondary Plan in the Township of Severn Official Plan and refer to Section 3.7.13 of this Plan

Refer to Schedule 5.1a and Section 3.14 Special Development Area: Friday Harbour Resort

SCHEDULE 5.1

To the County of Simcoe Official Plan

LAND USE DESIGNATIONS

Designations

- ▨ Settlements
- 🟩 Greenlands
- ▨ Agricultural
- ▨ Rural
- ▨ Strategic Settlement Employment Areas and Economic Employment Districts
- ▨ Lands not subject to this plan
- ▨ Settlement Area Boundary Under Appeal
- ① General Location of Site-Specific Appeals
- ▨ Lands Subject to Non-Decision

Reference Data

- ☐ Settlement Area Boundary
- ☐ Built Boundaries
- ▨ Special Development Area: Friday Harbour Resort
- Greenbelt Plan - Protected Countryside
  - ▨ (Refer to Schedule 5.3.3 For Details)
- Niagara Escarpment Plan Area
  - ▨ (Refer to Schedule 5.3.1 For Details)
- Oak Ridges Moraine Conservation Plan Area
  - ▨ (Refer to Schedule 5.3.2 For Details)
- — Provincial Highway
- — County Road
- — Trans Canada Pipeline
- — Lake Simcoe Protection Plan - Watershed Boundary

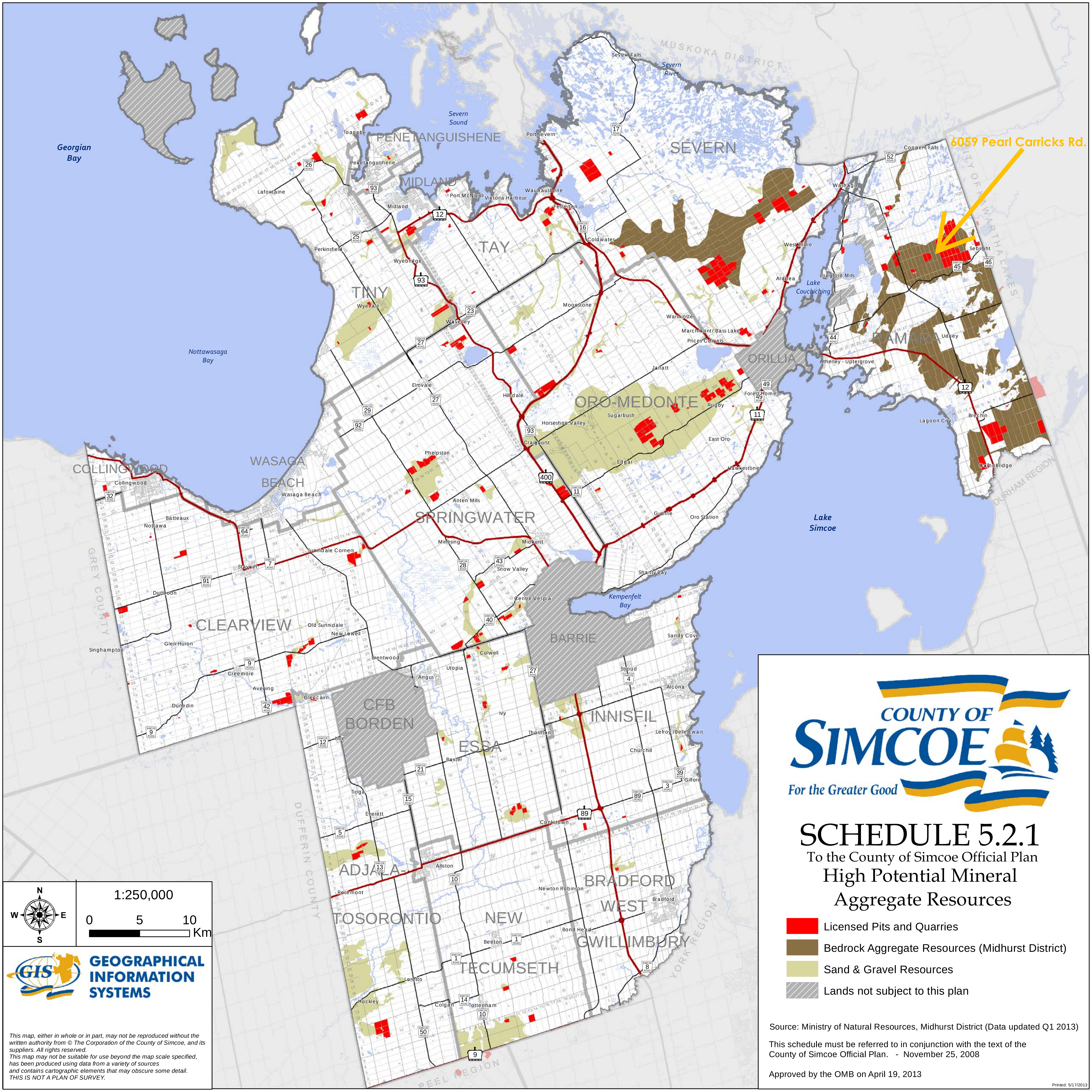
** Greenbelt Plan – Protected Countryside, Oak Ridges Moraine Conservation Plan Area and Niagara Escarpment Plan Area are included within the Greenbelt Plan Area*

This schedule must be referred to in conjunction with the text of the County of Simcoe Official Plan

Office Consolidation February 2023

Printed: 2023/02/14

Information outside Simcoe County is shown on this schedule for illustrative purposes to display inter-regional linkages



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N W E S

GEOGRAPHICAL INFORMATION SYSTEMS

This map, either in whole or in part, may not be reproduced without the written authority from © The Corporation of the County of Simcoe, and its suppliers. All rights reserved.
This map may not be suitable for use beyond the map scale specified, has been produced using data from a variety of sources and contains cartographic elements that may obscure some detail.
THIS IS NOT A PLAN OF SURVEY.

COUNTY OF SIMCOE

For the Greater Good

SCHEDULE 5.2.1

To the County of Simcoe Official Plan

High Potential Mineral Aggregate Resources

- 🟥 Licensed Pits and Quarries
- 🟫 Bedrock Aggregate Resources (Midhurst District)
- 🟨 Sand & Gravel Resources
- ▨ Lands not subject to this plan

Source: Ministry of Natural Resources, Midhurst District (Data updated Q1 2013)

This schedule must be referred to in conjunction with the text of the County of Simcoe Official Plan. - November 25, 2008

Approved by the OMB on April 19, 2013

Printed: 5/17/2013

APPENDIX B

Township of Ramara Official Plan

BIRKS

NATURAL HERITAGE CONSULTANTS

THE TOWNSHIP OF RAMARA OFFICIAL PLAN

SCHEDULE "A1" - LAND USE

Date Exported: 2025-05-09

DRAFT

COUNTY OF SIMCOE

TOWNSHIP OF RAMARA

THE TOWNSHIP OF RAMARA OFFICIAL PLAN

DRAFT

SCHEDULE "D" - HIGH POTENTIAL MINERAL AGGREGATE RESOURCE AREAS

Date Exported: 2025-04-11

THE TOWNSHIP OF RAMARA OFFICIAL PLAN

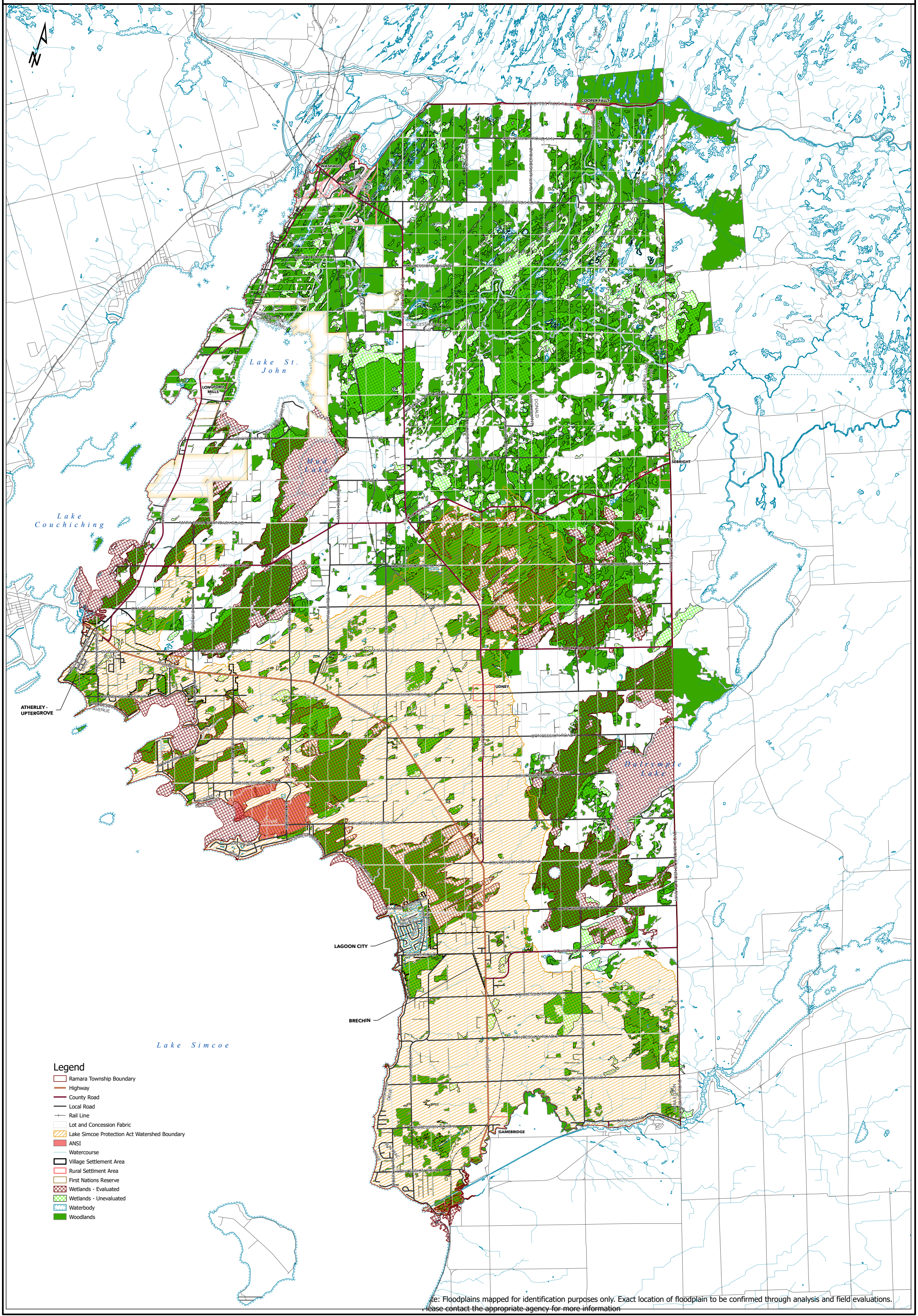
SCHEDULE "A2" - NATURAL HERITAGE

Date Exported: 2025-04-11

DRAFT

COUNTY OF SIMCOE

TOWNSHIP OF RAMARA



Legend

- ▭ Ramara Township Boundary
- ═ Highway
- ━ County Road
- ━ Local Road
- ┼ Rail Line
- ☐ Lot and Concession Fabric
- ▨ Lake Simcoe Protection Act Watershed Boundary
- 🟥 ANSI
- ─ Watercourse
- ▭ Village Settlement Area
- ▭ Rural Settlment Area
- ▭ First Nations Reserve
- ▩ Wetlands - Evaluated
- ▩ Wetlands - Unevaluated
- ⬚ Waterbody
- 🟩 Woodlands

te: Floodplains mapped for identification purposes only. Exact location of floodplain to be confirmed through analysis and field evaluations.
lease contact the appropriate agency for more information

APPENDIX C

Vascular Plant Data

BIRKS

NATURAL HERITAGE CONSULTANTS

Vascular Plant List

		Dry-Fresh Mixed Oak Deciduous Forest	Dry-Fresh Oak-Hardwood Non-Calcareous Shallow Deciduous Forest	Dry White Pine Non-Calcareous Bedrock Coniferous Forest	Dry-Fresh White Pine-Oak Mixed Forest	Dry-Fresh White Cedar-Poplar Mixed Forest	Dry-Fresh White Pine-Oak Tallgrass Mixed Woodland	Graminoid Bedrock Shallow Marsh	Cattail Graminoid Mineral Meadow Marsh	White-Cedar Hardwood Mineral Mixed Swamp	Common Juniper Shurb Alvar	Bur Oak Treed Alvar	Non-Calcaerous Open Rock Barren Meadow	Rock Barren	Exotic Status	Coefficient of Wetness	Subnational (Provincial) S_Rank	Provincial Endangered Species Act	Federal Species at Risk Act	National N_Rank
Scientific Name	Common Name	FODM1-4	FODR2-1	FOCS2-2	FOMM2-1	FOMM4-2	WOMM1-1	MASR1-1	MAMM1-2	SWMM1-1	RBSA1-1	RBTA1-6	RBOB2-2	Disturbed						
Abies balsamea	Balsam Fir			X												-3	S5	NAR	NAR	N5
Acer rubrum	Red Maple		X				X									0	S5	NAR	NAR	N5
Acer saccharum	Sugar Maple	X	X	X			X				X		X			3	S5	NAR	NAR	N5
Achillea millefolium	Common Yarrow						X	X			X		X	X	SE5?	3	SNA	NAR	NAR	NNR
Actaea rubra	Red Baneberry			X	X							X				3	S5	NAR	NAR	N5
Agrimonia gryposepala	Hooked Agrimony						X									3	S5	NAR	NAR	N5
Agrostis gigantea	Redtop							X							SE5	-3	SNA	NAR	NAR	NNA
Alisma subcordatum	Southern Water-plantain										X					-5	S4?	NAR	NAR	N4?
Alnus incana	Grey Alder								X							-3	S5	NAR	NAR	N5
Anemone virginiana	Tall Anemone		X				X				X			X		3	S5	NAR	NAR	N5
Antennaria neglecta	Field Pussytoes						X				X		X			5	S5	NAR	NAR	N5
Apocynum androsaemifolium	Spreading Dogbane										X					5	S5	NAR	NAR	N5
Aquilegia canadensis	Red Columbine										X					3	S5	NAR	NAR	N5
Aralia nudicaulis	Wild Sarsaparilla		X				X									3	S5	NAR	NAR	N5
Arctium minus	Common Burdock						X					X			SE5	3	SNA	NAR	NAR	NNA
Arisaema triphyllum	Jack-in-the-pulpit		X													-3	S5	NAR	NAR	N5
Asarum canadense	Canada Wild-ginger				X											5	S5	NAR	NAR	N5
Asclepias incarnata	Swamp Milkweed								X							-5	S5	NAR	NAR	N5
Asclepias syriaca	Common Milkweed											X	X	X		5	S5	NAR	NAR	N5
Athyrium filix-femina	Common Lady Fern		X													0	S5	NAR	NAR	N5
Berberis vulgaris	Common Barberry										X				SE5	3	SNA	NAR	NAR	NNA
Betula papyrifera	Paper Birch	X	X				X							X		3	S5	NAR	NAR	N5
Bromus inermis	Smooth Brome				X						X				SE5	5	SNA	NAR	NAR	NNA
Carex bebbii	Bebb's Sedge							X								-5	S5	NAR	NAR	N5
Carex crinita	Fringed Sedge							X			X					-5	S5	NAR	NAR	N5
Carex cristatella	Crested Sedge						X									-3	S5	NAR	NAR	N5
Carex echinata	Star Sedge							X								-5	S5	NAR	NAR	N5
Carex gracillima	Graceful Sedge						X					X				3	S5	NAR	NAR	N5
Carex granularis	Limestone Meadow Sedge										X	X				-3	S5	NAR	NAR	N5
Carex hystericina	Porcupine Sedge							X	X				X			-5	S5	NAR	NAR	N5
Carex lasiocarpa	Woolly-fruit Sedge							X					X			-5	S5	NAR	NAR	N5
Carex michauxiana	Michaux's Sedge							X								-5	S4	NAR	NAR	N5
Carex pensylvanica	Pennsylvania Sedge						X									5	S5	NAR	NAR	N5
Carex plantaginea	Plantain-leaved Sedge						X									5	S5	NAR	NAR	N5
Carex vulpinoidea	Fox Sedge		X					X			X					-5	S5	NAR	NAR	N5
Castilleja coccinea	Scarlet Paintbrush							X					X			0	S4S5	NAR	NAR	N4N5
Cerastium fontanum	Common Mouse-ear Chickweed						X								SE5	3	SNA	NAR	NAR	NNA
Circaea canadensis	Broad-leaved Enchanter's Nightshade		X				X					X				3	S5	NAR	NAR	N5
Cirsium vulgare	Bull Thistle						X				X			X	SE5	3	SNA	NAR	NAR	NNA
Clematis virginiana	Virginia Clematis				X											0	S5	NAR	NAR	N5
Cornus sericea	Red-osier Dogwood			X			X									-3	S5	NAR	NAR	N5
Crataegus chrysocarpa	Fireberry Hawthorn						X									5	S5	NAR	NAR	N5
Crataegus punctata	Dotted Hawthorn						X									5	S5	NAR	NAR	N5
Dactylis glomerata	Orchard Grass						X				X				SE5	5	SNA	NAR	NAR	NNA
Daucus carota	Wild Carrot		X				X	X			X	X	X	X	SE5	5	SNA	NAR	NAR	NNA
Dianthus armeria	Deptford Pink										X			X	SE5	5	SNA	NAR	NAR	NNA
Dirca palustris	Eastern Leatherwood		X				X									0	S4	NAR	NAR	N4
Dryopteris carthusiana	Spinulose Wood Fern		X													-3	S5	NAR	NAR	N5
Dryopteris marginalis	Marginal Wood Fern		X													3	S5	NAR	NAR	N5
Echium vulgare	Common Viper's Bugloss						X				X			X	SE5	5	SNA	NAR	NAR	NNA
Eleocharis palustris	Creeping Spikerush							X								-5	S5	NAR	NAR	N5
Elymus canadensis	Canada Wildrye				X											3	S5	NAR	NAR	N5
Elymus hystrix	Bottlebrush Grass											X				5	S5	NAR	NAR	N5
Epilobium ciliatum	Northern Willowherb										X					-3	S5	NAR	NAR	N5
Epipactis helleborine	Broad-leaved Helleborine		X				X								SE5	3	SNA	NAR	NAR	NNA
Erigeron annuus	Annual Fleabane						X				X			X		3	S5	NAR	NAR	N5
Erigeron philadelphicus	Philadelphia Fleabane							X			X					-3	S5	NAR	NAR	N5
Eupatorium perfoliatum	Common Boneset							X	X		X					-3	S5	NAR	NAR	N5
Euthamia graminifolia	Grass-leaved Goldenrod										X					0	S5	NAR	NAR	N5
Eutrochium maculatum	Spotted Joe Pye Weed															-5	S5	NAR	NAR	N5
Fagus grandifolia	American Beech						X									3	S4	NAR	NAR	N4
Fragaria virginiana	Wild Strawberry						X				X			X		3	S5	NAR	NAR	N5
Frangula alnus	Glossy Buckthorn				X										SE5	0	SNA	NAR	NAR	NNA
Fraxinus americana	White Ash		X			X	X				X	X				3	S4	NAR	NAR	N4
Fraxinus pennsylvanica	Red Ash	X					X									-3	S4	NAR	NAR	N5
Galium mollugo	Smooth Bedstraw													X	SE5	5	SNA	NAR	NAR	NNA
Galium odoratum	Sweet-scented Bedstraw								X		X				SE1	5	SNA	NAR	NAR	NNA

		Dry-Fresh Mixed Oak Deciduous Forest	Dry-Fresh Oak-Hardwood Non-Calcareous Shallow Deciduous Forest	Dry White Pine Non-Calcareous Bedrock Coniferous Forest	Dry-Fresh White Pine-Oak Mixed Forest	Dry-Fresh White Cedar-Poplar Mixed Forest	Dry-Fresh White Pine-Oak Tallgrass Mixed Woodland	Graminoid Bedrock Shallow Marsh	Cattail Graminoid Mineral Meadow Marsh	White-Cedar Hardwood Mineral Mixed Swamp	Common Juniper Shurb Alvar	Bur Oak Treed Alvar	Non-Calcaerous Open Rock Barren Meadow	Rock Barren	Exotic Status	Coefficient of Wetness	Subnational (Provincial) S_Rank	Provincial Endangered Species Act	Federal Species at Risk Act	National N_Rank
Scientific Name	Common Name	FODM1-4	FODR2-1	FOCS2-2	FOMM2-1	FOMM4-2	WOMM1-1	MASR1-1	MAMM1-2	SWMM1-1	RBSA1-1	RBTA1-6	RBOB2-2	Disturbed						
Galium palustre	Common Marsh Bedstraw							X								-5	S5	NAR	NAR	N5
Geranium robertianum	Herb-Robert	X	X				X									3	S5	NAR	NAR	N5
Geum aleppicum	Yellow Avens										X	X		X		0	S5	NAR	NAR	N5
Geum laciniatum	Rough Avens										X					-3	S4	NAR	NAR	N5
Geum triflorum	Prairie Smoke												X			3	S4	NAR	NAR	N5
Glyceria striata	Fowl Mannagrass									X			X			-5	S5	NAR	NAR	N5
Hepatica acutiloba	Sharp-lobed Hepatica						X									5	S5	NAR	NAR	N5
Hypericum perforatum	Common St. John's-wort						X				X	X	X	X	SE5	5	SNA	NAR	NAR	NNA
Iris versicolor	Harlequin Blue Flag							X								-5	S5	NAR	NAR	N5
Juncus dudleyi	Dudley's Rush							X			X					-3	S5	NAR	NAR	N5
Juncus tenuis	Path Rush							X								0	S5	NAR	NAR	N5
Juniperus communis	Common Juniper						X	X			X		X	X		3	S5	NAR	NAR	N5
Lactuca canadensis	Canada Lettuce						X									3	S5	NAR	NAR	N5
Lemna minor	Small Duckweed							X								-5	S5	NAR	NAR	N5
Leonurus cardiaca	Common Motherwort						X							X	SE5	5	SNA	NAR	NAR	NNA
Lepidium campestre	Field Peppergrass													X	SE5	5	SNA	NAR	NAR	NNA
Leucanthemum vulgare	Oxeye Daisy		X				X						X		SE5	5	SNA	NAR	NAR	NNA
Lonicera canadensis	Canada Fly Honeysuckle				X		X									3	S5	NAR	NAR	N5
Lotus corniculatus	Garden Bird's-foot Trefoil						X	X			X			X	SE5	3	SNA	NAR	NAR	NNA
Lycopus americanus	American Water-horehound							X			X					-5	S5	NAR	NAR	N5
Lysimachia borealis	Northern Starflower	X														0	S5	NAR	NAR	N5
Lysimachia ciliata	Fringed Yellow Loosestrife											X				-3	S5	NAR	NAR	N5
Maianthemum canadense	Wild Lily-of-the-valley	X	X	X			X					X				3	S5	NAR	NAR	N5
Maianthemum racemosum	Large False Solomon's Seal		X													3	S5	NAR	NAR	N5
Medeola virginiana	Indian Cucumber-root						X									3	S5	NAR	NAR	N5
Medicago lupulina	Black Medick							X			X			X	SE5	3	SNA	NAR	NAR	NNA
Melilotus albus	White Sweet-clover		X								X				SE5	3	SNA	NAR	NAR	NNA
Mimulus ringens	Square-stemmed Monkeyflower							X			X					-5	S5	NAR	NAR	N5
Monarda fistulosa	Wild Bergamot						X				X		X	X		3	S5	NAR	NAR	N5
Mycelis muralis	Wall Lettuce		X												SE2	5	SNA	NAR	NAR	NNA
Nabalus altissimus	Tall Rattlesnakeroot	X														3	S5	NAR	NAR	N5
Oenothera biennis	Common Evening-primrose						X				X					3	S5	NAR	NAR	N5
Oenothera perennis	Perennial Evening-primrose										X		X			0	S5	NAR	NAR	N5
Onoclea sensibilis	Sensitive Fern						X					X				-3	S5	NAR	NAR	N5
Ostrya virginiana	Eastern Hop-hornbeam	X	X				X				X					3	S5	NAR	NAR	N5
Oxalis stricta	Upright Yellow Wood-sorrel						X								SE5	3	SNA	NAR	NAR	N5
Packera paupercula	Balsam Groundsel							X			X					0	S5	NAR	NAR	N5
Parthenocissus quinquefolia	Virginia Creeper						X					X	X			3	S4?	NAR	NAR	N4?
Penstemon hirsutus	Hairy Beardtongue												X			5	S4	NAR	NAR	N4
Phalaris arundinacea	Reed Canarygrass							X			X					-3	S5	NAR	NAR	N5
Phleum pratense	Common Timothy						X				X			X	SE5	3	SNA	NAR	NAR	NNA
Picea glauca	White Spruce						X				X			X		3	S5	NAR	NAR	N5
Picea mariana	Black Spruce					X										-3	S5	NAR	NAR	N5
Pilosella caespitosa	Meadow Hawkweed						X				X				SE5	5	SNA	NAR	NAR	NNA
Pinus strobus	Eastern White Pine		X	X	X		X			X			X	X		3	S5	NAR	NAR	N5
Plantago lanceolata	English Plantain						X				X	X		X	SE5	3	SNA	NAR	NAR	NNA
Plantago major	Common Plantain										X			X	SE5	3	SNA	NAR	NAR	NNR
Poa pratensis	Kentucky Bluegrass							X					X			3	S5	NAR	NAR	N5
Polygonatum pubescens	Hairy Solomon's Seal		X													5	S5	NAR	NAR	N5
Pontederia cordata	Pickerelweed										X					-5	S5	NAR	NAR	N5
Populus alba	White Poplar		X				X								SE5	5	SNA	NAR	NAR	NNA
Populus balsamifera	Balsam Poplar		X	X			X			X								NAR	NAR	
Populus grandidentata	Large-toothed Aspen		X	X		X										5	S5	NAR	NAR	N5
Populus tremuloides	Trembling Aspen						X				X					0	S5	NAR	NAR	N5
Potentilla recta	Sulphur Cinquefoil						X						X	X	SE5	5	SNA	NAR	NAR	NNA
Prunella vulgaris	Common Self-heal						X				X					0	S5	NAR	NAR	N5
Prunus serotina	Black Cherry	X					X				X					3	S5	NAR	NAR	N5
Prunus virginiana	Chokecherry												X			3	S5	NAR	NAR	N5
Pteridium aquilinum	Bracken Fern		X	X			X				X	X	X	X		3	S5	NAR	NAR	N5
Quercus alba	White Oak						X						X			3	S5	NAR	NAR	N5
Quercus macrocarpa	Bur Oak						X					X				3	S5	NAR	NAR	N5
Quercus rubra	Northern Red Oak	X	X			X	X			X	X					3	S5	NAR	NAR	N5
Ranunculus acris	Common Buttercup						X	X	X		X		X		SE5	0	SNA	NAR	NAR	NNA
Rhamnus cathartica	European Buckthorn					X	X				X	X		X	SE5	0	SNA	NAR	NAR	NNA
Rhus typhina	Staghorn Sumac										X					3	S5	NAR	NAR	N5
Ribes cynosbati	Eastern Prickly Gooseberry	X	X				X				X			X		3	S5	NAR	NAR	N5
Ribes triste	Swamp Red Currant															-5	S5	NAR	NAR	N5
Rorippa palustris	Marsh Yellowcress							X								-5	S5	NAR	NAR	N5
Rosa blanda	Smooth Rose						X									3	S5	NAR	NAR	N5
Rosa multiflora	Multiflora Rose						X					X			SE5	3	SNA	NAR	NAR	NNA

		Dry-Fresh Mixed Oak Deciduous Forest	Dry-Fresh Oak-Hardwood Non-Calcareous Shallow Deciduous Forest	Dry White Pine Non-Calcareous Bedrock Coniferous Forest	Dry-Fresh White Pine-Oak Mixed Forest	Dry-Fresh White Cedar-Poplar Mixed Forest	Dry-Fresh White Pine-Oak Tallgrass Mixed Woodland	Graminoid Bedrock Shallow Marsh	Cattail Graminoid Mineral Meadow Marsh	White-Cedar Hardwood Mineral Mixed Swamp	Common Juniper Shurb Alvar	Bur Oak Treed Alvar	Non-Calcaerous Open Rock Barren Meadow	Rock Barren	Exotic Status	Coefficient of Wetness	Subnational (Provincial) S_Rank	Provincial Endangered Species Act	Federal Species at Risk Act	National N_Rank
Scientific Name	**Common Name**	**FODM1-4**	**FODR2-1**	**FOCS2-2**	**FOMM2-1**	**FOMM4-2**	**WOMM1-1**	**MASR1-1**	**MAMM1-2**	**SWMM1-1**	**RBSA1-1**	**RBTA1-6**	**RBOB2-2**	**Disturbed**						
Rubus allegheniensis	Allegheny Blackberry		X				X				X					3	S5	NAR	NAR	N5
Rubus canadensis	Canada Blackberry						X									5	S5	NAR	NAR	N5
Rubus idaeus	Red Raspberry		X	X			X				X	X		X		3	S5	NAR	NAR	N5
Rubus occidentalis	Black Raspberry		X								X		X			5	S5	NAR	NAR	N5
Rumex crispus	Curled Dock							X			X	X		X	SE5	0	SNA	NAR	NAR	NNA
Salix discolor	Pussy Willow							X	X				X			-3	S5	NAR	NAR	N5
Salix lucida	Shining Willow							X								-3	S5	NAR	NAR	N5
Salix petiolaris	Meadow Willow							X		X	X					-3	S5	NAR	NAR	N5
Sanguinaria canadensis	Bloodroot			X			X									3	S5	NAR	NAR	N5
Sanicula canadensis	Canada Sanicle						X									3	S4	NAR	NAR	N4
Scirpus atrovirens	Dark-green Bulrush							X			X					-5	S5	NAR	NAR	N5
Scirpus cyperinus	Common Woolly Bulrush							X								-5	S5	NAR	NAR	N5
Scutellaria lateriflora	Mad-dog Skullcap															-5	S5	NAR	NAR	N5
Sedum acre	Mossy Stonecrop												X		SE5	5	SNA	NAR	NAR	NNA
Sisyrinchium montanum	Strict Blue-eyed-grass						X				X		X			0	S5	NAR	NAR	N5
Smilax tamnoides	Bristly Greenbriar						X					X				0	S5	NAR	NAR	N5
Solanum dulcamara	Bittersweet Nightshade						X								SE5	0	SNA	NAR	NAR	NNA
Solidago canadensis	Canada Goldenrod										X					3	S5	NAR	NAR	N5
Solidago juncea	Early Goldenrod										X			X		5	S5	NAR	NAR	N5
Solidago rugosa	Rough-stemmed Goldenrod										X					0	S5	NAR	NAR	N5
Spiraea alba	White Meadowsweet						X	X	X		X					-3	S5	NAR	NAR	N5
Streptopus lanceolatus	Rose Twisted-stalk		X													3	S5	NAR	NAR	N5
Symphyotrichum cordifolium	Heart-leaved Aster	X	X				X				X	X		X		5	S5	NAR	NAR	N5
Taraxacum officinale	Common Dandelion			X			X	X						X	SE5	3	SNA	NAR	NAR	N5
Thalictrum dioicum	Early Meadow-rue	X	X				X									3	S5	NAR	NAR	N5
Thuja occidentalis	Eastern White Cedar	X	X	X		X	X			X	X		X	X		-3	S5	NAR	NAR	N5
Tilia americana	Basswood		X				X				X					3	S5	NAR	NAR	N5
Toxicodendron radicans	Poison Ivy	X	X	X		X	X				X	X				0	S5	NAR	NAR	N5
Trichophorum cespitosum	Tufted Clubrush							X								-5	S5	NAR	NAR	N5
Trifolium pratense	Red Clover			X			X	X			X	X	X	X	SE5	3	SNA	NAR	NAR	NNA
Trillium grandiflorum	White Trillium			X			X									3	S5	NAR	NAR	N5
Triosteum aurantiacum	Orange-fruit Horse-gentian										X					5	S4S5	NAR	NAR	N4N5
Tsuga canadensis	Eastern Hemlock		X			X	X									3	S5	NAR	NAR	N5
Turritis glabra	Tower Mustard													X		5	S5	NAR	NAR	N5
Tussilago farfara	Coltsfoot		X												SE5	3	SNA	NAR	NAR	NNA
Typha angustifolia	Narrow-leaved Cattail							X	X						SE5	-5	SNA	NAR	NAR	N5
Ulmus americana	White Elm		X				X	X		X	X		X			-3	S5	NAR	NAR	N5
Ulmus thomasii	Rock Elm										X					0	S4	NAR	NAR	N4
Urtica dioica	Stinging Nettle										X				SE2	0	SNA	NAR	NAR	NNR
Verbascum thapsus	Common Mullein						X				X			X	SE5	5	SNA	NAR	NAR	NNA
Verbena hastata	Blue Vervain										X					-3	S5	NAR	NAR	N5
Viburnum rafinesqueanum	Downy Arrowwood						X									5	S5	NAR	NAR	N5
Vicia cracca	Tufted Vetch						X				X				SE5	5	SNA	NAR	NAR	NNA
Vitis riparia	Riverbank Grape						X							X		0	S5	NAR	NAR	N5

Subnational (Provincial) Exotic Status: SE1 to SE5 based on increasing abundance

Subnational (Provincial) Rank: S1 - Critically Imperiled, S2 - Imperiled, S3 - Vulnerable, S4 - Apparently Secure, S5 - Secure, S#? - Inexact Numeric Rank, SNA - Not Applicable, SNR - Unranked

National Rank: N1 - Critically Imperiled, N2 - Imperiled, N3 - Vulnerable, N4 - Apparently Secure, N5 - Secure, N#? - Inexact Numeric Rank, NNA - Not Applicable, NNR - Unranked

Endagered Species Act and Species at Risk Act: EXP (Extirpated), END (Endangered), THR (Threatened), SC (Special Concern), NAR (Not At Risk)

Regional Rank: R - Rare, C - Common, U - Uncommon, ^ - Introduced Native, * - Exotic, ** - Invasive Species, X - No local status (OSFN, 2023)

APPENDIX D

Amphibian Calling Data

BIRKS

NATURAL HERITAGE CONSULTANTS

Amphibian Call Survey Data

			Survey Station and Calling Level[2]									Conservation Rank[3]			
Scientific Name	**English Common Name**	**Survey[1]**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**National N-rank**	**Provincial S-rank**	**Provincial Endangered Species Act**	**Federal Species at Risk Act**
Anaxyrus americanus	American Toad	A										N5	S5	NAR	NAR
		B	L1 (1)			L1(3)					L3				
		C													
Dryophytes versicolor	Gray Treefrog	A										N5	S5	NAR	NAR
		B	L3	L3	L3	L3			L3						
		C	L2 (6)	L1 (3)	L2 (7)	L1 (3)		L1 (2)	L1 (2)	L1 (3)					
Pseudacris crucifer	Spring Peeper	A	L2 (8)	L3	L3	L3		L2 (6)	L3	L3	L2 (8)	N5	S5	NAR	NAR
		B		L1 (3)	L1 (3)	L1 (3)		L1 (1)	L1 (2)	L1 (2)					
		C													
Lithobates clamitans	Green Frog	A										N5	S5	NAR	NAR
		B				L1(1)			L1 (2)						
		C	L3		L1 (3)	L1 (3)			L3	L1 (2)	L1 (3)				
Lithobates pipiens	Northern Leopard Frog	A				L2 (5)			L1 (4)			N5	S5	NAR	NAR
		B													
		C													

[1] Survey Conditions

A - April 22, 2024; Start Time 2046 hr/ End Time 2240 hr; Temperature 7°C to 10°C; Wind B0; Cloud Cover 0%; Precipitation none; Observers: K. Tuininga, B. Baker

B - May 16, 2024; Start Time 2106 hr/ End Time 2259 hr; Temperature 20°C; Wind B1; Cloud Cover 0%; Precipitation none; Observers: S. Brady, B. Baker

C - June 17, 2024; Start Time 2135 hr/ End Time 2400 hr; Temperature 25°C; Wind B1; Cloud Cover 0%; Precipitation none; Observers: H. Marcks, K. Tuininga

[2] Call Level

L1 (# of individiuals heard): Individuals can be counted, calls not simultaneous; L2 (# of individuals heard): Calls distinguishable, some simultaneous calling; L3: Full chorus; calls simultaneous and overlapping.

[3] Conservation Rank

S-rank: S1 - Critically Imperiled; S2 - Imperiled, S3 - Vulnerable, S4 - Apparently Secure, S5 - Secure, SNR - Unranked, SNA - Not applicable, SU - Unrankable, S#? - Inexact Numeric Rank, S#B - Breeding, S#N - Non-breeding, S#M - Migrant
N-rank: N1 - Critically Imperiled; N2 - Imperiled, N3 - Vulnerable, N4 - Apparently Secure, N5 - Secure, NNR - Unranked, NNA - Not applicable, NU - Unrankable, N#? - Inexact Numeric Rank, N#B - Breeding, N#N - Non-breeding, N#M - Migrant
Endangered Species Act Species at Risk in Ontario List/SARA Schedule 1: EXP (Extirpated), END (Endangered), THR (Threatened), SC (Special Concern), NAR (Not At Risk)

APPENDIX E

Bat Habitat Survey Data

BIRKS

NATURAL HERITAGE CONSULTANTS

Bat Snag Density Calculations

SNAG FEATURES

Plot Number	ELC Community	Species	DBH	Dead Limb			Hollow			Hole			Dead Branches			Loose Bark			Cracks			Total Snag Feature (excluding dead limbs/branches)			Snag Features			Composite (tree contains snag features)	Decay Class	Composite Tree (contains snag features & has a decay class 1-3)	Candidate Roost Tree (contains snag feature >10m & has a decay class 1-3)	Snag Tree? (field notes; Y - yes, N - no)	Canopy (O - open, C - closed)	Comments
				<3m	3-10m	>10m	<3m	3-10m	>10m	<3m	3-10m	>10m	<3m	3-10m	>10m	<3m	3-10m	>10m	<3m	3-10m	>10m	<3m	3-10m	>10m	<3m	3-10m	>10m							
29	FOMM2-1	White Spruce	35										x	x	x	x	x	x				1	1	1	Y	Y	Y	Y	3	Y	Y	Y	O	
		White Oak	45																			0	0	0	N	N	N	N	---	N	N	---	O	
		White Spruce	26										x	x								0	0	0	N	N	N	N	---	N	N	---	O	
		White Spruce	32										x	x			x	x				0	1	1	N	Y	Y	Y	3	Y	Y	Y	O	
		White Oak	47												x							0	0	0	N	N	N	N	---	N	N	---	O	
		Red Oak	36												x							0	0	0	N	N	N	N	---	N	N	---	O	
		White Pine	37										x	x								0	0	0	N	N	N	N	---	N	N	---	O	
		White Oak	32											x	x	x	x	x				1	1	1	Y	Y	Y	Y	4	N	N	Y	O	
		White Ash	43												x							0	0	0	N	N	N	N	---	N	N	---	O	lean
		White Ash	37											x								0	0	0	N	N	N	N	1	N	N	---	O	EAB
		White Ash	61																			0	0	0	N	N	N	N	---	N	N	---	O	
		White Ash	35			x						x										0	0	1	N	N	Y	Y	1	Y	Y	Y	O	healed crack
		White Pine	40										x	x								0	0	0	N	N	N	N	---	N	N	---	O	
																					TOTAL	2	3	4	2	3	4	4		3	3	4		
37	FOMM2-1	White Pine	48										x	x								0	0	0	N	N	N	N	---	N	N	---	O	
		White Oak	32												x							0	0	0	N	N	N	N	---	N	N	---	O	
		White Oak	25												x							0	0	0	N	N	N	N	---	N	N	---	O	
		Red Oak	27																			0	0	0	N	N	N	N	---	N	N	---	O	
		White Pine	47										x	x								0	0	0	N	N	N	N	---	N	N	---	O	
		White Spruce	25										x									0	0	0	N	N	N	N	---	N	N	---	O	
		White Spruce	35										x	x								0	0	0	N	N	N	N	---	N	N	---	O	
		White Spruce	27										x	x	x							0	0	0	N	N	N	N	---	N	N	---	O	
		White Spruce	25										x	x								0	0	0	N	N	N	N	---	N	N	---	O	
		White Pine	27										x	x								0	0	0	N	N	N	N	---	N	N	---	O	
		White Pine	38										x	x	x							0	0	0	N	N	N	N	1	N	N	---	O	Loose bark on dead limb
		White Spruce	30										x	x								0	0	0	N	N	N	N	---	N	N	---	O	
		White Pine	37										x	x	x							0	0	0	N	N	N	N	---	N	N	---	O	
																					TOTAL	0	0	0	0	0	0	0		0	0	0		
30	FOMM2-1	Balsam Poplar	29		x										x							0	0	0	N	N	N	N	---	N	N	---	O	
		White Spruce	31										x	x	x							0	0	0	N	N	N	N	---	N	N	---	O	
		White Spruce	28										x	x								0	0	0	N	N	N	N	---	N	N	---	O	
		White Spruce	27										x	x								0	0	0	N	N	N	N	---	N	N	---	O	
		White Spruce	25										x	x								0	0	0	N	N	N	N	---	N	N	---	O	
		White Pine	62	x									x									0	0	0	N	N	N	N	---	N	N	---	O	
		White Spruce	28										x	x	x							0	0	0	N	N	N	N	1	N	N	---	O	
		Balsam Poplar	28												x							0	0	0	N	N	N	N	---	N	N	---	O	
		White Oak	29		x												x					0	1	0	N	Y	N	Y	1	Y	N	---	O	
		White Pine	47										x	x								0	0	0	N	N	N	N	---	N	N	---	O	
		Poplar	29																			0	0	0	N	N	N	N	6	N	N	---	O	
		White Spruce	37										x	x								0	0	0	N	N	N	N	---	N	N	---	O	
		Balsam Poplar	29													x	x	x				1	1	1	Y	Y	Y	Y	3	Y	Y	---	O	
		White Pine	28										x	x								0	0	0	N	N	N	N	---	N	N	---	O	
																					TOTAL	1	2	1	1	2	1	2		2	1	0		

	Composite (tree contains snag features)	Snag Tree? (field notes)	Candidate Roost Tree (contains snag feature >10m & has a decay class 1-3)	<3m	3-10m	>10m
Total	6.0	4.0	4.0	3.0	5.0	5.0
Avg (total # of snags/total # of plots)	2.0	1.3	1.3	1.0	1.7	1.7
/ha	40.0	26.7	26.7	20.0	33.3	33.3

3 plots = 0.15 ha
0.15 ha surveyed

Bat Snag Density Calculations

SNAG FEATURES

Plot Number	ELC Community	Species	DBH	Dead Limb			Hollow			Hole			Dead Branches			Loose Bark			Cracks			Total Snag Feature (excluding dead limbs/branches)			Snag Features			Composite (tree contains snag features)	Decay Class	Composite Tree (contains snag features & has a decay class 1-3)	Candidate Roost Tree (contains snag feature >10m & has a decay class 1-3)	Snag Tree? (field notes; Y - yes, N - no)	Canopy (O - open, C - closed)	Comments
				<3m	3-10m	>10m	<3m	3-10m	>10m	<3m	3-10m	>10m	<3m	3-10m	>10m	<3m	3-10m	>10m	<3m	3-10m	>10m	<3m	3-10m	>10m	<3m	3-10m	>10m							
7	FODM8-1	Large-toothed Aspen	32												x							0	0	0	N	N	N	N	---	N	N	---	C	
		White Ash	27												x							0	0	0	N	N	N	N	---	N	N	---	C	
		Large-toothed Aspen	25																			0	0	0	N	N	N	N	---	N	N	---	C	
		Large-toothed Aspen	32	x																		0	0	0	N	N	N	N	---	N	N	---	C	
		Sugar Maple	47	x												x						1	0	0	Y	N	N	Y	---	N	N	---	C	
		Red Maple	31	x												x						1	0	0	Y	N	N	Y	---	N	N	---	C	
		White Ash	30	x																		0	0	0	N	N	N	N	---	N	N	---	C	
TOTAL																						2	0	0	2	0	0	2		0	0	0		
5	FODM8-1	Sugar Maple	47	x	x																	0	0	0	N	N	N	N	1	N	N	---	C	
		Large-toothed Aspen	27								x	x				x	x					1	2	1	Y	Y	Y	Y	---	N	N	---	C	
		White Ash	36	x	x	x											x	x				0	1	1	N	Y	Y	Y	---	N	N	---	C	
		Large-toothed Aspen	26		x	x										x	x	x				1	1	1	Y	Y	Y	Y	---	N	N	---	C	
		Large-toothed Aspen	36		x	x											x	x				0	1	1	N	Y	Y	Y	---	N	N	---	C	
		Large-toothed Aspen	42								x						x					0	2	0	N	Y	N	Y	---	N	N	---	C	
		White Ash	27		x									x	x		x	x				0	1	1	N	Y	Y	Y	---	N	N	---	C	
		Large-toothed Aspen	39		x	x					x	x					x	x				0	2	2	N	Y	Y	Y	1	Y	Y	Y	C	
		Red Maple	36																			0	0	0	N	N	N	N	---	N	N	---	C	
		Large-toothed Aspen	40		x	x																0	0	0	N	N	N	N	---	N	N	---	C	
		Large-toothed Aspen	36		x	x																0	0	0	N	N	N	N	---	N	N	---	C	
		Sugar Maple	39		x									x								0	0	0	N	N	N	N	---	N	N	---	C	
		Large-toothed Aspen	42		x	x						x		x				x			x	0	0	3	N	N	Y	Y	1	Y	Y	Y	C	
		Sugar Maple	35								x	x				x				x	x	1	2	2	Y	Y	Y	Y	4	N	N	Y	C	dead
TOTAL																						3	12	12	3	8	8	9		2	2	3	C	
3	FODM8-1	Sugar Maple	40		x																	0	0	0	N	N	N	N	---	N	N	---	O	
TOTAL																						0	0	0	0	0	0	0		0	0	0		

	Composite (tree contains snag features)	Snag Tree? (field notes)	Candidate Roost Tree (contains snag feature >10m & has a decay class 1-3)	<3m	3-10m	>10m
Total	11.0	3.0	2.0	5.0	8.0	8.0
Avg (total # of snags/total # of plots)	3.7	1.0	0.7	1.7	2.7	2.7
/ha	73.3	20.0	13.3	33.3	53.3	53.3

3 plots = 0.15 ha

0.15 ha surveyed

Bat Snag Density Calculations

SNAG FEATURES

Plot Number	ELC Community	Species	DBH	Dead Limb			Hollow			Hole			Dead Branches			Loose Bark			Cracks			Total Snag Feature (excluding dead limbs/branches)			Snag Features			Composite (tree contains snag features)	Decay Class	Composite Tree (contains snag features & has a decay class 1-3)	Candidate Roost Tree (contains snag feature >10m & has a decay class 1-3)	Snag Tree? (field notes; Y - yes, N - no)	Canopy (O - open, C - closed)	Comments
				<3m	3-10m	>10m	<3m	3-10m	>10m	<3m	3-10m	>10m	<3m	3-10m	>10m	<3m	3-10m	>10m	<3m	3-10m	>10m	<3m	3-10m	>10m	<3m	3-10m	>10m							
1	FODR2-1 (North)	Red Oak	54				x								x							1	0	0	Y	N	N	Y	---	N	N	---	O	
		Sugar Maple	52		x												x					0	1	0	N	Y	N	Y	1	Y	N	---	O	Loose bark on dead limb
		White Pine	39										x	x								0	0	0	N	N	N	N	---	N	N	---	O	
		Red Oak	35												x							0	0	0	N	N	N	N	---	N	N	---	O	
		Bur Oak	28		x										x							0	0	0	N	N	N	N	---	N	N	---	O	
		Red Oak	39												x							0	0	0	N	N	N	N	---	N	N	---	O	
TOTAL																						1	1	0	1	1	0	2		1	0	0		
11	FODR2-1 (North)	Sugar Maple	49		x		x			x	x			x		x	x			x		3	3	0	Y	Y	N	Y	2	Y	N	Y	O	wildlife tree
		White Pine	33										x	x								0	0	0	N	N	N	N	---	N	N	---	O	
		Sugar Maple	30				x									x			x			3	0	0	Y	N	N	Y	6	N	N	---	C	1.5 metres tall
		Sugar Maple	42	x	x		x	x		x	x				x							2	2	0	Y	Y	N	Y	1	Y	N	Y	O	
		White Oak	52		x						x						x			x		0	3	0	N	Y	N	Y	2	Y	N	Y	C	
		Basswood	27																			0	0	0	N	N	N	N	---	N	N	---	O	
		Basswood	36	x	x																	0	0	0	N	N	N	N	---	N	N	---	C	
TOTAL																						8	8	0	3	3	0	4		3	0	3		
4	FODR2-1 (North)	Trembling Aspen	31		x																	0	0	0	N	N	N	N	---	N	N	---	O	
		Sugar Maple	33											x								0	0	0	N	N	N	N	---	N	N	---	O	
		Basswood	55											x								0	0	0	N	N	N	N	---	N	N	---	O	
		Red Oak	30																			0	0	0	N	N	N	N	---	N	N	---	O	
		Large-toothed Aspen	27		x																	0	0	0	N	N	N	N	---	N	N	---	C	
		Whiet Ash	39		x	x																0	0	0	N	N	N	N	---	N	N	---	C	EAB
		Large-toothed Aspen	29		x						x											0	1	0	N	Y	N	Y	1	Y	N	Y	C	
		Sugar Maple	38					x	x										x	x		1	2	1	Y	Y	Y	Y	1	Y	Y	Y	C	
		Large-toothed Aspen	27		x													x				0	0	1	N	N	Y	Y	---	N	N	---	C	
TOTAL																						1	3	2	1	2	2	3		2	1	2		
6	FODR2-1 (North)	Sugar Maple	42		x	x									x		x					0	1	0	N	Y	N	Y	1	Y	N	Y	C	
		Sugar Maple	52			x					x				x			x				0	1	1	N	Y	Y	Y	1	Y	Y	Y	C	
		Sugar Maple	42												x							0	0	0	N	N	N	N	---	N	N	---	C	
TOTAL																						0	2	1	0	2	1	2		2	1	2		
8	FODR2-1 (North)	White Ash	52		x										x							0	0	0	N	N	N	N	---	N	N	---	C	
		Large-toothed Aspen	36												x							0	0	0	N	N	N	N	---	N	N	---	O	
		White Oak	27												x							0	0	0	N	N	N	N	---	N	N	---	C	
		Ironwood	29		x										x							0	0	0	N	N	N	N	---	N	N	---	C	
		Sugar Maple	52											x	x							0	0	0	N	N	N	N	---	N	N	---	C	
		White Ash	33		x	x									x							0	0	0	N	N	N	N	1	N	N	---	C	EAB
TOTAL																						0	0	0	0	0	0	0		0	0	0		
9	FODR2-1 (North)	Basswood	52												x							0	0	0	N	N	N	N	---	N	N	---	O	
		Sugar Maple	32						x			x										0	0	2	N	N	Y	Y	1	Y	Y	Y	C	
		Large-toothed Aspen	36		x			x							x		x					0	2	0	N	Y	N	Y	---	N	N	Y	C	
		Sugar Maple	38											x								0	0	0	N	N	N	N	---	N	N	---	C	
		Basswood	39																			0	0	0	N	N	N	N	---	N	N	---	C	
		Sugar Maple	27												x							0	0	0	N	N	N	N	---	N	N	---	C	
		Basswood	42							x					x							1	0	0	Y	N	N	Y	---	N	N	---	C	
		Sugar Maple	51												x							0	0	0	N	N	N	N	---	N	N	---	C	
		Basswood	36			x									x							0	0	0	N	N	N	N	---	N	N	---	C	
		Sugar Maple	52		x									x	x							0	0	0	N	N	N	N	---	N	N	---	O	
TOTAL																						1	2	2	1	1	1	3		1	1	2		

	Composite (tree contains snag features)	Snag Tree? (field notes)	Candidate Roost Tree (contains snag feature >10m & has a decay class 1-3)	<3m	3-10m	>10m
Total	14.0	9.0	3.0	6.0	9.0	4.0
Avg (total # of snags/total # of plots)	2.3	1.5	0.5	1.0	1.5	0.7
/ha	46.7	30.0	10.0	20.0	30.0	13.3

6 plots = 0.3 ha
0.3 ha surveyed

Bat Snag Density Calculations

SNAG FEATURES

Plot Number	ELC Community	Species	DBH	Dead Limb			Hollow			Hole			Dead Branches			Loose Bark			Cracks			Total Snag Feature (excluding dead limbs/branches)			Snag Features			Composite (tree contains snag features)	Decay Class	Composite Tree (contains snag features & has a decay class 1-3)	Candidate Roost Tree (contains snag feature >10m & has a decay class 1-3)	Snag Tree? (field notes; Y - yes, N - no)	Canopy (O - open, C - closed)	Comments
				<3m	3-10m	>10m	<3m	3-10m	>10m	<3m	3-10m	>10m	<3m	3-10m	>10m	<3m	3-10m	>10m	<3m	3-10m	>10m	<3m	3-10m	>10m	<3m	3-10m	>10m							
20	FODM1-4	Bur Oak	42												x							0	0	0	N	N	N	N	---	N	N	---	O	Leaf cluster
		Bur Oak	32												x							0	0	0	N	N	N	N	---	N	N	---	O	Leaf cluster
		Bur Oak	28												x							0	0	0	N	N	N	N	---	N	N	---	O	
		Bur Oak	27							x												1	0	0	Y	N	N	Y	1	Y	N	Y	O	
		Bur Oak	28										x	x								0	0	0	N	N	N	N	---	N	N	---	O	
		American Elm	29												x							0	0	0	N	N	N	N	---	N	N	---	O	
		American Elm	32												x							0	0	0	N	N	N	N	---	N	N	---	O	
																					TOTAL	1	0	0	1	0	0	1		1	0	1		
19	FODM1-4	Red Oak	25												x							0	0	0	N	N	N	N	---	N	N	---	O	
		White Oak	42			x									x							0	0	0	N	N	N	N	---	N	N	---	O	
		Sugar Maple	31												x							0	0	0	N	N	N	N	---	N	N	---	O	
		White Oak	86	x						x	x				x	x	x	x				2	2	1	Y	Y	Y	Y	2	Y	Y	Y	O	wildlife tree
		White Cedar	27										x									0	0	0	N	N	N	N	---	N	N	---	O	
		White Spruce	25										x	x	x							0	0	0	N	N	N	N	3	N	N	---	O	
		Sugar Maple	28																			0	0	0	N	N	N	N	---	N	N	---	O	
		White Oak	27				x			x						x						3	0	0	Y	N	N	Y	5	N	N	Y	C	4m tall
		White Oak	34												x							0	0	0	N	N	N	N	---	N	N	---	O	
		White Spruce	25										x	x	x							0	0	0	N	N	N	N	3	N	N	---	O	lean
		White Oak	28				x			x						x						3	0	0	Y	N	N	Y	5	N	N	Y	O	
																					TOTAL	8	2	1	3	1	1	3		1	1	3		
18	FODM1-4	White Oak	42												x							0	0	0	N	N	N	N	---	N	N	---	O	
		Sugar Maple	80		x	x	x			x		x		x	x		x	x		x		2	2	2	Y	Y	Y	Y	2	Y	Y	Y	O	wildlife tree
		White Cedar	34										x									0	0	0	N	N	N	N	---	N	N	---	O	
		White Cedar	30				x	x		x	x		x									2	2	0	Y	Y	N	Y	1	Y	N	Y	O	
		White Cedar	32										x									0	0	0	N	N	N	N	---	N	N	---	O	
		Trembling Aspen	29												x		x					0	1	0	N	Y	N	Y	1	Y	N	Y	O	
		Red Oak	39		x												x					0	1	0	N	Y	N	Y	---	N	N	Y	O	leaf cluster
																					TOTAL	4	6	2	2	4	1	4		3	1	4		

	Composite (tree contains snag features)	Snag Tree? (field notes)	Candidate Roost Tree (contains snag feature >10m & has a decay class 1-3)	<3m	3-10m	>10m
Total	8.0	8.0	2.0	6.0	5.0	2.0
Avg (total # of snags/total # of plots)	2.7	2.7	0.7	2.0	1.7	0.7
/ha	53.3	53.3	13.3	40.0	33.3	13.3

3 plots = 0.15 ha
0.15 ha surveyed

Bat Snag Density Calculations

SNAG FEATURES

Plot Number	ELC Community	Species	DBH	Dead Limb			Hollow			Hole			Dead Branches			Loose Bark			Cracks			Total Snag Feature (excluding dead limbs/branches)			Snag Features			Composite (tree contains snag features)	Decay Class	Composite Tree (contains snag features & has a decay class 1-3)	Candidate Roost Tree (contains snag feature >10m & has a decay class 1-3)	Snag Tree? (field notes; Y - yes, N - no)	Canopy (O - open, C - closed)	Comments
				<3m	3-10m	>10m	<3m	3-10m	>10m	<3m	3-10m	>10m	<3m	3-10m	>10m	<3m	3-10m	>10m	<3m	3-10m	>10m	<3m	3-10m	>10m	<3m	3-10m	>10m							
13	FOMM4-2	White Spruce	35				x			x						x						3	0	0	Y	N	N	Y	5	N	N	Y	C	3m height
		White Cedar	28										x	x								0	0	0	N	N	N	N	---	N	N	---	C	
		White Oak	33																			0	0	0	N	N	N	N	---	N	N	---	O	
		White Cedar	25										x							x		0	1	0	N	Y	N	Y	---	N	N	---	C	healed crack
		White Cedar	44										x	x								0	0	0	N	N	N	N	---	N	N	---	C	
		Trembling Aspen	25												x							0	0	0	N	N	N	N	---	N	N	---	O	
		Ba;sam Poplar	27				x	x	x							x			x	x		3	2	1	Y	Y	Y	Y	4	N	N	Y	C	
		White Spruce	36										x	x	x	x	x	x				1	1	1	Y	Y	Y	Y	3	Y	Y	Y	O	
		Trembling Aspen	28								x											0	1	0	N	Y	N	Y	2	Y	N	Y	C	
		White Spruce	28																	x		0	1	0	N	Y	N	Y	4	N	N	Y	C	
																					TOTAL	7	6	2	3	5	2	6		2	1	5		
14	FOMM4-2	White Spruce	25											x	x							0	0	0	N	N	N	N	---	N	N	---	C	
		White Spruce	27										x	x	x							0	0	0	N	N	N	N	---	N	N	---	C	
		Trembling Aspen	25														x	x		x		0	2	1	N	Y	Y	Y	4	N	N	Y	C	
		Trembling Aspen	27			x								x	x			x				0	0	1	N	N	Y	Y	---	N	N	---	C	
		White Cedar	28																			0	0	0	N	N	N	N	---	N	N	---	O	
		Balsam Poplar	28																			0	0	0	N	N	N	N	4	N	N	Y	C	
		White Spruce	26										x	x	x							0	0	0	N	N	N	N	---	N	N	---	C	
		White Cedar	37										x	x	x							0	0	0	N	N	N	N	---	N	N	---	C	
		White Cedar	27										x	x	x							0	0	0	N	N	N	N	---	N	N	---	C	
		Balsam Poplar	26					x	x		x	x										0	2	2	N	Y	Y	Y	4	N	N	---	C	
		White Cedar	27										x	x	x							0	0	0	N	N	N	N	---	N	N	---	C	
																					TOTAL	0	4	4	0	2	3	3		0	0	2		
15	FOMM4-2	Trembling Aspen	41			x								x	x							0	0	0	N	N	N	N	---	N	N	---	O	
		Trembling Aspen	29			x								x	x		x	x				0	1	1	N	Y	Y	Y	---	N	N	---	O	
		Trembling Aspen	35		x	x										x	x	x				1	1	1	Y	Y	Y	Y	4	N	N	Y	O	
		White Cedar	25										x	x								0	0	0	N	N	N	N	---	N	N	---	C	
		Trembling Aspen	25																			0	0	0	N	N	N	N	---	N	N	---	O	
		Whit eAsh	26														x					0	1	0	N	Y	N	Y	2	Y	N	---	O	EAB
		Trembling Aspen	34		x	x											x	x				0	1	1	N	Y	Y	Y	2	Y	Y	Y		
																					TOTAL	1	4	3	1	4	3	4		2	1	2		
16	FOMM4-2	White Cedar	27																			0	0	0	N	N	N	N	---	N	N	---	C	
		White Cedar	35																	x		0	1	0	N	Y	N	Y	---	N	N	---		
		White Cedar	30											x	x							0	0	0	N	N	N	N	---	N	N	---		
		White Cedar	26																			0	0	0	N	N	N	N	---	N	N	---		
		White Cedar	32																			0	0	0	N	N	N	N	---	N	N	---		
		White Cedar	31,30				x															1	0	0	Y	N	N	Y	---	N	N	---		
		Balsam Poplar	25		x	x								x	x			x				0	0	1	N	N	Y	Y	2	Y	Y	---	O	
		White Cedar	25				x			x												2	0	0	Y	N	N	Y	---	N	N	---		
		Balsam Poplar	26		x	x				x				x	x			x				1	0	1	Y	N	Y	Y	2	Y	Y	---		
		Balsam Poplar	26		x	x								x	x	x		x				1	0	1	Y	N	Y	Y	---	N	N	---	C	
		White Oak	25											x	x							0	0	0	N	N	N	N	---	N	N	---	O	
		Trembling Aspen	33												x							0	0	0	N	N	N	N	---	N	N	---	O	
		White Cedar	27											x	x							0	0	0	N	N	N	N	---	N	N	---	C	
		White Spruce	27										x	x	x							0	0	0	N	N	N	N	---	N	N	---		
		Balsam Poplar	29							x						x						2	0	0	Y	N	N	Y	6	N	N	---	C	2 metres tall
		White Cedar	29										x	x								0	0	0	N	N	N	N	---	N	N	---	C	
		White Cedar	36										x	x								0	0	0	N	N	N	N	---	N	N	---		
																					TOTAL	7	1	3	5	1	3	7		2	2	0		

17	FOMM4-2	Trembling Aspen	30			x												x				0	0	1	N	N	Y	Y	---	N	N	---	O	
		White Cedar	29																			0	0	0	N	N	N	N	---	N	N	---		
		Balsam Poplar	25			x												x				0	0	1	N	N	Y	Y	3	Y	Y	Y	O	
		White Spruce	35										x	x								0	0	0	N	N	N	N	4	N	N	---	C	Dead; broke off at 8 metres
		Trembling Aspen	27		x	x											x	x				0	1	1	N	Y	Y	Y	---	N	N	---	O	
		Trembling Aspen	28		x	x											x	x				0	1	1	N	Y	Y	Y	2	Y	Y	Y	O	
		Trembling Aspen	25		x	x											x	x				0	1	1	N	Y	Y	Y	2	Y	Y	Y	O	
		White Cedar	25																			0	0	0	N	N	N	N	---	N	N	---	C	
		Trembling Aspen	27		x	x											x	x				0	1	1	N	Y	Y	Y	2	Y	Y	Y	O	
		Elm	47																			0	0	0	N	N	N	N	---	N	N	---		
																					TOTAL	0	4	6	0	4	6	6		4	4	4		
21	FOMM4-2	White Spruce	26										x	x	x							0	0	0	N	N	N	N	3	N	N	Y	C	
		White Spruce	30																			0	0	0	N	N	N	N	---	N	N	---	C	
		Balsam Poplar	32				x	x		x	x					x	x					3	3	0	Y	Y	N	Y	5	N	N	---	C	approximately 5 metres
		White Spruce	32										x	x	x							0	0	0	N	N	N	N	---	N	N	---	C	
		Balsam Poplar	30													x	x	x				1	1	1	Y	Y	Y	Y	3	Y	Y	Y	O	
		White Cedar	35										x	x	x							0	0	0	N	N	N	N	---	N	N	---	C	
		White Cedar	20										x	x								0	0	0	N	N	N	N	---	N	N	---	C	
		White Cedar	28										x	x		x	x					1	1	0	Y	Y	N	Y	---	N	N	---	C	
		White Cedar	28										x	x		x	x					1	1	0	Y	Y	N	Y	---	N	N	---	C	
		White Spruce	28										x	x								0	0	0	N	N	N	N	---	N	N	---	C	
		White Spruce	29										x	x								0	0	0	N	N	N	N	---	N	N	---	C	
		White Cedar	25										x	x								0	0	0	N	N	N	N	---	N	N	---	C	
		Balsam Poplar	25		x	x											x	x				0	1	1	N	Y	Y	Y	1	Y	Y	Y	O	
		White Cedar	28										x	x								0	0	0	N	N	N	N	---	N	N	---	C	
		Balsam Poplar	29																			0	0	0	N	N	N	N	---	N	N	---	O	
		Balsam Poplar	29																			0	0	0	N	N	N	N	---	N	N	---	O	
																					TOTAL	6	7	2	4	5	2	5		2	2	3		

	Composite (tree contains snag features)	**Snag Tree? (field notes)**	**Candidate Roost Tree (contains snag feature >10m & has a decay class 1-3)**	**<3m**	**3-10m**	**>10m**
Total	31.0	16.0	10.0	13.0	21.0	19.0
Avg (total # of snags/total # of plots)	5.2	2.7	1.7	2.2	3.5	3.2
/ha	103.3	53.3	33.3	43.3	70.0	63.3

6 plots = 0.3 ha

0.3 ha surveyed

Bat Snag Density Calculations

SNAG FEATURES

Plot Number	ELC Community	Species	DBH	Dead Limb			Hollow			Hole			Dead Branches			Loose Bark			Cracks			Total Snag Feature (excluding dead limbs/branches)			Snag Features			Composite (tree contains snag features)	Decay Class	Composite Tree (contains snag features & has a decay class 1-3)	Candidate Roost Tree (contains snag feature >10m & has a decay class 1-3)	Snag Tree? (field notes; Y - yes, N - no)	Canopy (O - open, C - closed)	Comments
				<3m	3-10m	>10m	<3m	3-10m	>10m	<3m	3-10m	>10m	<3m	3-10m	>10m	<3m	3-10m	>10m	<3m	3-10m	>10m	<3m	3-10m	>10m	<3m	3-10m	>10m							
23	FODR2-1 (South)	Green Ash	30			x									x							0	0	0	N	N	N	N	1	N	N	---	C	EAB
		Red Maple	36												x							0	0	0	N	N	N	N	---	N	N	---	C	
		Red Maple	44			x																0	0	0	N	N	N	N	---	N	N	---	C	
		Green Ash	42														x					0	1	0	N	Y	N	Y	1	Y	N	Y	C	EAB
		Green Ash	36												x							0	0	0	N	N	N	N	---	N	N	---	C	
		Red Maple	44																			0	0	0	N	N	N	N	---	N	N	---	C	
		American Elm	39													x	x	x				1	1	1	Y	Y	Y	Y	3	Y	Y	Y	C	
		Trembling Aspen	51					x	x		x	x										0	2	2	N	Y	Y	Y	2	Y	Y	Y	O	12 holes
		Red Oak	29																			0	0	0	N	N	N	N	---	N	N	Y	C	leaf cluster
		Red Maple	51																			0	0	0	N	N	N	N	---	N	N	---	C	
		Trembling Aspen	34																			0	0	0	N	N	N	N	---	N	N	---	C	
																					TOTAL	1	4	3	1	3	2	3		3	2	4		
24	FODR2-1 (South)	White Birch	36																			0	0	0	N	N	N	N	---	N	N	---	C	
		Trembling Aspen	40								x	x										0	1	1	N	Y	Y	Y	1	Y	Y	Y	O	
		Sugar Maple	36								x											0	1	0	N	Y	N	Y	1	Y	N	Y	O	
		Sugar Maple	34												x							0	0	0	N	N	N	N	---	N	N	---	O	
		Sugar Maple	35				x	x									x					1	2	0	Y	Y	N	Y	1	Y	N	Y	O	
		Sugar Maple	39			x																0	0	0	N	N	N	N	---	N	N	---	O	
		White Ash	42			x																0	0	0	N	N	N	N	---	N	N	---	O	
		Sugar Maple	39										x	x								0	0	0	N	N	N	N	---	N	N	---	O	
		Sugar Maple	41		x												x			x		0	2	0	N	Y	N	Y	1	Y	N	Y	O	
																					TOTAL	1	6	1	1	4	1	4		4	1	4		
25	FODR2-1 (South)	Sugar Maple	36								x							x		x		0	2	1	N	Y	Y	Y	1	Y	Y	Y	C	
		White Ash	44		x						x							x			x	0	1	2	N	Y	Y	Y	1	Y	Y	Y	C	
		Sugar Maple	36		x					x						x						2	0	0	Y	N	N	Y	1	Y	N	---	C	
		White Ash	27			x	x								x							1	0	0	Y	N	N	Y	1	Y	N	---	C	
		Sugar Maple	26												x				x	x		1	1	0	Y	Y	N	Y	---	N	N	Y	C	
		Basswood	30				x															1	0	0	Y	N	N	Y	1	Y	N	---	C	
		Sugar Maple	29												x							0	0	0	N	N	N	N	---	N	N	---	C	
		Sugar Maple	30								x											0	1	0	N	Y	N	Y	---	N	N	Y	C	
		Green Ash	43		x	x									x					x	x	0	1	1	N	Y	Y	Y	1	Y	Y	Y	O	EAB
		Sugar Maple	30							x	x							x			x	1	1	2	Y	Y	Y	Y	3	Y	Y	Y	O	
		Sugar Maple	33												x							0	0	0	N	N	N	N	---	N	N	---	C	
																					TOTAL	6	7	6	5	6	4	9		7	4	6		

	Composite (tree contains snag features)	**Snag Tree? (field notes)**	**Candidate Roost Tree (contains snag feature >10m & has a decay class 1-3)**	**<3m**	**3-10m**	**>10m**
Total	16.0	14.0	7.0	7.0	13.0	7.0
Avg (total # of snags/total # of plots)	5.3	4.7	2.3	2.3	4.3	2.3
/ha	106.7	93.3	46.7	46.7	86.7	46.7

3 plots = 0.15 ha
0.15 ha surveyed

Bat Snag Density Calculations

SNAG FEATURES

Plot Number	ELC Community	Species	DBH	Dead Limb			Hollow			Hole			Dead Branches			Loose Bark			Cracks			Total Snag Feature (excluding dead limbs/branches)			Snag Features			Composite (tree contains snag features)	Decay Class	Composite Tree (contains snag features & has a decay class 1-3)	Candidate Roost Tree (contains snag feature >10m & has a decay class 1-3)	Snag Tree? (field notes; Y - yes, N - no)	Canopy (O - open, C - closed)	Comments
				<3m	3-10m	>10m	<3m	3-10m	>10m	<3m	3-10m	>10m	<3m	3-10m	>10m	<3m	3-10m	>10m	<3m	3-10m	>10m	<3m	3-10m	>10m	<3m	3-10m	>10m							
32	FOCS2-2	White Pine	27										x	x	x							0	0	0	N	N	N	N	---	N	N	---	C	
		White Oak	33		x	x							x	x	x							0	0	0	N	N	N	N	---	N	N	---	C	
		White Pine	54		x	x											x					0	1	0	N	Y	N	Y	---	N	N	---	O	
		White Oak	32		x	x											x	x				0	1	1	N	Y	Y	Y	---	N	N	---	C	
		White Oak	27		x	x											x	x				0	1	1	N	Y	Y	Y	---	N	N	---	C	
		Elm	35		x								x									0	0	0	N	N	N	N	---	N	N	---	C	
		White Cedar	37				x															1	0	0	Y	N	N	Y	3	Y	N	---	C	dead
		White Pine	39		x									x			x					0	1	0	N	Y	N	Y	---	N	N	---	C	
																					TOTAL	1	4	2	1	4	2	5		1	0	0		
28	FOCS2-2	White Pine	28		x																	0	0	0	N	N	N	N	---	N	N	---	C	
		White Pine	50		x	x																0	0	0	N	N	N	N	---	N	N	---	C	
		White Pine	35		x																	0	0	0	N	N	N	N	---	N	N	---	C	
		White Pine	39						x							x	x				x	1	1	2	Y	Y	Y	Y	5	N	N	Y	C	
		Oak	36				x	x								x			x			3	1	0	Y	Y	N	Y	5	N	N	Y	C	
		Bur Oak	27												x							0	0	0	N	N	N	N	---	N	N	Y	C	leaf cluster
		White Spruce	25	x	x	x										x	x					1	1	0	Y	Y	N	Y	4	N	N	Y	C	
		White Pine	39		x																	0	0	0	N	N	N	N	---	N	N	---	C	
		Bur Oak	42											x	x					x		0	1	0	N	Y	N	Y	1	Y	N	Y	O	
		Bur Oak	37											x								0	0	0	N	N	N	N	---	N	N	---	O	
		White Pine	36		x									x								0	0	0	N	N	N	N	---	N	N	---	C	
		White Pine	38		x									x								0	0	0	N	N	N	N	---	N	N	---	C	
		White Pine	32		x									x								0	0	0	N	N	N	N	---	N	N	---	C	
		White Pine	27		x									x								0	0	0	N	N	N	N	---	N	N	---	C	
		White Pine	40		x									x								0	0	0	N	N	N	N	---	N	N	---	C	
		White Pine	25		x									x								0	0	0	N	N	N	N	---	N	N	---	C	
		White Pine	25		x									x								0	0	0	N	N	N	N	---	N	N	---	C	
		White Pine	37		x									x								0	0	0	N	N	N	N	---	N	N	---	C	
		White Pine	26		x									x								0	0	0	N	N	N	N	---	N	N	---	C	
		White Spruce	41				x	x								x	x		x	x		3	3	0	Y	Y	N	Y	4	N	N	Y	C	leaning
																					TOTAL	8	7	2	4	5	1	5		1	0	6		
27	FOCS2-2	White Pine			x												x	x				0	1	1	N	Y	Y	Y	---	N	N	---	C	
		White Pine			x												x	x				0	1	1	N	Y	Y	Y	---	N	N	---	C	
		White Pine			x												x	x				0	1	1	N	Y	Y	Y	---	N	N	---	C	
		White Pine			x												x	x				0	1	1	N	Y	Y	Y	---	N	N	---	C	
		White Pine			x												x	x				0	1	1	N	Y	Y	Y	---	N	N	---	C	
		Balsam Poplar					x										x	x	x	x		2	2	1	Y	Y	Y	Y	5	N	N	Y	C	
		Balsam Poplar			x	x					x	x								x	x	0	2	2	N	Y	Y	Y	1	Y	Y	Y	C	
		Bur Oajk				x																0	0	0	N	N	N	N	---	N	N	---	C	
		Bur Oajk				x																0	0	0	N	N	N	N	---	N	N	---	C	
		Bur Oajk				x																0	0	0	N	N	N	N	---	N	N	---	C	
		White Spruce		x	x	x													x	x		1	1	0	Y	Y	N	Y	3	Y	N	---	O	
																					TOTAL	3	10	8	2	8	7	8		2	1	2		

26	FOCS2-2	White Cedar	29												x							0	0	0	N	N	N	N	---	N	N	---	C	
		Red Maple	55												x							0	0	0	N	N	N	N	---	N	N	---	C	
		Green Ash	31												x							0	0	0	N	N	N	N	---	N	N	---	C	
		White Cedar	32										x	x								0	0	0	N	N	N	N	---	N	N	---	C	
		Red Oak	35		x	x											x					0	1	0	N	Y	N	Y	---	N	N	Y	C	
		White Cedar	29				x			x												2	0	0	Y	N	N	Y	---	N	N	Y	C	
		White Cedar	35										x	x								0	0	0	N	N	N	N	---	N	N	---	C	
		Green Ash	44		x			x			x				x							0	2	0	N	Y	N	Y	1	Y	N	Y	C	
		American Elm	29													x	x	x				1	1	1	Y	Y	Y	Y	3	Y	Y	Y	C	
		Red Maple	43																			0	0	0	N	N	N	N	---	N	N	---	C	
		American Elm	25																			0	0	0	N	N	N	N	5	N	N	---	C	2m tall
		Red Maple	50			x																0	0	0	N	N	N	N	---	N	N	---	O	
		White Cedar	27																			0	0	0	N	N	N	N	2	N	N	Y	C	
																					TOTAL	3	4	1	2	3	1	4		2	1	5		
22	FOCS2-2	Red Maple	27																			0	0	0	N	N	N	N	---	N	N	---	C	
		Green Ash	29			x											x	x			x	0	1	2	N	Y	Y	Y	3	Y	Y	Y	C	
		Sugar Maple	29											x	x							0	0	0	N	N	N	N	---	N	N	---	C	
		Red Maple	25												x							0	0	0	N	N	N	N	---	N	N	---	C	
		White Birch	26												x							0	0	0	N	N	N	N	1	N	N	---	C	
		Red Oak	32												x							0	0	0	N	N	N	N	---	N	N	---	C	
		Red Maple	34												x							0	0	0	N	N	N	N	---	N	N	---	C	
		Sugar Maple	59		x									x	x							0	0	0	N	N	N	N	1	N	N	---	C	
																					TOTAL	0	1	2	0	1	1	1		1	1	1		

	Composite (tree contains snag features)	Snag Tree? (field notes)	Candidate Roost Tree (contains snag feature >10m & has a decay class 1-3)	<3m	3-10m	>10m
Total	23.0	14.0	3.0	9.0	21.0	12.0
Avg (total # of snags/total # of plots)	4.6	2.8	0.6	1.8	4.2	2.4
/ha	92.0	56.0	12.0	36.0	84.0	48.0

5 plots = 0.25 ha

0.25 ha surveyed

APPENDIX F

Bat Acoustic Data Summary

10/06/2024 - 20/06/2024

S4U22033 - Beaver Pond

Sunset Time: 21:01
Sunrise Time: 5:31

SPECIES	20:30-21:00	21:00-21:30	21:30-22:00	22:00-22:30	22:30-23:00	23:00-23:30	23:30-00:00	00:00-00:30	00:30-1:00	1:00-1:30	1:30-2:00	2:00-2:30	2:30-3:00	3:00-3:30	3:30-4:00	4:00-4:30	4:30-5:00	5:00-5:30	5:30-6:00	TOTAL
MYLU	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	1	0	0	0	**3**
MYSE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
MYOTIS	0	0	0	0	0	0	0	2	0	0	0	0	1	0	1	1	3	0	0	**8**
PESU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
EPFULANO	0	0	3	2	4	0	1	1	3	1	0	3	0	1	1	4	2	0	0	**26**
LANO	0	0	**22***	**13**	0	0	2	2	3	2	1	1	7	2	4	**14**	6	0	0	**57**
LACI	0	0	50	**227**	**177**	115	113	112	47	4	3	3	1	2	0	1	43	6	0	**904**
LABO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	**1**
HighF	0	0	2	0	2	1	1	2	1	1	2	4	2	4	0	**11**	**6**	0	0	**39**
LowF	0	0	17	**43**	**27**	14	3	4	3	2	1	5	1	2	0	2	9	0	0	**133**
EPFU	0	0	7	18	6	6	2	5	6	3	3	4	1	3	3	2	4	0	0	**73**
TOTAL	0	0	72	285	212	130	120	123	57	10	7	16	12	11	7	34	69	6	0	**1244**

***red values represents highest SAR activity levels for values >10 passes**

*****TOTAL NON-MIGRATORY SAR 50***
TOTAL MIGRATORY SAR 1160

S4U22035 - Ridge

Sunset Time: 21:01
Sunrise Time: 5:31

SPECIES	20:30-21:00	21:00-21:30	21:30-22:00	22:00-22:30	22:30-23:00	23:00-23:30	23:30-00:00	00:00-00:30	00:30-1:00	1:00-1:30	1:30-2:00	2:00-2:30	2:30-3:00	3:00-3:30	3:30-4:00	4:00-4:30	4:30-5:00	5:00-5:30	5:30-6:00	TOTAL
MYLU	0	0	0	1	0	0	1	0	0	2	7	1	1	0	0	0	0	0	0	**13**
MYSE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
MYOTIS	0	0	0	0	0	0	0	0	0	1	5	1	1	1	0	0	0	0	0	**9**
PESU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
EPFULANO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
LANO	0	6	8	8	4	2	0	1	1	3	1	2	1	1	1	2	0	4	0	**45**
LACI	0	0	5	9	1	1	2	1	1	2	3	2	0	0	1	0	1	0	0	**29**
LABO	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**
HighF	0	0	1	3	3	2	2	0	1	0	0	0	1	1	0	1	2	0	0	**17**
LowF	0	2	19	**39**	**44**	21	18	7	8	2	2	3	1	0	0	3	6	2	0	**177**
EPFU	0	0	11	39	64	56	12	9	1	2	0	3	0	0	4	1	3	0	0	**205**
TOTAL	0	8	33	60	53	26	23	9	11	10	18	9	5	3	2	6	9	6	0	**496**

***red values represents highest SAR activity levels for values >10 passes**

*****TOTAL NON-MIGRATORY SAR 39***
TOTAL MIGRATORY SAR 269

S4U22041 - Maple Forest

Sunset Time: 21:01
Sunrise Time: 5:31

SPECIES	20:30-21:00	21:00-21:30	21:30-22:00	22:00-22:30	22:30-23:00	23:00-23:30	23:30-00:00	00:00-00:30	00:30-1:00	1:00-1:30	1:30-2:00	2:00-2:30	2:30-3:00	3:00-3:30	3:30-4:00	4:00-4:30	4:30-5:00	5:00-5:30	5:30-6:00	TOTAL
MYLU	0	0	**112**	107	9	3	3	8	9	4	8	5	0	4	8	**118**	44	0	0	**442**
MYSE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
MYOTIS	0	2	**33**	**67**	5	7	4	5	13	2	1	3	1	1	12	**24**	5	0	0	**185**
PESU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
EPFULANO	0	1	0	0	2	0	0	0	0	0	1	0	0	1	0	0	1	0	0	**6**
LANO	0	0	0	2	1	2	0	0	1	1	0	0	0	0	1	3	3	1	0	**15**
LACI	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	**2**
LABO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
HighF	0	0	5	5	1	0	0	1	2	1	0	1	0	3	0	6	2	0	0	**27**
LowF	0	0	1	4	13	1	9	5	0	1	3	1	0	3	0	0	2	0	0	**43**
EPFU	0	0	0	66	142	26	63	195	184	59	57	118	75	10	0	9	9	0	0	**1013**
TOTAL	0	3	151	185	31	13	16	19	25	10	13	10	2	12	21	151	57	1	0	**1733**

***red values represents highest SAR activity levels for values >10 passes**

*****TOTAL NON-MIGRATORY SAR 654***
TOTAL MIGRATORY SAR 93

S4U22043 - Maple Forest

Sunset Time: 21:01
Sunrise Time: 5:31

SPECIES	20:30-21:00	21:00-21:30	21:30-22:00	22:00-22:30	22:30-23:00	23:00-23:30	23:30-00:00	00:00-00:30	00:30-1:00	1:00-1:30	1:30-2:00	2:00-2:30	2:30-3:00	3:00-3:30	3:30-4:00	4:00-4:30	4:30-5:00	5:00-5:30	5:30-6:00	TOTAL
MYLU	0	0	3	4	10	4	0	6	2	5	4	2	1	2	3	1	2	0	0	**49**
MYSE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
MYOTIS	0	0	4	5	8	7	3	8	**23**	3	6	4	4	**13**	**13**	2	1	0	0	**104**
PESU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
EPFULANO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
LANO	0	3	6	**12**	5	1	5	6	**12**	5	1	3	4	3	0	0	5	0	0	**71**
LACI	0	0	7	7	8	4	6	0	1	0	0	1	1	3	2	0	0	0	0	**40**
LABO	0	0	0	0	1	0	0	0	0	0	0	4	0	0	0	0	0	0	0	**5**
HighF	0	0	0	0	0	1	2	1	7	3	1	1	1	1	1	2	0	0	0	**21**
LowF	0	0	2	2	0	4	3	1	2	0	1	3	0	1	1	0	1	0	0	**21**
EPFU	0	0	80	23	26	33	21	11	7	12	3	10	4	3	2	5	9	1	0	**250**
TOTAL	0	3	22	30	32	21	19	22	47	16	13	18	11	23	20	5	9	0	0	**561**

***red values represents highest SAR activity levels for values >10 passes**

*****TOTAL NON-MIGRATORY SAR 174***
TOTAL MIGRATORY SAR 158

S4U7906 - Maple Forest

Sunset Time: 21:01
Sunrise Time: 5:31

SPECIES	20:30-21:00	21:00-21:30	21:30-22:00	22:00-22:30	22:30-23:00	23:00-23:30	23:30-00:00	00:00-00:30	00:30-1:00	1:00-1:30	1:30-2:00	2:00-2:30	2:30-3:00	3:00-3:30	3:30-4:00	4:00-4:30	4:30-5:00	5:00-5:30	5:30-6:00	TOTAL
MYLU	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1	0	0	0	**3**
MYSE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
MYOTIS	0	0	5	**11**	1	**14**	2	**11**	5	5	0	0	1	9	1	2	0	0	0	**67**
PESU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
EPFULANO	0	0	1	0	0	0	0	0	1	5	0	3	0	0	0	0	1	0	0	**11**
LANO	0	0	0	0	1	2	5	4	1	1	0	1	0	5	0	1	0	2	0	**23**
LACI	0	0	0	0	0	0	3	0	0	0	1	0	0	0	0	0	0	0	0	**4**
LABO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
HighF	0	0	0	2	0	0	0	0	1	0	0	0	0	2	0	1	0	0	0	**6**
LowF	0	2	1	9	**17**	2	8	7	3	9	2	5	0	0	0	3	3	0	0	**71**
EPFU	0	0	0	3	4	4	5	5	3	4	16	2	0	2	0	0	0	0	0	**48**
TOTAL	0	2	7	22	19	18	18	22	11	21	3	9	1	17	1	8	4	2	0	**233**

***red values represents highest SAR activity levels for values >10 passes**

*****TOTAL NON-MIGRATORY SAR 76***
TOTAL MIGRATORY SAR 115

S4U22558 - NW Forest

Sunset Time: 21:01
Sunrise Time: 5:31

SPECIES	20:30-21:00	21:00-21:30	21:30-22:00	22:00-22:30	22:30-23:00	23:00-23:30	23:30-00:00	00:00-00:30	00:30-1:00	1:00-1:30	1:30-2:00	2:00-2:30	2:30-3:00	3:00-3:30	3:30-4:00	4:00-4:30	4:30-5:00	5:00-5:30	5:30-6:00	TOTAL
MYLU	0	0	**62**	**155**	26	39	28	20	11	15	34	6	5	8	14	15	5	0	0	**443**
MYSE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
MYOTIS	0	0	**51**	**98**	20	21	17	8	5	5	11	9	0	10	3	8	0	0	0	**266**
PESU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
EPFULANO	0	0	0	5	1	2	0	2	1	0	2	1	0	2	0	2	5	0	0	**23**
LANO	0	0	3	1	0	1	3	4	1	4	2	1	0	1	2	2	6	2	0	**33**
LACI	0	0	0	2	1	1	2	2	1	0	0	0	1	0	0	1	0	1	0	**12**
LABO	0	0	0	0	2	0	0	0	0	0	0	1	0	0	0	0	0	0	0	**3**
HighF	0	0	**45**	**88**	26	28	15	13	12	12	14	4	2	3	4	5	0	0	0	**271**
LowF	0	0	0	1	1	0	1	0	1	0	0	0	0	0	0	0	3	0	0	**7**
EPFU	0	0	0	1	3	1	1	1	0	2	1	1	2	0	0	0	0	0	0	**13**
TOTAL	0	0	161	350	77	92	66	49	32	36	63	22	8	24	23	33	19	3	0	**1071**

***red values represents highest SAR activity levels for values >10 passes**

*****TOTAL NON-MIGRATORY SAR 980***
TOTAL MIGRATORY SAR 349

10/06/2024 - 20/06/2024
S4U22538 - NW Forest
Sunset Time: 21:01
Sunrise Time: 5:31

SPECIES	20:30-21:00	21:00-21:30	21:30-22:00	22:00-22:30	22:30-23:00	23:00-23:30	23:30-00:00	00:00-00:30	00:30-1:00	1:00-1:30	1:30-2:00	2:00-2:30	2:30-3:00	3:00-3:30	3:30-4:00	4:00-4:30	4:30-5:00	5:00-5:30	5:30-6:00	TOTAL
MYLU	0	0	20	**124**	**85**	25	10	29	18	12	10	8	6	2	3	16	0	0	0	**368**
MYSE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
MYOTIS	0	0	3	3	**21**	2	1	1	3	1	0	1	0	0	2	3	0	0	0	**41**
PESU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
EPFULANO	0	0	4	3	3	0	3	0	2	0	2	1	2	1	1	2	5	1	0	**30**
LANO	0	0	5	1	2	4	1	4	5	1	0	2	0	1	1	5	**27**	3	0	**62**
LACI	0	0	0	1	1	3	1	1	3	1	0	3	0	0	0	0	2	2	0	**18**
LABO	0	0	0	0	1	0	1	0	0	0	3	2	1	0	0	0	0	0	0	**8**
HighF	0	0	24	**133**	**127**	64	28	48	41	49	56	30	41	2	3	67	4	0	0	**717**
LowF	0	0	2	2	1	1	0	2	2	0	2	7	3	0	0	0	2	0	0	**24**
EPFU	0	0	3	1	7	5	3	1	2	0	0	3	1	0	0	2	1	0	0	**29**
TOTAL	0	0	58	267	241	99	45	85	74	64	73	54	53	6	10	93	40	6	0	**1297**

***red values represents highest SAR activity levels for values >10 passes**

*****TOTAL NON-MIGRATORY SAR 1126***
TOTAL MIGRATORY SAR 859

S4U7956 - Oak Forest
Sunset Time: 21:01
Sunrise Time: 5:31

SPECIES	20:30-21:00	21:00-21:30	21:30-22:00	22:00-22:30	22:30-23:00	23:00-23:30	23:30-00:00	00:00-00:30	00:30-1:00	1:00-1:30	1:30-2:00	2:00-2:30	2:30-3:00	3:00-3:30	3:30-4:00	4:00-4:30	4:30-5:00	5:00-5:30	5:30-6:00	TOTAL
MYLU	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	**2**
MYSE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
MYOTIS	0	0	0	1	0	0	0	0	0	2	0	0	1	0	0	0	0	0	0	**4**
PESU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
EPFULANO	0	1	0	1	0	2	1	2	0	1	0	0	0	0	0	0	0	0	0	**8**
LANO	0	0	2	0	1	0	1	5	4	0	1	0	0	1	1	1	0	0	0	**17**
LACI	0	0	0	3	1	1	2	4	1	1	0	0	0	1	0	0	0	0	0	**14**
LABO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
HighF	0	0	0	0	0	1	0	1	0	1	1	1	1	3	1	2	0	0	0	**12**
LowF	0	0	2	3	2	1	2	0	0	1	0	1	0	0	0	0	0	0	0	**12**
EPFU	0	0	0	1	3	0	1	0	0	0	1	0	1	0	1	2	0	0	0	**10**
TOTAL	0	1	4	8	4	5	7	12	5	6	2	3	2	5	2	3	0	0	0	**79**

***red values represents highest SAR activity levels for values >10 passes**

*****TOTAL NON-MIGRATORY SAR 18***
TOTAL MIGRATORY SAR 63

S4U7500 - Mixed Forest
Sunset Time: 21:01
Sunrise Time: 5:31

SPECIES	20:30-21:00	21:00-21:30	21:30-22:00	22:00-22:30	22:30-23:00	23:00-23:30	23:30-00:00	00:00-00:30	00:30-1:00	1:00-1:30	1:30-2:00	2:00-2:30	2:30-3:00	3:00-3:30	3:30-4:00	4:00-4:30	4:30-5:00	5:00-5:30	5:30-6:00	TOTAL
MYLU	0	0	**18**	**26**	7	11	2	1	5	4	16	5	8	2	6	2	6	0	0	**119**
MYSE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
MYOTIS	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	**2**
PESU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	**1**
EPFULANO	0	0	1	4	4	1	1	0	0	1	0	0	1	1	0	1	0	0	0	**15**
LANO	0	0	**12**	5	7	8	**11**	**11**	3	5	3	1	2	2	2	3	6	0	0	**81**
LACI	0	0	3	5	5	5	3	5	1	0	0	0	0	2	0	4	0	0	0	**33**
LABO	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**
HighF	0	0	1	2	1	0	1	0	2	1	0	1	1	2	1	0	1	0	0	**14**
LowF	0	0	4	0	1	1	0	0	0	0	1	0	0	0	0	0	3	0	0	**10**
EPFU	0	0	6	10	2	4	6	2	0	2	5	2	8	5	6	2	1	0	0	**61**
TOTAL	0	0	39	42	25	27	18	17	11	12	20	7	12	10	10	10	16	0	0	**337**

***red values represents highest SAR activity levels for values >10 passes**

*****TOTAL NON-MIGRATORY SAR 136***
TOTAL MIGRATORY SAR 154

S4U7808 - White Pine Forest
Sunset Time: 21:01
Sunrise Time: 5:31

SPECIES	20:30-21:00	21:00-21:30	21:30-22:00	22:00-22:30	22:30-23:00	23:00-23:30	23:30-00:00	00:00-00:30	00:30-1:00	1:00-1:30	1:30-2:00	2:00-2:30	2:30-3:00	3:00-3:30	3:30-4:00	4:00-4:30	4:30-5:00	5:00-5:30	5:30-6:00	TOTAL
MYLU	0	0	2	0	6	2	9	1	0	5	3	1	0	0	0	4	2	0	0	**35**
MYSE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
MYOTIS	0	0	0	2	1	1	2	1	1	0	3	2	2	0	0	1	0	0	0	**16**
PESU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
EPFULANO	0	1	22	**41**	**54**	27	13	18	10	4	5	5	2	2	2	1	1	0	0	**208**
LANO	0	0	**17**	9	5	2	7	4	5	0	6	1	1	2	1	2	1	0	0	**63**
LACI	0	0	9	**16**	2	7	4	4	3	2	1	0	1	1	1	1	4	2	0	**58**
LABO	0	0	0	1	0	0	0	0	0	0	0	0	2	0	0	0	1	0	0	**4**
HighF	0	0	5	7	3	3	3	3	2	4	0	2	1	1	1	5	6	0	0	**46**
LowF	0	0	10	**30**	**18**	**18**	8	8	11	3	7	6	1	1	4	2	1	1	0	**129**
EPFU	0	0	42	219	249	97	58	119	82	2	34	20	6	3	9	7	4	0	0	**951**
TOTAL	0	1	65	106	89	60	46	39	32	18	25	17	10	7	9	16	16	3	0	**1510**

***red values represents highest SAR activity levels for values >10 passes**

*****TOTAL NON-MIGRATORY SAR 97***
TOTAL MIGRATORY SAR 508

Species ID	
MYLU	Myotis lucifugus
MYSE	Myotis septentrionalis
PESU	Perimyotis subflavus
EPFU	Eptesicus fuscus
LANO	Lasionycteris noctivagans
LACI	Lasiurus cinereus
LABO	Lasiurus borealis
MYLE	Myotis leibii

Groupings	
MYOTIS	Myotis sp.
EPFULANO	Eptesicus fuscus/Lasionycteris noctivagans
LowF	Low Frequency Bat (<35kHz Fmin)
HighF	High Frequency Bat (>35kHz Fmin)

Minimum Frequency Range of Species	
MYLU	40 - 45kHz
MYSE	40 - 45kHz
PESU	35 - 40kHz
EPFU	25 - 30kHz
LANO	25 - 30kHz
LACI	<25kHz
LABO	30 - 35kHz
MYLE	40 - 45kHz

*****TOTALS INCLUDE HIGHF AND LOWF AND EPFULANO VALUES***

APPENDIX G

Significant Wildlife Habitat Assessment

BIRKS
NATURAL HERITAGE CONSULTANTS

Significant Wildlife Habitat Criteria Schedule for Ecoregion 6E

Seasonal Concentration Areas of Animals

Wildlife Habitat	Wildlife Species	Candidate SWH		Confirmed SWH	Assessment
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Waterfowl Stopover and Staging Areas (Terrestrial) **Rationale:** Habitat important to migrating waterfowl.	American Black Duck Wood Duck Green-winged Teal Blue-winged Teal Mallard Northern Pintail Northern Shoveler American Wigeon Gadwall	CUM1 CUT1 Plus evidence of annual spring flooding from melt water or run-off within these Ecosites.	Fields with sheet water during Spring (mid-March to May). • Fields flooding during spring melt and run-off provide important invertebrate foraging habitat for migrating waterfowl. • Agricultural fields with waste grains are commonly used by waterfowl, these are not considered SWH unless they have spring sheet water available. Information Sources • Anecdotal information from the landowner, adjacent landowners or local naturalist clubs may be good information in determining occurrence. • Reports and other information available from Conservation Authorities • Sites documented through waterfowl planning processes • Field Naturalist Clubs • Ducks Unlimited Canada • Natural Heritage Information Centre (NHIC) Waterfowl Concentration Area	Studies carried out and verified presence of an annual concentration of any listed species, evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects" • Any mixed species aggregations of 100 or more individuals required. • The flooded field ecosite habitat plus a 100-300m radius area, dependant on local site conditions and adjacent land use is the significant wildlife habitat. • Annual use of habitat is documented from information sources or field studies (annual use can be based on studies or determined by past surveys with species numbers and dates). • Significant Wildlife Habitat Mitigation Support Tool Index #7 provides development effects and mitigation measures.	No cultural thicket or fields with spring flooding were observed on the property or adjacent lands. Mallard was observed on site; none of the other listed species were documented during field surveys. NHIC does not list occurrences of Waterfowl Concentration Area in the area. Suitable habitat for waterfowl stopover and staging (terrestrial) SWH is therefore not present.

Wildlife Habitat	Wildlife Species	Candidate SWH		Confirmed SWH	Assessment
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Waterfowl Stopover and Staging Areas (Aquatic) **Rationale:** Important for local and migrant waterfowl populations during the spring or fall migration or both periods combined. Sites identified are usually only one of a few in the eco-district.	Canada Goose Cackling Goose Snow Goose American Black Duck Northern Pintail Northern Shoveler American Wigeon Gadwall Green-winged Teal Blue-winged Teal Hooded Merganser Common Merganser Lesser Scaup Greater Scaup Long-tailed Duck Surf Scoter White-winged Scoter Black Scoter Ring-necked duck Common Goldeneye Bufflehead Redhead Ruddy Duck Red-breasted Merganser Brant Canvasback Ruddy Duck	MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 SWD1 SWD2 SWD3 SWD4 SWD5 SWD6 SWD7	• Ponds, marshes, lakes, bays, coastal inlets, and watercourses used during migration. Sewage treatment ponds and storm water ponds do not qualify as a SWH, however a reservoir managed as a large wetland or pond/lake does qualify. • These habitats have an abundant food supply (mostly aquatic invertebrates and vegetation in shallow water) Information Sources • Environment Canada. • Naturalist clubs often are aware of staging/stopover areas. • OMNRF Wetland Evaluations indicate presence of locally and regionally significant waterfowl staging. • Sites documented through waterfowl planning processes • Ducks Unlimited projects • Element occurrence specification by Nature Serve: http://www.natureserve.org • Natural Heritage Information Centre (NHIC) Waterfowl Concentration Areas	Studies carried out and verified presence of: • Aggregations of 100 or more of listed species for 7 days, results in > 700 waterfowl use days. • Areas with annual staging of ruddy ducks, canvasbacks, and redheads are SWH • The combined area of the ELC ecosites and a 100m radius area is the SWH • Wetland area and shorelines associated with sites identified within the Significant Wildlife Habitat Technical Guide Appendix K are significant wildlife habitat. • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects" • Annual Use of Habitat is Documented from Information Sources or Field Studies (Annual can be based on completed studies or determined from past surveys with species numbers and dates recorded). • Significant Wildlife Habitat Mitigation Support Tool Index #7 provides development effects and mitigation measures.	Suitable habitats are not present on the property for waterfowl stopover and staging (aquatic). No ponds, lakes, bays, or coastal inlets are within the Study Area and no suitable habitat is present to accommodate large aggregations of waterfowl. None of the listed species were documented during site investigations.; Canada Goose was observed as a fly-over. NHIC does not list occurrences of Waterfowl Concentration Area in the area. Suitable habitat for waterfowl stopover and staging (aquatic) SWH is therefore not present.

Wildlife Habitat	Wildlife Species	Candidate SWH		Confirmed SWH	Assessment
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Shorebird Migratory Stopover Area **Rationale:** High quality shorebird stopover habitat is extremely rare and typically has a long history of use.	Greater Yellowlegs Lesser Yellowlegs Marbled Godwit Hudsonian Godwit Black-bellied Plover American Golden-Plover Semipalmated Plover Solitary Sandpiper Spotted Sandpiper Semipalmated Sandpiper Pectoral Sandpiper White-rumped Sandpiper Baird's Sandpiper Least Sandpiper Purple Sandpiper Stilt Sandpiper Short-billed Dowitcher Red-necked Phalarope Whimbrel Ruddy Turnstone Sanderling Dunlin	BBO1 BBO2 BBS1 BBS2 BBT1 BBT2 SDO1 SDS2 SDT1 MAM1 MAM2 MAM3 MAM4 MAM5	• Shorelines of lakes, rivers and wetlands, including beach areas, bars and seasonally flooded, muddy and un-vegetated shoreline habitats. • Great Lakes coastal shorelines, including groynes and other forms of armour rock lakeshores, are extremely important for migratory shorebirds in May to mid-June and early July to October. • Sewage treatment ponds and storm water ponds do not qualify as a SWH. Information Sources • Western hemisphere shorebird reserve network. • Canadian Wildlife Service (CWS) Ontario Shorebird Survey. • Bird Studies Canada • Ontario Nature • Local birders and naturalist clubs • Natural Heritage Information Center (NHIC) Shorebird Migratory Concentration Area	Studies confirming: • Presence of 3 or more of listed species and > 1000 shorebird use days during spring or fall migration period (shorebird use days are the accumulated number of shorebirds counted per day over the course of the fall or spring migration period) • Whimbrel stop briefly (<24hrs) during spring migration, any site with >100 Whimbrel used for 3 years or more is significant. • The area of significant shorebird habitat includes the mapped ELC shoreline ecosites plus a 100m radius area • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects" • Significant Wildlife Habitat Mitigation Support Tool Index #8 provides development effects and mitigation measures.	NHIC does not list occurrences of Shorebird Migratory Concentration Area in the area. Listed species were not documented during site surveys. Suitable habitat is not present for Shorebird Migratory Stopover Area; no rivers, beach areas or unvegetated shoreline habitats in the Study Area. Suitable habitat for shorebird migratory stopover area SWH is therefore not present.

Wildlife Habitat	Wildlife Species	Candidate SWH		Confirmed SWH	Assessment
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Raptor Wintering Area **Rationale:** Sites used by multiple species, a high number of individuals and used annually are most significant	Rough-legged Hawk Red-tailed Hawk Northern Harrier American Kestrel Snowy Owl **Special Concern:** Short-eared Owl Bald Eagle	Hawks/Owls: Combination of ELC Community Series; need to have present one Community Series from each land class; Forest: FOD, FOM, FOC. Upland: CUM; CUT; CUS; CUW. Bald Eagle: Forest community Series: FOD, FOM, FOC, SWD, SWM or SWC on shoreline areas adjacent to large rivers or adjacent to lakes with open water (hunting area).	• The habitat provides a combination of fields and woodlands that provide roosting, foraging and resting habitats for wintering raptors. • Raptor wintering sites (hawk/owl) need to be > 20 ha with a combination of forest and upland. • Least disturbed sites, idle/fallow or lightly grazed field/meadow (>15ha) with adjacent woodlands • Field area of the habitat is to be wind swept with limited snow depth or accumulation. • Eagle sites have open water, large trees and snags available for roosting Information Sources: • OMNRF Ecologist or Biologist Field Naturalist Clubs • Natural Heritage Information Center (NHIC) Raptor Winter Concentration Area • Data from Bird Studies Canada • Results of Christmas Bird Counts Reports and other information available from Conservation Authorities.	Studies confirm the use of these habitats by: • One or more Short-eared Owls or; One or more Bald Eagles or; At least 10 individuals and two of the listed hawk/owl species. • To be significant a site must be used regularly (3 in 5 years) for a minimum of 20 days by the above number of birds. • The habitat area for an Eagle winter site is the shoreline forest ecosites directly adjacent to the prime hunting area • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects" • Significant Wildlife Habitat Mitigation Support Tool Index #10 and #11 provides development effects and mitigation measures.	Listed species were not documented during breeding bird surveys. NHIC does not list any element occurrence of Raptor Winter Concentration Area in the area. Bald Eagle habitat is not present in the Study Area; no lake or river shoreline areas within the Study Area. The Study Area contains a mix of woodlands and open uplands. The open areas on the property are meadow/rock barren and smaller in size. Overall, suitable habitat for raptor wintering SWH is considered to be absent from the Study Area.

Wildlife Habitat	Wildlife Species	Candidate SWH		Confirmed SWH	Assessment
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Bat Hibernacula **Rationale;** Bat hibernacula are rare habitats in all Ontario landscapes.	Big Brown Bat Tri-coloured Bat	Bat Hibernacula may be found in these ecosites: CCR1 CCR2 CCA1 CCA2 (Note: buildings are not considered to be SWH)	• Hibernacula may be found in caves, mine shafts, underground foundations and Karsts. • Active mine sites should not be considered as SWH • The locations of bat hibernacula are relatively poorly known. Information Sources • OMNRF for possible locations and contact for local experts • Natural Heritage Information Center (NHIC) Bat Hibernaculum Ministry of Northern • Development and Mines for location of mine shafts. • Clubs that explore caves (e.g. Sierra Club) • University Biology Departments with bat experts.	• All sites with confirmed hibernating bats are SWH. • The habitat area includes a 200m radius around the entrance of the hibernaculum, for most development types and 1000m for wind farms • Studies are to be conducted during the peak swarming period (Aug. – Sept.). Surveys should be conducted following methods outlined in the “Bats and Bat Habitats: Guidelines for Wind Power Projects. • Significant Wildlife Habitat Mitigation Support Tool Index #1 provides development effects and mitigation measures.	No caves, mine shafts, open karst or underground foundations have been identified. Potential areas of karst associated with the property are regularly inundated with water. Suitable habitat for bat hibernacula is therefore not present.
Bat Maternity Colonies **Rationale:** Known locations of forested bat maternity colonies are extremely rare in all Ontario landscapes.	Big Brown Bat Silver-haired Bat	Maternity colonies considered SWH are found in forested Ecosites. All ELC Ecosites in ELC Community Series: FOD FOM SWD SWM	• Maternity colonies can be found in tree cavities, vegetation and often in buildings (buildings are not considered to be SWH). • Maternity roosts are not found in caves and mines in Ontario. • Maternity colonies located in Mature deciduous or mixed forest stands with >10/ha large diameter (>25cm dbh) wildlife trees • Female Bats prefer wildlife tree (snags) in early stages of decay, class 1-3. • Silver-haired Bats prefer older mixed or deciduous forest and form maternity colonies in tree cavities and small hollows. Older forest areas with at least 21 snags/ha are preferred Information Sources • OMNRF for possible locations and contact for local experts • University Biology Departments with bat experts.	• Maternity Colonies with confirmed use by; • >10 Big Brown Bats • >5 Adult Female Silver-haired Bats • The area of the habitat includes the entire woodland or a forest stand ELC Ecosite or an Ecoelement containing the maternity colonies. • Evaluation methods for maternity colonies should be conducted following methods outlined in the “Bats and Bat Habitats: Guidelines for Wind Power Projects”. • Significant Wildlife Habitat Mitigation Support Tool Index #12 provides development effects and mitigation measures.	**Vegetation communities present on the property and adjacent lands were considered to have potential to provide this function.** **Thirty-one plots (1.55 ha) were surveyed on the property to assess for maternity bat roost habitat.** **Additionally, acoustic recorders were deployed on the property to provide additional information.** **Further discussion on bat habitat and bat maternity colonies is provided in the NER.**

Wildlife Habitat	Wildlife Species	Candidate SWH		Confirmed SWH	Assessment
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Turtle Wintering Areas **Rationale:** Generally sites are the only known sites in the area. Sites with the highest number of individuals are most significant.	Midland Painted Turtle **Special Concern:** Northern Map Turtle Snapping Turtle	Snapping and Midland Painted Turtles; ELC Community Classes; SW, MA, OA and SA, ELC Community Series; FEO and BOO Northern Map Turtle; Open Water areas such as deeper rivers or streams and lakes with current can also be used as over-wintering habitat.	• For most turtles, wintering areas are in the same general area as their core habitat. Water must be deep enough not to freeze and have soft mud substrates. • Over-wintering sites are permanent water bodies, large wetlands, and bogs or fens with adequate Dissolved Oxygen • Man-made ponds such as sewage lagoons or storm water ponds should not be considered SWH. Information Sources • NHE studies carried out by Conservation Authorities. • Local field naturalists and experts, as well as university herpetologists may also know where to find some of these sites. • OMNRF Ecologist or Biologist • Field Naturalist clubs • Natural Heritage Information Center (NHIC)	• Presence of 5 over-wintering Midland Painted Turtles is significant. • One or more Northern Map Turtle or Snapping Turtle over-wintering within a wetland is significant. • The mapped ELC ecosite area with the over wintering turtles is the SWH. If the hibernation site is within a stream or river, the deep-water pool where the turtles are over wintering is the SWH. • Over wintering areas may be identified by searching for congregations (Basking Areas) of turtles on warm, sunny days during the fall (Sept. – Oct.) or spring (Mar. – May) • Congregation of turtles is more common where wintering areas are limited and therefore significant • Significant Wildlife Habitat Mitigation Support Tool Index #28 provides development effects and mitigation measures for turtle wintering habitat.	**The proposed development area contains habitat for turtles during the active season; the Study Area contains swamp, marsh, and drainage features.** **Some of those features contain habitat for overwintering, (*i.e.,* water of sufficient depth for turtle overwintering) and therefore were considered Candidate SWH for Turtle Wintering.** **Further discussion is provided in the NER.**

Wildlife Habitat	Wildlife Species	Candidate SWH		Confirmed SWH	Assessment
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Reptile Hibernaculum Rationale; Generally sites are the only known sites in the area. Sites with the highest number of individuals are most significant.	Snakes: Eastern Gartersnake Northern Watersnake Northern Red-bellied Snake Northern Brownsnake Smooth Green Snake Northern Ring-necked Snake Milksnake Special Concern: Eastern Ribbonsnake Lizard: Special Concern (Southern Shield population): Five-lined Skink	For all snakes, habitat may be found in any ecosite other than very wet ones. Talus, Rock Barren, Crevice, Cave, and Alvar sites may be directly related to these habitats. Observations or congregations of snakes on sunny warm days in the spring or fall is a good indicator. For Five-lined Skink, ELC Community Series of FOD and FOM and Ecosites: FOC1 FOC3	• For snakes, hibernation takes place in sites located below frost lines in burrows, rock crevices and other natural or naturalized locations. The existence of features that go below frost line; such as rock piles or slopes, old stone fences, and abandoned crumbling foundations assist in identifying candidate SWH. • Areas of broken and fissured rock are particularly valuable since they provide access to subterranean sites below the frost line • Wetlands can also be important over-wintering habitat in conifer or shrub swamps and swales, poor fens, or depressions in bedrock terrain with sparse trees or shrubs with sphagnum moss or sedge hummock ground cover. • Five-lined skink prefer mixed forests with rock outcrop openings providing cover rock overlaying granite bedrock with fissures. Information Sources • In spring, local residents or landowners may have observed the emergence of snakes on their property (e.g. old dug wells). • Reports and other information available from Conservation Authorities. • Field Naturalists clubs • University herpetologists • Natural Heritage Information Center (NHIC) • OMNRF ecologist or biologist may be aware of locations of wintering skinks	Studies confirming: • Presence of snake hibernacula used by a minimum of five individuals of a snake sp. or; individuals of two or more snake spp. • Congregations of a minimum of five individuals of a snake sp. or; individuals of two or more snake spp. near potential hibernacula (eg. foundation or rocky slope) on sunny warm days in Spring (Apr/May) and Fall (Sept/Oct) • Note: If there are Special Concern Species present, then site is SWH • Note: Sites for hibernation possess specific habitat parameters (e.g. temperature, humidity, etc.) and consequently are used annually, often by many of the same individuals of a local population (i.e. strong hibernation site fidelity). Other critical life processes (e.g. mating) often take place in close proximity to hibernacula. The feature in which the hibernacula is located plus a 30 m radius area is the SWH • Significant Wildlife Habitat Mitigation Support Tool Index #13 provides development effects and mitigation measures for snake hibernacula. • Presence of any active hibernaculum for skink is significant. • Significant Wildlife Habitat Mitigation Support Tool Index #37 provides development effects and mitigation measures for five-lined skink wintering habitat.	**There are woodland and rock barren sites on the property and adjacent lands. Within the Study Area reptiles may gain access to below the frost line for hibernation through rodent burrows, tree root systems and rock crevices.** **Further discussion is provided in the NER.**

Wildlife Habitat	Wildlife Species	Candidate SWH		Confirmed SWH	Assessment
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Colonially - Nesting Bird Breeding Habitat (Bank and Cliff) **Rationale:** Historical use and number of nests in a colony make this habitat significant. An identified colony can be very important to local populations. All swallow populations are declining in Ontario.	Cliff Swallow Northern Rough-winged Swallow (this species is not colonial but can be found in Cliff Swallow colonies)	Eroding banks, sandy hills, borrow pits, steep slopes, and sand piles. Cliff faces, bridge abutments, silos, barns. Habitat found in the following ecosites: CUM1 CUT1 CUS1 BLO1 BLS1 BLT1 CLO1 CLS1 CLT1	• Any site or areas with exposed soil banks, undisturbed or naturally eroding that is not a licensed/permitted aggregate area. • Does not include man-made structures (bridges or buildings) or recently (2 years) disturbed soil areas, such as berms, embankments, soil or aggregate stockpiles. • Does not include a licensed/permitted Mineral Aggregate Operation. Information Sources • Reports and other information available from Conservation Authorities. • Ontario Breeding Bird Atlas • Bird Studies Canada; *NatureCounts* http://www.birdscanada.org/birdmon/ • Field Naturalist Clubs.	Studies confirming: • Presence of 1 or more nesting sites with 8 or more cliff swallow pairs and/or rough-winged swallow pairs during the breeding season. • A colony identified as SWH will include a 50m radius habitat area from the peripheral nests • Field surveys to observe and count swallow nests are to be completed during the breeding season. Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects" • Significant Wildlife Habitat Mitigation Support Tool Index #4 provides development effects and mitigation measures	No eroding banks, sandy hills, borrow pits, sand piles, cliff faces, bridge abutments suitable for colonially-nesting bird breeding habitat (bank and cliff) were observed on the property or adjacent lands. None of the listed species were recorded during site surveys. Suitable habitat for Colonially - Nesting Bird Breeding Habitat (Bank and Cliff) SWH is therefore not present.

Wildlife Habitat	Wildlife Species	Candidate SWH		Confirmed SWH	Assessment
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Colonially - Nesting Bird Breeding Habitat (Tree/Shrubs) **Rationale**: Large colonies are important to local bird population, typically sites are only known colony in area and are used annually.	Great Blue Heron Black-crowned Night-Heron Great Egret Green Heron	SWM2 SWM3 SWM5 SWM6 SWD1 SWD2 SWD3 SWD4 SWD5 SWD6 SWD7 FET1	• Nests in live or dead standing trees in wetlands, lakes, islands, and peninsulas. Shrubs and occasionally emergent vegetation may also be used. • Most nests in trees are 11 to 15 m from ground, near the top of the tree. Information Sources • Ontario Breeding Bird Atlas, colonial nest records. • Ontario Heronry Inventory 1991 available from Bird Studies Canada or NHIC (OMNRF). • Natural Heritage Information Center (NHIC) Mixed Wader Nesting Colony • Aerial photographs can help identify large heronries. • Reports and other information available from CAs. • MNRF District Offices. • Local naturalist clubs.	Studies confirming: • Presence of 5 or more active nests of Great Blue Heron or other listed species. • The habitat extends from the edge of the colony and a minimum 300m radius or extent of the Forest Ecosite containing the colony or any island <15.0ha with a colony is the SWH • Confirmation of active heronries are to be achieved through site visits conducted during the nesting season (April to August) or by evidence such as the presence of fresh guano, dead young and/or eggshells • Significant Wildlife Habitat Mitigation Support Tool Index #5 provides development effects and mitigation measures.	NHIC does not list an occurrence of Mixed Wader Nesting Colony in the area. No Important Bird Areas (www.ibacanada.com) mapped in the area and no nesting sites in the area identified on Ontario GeoHub (formerly LIO). No lakes, islands or peninsulas present in the Study Area, swamp communities are within the southern portion of the property. One Great Blue Heron was observed in the southern wetlands during second breeding bird survey (June 11), and incidentally during a vegetation survey. No probable or confirmed breeding evidence was noted. It is assumed that the bird was foraging. No Candidate Colonially -Nesting Bird Breeding Habitat (Tree/Shrubs) SWH is considered present in the Study Area.

Wildlife Habitat	Wildlife Species	Candidate SWH		Confirmed SWH	Assessment
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Colonially - Nesting Bird Breeding Habitat (Ground) **Rationale;** Colonies are important to local bird population, typically sites are only known colony in area and are used annually.	Herring Gull Great Black-backed Gull Little Gull Ring-billed Gull Common Tern Caspian Tern Brewer's Blackbird	Any rocky island or peninsula (natural or artificial) within a lake or large river (two-lined on a 1;50,000 NTS map). Close proximity to watercourses in open fields or pastures with scattered trees or shrubs (Brewer's Blackbird) MAM1 – 6; MAS1 – 3; CUM CUT CUS	• Nesting colonies of gulls and terns are on islands or peninsulas associated with open water or in marshy areas. • Brewers Blackbird colonies are found loosely on the ground in low bushes in close proximity to streams and irrigation ditches within farmlands. Information Sources • Ontario Breeding Bird Atlas , rare/colonial species records. • Canadian Wildlife Service • Reports and other information available from CAs. • Natural Heritage Information Center (NHIC) Colonial Waterbird Nesting Area • MNRF District Offices. • Field Naturalist clubs.	Studies confirming: • Presence of > 25 active nests for Herring Gulls or Ring-billed Gulls, >5 active nests for Common Tern or >2 active nests for Caspian Tern. • Presence of 5 or more pairs for Brewer's Blackbird. • Any active nesting colony of one or more Little Gull, and Great Black-backed Gull is significant. • The edge of the colony and a minimum 150m radius area of habitat, or the extent of the ELC ecosites containing the colony or any island <3.0ha with a colony is the SWH • Studies would be done during May/June when actively nesting. Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects" • Significant Wildlife Habitat Mitigation Support Tool Index #6 provides development effects and mitigation measures.	Habitat in the Study Area does not meet key criteria – no lake, river, rocky islands or peninsulas within the area. None of the listed species were observed during breeding bird surveys. Suitable colonially-nesting bird breeding habitat (ground) is therefore not present in the Study Area.

Wildlife Habitat	Wildlife Species	Candidate SWH		Confirmed SWH	Assessment
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Migratory Butterfly Stopover Areas **Rationale:** Butterfly stopover areas are extremely rare habitats and are biologically important for butterfly species that migrate south for the winter.	Painted Lady Red Admiral Special Concern Monarch	Combination of ELC Community Series; need to have present one Community Series from each land class: Field: CUM CUT CUS Forest: FOC FOD FOM CUP Anecdotally, a candidate site for butterfly stopover will have a history of butterflies being observed.	A butterfly stopover area will be a minimum of 10 ha in size with a combination of field and forest habitat present and will be located within 5 km of Lake Ontario. • The habitat is typically a combination of field and forest, and provides the butterflies with a location to rest prior to their long migration south • The habitat should not be disturbed, fields/meadows with an abundance of preferred nectar plants and woodland edge providing shelter are requirements for this habitat. • Staging areas usually provide protection from the elements and are often spits of land or areas with the shortest distance to cross the Great Lakes Information Sources • OMNRF (NHIC) • Agriculture Canada in Ottawa may have list of butterfly experts. • Field Naturalist Clubs • Toronto Entomologists Association • Conservation Authorities	Studies confirm: • The presence of Monarch Use Days (MUD) during fall migration (Aug/Oct). MUD is based on the number of days a site is used by Monarchs, multiplied by the number of individuals using the site. Numbers of butterflies can range from 100-500/day, significant variation can occur between years and multiple years of sampling should occur. • Observational studies are to be completed and need to be done frequently during the migration period to estimate MUD. • MUD of >5000 **or** >3000 with the presence of Painted Ladies or Red Admiral's is to be considered significant. • Significant Wildlife Habitat Mitigation Support Tool Index #16 provides development effects and mitigation measures.	Study Area is not located within 5 km of Lake Ontario and thus this habitat function is not applicable.

Wildlife Habitat	Wildlife Species	Candidate SWH		Confirmed SWH	Assessment
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Landbird Migratory Stopover Areas **Rationale:** Sites with a high diversity of species as well as high numbers are most significant.	All migratory songbirds.: Canadian Wildlife Service Ontario website. All migrant raptor species: Ontario Ministry of Natural Resources: Fish and Wildlife Conservation Act, 1997. Schedule 7: Specially Protected Birds (Raptors)	All Ecosites associated with these ELC Community Series; 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 • Sites have a variety of habitats; forest, grassland and wetland complexes. • The largest sites are more significant • Woodlots and forest fragments are important habitats to migrating birds, these features located along the shore and located within 5km of Lake Ontario are Candidate SWH . Information Sources • Bird Studies Canada • Ontario Nature • Local birders and naturalist club • Ontario Important Bird Areas (IBA) Program	Studies confirm: • Use of the habitat by >200 birds/day and with >35 spp with at least 10 bird spp. recorded on at least 5 different survey dates. This abundance and diversity of migrant bird species is considered above average and significant. • Studies should be completed during spring (Apr./May) and fall (Aug/Oct) migration using standardized assessment techniques. Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects” • Significant Wildlife Habitat Mitigation Support Tool Index #9 provides development effects	Study Area is not located within 5 km of Lake Ontario and thus this habitat function is not applicable.

Wildlife Habitat	Wildlife Species	Candidate SWH		Confirmed SWH	Assessment
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Deer Yarding Areas **Rationale:** Winter habitat for deer is considered to be the main limiting factor for northern deer populations. In winter, deer congregate in “yards” to survive severe winter conditions. Deer yards typically have a long history of annual use by deer, yards typically represent 10-15% of an areas summer range.	White-tailed Deer	Note: OMNRF to determine this habitat. ELC Community Series providing a thermal cover component for a deer yard would include; FOM, FOC, SWM and SWC. Or these ELC Ecosites; CUP2 CUP3 FOD3 CUT	• Deer yarding areas or winter concentration areas (yards) are areas deer move to in response to the onset of winter snow and cold. This is a behavioural response and deer will establish traditional use areas. The yard is composed of two areas referred to as Stratum I and Stratum II. Stratum II covers the entire winter yard area and is usually a mixed or deciduous forest with plenty of browse available for food. Agricultural lands can also be included in this area. Deer move to these areas in early winter and generally, when snow depths reach 20 cm, most of the deer will have moved here. If the snow is light and fluffy, deer may continue to use this area until 30 cm snow depth. In mild winters, deer may remain in the Stratum II area the entire winter. • The Core of a deer yard (Stratum I) is located within the Stratum II area and is critical for deer survival in areas where winters become severe. It is primarily composed of coniferous trees (pine, hemlock, cedar, spruce) with a canopy cover of more than 60%. • OMNRF determines deer yards following methods outlined in “Selected Wildlife and Habitat Features: Inventory Manual" • Woodlots with high densities of deer due to artificial feeding are not significant.	No Studies Required: • Snow depth and temperature are the greatest influence on deer use of winter yards. Snow depths > 40cm for more than 60 days in a typically winter are minimum criteria for a deer yard to be considered as SWH. • Deer Yards are mapped by OMNRF District offices. Locations of Core or Stratum 1 and Stratum 2 Deer yards considered significant by OMNRF will be available at local MNRF offices or via Land Information Ontario (LIO). • Field investigations that record deer tracks in winter are done to confirm use (best done from an aircraft). Preferably, this is done over a series of winters to establish the boundary of the Stratum I and Stratum II yard in an "average" winter. MNRF will complete these field investigations. • If a SWH is determined for Deer Wintering Area or if a proposed development is within Stratum II yarding area then Movement Corridors are to be considered as outlined within this Schedule. • Significant Wildlife Habitat Mitigation Support Tool Index #2 provides development effects and mitigation measures.	**Based on available background information from Ontario GeoHub, deer wintering habitat (Stratum II) is mapped within the southern portion of the Study Area and south.** **Further discussion is provided in the NER.**

Wildlife Habitat	Wildlife Species	Candidate SWH		Confirmed SWH	Assessment
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Deer Winter Congregation Areas **Rationale:** Deer movement during winter in the southern areas of Ecoregion 6E are not constrained by snow depth, however deer will annually congregate in large numbers in suitable woodlands to reduce or avoid the impacts of winter conditions.	White-tailed Deer	All Forested Ecosites with these ELC Community Series; FOC FOM FOD SWC SWM SWD Conifer plantations much smaller than 50 ha may also be used.	• Woodlots will typically be >100 ha in size. Woodlots <100ha may be considered as significant based on MNRF studies or assessment. • Deer movement during winter in the southern areas of Ecoregion 6E are not constrained by snow depth, however deer will annually congregate in large numbers in suitable woodlands. • If deer are constrained by snow depth refer to the Deer Yarding Area habitat. • Large woodlots > 100ha and up to 1500 ha are known to be used annually by densities of deer that range from 0.1-1.5 deer/ha . • Woodlots with high densities of deer due to artificial feeding are not significant. Information Sources • MNRF District Offices • LIO/NRVIS	Studies confirm: • Deer management is an MNRF responsibility, deer winter congregation areas considered significant will be mapped by MNRF • Use of the woodlot by white-tailed deer will be determined by MNRF, all woodlots exceeding the area criteria are significant, unless determined not to be significant by MNRF • Studies should be completed during winter (Jan/Feb) when >20cm of snow is on the ground using aerial survey techniques, ground or road surveys. or a pellet count deer density survey. • If a SWH is determined for Deer Wintering Area or if a proposed development is within Stratum II yarding area then Movement Corridors are to be considered as outlined below. • Significant Wildlife Habitat Mitigation Support Tool Index #2 provides development effects and mitigation measures.	**Based on available background information from Ontario GeoHub, deer wintering habitat (Stratum II) is mapped within the southern portion of the Study Area and south.** **Further discussion is provided in the NER.**

Rare Vegetation Communities

Rare Vegetation Community	Candidate SWH			Confirmed SWH	Assessment
	ELC Ecosite Code	Habitat Description	Detailed Information and Sources	Defining Criteria	
Cliffs and Talus Slopes **Rationale:** Cliffs and Talus Slopes are extremely rare habitats in Ontario.	Any ELC Ecosite within Community Series: TAO TAS TAT CLO CLS CLT	A Cliff is vertical to near vertical bedrock >3m in height. A Talus Slope is rock rubble at the base of a cliff made up of coarse rocky debris	Most cliff and talus slopes occur along the Niagara Escarpment. Information Sources • The Niagara Escarpment Commission has detailed information on location of these habitats. • OMNRF District • Natural Heritage Information Center (NHIC) has location information available on their website • Field Naturalist clubs • Conservation Authorities	• Confirm any ELC Vegetation Type for Cliffs or Talus Slopes • Significant Wildlife Habitat Mitigation Support Tool Index #21 provides development effects and mitigation measures.	Habitat in the Study Area does not meet key criteria to be considered significant. No cliff and talus slopes are present in the area.
Sand Barren **Rationale;** Sand barrens are rare in Ontario and support rare species. Most Sand Barrens have been lost due to cottage development and forestry	ELC Ecosites: SBO1 SBS1 SBT1 Vegetation cover varies from patchy and barren to continuous meadow (SBO1), thicket-like (SBS1), or more closed and treed (SBT1). Tree cover always ≤ 60%	Sand Barrens typically are exposed sand, generally sparsely vegetated and caused by lack of moisture, periodic fires and erosion. Usually located within other types of natural habitat such as forest or savannah. Vegetation can vary from patchy and barren to tree covered, but less than 60%.	A sand barren area >0.5ha in size. Information Sources • OMNRF Districts. • Natural Heritage Information Center (NHIC) has location information available on their website. • Field Naturalist clubs • Conservation Authorities	• Confirm any ELC Vegetation Type for Sand Barrens • Site must not be dominated by exotic or introduced species (<50% vegetative cover are exotic sp.) • Significant Wildlife Habitat Mitigation Support Tool Index #20 provides development effects and mitigation measures.	Habitat in the Study Area does not meet key criteria to be considered significant. No sand barren sites are present in the area.

Rare Vegetation Community	**Candidate SWH**			**Confirmed SWH**	**Assessment**
	ELC Ecosite Code	**Habitat Description**	**Detailed Information and Sources**	**Defining Criteria**	
Alvar **Rationale;** Alvars are extremely rare habitats in Ecoregion 6E. Most alvars in Ontario are in Ecoregions 6E and 7E. Alvars in 6E are small and highly localized just north of the Palaeozoic-Precambrian contact.	ALO1 ALS1 ALT1 FOC1 FOC2 CUM2 CUS2 CUT2-1 CUW2 **Five Alvar Species:** 1) *Carex crawei* 2) *Panicum philadelphicum* 3) *Eleocharis compressa* 4) *Scutellaria parvula* 5) *Trichostema brachiatum* These indicator species are very specific to Alvars within Ecoregion 6E	An alvar is typically a level, mostly unfractured calcareous bedrock feature with a mosaic of rock pavements and bedrock overlain by a thin veneer of soil. The hydrology of alvars is complex, with alternating periods of inundation and drought. Vegetation cover varies from sparse lichen-moss associations to grasslands and shrublands and comprising a number of characteristic or indicator plants. Undisturbed alvars can be phyto- and zoogeographically diverse, supporting many uncommon or are relict plant and animal species. Vegetation cover varies from patchy to barren with a less than 60% tree cover	An Alvar site > 0.5 ha in size. Information Sources • Alvars of Ontario (2000), Federation of Ontario Naturalists. • Ontario Nature – Conserving Great Lakes Alvars. • Natural Heritage Information Center (NHIC) has location information available on their website • OMNRF Districts • Field Naturalist clubs. • Conservation Authorities.	• Field studies that identify four of the five Alvar Indicator Species at a Candidate Alvar site is Significant. • Site must not be dominated by exotic or introduced species (<50% vegetative cover are exotic sp.). • The alvar must be in excellent condition and fit in with surrounding landscape with few conflicting land uses • Significant Wildlife Habitat Mitigation Support Tool Index #17 provides development effects and mitigation measures.	**Ecosites associated with Alvar habitat in Ontario were identified on the subject property. For the purpose of this assessment, the habitat does not meet criteria to be considered significant. Four of the five indicator species were not identified in any of the alvar communities and there is a high percentage of non exotic/introduced species within the communities.** **Habitat in the Study Area does not meet key criteria to be considered significant.** **Notwithstanding, due to the rarity of Alvar habitat within Ontario, further considered is provided within the NER.**

Rare Vegetation Community	Candidate SWH			Confirmed SWH	Assessment
	ELC Ecosite Code	Habitat Description	Detailed Information and Sources	Defining Criteria	
Old Growth Forest **Rationale;** Due to historic logging practices, extensive old growth forest is rare in the Ecoregion. Interior habitat provided by old growth forests is required by many wildlife species.	Forest Community Series: FOD FOC FOM SWD SWC SWM	Old Growth forests are characterized by heavy mortality or turnover of over-storey trees resulting in a mosaic of gaps that encourage development of a multi-layered canopy and an abundance of snags and downed woody debris.	Woodland areas 30 ha or greater in size or with at least 10 ha interior habitat assuming 100 m buffer at edge of forest. Information Sources • OMNRF Forest Resource Inventory mapping • OMNRF Districts. • Field Naturalist clubs • Conservation Authorities • Sustainable Forestry Licence (SFL) companies will possibly know locations through field operations. • Municipal forestry departments	Field Studies will determine: • If dominant trees species of the are >140 years old, then the area containing these trees is SWH • The forested area containing the old growth characteristics will have experienced no recognizable forestry activities (cut stumps will not be present) • The area of forest ecosites combined or an eco-element within an ecosite that contains the old growth characteristics is the SWH. • Determine ELC vegetation types for the forest area containing the old growth characteristics • Significant Wildlife Habitat Mitigation Support Tool Index #23 provides development effects and mitigation measures.	One woodland feature within the south eastern portion of the Study Area and adjacent lands has been measured to be greater than 30 ha in size and contains over 10 ha of interior forest assuming a 100 m buffer at the edge of the forest. However, the woodland habitat is not considered to be old growth forest as the dominant trees within the Study Area are less than 140 years old and the woodland lacks the characteristics required to be considered old growth.
Savannah **Rationale:** Savannahs are extremely rare habitats in Ontario.	TPS1 TPS2 TPW1 TPW2 CUS2	A Savannah is a tallgrass prairie habitat that has tree cover between 25 – 60%.	No minimum size to site. Site must be restored or a natural site. Remnant sites such as railway right of ways are not considered to be SWH. Information Sources • Natural Heritage Information Center (NHIC) has location information available on their website • OMNRF Districts • Field Naturalist clubs. • Conservation Authorities.	Field studies confirm one or more of the Savannah indicator species listed in Appendix N should be present. Note: Savannah plant spp. list from Ecoregion 6E should be used. • Area of the ELC Ecosite is the SWH. • Site must not be dominated by exotic or introduced species (<50% vegetative cover are exotic sp.). • Significant Wildlife Habitat Mitigation Support Tool Index #18 provides development effects and mitigation measures. •	Habitat in the Study Area does not meet key criteria to be considered significant. No savannah sites are present in the area.

Rare Vegetation Community	Candidate SWH			Confirmed SWH	Assessment
	ELC Ecosite Code	Habitat Description	Detailed Information and Sources	Defining Criteria	
Tallgrass Prairie **Rationale:** Tallgrass Prairies are extremely rare habitats in Ontario.	TPO1 TPO2	A Tallgrass Prairie has ground cover dominated by prairie grasses. An open Tallgrass Prairie habitat has < 25% tree cover.	No minimum size to site. Site must be restored or a natural site. Remnant sites such as railway right of ways are not considered to be SWH. Information Sources • Natural Heritage Information Center (NHIC) has location information available on their website • OMNRF Districts • Field Naturalist clubs. • Conservation Authorities.	Field studies confirm one or more of the Prairie indicator species listed in Appendix N should be present. Note: Prairie plant spp. list from Ecoregion 6E should be used • Area of the ELC Ecosite is the SWH. • Site must not be dominated by exotic or introduced species (<50% vegetative cover are exotic sp.). • Significant Wildlife Habitat Mitigation Support Tool Index #19 provides development effects and mitigation measures.	Habitat in the Study Area does not meet key criteria to be considered significant. There are no tallgrass prairie sites within the area.
Other Rare Vegetation Communities **Rationale:** Plant communities that often contain rare species which depend on the habitat for survival.	Provincially Rare S1, S2 and S3 vegetation communities are listed in Appendix M of the Significant Wildlife Habitat Technical Guide. Any ELC Ecosite Code that has a possible ELC Vegetation Type that is Provincially Rare is Candidate SWH.	Rare Vegetation Communities may include beaches, fens, forest, marsh, barrens, dunes and swamps.	ELC Ecosite codes that have the potential to be a rare ELC Vegetation Type as outlined in appendix M The OMNRF/NHIC will have up to date listing for rare vegetation communities. Information Sources • Natural Heritage Information Center (NHIC) has location information available on their website • OMNRF Districts • Field Naturalist clubs. • Conservation Authorities.	Field studies should confirm if an ELC Vegetation Type is a rare vegetation community based on listing within Appendix M of Significant Wildlife Habitat Technical Guide. • Area of the ELC Vegetation Type polygon is the SWH. • Significant Wildlife Habitat Mitigation Support Tool Index #37 provides development effects and mitigation measures.	No rare vegetation communities have been documented within the Study Area.

Specialized Habitat for Wildlife

Wildlife Habitat	Wildlife Species	Candidate SHW		Confirmed SWH	Assessment
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Waterfowl Nesting Area **Rationale;** Important to local waterfowl populations, sites with greatest number of species and highest number of individuals are significant.	American Black Duck Northern Pintail Northern Shoveler Gadwall Blue-winged Teal Green-winged Teal Wood Duck Hooded Merganser Mallard	All upland habitats located adjacent to these wetland ELC Ecosites are Candidate SWH: MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 SWT1 SWT2 SWD1 SWD2 SWD3 SWD4 Note: includes adjacency to Provincially Significant Wetlands	A waterfowl nesting area extends 120 m from a wetland (> 0.5 ha) or a wetland (>0.5ha) and any small wetlands (0.5ha) within 120m or a cluster of 3 or more small (<0.5 ha) wetlands within 120 m of each individual wetland where waterfowl nesting is known to occur. • Upland areas should be at least 120 m wide so that predators such as racoons, skunks, and foxes have difficulty finding nests. • Wood Ducks and Hooded Mergansers utilize large diameter trees (>40cm dbh) in woodlands for cavity nest sites. Information Sources • Ducks Unlimited staff may know the locations of particularly productive nesting sites. • OMNRF Wetland Evaluations for indication of significant waterfowl nesting habitat. • Reports and other information available from Conservation Authorities.	Studies confirmed: • Presence of 3 or more nesting pairs for listed species excluding Mallards, or; • Presence of 10 or more nesting pairs for listed species including Mallards. • Any active nesting site of an American Black Duck is considered significant. • Nesting studies should be completed during the spring breeding season (April - June). Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects” • A field study confirming waterfowl nesting habitat will determine the boundary of the waterfowl nesting habitat for the SWH, this may be greater or less than 120 m from the wetland and will provide enough habitat for waterfowl to successfully nest. • Significant Wildlife Habitat Technical Guide Index #25 provides development effects and mitigation measures.	Swamp and marsh wetland habitats are present in the Study area. Upland habitats of sufficient width are not present in the Study Area adjacent to the candidate SWH ecosites. None of the listed species were documented during breeding bird surveys, expect one Mallard pair. Waterfowl nesting area SWH is therefore not present in the Study Area.

Wildlife Habitat	Wildlife Species	Candidate SHW		Confirmed SWH	Assessment
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Bald Eagle and Osprey Nesting, Foraging and Perching Habitat **Rationale;** Nest sites are fairly uncommon in Eco-region 6E and are used annually by these species. Many suitable nesting locations may be lost due to increasing shoreline development pressures and scarcity of habitat.	Osprey **Special Concern** Bald Eagle	ELC Forest Community Series: FOD, FOM, FOC, SWD, SWM and SWC directly adjacent to riparian areas – rivers, lakes, ponds and wetlands	Nests are associated with lakes, ponds, rivers or wetlands along forested shorelines, islands, or on structures over water. • Osprey nests are usually at the top a tree whereas Bald Eagle nests are typically in super canopy trees in a notch within the tree's canopy. • Nests located on man-made objects are not to be included as SWH (e.g., telephone poles and constructed nesting platforms). Information Sources • Natural Heritage Information Center (NHIC) compiles all known nesting sites for Bald Eagles in Ontario. • MNRF values information (LIO/NRVIS) will list known nesting locations. Note: data from NRVIS is provided as a point and does not represent all the habitat. • Nature Counts, Ontario Nest Records Scheme data. • OMNRF Districts. • Check the Ontario Breeding Bird Atlas or Rare Breeding Birds in Ontario for species documented • Reports and other information available from Conservation Authorities. • Field Naturalists clubs	Studies confirm the use of these nests by: • One or more active Osprey or Bald Eagle nests in an area. • Some species have more than one nest in a given area and priority is given to the primary nest with alternate nests included within the area of the SWH. • For an Osprey, the active nest and a 300 m radius around the nest or the contiguous woodland stand is the SWH, maintaining undisturbed shorelines with large trees within this area is important. • For a Bald Eagle the active nest and a 400-800 m radius around the nest is the SWH. Area of the habitat from 400-800m is dependent on-site lines from the nest to the development and inclusion of perching and foraging habitat • To be significant a site must be used annually. When found inactive, the site must be known to be inactive for > 3 years or suspected of not being used for >5 years before being considered not significant. • Observational studies to determine nest site use, perching sites and foraging areas need to be done from mid March to mid August. • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects" • Significant Wildlife Habitat Technical Guide Index #26 provides development effects and mitigation measures	Ontario GeoHub (formerly LIO) mapping does not show any known nesting locations in the area. Forested habitat is present within the Study Area. No lakes, ponds or rivers in the Study Area. No Osprey or Bald Eagles were observed during breeding bird surveys. Bald Eagle and Osprey Nesting, Foraging and Perching SWH is therefore considered to be absent from the Study Area.

Wildlife Habitat	Wildlife Species	Candidate SHW		Confirmed SWH	Assessment
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Woodland Raptor Nesting Habitat **Rationale:** Nests sites for these species are rarely identified; these area sensitive habitats and are often used annually by these species.	Northern Goshawk Cooper's Hawk Sharp-shinned Hawk Red-shouldered Hawk Barred Owl Broad-winged Hawk	May be found in all forested ELC Ecosites. May also be found in SWC, SWM, SWD and CUP3	All natural or conifer plantation woodland/forest stands >30ha with >10ha of interior habitat. Interior habitat determined with a 200m buffer • Stick nests found in a variety of intermediate-aged to mature conifer, deciduous or mixed forests within tops or crotches of trees. Species such as Coopers hawk nest along forest edges sometimes on peninsulas or small off-shore islands. • In disturbed sites, nests may be used again, or a new nest will be in close proximity to old nest. Information Sources • OMNRF Districts. • Check the Ontario Breeding Bird Atlas or Rare Breeding Birds in Ontario for species documented. • Check data from Bird Studies Canada. • Reports and other information available from Conservation Authorities.	Studies confirm: • Presence of 1 or more active nests from species list is considered significant. • Red-shouldered Hawk and Northern Goshawk – A 400m radius around the nest or 28 ha area of habitat is the SWH (the 28ha habitat area would be applied where optimal habitat is irregularly shaped around the nest) • Barred Owl – A 200m radius around the nest is the SWH. • Broad-winged Hawk and Coopers Hawk– A 100m radius around the nest is the SWH. • Sharp-Shinned Hawk – A 50m radius around the nest is the SWH. • Conduct field investigations from mid-March to end of May. The use of call broadcasts can help in locating territorial (courting/nesting) raptors and facilitate the discovery of nests by narrowing down the search area. • Significant Wildlife Habitat Technical Guide Index #27 provides development effects and mitigation measures.	One woodland feature that is partially within the south-eastern portion of the Study Area has been measured to be greater than 30 ha in size, however with less than 10 ha of interior forest assuming a 200 m buffer at the edge of the forest. Red-shouldered Hawk was heard north of Donald Carricks Lane, off property to the north. Candidate Woodland Raptor Nesting Habitat SWH is not considered to be in the Study Area.

Wildlife Habitat	Wildlife Species	Candidate SHW		Confirmed SWH	Assessment
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Turtle Nesting Areas **Rationale;** These habitats are rare and when identified will often be the only breeding site for local populations of turtles.	Midland Painted Turtle Special Concern Species Northern Map Turtle Snapping Turtle	Exposed mineral soil (sand or gravel) areas adjacent (<100m) or within the following ELC Ecosites: MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 BOO1 FEO1	• Best nesting habitat for turtles are close to water and away from roads and sites less prone to loss of eggs by predation from skunks, raccoons or other animals. • For an area to function as a turtle-nesting area, it must provide sand and gravel that turtles are able to dig in and are located in open, sunny areas. Nesting areas on the sides of municipal or provincial road embankments and shoulders are not SWH. • Sand and gravel beaches adjacent to undisturbed shallow weedy areas of marshes, lakes, and rivers are most frequently used. Information Sources • Use Ontario Soil Survey reports and maps to help find suitable substrate for nesting turtles (well-drained sands and fine gravels). • Check the Ontario Herpetofaunal Summary Atlas records or other similar atlases for uncommon turtles; location information may help to find potential nesting habitat for them. • Natural Heritage Information Center (NHIC) • Field Naturalist clubs	Studies confirm: • Presence of 5 or more nesting Midland Painted Turtles • One or more Northern Map Turtle or Snapping Turtle nesting is a SWH. • The area or collection of sites within an area of exposed mineral soils where the turtles nest, plus a radius of 30-100m around the nesting area dependant on slope, riparian vegetation and adjacent land use is the SWH. • Travel routes from wetland to nesting area are to be considered within the SWH as part of the 30-100m area of habitat. • Field investigations should be conducted in prime nesting season typically late spring to early summer. Observational studies observing the turtles nesting is a recommended method. Significant Wildlife Habitat Technical Guide Index #28 provides development effects and mitigation measures for turtle nesting habitat.	No exposed mineral soil observed in the Study Area for turtle nesting. Nesting areas on the sides of municipal or provincial road embankments and shoulders are not SWH. Suitable turtle nesting areas SWH therefore not present in the Study Area.

Wildlife Habitat	Wildlife Species	Candidate SHW		Confirmed SWH	Assessment
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Seeps and Springs **Rationale;** Seeps/Springs are typical of headwater areas and are often at the source of coldwater streams.	Wild Turkey Ruffed Grouse Spruce Grouse White-tailed Deer Salamander spp.	Seeps/Springs are areas where ground water comes to the surface. Often they are found within headwater areas within forested habitats. Any forested Ecosite within the headwater areas of a stream could have seeps/springs.	Any forested area (with <25% meadow/field/pasture) within the headwaters of a stream or river system. • Seeps and springs are important feeding and drinking areas especially in the winter will typically support a variety of plant and animal species Information Sources • Topographical Map. • Thermography. • Hydrological surveys conducted by Conservation Authorities and Ministry of the Environment, Conservation and Parks. • Field Naturalists clubs and landowners. • Municipalities and Conservation Authorities may have drainage maps and headwater areas mapped.	Field Studies confirm: • Presence of a site with 2 or more seeps/springs should be considered SWH. • The area of an ELC forest ecosite or an ecoelement within ecosite containing the seeps/springs is the SWH. The protection of the recharge area considering the slope, vegetation, height of trees and groundwater condition need to be considered in delineation the habitat. • Significant Wildlife Habitat Technical Guide Index #30 provides development effects and mitigation measures	The property is not within a headwater of a stream of river system.

Wildlife Habitat	Wildlife Species	Candidate SHW		Confirmed SWH	Assessment
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Amphibian Breeding Habitat (Woodland). **Rationale:** These habitats are extremely important to amphibian biodiversity within a landscape and often represent the only breeding habitat for local amphibian populations	Eastern Newt Blue-spotted Salamander Spotted Salamander Gray Treefrog Spring Peeper Western Chorus Frog Wood Frog	All Ecosites associated with these ELC Community Series; FOC FOM FOD SWC SWM SWD Breeding pools within the woodland or the shortest distance from forest habitat are more significant because they are more likely to be used due to reduced risk to migrating amphibians	• Presence of a wetland, pond or woodland pool (including vernal pools) >500m2 (about 25m diameter) within or adjacent (within 120m) to a woodland (no minimum size). Some small wetlands may not be mapped and may be important breeding pools for amphibians. • Woodlands with permanent ponds or those containing water in most years until mid-July are more likely to be used as breeding habitat Information Sources • Ontario Herpetofaunal Summary Atlas (or other similar atlases) for records • Local landowners may also provide assistance as they may hear spring-time choruses of amphibians on their property. • OMNRF District. • OMNRF wetland evaluations • Field Naturalist clubs • Canadian Wildlife Service • Amphibian Road Call Survey • Ontario Vernal Pool Association: http://www.ontariovernalpools.org	Studies confirm; • Presence of breeding population of 1 or more of the listed newt/salamander species or 2 or more of the listed frog species with at least 20 individuals (adults or eggs masses) or 2 or more of the listed frog species with Call Level Codes of 3. • A combination of observational study and call count surveys will be required during the spring (March-June) when amphibians are concentrated around suitable breeding habitat within or near the woodland/wetlands. • The habitat is the wetland area plus a 230m radius of woodland area. If a wetland area is adjacent to a woodland, a travel corridor connecting the wetland to the woodland is to be included in the habitat. • Significant Wildlife Habitat Technical Guide Index #14 provides development effects and mitigation measures.	**Amphibian call surveys were conducted. American Toad, Gray Treefrog, Spring Peeper, Green Frog, and Northern Leopard Frog were recorded calling during the evening surveys.** **Five of the amphibian call survey stations recorded a full chorus (L3) of more than one species (i.e., Gray Treefrog, Spring Peeper, Green Frog), in addition to other species calling at lower numbers (L1 or L2).** **Further discussion is provided in the NER.**

Wildlife Habitat	Wildlife Species	Candidate SHW		Confirmed SWH	Assessment
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Amphibian Breeding Habitat (Wetlands) **Rationale;** Wetlands supporting breeding for these amphibian species are extremely important and fairly rare within Central Ontario landscapes.	Eastern Newt American Toad Spotted Salamander Four-toed Salamander Blue-spotted Salamander Gray Treefrog Western Chorus Frog Northern Leopard Frog Pickerel Frog Green Frog Mink Frog Bullfrog	ELC Community Classes SW, MA, FE, BO, OA and SA. Typically these wetland ecosites will be isolated (>120m) from woodland ecosites, however larger wetlands containing predominantly aquatic species (e.g. Bull Frog) may be adjacent to woodlands.	• Wetlands>500m2 (about 25m diameter), supporting high species diversity are significant; some small or ephemeral habitats may not be identified on MNRF mapping and could be important amphibian breeding habitats. • Presence of shrubs and logs increase significance of pond for some amphibian species because of available structure for calling, foraging, escape and concealment from predators. • Bullfrogs require permanent water bodies with abundant emergent vegetation. Information Sources • Ontario Herpetofaunal Summary Atlas (or other similar atlases) • Canadian Wildlife Service Amphibian Road Surveys and Backyard Amphibian Call Count. • OMNRF Districts and wetland evaluations • Reports and other information available from Conservation Authorities.	Studies confirm: • Presence of breeding population of 1 or more of the listed newt/salamander species or 2 or more of the listed frog/toad species with at least 20 individuals (adults or eggs masses) or 2 or more of the listed frog/toad species with Call Level Codes of 3. **or;** Wetland with confirmed breeding Bullfrogs are significant. • The ELC ecosite wetland area and the shoreline are the SWH. • A combination of observational study and call count surveys will be required during the spring (March-June) when amphibians are concentrated around suitable breeding habitat within or near the wetlands. • If a SWH is determined for Amphibian Breeding Habitat (Wetlands) then Movement Corridors are to be considered as outlined below. • Significant Wildlife Habitat Technical Guide Index #15 provides development effects and mitigation measures.	**Amphibian call surveys were conducted. American Toad, Gray Treefrog, Spring Peeper, Green Frog, and Northern Leopard Frog were recorded calling during the evening surveys.** **Five of the amphibian call survey stations recorded a full chorus (L3) of more than one species (i.e., Gray Treefrog, Spring Peeper, Green Frog), in addition to other species calling at lower numbers (L1 or L2).** **Further discussion is provided in the NER.**

Wildlife Habitat	Wildlife Species	Candidate SHW		Confirmed SWH	Assessment
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Woodland Area-Sensitive Bird Breeding Habitat **Rationale:** Large, natural blocks of mature woodland habitat within the settled areas of Southern Ontario are important habitats for area sensitive interior forest song 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:** Canada Warbler	All Ecosites associated with these ELC Community Series; FOC FOM FOD SWC SWM SWD	Habitats where interior forest breeding birds are breeding, typically large mature (>60 yrs old) forest stands or woodlots >30 ha, • Interior forest habitat is at least 200 m from forest edge habitat. Information Sources • Local bird clubs. • Canadian Wildlife Service (CWS) for the location of forest bird monitoring. • Bird Studies Canada conducted a 3-year study of 287 woodlands to determine the effects of forest fragmentation on forest birds and to determine what forests were of greatest value to interior species • Reports and other information available from Conservation Authorities.	Studies confirm: • Presence of nesting or breeding pairs of 3 or more of the listed wildlife species. • Note: any site with breeding Canada Warblers is to be considered SWH. • Conduct field investigations in spring and early summer when birds are singing and defending their territories. • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects" • Significant Wildlife Habitat Technical Guide Index #34 provides development effects and mitigation measures.	**5.6Yellow-bellied Sapsucker, Red-breasted Nuthatch, Veery, Black-throated Green Warbler, and Ovenbird were recorded on site.** **Further consideration provided in NER report.**

Habitat for Species of Conservation Concern (Not including Endangered or Threatened Species)

Wildlife Habitat	Wildlife Species	Candidate SHW		Confirmed SWH	Assessment
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Marsh Breeding Bird Habitat **Rationale;** Wetlands for these bird species are typically productive and fairly rare in Southern Ontario landscapes.	American Bittern Virginia Rail Sora Common Moorhen American Coot Pied-billed Grebe Marsh Wren Sedge Wren Common Loon Sandhill Crane Green Heron Trumpeter Swan **Special Concern:** Black Tern Yellow Rail	MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 SAS1 SAM1 SAF1 FEO1 BOO1 For Green Heron: All SW, MA and CUM1 sites.	• Nesting occurs in wetlands. • All wetland habitat is to be considered as long as there is shallow water with emergent aquatic vegetation present. • For Green Heron, habitat is at the edge of water such as sluggish streams, ponds and marshes sheltered by shrubs and trees. Less frequently, it may be found in upland shrubs or forest a considerable distance from water. Information Sources • OMNRF District and wetland evaluations. • Field Naturalist clubs • Natural Heritage Information Center (NHIC) Records. • Reports and other information available from Conservation Authorities. • Ontario Breeding Bird Atlas.	Studies confirm: • Presence of 5 or more nesting pairs of Sedge Wren or Marsh Wren or 1 pair of Sandhill Cranes; **or** breeding by any combination of 5 or more of the listed species. • Note: any wetland with breeding of 1 or more Black Terns, Trumpeter Swan, Green Heron or Yellow Rail is SWH. • Area of the ELC ecosite is the SWH. • Breeding surveys should be done in May/June when these species are actively nesting in wetland habitats. • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects" • Significant Wildlife Habitat Technical Guide Index #35 provides development effects and mitigation measures	NHIC does not list occurrence of marsh breeding bird nesting in the area. **The meadow marsh communities in the Study Area contained habitat required for this SWH (*i.e.* shallow water with emergent vegetation).** **Virginia Rail, Sora recorded on the property.** **Further discussion provided in the NER.**

Wildlife Habitat	Wildlife Species	Candidate SHW		Confirmed SWH	Assessment
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Open Country Bird Breeding Habitat **Rationale;** This wildlife habitat is declining throughout Ontario and North America. Species such as the Upland Sandpiper have declined significantly the past 40 years based on CWS (2004) trend records.	Upland Sandpiper Vesper Sparrow Northern Harrier Savannah Sparrow **Special Concern** Short-eared Owl Grasshopper Sparrow	CUM1 CUM2	Large grassland areas (includes natural and cultural fields and meadows) >30 ha • Grasslands not Class 1 or 2 agricultural lands, and not being actively used for farming (i.e. no row cropping or intensive hay or livestock pasturing in the last 5 years). • Grassland sites considered significant should have a history of longevity, either abandoned fields, mature hayfields and pasturelands that are at least 5 years or older. • The Indicator bird species are area sensitive requiring larger grassland areas than the common grassland species. Information Sources • Agricultural land classification maps, Ministry of Agriculture. • Local bird clubs. • Ontario Breeding Bird Atlas • Reports and other information available from Conservation Authorities.	Field Studies confirm: • Presence of nesting or breeding of 2 or more of the listed species. • A field with 1 or more breeding Short-eared Owls or Grasshopper Sparrow is to be considered SWH. • The area of SWH is the contiguous ELC ecosite field areas. • Conduct field investigations of the most likely areas in spring and early summer when birds are singing and defending their territories. • Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects” • Significant Wildlife Habitat Technical Guide Index #32 provides development effects and mitigation measures	The Study Area contains open uplands within the Study Area, however on the property it is a small area which would not be appropriate for this function. None of the listed species were documented during site surveys. Suitable open country bird breeding SWH therefore is not present in the Study Area.

Wildlife Habitat	Wildlife Species	Candidate SHW		Confirmed SWH	Assessment
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Shrub/Early Successional Bird Breeding Habitat **Rationale;** This wildlife habitat is declining throughout Ontario and North America. The Brown Thrasher has declined significantly over the past 40 years based on CWS (2004) trend records.	Indicator Spp: Brown Thrasher Clay-coloured Sparrow Common Spp. Field Sparrow Black-billed Cuckoo Eastern Towhee Willow Flycatcher **Special Concern:** Golden-winged Warbler	CUT1 CUT2 CUS1 CUS2 CUW1 CUW2 Patches of shrub ecosites can be complexed into a larger habitat for some bird species	Large field areas succeeding to shrub and thicket habitats>10ha in size. • Shrub land or early successional fields, not class 1 or 2 agricultural lands, not being actively used for farming (i.e. no row-cropping, haying or live-stock pasturing in the last 5 years). • Shrub thicket habitats (>10 ha) are most likely to support and sustain a diversity of these species. • Shrub and thicket habitat sites considered significant should have a history of longevity, either abandoned fields or pasturelands. Information Sources • Agricultural land classification maps, Ministry of Agriculture. • Local bird clubs. • Ontario Breeding Bird Atlas • Reports and other information available from Conservation Authorities.	Field Studies confirm: • Presence of nesting or breeding of 1 of the indicator species and at least 2 of the common species. • A habitat with breeding Golden-winged Warbler is to be considered as Significant Wildlife Habitat. • The area of the SWH is the contiguous ELC ecosite field/thicket area. • Conduct field investigations of the most likely areas in spring and early summer when birds are singing and defending their territories • Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects” • Significant Wildlife Habitat Technical Guide Index #33 provides development effects and mitigation measures.	No large shrub or thicket habitats within the Study Area; patches of shrub, thicket and woodlands are present. **Brown Thrasher, Field Sparrow, Eastern Towhee and Golden-winged Warbler recorded during breeding bird surveys.** **Further discussion on Shrub/early successional bird breeding SWH is provided in the NER.**

Wildlife Habitat	Wildlife Species	Candidate SHW		Confirmed SWH	Assessment
		ELC Ecosite Codes	**Habitat Criteria and Information Sources**	**Defining Criteria**	
Terrestrial Crayfish **Rationale:** Terrestrial Crayfish are only found within SW Ontario in Canada and their habitats are very rare.	Chimney or Digger Crayfish; (*Fallicambarus fodiens*) Devil Crayfish or Meadow Crayfish; (*Cambarus Diogenes*)	MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 MAS1 MAS2 MAS3 SWD SWT SWM CUM1 with inclusions of above meadow marsh or swamp ecosites can be used by terrestrial crayfish.	Wet meadow and edges of shallow marshes (no minimum size) should be surveyed for terrestrial crayfish. • Constructs burrows in marshes, mudflats, meadows, the ground can't be too moist. Can often be found far from water. • Both species are a semi-terrestrial burrower which spends most of its life within burrows consisting of a network of tunnels. Usually the soil is not too moist so that the tunnel is well formed. Information Sources • Information sources from "Conservation Status of Freshwater Crayfishes" by Dr. Premek Hamr for the WWF and CNF March 1998	Studies Confirm: • Presence of 1 or more individuals of species listed or their chimneys (burrows) in suitable meadow marsh, swamp or moist terrestrial sites • Area of ELC ecosite or an ecoelement area of meadow marsh or swamp within the larger ecosite area is the SWH. • Surveys should be done April to August in temporary or permanent water. Note the presence of burrows or chimneys are often the only indicator of presence, observance or collection of individuals is very difficult • Significant Wildlife Habitat Technical Guide Index #36 provides development effects and mitigation measures.	No evidence of terrestrial crayfish observed.
Special Concern and Rare Wildlife Species **Rationale:** These species are quite rare or have experienced significant population declines in Ontario.	All Special Concern and Provincially Rare (S1-S3, SH) plant and animal species. Lists of these species are tracked by the Natural Heritage Information Centre.	All plant and animal element occurrences (EO) within a 1 or 10km grid. Older element occurrences were recorded prior to GPS being available, therefore location information may lack accuracy	When an element occurrence is identified within a 1 or 10 km grid for a Special Concern or provincially Rare species; linking candidate habitat on the site needs to be completed to ELC Ecosites Information Sources • Natural Heritage Information Centre (NHIC) will have Special Concern and Provincially Rare (S1-S3, SH) species lists with element occurrences data. • NHIC Website "Get Information" : http://nhic.mnr.gov.on.ca • Ontario Breeding Bird Atlas • Expert advice should be sought as many of the rare spp. have little information available about their requirements.	Studies Confirm: • Assessment/inventory of the site for the identified special concern or rare species needs to be completed during the time of year when the species is present or easily identifiable. • The area of the habitat to the finest ELC scale that protects the habitat form and function is the SWH, this must be delineated through detailed field studies. The habitat needs be easily mapped and cover an important life stage component for a species e.g. specific nesting habitat or foraging habitat. • Significant Wildlife Habitat Technical Guide Index #37 provides development effects and mitigation measures.	**Further consideration provided in NER report.**

Animal Movement Corridors

Wildlife Habitat	Wildlife Species	Candidate SHW		Confirmed SWH	Assessment
		ELC Ecosite	Habitat Criteria and Information Sources	Defining Criteria	
Amphibian Movement Corridors **Rationale;** Movement corridors for amphibians moving from their terrestrial habitat to breeding habitat can be extremely important for local populations.	Eastern Newt American Toad Spotted Salamander Four-toed Salamander Blue-spotted Salamander Gray Treefrog Western Chorus Frog Northern Leopard Frog Pickerel Frog Green Frog Mink Frog Bullfrog	Corridors may be found in all ecosites associated with water. • Corridors will be determined based on identifying the significant breeding habitat for these species	Movement corridors between breeding habitat and summer habitat. • Movement corridors must be determined when Amphibian breeding habitat is confirmed as SWH (Amphibian Breeding Habitat –Wetland) Information Sources • MNRF District Office. • Natural Heritage Information Center (NHIC). • Reports and other information available from Conservation Authorities. • Field Naturalist Clubs.	• Field Studies must be conducted at the time of year when species are expected to be migrating or entering breeding sites. • Corridors should consist of native vegetation, with several layers of vegetation. • Corridors unbroken by roads, waterways or bodies, and undeveloped areas are most significant • Corridors should have at least 15m of vegetation on both sides of waterway or be up to 200m wide of woodland habitat and with gaps <20mcxlix . • Shorter corridors are more significant than longer corridors, however amphibians must be able to get to and from their summer and breeding habitat. • Significant Wildlife Habitat Technical Guide Index #40 provides development effects and mitigation measures	**Consideration of amphibian breeding habitat and movement corridors is provided in the NER.**

Wildlife Habitat	Wildlife Species	Candidate SHW		Confirmed SHW	Assessment
		ELC Ecosite	Habitat Criteria and Information Sources	Defining Criteria	
Deer Movement Corridors **Rationale:** Corridors important for all species to be able to access seasonally important life-cycle habitats or to access new habitat for dispersing individuals by minimizing their vulnerability while travelling.	White-tailed Deer	Corridors may be found in all forested ecosites. A Project Proposal in Stratum II Deer Wintering Area has potential to contain corridors.	Movement corridor must be determined when Deer Wintering Habitat is confirmed as SWH • A deer wintering habitat identified by the OMNRF as will have corridors that the deer use during fall migration and spring dispersion. • Corridors typically follow riparian areas, woodlots, areas of physical geography (ravines, or ridges). Information Sources • MNRF District Office. • Natural Heritage Information Center (NHIC). • Reports and other information available from Conservation Authorities. • Field Naturalist Clubs.	• Studies must be conducted at the time of year when deer are migrating or moving to and from winter concentration areas. • Corridors that lead to a deer wintering habitat should be unbroken by roads and residential areas. • Corridors should be at least 200m wide with gaps <20m and if following riparian area with at least 15m of vegetation on both sides of waterway. • Shorter corridors are more significant than longer corridors. • Significant Wildlife Habitat Technical Guide Index #39 provides development effects and mitigation measures	**Based on available background information from Ontario GeoHub, deer wintering habitat (Stratum II) is mapped within the southern portion of the Study Area and south.** **Further discussion on wintering habitat and movement is provided in the NER.**

Exceptions for Ecoregion 6E

EcoDistrict	Wildlife Habitat and Species	Candidate			Confirmed SWH	Assessment
		Ecosites	Habitat Description	Habitat Criteria and Information	Defining Criteria	
6E-14 **Rationale:** The Bruce Peninsula has an isolated and distinct population of black bears. Maintenance of large woodland tracts with mast-producing tree species is important for bears.	**Mast Producing Areas** Black Bear	All Forested habitat represented by ELC Community Series: FOM FOD	• Black bears require forested habitat that provides cover, winter hibernation sites, and mast-producing tree species. • Forested habitats need to be large enough to provide cover and protection for black bears	Woodland ecosites >30ha with mast-producing tree species, either soft (cherry) or hard (oak and beech), Information Sources Important forest habitat for black bears may be identified by OMNRF.	All woodlands > 30ha with a 50%composition of these ELC Vegetation Types are considered significant: FOM1-1 FOM2-1 FOM3-1 FOD1-1 FOD1-2 FOD2-1 FOD2-2 FOD2-3 FOD2-4 FOD4-1 FOD5-2 FOD5-3 FOD5-7 FOD6-5 Significant Wildlife Habitat Technical Guide Index #3 provides development effects and mitigation measures.	Not applicable, study area is not located on the Bruce Peninsula.

EcoDistrict	Wildlife Habitat and Species	Candidate			Confirmed SWH	Assessment
		Ecosites	Habitat Description	Habitat Criteria and Information	Defining Criteria	
6E- 17 **Rationale:** Sharp-tailed grouse only occur on Manitoulin Island in Eco-region 6E, Leks are an important habitat to maintain their population	**Lek** **Sharp-tailed Grouse**	CUM CUS CUT	• The lek or dancing ground consists of bare, grassy or sparse shrubland. There is often a hill or rise in topography. • Leks are typically a grassy field/meadow >15ha with adjacent shrublands and >30ha with adjacent deciduous woodland. Conifer trees within 500m are not tolerated.	Grasslands (field/meadow) are to be >15ha when adjacent to shrubland and >30ha when adjacent to deciduous woodland. • Grasslands are to be undisturbed with low intensities of agriculture (light grazing or late haying) • Leks will be used annually if not destroyed by cultivation or invasion by woody plants or tree planting Information Sources • OMNRF district office • Bird watching clubs • Local landowners • Ontario Breeding Bird Atlas	Studies confirming lek habitat are to be completed from late March to June. • Any site confirmed with sharp-tailed grouse courtship activities is considered significant • The field/meadow ELC ecosites plus a 200 m radius area with shrub or deciduous woodland is the lek habitat • Significant Wildlife Habitat Technical Guide Index #32 provides development effects and mitigation measures	Not applicable, study area is not located on Manitoulin Island.

APPENDIX H

Species at Risk Assessment

BIRKS

NATURAL HERITAGE CONSULTANTS

Species at Risk Assessment (Threatened and Endangered Species protected under Section 16 of the SCA, 2025 and Schedule 1 of the SARA).

Common Name	Scientific Name	Provincial Designation (SCA)[1]	Federal Designation (SARA)[1]	Habitat Requirements	Background Records Available	Do Background Records Suggest Potential Presence in Study Area?	Habitat Affinities Present Within Study Area	Potential for Impacts to Species or Habitat
Amphibians and Reptiles								
Blanding's Turtle	*Emydoidea blandingii*	Threatened	Endangered Great Lakes / St. Lawrence population	Shallow lakes, ponds and wetlands with mucky soft bottoms.	ORAA Squares 17PK45, 17PK44 NHIC 1 km grid data report and NHIC Information Request	**Yes** - ORAA records in squares 17PK45 and 17PK44. **No** - NHIC data does not Identify the species in the Study Area.	**Yes** – habitats within the property and Study Area represent suitable habitat conditions for the species.	**Yes** – An observation of one individual was reported to Birks NHC, within the WU-4 unit. The proposed limit of extraction will require the relocation of mapped watercourses and the loss of upland habitats. The proposed limit of extraction will include a 30 m setback to the mapped limit of wetland. **Consideration for potential impacts to habitat and species provided within NER.**
Eastern Hog-nosed Snake	*Heterodon platirhinos*	Threatened	Threatened	Fields, forest, shrublands, beaches, old dune habitats. Open, sandy soils. Typically, Eastern Hog-nosed snakes prefer habitats that have loose sandy soil like beaches, and open forest cover, although they have also been found in many other habitat types which suggests that this snake may be able to thrive in many different habitats.	ORAA Squares 17PK45, 17PK44 NHIC 1 km grid data report and NHIC Information Request	**Yes** - ORAA records of this species from 1977 to 2019 in squares 17PK45 and 17PK44. **No** - NHIC data does not Identify the species in the Study Area.	**Yes** – habitats within the property and Study Area represent suitable habitat conditions for the species, including foraging, thermoregulation, overwintering, and nesting. The Study Area represents the species most northern territory/range.	**Yes** – the proposed limit of extraction will require the loss of potential marginal habitat features, should the species be present in this northern range. **Consideration for potential impacts to habitat and species provided within NER.**
Massasauga rattlesnake	*Sistrurus catenatus*	Threatened Great Lakes / St. Lawrence population	Threatened Great Lakes / St. Lawrence population	Populations in Great Lakes/St. Lawrence are concentrated in the upper Bruce Peninsula and east side of Georgian Bay. Massasaugas require semi-open habitat to provide both cover and opportunities for thermoregulation. In Georgian Bay, Massasaugas use a mosaic of bedrock barrens, conifer swamps, beaver meadows, fens, bogs, and shoreline habitats.	ORAA Squares 17PK45, 17PK44 NHIC 1 km grid data report and NHIC Information Request	**No** - ORAA does not have known records in the Study Area. Adjacent square 17PK35 has a historical record from 1984. **No** - NHIC data does not identify the species in the Study Area.	**No** – this population is highly restricted to Georgian Bay shoreline and islands. The lack of background records for this species is representative of its historical range, not the current range of the species.	**No** – species not expected to occur within the Study Area. **No further consideration required.**
Western Chorus Frog	*Pseudacris triseriata*	Not Listed	Threatened Great Lakes / St. Lawrence – Canadian Shield population	This species of frog inhabits forest openings around woodland ponds but can also be found in or near damp meadows, marshes, bottomland swamps and temporary ponds in open country, or even urban areas. This frog breeds in almost any fishless pond with at least 10 centimetres of water. The western chorus frog overwinters underground or under surface cover, such as fallen logs.	ORAA Squares 17PK45, 17PK44 NHIC 1 km grid data report and NHIC Information Request	**Yes** – ORAA records of the species from 2018 to 2000 in squares 17PK45 and 17PK44. **No** – NHIC data does not identified the species in the Study Area.	**Yes** – wetland habitats within the property and Study Area represent suitable habitat conditions for the species.	Species not identified during Birks NHC evening amphibian call surveys. Species is not afforded habitat protection under the federal SARA on private lands. **No further consideration required.**
Birds								
Bank Swallow	*Riparia riparia*	Not Listed	Threatened	It nests in a wide variety of naturally and anthropogenically created vertical banks, which often erode and change over time; many nests are in active or former aggregate pits.	OBBA 2nd Atlas Squares 17PK45, 17PK44 NHIC 1 km grid data report and NHIC Information Request	**Yes –** OBBA records indicate confirmed breeding for the species (58%) **No** – NHIC data does not identified the species in the Study Area.	**No** – the property does not contain any suitable features to support nesting for the species. Manmade vertical banks are absent from the study area.	**No** – species not expected to occur within the Study Area. Species not identified during 2024 dawn breeding bird surveys. **No further consideration required.**
Chimney Swift	*Chaetura pelagica*	Not Listed	Threatened	Chimney Swift is highly specialized in its habitat requirements, requiring vertical cavities for roosting and nesting. Prior to European settlement, the species predominantly used large hollow trees for nesting and roosting. However, the species readily adapted to the creation of artificial structures, and now primarily uses chimneys for nesting and roosting.	OBBA 2nd Atlas Squares 17PK45, 17PK44 NHIC 1 km grid data report and NHIC Information Request	**Yes –** OBBA records indicate probable breeding for the species (32%) **No** – NHIC data does not identified the species in the Study Area.	**No** – the property does not contain any suitable features to support nesting/roosting for the species. Manmade vertical cavities are absent from the Study Area.	**No** – species not expected to occur within the study area. Species not identified during 2024 dawn breeding bird surveys. **No further consideration required.**
Eastern Meadowlark	*Sturnella magna*	Not Listed	Threatened	Primarily tall native grasslands, such as pastures, savannahs and hayfields. Non-native pastures, hayfields, weedy meadows. Large tracts of open area are preferred over smaller fragments.	OBBA 2nd Atlas Squares 17PK45, 17PK44 NHIC 1 km grid data report and NHIC Information Request	**Yes –** OBBA records indicate confirmed breeding for the species (83%) **No** – NHIC data does not identified the species in the Study Area.	**Yes** – open alvar habitat on the property and adjacent lands to the north represents suitable habitat for the species.	**No** – although suitable habitats are present on the property, species specific surveys did not identify the species. Future establishment of the species in the Study Area may occur and as such the species is further considered in the NER report. **Consideration for potential impacts to habitat and species provided within NER.**
Bobolink	*Dolichonyx oryzivorus*	Not Listed	Threatened	Common in areas of agricultural grasslands such as hay and pasture farm fields but are also found in other open areas.	OBBA 2nd Atlas Square 17PK45, 17PK44 NHIC 1 km grid data report and NHIC Information Request	**Yes –** OBBA records indicate confirmed breeding for the species (83%) **No** – NHIC data does not identified the species in the Study Area.	**Yes** – open alvar habitat on the property and adjacent lands to the north represents suitable habitat for the species.	**No** – although suitable habitats are present on the property, species specific surveys did not identify the species. Future establishment of the species in the Study Area may occur and as such the species is further considered in the NER report.

Species at Risk Assessment (Threatened and Endangered Species protected under Section 16 of the SCA, 2025 and Schedule 1 of the SARA).

Common Name	Scientific Name	Provincial Designation (SCA)[1]	Federal Designation (SARA)[1]	Habitat Requirements	Background Records Available	Do Background Records Suggest Potential Presence in Study Area?	Habitat Affinities Present Within Study Area	Potential for Impacts to Species or Habitat
								Consideration for potential impacts to habitat and species provided within NER.
Cerulean Warbler	*Setophaga cerulea*	Not Listed	Endangered	Cerulean Warblers spend their summers (breeding seasons) in mature, deciduous forests with large, tall trees and an open under storey.	OBBA 2nd Atlas Square 17PK45, 17PK44 NHIC 1 km grid data report and NHIC Information Request	**No** – OBBA 2nd Atlas does not identify the species within the Study Area. **No** – NHIC data does not identified the species in the Study Area.	**Yes** – forest communities within the property may represent suitable habitat for the species.	**No** – although suitable habitats are present on the property, species not identified during 2024 dawn breeding bird surveys. **No further consideration required.**
Least Bittern	*Ixobrychus exilis*	Not Listed	Threatened	In Ontario, the Least bittern is found in a variety of wetland habitats, but strongly prefers cattail marshes with a mix of open pools and channels.	OBBA 2nd Atlas Square 17PK45, 17PK44 NHIC 1 km grid data report and NHIC Information Request	**Yes –** OBBA records indicate possible breeding for the species (23%) **No** – NHIC data does not identified the species in the Study Area.	**No** – wetland habitat within the property are predominately swamps. Marsh wetlands are largely dominated by sedges and not representative of key habitat for the species.	**No –** species not expected to occur within the study area. Species not identified during 2024 evening surveys. **No further consideration required.**
Louisiana Waterthrush	*Parkesia motacilla*	Not Listed	Threatened	The Louisiana waterthrush is usually found in steep, forested ravines with fast-flowing streams. Although it prefers running water, especially clear, coldwater streams, it also less frequently inhabits heavily wooded, deciduous swamps having large pools of open water. It nests among the roots of fallen trees, in niches of stream banks, and in or under mossy logs.	OBBA 2nd Atlas Square 17PK45, 17PK44 NHIC 1 km grid data report and NHIC Information Request	**No–** OBBA does not have any records of this species in the area (atlas squares 17TPK45, 17TPK44); only reported in 4% of the survey squares in Simcoe Region. **No** – NHIC data does not identified the species in the Study Area.	**Yes** – forest communities within the property may represent suitable habitat for the species.	**No** – although suitable habitats are present on the property, species not identified during 2024 dawn breeding bird surveys. **No further consideration required.**
Loggerhead Shrike (Carden Population)	*Lanius ludovicianus*	Not Listed	Endangered 'Eastern subspecies'	In Ontario, the Loggerhead shrike prefers pasture or other grasslands with scattered low trees and shrubs. It lives in fields or alvars (areas of exposed bedrock) with short grass, which makes it easier to spot prey. It builds its nest in small trees or shrubs and hunts by waiting patiently in tree branches until it swoops down and attacks its unsuspecting prey – usually large insects, such as grasshoppers. Loggerhead shrikes also require spiny, multi-branched shrubs where they can impale prey before eating it. Barbed wired fencing can also be used for this.	OBBA 2nd Atlas Square 17PK45, 17PK44 NHIC 1 km grid data report and NHIC Information Request	**No** – OBBA 2nd Atlas does not identify the species within the Study Area. **Yes –** element occurrence is reported for NHIC grid square 17PK4049. NHIC data Provincially Tracked Species Observation (PTSObs) for 1988 record along western property limit.	**Yes** – open alvar habitats on the property represent marginal habitat for the species. Overall, alvar habitats on the property are small and lack the abundance of hawthorn shrubs typically associated with the species.	**No** – although suitable habitats are present on the property, species specific surveys did not identify the species. Future establishment of the species in the Study Area may occur and as such the species is further considered in the NER report. **Consideration for potential impacts to habitat and species provided within NER.**
Red-headed Woodpecker	*Melanerpes erythrocephalus*	Not Listed	Endangered	Considered generalist omnivores, feeding on a variety of plants, insects and even small vertebrates, and showing flexibility in habitat selection. However, they are cavity-nesters. As such, they rely on an abundance of dead older wood to excavate nests.	OBBA 2nd Atlas Square 17PK45, 17PK44 NHIC 1 km grid data report and NHIC Information Request	**No** – OBBA 2nd Atlas does not identify the species within the Study Area. **No** – NHIC data does not identified the species in the Study Area.	**Yes** – although forest communities within the property were documented to contain cavity trees, they were not in an abundance that is typically associated with the species.	**No** – although suitable habitats are present on the property, species not identified during 2024 dawn breeding bird surveys. **No further consideration required.**
Wood Thrush	*Hylocichla mustelina*	Not Listed	Threatened	Lives in mature deciduous and mixed (conifer-deciduous) forests. They seek moist stands of trees with well-developed undergrowth and tall trees for singing perches. These birds prefer large forests but will also use smaller stands of trees. They build their nests in living saplings, trees or shrubs, usually in sugar maple or American beech.	OBBA 2nd Atlas Square 17PK45, 17PK44 NHIC 1 km grid data report and NHIC Information Request	**Yes** – probable breeding reported in OBBA squares 17PK45, 17PK44. **Yes** – element occurrence reported for NHIC squares 17PK4050, 17PK4049, and 17PK4149. NHIC data Provincially Tracked Species Observation (PTSObs) 2004 record at southwestern portion of the Study Area.	**Yes** – forest communities within the property may represent suitable habitat for the species.	**No** – although suitable habitats are present on the property, species not identified during 2024 dawn breeding bird surveys. **No further consideration required.**
Golden-winged Warbler	*Vermivora chrysoptera*	Not Listed	Threatened	Golden-winged Warblers tend to nest in groups of up to ten pairs of breeding birds and often return to the same areas to nest year after year. This species prefers to nest in areas with young shrubs surrounded by mature forest – areas that have recently been disturbed, such as field edges, hydro or utility right-of-ways, and logged areas.	OBBA 2nd Atlas Square 17PK45, 17PK44 NHIC 1 km grid data report and NHIC Information Request	**Yes** – probable breeding reported in OBBA square 17TPK44 and confirmed breeding evidence in survey square 17TPK45. **Yes** – element occurrence is reported for NHIC grid square 17PK4050. However, NHIC Information Package does not Identify the Species in the Study Area.	**Yes** – the mix of open habitats (including rock barren/alvar), forest and woodland represents suitable habitat for this species.	Species recorded during Birks NHC 2024 breeding bird surveys. **Consideration for potential impacts to habitat and species provided within NER.**

Species at Risk Assessment (Threatened and Endangered Species protected under Section 16 of the SCA, 2025 and Schedule 1 of the SARA).

Common Name	Scientific Name	Provincial Designation (SCA)[1]	Federal Designation (SARA)[1]	Habitat Requirements	Background Records Available	Do Background Records Suggest Potential Presence in Study Area?	Habitat Affinities Present Within Study Area	Potential for Impacts to Species or Habitat
Eastern Whip-poor-will	*Antrostomus vociferus*	Not Listed	Threatened	The Eastern Whip-poor-will is a medium sized bird usually found in areas with a mix of open and forested areas. Nesting habitat can include young woodlands, rock or sand barrens with scattered trees, and sparse plantations of coniferous trees.	OBBA 2nd Atlas Square 17PK45, 17PK44 NHIC 1 km grid data report and NHIC Information Request	**Yes** – probable breeding reported in OBBA squares 17TPK44 and 17TPK45. **Yes** - occurrence records reported in NHIC squares 17PK4050, 17PK4150, and 17PK4049; NHIC data Provincially Tracked Species Observation (PTSObs) 2019 and 2020 records at northeastern, northwestern and southwestern portions of the Study Area.	**Yes** – the mix of open habitats (including rock barren/alvar), forest and woodland represents suitable habitat for this species.	Species recorded during Birks NHC 2024 breeding bird surveys. **Consideration for potential impacts to habitat and species provided within NER.**
Mammals								
Eastern Small-footed Myotis	*Myotis leibii*	Endangered	Not Listed	Roosts in rock outcrops, buildings, under bridges, in caves, mines or hollow trees. Hibernates in caves and abandoned mines.	No known background sources.	N/A	No suitable habitat features present within the study area.	**No** – species not expected to occur within the Study Area. Acoustic surveys did not identify the species. **No further consideration required.**
Little Brown Myotis	*Myotis lucifugus*	Endangered	Endangered	Known maternity habitat for Little Brown Myotis in Ontario consists primarily of buildings (NHIC 2019, Heaven 2018) or features associated with buildings, such as artificial roosting structures. However, natural roosting sites such as rock crevices, exfoliating tree bark, and cavities and crevices in trees are also known to provide maternity habitat. (Source: Humphrey, Christy and Heather Fotherby. 2019).	According to the Recovery Strategy for the species, the property is located within the known range for this species.	N/A	**Yes** – the deciduous and mixed forest communities within the property represent key habitat for the species. Wetlands and open habitats on the property may function as foraging habitat. No overwintering/hibernacula habitat on the property and Study Area.	**Yes** – loss of woodland habitat could constitute loss of roosting habitat. Species identified during acoustic surveys. **Consideration for potential impacts to habitat and species provided within NER.**
Northern Myotis	*Myotis septentrionalis*	Endangered	Endangered	Data on maternity habitat used by Northern Myotis in Ontario is generally lacking. Pregnant or lactating females have been confirmed in roosts in Ontario in one building and in one tree network in the province to date. (Source: Humphrey, Christy and Heather Fotherby. 2019).	According to the Recovery Strategy for the species, the property is located within the known range for this species.	N/A	**Yes** – the deciduous and mixed forest communities within the property represent key habitat for the species. Wetlands and open habitats on the property may function as foraging habitat. No overwintering/hibernacula habitat on the property and Study Area.	**Yes** – loss of woodland habitat could constitute loss of roosting habitat. Species ground (Myotis) identified during acoustic surveys. **Consideration for potential impacts to habitat and species provided within NER.**
Tri-colored Bat	*Perimyotis subflavus*	Endangered	Endangered	Maternity habitat for this species more poorly understood than habitat for Northern Myotis and Little Brown Myotis, but has been identified in the following features: - Dead leaf clusters in the shape of an umbrella, including dead leaf clusters belonging to broken branches, those formed by natural causes, and from the clusters of dead leaves and other material used in Eastern Gray Squirrel (Sciurus carolinensis) nests; - Dense clusters of live foliage; - Arboreal lichens or epiphytes; and - Buildings, including along outside walls beneath overhangs (e.g., porches, decks) and in garages, sheds and barns. (Source: Humphrey, Christy and Heather Fotherby. 2019).	According to the Recovery Strategy for the species, the property is not within the known range for this species.	N/A	**Yes** – the deciduous and mixed forest communities within the property represent key habitat for the species. Wetlands and open habitats on the property may function as foraging habitat. No overwintering/hibernacula habitat on the property and Study Area.	**No** – although suitable habitats are present on the property, species not identified during acoustic surveys. **No further consideration required.**
Eastern Red Bat	*Lasiurus borealis*	Endangered	Not Listed	Summer habitat is characterized as foraging, drinking and roost sites which are primarily deciduous and coniferous forests of any age class. Roosting occurs among the foliage of trees and occasionally shrubs but tend to be on large diameter and tall trees reaching or exceeding the height of the surrounding canopy (COSSARO 2024). Eastern Red Bats avoid conifer species when suitable deciduous species are present (COSEWIC 2024). Eastern Red Bat overwinter in the southern United States.	Eastern Red Bat's range spans most of Ontario and appears commonly on fatality data from wind energy facilities.	N/A	**Yes** – the deciduous and mixed forest communities within the property represent key habitat for the species. Wetlands and open habitats on the property may function as foraging habitat.	**Yes** – loss of woodland habitat could constitute loss of roosting habitat. Species identified during acoustic surveys. **Consideration for potential impacts to habitat and species provided within NER.**

Species at Risk Assessment (Threatened and Endangered Species protected under Section 16 of the SCA, 2025 and Schedule 1 of the SARA).

Common Name	Scientific Name	Provincial Designation (SCA)[1]	Federal Designation (SARA)[1]	Habitat Requirements	Background Records Available	Do Background Records Suggest Potential Presence in Study Area?	Habitat Affinities Present Within Study Area	Potential for Impacts to Species or Habitat
Hoary Bat	*Lasiurus cinereus*	Endangered	Not Listed	Similarly to Easten Red Bat, Hoary Bat using mostly treed habitats (coniferous or deciduous) for roosting or foraging, with a particularly strong dependence on trees as roosting sites (COSWEIC 2024). Trees used as maternity roosts by Hoary Bats and Eastern Red Bats tend to be large diameter and tall, reaching or exceeding the height of the surrounding canopy (COSEWIC 2024).	Hoary Bat is a wide-ranging species across North America and is considered among the widest ranging native terrestrial mammals in the Western Hemisphere (COSSARO 2024).	N/A	**Yes** – the deciduous and mixed forest communities within the property represent key habitat for the species. Wetlands and open habitats on the property may function as foraging habitat.	**Yes –** loss of woodland habitat could constitute loss of roosting habitat. Species identified during acoustic surveys. **Consideration for potential impacts to habitat and species provided within NER.**
Silver-haired Bat	*Lasionycteris noctivagans*	Endangered	Not Listed	Roosting by Silver-haired Bats occurs primarily under bark and in the cavities of trees, making them reliant on habitats where large, decaying trees are available. Silver-haired Bats roost in a variety of large diameter coniferous and deciduous trees. Unlike lasiurines, where use of anthropogenic structures is rare, Silver-haired Bats may occasionally roost in or on buildings, especially during migration when natural roosting sites may be scarce.	The Silver-haired bat is widely distributed in North America, found from the northern boreal to the state of Tamaulipas, Mexico (COSSARO 2024).	N/A	**Yes –** loss of woodland habitat could constitute loss of roosting habitat. Species identified during acoustic surveys. **Consideration for potential impacts to habitat and species provided within NER.**	**Yes –** loss of woodland habitat could constitute loss of roosting habitat. Species identified during acoustic surveys. **Consideration for potential impacts to habitat and species provided within NER.**
Plants								
Butternut	*Juglans cinerea*	Endangered	Endangered	In Ontario, Butternut usually grows alone or in small groups in deciduous forests. It prefers moist, well-drained soil and is often found along streams. It is also found on well-drained gravel sites and rarely on dry rocky soil. This species does not do well in the shade, and often grows in sunny openings and near forest edges.	NHIC 1 km grid data report and NHIC Information Request	**No** – NHIC data does not identified the species in the Study Area. **Yes** - General known occurrences in Simcoe County.	**Yes** – open portions of the property contain suitable conditions for the species.	**No –** species not documented within the property during vegetation surveys. **No further consideration required.**
Black Ash	*Fraxinus nigra*	Endangered	Not Listed	Black Ash is a facultative wetland species that occurs in moist bottomland habitats such as swamps, fens, floodplain forests and shorelines. It is most commonly found and grows best in well-aerated flooded areas. It occasionally occurs in upland habitats, but upland occurrences are typically in depressions or other moist microsites.	NHIC 1 km grid data report and NHIC Information Request	**No** – NHIC data does not identified the species in the Study Area. **Yes** - General known occurrences in Simcoe County.	**Yes** – swamp habitats within the property are suitable to support this species.	**No –** although species was confirmed in the SWDM3-2 wetland community, no development is proposed within 30 m of the delineated wetland limit. **No further consideration required.**

[1] Designation Status

Provincial Designation – Protected Species in Ontario List, Ontario Regulation 60/26 under *Species Conservation Act*, 2025

Federal Designation – List of Wildlife Species at Risk, Schedule 1 under *Species at Risk Act*, 2002

APPENDIX I

Terrestrial Photographic Appendix

BIRKS

NATURAL HERITAGE CONSULTANTS

Photograph 1. Entrance to Property. Disturbed Lands from past Aggregate Exploration Activities

Photograph 2. RBSA1-1 Vegetation Community with FOCS2-2 Community in Background

Photograph 3. RBSA1-1 Vegetation Community with Karst Pavement. FOCS2-2 Community in Background.

Photograph 4. MAMM1-9 Wetland Community. FOCS2-2 Community in Background.

Photograph 5. FOCS2-2 Vegetation Community

Photograph 6. FOMM4-2 Vegetation Community

Photograph 7. Spring Flooding in FOCS2-2 Vegetation Community

Photograph 8. FODR2-1 Vegetation Community

Photograph 9. Snake Activity/Emergence (Eastern Gartersnake) Observed in FODR2-1 Vegetation Community in Spring 2024

Photograph 10. Snake Activity/Emergence (Eastern Ribbonsnake) Observed in FODR2-1 Vegetation Community in Spring 2025

Photograph 11. SWMM1-1 Wetland Vegetation Community with Beaver Activity

Photograph 12. SWCM1-1 Wetland Vegetation Community with Beaver Activity

Photograph 13. SWTM1-1 Wetland Vegetation Community with Defined Channel

Photograph 14. SWDM3-2 Wetland vegetation Community

Photograph 15. Defined Channel in WOMM1-1 Vegetation Community

Photograph 16. Spring Flooding in RBTA1-6 Vegetation Community

Photograph 17. MASR1-1 Wetland Vegetation Community with Scarlet Paintbrush, Common Woolly Bulrush, and Balsam Groundsel

Photograph 18. RBSA1-1 Vegetation Community with WOMM1-1 and FODR2-1 Vegetation Communities in Background

Photograph 19. MASR1-1 Wetland Vegetation Community with Spring overland flow

Photograph 20. Beaver Pond/SAF_1-3 Wetland Vegetation Community

Photograph 21. Channelled watercourse flowing into karst from south

Photograph 22. Re-emergence of watercourse following underground flow

Photograph 23. Channelled watercourse flowing through WOMM1-1 Vegetation Community

Photograph 24. Watercourse entering karst

APPENDIX J

Dawn Breeding Bird Data

Dawn Breeding Bird Data

			Survey Station																				Conservation Rank			
Family	Scientific Name	English Common Name	1	2	3	4	5	6	7	8	9	10	11	12	13	14	16	17	18	19	20	Incidental	Breeding Evidence	National N-rank	Provincial S-rank	Provincial Endangered Species Act	Federal Species at Risk Act
Tyrannidae	*Empidonax alnorum*	Alder Flycatcher															S^A						Possible	N5B	S5B	NAR	NAR
Corvidae	*Corvus brachyrhynchos*	American Crow		H	H^B	C^A/FO^A	H^B	H^B	H^A	H^B	H^B	H^B	C^A	C^A			H^B		H^A	C^B	H		Possible	N5B,N5N	S5	NAR	NAR
Fringillidae	*Spinus tristis*	American Goldfinch	S^B	S^B			S^B					S^A	C^A		H^B			S^B	T				Probable	N5B,N5N	S5	NAR	NAR
Parulidae	*Setophaga ruticilla*	American Redstart		T			S^A			S^B					S^A				S^B		T		Probable	N5B	S5B	NAR	NAR
Turdidae	*Turdus migratorius*	American Robin	S^A		S^A	H				S^B					H^B		T		S^B				Probable	N5B,N5N	S5	NAR	NAR
Scolopacidae	*Scolopax minor*	American Woodcock											H^B										Possible	N5B	S4B	NAR	NAR
Icteridae	*Icterus galbula*	Baltimore Oriole											S^B		S^B			H^B					Possible	N5B	S4B	NAR	NAR
Hirundinidae	***Hirundo rustica***	**Barn Swallow**											$\mathbf{FO^B}$										**Observed**	**N4N5B**	**S4B**	**SC**	**THR**
Parulidae	*Setophaga castanea*	Bay-breasted Warbler											S^B										Possible	N5B	S5B	NAR	NAR
Alcedinidae	*Megaceryle alcyon*	Belted Kingfisher								FO^A								H^A					Possible	N5B,N4N	S5B,S4N	NAR	NAR
Parulidae	*Mniotilta varia*	Black-and-white Warbler			S^B			S^A			S^A	S^A	S^A				T			S^A	S^A		Probable	N5B	S5B	NAR	NAR
Paridae	*Poecile atricapillus*	Black-capped Chickadee					S^B								C^A,H^A	T		H^A	S^B		H		Probable	N5	S5	NAR	NAR
Parulidae	*Setophaga virens*	Black-throated Green Warbler			T	T																	Probable	N5B	S5B	NAR	NAR
Corvidae	*Cyanocitta cristata*	Blue Jay						H^B		C^A/A^A	S^B				H^B	H				C	H^B		Probable	N5	S5	NAR	NAR
Certhiidae	*Certhia americana*	Brown Creeper												S^A							S^B		Possible	N5B,N5N	S5	NAR	NAR
Mimidae	*Toxostoma rufum*	Brown Thrasher	T	S^A			H^B	S^A		S^B													Probable	N5B	S4B	NAR	NAR
Icteridae	*Molothrus ater*	Brown-headed Cowbird									S^A												Possible	N5B,N5N	S5	NAR	NAR
Anatidae	*Branta canadensis*	Canada Goose	FO^A																				Observed	N5B,N5N	S5	NAR	NAR
Bombycillidae	*Bombycilla cedrorum*	Cedar Waxwing		H^A												H^B							Possible	N5B,N5N	S5	NAR	NAR
Parulidae	*Setophaga pensylvanica*	Chestnut-sided Warbler		S^B	S^A	S^A	T		T			T		S^B	S^B					S^B			Probable	N5B	S5B	NAR	NAR
Passerellidae	*Spizella passerina*	Chipping Sparrow	S^A				S^A		S^A					S^A									Possible	N5B	S5B,S3N	NAR	NAR
Icteridae	*Quiscalus quiscula*	Common Grackle	S^B					H^B			S^B				H^B			T	FO^B	H^A			Probable	N5B,N5N	S5	NAR	NAR
Caprimulgidae	***Chordeiles minor***	**Common Nighthawk**																				**X**	**Observed**	**N4N5B,N5M**	**S4B**	**SC**	**SC**
Corvidae	*Corvus corax*	Common Raven																				X	Observed	N5	S5	NAR	NAR
Parulidae	*Geothlypis trichas*	Common Yellowthroat	S^A										T	T	S^A	S^A	T	S^B	T	S^B			Probable	N5B,N3N	S5B,S3N	NAR	NAR
Picidae	*Dryobates pubescens*	Downy Woodpecker																		C^A			Possible	N5	S5	NAR	NAR
Tyrannidae	*Tyrannus tyrannus*	Eastern Kingbird					H^B						H							$C/H^A/P^A$	S^B		Probable	N5B	S4B	NAR	NAR
Tyrannidae	*Sayornis phoebe*	Eastern Phoebe			T																		Probable	N5B	S5B	NAR	NAR
Passerellidae	*Pipilo erythrophthalmus*	Eastern Towhee	S^B	S^A			S^B							S^B	S^B							X	Possible	N4B,N3N	S4B,S3N	NAR	NAR
Caprimulgidae	***Antrostomus vociferus***	**Eastern Whip-poor-will**																				**X**	**Probable**	**N4B,N3M**	**S4B**	**SC**	**THR**
Tyrannidae	***Contopus virens***	**Eastern Wood-pewee**														$\mathbf{S^B}$		$\mathbf{S^B}$		$\mathbf{S^B}$	$\mathbf{S^A}$	**X**	**Possible**	**N4B**	**S4B**	**SC**	**SC**
Sturnidae	*Sturnus vulgaris*	European Starling		S^A									FO^A		H^B								Possible	NNA	SNA	NAR	NAR
Passerellidae	*Spizella pusilla*	Field Sparrow	T	S^A			S^A/H^C	S^A		S^A				S^B	S^B								Probable	N4B	S4B,S3N	NAR	NAR
Parulidae	***Vermivora chrysoptera***	**Golden-winged Warbler**	$\mathbf{S^B}$				$\mathbf{S^A/H^C}$								$\mathbf{S^A}$		$\mathbf{S^B}$	$\mathbf{S^A}$				**X**	**Probable**	**N3B**	**S3B**	**SC**	**THR**
Mimidae	*Dumetella carolinensis*	Gray Catbird		S^B			T				S^B	S^B	S^B	S^B			S^B		T				Probable	N5B,N3N	S5B,S3N	NAR	NAR
Ardeidae	*Ardea herodias*	Great Blue Heron														FO^B		S^B			FO^B	X	Possible	N5B,N4N	S4	NAR	NAR
Tyrannidae	*Myiarchus crinitus*	Great Crested Flycatcher	S^A		C^A				S^A	C^A/A^A					C^A	C^A	S^A	S^B	S^A	C^A			Probable	N5B	S5B	NAR	NAR
Ardeidae	*Butorides virescens*	Green Heron												H^B									Possible	N4B	S4B	NAR	NAR
Troglodytidae	*Troglodytes aedon*	House Wren		S^A										S^A			S^B						Possible	N5B	S5B	NAR	NAR
Cardinalidae	*Passerina cyanea*	Indigo Bunting	S^A					S^A									S^B						Possible	N5B	S5B	NAR	NAR
Charadriidae	*Charadrius vociferus*	Killdeer	S^A																				Possible	N5B,N4N5N	S4B	NAR	NAR
Tyrannidae	*Empidonax minimus*	Least Flycatcher			S^B																S^B		Possible	N5B	S5B	NAR	NAR
Parulidae	*Setophaga magnolia*	Magnolia Warbler	S^A																				Possible	N5B	S5B	NAR	NAR
Anatidae	*Anas platyrhynchos*	Mallard											P^B						P^B	FO^B			Probable	N5B,N5N	S5	NAR	NAR
Columbidae	*Zenaida macroura*	Mourning Dove																			S^A		Possible	N5B,N5N	S5	NAR	NAR
Parulidae	*Leiothlypis ruficapilla*	Nashville Warbler	S^A																				Possible	N5B	S5B	NAR	NAR
Picidae	*Colaptes auratus*	Northern Flicker	S^B			C^A						S^A	C^A	C^A		H^B		S^B			H^B		Possible	N5B,N5N	S5	NAR	NAR
Parulidae	*Parkesia noveboracensis*	Northern Waterthrush			S^B											S^B		S^B		T			Probable	N5B	S5B	NAR	NAR
Parulidae	*Seiurus aurocapilla*	Ovenbird	S^A		T	T	S^B	S^B		T	S^B	T						T				X	Probable	N5B	S5B	NAR	NAR
Picidae	*Dryocopus pileatus*	Pileated Woodpecker					H^B										S^B						Possible	N5	S5	NAR	NAR
Parulidae	*Setophaga pinus*	Pine Warbler							S^B														Possible	N5B,N3N	S5B,S3N	NAR	NAR
Picidae	*Melanerpes carolinus*	Red-bellied Woodpecker																		C^A			Possible	N5	S5	NAR	NAR
Sittidae	*Sitta canadensis*	Red-breasted Nuthatch			S^A				S^B			S^A		S^B	S^B	S^B							Possible	N5	S5	NAR	NAR

			Survey Station																			Conservation Rank			
Family	**Scientific Name**	**English Common Name**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**16**	**17**	**18**	**19**	**20**	**Incidental**	**Breeding Evidence**	**National N-rank**	**Provincial S-rank**	**Provincial Endangered Species Act**	**Federal Species at Risk Act**
Vireonidae	*Vireo olivaceus*	Red-eyed Vireo	T	S[B]	T	T	T	T	T	T		T	S[A]	S[B]	S[A]	S[A]	T	T	T	S[A]	T		Probable	N5B,N5N	S5B	NAR	NAR
Accipitridae	*Buteo lineatus*	Red-shouldered Hawk		T[C]																		X	Probable	N4B,N2N	S4B,S2N	NAR	NAR
Icteridae	*Agelaius phoeniceus*	Red-winged Blackbird		S[A]					S[B]			S[B]	H/P[A]/S[A]	S			S[B]	S[B]	T	C/P[A]	C		Probable	N5B,N5N	S5	NAR	NAR
Cardinalidae	*Pheucticus ludovicianus*	Rose-breasted Grosbeak												S[B]				S[A]			S[A]		Possible	N5B	S5B	NAR	NAR
Phasianidae	*Bonasa umbellus*	Ruffed Grouse																				X	Observed	N5	S5	NAR	NAR
Cardinalidae	*Piranga olivacea*	Scarlet Tanager																		S[B]			Possible	N5B	S5B	NAR	NAR
Passerellidae	*Melospiza melodia*	Song Sparrow	T	S[B]			S[B]	S[B]	S[B]	S[A]	T	T		S[A]	S[B]		T	S[B]	T	S[A]	T		Probable	N5B,N5N	S5	NAR	NAR
Rallidae	*Porzana carolina*	Sora		H[C]																			Possible	N5B	S5B	NAR	NAR
Passerellidae	*Melospiza georgiana*	Swamp Sparrow											T	T			S[B]	T	T	S[B]			Probable	N5B,N4N	S5B,S4N	NAR	NAR
Hirundinidae	*Tachycineta bicolor*	Tree Swallow											FO[A]										Observed	N5B	S4S5B	NAR	NAR
Cathartidae	*Cathartes aura*	Turkey Vulture																	FO[A]				Observed	N5B,N3N	S5B,S3N	NAR	NAR
Turdidae	*Catharus fuscescens*	Veery				C														S[B]	S/H[A]		Possible	N5B	S5B	NAR	NAR
Passerellidae	*Pooecetes gramineus*	Vesper Sparrow					S[B]														S[B]		Possible	N5B	S4B	NAR	NAR
Rallidae	*Rallus limicola*	Virginia Rail											S[B]						S[A]				Possible	N5B,NUN	S4S5B	NAR	NAR
Vireonidae	*Vireo gilvus*	Warbling Vireo											S[B]										Possible	N5B	S5B	NAR	NAR
Sittidae	*Sitta carolinensis*	White-breasted Nuthatch	S[B]																				Possible	N5	S5	NAR	NAR
Phasianidae	*Meleagris gallopavo*	Wild Turkey	H[A]																			X	Possible	N5	S5	NAR	NAR
Scolopacidae	*Gallinago delicata*	Wilson's Snipe		T/P[C]	S[A]/FO[A]		S[A], D[B]		T	S[B]	S[B]	S[B]	H[A], P[B]	H[B]			S[B]	S[B]	S[A]/P[B]		S[A]/FO[A], H[B]	X	Probable	N5B	S5B	NAR	NAR
Anatidae	*Aix sponsa*	Wood Duck											P[B]			H[B]							Probable	N5B,N4N	S5B,S3N	NAR	NAR
Parulidae	*Setophaga petechia*	Yellow Warbler			S[A]	S[B]	S[B]					S[B]	T		T		S[B]		T		T		Probable	N5B	S5B	NAR	NAR
Picidae	*Sphyrapicus varius*	Yellow-bellied Sapsucker	S[A]																				Possible	N5B,N3N	S5B,S3N	NAR	NAR

Survey Conditions:

[A] May 30, 2024; Start Time 0633hr/ End Time 0933hr; Temperature 3°C - 6°C; Wind B0; Cloud Cover 0%; Precipitation none; Observers: K. Tuininga, S. Brady

[B] June 11, 2024; Start Time 0638hr/ End Time 0929hr; Temperature 10°C; Wind B0; Cloud Cover 100%; Precipitation none; Observer: K. Tuininga, B. Baker

[C] June 27, 2024 Start Time 0705hr/ End Time 1042hr; Temperature 11^{0}C; Wind B3; Cloud Cover 40%; Precipitation none; Observer: K. Tuininga

OBBA Breeding Evidence Codes:

H - Species observed in its breeding season in suitable nesting habitat
C - Call heard (male or female), in suitable nesting habitat in nesting season.
S - Singing male present, or breeding calls heard, in suitable nesting habitat in nesting season.
N - Nest Building or excavation of nest hole
P - Pair observed in suitable nesting habitat in nesting season
FO - Fly over
T - Presumed territory based on the presence of an adult bird (usually singing, but not necessarily so), in the same suitable nesting habitat patch on at least two visits, one week or more apart, during the species' breeding season

Conservation Rank

S-rank: S1 - Critically Imperiled; S2 - Imperiled, S3 - Vulnerable, S4 - Apparently Secure, S5 - Secure, SNR - Unranked, SNA - Not applicable, SU - Unrankable, S#? - Inexact Numeric Rank, S#B - Breeding, S#N - Non-breeding, S#M - Migrant
N-rank: N1 - Critically Imperiled; N2 - Imperiled, N3 - Vulnerable, N4 - Apparently Secure, N5 - Secure, NNR - Unranked, NNA - Not applicable, NU - Unrankable, N#? - Inexact Numeric Rank, N#B - Breeding, N#N - Non-breeding, N#M - Migrant
ESA/SARA List: EXP (Extirpated), END (Endangered), THR (Threatened), SC (Special Concern), NAR (Not At Risk)

APPENDIX K

Fish Habitat Photos and Thermal Data

BIRKS

NATURAL HERITAGE CONSULTANTS

Photograph 1. Overland outfall from Beaver Pond (April 15, 2024).

Photograph 2. Western drainage at the deciduous to coniferous forest transition (April 15, 2024).

Photograph 3. Transiton of western drainage feature from marsh to forested upland areas (April 15, 2024).

→ Direction of Flow

Photo numbers correspond with Figure 3 of this report.

Photograph 4. Subsurface entry point (April 15, 2024).

Photograph 5. Western drainage during low flow period (October 11, 2024).

Photograph 6. Re-emergence of feature north of the property limit (October 11, 2024).

Photograph 7. Typical condition of the eastern drainage feature (October 11, 2024).

→ Direction of Flow

Photo numbers correspond with Figure 3 of this report.

Photograph 8. Crossing of eastern drainage at Concession B-C Road facing north. (July 31, 2024)

Water Temperature data obtained from Tatham Engineering

Air Temperature and weather data obtained from Environment Canada Weather Station ‘Orillia Brain’ (Climate ID 6115811; Location: 44.6 deg N, -79.44 deg E).

Sample Station Locations indicated on Figure 14 from Tatham, 2025 (Appended)

2024

	SW2	**SW1**	
Date/time	**Water Temperature [°C]**	**Water Temperature [°C]**	**Air temperature [°C]**
2024-07-01 16:00	16.01	16.62	24.5
2024-07-02 16:15	16.30	17.03	25.5
2024-07-06 16:15	17.76	19.22	29.5
2024-07-07 16:15	17.69	19.15	25.5
2024-07-21 16:15	18.08	18.78	27.5
2024-07-22 16:30	17.69	18.34	27.5
2024-07-27 16:15	17.27	18.36	27
2024-07-28 16:15	17.45	19.30	28
2024-07-29 16:15	17.68	19.87	30
2024-08-01 16:15	18.41	20.97	30
2024-08-02 16:15	18.55	20.81	29
2024-08-03 16:15	18.59	20.96	29.5
2024-08-15 16:15	17.07	18.67	29

AVERAGE 17.99 18.26

2025

SW2			SW1			SW3		
Date	**Temp. (°C)**		**Date**	**Temp. (°C)**		**Date**	**Temp. (°C)**	Maximum Air Temp (°C)
2024-07-29 16:15	17.68		2024-07-30 16:15	20.237		2025-07-27 16:15	19.397	29
2024-07-27 16:15	17.273		2025-07-27 16:15	21.28200		2025-07-28 16:15	20.147	34.5
2024-07-28 16:15	17.453		2024-07-28 16:15	19.277		2025-07-29 16:15	20.053	31
2024-07-30 16:15	17.92		2025-07-29 16:15	21.50400		2025-07-30 16:15	19.5	28
2024-07-31 16:15	18.5		2024-07-31 16:15	20.76		2025-07-31 16:15	18.437	25.5
2024-08-01 16:15	18.407		2024-08-01 16:15	21.003		2025-08-01 16:15	17.563	25.5
2024-08-02 16:15	18.547		2024-08-02 16:15	20.817		2025-08-02 16:15	17.687	26.5
2024-08-03 16:15	18.593		2024-08-03 16:15	20.973		2025-08-03 16:15	18.25	27.5
2024-08-04 16:15	18.523		2024-08-04 16:15	20.31		2025-08-04 16:15	18.397	27.5
2024-08-05 16:15	18.553		2024-08-05 16:15	19.62		2025-08-05 16:15	18.647	29
2024-08-06 16:15	18.327		2024-08-06 16:15	18.417		2025-08-07 16:15	19.5	30
2024-08-11 16:15	17.047		2024-08-07 16:15	18.293		2025-08-06 16:15	19.063	29
2024-08-12 16:15	16.93		2024-08-11 16:15	16.31		2025-08-11 16:15	21.11	33
2024-08-23 16:15	16.007		2024-08-12 16:15	17.13		2025-08-12 16:15	21.373	32.5
2025-08-07 16:15	20.05300		2024-08-23 16:15	17.033		2025-08-23 16:15	18.243	26
Average	17.84			19.71			19.22	

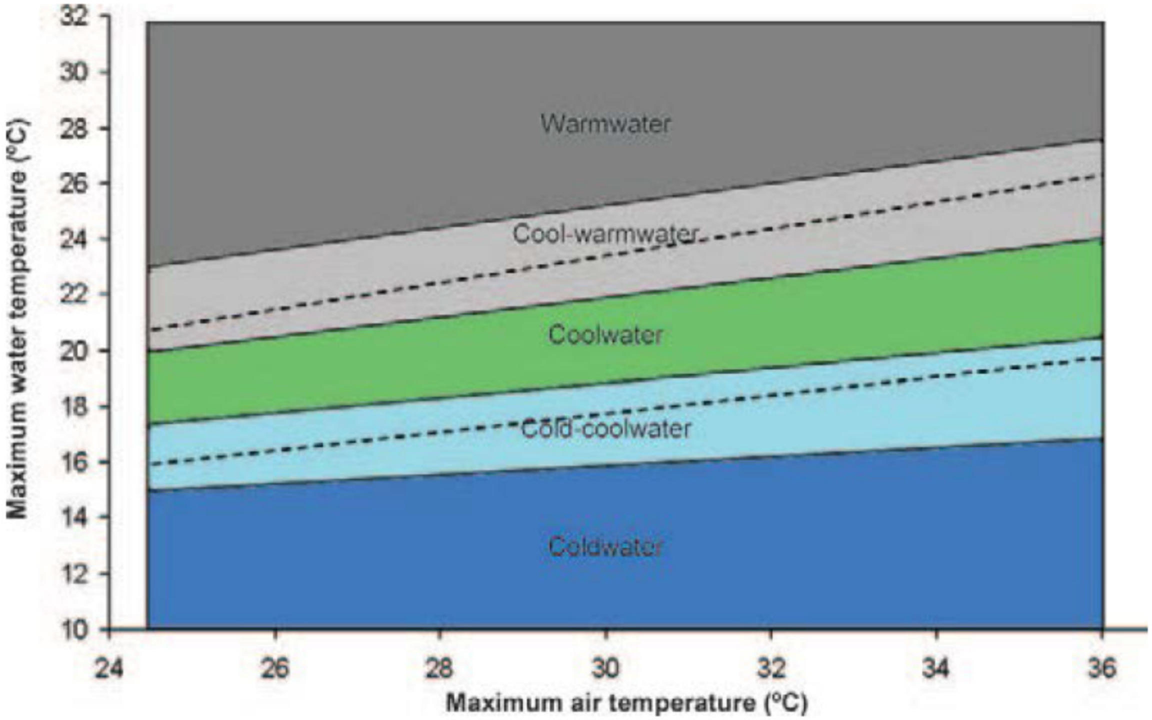


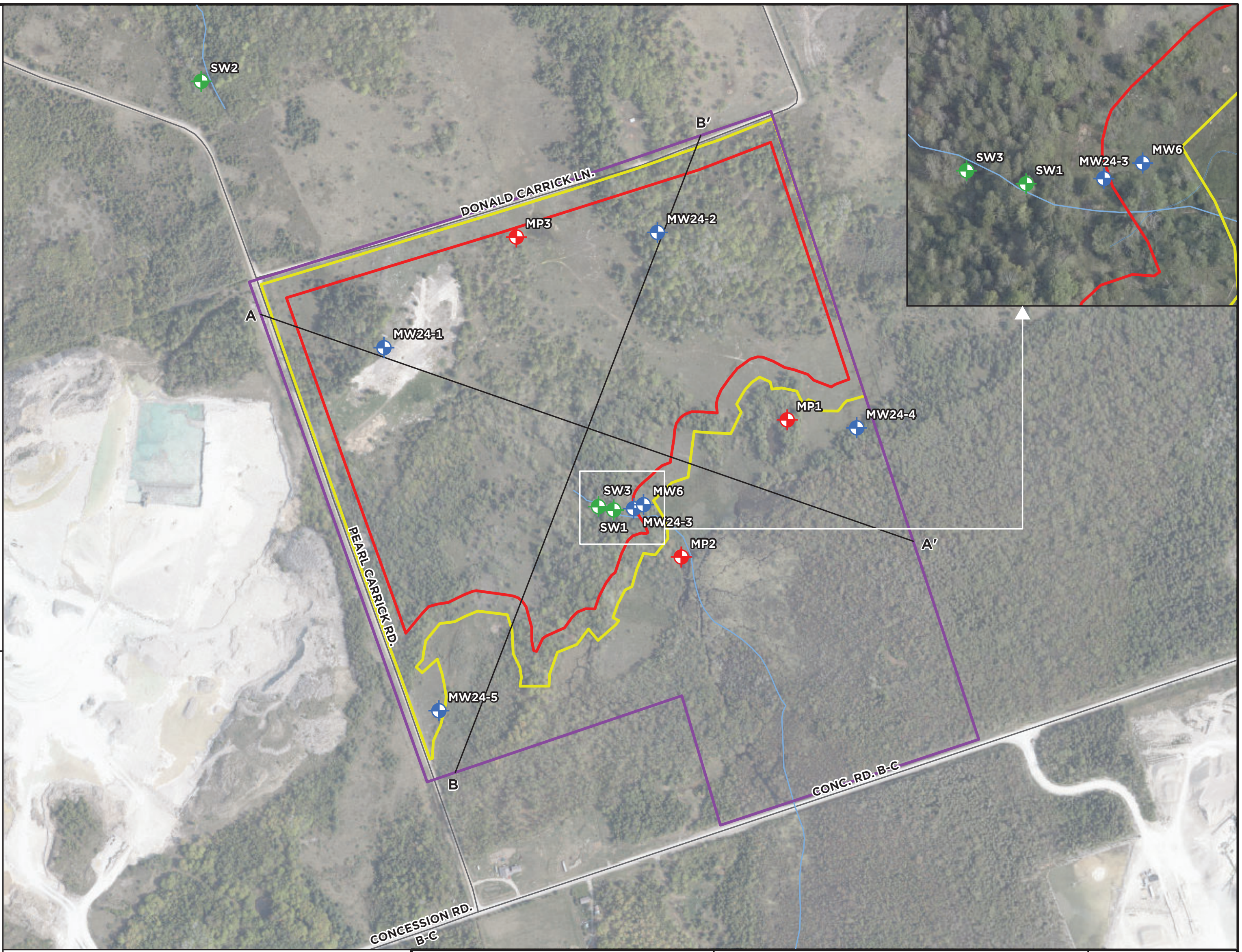
Figure A2. Chu *et al.* (2009) thermal regime nomogram (dotted lines represent the boundaries of the Stoneman and Jones (1996) classification.

N

NOTES:
1. COORDINATE SYSTEM: NAD 1983 UTM ZONE 17N
2. CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENSE – ONTARIO.

LEGEND

🟪	PROPERTY BOUNDARY
🟥	PROPOSED LIMIT OF EXTRACTION
🟨	PROPOSED LICENCE BOUNDARY
⊕	PIEZOMETER
⊕	MONITORING WELL
⊕	STREAMFLOW MONITORING LOCATIONS
—	ROADS
—	WATERCOURSE
—	CROSS-SECTIONS



0 115 230 460
METERS

TATHAM
ENGINEERING

RAMARA QUARRY
LEVEL 1 AND 2 HYDROGEOLOGICAL ASSESSMENT
SITE MONITORING LOCATION PLAN

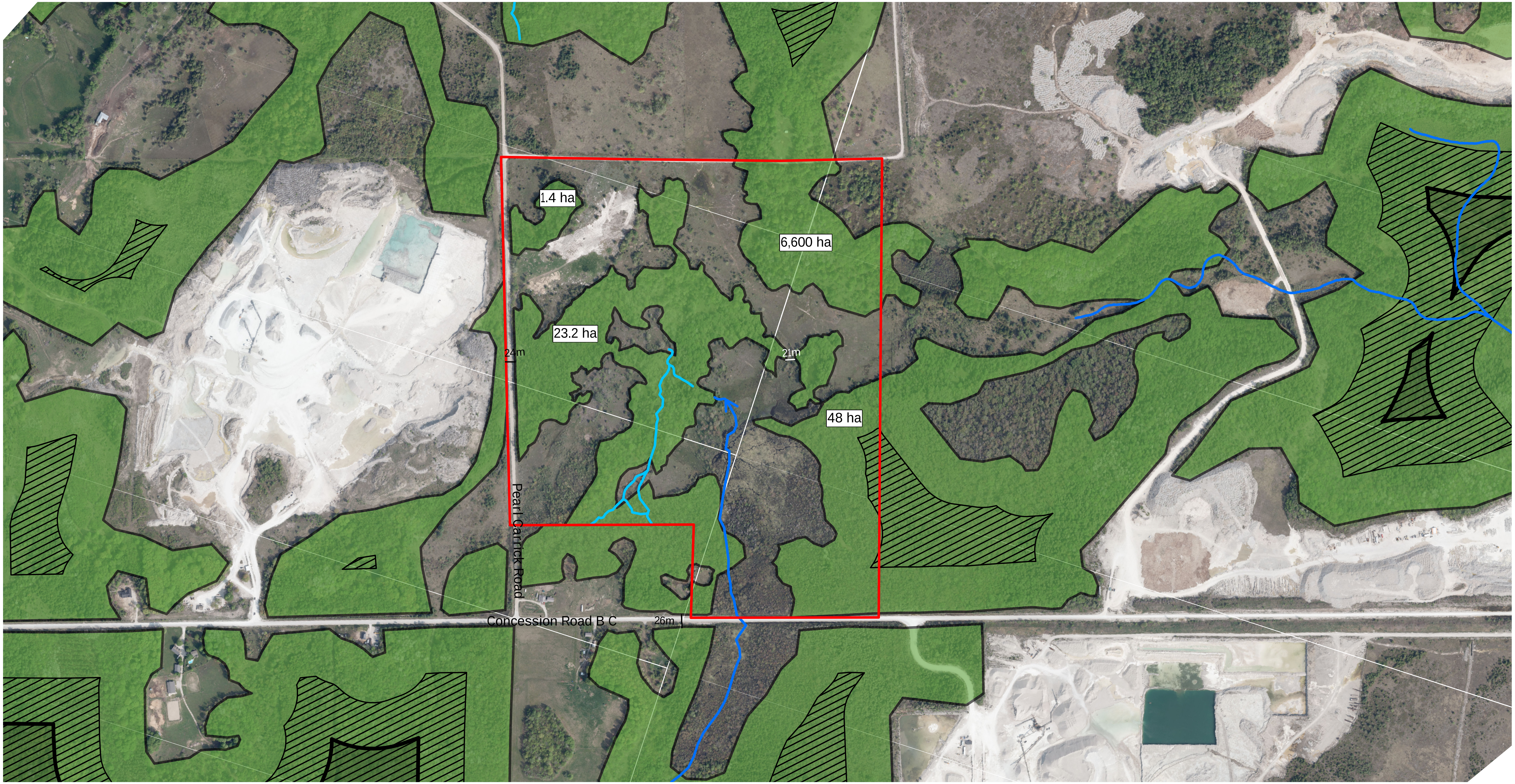
DWG. No.
FIG-14

SCALE: 1:6,000	DRAWN: AO	DATE: OCT. 2025	JOB NO. 424371

I:\2024 Projects\424371 - Sarjeants - Ramara Quarry\GIS\GIS Models\424371- Sarjeants Ramara\424371- Sarjeants Ramara.aprx

APPENDIX L

Candidate Significant Woodland Assessment



6059 Pearl Carrick Road

Township of Ramara

Candidate Significant Woodland Mapping

🟥 Property Limit (Approximate)
Watercourse (Birks NHC)
Watercourse (GeoHub/Birks NHC)

Significant Woodland Mapping (Birks NHC)
🟩 Candidate Significant Woodland (Birks NHC)
▨ 100m Interior Woodland Habitat
▭ 200m Interior Woodland Habitat

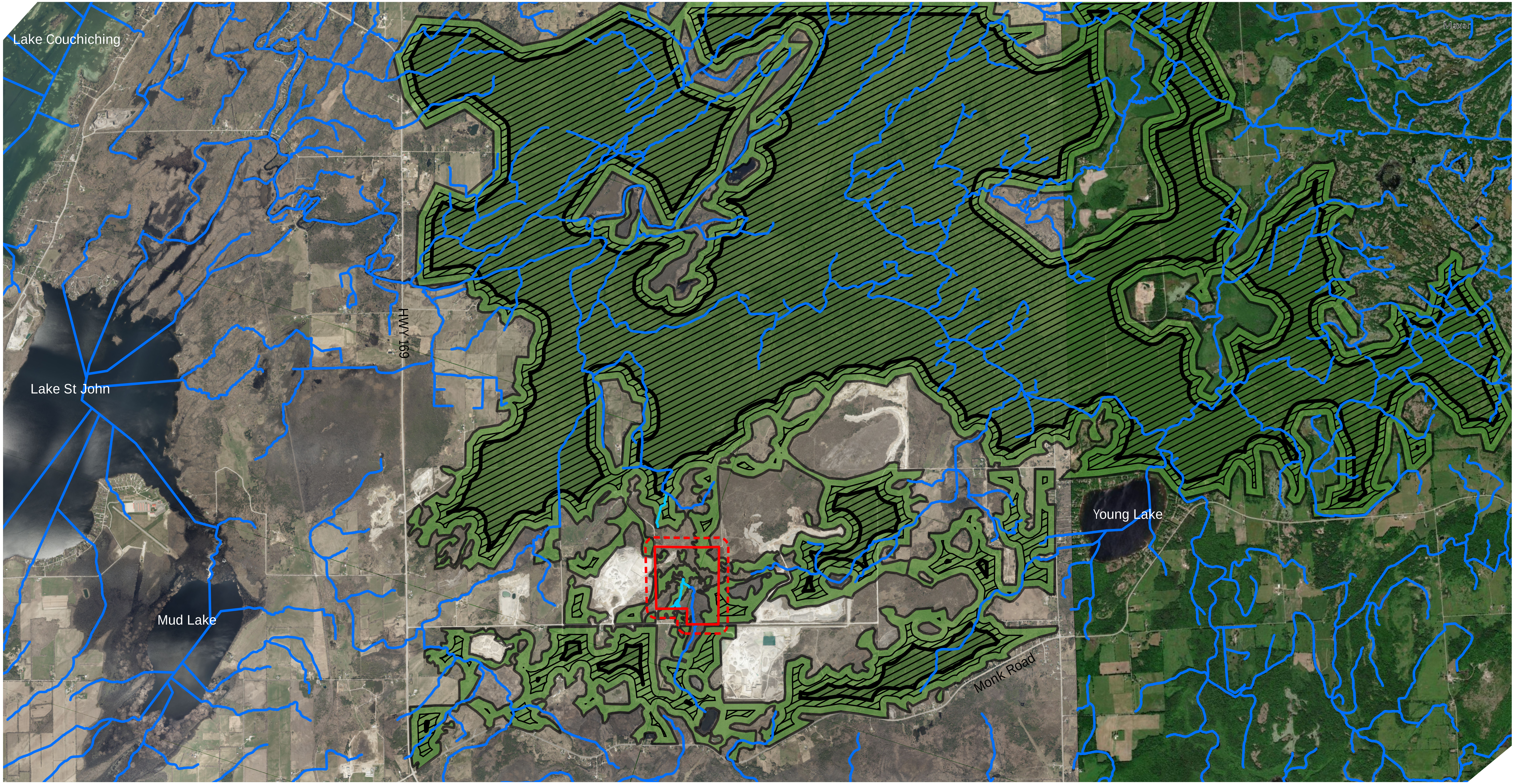
MAP DRAWING INFORMATION:
DATA PROVIDED BY: ESRI CANADA, Ontario GeoHub, SIMCOE OPEN DATA

MAP CREATED BY: SB
MAP CHECKED BY: BB
MAP PROJECTION: NAD 1983 UTM ZONE 17N

0 100 200 400 600 800 Meters

FILE LOCATION:
Path: C:\Users\S_Brady\BirksNHC\Birks NHC Team for all - Documents\Project Folders\04 - SBrady Projects\ArcGIS - Projects here\Projects - here\02-014-2023 Pearl Carrick

PROJECT: 02-014-2023 STATUS: ISSUED DATE: 5/05/2026



6059 Pearl Carrick Road
Township of Ramara

🟥 Property Limit (Approximate)
⬚ 120m Study Area
— Watercourse (Birks NHC)
— Watercourse (GeoHub)

Natural Heritage Features

🟩 Candidate Significant Woodland (Birks NHC)
▨ 100m Interior Woodland Habitat
▭ 200m Interior Woodland Habitat

Candidate Significant Woodland Mapping

MAP DRAWING INFORMATION:
DATA PROVIDED BY: ESRI CANADA

MAP CREATED BY: SB
MAP CHECKED BY: BB
MAP PROJECTION: NAD 1983 UTM ZONE 17N

N W E S

0 0.5 1 2 3 4 Kilometers

FILE LOCATION:

Path: C:\Users\S_Brady\BirksNHC\Birks NHC Team for all - Documents\Project Folders\04 - SBrady Projects\ArcGIS - Projects here\Projects - here\02-014-2023 Pearl Carrick

PROJECT: 02-014-2023 STATUS: **ISSUED** DATE: **5/05/2026**

Appendix L. Significant Woodland Assessment

CRITERIA	STANDARDS	ASSESSMENT
Woodland Size Criteria		
• Size refers to the aerial (spatial) extent of the woodland (irrespective of ownership) • Woodland areas are considered to be generally continuous even if intersected by narrow gaps 20m or less in width between crown edges. • Size value is related to the scarcity of woodland in the landscape derived on a municipal basis with consideration of the differences in woodland coverage among physical sub-units (e.g., watersheds, biophysical regions). • Size criteria should also account for differences in landscape-level physiography (e.g., moraines, clay planes) and community vegetation types.	Where woodlands cover: • Is less than about 5% of land cover, woodlands 2ha in size or larger should be considered significant • Is about 5-15% of land cover, woodlands 4ha in size or larger should be considered significant • Is about 15-30% of land cover, woodlands 20ha in size or larger should be considered significant. • **Is about 30-60% of land cover, woodlands 50ha in size or larger should be considered significant** • Occupies more than 60% of the land, a minimum size is not suggested, and other factors should be considered	• The Ontario Watershed Boundaries (OWB) are classified in the following data classes. The following lists the property's OWB classification: ○ OWB Primary - Great Lakes – St. Lawrence River ○ OWB Secondary – Eastern Georgian Bay ○ OWB Tertiary – Severn River-Lake Simcoe ○ OWB Quaternary – Head River • The Severn River-Lake Simcoe contains 8 subwatersheds with a combined drainage are of 2,770 square kilometers: Black River, Head River, Kahshe/Gartersnake River, Lake Couchiching, Lake St. John, Severn River, Upper Black River and Upper Talbot River. • Approximately 60% of the Severn River-Lake Simcoe watershed area consists of natural vegetative cover (source: South Georgian Bay Lake Simcoe Region Drinking Water Source Protection). • Therefore, a woodland within this watershed must be 50 ha in size or larger to be considered significant. • Woodland habitat within the property are bound by municipal roads, open thicket swamp communities, and active aggregate operations. • Four (4) separate woodland units have been mapped within the property, including two units that extend on adjacent lands. • The northern most unit, measuring approximately 6,600 ha, would therefore be of sufficient size to be considered Significant Woodland based on the ***Woodland Size Criteria***. • The remaining units are not of sufficient size to meet this criterion. • ***Therefore, based on <u>Woodland Size</u> Criteria, the northern woodland unit within the study area appears to be considered Significant in the context of the PPS.***
Ecological Function Criteria		
Woodland Interior		
• Interior Habitat more than 100m from the edge (as measured from the limits of a continuous woodland as defined above) is important for some species. • For purposes of this criterion, a maintained public road would create an edge even if the opening was not wider than 20m and did not create a separate woodland.	Woodlands should be considered significant if they have: • Any interior habitat where woodlands cover less than about 15% of the land cover • 2 ha or more of interior habitat where woodlands cover about 15-30% of the land cover	• The northern most and southeastern units contain woodland interior habitat. However, only the northern most unit contains sufficient interior habitat to meet this criterion. • ***Therefore, one woodland unit (northern most) within the study area appears to be significant by the <u>Woodland Interior</u> Criteria in the context of the PPS.***

Appendix L. Significant Woodland Assessment

CRITERIA	STANDARDS	ASSESSMENT
	• **8 ha or more of interior habitat where woodlands cover about 30-60% of the land cover** • 20 ha or more of interior habitat where woodlands cover about 60% of the land cover	
Proximity to Other Woodlands or Other Habitats		
• Woodlands that overlap, abut or are close to other significant natural heritage features or areas could be considered more valuable or significant than those that are not. • Patches close to each other are of greater mutual benefit and value to wildlife.	Woodlands should be considered significant if: • A portion of the woodland is located within a specific distance (e.g., 30m) of a significant natural feature or fish habitat likely receiving ecological benefit from the woodland and the entire woodland meets the minimum area threshold (e.g., 0.5-20ha, depending on circumstance)	• The central (23.2 ha) and south eastern (48 ha) woodland units contains watercourses and wetland habitats that support and/or provide contributing habitat to fish as well as wetland habitat which could be receiving ecological benefit from those woodland units. • However, these units do not meet the overall size criterion to be considered significant. Notwithstanding, for the purposes of this assessment, the central and south eastern woodland units will be assessed for its ***Proximity to Other Woodlands or Other Habitats*** function. • ***Therefore, based on <u>Proximity to Other Woodlands or Other Habitats</u> Criteria, the central and south eastern woodland units within the Study Area would be considered Significant in the context of the PPS.***
Linkages		
• Linkages are important connections providing for movement between habitats. • Woodlands that are located between other significant features or areas can be considered to perform an important linkage function as "stepping stones" for movement between habitats.	Woodlands should be considered significant if they: • Are located within a defined natural heritage system or provide a connecting link between two other significant features, each of which is within a specified distance (e.g., 120m) and meets minimum area thresholds (e.g., 1-20ha, depending on circumstance)	• Woodland on the property is generally bordered by municipal roads and active aggregate operations which impairs the linkage function of the feature to other significant features. • Woodland habitat is within the County of Simcoe Official plan as 'Greenlands' and the Township of Ramara as 'Supportive and Complimentary Areas and Corridors' • ***Therefore, based on <u>Linkages</u> Criteria, the woodland within the study area would be considered Significant in the context of the PPS.***
Water Protection		
• Source water protection is important. • Natural hydrological processes should be maintained.	Woodlands should be considered significant if they:	• According to the Simcoe Source Water Protection Mapping, a portion of the property is mapped as being within a Significant Groundwater Recharge Area.

Appendix L. Significant Woodland Assessment

CRITERIA	STANDARDS	ASSESSMENT
	• Are located within a sensitive or threatened watershed or a specific distance (e.g., 50m or top of valley bank if greater) or a sensitive groundwater discharge, sensitive recharge, sensitive headwater area, watercourse or fish habitat and meet minimum area thresholds (e.g., 0.5-10ha, depending on circumstance)	• Based on the available mapping, all woodland units would be within the recharge area. • ***Therefore, based on <u>Water Protection Criteria</u>, woodland within the study area would be considered Significant in the context of the PPS.***
Woodland Diversity		
• Certain woodland species have had major reductions in representation on the landscape and may need special consideration. • More native diversity is more valuable than less diversity.	Woodlands should be considered significant if they have: • A naturally occurring composition of native forest species that have declined significantly south and east of the Canadian Shield and meet minimum area thresholds (e.g., 1-20ha, depending on circumstance) • A high native diversity through a combination of composition and terrain (e.g., a woodland extending from a hilltop to a valley bottom or to opposite slopes) and meet minimum area thresholds (e.g., 2-20ha, depending on circumstance)	• The overall ELC forest communities within the study area are not representative of a rare vegetation community, uncommon within the Severn River-Lake Simcoe Watershed. • The mapped woodland units are not characteristic of a varying terrain. • ***Therefore, the mapped woodland units within the study area are not considered Significant by the <u>Woodland Diversity</u> criteria in the context of the PPS.***
Uncommon Characteristics Criteria		
• Woodlands that are uncommon in terms of species composition, cover type, age or structure should be protected. • Older woodlands (i.e., woodlands greater than 100 years old) are particularly valuable for several reasons, including their contributions to genetic, species and ecosystem diversity.	Woodlands should be considered significant if they have: • A unique species composition or the site is represented by less than 5% overall in woodland area and meets minimum area thresholds (e.g., 0.5ha, depending on circumstance) • A vegetation community with a provincial ranking of S1, S2 or S3 (as ranked by the	• The ELC vegetation communities within the study area are not uncommon in terms of species composition, cover types (*i.e.,* composition of ELC vegetation types), structure or age. • ***Therefore, the mapped woodland units within the study area are not considered Significant by the <u>Uncommon Characteristics</u> Criteria in the context of the PPS.***

Appendix L. Significant Woodland Assessment

CRITERIA	STANDARDS	ASSESSMENT
	NHIC and meet minimum area thresholds (*e.g.*, 0.5ha, depending on circumstance) • Habitat (e.g., with 10 individual stems or 100m^2 of leaf coverage) of a rare, uncommon or restricted woodland plant species and meet minimum area thresholds (e.g., 0.5ha, depending on circumstance): vascular plant species for which the NHIC's Southern Ontario Coefficient of Conservatism is 8, 9 or 10; tree species of restricted distribution such as sassafras or rock elm; species existing only in a limited number of sites within the planning area • Characteristics of older woodlands or woodlands with larger tree size structure in native species meet minimum area thresholds (e.g., 1-10ha, depending on circumstance): older woodlands could be defined as having 10 or more trees/ha greater than 100 years old; larger tree size structure could be defined as 10 or more trees/ha at least 50cm in diameter, or a basal area of 8 or more m^2/ha in trees that are at least 40cm in diameter	
Economic and Social Function Values Criteria		
• Woodlands that have high economic or social values through particular site characteristics or deliberate management should be protected.	Woodlands should be considered significant if they have: • High productivity in terms of economically viable products together with continuous native natural attributes and meet minimum area thresholds (e.g., 2-20ha, depending on circumstance) • A high value in special services such as air-quality improvement or recreation at a sustainable level that is compatible with long-term retention and meet minimum area thresholds (e.g., 0.2-10ha, depending on circumstance)	• The contiguous woodland feature does not generate economically viable forest products. • No formal recreational use of property of adjacent lands. • The woodland feature is not identified as providing education, cultural or historical value. • ***Therefore, the woodland unit within the study area does not appear Significant by the Economic and Social Function Values Criteria in the context of the PPS.***

Appendix L. Significant Woodland Assessment

CRITERIA	STANDARDS	ASSESSMENT
	• Important identified appreciation, education, cultural or historical value and meet minimum area thresholds (e.g., 0.2-10ha, depending on circumstance)	