TECHNICAL REPORT

Natural Environment Report

Proposed Renfrew Golf Pit, Horton Township, Renfrew County, Ontario

Submitted to:

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Distribution List

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1.0 INTRODUCTION

WSP Canada Inc. (WSP) has been retained by Thomas Cavanagh Construction Limited. (Cavanagh) to undertake natural environment studies to accompany the application for a new Class A pit (below water) under the *Aggregate Resources Act* (ARA; Ontario 1990a) for the proposed Cavanagh Renfrew Pit, located Part of Lots 23, 24 and 25, Concession 1, Horton Township, Renfrew County, Ontario (the Site; Figure 1).

1.1 Purpose

This report specifically addresses the requirements of Section 2.2 (Natural Environment Report [NER]) of the Aggregate Resources of Ontario: Technical Reports and Information Standards (Ontario 2020). The Site is currently zoned Extractive Industrial-holding. The removal of the holding zone is subject to the completion and acceptance of several studies including an Environmental Impact Study. This NER is intended to satisfy the requirements for an Environmental Impact Study in support of removing the holding zone.

The purpose of this report is to assess potential environmental impacts of the proposed aggregate extraction on the Site and Study Area with respect to the following:

a) significant wetlands

b) other coastal wetlands in Ecoregions 5E, 6E and 7E

c) fish habitat

d) significant woodlands and significant valleylands in Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Mary's River)

e) habitat of endangered and threatened species

f) significant wildlife habitat

g) significant areas of natural and scientific interest (ANSI)

h) within the area of one or more provincial plan(s), any key natural heritage features not included in a) through g)

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 report must also identify if the Site or any of the features included in a) through g) are located within a natural heritage system that has been identified by a municipality in Ecoregions 6E and 7E or by the province as part of a provincial plan.

The potential impacts of the extraction on groundwater and surface water resources are included in the accompanying Water Report (WSP 2023) and have been summarized where appropriate in this report.

For the purpose of this report, the following definitions are used:

Site – The total land area owned by Cavanagh that is proposed for licensing under the ARA [40.5 hectares (ha); Figure 1].

Extraction Limit – The total area within the Site proposed for extraction (31.6 ha; Figure 1). This area generally represents the area of the Site less a 15 m setback from the proposed license boundary except for where the extraction approaches mapped water features (watercourses and wetlands), where a 30 m setback has been applied. A 3 m setback has been proposed for a portion of the western side of the Site.

Study Area – The Study Area for the NER assessment is defined in the Aggregate Resources of Ontario: Technical reports and information standards (Ontario 2020) as the Site and surrounding 120 metres (m). The predicted radius of influence (based on the 1-metre groundwater level drawdown contour) resulting from extraction of the Site does not extend beyond the 120 m study area. The extent of the predicted radius of influence (1-metre groundwater drawdown) is shown on Figure 1.

1.2 Site Description

The Site is approximately 40.5 ha in size, located adjacent to the Renfrew Golf Club at the terminus of Golf Course Road, Horton Township, Renfrew County. The majority of the Site is dominated by natural cover in the form of meadows, thickets, deciduous and mixed forests subject to forestry activities. At the southern end of the Site is a portion of a large shallow marsh wetland, and one small pond feature.

1.2.1 Adjacent Land Use

West and south of the Site are agricultural lands. To the north and northeast are forested areas, and the golf course is located to the southeast. Immediately adjacent to the southwestern boundary of the Site is a large pond feature known as 'Clubhouse Lake'. Off-Site, but within the Study Area, are additional wetland pockets and drainage features. A public trail runs generally in a north-south direction, west of the Site.

2.0 ENVIRONMENTAL POLICY CONTEXT

The Site is located in Horton Township, County of Renfrew. Documents reviewed to gain an understanding of the natural heritage features and regulations that are relevant to the Site and Study Area consisted of the following:

- The ARA (Ontario 1990a) Aggregate Resources of Ontario: Technical reports and information standards (Ontario 2020)
- The Provincial Policy Statement (PPS; MMAH 2020)
- The *Fisheries Act* (Canada 1985)
- The *Migratory Birds Convention Act* (Canada 1994)
- The *Species at Risk Act* (Canada 2002)
- The *Endangered Species Act* (Ontario 2007)
- County of Renfrew Official Plan (Renfrew 2020)

An overview of the above noted legislation and policy documents are discussed in Sections 2.1 to 2.6.

2.1 Aggregate Resources Act

Applicants are required under the Aggregate Resources of Ontario: Technical Reports and Information Standards (Ontario 2020) to prepare an NER that must identify significant natural environment features that occur on, or in proximity to (i.e., within 120 m) the proposed operation. Significant natural heritage features are defined in the PPS (MMAH 2020) with guidance from supporting technical manuals prepared by the Ministry of Natural Resources and Forestry (MNRF; MNRF 2000; MNRF 2010; MNRF 2015a). Where any significant natural features 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 report must also identify if the Site lies within a natural heritage system identified by a municipality (in ecoregions 6E or 7E) or by the province as part of a provincial plan (e.g., Greenbelt Plan).

2.2 Provincial Policy Statement

The Provincial Policy Statement (PPS; MMAH 2020) was issued under Section 3 of the *Planning Act* (Ontario 1990b).

The natural heritage policies of the PPS indicate that:

2.1.4 Development and site alteration shall not be permitted in:

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

b) Significant coastal wetlands.

2.1.5 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. Mary's River).

c) Significant valleylands in Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Mary's River).

d) Significant wildlife habitat.

e) Significant areas of natural and scientific interest.

f) Coastal wetlands in Ecoregions 5E, 6E and 7E that are not subject to policy 2.1.4(b).

2.1.6 Development and site alteration shall not be permitted in fish habitat except in accordance with provincial and federal requirements.

2.1.7 Development and site alteration shall not be permitted in habitat of endangered species and threatened species, except in accordance with provincial and federal requirements.

2.1.8 Development and site alteration shall not be permitted on adjacent lands to the natural heritage features and areas identified in policies 2.1.4, 2.1.5 and 2.1.6 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 functions.

2.1.9 Nothing in policy 2.1 is intended to limit the ability of agricultural uses to continue.

2.3 Fisheries Act

The purpose of the federal *Fisheries Act* (Canada 1985) is to maintain healthy, sustainable, and productive Canadian fisheries through the prevention of pollution and the protection of fish and their habitat. Under the *Fisheries Act* (Canada 1985), work in and near water must comply with the fish and fish habitat protection provisions of the *Fisheries Act* by incorporating measures to avoid (DFO 2019):

- causing the death of fish
- harmful alteration, disruption, or destruction (HADD) of fish habitat in your work, undertaking or activity

All projects where work is being proposed that cannot avoid impacts to fish or fish habitat require a Fisheries and Oceans Canada (DFO) project review (DFO 2019). DFO will review the project to identify potential risks of the project to the conservation and protection of fish and fish habitat. If potential impacts can be avoided, project approval is not required (DFO 2020). However, if it is determined that the project will result in death of fish or HADD of fish habitat, an authorization is required under the *Fisheries Act*. Proponents of projects requiring a *Fisheries Act* authorization may be required to also submit a habitat offsetting plan, which provides details of how the death of fish and/or HADD of fish habitat will be offset, and outlines associated costs and monitoring commitments. Proponents also have a duty to notify DFO of any unforeseen activities during the project that cause harm to fish or fish habitat.

2.4 Migratory Birds Convention Act

The *Migratory Birds Convention Act* (MBCA; Canada 1994) prohibits the killing or capturing of migratory birds, as well as any damage, destruction, removal or disturbance of active nests. It also allows the Canadian government to pass and enforce regulations to protect various species of migratory birds, as well as their habitats.
While Environment and Climate Change Canada (ECCC) can issue permits allowing the destruction of nests for scientific or agricultural purposes, or to prevent damage being caused by birds, it does not typically allow for permits in the case of industrial or construction activities.

Recent changes to the regulations associated with the MBCA have added sixteen 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.

2.5 Species at Risk

2.5.1 Species at Risk Act (SARA)

At a federal level, species at risk (SAR) designations for species occurring in Canada are initially determined by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). If approved by the federal Minister of the Environment and Climate Change, species are added to the federal List of Wildlife Species at Risk (Canada 2002). Species that are included on Schedule 1 as endangered or threatened are afforded protection of critical habitat on federal lands under the *Species at Risk Act* (SARA). On private or provincially-owned lands, only aquatic species listed as endangered, threatened or extirpated and migratory birds are protected under the SARA, unless ordered by the Governor in Council.

2.5.2 Endangered Species Act (ESA)

SAR designations for species in Ontario are initially determined by the Committee on the Status of Species at Risk in Ontario (COSSARO), and if approved by the provincial Minister of Environment, Conservation and Parks, species are added to the provincial *Endangered Species Act* (ESA) which came into effect June 30, 2008 (Ontario 2007). The legislation prohibits the killing or harming of species identified as endangered or threatened in the various schedules to the Act. The ESA also provides habitat protection to all species listed as threatened or endangered. The Species at Risk Ontario (SARO) list is contained in O. Reg. 230/08.

Subsection 9(1) of the ESA prohibits the killing, harming or harassing of species identified as 'endangered' or 'threatened' in the various schedules to the Act. Subsection 10(1)(a) of the ESA states that *"No person shall damage or destroy the habitat of a species that is listed on the Species at Risk in Ontario* (*SARO*) *list as an endangered or threatened species"*.

General habitat protection is provided, by the ESA, to all threatened and endangered species. Species-specific habitat protection is only afforded to those species for which a habitat regulation has been prepared and passed into law as a regulation of the ESA. The ESA has a permitting process to allow alterations to protected species or their habitats as well as a registration process for certain activities and species.

2.6 County of Renfrew

Based on the County of Renfrew Notice of Decision dated February 25, 2022, the site is currently zoned Extractive Industrial-holding. The removal of the holding zone is subject to the completion and acceptance of several studies including an Environmental Impact Study. This NER is intended to satisfy the requirements for an Environmental Impact Study in support of removing the holding zone.

3.0 PROPOSED DEVELOPMENT AND REHABILITATION

The proposed pit development consists of removal of overburden material within the extraction area down to the bedrock surface (or until non-marketable material is encountered) for areas where the water table is located within the bedrock (i.e., in the northern half of the Site). A 15 m setback is planned from the proposed license boundary except for where the extraction approaches mapped water features (watercourses and wetlands), where a 30 m setback has been applied. A 3 m setback has been proposed for a portion of the western side of the Site. Berms are proposed in portions of the setbacks (Figure 1).

Extraction of the first lift will commence in the southern portion of the extraction area and will proceed radially towards the north, east and west setback limits. The first lift will extend to the water table, or the bedrock/non-marketable material surface, whichever is encountered first. Usable material identified below the water table will be extracted in the second lift. Excavation can proceed up to a maximum of 10 m below the water table. Extraction below the water table will primarily occur in the southern half of the Site and will result in the formation of a pit lake within this area.

Based on the nature of the subsurface materials, the final pit floor elevation will vary from approximately 135 m above sea level (mASL) to 154 mASL in the north/northwest portion of the Site to 120 mASL in the southern portion of the Site and will be primarily controlled by the elevation of the bedrock within the extraction area. Only unconsolidated materials (sand, gravel, etc.) will be removed from the Site. Any bedrock encountered on the Site will remain in place.

Extraction operations below the groundwater table will not involve dewatering of the excavation. The material within the below water portion of the pit will be scooped out from below the water table and stockpiled on dry land adjacent to the pit lake allowing the water to drain from the extracted material.

The final rehabilitation plan includes a permanent pit lake located within the southern portion of the extraction area. The majority of the area north of the pit lake will be rehabilitated as forest. During rehabilitation, side slopes at 3H:1V will be established. This will result in a decrease of the pit lake storage volume after rehabilitation. The sloping areas around the pit will be rehabilitated using seed mix of native grasses and herbaceous plants. Excavation of areas where the bedrock drops, and the overburden thickens in the northern portion of the Site may result in ponded areas within the bedrock lows following rehabilitation. The predicted elevation of the permanent pond will be approximately 130 mASL based on the lowest elevation of the ground surface on the southwest perimeter of the proposed extraction area (near Clubhouse Lake). The proposed rehabilitation plan calls for the inclusion of a range of habitats including upland forest (approximately 20.1 ha) in the northern and northwestern half of the Site, a pit lake (approximately 8.3 ha) in the southern half, and shallow wetland at the interface between the two. At the toe of the slopes extending into the proposed lake will be shallow shoreline treatments (wetlands) to create more diverse habitat. Plantings in this area will include edge, submergent and emergent native herbaceous and woody species. In-water plantings will extend approximately +/-5 m from shore and will be interspersed with cover structures such as boulders and root wads. Basking logs, woody debris and nesting platforms will be installed for wildlife such as turtles, waterfowl and fish. Species used in the rehabilitation plan will be native, non-invasive, and seek to mirror the pre-extraction species assemblages.

To help contain the runoff volumes estimated during the fully operational and rehabilitation conditions within the pit lake (i.e., no off-site discharge, and limit the potential for overflow to the southwest wetland upstream from Clubhouse Lake) the following mitigation measures are proposed:

- An emergency surface overflow drainage ditch, to be constructed along the Site access road will direct potential excess flows during unusually large precipitation or snowmelt events around the southwest wetland to Clubhouse Lake.
- A 1.3 m high perimeter berm will be constructed along the south edge of the extraction area at the low point around the pit lake to help retain runoff volumes within the pit lake.

WSP (2023) determined that no off-site discharge is anticipated to occur under average annual water balance conditions.

4.0 METHODS

4.1 Background Review

The investigation of existing conditions on the Site and in the Study Area included a background information search and literature review to gather data about the local area and provide context for the evaluation of the natural features. This included review of the following resources:

- MNRF Natural Heritage Information Centre (NHIC) Make-a-Map geographic explorer for SAR, rare (S1-S3) species reported as occurring in the vicinity of the Site, and natural areas information queries (MNRF 2023a)
- Environment and Climate Change Canada's (ECCC) SAR Public Registry (ECCC 2023) including COSEWIC status reports, assessments, and recovery strategies

- SAR in Ontario List (O. Reg. 230/08) (MNRF 2023b) including COSSARO species assessment reports
- DFO Aquatic Species at Risk Maps (DFO 2023)
- Breeding Bird Atlas of Ontario (OBBA) (Cadman et al. 2007)
- Atlas of the Mammals of Ontario (Dobbyn 1994)
- Ontario Reptile and Amphibian Atlas (Ontario Nature 2019)
- Bat Conservation International (BCI) range maps (BCI 2023)
- Ontario Butterfly Atlas (Jones et al. 2023)
- eBird species maps (eBird 2023)
- Vascular Plants at Risk (Leslie 2018)
- MNRF Land Information Ontario Aquatic Resources Area Layer (MNRF 2023c)
- Information contained in natural heritage related map layers from Land Information Ontario (LIO; 2023) and the Ontario Land Cover Compilation (MNRF 2023d)
- County of Renfrew Official Plan (Renfrew 2020)
- Existing high-resolution aerial imagery and mapping

To develop an understanding of the drainage patterns, ecological communities and potential natural heritage features that may be affected by the proposed aggregate extraction, MNRF LIO data were used to create base layer mapping for the Study Area. A geographic query of the MNRF Make-a-Map database was conducted to identify element occurrences of any natural heritage features, including wetlands, ANSI, rare vegetation communities and rare species [i.e., S1-S3 species in the Natural Heritage Information Centre (NHIC)], threatened or endangered species and other natural heritage features within two kilometres of the Site. A formal information request was also submitted to the MNRF and ARA Approvals with responses received in spring 2021 and winter 2022 (Appendix A). The information provided was incorporated in this report.

4.2 SAR Screening

A SAR screening was completed for the Site and Study Area, focusing on the review of records and range maps pertaining to species that are designated as threatened, endangered or special concern under the ESA, and species that are protected under Schedule 1 of the SARA. Species with ranges overlapping the Site or Study Area, or recent occurrence records in the vicinity, were screened by comparing their habitat requirements to habitat conditions at the Site and Study Area.

The potential for the species to occur was determined through a probability of occurrence. A ranking of low indicates no suitable habitat availability for that species in the Site and Study Area and no specimens identified. Moderate probability indicates more potential for the species to occur, as suitable habitat appeared to be present in the Study Area, but no occurrence of the species has been recorded. Alternatively, a moderate probability could indicate an observation of a species, but there is no suitable habitat on the Site or in the Study Area.
High potential indicates a known species record at the Site or in the Study Area (including during field surveys or background data review) and good quality habitat is present.

Searches were conducted during field surveys for suitable habitats and signs of all SAR identified through the desktop screening. The screening was refined based on field surveys (i.e., habitat assessment) and/or species-specific surveys. Any habitat identified during ground-truthing or other field surveys with potential to provide suitable conditions for additional SAR not already identified through the desktop screening was also assessed and recorded.

4.3 Field Surveys

The habitats and communities on the Site were characterized through field surveys. The habitats in the Study Area were characterized through review of aerial imagery, and through visual assessment from accessible lands (e.g., roadside, edge of the Site). The following sections outline the methods used for each of the field surveys. During all surveys, visual encounter surveys (VES) and area searches were conducted, and wildlife, plant, and habitat observations were recorded. Searches were also conducted to document the presence or absence of suitable habitat, based on habitat preferences, for those species identified in the desktop SAR screening described above. The dates when all surveys were conducted are included in Table 1. Locations of all survey stations are shown on Figure 1.

Table 1: Summary of Field Surveys Conducted on the Site in 2021

Year	Date	Type of Survey
2021	April 8	Site Reconnaissance, Nocturnal Anuran Survey, Turtle Survey, Visual Encounter Survey (VES)
	April 23	Turtle Survey, VES
	May 13	Turtle Survey, VES
	May 19	Eastern Whip-poor-will Survey, Nocturnal Anuran Survey, VES
	May 27	Eastern Whip-poor-will Survey, VES
	May 29	Breeding Bird Survey, Turtle Survey, Plant Community Survey, Botanical Inventory, VES
	June 2	Turtle Survey, VES
	June 18	Breeding Bird Survey, Bat Detector Set-up, VES
	June 29	Breeding Bird Survey (grassland only), Plant Community Survey, Botanical Inventory, VES
	July 23	Plant Community Survey, Botanical Inventory, Bat Detector Take-down, VES

4.4 Plant Community Assessment and Botanical Surveys

4.4.1 Ecological Land Classification

Ecological land classification (ELC) mapping and data on the Site were gathered according to standard protocols (Lee et al. 1998). ELC was completed and refined over several visits to capture seasonal variability in the dominant plant forms. ELC mapping of the Study Area was completed through interpretation of aerial imagery, and observations made from public access points (e.g., roadside) and from the edge of the Site.

4.4.2 Botanical Inventory

A botanical inventory was completed concurrent with the plant community assessments, with a running list compiled of all plants encountered on the Site. An effort was made to search for SAR, provincially rare plants (ranked as S1 to S3 by NHIC), as well as food plants for any SAR insects. The running list of plants observed was augmented, as needed, during all field surveys.

4.4.3 Wetlands

On-Site wetlands were delineated using the protocols of the Ontario Wetland Evaluation System (OWES; MNRF 2022) by a certified wetland evaluator.

4.5 Wildlife and Wildlife Habitat Surveys

4.5.1 Herpetile Surveys

To document use of the on-Site wetlands and in the Study Area by breeding amphibians, two rounds of nocturnal anural call-count surveys were conducted (early and mid-season). Surveys followed standardized Marsh Monitoring Program (MMP) protocols (BSC 1995) and included evening call-count surveys, as well as VES in areas where access was permitted. A third (late-season) survey was not completed as the wetlands on the Site did not hold water long enough in the season to support late-calling species.

Basking turtle visual surveys were focused around suitable habitat on the Site and in the Study Area. Observation areas included natural water bodies that appeared to provide potentially suitable turtle habitat. Using the Occurrence Survey Protocol for Blanding's Turtle in Ontario (MNRF 2015b) as guidance, WSP conducted five survey rounds when water temperatures were at or above 10°C (April through to June 15). These protocols are appropriate for searching for a range of turtle species, since most turtle species have similar ecologies. WSP biologists scanned (i.e., with binoculars or spotting scope) suitable habitats on sunny days, from mid-morning to mid-afternoon. Turtles will typically bask on logs, hummocks, and vegetation clumps.

During all field surveys, VES for herpetiles on the Site were conducted following recommended MNRF protocols (MNRF 2013; MNRF 2016).

4.5.2 Breeding Bird Surveys

Three early morning breeding bird surveys (BBS) were conducted on the Site in June and July at least two (2) weeks apart, following standard protocols (Sauer et al. 2008; Cadman et al. 2007). Surveys were conducted at point-count stations distributed throughout all habitats on the Site (including potential SAR habitat and grassland bird habitat) and occurred between 30 minutes before sunrise and 10:00 am to encompass the period of maximum bird song. A list of all species was compiled, and the locations of any SAR was marked using a hand-held GPS.

Eastern whip-poor-will (*Caprimulgus vociferus*) is known to occur in the vicinity of the Site. Current draft MNRF methodology (MNRF 2014a) requires three Site visits in order to assess presence of this species. WSP conducted three crepuscular/nocturnal BBS during twilight or after dark in accordance with the recommended methodologies.

During all field surveys, VES were performed for bird species not well covered by point count surveys, such as raptors and all bird observations were documented. Attention was also paid to searching for evidence of nesting by those migratory birds covered under the special provisions of the MBCA (e.g., woodpeckers).

4.5.3 Mammal Surveys

4.5.3.1 Bat Surveys

Bat surveys at the Site included a daytime habitat assessment (e.g., searching for suitable roosting habitat, such as trees with cavities, loose bark or clumps of dead leaves) and acoustic bat surveys. Two acoustic bat detectors (Wildlife Acoustics SM4 units) were deployed on the Site and programmed to record bat calls for at least 10 consecutive nights, as per MECP recommended protocols (MECP 2021). Each station was located to provide coverage and target areas where bats would most likely be roosting, commuting or feeding. The U1 microphones were programmed to record from 30 minutes before sunset to 30 minutes after sunrise.

SonoBat Data Wizard was used to attribute file names and scrub the data set of noise files. The high-grade noise scrubber setting was used. Bat call files were processed with SonoBat 4.4.5 call analysis software (Sonobat, Arcata, CA, USA) with the north-northeast classifier for automated classification. Manual call analysis of a portion of the calls was performed to determine at what threshold the software's species attributions become unreliable. In some instances, all files within a species category were manually analysed to confirm identifications (i.e., for unlikely species and high frequency files). Calls were grouped as undetermined high- or low- frequency species (i.e., characteristic frequency above or below 35 kHz), or undetermined bats when species or group determinations could not be made. A Myotis category was also created that included calls identified as undifferentiated Myotis species, as well as high-frequency calls not identified to the species or genus level.

4.5.4 Visual Encounter Surveys

General wildlife surveys included track and sign surveys, area searches, and incidental observations, concurrent with other field surveys. These surveys followed recommended protocols (McDiarmid 2012; Bookhout 1994; Pyle 1984; MNRF 2013; MNRF 2016). During these surveys, the full range of habitats across the Site and in accessible parts of the Study Area were searched, with special attention paid to edge habitats and other areas where wildlife might be active. Areas of exposed substrate such as sand or mud were located and examined for any visible tracks. Any wildlife (including mammals, reptiles, amphibians, birds, butterflies, and dragonflies) seen and identified were recorded. When encountered, tracks and other signs (e.g., tracks, scats, hair, tree scrapes, etc.) were identified to a species, if possible, and recorded.

4.5.5 Aquatic Surveys

Watercourses on the Site and, to the extent possible those in the Study Area, were assessed through a rapid fisheries habitat assessment. The features were characterized and their potential to provide fish habitat was assessed.

4.6 Analysis of Significance and Sensitivity and Impact Assessment

An assessment was conducted to determine the significance and sensitivity of natural features as well as significant species observed or determined to have the potential to exist on the Site or in the Study Area. The assessment was completed by comparing natural environment data collected through background material and the field surveys to published resources as described in Section 4.1, and through a detailed analysis using the methods and criteria outlined in the following sources:

- Natural Heritage Reference Manual (NHRM; MNRF 2010)
- Significant Wildlife Habitat Technical Guide (SWHTG; MNRF 2000)
- Significant Wildlife Habitat Criteria Schedules for Ecoregions 6E (SWHCS; MNRF 2015a)

An assessment was then conducted to determine how the proposed extraction may negatively impact significant natural features or SAR. Preventative, mitigative and remedial measures were considered in assessing the net effects of the proposed extraction on the surrounding ecosystem. Where impacts to significant wildlife habitat were determined to be present, mitigation was determined using the guidance provided in the Significant Wildlife Habitat Mitigation Support Tool (SWHMiST; MNRF 2014b).

5.0 EXISTING CONDITIONS

5.1 Ecosystem Setting and Regional Context

The Study Area is located in Ecoregion 6E (Lake Simcoe - Rideau), which covers approximately 6.4% of Ontario, extending from Lake Huron east to the Rideau River (Crins et al. 2009). Ecoregion 6E is dominated by the Great Lakes – St. Lawrence Forest Region, which is underlain primarily by dolomite and limestone bedrock, except along the Frontenac Arch between Algonquin Park and the Adirondack Mountains where granites and gneisses are mixed with limestones and sandstones (Crins et al. 2009). The majority of this ecoregion exists as cropland (44.4%) and pasture or abandoned fields (12.8%), while water covers 4% of the ecoregion (Crins et al. 2009).

The Site and Study Area lie within the Muskrat Lake Ridges physiographic region in an area dominated by shallow till and rock ridges (Chapman and Putnam 1984). The Site and Study Area are located within the Bonnechere River watershed.

5.2 Geology and Hydrogeology

Published surficial geological mapping indicates that the site is generally covered by ice-contact stratified sand and gravel deposits, with some organic deposits in the low-lying areas at the south of the site and Precambrian bedrock outcrops near the northern boundary (WSP 2023). Published bedrock geology mapping indicates the upper bedrock unit in the vicinity of the site consists of Precambrian Bedrock consisting of Carbonate Metasedimentary Rocks (i.e., marble) (WSP 2023). Groundwater depths range from 2.6 to 33.6 metres below ground surface (mbgs) across the Site (WSP 2023). Groundwater elevations in all monitoring wells are generally stable (i.e., vary by less than one metre) and display minor seasonal variations (WSP 2023). Overburden groundwater generally flows from northeast to southwest across the Site towards Clubhouse Lake (WSP 2023).

5.3 Surface Water Resources

Surface water features on the Site are limited to a small section of a primarily off-Site intermittent stream located northeast of the Site, a small shallow pond and a portion of a primarily off-Site marsh, both located in the southern part of the Site. The intermittent stream located in the northeast of the Site is interpreted to be fed by surface water (WSP 2023). A surface water connection between the watercourse at the northeastern edge of the Site, running through the Site to Clubhouse Lake, is mapped on published sources (MNRF 2023c) but was not present in the field and so is not discussed further in this report. A targeted search for this feature or evidence of its past presence was performed during site investigations and no evidence of it was observed; WSP (2023) determined that although not present at surface, flows from the northwestern portion of the Site eventually enter Clubhouse Lake via shallow groundwater movement. The pond and marsh in the southern part of the Site are interpreted to intercept the groundwater table (WSP 2023).

Within the Study Area is a larger portion of the intermittent stream northeast of the Site, several smaller intermittent streams, wetlands, and Clubhouse Lake.

5.4 Plant Communities

5.4.1 Regional Setting

The Study Area is located in the Upper St. Lawrence section of the Great Lakes – St. Lawrence Forest Region, which contains a wide variety of both coniferous and deciduous species, and is typically dominated by sugar maple (*Acer saccharum*) and American beech (*Fagus grandifolia*) in combination with red maple (*Acer rubrum*), basswood (*Tilia americana*), yellow birch (*Betula alleghaniensis*), white ash (*Fraxinus americana*), largetooth aspen (*Populus grandidentata*) and red oak (*Quercus rubra*) and bur oak (*Quercus macrocarpa*) (Rowe 1972). Eastern hemlock (*Tsuga canadensis*), white pine (*Pinus strobus*) and balsam fir (*Abies balsamea*) and white spruce (*Abies basamea*) occur over shallow, acidic or eroding substrates (Rowe 1972).

5.4.2 Ecological Land Classification

Overall, the Site consists of deciduous and mixed forest, including large areas of recent logging, mixed meadow, deciduous thickets, and a small portion of a marsh that continues off-site. There are small wetland inclusions, ponds, and vernal pools within these communities as well. The Study Area includes the Site, plus additional forest, disturbed areas, hayfields, wetlands, and a small lake.

During the field surveys conducted on the Site, nine plant communities were identified based on the ELC system (Lee et al. 1998). No provincially rare plant communities were identified. Plant communities are shown on Figure 1 and are described in Table 2.

Table 2: Plant Communities on the Site

Plant Community	Description	SRANK[a]
TERRESTRIAL		
CUM1-1 Mixed Meadow	This community is a single meadow in the middle of the Site, at the top of a slope. It is dominated by a mixture of grasses and forbs such as orchard grass (*Dactylis glomerata*), Timothy (*Phleum pratense*), lamb's-quarters (*Chenopodium album*), and common milkweed (*Asclepius syriaca*) on sandy soils. Some areas within this community are comprised of bare sand due to recent disturbance, and small patches of treed areas dominated by trembling aspen (*Populus tremuloides*) occur.	N/A
CUT1 Deciduous Thicket	This community is two small areas in the northern half of the Site. One is on the side of a slope and the other is in a flat area; both are regenerating from historic disturbance. They are dominated by shrubs such as staghorn sumac (*Rhus typhina*), red raspberry (*Rubus idaeus*) and prickly ash (*Zanthoxylum americanum*); with various other meadow plants and small trees such as Canada goldenrod (*Solidago canadensis*), smooth brome (*Bromus inermis*) and trembling aspen.	N/A
FOD3-1 Dry to Fresh Poplar/Mixed Hardwood Deciduous Forest	This community is two immature forest stands on sandy soils along the western and southern edges of the Site. The canopy is mostly open and dominated by trembling aspen and large-toothed aspen, with associates such as sugar maple, and white ash (*Fraxinus americana*). The understory and ground cover are moderate to dense with a mixture of young trees and other species including round-leaved dogwood (*Cornus rugosa*), poison-ivy (*Rhus radicans*), wild sarsaparilla (*Aralia nudicaulia*), and false Solomon's-seal (*Maianthemum racemosa*). There is a relatively large shallow pond within the southern of these two stands. Downed woody debris is abundant, snags and cavity trees are occasional.	N/A

Plant Community	Description	SRANK[a]
FOD5-2 Recently Logged Dry to Fresh Sugar Maple – Beech Deciduous Forest	This community is a recently logged forest on sandy to loamy soil that makes up most of the northern half of the Site. Most of it has been logged in recent years, although some remnant untouched patches and scattered immature to semi-mature trees still occur. Tree species dominance varies but includes sugar maple and beech, with associates such as ironwood, large-toothed aspen, and red oak. The understory and ground cover are sparse to moderate with a variety of species such as purple-flowering raspberry (*Rubus odoratus*), alternate-leaved dogwood (*Cornus alternifolia*), white trillium (*Trillium grandifolia*), bloodroot (*Sanguinaria canadensis*), and Pennsylvania sedge (*Carex pensylvanica*). Downed woody debris is abundant, and snags and cavity trees are rare.	N/A
FOM6-2 Fresh to Moist Hemlock – Hardwood Mixed Forest	This community is two small stands of semi-mature to mature mixed forest on sandy loam over clay at the northern edge of the Site and Study Area. Only one of these two areas overlaps with the Site. The canopy is primarily closed and dominated by eastern hemlock (*Tsuga canadensis*) and red maple (*Acer rubrum*) with associates such as yellow birch (*Betula papyrifera*), eastern white cedar (*Thuja occidentalis*), and sugar maple. The understory and groundcover are sparse, with species such as wild sarsaparilla, evergreen woodfern (*Dryopteris intermedia*), and Canada mayflower (*Maianthemum canadense*). Within the stand that overlaps with the Site is a series of vernal and isolated permanent pools. Water levels within these pools ranged from 2 cm to 40 cm, and they held water during all field visits in 2021. Downed woody debris and snags were occasional within this community.	N/A
WETLAND		
SWD2-2 Green Ash Mineral Deciduous Swamp	This community is a small basin swamp on clay soils in the eastern corner of the Study Area, but not on the Site. It is semi-mature with a partially open canopy, dominated by green ash (*Fraxinus pensylvanica*), with associates such as red maple. It is fed by a small intermittent stream from the north and is flooded during spring into at least early summer. Very few plants were observed in the understory and groundcover. Downed woody debris and snags were rare.	NA
MAS2 Cattail-Sedge Mineral Shallow Marsh	This community is a basin marsh on moderate organics and sand over clay at the southwestern corner of the Site and Study Area. It is dominated by robust and narrow-leaved emergents such as common cattail (*Typha latifolia*), and sedges. Various other plants occur, including shrubs and forbs such as speckled alder (*Alnus incana*), and Joe-pyeweed (*Eutrochium maculatum*). There is an open area of ponded water in the middle of this marsh, the rest of the marsh undergoes periodic flooding.	N/A
ANTHROPOGENIC		
AGRC - Agricultural	This area is a graminoid hayfield in the Study Area, but not on the Site.	N/A
RES/REC	This community is located in the Study Area and includes residential properties, a golf course, roadways, and other similar areas.	N/A

Notes: [a] SRANK is a provincial –level rank indicating the conservation status of a species or plant community and is assigned by the NHIC in Ontario (NHIC 2023). SRANKs are not legal designations but are used to prioritize protection efforts in the Province. SRANKs for plant communities in Ontario are defined in the Significant Wildlife Habitat Technical Guide (MNRF 2000). Ranks 1-3 are considered extremely rare to uncommon in Ontario; Ranks 4 and 5 are considered to be common and widespread. N/A indicates a community that has not been ranked.

5.4.3 Vascular Plants

A total of 119 vascular plants were identified on the Site during the field surveys. For a list of plants identified within the Site refer to Appendix C. No SAR or provincially rare plant species were observed on the Site.

5.5 Wildlife

A list of all wildlife or wildlife signs encountered on the Site during field surveys is provided in Appendix D.

5.5.1 Herpetiles

A total of nine herpetile species were identified in the Study Area. Four species of frogs were identified in the wetlands on the Site and Study Area. With the exception of the small pond near the southern end of the Site, all frogs were observed in the adjacent wetlands and Clubhouse Lake, within the Study Area. One individual garter snake (*Thamnophis sirtalis*) was observed in the middle of the Site. Vernal pools and flooded areas within the Study Area, but off-Site, were seen to contain clumps of wood-frog eggs (*Lithobates sylvaticus*), and blue-spotted salamander eggs (*Ambystoma laterale*).

Several midland painted turtles (*Chrysemys picta marginata*) were observed basking in the small pond on the Site, as well as Clubhouse Lake. A large snapping turtle (*Chelydra serpentina*) was observed in Clubhouse Lake immediately adjacent to the Site, within the Study Area, on more than one occasion. Its likely the same individual. Snapping turtle is designated as special concern under the ESA. For more information on this species refer to Section 6.7.

5.5.2 Birds

A total of 45 bird species were identified in the Study Area. This includes a mix of edge, and forest species such as song sparrow (*Melospiza melodia*), and black-throated green warbler (*Setophaga virens*). One eastern whip-poor-will was heard on the first survey event, outside the Site, but in the Study Area. However, this individual was not heard again on subsequent surveys, and was therefore likely a vagrant or late migrant. Eastern whip-poor-will is designated as threatened under the ESA and the SARA. As no evidence of breeding on the Site or in the Study Area was noted during the field surveys, this species is not discussed further in this report.

No evidence of nests of bird species listed under the special provisions of the MBCA were observed at the Site, although these species may nest in the Study Area.

5.5.3 Mammals

A total of 15 species of mammals were identified on the Site. This included species that are common in the region such as white-tailed deer (*Odocoileus virginianus*), eastern chipmunk (*Tamias striatus*), and coyote (*Canis latrans*). With the exception of the bat species discussed below, no SAR or provincially rare mammals were identified on the Site. No concentrations of mammals or den sites were noted.

5.5.3.1 Bats

The acoustic detectors were set to record at two stations on the Site (Figure 1) and data from 16 consecutive nights was analyzed. Five to six species of bats were recorded at each station, most commonly big brown bat (*Eptesicus fuscus*), hoary bat (*Lasiurus cinereus*), eastern red bat (*Lasiurus borealis*) and silver-haired bat (*Lasionycteris noctivagans*), followed by fewer recordings of little brown myotis (*Myotis lucifugus*) and eastern small-footed myotis (*Myotis leibii*). Overall, bat activity was moderate at Station 1 and high at Station 2 compared to other sites WSP has surveyed in the local landscape.

Of the 891 total bat passes recorded at Station 1, there were 14 SAR or potential SAR bat passes at this station (1.6% of recorded calls), including three little brown myotis and 11 passes identified as high-frequency unknown or unknown myotis calls.

Of the 2462 total bat passes recorded at Station 2, there were 37 SAR or potential SAR bat passes at this station (1.5% or recorded calls), including: three little brown myotis; five eastern small-footed; and 29 high-frequency unknown or unknown myotis calls.

SAR bats are discussed further in Section 6.1.

5.5.4 Bumblebees, Dragonflies, and Butterflies

A total of 12 insect species were identified during the field surveys. This included common species such as black swallowtail (*Papilio polyxenes*), common eastern bumblebee (*Bombus impatiens*), and widow skimmer (*Libellula luctuosa*). The majority of individuals observed were associated with the meadow and forest edges and no unusual concentrations were noted. A few individual monarch (*Danaus plexippus*) adults were observed feeding on nectar in the meadow on the Site. Although a moderate number of milkweed plants occur, no monarch caterpillars were observed. Monarch is designated as special concern under the ESA and the SARA. For more information on monarch refer to Section 6.7.

5.6 Aquatic Habitat and Fish

Within the Site there is limited potential for fish habitat. There is a small shallow pond within the FOD3-1 at the southern portion of the Site (Figure 1); however, this pond is isolated and all but dries up by mid-summer when oxygen levels were very low (1.9 mg/L). This pond does not represent fish habitat.

A small intermittent stream flows within the Study Area, along the northeast edge of the Site. A very small section of this stream touches the Site boundary. This stream appears to dissipate into a basin swamp (SWD2-2) and no surface water outlet was observed. Both the stream and the SWD2-2 were seen to dry up mid-summer. Given the intermittent nature and lack of downstream connections, WSP's opinion is that this feature does not function as or contribute to fish habitat, though it is mapped as a coldwater tributary of Crozier Creek (MNRF 2023c). The mapped connection between this feature and Crozier Creek was not observed in the field, as noted in Section 5.3. WSP (2023) determined that this feature is surface water fed.

Within the Study Area, outside of the Site, is a small lake called Clubhouse Lake. Large schools of small-bodied fish (primarily cyprinids) were observed within this lake, confirming it as fish habitat. The lake outflows to a tributary of Crozier Creek, which eventually outflows to the Bonnechere River. This tributary is mapped as coldwater habitat (MNRF 2023c).

There is a small watercourse that flows intermittently into Clubhouse Lake from the MAS2 community, flowing through the Site for a very short distance. This feature, given its connection to Clubhouse Lake, is considered fish habitat, and is mapped as coldwater habitat (MNRF 2023c). Based on the results of WSP (2023), the water in the MAS2 community is primarily associated with groundwater inputs; however, a beaver dam at the outlet of the MAS2 community to Clubhouse Lake slows drainage of this feature and may result in warming of the water in the MAS2 community. Limited temperature monitoring undertaken by WSP (2023) indicates that water temperature in this feature fluctuates in response to air temperature and is therefore unlikely to qualify as coldwater fish habitat.

Two additional small streams occur in the western and northern portion of the Study Area, outside of the Site. These features were not accessed due to them being on private land and not visible from the Site. Their status as fish habitat is unknown, although they are identified as coldwater habitat (MNRF 2023c).

6.0 SIGNIFICANT NATURAL FEATURES AND IMPACT ASSESSMENT

This section assesses the significance of natural features and functions (as outlined in Section 2.0) observed on the Site or in the Study Area, as well as the potential impacts to those features that may result from the proposed extraction, in consideration of mitigation measures.

6.1 Habitat of Endangered or Threatened Species

Based on the background review and field surveys, two endangered or threatened species and/or their defined habitat were identified on, or have moderate or high potential to be present on the Site and/or in the Study Area (Appendix B). This included little brown myotis and eastern small-footed myotis.

Eastern Small-footed Myotis and Little Brown Myotis

Little brown myotis and eastern small-footed myotis are both designated as endangered under the ESA. Both species were recorded on the Site during acoustic surveys and have a high potential to be present in the Study Area. In natural habitats, little brown myotis shows preference for roosting in hollow trees and under peeling bark; whereas eastern small-footed myotis shows preference for roosting in rock piles and talus (ECCC 2019). Both species may use caves or abandoned mines for hibernaculum, but high humidity and stable above freezing temperatures are required (ECCC 2019).

Based on the activity level, the timing of detections and an assessment of habitats in the vicinity of each detector, it is interpreted that there is no maternity roost for eastern small-footed myotis or little brown myotis in the vicinity of either station. These species may be using the Site for foraging and commuting. The Site will continue to be suitable for foraging during extraction and in the rehabilitation condition.

No hibernaculum for either of these species is present on the Site or in the Study Area. There is suitable maternity roosting habitat for both of these species off-Site in the Study Area.

Based on this analysis, WSP's opinion is that no permit under the ESA is required for these species. Basic mitigation to avoid harm to individuals of this species are presented in Section 7.1.

SAR in the Study Area

There is potential for additional endangered or threatened species to be present in the Study Area (see Appendix B); however, none were observed in the Study Area during the field studies. No impacts to habitats in the Study Area are anticipated to result from the proposed extraction, as discussed further in the sections below.

6.2 Significant Wetlands and Coastal Wetlands

Significant wetlands are areas identified as provincially significant by the MNRF using evaluation procedures established by the province, as amended from time to time (MMAH 2020). Wetlands are assessed based on a range of criteria, including biology, hydrology, societal value and special features (MNRF 2022).

Based on the desktop assessment, there are no provincially significant wetlands (PSW) on the Site or in the Study Area. The nearest PSW is more than 5 km from the Study Area.

Portions of two small, unevaluated wetlands overlap the Site (ELC codes MAS2 and SWD2-2; Figure 1). The County of Renfrew official plan (2020) does not map these wetlands as "Environmental Protection". There are additional small unevaluated wetlands off-Site within the Study Area (Figure 1). Based on WSP's observations in the field, these small wetlands have no form or function associated with them that would warrant designation as

PSW in their own right. Further, all but the MAS2 wetland are smaller than 2.0 ha in size and are therefore generally considered too small to be evaluated under OWES (MNRF 2022). However, for the purposes of this report, all the wetlands on and off-Site within the Study Area have been assessed as if they are PSW to ensure appropriate assessment of potential impacts. The wetlands that overlap the Site are set back from the proposed extraction limit by 30 m, in which no vegetation clearing will occur. This setback will provide a natural protective barrier to the wetlands from the adjacent extraction. Based on the water balance and groundwater level drawdown prediction, WSP (2023) concluded that significant impacts to wetlands on the Site and in the Study Area resulting from the operation and rehabilitation of the pit are not predicted. The estimated percentage changes in the surplus volumes during the operation and rehabilitated conditions are less than ±5%, which is considered insignificant (WSP 2023). Based on this, no impacts to these wetland features are expected to result from the proposed extraction.

There are no coastal wetlands on the Site or in the Study Area. No further analysis is warranted.

6.3 Fish Habitat

Based on the assessment discussed in Section 5.6, fish habitat on the Site is limited to the small feature that connects Clubhouse Lake to the MAS2 community (Figure 1) which is considered a coldwater stream according to existing mapping (MNRF 2023c). However, the presence of a beaver dam appears to slow drainage in the MAS2 community, which may allow for warming of the water prior to discharge. This is supported by the results of limited temperature monitoring undertaken by WSP (2023) that showed the water temperature in this feature fluctuates with air temperature and therefore is unlikely to be coldwater habitat.

Within the Study Area, outside of the Site, fish habitat is represented by Clubhouse Lake, and possibly the two small watercourses north and west of the Site in the Study Area which are mapped as coldwater habitats (Figure 1), Based on the water balance and groundwater level drawdown prediction, WSP (2023) concluded that significant impacts to surface water features on the Site and in the Study Area, resulting from the operation and rehabilitation of the pit are not predicted. The estimated percentage changes in the surplus volumes during the operation and rehabilitated conditions are less than ±5%, which is considered insignificant (WSP 2023). Based on this, no impacts to fish habitat is expected to result from the proposed extraction.

Although not considered fish habitat, the intermittent stream in the northeast of the Site is surface water fed (WSP 2023), and therefore any flows in that feature will not be impacted hydrologically or thermally by the proposed extraction.

6.4 Significant Woodlands

Significant woodlands are to be defined and designated by the local planning authority (MNRF 2010). According to the PPS, significant woodlands are to be identified using criteria established by the MNRF in the NHRM (MNRF 2010). The County of Renfrew has undertaken an exercise to identify significant woodlands in their jurisdiction using the NHRM (MNRF 2010) guidance for determining significance of woodlands.

Significant woodlands are mapped on the Site in the County of Renfrew official plan (Schedule B, Map 4; Renfrew 2020), and correspond to the forested portions of the Site that cover much of the Site (with the exception of the open areas; Figure 2).

Logging has occurred in a large portion of the significant woodland on the Site, primarily at the northwest end of the Site. Although this activity has significantly reduced the presence of mature and semi-mature trees, the community is still considered a forest community according to the ELC system, based on existing immature trees

left behind as well as rapid regeneration of seedlings that is occurring. Based on WSP's field observations, there are additional areas of forest on the Site that are mature and contiguous with the areas identified in the County of Renfrew official plan as significant woodland, and so have been included as significant woodland for the purposes of this report (Figure 2).

The forests on the Site represent the southern edge of an extensive, ~1200 ha forested area that extends north and east of the Site, which is itself part of a larger forested area though it is separated from the larger area by utility corridors and two-lane roads. The proposed extraction will remove 20.1 ha of the 22.0 ha on-Site significant woodland (~91%). The remaining on-Site portions of the significant woodland will be located in the setback areas where berms are not proposed and will continue to be contiguous with the off-Site forests. It is possible that additional woodland area will be left intact along the northwestern edge of the Site, where bedrock and topography may make extraction of aggregate difficult. This potential scenario has not been included in our assessment of impacts; instead, a worst-case-scenario has been considered (i.e., 20.1 ha of forest removal). As noted, the Site is located at the southern edge of an extensive forest, so this removal will not result in fragmentation of the larger off-Site forest. Based on WSP (2023) there will be some groundwater lowering in the area east of the Site, which overlaps a portion of the significant woodlands in this area. According to WSP (2023) within the treed portion of the predicted zone of groundwater drawdown the water has consistently been at least 1.6 m below ground surface, and up to 3.9 m below the ground surface. The tree species in this area (e.g., sugar maple, American beech) typically have root systems that do not extend beyond 1 – 2 m below ground surface. For this reason, the forest in this area is not interpreted to rely on groundwater for sustenance, and so a lowering of the water table in this area is not expected to cause negative impacts to the significant woodlands within the Study Area.

The proposed extraction will temporarily remove 20.1 ha of forest at the edge of an extensive significant woodland, which will not negatively impact the form or function of the significant woodland as a whole. Portions of the significant woodland will remain on the Site in the setback areas during extraction, and in the rehabilitation plan calls for implementation of 20.1 ha of forest. Based on this, no impacts to significant woodlands are expected in the long-term. Standard mitigation relating to dust, which has the potential to impact off-Site vegetation, is discussed in Section 7.1. No further analysis is warranted.

6.5 Significant Valleylands

Significant valleylands should be defined and designated by the planning authority. General guidelines for determining significance of these features are presented in the NHRM (MNRF 2010). Recommended criteria for designating significant valleylands include prominence as a distinctive landform, degree of naturalness, importance of its ecological functions, restoration potential, and historical and cultural values.

The County of Renfrew official plan (Schedule B, Map 4; Renfrew 2020) identifies areas of valleylands, associated with the mapped watercourses (Figure 1) in the Study Area. The official plan notes that not all valleylands mapped will meet the criteria for provincial significance. Based on WSP's observations, the only valley feature is located off-Site where the small watercourse along the eastern edge of the Study Area flows through the FOM6-2 community. This feature is not likely to be considered significant in the planning area and will not be affected by the proposed extraction. No further analysis is warranted.

6.6 Significant Areas of Natural or Scientific Interest (ANSIs)

Significant Areas of Natural and Scientific Interest (ANSIs) are areas identified as provincially significant by the MNRF using evaluation procedures established by the Province, as amended from time to time.

There are no ANSI on the Site or in the Study Area. No further analysis is warranted.

6.7 Significant Wildlife Habitat

Significant wildlife habitat (SWH) is one of the more complicated natural heritage features to identify and evaluate. The NHRM includes criteria and guidelines for designating SWH. There are two other documents, the Significant Wildlife Habitat Technical Guide (SWHTG) and the Significant Wildlife Habitat Criteria Schedules (SWHCS) (MNRF 2000 and MNRF 2015a), that can be used to help decide what areas and features should be considered significant wildlife habitat. These documents were used as reference material for this study.

There are four general types of significant wildlife habitat: seasonal concentration areas, rare vegetation communities or specialized habitats for wildlife, species of conservation concern, and animal movement corridors. The specific habitats considered in this report were evaluated based on the criteria outlined in the SWHCS for ecoregion 6E (MNRF 2015a). All types of SWH are discussed below in relation to the Site and the Study Area.

6.7.1 Seasonal Concentration Areas

Seasonal concentration areas are those areas where large numbers of a species congregate at one particular time of the year. If a SAR, or if a large proportion of the population may be lost if significant portions of the habitat are altered, all examples of certain seasonal concentration areas may be designated.

The SWHTG for ecoregion 6E identifies the following types of seasonal concentrations of animals that may be considered significant wildlife habitat, and outlines means of identifying such habitat. They are:

- Waterfowl stopover and staging areas (aquatic and/or terrestrial)
- Shorebird migratory stopover areas
- Raptor wintering areas
- Bat hibernacula
- Bat maternity roost colonies
- Turtle wintering areas
- Snake hibernaculum
- Colonially nesting bird breeding habitat (bank and cliff)
- Colonially nesting bird breeding habitat (tree / shrub)
- Colonially nesting bird breeding habitat (ground)
- Migratory butterfly stopover areas
- Landbird migratory stopover areas
- Deer yarding and winter congregation areas

No areas suitable for supporting waterfowl during migration times (stopover and staging) were identified on the Site during field surveys. No terrestrial stopover or staging habitat was observed on the Site or in the Study Area.

Shorebird stopover sites are typically well-known and have a long history of use. There are no areas of suitable shorebird foraging habitat on the Site or in the Study Area. In addition, no concentrations of shorebirds or presence of the listed species was identified during the field surveys.

Ideal raptor wintering areas are generally located in mature mixed or coniferous woodlands that abut windswept fallow fields or pastures that do not get covered by deep snow. There are no suitable habitats on the Site or in the Study Area for raptor winter feeding and roosting.

No suitable areas of bat hibernacula were observed in the Study Area, and the Site and Study Area are not mapped as karst topography (OMNDM 2016). Based on the field surveys, no portions of the Site provide the necessary number (>10/ha) of large (>25cm DBH) wildlife trees to be considered significant maternity roost habitat; however, this habitat type may be present within the mature forests within the Study Area (off-Site). No impacts to woodlands in the Study Area are anticipated to result from the proposed extraction.

No potential turtle over-wintering habitat was observed on the Site, as no standing water of suitable depth or hydroperiod was present. Within the Study Area, suitable over-wintering habitat is present within Clubhouse Lake. According to WSP (2023), no significant potential impacts to the total amount of water entering Clubhouse Lake are anticipated to result from the proposed extraction.

Snake hibernacula and evidence of snake congregations were searched for during field surveys on the Site. No evidence of snake congregation was observed during field surveys. No structures on the Site or in the Study Area were deemed suitable for potential hibernacula.

There are no banks or cliffs suitable for colonial bird nesting habitat on the Site or in the Study Area, and no evidence of use by colonial bank or cliff nesting birds was observed at the Site during targeted surveys.

Colonially nesting tree / shrub breeding habitats consist of heronries, while colonially nesting ground bird breeding habitat consist of rocky islands and peninsulas where species such as gulls and terns nest. No such habitats are present on the Site or in the Study Area, and no heronries were identified during the field surveys.

The Site and Study Area are not located within 5 km of Lake Ontario, therefore there is no butterfly stopover habitat.

The Site and Study Area are not located within 5 km of Lake Ontario, therefore there is no landbird migratory stopover habitat.

Deer management is an MNRF responsibility, and no mapping of deer yards or wintering areas overlap the Site or Study Area. Deer wintering areas are mapped northwest of the Study Area (LIO 2023).

6.7.2 Rare Vegetation Communities or Specialized Habitats for Wildlife

Rare Vegetation Communities

Rare vegetation communities are those that are considered rare in the province, such as sand barrens, alvars, savannah and tallgrass prairie. It is assumed that these habitats are at risk and that they are also likely to support additional wildlife species that are considered significant. Generally, communities assigned an SRANK of S1 to S3 (extremely rare to rare-uncommon) by the NHIC qualify as rare. In addition to those communities considered rare by the NHIC (NHIC 2023b), old-growth forests are also considered rare.

None of the plant communities identified on the Site are ranked S1 to S3 by the NHIC, nor were any old growth forests identified.

Specialized Habitats for Wildlife

Specialized habitats for wildlife are microhabitats that provide a critical resource to some groups of wildlife. The SWHTG for ecoregion 6E defines specialized habitats that may be considered significant wildlife habitat, and outlines means of identifying such habitats. They are:

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

Waterfowl nesting areas consist of upland habitats extending 120 m from swamp and marsh habitats where waterfowl nesting is known to occur. To qualify as SWH, the wetlands must meet size criteria and contain certain numbers of listed species of waterfowl. No such habitats are present on the Site or in the Study Area.

Bald eagle and osprey nesting, foraging and perching habitat may be identified where an active nest is present, and includes the surrounding habitats. No active nests of either species was identified on the Site or in the Study Area.

Woodland raptor nesting habitat was not identified as no raptor nests were observed during field surveys. Further, to meet the SWHECS criteria for this habitat type, there must be >10 ha of interior forest habitat (measured 200 m from any edge) present. This is not present on the Site as the majority of the forests at the Site are disturbed (i.e., logged), but may be present in the Study Area. Because of the open character of the logged forests at the Site, they are essentially functioning as an “edge” and their removal will not reduce interior forest that may be present in the Study Area. No impacts to woodlands in the Study Area are anticipated to result from the proposed extraction.

The SWHECS indicates that exposed mineral soils in open sunny areas within 100 m of wetland habitats must be present to support turtle nesting. The only features that showed potential or confirmed use by turtles were the large MAS2 community, the small pond, and Clubhouse Lake. These features are clustered at the southern end of the Site and Study Area. Nesting habitat within 100 m of these features includes fields and lawns south of the Site in the Study Area, and the golf course which is up a slope north of the Site in the Study Area. The only potential turtle nesting habitat on the Site is the newly constructed access road, which should not be considered SWH due to the increased potential for predation and/or destruction of nests via road traffic and during wash-out events. No evidence of turtle nesting was observed on the Site during field surveys.

A single seep was observed at the southern edge of the Site within the FOD3-1 community where the MAS2 community outflows to Clubhouse Lake (Figure 2). This area lies approximately 200 m outside of the extraction area, and is not expected to be impacted by the proposed extraction. Although the wetlands in the southern part of the Site were determined to intercept the groundwater table, this does not qualify as a seep or spring. According to the SWHECS, two or more seeps may qualify a Site as SWH for seeps and springs. This test has not been met at the Site.

To be considered woodland or wetland amphibian breeding habitat according to the SWHECS, wetlands must be at least 500 m^2 in area and contain certain species richness and abundance. It was determined that wetlands on the Site and in the Study Area are considered 'woodland' breeding habitat, according to the SWHECS. Wetlands on the Site and in the Study Area were surveyed for breeding amphibians, and it was determined that the large marsh community (ELC code MAS2) that overlaps a portion of the southwestern corner of the Site is SWH, as is the small pond feature in the southern portion of the Site (opposite Clubhouse Lake) (Figure 2). In the Study Area, a vernal pool located just north of the Site (within the western FOM6-2 polygon) is considered SWH. None of the other wetlands in the Study Area, or Clubhouse Lake, meet the criteria to be considered SWH for breeding amphibians. The SWH, per the SWHECS, includes the forested areas within 230 m of the wetlands identified (Figure 2).

None of the wetlands associated with this type of SWH at the Site or in the Study Area will be impacted by the proposed extraction, as discussed in Section 6.2. The proposed extraction will remove 13.5 ha of the 18.1 ha (~75%) of SWH for amphibian breeding at the Site (exclusively upland habitat adjacent to breeding pools) in two areas: at the north end and at the south end of the Site. At the north end, the breeding habitat is contiguous with an extensive area of suitable upland habitat (~1200 ha), so the loss of the on-Site upland habitat is not expected to have a significant impact on the amphibians that breed in that feature. At the south end of the Site, the majority of the upland habitat associated with the breeding ponds will be retained (Figure 2). The loss of 13.5 ha of this habitat type on the Site will be temporary, as in the rehabilitated state the lost 20.1 ha of upland forest will be restored. Based on this, the proposed extraction will not impact the form or function of this type of SWH as suitable habitat will continue to be present during extraction and will be reinstated at rehabilitation. The vernal pool within the FOM6-2 community is not expected to be impacted hydrologically by the proposed extraction due to the shallow bedrock in that area, and because the feature is up gradient from the flow of groundwater compared to the location of the proposed pit (i.e., groundwater from the pit area does not flow towards the vernal pool). A very small portion of the catchment area of this feature may be removed by the proposed pit, however; this represents only a small fraction of the catchment area of this feature, so no significant changes to the overall contributions of surface water run off to the feature are expected to result.

There are no undisturbed forested areas on the Site that provide habitat for area-sensitive breeding birds (measured 200 m from the edge). Because the majority of forests on the Site are disturbed (i.e., logged), they are essentially functioning as an "edge" and their removal will not create a loss of any interior forest that may be present off-Site in the Study Area. No impacts to forests in the Study Area are anticipated to result from the proposed extraction.

6.7.3 Habitat for Species of Conservation Concern

Habitat for species of conservation concern (SOCC) includes habitat for three groups of species:

- Species that are rare, those whose populations are significantly declining, or have a high percentage of their global population in Ontario;
- Species listed as special concern under the ESA; and,
- Species listed as threatened or endangered under SARA only.

Rare species are considered at five levels: globally rare, nationally rare, provincially rare, regionally rare, and locally rare (i.e., in the municipality). This is also the order of priority that should be attached to the importance of maintaining species. Some species have been identified as being susceptible to certain practices, and their

presence may result in an area being designated significant wildlife habitat. The final group of species of conservation concern includes species that have a high proportion of their global population in Ontario. Although they may be common in Ontario, they are found in low numbers in other jurisdictions.

Two SOCC were observed on the Site and in the Study Area: monarch and snapping turtle. Additional SOCC were identified as having moderate potential to be present in the Study Area (Appendix B), but none were observed. As noted, a few adult monarch were observed nectaring in the open areas of the Site, and a single snapping turtle was observed in Clubhouse Lake. Based on the low numbers of both of these species observed on the Site and in the Study Area, WSP's opinion is that no significant habitat for either is present on Site or in the Study Area. Further, Clubhouse Lake will not be impacted by the proposed aggregate extraction as discussed in Section 6.2, and suitable nectaring habitat will remain on the Site in the setback areas during operations. Post-extraction, the upland area of the Site (20.1 ha) will be replanted as forest but will have a meadow-like understory while the planted trees mature, offering nectaring opportunities for monarch and other pollinators. Mitigation to protect turtles during site preparation and operations is discussed in Section 7.1.

In addition, there are four specific habitat types identified as potentially providing habitat for species of conservation concern:

- Marsh bird breeding habitat;
- Open country bird breeding habitat;
- Shrub/early successional bird breeding habitat; and,
- Terrestrial crayfish.

None of the indicator marsh breeding bird species were observed during daytime or evening surveys, therefore SWH of this type is not deemed present at the Site or in the Study Area. No open country breeding bird habitat is present on the Site or in the Study Area meeting the requirements for SWH. Although one indicator species was observed (Savannah sparrow [*Passerculus sandwichensis*]), two species are required to meet the criteria. No indicator or common species for shrub/early successional breeding bird habitat were observed on the Site or in the Study Area. No evidence of terrestrial crayfish was identified on the Site or in the Study Area during the field surveys.

6.7.4 Animal Movement Corridors

The SWHTG (MNRF 2000) defines animal movement corridors as elongated, naturally vegetated parts of the landscape used by animals to move from one habitat to another. This is generally in response to different seasonal habitat requirements. For example, trails used by deer to move to wintering areas or areas used by amphibians between breeding and summer habitat. To qualify as significant wildlife habitat, these corridors would be a critical link between habitats that are regularly used by wildlife.

The SWHECS (MNRF 2015a) indicates that movement corridors are to be identified where certain types of SWH have been identified according to the SWHECS, including:

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

SWH for breeding amphibians was confirmed on the Site, associated with the MAS2 community and the small pond feature, and off-Site within the Study Area associated with vernal pooling in the western FOM6-2 community. This habitat is amphibian breeding habitat (woodland), not (wetland), therefore no corridors are to be identified according to the SWHECS.

6.8 Other Natural Features or Designations

There are no other natural heritage features or designations identified on the Site or in the Study Area.

7.0 MITIGATION AND MONITORING

Below is a discussion of the mitigation and monitoring proposed for the Site. Specific wording relating to mitigation and monitoring to be applied to the Site Plans for the project are provided in Section 8.1.

7.1 Mitigation

The rehabilitation plan presented in Section 3.0 will provide mitigation for lost habitats at the Site, including the reinstatement of 20.1 ha of forest habitat removed during extraction, as well as shoreline wetland habitat and an open lake.

The proposed limit of extraction will be buffered from adjacent natural areas by a 15 m buffer, except where adjacent to surface water features where a 30 m setback will be implemented, and a small portion of the western boundary will have a 3 m setback applied. Existing vegetation within these setback areas will remain during site preparation and operation of the Site, except in the areas where berms are proposed (Figure 1). These natural setbacks will provide a buffer to the adjacent natural features and maintain natural areas on the Site that will continue to provide habitat for wildlife in the local landscape. As an added precaution, during construction and earth-moving operations, sediment control measures will be in place to prevent the runoff of suspended solids from entering the setback areas. Dust suppression protocols will be developed to minimize nuisance dust emissions.

To avoid direct or indirect impacts to breeding birds, no clearing of vegetation should take place within the core breeding bird season to avoid contravention of the MBCA (April 1 – August 31) unless a nesting survey has been completed by a qualified biologist within 24 hours of the clearing, and no active nests were observed. If an active nest is observed, the area must be buffered and vegetation clearing at that location postponed until the nest is no longer active. To avoid harm to individual bats that may be roosting at the Site, tree-clearing should not take place from April 1 – September 30.

To mitigate the potential for turtles to be harmed on the access road, WSP recommends that an Encounter Protocol be prepared that will include information on what to do in the event that a turtle is found on-Site. All on-Site staff are to be familiar with and trained on the components of the Encounter Protocol described above.

An Awareness Package is to be prepared that lists the SAR that may be present on the Site or in the local landscape, and all staff should be made aware of the content through specific training. The package should include information on species identification, protection under relevant legislation, and what to do if SAR or other wildlife is encountered at the Site.

Standard best management practices for noise and dust mitigation at pit operations will be employed to reduce impacts on adjacent lands, and the habitats they provide.

7.2 Monitoring

Based on the findings of this Natural Environment Report, no monitoring is required or recommended. Monitoring of surface and groundwater, to confirm the predicted impacts, are prescribed in WSP (2023).

8.0 SUMMARY AND RECOMMENDATIONS

The proposed project has been assessed for potential ecological impacts under the Aggregate Resources of Ontario: Technical reports and information standards (Ontario August 2020), the Provincial Policy Statement, policies of the County of Renfrew, as well as other relevant legislation, including the ESA.

Based on these analyses, it is expected that there will be no negative impacts to the significant natural features and functions on the Site or in the Study Area. These conclusions are based on the following recommendations:

- Establish a minimum 15 m setback to extraction, except where adjacent to wetlands where a 30 m setback is to be implemented and the small area along the western edge where a 3 m setback is proposed. No clearing of vegetation is to occur within these setbacks except where berms are proposed as shown on Figure 1.
- Construct an emergency surface overflow drainage ditch along the Site access road, and a 1.3 m high perimeter berm along the south edge of the extraction area per WSP (2023).
- No clearing of vegetation within the core breeding bird season (April 1 – August 31) unless a nesting survey has been completed by a qualified biologist within 24 hours of the clearing, and no active nests were observed.
- No clearing of trees during the active season for bats (April 1 – September 30).
- Preparation of an Awareness Package highlighting SAR that may be present at or near the Site, including information on identification, legal protection, and encounter procedures to be followed in the event that a SAR or any wildlife is encountered. The Awareness Package is to be available at the Site, and all staff should be made aware of the content through specific training.
- Standard best management practices to reduce dust and noise mitigation at the pit are to be implemented.
- These mitigation measures are to be included on the Site Plans for the project.

9.0 LIMITATIONS AND USE OF REPORT

This report was prepared for the exclusive use of Thomas Cavanagh Construction Ltd. The report, which specifically includes all tables, figures and appendices, is based on data and information collected by WSP Canada Inc. and is based solely on the conditions of the properties at the time of the work, supplemented by historical information and data obtained by WSP Canada Inc. as described in this report.

WSP Canada Inc. has relied in good faith on all information provided and does not accept responsibility for any deficiency, misstatements, or inaccuracies contained in the report as a result of omissions, misinterpretation, or fraudulent acts of the persons contacted or errors or omissions in the reviewed documentation.

The services performed, as described in this report, were conducted in a manner consistent with that level of care and skill normally exercised by other members of the engineering and science professions currently practicing under similar conditions, subject to the time limits and financial and physical constraints applicable to the services.

Any use which a third party makes of this report, or any reliance on, or decisions to be made based on it, are the responsibilities of such third parties. WSP Canada Inc. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

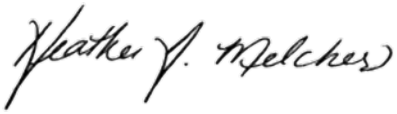
The findings and conclusions of this report are valid only as of the date of this report. If new information is discovered in future work, including excavations, borings, or other studies, WSP Canada Inc. should be requested to re-evaluate the conclusions of this report, and to provide amendments as required.

10.0 CLOSURE

We trust this report meets your current needs. If you have any further questions regarding this report, please contact the undersigned.

WSP Canada Inc.

Gwendolyn Weeks, HBScEnv
Lead Ecologist



Heather Melcher, MSc
Director, Ecology - Ontario Earth and Environment

GW/HM/ld/sg
https://golderassociates.sharepoint.com/sites/145731/project files/6 deliverables/natural environment/21465813_cavanagh renfrew_ner_december 2023_final.docx

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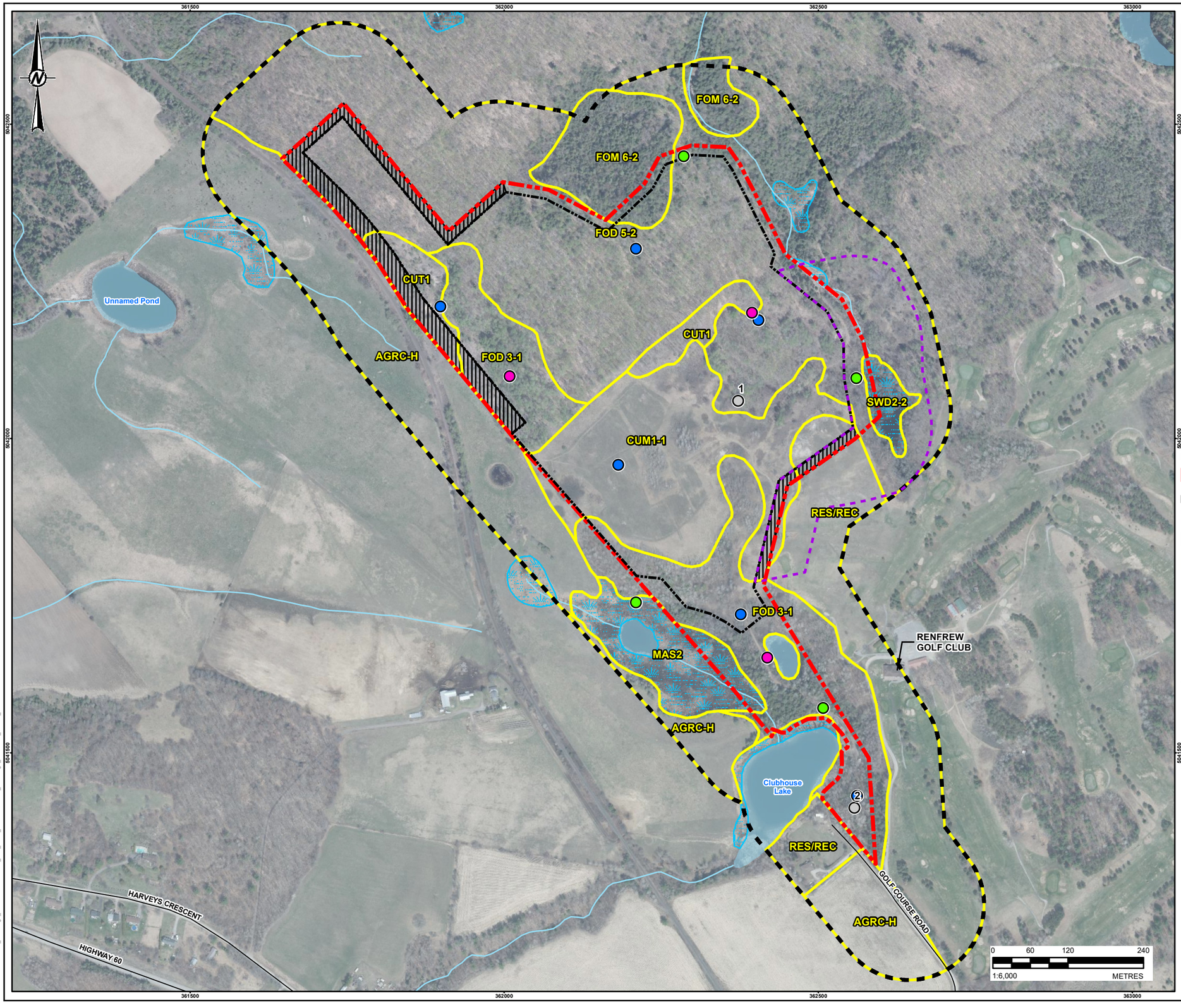
FIGURES



KEY MAP

SCALE 1:200,000

LEGEND

- EASTERN WHIP-POOR-WILL STATION
- BREEDING BIRD STATION
- NOCTURNAL ANURAN STATION
- BAT DETECTOR STATION
- ROADWAY
- WATERCOURSE
- WATERBODY
- WETLAND
- PROPOSED EXTRACTION LIMIT
- SITE
- 120 m STUDY AREA
- PREDICTED 1-METRE GROUNDWATER DRAWDOWN RADIUS OF INFLUENCE
- PROPOSED BERM LOCATIONS
- ECOLOGICAL LAND CLASSIFICATION

AGRC-H: GRAMINOID HAYFIELD
CUM1-1: MIXED MEADOW
CUT1: DECIDUOUS THICKET
FOD3-1: DRY TO FRESH POPLAR/MIXED HARDWOOD DECIDUOUS FOREST
FOD5-2: RECENTLY LOGGED DRY TO FRESH SUGAR MAPLE – BEECH DECIDUOUS FOREST
FOM6-2:FRESH TO MOIST HEMLOCK: HARDWOOD MIXED FOREST
MAS2: SHALLOW CATTAIL-SEDGE MINERAL MARSH
RES/REC: RESIDENTIAL/RECREATIONAL
SWD2-2: GREEN ASH MINERAL DECIDUOUS SWAMP

NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)
1. LAND INFORMATION ONTARIO (LIO) DATA PRODUCED BY GOLDER ASSOCIATES LTD. UNDER LICENCE FROM ONTARIO MINISTRY OF NATURAL RESOURCES, © QUEENS PRINTER 2020
2. KEY MAP: © OPENSTREETMAP (AND) CONTRIBUTORS, CC-BY-SA
COUNTY OF RENFREW
3. BING IMAGERY SUPPLIED BY ESRI AND MICROSOFT © 2020 MICROSOFT CORPORATION AND ITS DATA SUPPLIERS. IMAGERY DATE: 10/10/2016
4. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: MTM ZONE 9, VERTICAL DATUM: CGVD28

CLIENT
THOMAS CAVANAGH CONSTRUCTION LIMITED

PROJECT
RENFREW GOLF CLUB NATURAL ENVIRONMENT REPORT

TITLE
ECOLOGICAL LAND CLASSIFICATION AND SURVEY STATIONS

CONSULTANT

wsp

YYYY-MM-DD	2023-12-11
DESIGNED	----
PREPARED	JEM
REVIEWED	GW
APPROVED	HM

PROJECT NO.	CONTROL	REV.	FIGURE
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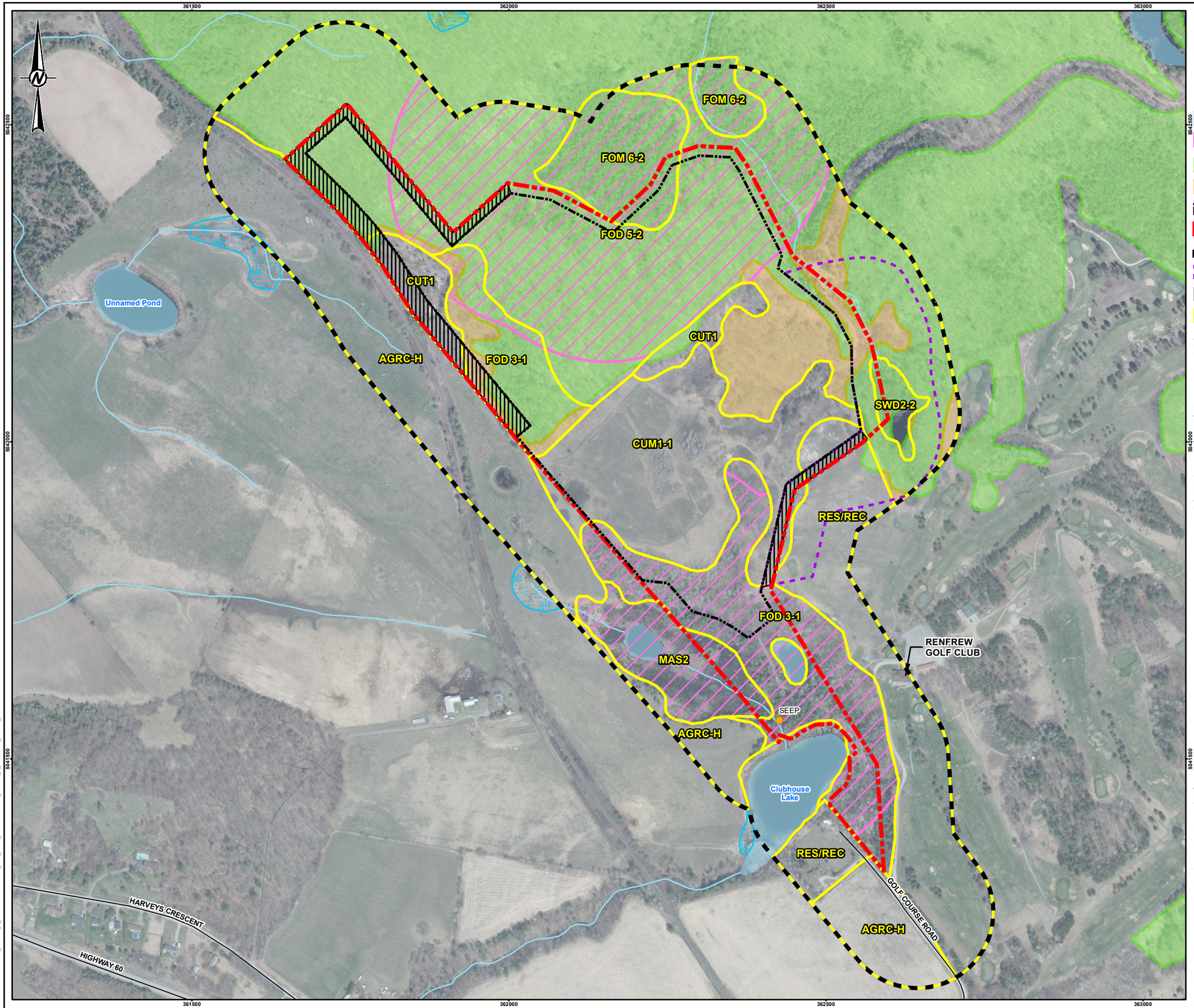

LEGEND

- SEEP
- ROADWAY
- WATERCOURSE
- WATERBODY
- WETLAND
- SIGNIFICANT WILDLIFE HABITAT - AMPHIBIAN BREEDING (WOODLAND)
- SIGNIFICANT WOODLAND (COUNTY OF RENFREW OFFICIAL PLAN, SCHEDULE "B" - MAP 4, NATURAL HERITAGE FEATURES)
- SIGNIFICANT WOODLAND (WSP 2021)
- PROPOSED EXTRACTION LIMIT
- SITE
- 120 m STUDY AREA
- PREDICTED 1-METRE GROUNDWATER DRAWDOWN RADIUS OF INFLUENCE
- PROPOSED BERM LOCATIONS
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NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

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2. KEY MAP: COUNTY OF RENFREW
3. BING IMAGERY SUPPLIED BY ESRI AND MICROSOFT © 2020 MICROSOFT CORPORATION AND ITS DATA SUPPLIERS. IMAGERY DATE: 10/10/2016
4. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: MTM ZONE 9, VERTICAL DATUM: CGVD28

0 60 120 240
1:6,000 METRES

CLIENT
THOMAS CAVANAGH CONSTRUCTION LIMITED

PROJECT
RENFREW GOLF CLUB NATURAL ENVIRONMENT REPORT

TITLE
SIGNIFICANT NATURAL FEATURES

CONSULTANT

YYYY-MM-DD	2023-12-11
DESIGNED	----
PREPARED	JEM
REVIEWED	GW
APPROVED	HM

PROJECT NO.	CONTROL	REV.	FIGURE
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APPENDIX A

Agency Correspondence

From: Hann, Carolyn (MECP) <Carolyn.Hann@ontario.ca>
Sent: June 9, 2021 4:15 PM
To: Weeks, Gwendolyn
Subject: 2021-06-09_ARA information request - Renfrew
Attachments: DRAFT-Proponents Guide to Preliminary Screening-May 2019.pdf

EXTERNAL EMAIL

Hi Gwendolyn,

I have attached the Draft Client's Guide to Preliminary Screening for Species at Risk. If you are looking for species at risk occurrence information for a particular site please complete a review and advance and submit the details to SAROntario@ontario.ca for review. Once it is received it will be tagged to a biologist for review and they will provide any additional information that may be missing. It is also helpful if you provide a lat/long or UTM for the proposed project location.

I have looked at the attached location and have the following species at risk occurrence information available for your consideration:

- Bobolink
- Blanding's Turtle
- Barn Swallow
- Eastern Meadowlark
- Red-headed Woodpecker
- Eastern Wood Pewee
- Snapping Turtle

There is also potential for the following species at risk to occur in the area:

- Butternut
- Species at Risk Bats (Northern Myotis, Eastern Small-footed Myotis, Little Brown Myotis, Tricolored Bat)
- Eastern Whip-poor-will
- Wood Thrush
- Wood Turtle

Please note it remains the clients responsibility to:

- Carry out preliminary screening for their project,
- Obtain the best available information for all applicable information sources,
- Conduct necessary field studies or inventories to identify and confirm the presence of absence of species at risk or their habitat,
- Consider any potential impacts to species at risk that a proposed activity might cause, and
- Comply with the Endangered Species Act (ESA).

Additionally, while this data represents MECP's best current available information, it is important to note that a lack of information for a site does not mean that species at risk or their habitat are not present. There are many areas where the Government of Ontario does not currently have information, especially in more remote parts of the province. On-site assessments can better verify

site conditions, identify and confirm presence of species at risk and/or their habitats. It is the responsibility of the proponent to ensure that species at risk are not killed, harmed, or harassed, and that their habitat is not damaged or destroyed through the activities carried out on the site.

Best,

Carolyn Hann
Management Biologist | Permissions and Compliance Section | Ontario Ministry of Environment, Conservation and Parks | 10-1 Campus Drive, Kemptville, Ontario, K0G 1J0 | PH: 613.355.7312 | Email: carolyn.hann@ontario.ca

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From: Weeks, Gwendolyn <Gwendolyn_Weeks@golder.com>
Sent: April-23-21 10:25 AM
To: Species at Risk (MECP) <SAROntario@ontario.ca>
Subject: ARA information request - Renfrew

Hello,
We are hoping to obtain species at risk information for the attached property, in support of a pending Aggregate Resources Act application. Please advise if there is any Species at Risk information for this Site, or the area within 1km of this Site, that is not available on the Natural Heritage Explorer "Make a Map" web application.
Many thanks,
-Gwendolyn

Gwendolyn Weeks (B.Sc.Env. (Hons))
Senior Terrestrial Ecologist

GOLDER
MEMBER OF WSP

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Work Safe, Home Safe

From: Koopman, Kaitlyn (MNRF) <Kaitlyn.Koopman@ontario.ca>
Sent: April 23, 2021 8:22 AM
To: Weeks, Gwendolyn
Subject: RE: ARA Information Request

EXTERNAL EMAIL

Good morning Ms. Weeks,

Thank you for your inquiry about information regarding natural heritage features. The data you are looking to find can actually be accessed online through the Land Information Ontario Portal, and I have given links below. The first link is to an information page about the application and the data available, and the second is a link to the application itself.

https://www.ontario.ca/page/land-information-ontario

https://geohub.lio.gov.on.ca/

If you have any further inquiries, or have any difficulties finding information, you can contact our Resources Operations Supervisor, Karen Handford, at Karen.Handford@ontario.ca for assistance.

Thank you once again.

Respectfully,

Kaitlyn Koopman
Resources Clerk
Ministry of Natural Resources and Forestry
Pembroke District

From: Weeks, Gwendolyn <Gwendolyn_Weeks@golder.com>
Sent: April 22, 2021 2:51 PM
To: Lyons, Mary (MNRF) <Mary.Lyons@ontario.ca>; MNRF PEM (MNRF) <MNRF.PEM@ontario.ca>
Subject: FW: ARA Information Request

Hi There,
I am preparing a natural environment report in support of an Aggregate Resources Act application in your district. I need to gather information on natural heritage features (e.g. PSW, fish and fish habitat, etc.). Is there someone in particular I should contact regarding this, and is there a formal information request form that I need to fill out?
Many thanks,
-Gwendolyn

Gwendolyn Weeks (B.Sc.Env. (Hons))
Senior Terrestrial Ecologist

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Work Safe, Home Safe

From: NHIC-Requests (NDMNRF) <nhicrequests@ontario.ca>
Sent: March 2, 2022 11:22 AM
To: Weeks, Gwendolyn
Cc: NHIC-Requests (NDMNRF)
Subject: RE: Haley Station - BLTU elemental occurrences
Attachments: NHIC_Data_Acces_Form_External_Clients_20210823.docx

EXTERNAL EMAIL

Hello Gwendolyn,

Thank you for sending me the shapefiles.

Renfrew Site:
- No records for Blanding's Turtle that intersect the site
- No records for Blanding's Turtle that are within 2 KM of the site boundaries
- Five records for Blanding's Turtle that are within 3 KM of the site boundaries

Haley Site:
- One record for Blanding's Turtle that intersects the site boundaries. The location the observation was made at is described as "roadside, lowland creek". In our mapping the record is represented by a 1-kilometre circle because we aren't sure exactly where the observation was made.
- An additional two records for Blanding's Turtle that are within 2 KM of the site boundaries
- An additional two records for Blanding's Turtle that are within 3 KM of the site boundaries.

I can't comment on category 2 or 3 habitat, or provide any interpretations related to Ontario's Endangered Species Act, 2007. This is not part of the Ontario Natural Heritage Information Centre's business. Please direct questions related to the Endangered Species Act, 2007 to the Ministry of Environment, Conservation and Parks at SAROntario@ontario.ca.

If you need detailed data to complete your project then please complete the attached data access request form and return it to NHICrequests@ontario.ca.

Before you can access detailed data anyone who will be working with the data must complete data sensitivity training (a 30-minute online module) and Golder or the project proponent must sign a sensitive data use license agreement. Licensees can share data with their employees, representatives or agents, so if the project proponent is the licensee they can share the data with Golder. If Golder is the licensee Golder cannot share the data with the project proponent. According to our records you completed data sensitivity training on Feb 2 2014.

If hope this information is helpful.

Best regards,
Martina

Martina Furrer
Biodiversity Information Biologist
Ontario Natural Heritage Information Centre
Ministry of Northern Development, Mines, Natural Resources and Forestry
705.761.7517 | martina.furrer@ontario.ca

https://www.ontario.ca/page/natural-heritage-information-centre

Please note: As part of providing accessible customer service, please let me know if you have any accommodation needs or require communication supports or alternate formats.

From: Weeks, Gwendolyn <Gwendolyn_Weeks@golder.com>
Sent: March 2, 2022 9:22 AM
To: NHIC-Requests (NDMNRF) <nhicrequests@ontario.ca>
Subject: RE: Haley Station - BLTU elemental occurrences

Hi Martina,
Thank you for your response. I have attached the shapefile for the site in question, and a second site very nearby that I am hoping you can help with as well? If you have any questions, please let me know. The Sites are referred to as "Haley" and "Renfrew".
Thanks,
-Gwendolyn

From: NHIC-Requests (NDMNRF) <nhicrequests@ontario.ca>
Sent: March 1, 2022 3:53 PM
To: Weeks, Gwendolyn <Gwendolyn_Weeks@golder.com>
Cc: NHIC-Requests (NDMNRF) <nhicrequests@ontario.ca>
Subject: RE: Haley Station - BLTU elemental occurrences

Hi Gwendolyn,

Thank you for contacting the Ontario Natural Heritage Information Centre.

Would you have a shapefile of the site that you could send me? That way I could query our data to see if we have any Blanding's Turtle records that are within 2 km of the site's boundaries.

Martina

Martina Furrer
Biodiversity Information Biologist
Ontario Natural Heritage Information Centre
Ministry of Northern Development, Mines, Natural Resources and Forestry
705.761.7517 | martina.furrer@ontario.ca

https://www.ontario.ca/page/natural-heritage-information-centre

Please note: As part of providing accessible customer service, please let me know if you have any accommodation needs or require communication supports or alternate formats.

From: Weeks, Gwendolyn <Gwendolyn_Weeks@golder.com>
Sent: March 1, 2022 3:34 PM
To: NHIC-Requests (NDMNRF) <nhicrequests@ontario.ca>
Subject: Haley Station - BLTU elemental occurrences

Hi There,

I am aware of several EO of Blanding's Turtles in the vicinity of the Site shown on the attached figure (1095574, 1095573, 1095584, 1095583).

The Site is located in Horton Township, Renfrew County.

I need to know if the wetlands on the Site constitute Category 2 habitat [i.e., are within 2 km of a known occurrence location, per the general habitat description ("The wetland complex (i.e., all suitable wetlands or waterbodies within 500 m of each other) that extends up to 2 km from an occurrence, and the area within 30 m around those suitable wetlands or waterbodies"]

AND

whether any Category 3 habitat overlaps the Site (based on 250 m setbacks from Category 2 habitat that may be present off-Site).

If you could help me with this, that would be great, and it would mean that I do not need the exact centroid of the EOs.

Thanks,
-Gwendolyn

Gwendolyn Weeks, H.Bsc.Env.
Lead Ecologist

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WSP and Golder have joined together to form the premier environmental consultancy in the industry. Together we are 14,000 strong, future ready and delivering innovative solutions to our clients around the globe.

From: NHIC-Requests (MNRF) <nhicrequests@ontario.ca>
Sent: January 31, 2023 11:32 AM
To: Weeks, Gwendolyn
Cc: NHIC-Requests (MNRF)
Subject: RE: Question re: Wood Turtle

Hi Gwendolyn,

Thank you for contacting the Ontario Natural Heritage Information Centre. I queried our data and we don't appear to have any record for Wood Turtle from within 6000 m of your project site.

This doesn't necessarily mean there are no Wood Turtles present in this area; the area may not have been surveyed or data may not have been shared with us. Our data aren't a substitute for site visits.

I hope this helps. Please let me know if you have additional questions.

Cheers,
Martina

Martina Furrer
Ontario Natural Heritage Information Centre
Ministry of Natural Resources and Forestry
NHICrequests@ontario.ca

https://www.ontario.ca/page/natural-heritage-information-centre

Please note: As part of providing accessible customer service, please let me know if you have any accommodation needs or require communication supports or alternate formats.

From: Weeks, Gwendolyn <gwendolyn.weeks@wsp.com>
Sent: January 30, 2023 3:32 PM
To: NHIC-Requests (MNRF) <nhicrequests@ontario.ca>
Subject: Question re: Wood Turtle

Hi There,
We are working on an Aggregate Resources Act application and wood turtle was identified as potentially present through early consultation with the MNRF (pre-dating MECP's take-over of SAR). I suspect that wood turtle made the list for this Site at the county-level, rather than any particular records tied to the vicinity of the Site itself.

Attached is a kmz showing the location of the Site.

According to the habitat regulation for this species, the regulated habitat is any waterbody tied to a record of this species; any waterbody within 6000 m of that waterbody; and the area within 500 of the waterbodies. Based on this, I am hoping you can let me know if there are any records tied to the waterbodies that flow through the Site, or whether the waterbodies on the Site are within 6000 m of a waterbody that is tied to a record.

I have taken the sensitivity training, and our report would follow the requirements for reporting of sensitive information.

Many thanks,
-Gwendolyn

Gwendolyn Weeks, H.B.Sc.Env.
Lead Ecologist
Ecology - Ontario Earth and Environment

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-LAEmHhHzdJzBlTWfa4Hgs7pbKI

APPENDIX B

Species at Risk Screening

Taxon	Common Name	Scientific Name	Endangered Species Act, Reg. 230/08 SARO List Status[1]	Species at Risk Act, Schedule 1 List of Wildlife SAR Status[2]	COSEWIC Status [3]	Global Rarity Rank[4]	Provincial Rarity Rank[5]	Source(s)	Ontario Habitat Descriptions	Probability of Occurrence on Site	Probability of Occurrence in Study Area	ESA Habitat Protection Provisions[6]	References
Amphibian	Western chorus frog - Great Lakes St. Lawrence / Canadian Shield population	*Pseudacris triseriata*	—	THR	THR	G5TNR	S3	Range	In Ontario, habitat of this amphibian species typically consists of marshes or wooded wetlands, particularly those with dense shrub layers and grasses, as this species is a poor climber. They will breed in almost any fishless pond including roadside ditches, gravel pits and flooded swales in meadows. This species hibernates in terrestrial habitats under rocks, dead trees or leaves, in loose soil or in animal burrows. During hibernation, this species is tolerant of flooding (Environment Canada 2015).	Low - none were observed during targeted surveys.	Low- none were observed during targeted surveys.		Environment Canada. 2015. Recovery Strategy for the Western Chorus Frog (Pseudacris triseriata), Great Lakes/ St. Lawrence - Canadian Shield population, in Canada. Species at Risk Act Recovery Strategy Series. Ottawa ON: Environment Canada; [accessed 29 November 2019]. https://wildlife-species.canada.ca/species-risk-registry/virtual_sara/files/plans/Rs-WesternChorusFrogGLSLBC-v00-2015Dec01_e.pdf. vi + 50 p.
Arthropod	Monarch	*Danaus plexippus*	SC	SC	END	G4	S2N, S4B	OOA	In Ontario, monarch is found throughout the northern and southern regions of the province. This butterfly is found wherever there is milkweed (*Asclepias* spp.) plants for its caterpillars and wildflowers that supply a nectar source for adults. It is often found on abandoned farmland, meadows, open wetlands, prairies and roadsides, but also in city gardens and parks. Important staging areas during migration occur along the north shores of the Great Lakes (COSEWIC 2010).	High - a few individuals were observed during targeted surveys.	High - a few individuals were observed during targeted surveys.		COSEWIC (Committee on the Status of Endangered Wildlife in Canada). 2010. COSEWIC assessment and status report on the Monarch Danaus plexippus in Canada. Ottawa ON: Committee on the Status of Endangered Wildlife in Canada; [accessed 22 November 2019]. https://www.registrelep-sararegistry.gc.ca/virtual_sara/files/cosewic/sr_Monarch_0810_e1.pdf. vii + 43 p.
Bird	Bald eagle	*Haliaeetus leucocephalus*	SC	—	NAR	G5	S2N,S4B	eBird	In Ontario, bald eagle nests are typically found near the shorelines of lakes or large rivers, often on forested islands. The large, conspicuous nests are typically found in large super-canopy trees along water bodies (Buehler 2000).	Low - none were observed during targeted surveys.	Low- none were observed during targeted surveys.		Buehler DA. 2000. Bald Eagle (Haliaeetus leucocephalus). In The Birds of North America Online (AF Poole and FB Gill, eds.), Version 2.0. Ithaca NY: Cornell Lab of Ornithology; [accessed 29 November 2019]. https://doi.org/10.2173/bna.506.
Bird	Bank swallow	*Riparia riparia*	THR	THR	THR	G5	S4B	eBird	In Ontario, bank swallow breeds in a variety of natural and anthropogenic habitats, including lake bluffs, stream and riverbanks, sand and gravel pits, and roadcuts. Nests are generally built in a vertical or near-vertical bank. Breeding sites are typically located near open foraging sites such as rivers, lakes, grasslands, agricultural fields, wetlands and riparian woods. Forested areas are generally avoided (Garrison 1999).	Low - none were observed during targeted surveys.	Low- none were observed during targeted surveys.	General (Draft) Category 1 – Breeding colony, including burrows and substrate between them Category 2 – Area within 50 m of the front of breeding colony face Category 3 – Area of suitable foraging habitat within 500 m of the outer edge of breeding colony	Garrison BA. 1999. Bank Swallow (Riparia riparia). The Birds of North America Online (AF Poole and FB Gill, eds). Ithaca NY: Cornell Lab of Ornithology; [accessed 20 November 2019]. https://doi.org/10.2173/bna.414.
Bird	Barn swallow	*Hirundo rustica*	SC	THR	SC	G5	S4B	OBBA; MECP	In Ontario, barn swallow breeds in areas that contain a suitable nesting structure, open areas for foraging, and a body of water. This species nests in human made structures including barns, buildings, sheds, bridges, and culverts. Preferred foraging habitat includes grassy fields, pastures, agricultural cropland, lake and river shorelines, cleared rights-of-way, and wetlands (COSEWIC 2011). Mud nests are fastened to vertical walls or built on a ledge underneath an overhang. Suitable nests from previous years are reused (Brown and Brown 2019).	Low - none were observed during targeted surveys.	Low- none were observed during targeted surveys.	General Category 1 – Nest Category 2 – Area within 5 m of the nest Category 3 – Area between 5-200 m of the nest	Brown MB, Brown CR. 2019. Barn Swallow (Hirundo rustica). In The Birds of North America Online (P. G. Rodewald, ed), version 2.0. Ithaca NY: Cornell Lab of Ornithology; [accessed 20 November 2019]. https://doi.org/10.2173/bna.barswa.02. COSEWIC (Committee on the Status of Endangered Wildlife in Canada). 2011. COSEWIC assessment and status report on the Barn Swallow Hirundo rustica in Canada. Ottawa ON: Committee on the Status of Endangered Wildlife in Canada; [accessed 22 November 2019]. https://wildlife-species.canada.ca/species-risk-registry/virtual_sara/files/cosewic/sr_barn_swallow_0911_eng.pdf. ix + 37 p.
Bird	Black tern	*Chlidonias niger*	SC	—	NAR	G4	S3B	eBird	In Ontario, black tern breeds in freshwater marshlands where it forms small colonies. It prefers marshes or marsh complexes greater than 20 ha in area and which are not surrounded by wooded area. Black terns are sensitive to the presence of agricultural activities. The black tern nests in wetlands with an even combination of open water and emergent vegetation, and still waters of 0.5-1.2 m deep. Preferred nest sites have short dense vegetation or tall sparse vegetation often consisting of cattails, bulrushes and occasionally burreed or other marshland plants. Black terns also require posts or snags for perching (Weseloh 2007).	Low - no suitable marsh habitat occurs.	Low - no suitable marsh habitat occurs.		Weseloh C. 2007. Black Tern, pp. 590-591 in Cadman MD, Sutherland DA, Beck GG, Lepage D, Couturier AR, eds. Atlas of the Breeding Birds of Ontario, 2001-2005. Toronto ON: Bird Studies Canada, Environment Canada, Ontario Field Ornithologists, Ontario Ministry of Natural Resources and Ontario Nature. xxii + 706 p.

Taxon	Common Name	Scientific Name	Endangered Species Act, Reg. 230/08 SARO List Status[1]	Species at Risk Act, Schedule 1 List of Wildlife SAR Status[2]	COSEWIC Status [3]	Global Rarity Rank[4]	Provincial Rarity Rank[5]	Source(s)	Ontario Habitat Descriptions	Probability of Occurrence on Site	Probability of Occurrence in Study Area	ESA Habitat Protection Provisions[6]	References
Bird	Bobolink	*Dolichonyx oryzivorus*	THR	THR	THR	G5	S4B	OBBA; MEC	In Ontario, bobolink breeds in grasslands or graminoid dominated hayfields with tall vegetation (Gabhauer 2007). Bobolink prefers grassland habitat with a forb component and a moderate litter layer. They have low tolerance for presence of woody vegetation and are sensitive to frequent mowing within the breeding season. They are most abundant in established, but regularly maintained, hayfields, but also breed in lightly grazed pastures, old or fallow fields, cultural meadows and newly planted hayfields. Their nest is woven from grasses and forbs. It is built on the ground, in dense vegetation, usually under the cover of one or more forbs (Renfrew et al. 2015).	Low - none were observed during targeted surveys.	Moderate - hayfields in the Study Area may be suitable habitat.	General Category 1 – Nest and area within 10 m of nest Category 2 – Area between 10 – 60 m of the nest or centre of approximated defended territory Category 3 - Area of continuous suitable habitat between 60 – 300 m of the nest or centre of approximated defended territory	Gabhauer MA. 2007. Bobolink, pp. 586-587 in Cadman MD, Sutherland DA, Beck GG, Lepage D, Couturier AT, eds. Atlas of the Breeding Birds of Ontario, 2001-2005. Toronto ON: Bird Studies Canada, Environment Canada, Ontario Field Ornithologists, Ontario Ministry of Natural Resources and Ontario Nature. xxii + 706 p. Renfrew R, Strong AM, Perlut NG, Martin SG, Gavin TA. 2015. Bobolink (Dolichonyx oryzivorus). In The Birds of North America (PG Rodewald, ed.), version 2.0. Ithaca NY: Cornell Lab of Ornithology; [accessed 29 November 2019]. https://doi.org/10.2173/bna.176.
Bird	Canada warbler	*Cardellina canadensis*	SC	THR	THR	G5	S4B	eBird	In Ontario, breeding habitat for Canada warbler consists of moist mixed forests with a well-developed shrubby understory. This includes low-lying areas such as cedar and alder swamps, and riparian thickets (McLaren 2007). It is also found in densely vegetated regenerating forest openings. Suitable habitat often contains a developed moss layer and an uneven forest floor. Nests are well concealed on or near the ground in dense shrub or fern cover, often in stumps, fallen logs, overhanging stream banks or mossy hummocks (Reitsma et al. 2010).	Low - none were observed during targeted surveys.	Moderate - forests in the Study Area may be suitable habitat.		McLaren P. 2007. Canada Warbler, pp. 528-529 in Cadman MD, Sutherland DA, Beck GG, Lepage D, Couturier AT, eds. Atlas of the Breeding Birds of Ontario, 2001-2005. Toronto ON: Bird Studies Canada, Environment Canada, Ontario Field Ornithologists, Ontario Ministry of Natural Resources and Ontario Nature. xxii + 706 p. Reitsma L, Goodnow M, Hallworth MT, Conway CJ. 2009. Canada Warbler (Cardellina canadensis). In The Birds of North America Online (A. Poole, ed.), version 2.0. Ithaca NY: Cornell Lab of Ornithology; [accessed 29 November 2019]. https://doi.org/10.2173/bna.421.
Bird	Cerulean warbler	*Setophaga cerulea*	THR	END	END	G4	S3B	eBird	In Ontario, breeding habitat of cerulean warbler consists of second-growth or mature deciduous forest with a tall canopy of uneven vertical structure and a sparse understory. This habitat occurs in both wet bottomland forests and upland areas, and often contains large hickory and oak trees. This species may be attracted to gaps or openings in the upper canopy. The cerulean warbler is associated with large forest tracks but may occur in woodlots as small as 10 ha (COSEWIC 2010). Nests are usually built on a horizontal limb in the mid-story or canopy of a large deciduous tree (Buehler et al. 2013).	Low - none were observed during targeted surveys.	Moderate - forests in the Study Area may be suitable habitat.	General	Buehler DA, Hamel PB, Boves T. 2013. Cerulean Warbler (Setophaga cerulean). In The Birds of North America (AF Poole, ed), version 2.0. Ithaca, NY: Cornell Lab of Ornithology; [accessed 29 November 2019]. https://doi.org/10.2173/bna.511 COSEWIC (Committee on the Status of Endangered Wildlife in Canada). 2010. COSEWIC assessment and status report on the Cerulean Warbler Dendroica cerulean in Canada. Ottawa ON: Committee on the Status of Endangered Wildlife in Canada; [accessed 22 November 2019]. https://www.sararegistry.gc.ca/virtual_sara/files/cosewic/sr_cerulean_warbler_e.pdf. x + 40 p.
Bird	Chimney swift	*Chaetura pelagica*	THR	THR	THR	G4G5	S3B	eBird	In Ontario, chimney swift breeding habitat is varied and includes urban, suburban, rural and wooded sites. They are most commonly associated with towns and cities with large concentrations of chimneys. Preferred nesting sites are dark, sheltered spots with a vertical surface to which the bird can grip. Unused chimneys are the primary nesting and roosting structure, but other anthropogenic structures and large diameter cavity trees are also used (COSEWIC 2007).	Low - no suitable structures occur, and none were observed during targeted surveys.	Moderate - structures in the Study Area may be suitable nesting habitat.	General Category 1 – Human-made nest/roost, or natural nest/roost cavity and area within 90 m of natural cavity	COSEWIC (Committee on the Status of Endangered Wildlife in Canada). 2007. COSEWIC assessment and status report on the Chimney Swift Chaetura pelagica in Canada. Ottawa ON: Committee on the Status of Endangered Wildlife in Canada; [accessed 22 November 2019]. https://wildlife-species.canada.ca/species-risk-registry/virtual_sara/files/cosewic/sr_chaetura_pelagica_e.pdf. vii + 49 p.
Bird	Common nighthawk	*Chordeiles minor*	SC	THR	SC	G5	S4B	eBird	In Ontario, these aerial foragers require areas with large open habitat. This includes farmland, open woodlands, clearcuts, burns, rock outcrops, alvars, bogs, fens, prairies, gravel pits and gravel rooftops in cities (Sandilands 2007)	Low - none were observed during targeted surveys.	Low - none were observed during targeted surveys.		Sandilands A. 2007. Common Nighthawk, pp. 308-309 in Cadman, MD, Sutherland DA, Beck GG, Lepage D, Couturier AR, eds. Atlas of the Breeding Birds of Ontario, 2001-2005. Toronto ON: Bird Studies Canada, Environment Canada, Ontario Field Ornithologists, Ontario Ministry of Natural Resources and Ontario Nature. xxii + 706 p.
Bird	Eastern meadowlark	*Sturnella magna*	THR	THR	THR	G5	S4B	OBBA; MEC	In Ontario, eastern meadowlark breeds in pastures, hayfields, meadows and old fields. Eastern meadowlark prefers moderately tall grasslands with abundant litter cover, high grass proportion, and a forb component (Hull 2019). They prefer well drained sites or slopes, and sites with different cover layers (Roseberry and Klimstra 1970).	Low - none were observed during targeted surveys.	Moderate - hayfields in the Study Area may be suitable habitat.	General Category 1 – Nest and area within 10 m of the nest Category 2 – Area between 10 – 100 m of the nest or centre of approximated defended territory Category 3 – Area of continuous suitable habitat between 100 – 300 m of the nest or centre of approximated defended territory	Hull SD, Shaffer JA, Lawrence DI. 2019. The effects of management practices on grassland birds: Eastern Meadowlark (Sturnella magna). Jamestown ND: US Geological Survey; [accessed 02 December 2019]. https://pubs.usgs.gov/pp/1842/mm/pp1842MM.pdf. Roseberry JL, Klimstra WD. 1970. The nesting ecology and reproductive performance of the Eastern Meadowlark. The Wilson Bulletin 82(3): 243-267.

Taxon	Common Name	Scientific Name	Endangered Species Act, Reg. 230/08 SARO List Status[1]	Species at Risk Act, Schedule 1 List of Wildlife SAR Status[2]	COSEWIC Status [3]	Global Rarity Rank[4]	Provincial Rarity Rank[5]	Source(s)	Ontario Habitat Descriptions	Probability of Occurrence on Site	Probability of Occurrence in Study Area	ESA Habitat Protection Provisions[6]	References
Bird	Eastern whip-poor-will	*Antrostomus vociferus*	THR	THR	THR	G5	S4B	MECP	In Ontario, whip-poor-will breeds in semi-open forests with little ground cover. Breeding habitat is dependent on forest structure rather than species composition, and is found on rock and sand barrens, open conifer plantations and post-disturbance regenerating forest. Territory size ranges from 3 to 11 ha (COSEWIC 2009). No nest is constructed, and eggs are laid directly on the leaf litter (Mills 2007).	Low - a single individual was observed, but it was not on territory and not observed again and is considered a late migrant or vagrant.	Low - none were observed during targeted surveys.	General Category 1 – Nest and area within 20 m of nest Category 2 – Area between 20-170 m from nest or centre of approximated defended territory Category 3 – Area of suitable habitat within 170-500 m of the nest, or centre of approximated defended territory	COSEWIC (Committee on the Status of Endangered Wildlife in Canada). 2009. COSEWIC assessment and status report on the Whip-poor-will Caprimulgus vociferus in Canada. Ottawa ON: Committee on the Status of Endangered Wildlife in Canada; [accessed 02 December 2019]. https://wildlife-species.canada.ca/species-risk-registry/virtual_sara/files/cosewic/sr_whip-poor-will_0809_e.pdf. vi + 28 p. Mills A. 2007. Whip-poor-will, pp. 312-313 in Cadman MD, Sutherland DA, Beck GG, Lepage D, Couturier AR, eds. Atlas of the Breeding Birds of Ontario, 2001-2005. Toronto ON: Bird Studies Canada, Environment Canada, Ontario Field Ornithologists, Ontario Ministry of Natural Resources and Ontario Nature. xxii + 706 p.
Bird	Eastern wood-pewee	*Contopus virens*	SC	SC	SC	G5	S4B	OBBA; MECP	In Ontario, eastern wood-pewee inhabits a wide variety of wooded upland and lowland habitats, including deciduous, coniferous, or mixed forests. It occurs most frequently in forests with some degree of openness. Intermediate-aged forests with a relatively sparse midstory are preferred. In younger forests with a relatively dense midstory, it tends to inhabit the edges. Also occurs in anthropogenic habitats providing an open forested aspect such as parks and suburban neighborhoods. Nest is constructed atop a horizontal branch, 1-2 m above the ground, in a wide variety of deciduous and coniferous trees (COSEWIC 2012).	Low - none were observed during targeted surveys.	Moderate - forests in the Study Area may be suitable habitat.		COSEWIC (Committee on the Status of Endangered Wildlife in Canada). 2012. COSEWIC assessment and status report on the Eastern Wood-pewee Contopus virensin Canada. Ottawa ON: Committee on the Status of Endangered Wildlife in Canada; [accessed 02 December 2019]. https://wildlife-species.canada.ca/species-risk-registry/virtual_sara/files/cosewic/sr_Eastern%20Wood-pewee_2013_e.pdf. x + 39 p.
Bird	Evening grosbeak	*Coccothraustes vespertinus*	SC	SC	SC	G5	S4B	OBBA	In Ontario, evening grosbeak breeds across northern Ontario, as far south as southern Georgian Bay, in open mature coniferous or mixed forests dominated by fir species, white spruce and/or trembling aspen (MECP 2019).	Low - none were observed during targeted surveys.	Moderate - forests in the Study Area may be suitable habitat.		MECP (Ministry of Environment, Conservation and Parks). 2019. Evening Grosbeak. [updated 04 November 2019; accessed 02 December 2019]. https://www.ontario.ca/page/evening-grosbeak.
Bird	Golden-winged warbler	*Vermivora chrysoptera*	SC	THR	THR	G4	S4B	eBird	In Ontario, golden-winged warbler breeds in regenerating scrub habitat with dense ground cover and a patchwork of shrubs, usually surrounded by forest. Their preferred habitat is characteristic of a successional landscape associated with natural or anthropogenic disturbance such as rights-of-way, and field edges or openings resulting from logging or burning. The nest of the golden-winged warbler is built on the ground at the base of a shrub or leafy plant, often at the shaded edge of the forest or at the edge of a forest opening (Confer et al. 2011).	Low - none were observed during targeted surveys.	Moderate - regenerating habitat in the Study Area may be suitable habitat.		Confer JL, Hartman P, Roth A. 2011. Golden-winged Warbler (Vermivora chrysoptera). In The Birds of North America (AF Poole ed), version 2.0. Ithaca, NY: Cornell Lab of Ornithology; [accessed 19 December 2018]. https://doi.org/10.2173/bna.20.
Bird	Grasshopper sparrow *pratensis* subspecies	*Ammodramus savannarum* (pratensis subspecies)	SC	SC	SC	G5	S4B	OBBA	In Ontario, grasshopper sparrow is found in medium to large grasslands with low herbaceous cover and few shrubs. It also uses a wide variety of agricultural fields, including cereal crops and pastures. Close-grazed pastures and limestone plains (e.g. Carden and Napanee Plains) support highest density of this bird in the province (COSEWIC 2013).	Low - none were observed during targeted surveys.	Moderate - hayfields in the Study Area may be suitable habitat.		COSEWIC (Committee on the Status of Endangered Wildlife in Canada). 2013. COSEWIC assessment and status report on the Grasshopper Sparrow pratensis subspecies Ammodramus savannarum pratensis in Canada. Ottawa ON: Committee on the Status of Endangered Wildlife in Canada; [accessed 02 December 2019]. https://wildlife-species.canada.ca/species-risk-registry/virtual_sara/files/cosewic/sr_Grasshopper%20Sparrow_2013_e.pdf. ix + 36 p.
Bird	Least bittern	*Ixobrychus exilis*	THR	THR	THR	G5	S4B	eBird	In Ontario, least bittern breeds in marshes, usually greater than 5 ha, with emergent vegetation, relatively stable water levels and areas of open water. Preferred habitat has water less than 1 m deep (usually 10 – 50 cm). Nests are built in tall stands of dense emergent or woody vegetation (Woodliffe 2007). Clarity of water is important as siltation, turbidity, or excessive eutrophication hinders foraging efficiency (COSEWIC 2009).	Low - no suitable marsh habitat occurs.	Low - no suitable marsh habitat occurs.	General (as of June 30, 2013)	COSEWIC (Committee on the Status of Endangered Wildlife in Canada). 2009. COSEWIC assessment and update status report on the Least Bittern Ixobrychus exilis in Canada. Ottawa ON: Committee on the Status of Endangered Wildlife in Canada; [accessed 02 December 2019]. https://wildlife-species.canada.ca/species-risk-registry/virtual_sara/files/cosewic/sr_least_bittern_0809_e.pdf. vi + 36 p. Woodliffe PA. 2007. Least Bittern, pp. 156-157 in Cadman MD, Sutherland DA, Beck GG, Lepage D, Couturier AR, eds. Atlas of the Breeding Birds of Ontario, 2001-2005. Toronto ON: Bird Studies Canada, Environment Canada, Ontario Field Ornithologists, Ontario Ministry of Natural Resources and Ontario Nature. xxii + 706 p.

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Bird	Olive-sided flycatcher	*Contopus cooperi*	SC	THR	SC	G4	S4B	OBBA	In Ontario, olive-sided flycatcher breeding habitat consists of natural openings in coniferous or mixed forests, including bogs, burns, riparian zones, and cutover areas. They are also found in semi-open forest stands and early successional forest when tall snags and residual live trees are present. In the boreal forest it is often associated with muskeg, bogs, fens and swamps dominated by spruce and tamarack. Open areas with tall trees or snags for perching are used for foraging (COSEWIC 2007). Nests are usually built on horizontal branches of conifers (Peck and James 1987).	Low - none were observed during targeted surveys.	Moderate - forests in the Study Area may be suitable habitat.		COSEWIC (Committee on the Status of Endangered Wildlife in Canada). 2007. COSEWIC assessment and status report on the Olive-sided Flycatcher Contopus cooperi in Canada. Ottawa ON: Committee on the Status of Endangered Wildlife in Canada; [accessed 02 December 2019]. https://wildlife-species.canada.ca/species-risk-registry/virtual_sara/files/cosewic/srOlive-sidedFlycatcher2018e.pdf. vii + 25 p. Peck GK, James RD. 1987. The breeding birds of Ontario: nidiology and distribution. Vol. 2: Passerines. Toronto ON: Royal Ontario Museum. 397 p.
Bird	Peregrine falcon (anatum/tundrius subspecies)	*Falco peregrinus anatum/tundrius*	SC	SC	Not at Risk	G4	S3B	eBird	In Ontario, peregrine falcon breeds in areas containing suitable nesting locations and sufficient prey resources. Such habitat includes both natural locations containing cliff faces (heights of 50 - 200 m preferred) and anthropogenic landscapes including urban centres containing tall buildings, open pit mines and quarries, and road cuts. Peregrine falcons nest on cliff ledges and crevices and building ledges. Nests consist of a simple scrape in the substrate (COSEWIC 2017).	Low - none were observed during targeted surveys.	Low - no suitable nesting habitat occurs.		COSEWIC (Committee on the Status of Endangered Wildlife in Canada). 2017. COSEWIC assessment and update status report on the Peregrine Falcon Falco peregrinus (pealei subspecies – Falco peregrinus and pealei anatum/tundrius – Falco peregrinus anatum/tundrius) in Canada. Ottawa ON: Committee on the Status of Endangered Wildlife in Canada; [accessed 02 December 2019]. https://wildlife-species.canada.ca/species-risk-registry/virtual_sara/files/cosewic/srPeregrineFalcon2017e.pdf. vii + 45 p.
Bird	Red-headed woodpecker	*Melanerpes erythrocephalus*	END	END	END	G5	S4B	OBBA; MEC	In Ontario, red-headed woodpecker breeds in open, deciduous woodlands or woodland edges and are often found in parks, cemeteries, golf courses, orchards and savannahs (Woodliffe 2007). They may also breed in forest clearings or open agricultural areas provided that large trees are available for nesting. They prefer forests with little or no understory vegetation. They are often associated with beech or oak forests, beaver ponds and swamp forests where snags are numerous. Nests are excavated in the trunks of large dead trees (Frei et al. 2017).	Low - none were observed during targeted surveys.	Moderate - forests in the Study Area may be suitable habitat.	General (as of Jan 27, 2022)	Frei B, Smith KG, Withgott JH, Rodewald PG, Pyle P, Patten MA. 2017. Red-headed Woodpecker (Melanerpes erythrocephalus). In The Birds of North America (PG Rodewald, ed), version 2.1. Ithaca, NY: Cornell Lab of Ornithology; [accessed 02 December 2019]. https://doi.org/10.2173/bna.rehwoo.02.1. Woodliffe PA. 2007. Red-headed Woodpecker, pp. 320-321 in Cadman MD, Sutherland DA, Beck GG, Lepage D, Couturier AR, eds. Atlas of the Breeding Birds of Ontario, 2001-2005. Toronto ON: Bird Studies Canada, Environment Canada, Ontario Field Ornithologists, Ontario Ministry of Natural Resources and Ontario Nature. xxii + 706 p.
Bird	Short-eared owl	*Asio flammeus*	THR	SC	THR	G5	S2N,S4B	eBird	In Ontario, short-eared owl breeds in a variety of open habitats including grasslands, tundra, bogs, marshes, clear-cuts, burns, pastures and occasionally agricultural fields. The primary factor in determining breeding habitat is proximity to small mammal prey resources (COSEWIC 2008). Nests are built on the ground at a dry site and usually adjacent to a clump of tall vegetation used for cover and concealment (Gahbauer 2007).	Low - none were observed during targeted surveys.	Moderate - hayfields in the Study Area may be suitable habitat.		COSEWIC (Committee on the Status of Endangered Wildlife in Canada). 2008. COSEWIC assessment and update status report on the Short-eared Owl Asio flammeus in Canada. Ottawa ON: Committee on the Status of Endangered Wildlife in Canada; [accessed 02 December 2019]. https://wildlife-species.canada.ca/species-risk-registry/virtual_sara/files/cosewic/sr_shorteared_owl_0808_e.pdf. vi + 24 p. Gahbauer MA. 2007. Short-eared Owl, pp. 302-303 in Cadman MD, Sutherland DA, Beck GG, Lepage D, Couturier AR, eds. Atlas of the Breeding Birds of Ontario, 2001-2005. Toronto ON: Bird Studies Canada, Environment Canada, Ontario Field Ornithologists, Ontario Ministry of Natural Resources and Ontario Nature. xxii + 706 p.
Bird	Wood thrush	*Hylocichla mustelina*	SC	THR	THR	G4	S4B	OBBA; MEC	In Ontario, wood thrush breeds in moist, deciduous hardwood or mixed stands that are often previously disturbed, with a dense deciduous undergrowth and with tall trees for singing perches. This species selects nesting sites with the following characteristics: lower elevations with trees less than 16 m in height, a closed canopy cover (>70 %), a high variety of deciduous tree species, moderate subcanopy and shrub density, shade, fairly open forest floor, moist soil, and decaying leaf litter (COSEWIC 2012).	Low - none were observed during targeted surveys.	Moderate - forests in the Study Area may be suitable habitat.		COSEWIC (Committee on the Status of Endangered Wildlife in Canada). 2012. COSEWIC assessment and status report on the Wood Thrush Hylocichla mustelina in Canada. Ottawa ON: Committee on the Status of Endangered Wildlife in Canada; [accessed 02 December 2019]. https://wildlife-species.canada.ca/species-risk-registry/virtual_sara/files/cosewic/sr_Wood%20Thrush_2013_e.pdf. ix + 46 p.

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Lichen	Pale-bellied frost lichen	*Physconia subpallida*	END	END	END	GNR	S2S3	Range	In Ontario, pale-bellied frost lichen grows on trees in mature, deciduous forests with relatively open understory, but moderate to high canopy cover. Common host trees include ash, black walnut, hop-hornbeam, and elm, although in Ontario, it is most often found on hop-hornbeam. This lichen has also been found growing on fence rails and rocks (Lewis 2011).	Low - none were observed during targeted surveys.	Moderate - forests in the Study Area may be suitable habitat.	Regulated In the geographic areas of: Algonquin Provincial Park, counties of Haliburton, Hastings, Lanark, Lennox and Addington, Peterborough and Renfrew; townships of Central Frontenac, North Frontenac, and South Frontenac within County of Frontenac, townships of Athens, Elizabethtown-Kitley, Merrickville-Wolford and Rideau Lakes within County of Leeds and Grenville, and township of South Algonquin in District of Nipissing; Municipalities of Central Frontenac, Northern Frontenac, Lanark Highlands, Addington Highlands and Greater Madawaska Regulated Habitat: • host tree on which the lichen exists and area within 50 m of trunk • area within 100 m of lichen that falls within water body, watercourse, or area belonging to ELC community and that is (i) suitable for natural colonization from existing population of lichen or (ii) contributes to maintenance of suitable microsite characteristics for the lichen to exist	Lewis CL. 2011. Recovery Strategy for the Pale-bellied Frost Lichen (Physconia subpallida) in Ontario. Ontario Recovery Strategy Series. Peterborough ON: Ontario Ministry of Natural Resources; [accessed 02 December 2019]. https://www.ontario.ca/page/pale-bellied-frost-lichen-recovery-strategy.
Mammal	Eastern small-footed myotis	*Myotis leibii*	END	—	—	G4	S2S3	BCI	In Ontario, eastern small-footed myotis is not known to roost in trees, but there is very little known about its roosting habits. The species generally roosts on the ground under rocks, in rock crevices, talus slopes and rock piles, but it occasionally inhabits buildings. Entrances of caves or abandoned mines where humidity is low, and temperatures are cool and sometimes subfreezing may be used as hibernacula (Humphrey 2017).	High - recorded at the Site; but no evidence of maternity roosting at the Site.	Moderate - may forage in the study area, but no suitable maternity roost habitat observed.	General	Humphrey C. 2017. Recovery Strategy for the Eastern Small-footed Myotis (Myotis leibii) in Ontario. Ontario Recovery Strategy Series. Peterborough ON: Ontario Ministry of Natural Resources; [accessed 02 December 2019]. https://files.ontario.ca/mnrf_sar_rs_esfm_final_accessible.pdf vii + 76 p.
Mammal	Little brown myotis	*Myotis lucifugus*	END	END	END	G3	S3	BCI	In Ontario, this species' range is extensive and covers much of the province. It will roost in both natural and man-made structures. Roosting colonies require a number of large dead trees, in specific stages of decay and that project above the canopy in relatively open areas. May form nursery colonies in the attics of buildings within 1 km of water. Caves or abandoned mines may be used as hibernacula, but high humidity and stable above freezing temperatures are required (ECCC 2018).	High - recorded at the Site; but no evidence of maternity roosting at the Site.	Moderate - forests in the Study Area may be suitable habitat.	General	ECCC (Environment and Climate Change Canada). 2018. Recovery Strategy for the Little Brown Myotis (Myotis lucifugus), the Northern Myotis (Myotis septentrionalis), and the Tri-colored Bat (Perimyotis subflavus) in Canada. Species at Risk Act Recovery Strategy Series. Ottawa ON: Environment and Climate Change Canada; [accessed 02 December 2019]. https://wildlife-species.canada.ca/species-risk-registry/virtual_sara/files/plans/Rs-TroisChauveSourisThreeBats-v01-2019Nov-Eng.pdf. ix + 172 p.
Mammal	Northern myotis	*Myotis septentrionalis*	END	END	END	G1G2	S3	BCI	In Ontario, this species' range is extensive and covers much of the province. It will usually roost in hollows, crevices, and under loose bark of mature trees. Roosts may be established in the main trunk or a large branch of either living or dead trees. Caves or abandoned mines may be used as hibernacula, but high humidity and stable above freezing temperatures are required (ECCC 2018).	Low - none observed during targeted surveys.	Moderate - forests in the Study Area may be suitable habitat.	General	ECCC (Environment and Climate Change Canada). 2018. Recovery Strategy for the Little Brown Myotis (Myotis lucifugus), the Northern Myotis (Myotis septentrionalis), and the Tri-colored Bat (Perimyotis subflavus) in Canada. Species at Risk Act Recovery Strategy Series. Ottawa ON: Environment and Climate Change Canada; [accessed 02 December 2019]. https://wildlife-species.canada.ca/species-risk-registry/virtual_sara/files/plans/Rs-TroisChauveSourisThreeBats-v01-2019Nov-Eng.pdf. ix + 172 p.
Mammal	Tri-colored bat	*Perimyotis subflavus*	END	END	END	G2G3	S3?	BCI	In Ontario, tri-colored bat may roost in foliage, in clumps of old leaves, hanging moss or squirrel nests. They are occasionally found in buildings although there are no records of this in Canada. They typically feed over aquatic areas with an affinity to large-bodied water and will likely roost in close proximity to these. Hibernation sites are found deep within caves or mines in areas of relatively warm temperatures. These bats have strong roost fidelity to their winter hibernation sites and may choose the exact same spot in a cave or mine from year to year (ECCC 2018).	Low - none observed during targeted surveys.	Moderate - forests in the Study Area may be suitable habitat.	General	ECCC (Environment and Climate Change Canada). 2018. Recovery Strategy for the Little Brown Myotis (Myotis lucifugus), the Northern Myotis (Myotis septentrionalis), and the Tri-colored Bat (Perimyotis subflavus) in Canada. Species at Risk Act Recovery Strategy Series. Ottawa ON: Environment and Climate Change Canada; [accessed 02 December 2019]. https://wildlife-species.canada.ca/species-risk-registry/virtual_sara/files/plans/Rs-TroisChauveSourisThreeBats-v01-2019Nov-Eng.pdf. ix + 172 p.
Reptile	Blanding's turtle - Great Lakes / St.Lawrence population	*Emydoidea blandingii*	THR	END	END	G4	S3	RAA; MEC	In Ontario, Blanding's turtle will use a range of aquatic habitats, but favor those with shallow, standing or slow-moving water, rich nutrient levels, organic substrates and abundant aquatic vegetation. They will use rivers but prefer slow-moving currents and are likely only transients in this type of habitat. This species is known to travel great distances over land in the spring in order to reach nesting sites, which can include dry conifer or mixed forests, partially vegetated fields, and roadsides. Suitable nesting substrates include organic soils, sands, gravel and cobble. They hibernate underwater and infrequently under debris close to water bodies (COSEWIC 2016).	Low - none observed during targeted surveys and no records within 2 km of the Site (confirmed by correspondence with NHIC 2022).	Low - none observed during targeted surveys and no records within 2 km of the Site (NHIC 2022)	General Category 1 – Nest and area within 30 m or overwintering sites and area within 30 m Category 2 – Wetland complex (i.e. all suitable wetlands or waterbodies within 500 m of each other) that extends up to 2 km from occurrence, and the area within 30 m around those suitable wetlands or waterbodies Category 3 – Area between 30 – 250 m around suitable wetlands/waterbodies identified in category 2, within 2 km of an occurrence	COSEWIC (Committee on the Status of Endangered Wildlife in Canada). 2016. COSEWIC assessment and update status report on the Blanding's Turtle Emydoidea blandingii (Nova Scotia population and Great Lakes/St. Lawrence population) in Canada. Ottawa ON: Committee on the Status of Endangered Wildlife in Canada; [accessed 02 December 2019]. https://wildlife-species.canada.ca/species-risk-registry/virtual_sara/files/cosewic/sr_Blanding%E2%80%99s%20Turtle_2016_e.pdf. xix + 110 p.

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Reptile	Eastern ribbonsnake - Great Lakes population	*Thamnophis sauritius*	SC	SC	SC	G5	S4	Range	In Ontario, eastern ribbonsnake is semi-aquatic, and is rarely found far from shallow ponds, marshes, bogs, streams or swamps bordered by dense vegetation. They prefer sunny locations and bask in low shrub branches. Hibernation occurs in mammal burrows, rock fissures or even ant mounds (COSEWIC 2012).	Low - none were observed during targeted surveys.	Moderate - suitable habitat may occur in the Study Area		COSEWIC (Committee on the Status of Endangered Wildlife in Canada). 2012. COSEWIC assessment and status report on the Eastern Ribbonsnake Thamnophis sauritus in Canada. Ottawa ON: Committee on the Status of Endangered Wildlife in Canada; [accessed 02 December 2019]. https://wildlife-species.canada.ca/species-risk-registry/virtual_sara/files/cosewic/sr_coulevre_mnc_e_ribbonsnake_1113_e.pdf. xii + 39 p.
Reptile	Northern map turtle	*Graptemys geographica*	SC	SC	SC	G5	S3	RAA; MEC	In Ontario, northern map turtle prefers large waterbodies with slow-moving currents, soft substrates, and abundant aquatic vegetation. Ideal stretches of shoreline contain suitable basking sites, such as rocks and logs. Along Lakes Erie and Ontario, this species occurs in marsh habitat and undeveloped shorelines. It is also found in small to large rivers with slow to moderate flow. Hibernation takes place in soft substrates under deep water (COSEWIC 2012).	Low - no suitable habitat occurs.	Low - no suitable habitat occurs.		COSEWIC (Committee on the Status of Endangered Wildlife in Canada). 2012. COSEWIC assessment and status report on the Northern Map Turtle Graptemys geographica in Canada. Ottawa ON: Committee on the Status of Endangered Wildlife in Canada; [accessed 02 December 2019]. https://wildlife-species.canada.ca/species-risk-registry/virtual_sara/files/cosewic/sr_tortue_geog_n_map_turtle_1113_e.pdf. xi + 63 p.
Reptile	Snapping turtle	*Chelydra serpentina*	SC	SC	SC	G5	S4	RAA; MEC	In Ontario, snapping turtle uses a wide range of waterbodies, but shows preference for areas with shallow, slow-moving water, soft substrates and dense aquatic vegetation. Hibernation takes place in soft substrates under water. Nesting sites consist of sand or gravel banks along waterways or roadways (COSEWIC 2008).	High - a single individual was observed on Clubhouse Lake at the edge of the Site.	High - a single individual was observed in Clubhouse Lake.		COSEWIC (Committee on the Status of Endangered Wildlife in Canada). 2008. COSEWIC assessment and status report on the Snapping Turtle Chelydra serpentina in Canada. Ottawa ON: Committee on the Status of Endangered Wildlife in Canada; [accessed 02 December 2019]. https://wildlife-species.canada.ca/species-risk-registry/virtual_sara/files/cosewic/sr_snapping_turtle_0809_e.pdf. vii + 47 p.
Reptile	Stinkpot or Eastern musk turtle	*Sternotherus odoratus*	SC	THR	SC	G5	S3	Range	In Ontario, eastern musk turtle is very rarely out of water and prefers permanent bodies of water that are shallow and clear, with little or no current and soft substrates with abundant organic materials. Abundant floating and submerged vegetation is preferred. Hibernation occurs in soft substrates under water. Eggs are sometimes laid on open ground, or in shallow nests in decaying vegetation, shallow gravel or rock crevices (COSEWIC 2012).	Low - none were observed during targeted surveys.	Low - none were observed during targeted surveys.		COSEWIC (Committee on the Status of Endangered Wildlife in Canada). 2012. COSEWIC assessment and status report on the Eastern Musk Turtle Sternotherus odoratus in Canada. Ottawa ON: Committee on the Status of Endangered Wildlife in Canada; [accessed 02 December 2019]. https://wildlife-species.canada.ca/species-risk-registry/virtual_sara/files/cosewic/sr_Eastern%20Musk%20Turtle_2013_e.pdf. xiii + 68 p.
Reptile	Wood turtle	*Glyptemys insculpta*	END	THR	THR	G3	S2	ange; MEC	In Ontario, wood turtle spends spring and fall in or near waterbodies, including clear rivers and streams with sandy or gravel-sand substrates and moderate to fast current. During the summer, this species is often found on land in habitats with moderate or patchy shrub and tree cover, often more than 500 m from water. Hibernation takes place in substrates under water. Nesting sites are found on sand or gravel-sand beaches and banks with patchy vegetation cover. Other sites less often used include gravel holes, roadsides, railways, utility corridors, farmland and pastures (Ontario Wood Turtle Recovery Team 2010).	Low - none observed during targeted surveys and no suitable watercourses present. Correspondence with NHIC (2023) confirmed no records within a 6 km radius of the Site.	Low - NHIC (2023) confirmed no records within a 6 km radius of the Site.	Regulated In the geographic areas of: regional municipalities of Halton, Niagara, and Waterloo; and counties of Huron and Simcoe Regulated Habitat: • any part of a river, stream, or other body of water, up to high water mark, being used by wood turtle or on which it directly depends to carry out its life processes and any part of a river, stream, or other body of water, up to high water mark within 2000 m that provides suitable conditions for wood turtle to carry out life processes • the area above the high water mark within 200 m of the area described above • area above the high water mark not described above and that is being used by a wood turtle as a nesting site or that is within 300 m of that area In the geographic areas of: territorial districts of Algoma, Nipissing and Parry Sound; the City of Greater Sudbury; and county of Renfrew Regulated Habitat: • any part of a river, stream, or other body of water, up to high water mark, being used by wood turtle or on which it directly depends to carry out its life processes and any part of a river, stream, or other body of water, up to high water mark within 6000 m that provides suitable conditions for wood turtle to carry out life processes • the area above the high water mark within 500 m of the area described above • area above the high water mark not described above and that is being used by a wood turtle as a nesting site or that is within 300 m of that area	Ontario Wood Turtle Recovery Team. 2010. Recovery strategy for the Wood Turtle (Glyptemys insculpta) in Ontario. Ontario Recovery Strategy Series. Peterborough ON: Ontario Ministry of Natural Resources; [accessed 02 December 2019]. https://www.ontario.ca/page/wood-turtle-recovery-strategy.

Taxon	Common Name	Scientific Name	Endangered Species Act, Reg. 230/08 SARO List Status[1]	Species at Risk Act, Schedule 1 List of Wildlife SAR Status[2]	COSEWIC Status [3]	Global Rarity Rank[4]	Provincial Rarity Rank[5]	Source(s)*	Ontario Habitat Descriptions	Probability of Occurrence on Site	Probability of Occurrence in Study Area	ESA Habitat Protection Provisions[6]	References
Vascular Plant	American ginseng	*Panax quinquefolius*	END	END	END	G3G4	S2	Range	In Ontario, American ginseng is found in moist, undisturbed and relatively mature deciduous woods often dominated by sugar maple. It is commonly found on well-drained, south-facing slopes. American ginseng grows under closed canopies in well-drained soils of glacier origin that have a neutral pH (ECCC 2018).	Low - none were observed during targeted surveys.	Moderate - forests in the Study Area may be suitable habitat.	General Category 1 – Area occupied by American ginseng and area of forest or treed swamp ELC community classes within 100 m of occupied area Category 2 – Area of forest or treed swamp ELC community classes between 100-150 m of occupied area, and contiguous with category 1	ECCC (Environment and Climate Change Canada). 2018. Recovery Strategy for the American Ginseng (Panax quinquefolius) in Canada. Species at Risk Act Recovery Strategy Series. Ottawa ON: Environment and Climate Change Canada; [accessed 02 December 2019]. https://wildlife-species.canada.ca/species-risk-registry/virtual_sara/files/plans/rs_american_ginseng_e_final.pdf vii + 32 p.
Vascular Plant	Black ash	*Fraxinus nigra*	END (temporary suspension of protection until Jan 2024)	—	THR	G5	S3	Range	Found throughout Ontario in moist ecosystems; commonly found in northern swampy woodlands (MNRF 2018). This species typically grows on mucky or peaty soils and is considered a facultative wetland species (Reznicek et al. 2011).	Low - none were observed during targeted surveys.	Low - none were observed in the Study Area.	No protection until Jan 2024 per temporary suspension order	MNRF (Ministry of Natural Resources and Forestry). 2019. Black Ash. [modified 16 October 2019; accessed 04 December 2019]. https://www.ontario.ca/page/black-ash. Reznicek AA, Voss EG, Walters BS. 2011. Fraxinus nigra. Ann Arbour MI: University of Michigan; [accessed 19 December 2018]. https://michiganflora.net/species.aspx?id=1733.
Vascular Plant	Butternut	*Juglans cinerea*	END	END	END	G4	S2?	ange; MEC	In Ontario, butternut is found along stream banks, on wooded valley slopes, and in deciduous and mixed forests. It is commonly associated with beech, maple, oak and hickory (Voss and Reznicek 2012). Butternut prefers moist, fertile, well-drained soils, but can also be found in rocky limestone soils. This species is shade intolerant (Farrar 1995).	Low - none were observed during targeted surveys on the Site or within 50m.	Low - none were observed during targeted surveys on the Site or within 50m.	General (as of June 30, 2013)	Farrar JL. 1995. Trees in Canada. Markham, ON: Fitzhenry & Whiteside Limited and Ottawa, ON: Canadian Forest Service, Natural Resources Canada. 502 p. Voss EG, Reznicek AA. 2012. Field Manual of Michigan Flora. Ann Arbour MI: University of Michigan Press. 990 p.

Notes:

[1] *Endangered Species Act* (ESA), 2007. General (O.Reg 242/08 last amended 1 April 2021 as O. Reg 228/21). Species at Risk in Ontario List (O.Reg 230/08 last amended 26 January 2022 as O. Reg. 24/22); Schedule 1 (Extirpated - EXP), Schedule 2 (Endangered - END), Schedule 3 (Threatened - THR), Schedule 4 (Special Concern - SC)

[2] *Species at Risk Act* (SARA), 2002. Schedule 1 (Last amended 01 September 2021); Part 1 (Extirpated), Part 2 (Endangered), Part 3 (Threatened), Part 4 (Special Concern)

[3] Committee on the Status of Endangered Wildlife in Canada (COSEWIC) http://www.cosewic.gc.ca/

[4] Global Ranks (GRANK) are Rarity Ranks assigned to a species based on their range-wide status. GRANKS are assigned by a group of consensus of Conservation Data Centres (CDCs), scientific experts and the Nature Conservancy. These ranks are not legal designations. G1 (Extremely Rare), G2 (Very Rare), G3 (Rare to uncommon), G4 (Common), G5 (Very Common), GH (Historic, no record in last 20yrs), GU (Status uncertain), GX (Globally extinct), ? (Inexact number rank), G? (Unranked), Q (Questionable), T (rank applies to subspecies or variety). Last assessed August 2011

[5] Provincial Ranks (SRANK) are Rarity Ranks assigned to a species or ecological communities, by the Natural Heritage Information Centre (NHIC). These ranks are not legal designations. SRANKS are evaluated by NHIC on a continual basis and updated lists produced annually. SX (Presumed Extirpated), SH (Possibly Extirpated - Historical), S1 (Critically Imperiled), S2 (Imperiled), S3 (Vulnerable), S4 (Apparently Secure), S5 (Secure), SNA (Not Applicable), S#S# (Range Rank), S? (Not ranked yet), SAB (Breeding Accident), SAN (Non-breeding Accident), SX (Apparently Extirpated). Last assessed November 2019.

[6] General Habitat Protection is applied when a species is newly listed as endangered or threatened on the SARO list under the ESA, 2007. The definition of general habitat applies to areas that a species currently depends on. These areas may include dens and nests, wetlands, forests and other areas essential for breeding, rearing, feeding, hibernation and migration. General habitat protection will also apply to all listed endangered or threatened species without a species-specific habitat regulation as of June 30, 2013 (ESA 2007, c.6, s.10 (2)). Regulated Habitat is species-specific habitat used as the legal description of that species habitat. Once a species-specific habitat regulation is created, it replaces general habitat protection. Refer to O.Reg 242/08 for full details regarding regulated habitat.

[7] Refer to the individual species' federal recovery strategy for a full description of the critical habitat (http://www.sararegistry.gc.ca/sar/recovery/recovery_e.cfm)

*Species Codes derived from the following sources: Birds – 53rd AOU Supplement (2012); Amphibians – Marsh Monitoring Program (Bird Studies Canada 2003); Fish – Golder; Reptiles – Golder.

*NHIC (Natural Heritage Information Centre); ROM (Royal Ontario Museum); OBBA (Ontario Breeding Bird Atlas); Herp Atlas (Reptiles and Amphibians of Ontario); Odonata Atlas (of Ontario); Mammal Atlas (of Ontario); BCI (Bat Conservation International); Butterfly Atlas (Ontario Butterfly Atlas)

'—' No status

APPENDIX C

List of Vascular Plants

Scientific Name	Common Name	Origin[a]	Global Rarity Status[b]	Ontario Rarity Status[b]	SARA[c]	ESA[d]
Acer rubrum	Red maple	N	G5	S5	-	-
Acer saccharum	Sugar maple	N	G5	S5	-	-
Achillea millefolium	Common yarrow	I	G5T5?	SNA	-	-
Agrostis gigantea	Red top	I	G4G5	SNA	-	-
Ambrosia artemisiifolia	Ragweed	N	G5	S5	-	-
Amphicarpaea bracteata	Hog-peanut	N	G5	S5	-	-
Apocynum androsaemifolium	Spreading dogbane	N	G5	S5	-	-
Aralia nudicaulis	Wild sarsaparilla	N	G5	S5	-	-
Artemisia biennis	Biennial wormwood	I	G5	SNA	-	-
Asarum canadense	Wild ginger	N	G5	S5	-	-
Asclepias syriaca	Common milkweed	N	G5	S5	-	-
Athyrium filix-femina	Lady fern	N	G5T5	S5	-	-
Atriplex patula	Halbred-leaved orache	N	G5	S5	-	-
Betula alleghaniensis	Yellow birch	N	G5	S5	-	-
Betula papyrifera	White birch	N	G5	S5	-	-
Bromus inermis	Smooth brome	I	GNR	SNA	-	-
Carex intumescens	Bladder sedge	N	G5	S5	-	-
Carex pensylvanica	Pensylvania sedge	N	G5	S5	-	-
Carex spp.	Sedges	N	?	?	-	-
Carex stipata	Awl-fruited sedge	N	G5	S5	-	-
Carex utriculata	Bladder sedge	N	G5	S5	-	-
Chenopodium album	Lamb's-quarters	I	G5T5	SNA	-	-
Circaea lutetiana	Enchanter’s nightshade	N	G5	S5	-	-
Conyza canadensis	Horseweed	N	G5	S5	-	-
Cornus alternifolia	Alternate-leaved dogwood	N	G5	S5	-	-
Cornus rugosa	Round-leaved dogwood	N	G5	S5	-	-
Danthonia spicata	Poverty oat-grass	N	G5	S5	-	-
Daucus carota	Wild carrot	I	GNR	SNA	-	-
Desmodium glutinosum	Pointed-leaved tick-trefoil	N	G5	S4	-	-
Doellingeria umbellata	Flat-topped aster	N	G5T5	S5	-	-
Dryopteris intermedia	Evergreen woodfern	N	G5	S5	-	-
Echium vulgare	Viper's bugloss	I	GNR	SNA	-	-
Equisetum arvense	Field horsetail	N	G5	S5	-	-
Erigeron philadelphicus	Philadelphia fleabane	N	G5	S5	-	-
Eurybia macrophylla	Large-leaved aster	N	G5	S5	-	-
Eutrochium maculatum	Joe-pye weed	N	G5TNR	S5	-	-
Fagus grandifolia	Beech	N	G5	S4	-	-
Fraxinus americana	White ash	N	G5	S5	-	-
Fraxinus pennsylvanica	Green ash	N	G5	S5	-	-
Galeopsis tetrahit	Hemp-nettle	I	GNR	SNA	-	-
Galium palustre	Marsh bedstraw	N	G5	S5	-	-
Hieracium caespitosum	Yellow hawkweed	I	GNR	SNA	-	-
Juncus dudleyi	Path rush	N	G5	S5	-	-
Juncus tenuis	Path rush	N	G5	S5	-	-
Juniperus communis	Common juniper	N	G5	S5	-	-
Lemna minor	Duckweed	N	G5	S5	-	-
Lepidium densiflorum	Common pepper-grass	I	G5	SNA	-	-
Leucanthemum vulgare	Ox-eye daisy	I	GNR	SNA	-	-
Linaria vulgaris	Butter-and-eggs	I	GNR	SNA	-	-
Lonicera canadensis	Fly-honeysuckle	N	G5	S5	-	-
Lonicera hirsuta	Hairy honeysuckle	N	G4G5	S5	-	-
Lonicera involucrata	Fly-honeysuckle	N	G5	S5	-	-
Lonicera morrowii	Hedge honeysuckle	I	GNR	SNA	-	-
Lotus corniculatus	Bird’s-foot trefoil	I	GNR	SNA	-	-
Maianthemum canadense	Canada mayflower	N	G5	S5	-	-
Maianthemum racemosum	False Solomon's-seal	N	G5	S5	-	-
Medicago lupulina	Black medick	I	GNR	S5	-	-
Medicago sativa	Alfalfa	I	GNR	S5	-	-
Oenothera biennis	Common evening-primrose	N	G5	S5	-	-
Osmunda cinnamomea	Cinnamon fern	N	G5	S5	-	-
Ostrya virginiana	Ironwood	N	G5	S5	-	-
Oxalis stricta	Common yellow wood-sorrel	N	G5	S5	-	-
Panicum capillare	Witch grass	N	G5	S5	-	-
Parthenocissus inserta	Virginia creeper	N	G5	S5	-	-

Scientific Name	Common Name	Origin[a]	Global Rarity Status[b]	Ontario Rarity Status[b]	SARA[c]	ESA[d]
Physalis heterophylla	Clammy ground-cherry	N	G5	S4	-	-
Picea glauca	White spruce	N	G5	S5	-	-
Plantago lanceolata	Narrow-leaved plantain	I	G5	SNA	-	-
Plantago major	Common plantain	I	G5	SNA	-	-
Populus balsamifera	Balsam poplar	N	G5	S5	-	-
Populus tremuloides	Trembling aspen	N	G5	S5	-	-
Potentilla argentea	Silvery cinquefoil	I	GNR	SNA	-	-
Potentilla norvegica	Rough cinquefoil	I	G5	S5	-	-
Potentilla simplex	Old-field cinquefoil	N	G5	S5	-	-
Prunus pensylvanica	Pin cherry	N	G5	S5	-	-
Prunus virginiana	Choke cherry	N	G5	S5	-	-
Pteridium aquilinum	Bracken	N	G5	S5	-	-
Quercus macrocarpa	Bur oak	N	G5	S5	-	-
Quercus rubra	Red oak	N	G5	S5	-	-
Rhamnus cathartica	Common buckthorn	I	GNR	SNA	-	-
Rhus radicans	Poison-ivy	N	G5T5	S5	-	-
Rhus typhina	Staghorn sumac	N	G5	S5	-	-
Ribes cynosbati	Prickly gooseberry	N	G5	S5	-	-
Rubus idaeus	Red raspberry	N	G5T5	S5	-	-
Rubus odoratus	Purple-flowering raspberry	N	G5	S5	-	-
Rudbeckia hirta	Black-eyed susan	N	G5	S5	-	-
Salix discolor	Pussy willow	N	G5	S5	-	-
Salix spp.	Willows	N	G5	?	-	-
Sanguinaria canadensis	Bloodroot	N	G5	S5	-	-
Setaria pumila	Yellow foxtail	I	GNR	SNA	-	-
Silene latifolia	White campion	I	GNR	SNA	-	-
Silene vulgaris	Bladder campion	I	GNR	SNA	-	-
Solidago canadensis	Canada goldenrod	N	G5T5	S5	-	-
Solidago hispida	Hairy goldenrod	N	G5	S5	-	-
Solidago juncea	Early goldenrod	N	G5	S5	-	-
Solidago rugosa	Rough Goldenrod	N	G5	S5	-	-
Spiraea alba	Meadowsweet	N	G5	S5	-	-
Symphyotrichum cordifolium	Heart-leaved aster	N	G5	S5	-	-
Symphyotrichum lanceolatum	Panicled aster	N	G5T5	S5	-	-
Symphyotrichum novae-angliae	New England Aster	N	G5	S5	-	-
Symphyotrichum puniceum	Red-stemmed aster	N	G5	S5	-	-
Thuja occidentalis	Eastern white cedar	N	G5	S5	-	-
Tilia americana	Basswood	N	G5	S5	-	-
Trifolium arvense	Rabbit-foot clover	I	GNR	SNA	-	-
Trifolium pratense	Red clover	I	GNR	SNA	-	-
Trifolium repens	White clover	I	GNR	SNA	-	-
Trillium erectum	Red trillium	N	G5	S5	-	-
Trillium grandiflorum	White trillium	N	G5	S5	-	-
Turritis glabra	Tower mustard	N	G5	S5	-	-
Typha latifolia	Common cattail	N	G5	S5	-	-
Ulmus americana	White elm	N	G5?	S5	-	-
Urtica dioica	Stinging nettle	N	G5T?	S5	-	-
Verbascum thapsus	Common mullein	I	GNR	SNA	-	-
Verbena bracteata	Bracted vervain	N	G5	S4?	-	-
Verbena hastata	Blue vervain	N	G5	S5	-	-
Verbena stricta	Hoary vervain	N	G5	S4	-	-
Vicia cracca	Cow-vetch	I	GNR	SNA	-	-
Vitis riparia	Riverbank grape	N	G5	S5	-	-
Zanthoxylum americanum	Prickly-ash	N	G5	S5	-	-
Waldsteinia fragarioides	Barren strawberry	N	G5	S5	-	-

Notes:

[a] Origin: N = Native; (N) = Native but not in study area region; I = Introduced.

[b] Ranks based upon determinations made by the Ontario Natural Heritage Information Centre.
G = Global; S = Provincial; Ranks 1-3 are considered imperiled or rare; Ranks 4 and 5 are considered secure.
SNA = Not applicable for Ontario Ranking (e.g. Exotic species); SNR = Provincial conservation status not yet assessed;

[c] Species at Risk Act (SARA), Schedule 1

[d] Ontario *Endangered Species Act* (ESA)

APPENDIX D

List of Wildlife

Common Name	Scientific Name	Origin[a]	Global Rarity Status[b]	Ontario Rarity Status[b]	SARA[c]	ESA[d]
Insects						
Black swallowtail	*Papilio polyxenes*	N	G5	S5	–	–
Brown-belted bumblebee	*Bombus griseocollis*	N	G5	S4	–	–
Cabbage white	*Pieris rapae*	I	G5	SNA	–	–
Clouded sulphur	*Colias philodice*	N	G5	S5	–	–
Common eastern bumblebee	*Bombus impatiens*	N	G5	S4S5	–	–
Common ringlet	*Coenonympha tullia*	N	G5	S5	–	–
Common wood nymph	*Cercyonis pegala*	N	G5	S5	–	–
Dot-tailed whiteface	*Leucorrhinia intacta*	N	G5	S5	–	–
Monarch	***Danaus plexippus***	**N**	**G4**	**S2N.S4B**	**SC**	**SC**
Twelve-spotted skimmer	Libellula pulchella	N	G5	S5	–	–
White-faced meadowhawk	*Sympetrum obtrusum*	N	G5	S5	–	–
Widow skimmer	*Libellula luctuosa*	N	G5	S5	–	–
Reptiles and Amphibians						
American toad	*Anaxyrus americanus*	N	G5	S5	–	–
Blue-spotted salamander	*Ambystoma laterale*	N	G5	S4	–	–
Common snapping turtle	***Chelydra serpentina***	**N**	**G5**	**S3**	**SC**	**SC**
Eastern garter snake	*Thamnophis sirtalis*	N	G5	S5	–	–
Green frog	*Lithobates clamitans*	N	G5	S5	–	–
Northern leopard frog	*Lithobates pipiens*	N	G5	S5	–	–
Midland painted turtle	***Chrysemys picta marginata***	**N**	**G5T5**	**S4**	**SC**	**–**
Spring peeper	*Pseudacris crucifer*	N	G5T5	S5	–	–
Wood frog	*Lithobates sylvaticus*	N	G5	S5	–	–
Birds						
American crow	*Corvus brachyrhynchos*	N	G5	S5	–	–
American goldfinch	*Carduelis tristis*	N	G5	S4B	–	–
American redstart	*Setophaga ruticilla*	N	G5	S4	–	–
American robin	*Turdus migratorius*	N	G5	S4B	–	–
American woodcock	*Scolopax minor*	N	G5	S5B	–	–
Baltimore oriole	*Icterus galbula*	N	G5	S5B	–	–
Belted kingfisher	*Ceryle alcyon*	N	G5	S4B	–	–
Black-and-white warbler	*Mniotilta varia*	N	G5	S5B	–	–
Blackburnian warbler	*Setophaga fusca*	N	G5	S5B	–	–
Black-capped chickadee	*Poecile atricapilla*	N	G5	S4B	–	–
Black-throated blue warbler	*Setophaga caerulescens*	N	G5	S4	–	–
Black-throated green warbler	*Setophaga virens*	N	G5	S5B	–	–
Blue jay	*Cyanocitta cristata*	N	G5	S5	–	–
Brown-headed cowbird	*Molothrus ater*	N	G5	S5	–	–
Canada goose	*Branta canadensis*	N	G5	S5B	–	–
Chestnut-sided warbler	*Setophaga pensylvanica*	N	G5	S5B	–	–
Common grackle	*Quiscalus quiscula*	N	G5	S5	–	–
Downy woodpecker	*Picoides pubescens*	N	G5	S5B	–	–
Eastern kingbird	*Tyrannus tyrannus*	N	G5	S4B	–	–
Eastern phoebe	*Sayornis phoebe*	N	G5	S4B	–	–
European starling	*Sturnus vulgaris*	I	G5	S5B	–	–
Great crested flycatcher	*Myiarchus crinitus*	N	G5	S5B, S4N	–	–
Indigo bunting	*Passerina cyanea*	N	G5	S5B	–	–
Least flycatcher	*Empidonax minimus*	N	G5	SNA	–	–
Mallard	*Anas platyrhynchos*	N	G5	S4B	–	–
Mourning dove	*Zenaida macroura*	N	G5	S5	–	–

Common Name	Scientific Name	Origin[a]	Global Rarity Status[b]	Ontario Rarity Status[b]	SARA[c]	ESA[d]
Northern cardinal	*Cardinalis cardinalis*	N	G5	S4B	–	–
Northern flicker	*Colaptes auratus*	N	G5	S4B	–	–
Ovenbird	*Seiurus aurocapilla*	N	G5	S4B	–	–
Pileated woodpecker	*Dryocopus pileatus*	N	G5	S5	–	–
Red-eyed vireo	*Vireo olivaceus*	N	G5	S5	–	–
Red-tailed hawk	*Buteo jamaicensis*	N	G5	S5	–	–
Red-winged blackbird	*Agelaius phoeniceus*	N	G5	S5B	–	–
Ring-billed gull	*Larus delawarensis*	N	G5	S5B	–	–
Rose-breasted grosbeak	*Pheucticus ludovicianus*	N	G5	S5B	–	–
Ruffed grouse	*Bonasa umbellus*	N	G5	S5B	–	–
Savannah sparrow	*Passerculus sandwichensis*	N	G5	S4B	–	–
Song sparrow	*Melospiza melodia*	N	G5	S5B	–	–
Spotted sandpiper	*Actitis macularia*	N	G5	S4B	–	–
Swamp sparrow	*Melospiza georgiana*	N	G5	S5	–	–
Tree swallow	*Tachycineta bicolor*	N	G5	S4B	–	–
Veery	*Catharus fuscescens*	N	G5	S5	–	–
Warbling vireo	*Vireo gilvus*	N	G5	S4B	–	–
White-throated sparrow	*Zonotrichia albicollis*	N	G5	S5B	–	–
Wild turkey	*Meleagris gallopava*	N	G5	S5	–	–
Mammals						
Big brown bat	*Eptesicus fuscus*	N	G5	S4	–	–
Black bear	*Ursus americanus*	N	G5	S5	–	–
Coyote	*Canis latrans*	N	G5	S5	–	–
Eastern Chipmunk	*Tamias striatus*	N	G5	S5	–	–
Eastern red bat	*Lasiurus borealis*	N	G3G4	S4	–	–
Eastern small-footed myotis	*Myotis leibii*	N	G4	S2S3	–	**END**
Grey squirrel	*Sciurus carolinensis*	N	G5	S5	–	–
Hoary bat	*Lasiurus cinereus*	N	G3G4	S4	–	–
Little brown myotis	*Myotis lucifugus*	N	G3	S3	**END**	**END**
Racoon	*Procyon lotor*	N	G5	S5	–	–
Red fox	*Vulpes vulpes*	N	G5	S5	–	–
River otter	*Lontra canadensis*	N	G6	S6	–	–
Red Squirrel	*Tamiasciurus hudsonicus*	N	G5	S5	–	–
Silver-haired bat	*Lasionycteris noctivagans*	N	G3G4	S4	–	–
White-tailed Deer	*Odocoileus virginianus*	N	G5	S5	–	–

Notes:

[a] Origin: N = Native; (N) = Native but not in study area region; I = Introduced.

[b] Ranks based upon determinations made by the Ontario Natural Heritage Information Centre .
G = Global; S = Provincial; Ranks 1-3 are considered imperiled or rare; Ranks 4 and 5 are considered secure.
SNA = Not applicable for Ontario Ranking (e.g. Exotic species)

[c] Canada Species at Risk Act (Schedule 1)

[d] Ontario Endangered Species Act (O.Reg.230/08) (END - Endangered), (THR - Threatened), (SC- Special Concern)

APPENDIX E

Curriculum Vitae

WSP Canada Inc. – Mississauga

Principal, Senior Ecologist

Heather Melcher is a Principal, Senior Ecologist and Project Manager/Director with Golder Associates. Heather has over 20 years of experience working in a number of sectors including transportation, oil and gas, transmission, land development, power, aggregates and mining. Her experience lies in designing, managing and carrying out environmental impact assessments within provincial and federal frameworks and environmental land use policies for projects of various size and complexity. She leads a team of ecologists and multi-disciplinary project teams to holistically assess potential project impacts through integration of components. Heather works closely with provincial and federal agencies to help her clients navigate changing planning and species at risk (SAR) legislation. Heather has experience developing rehabilitation plans for disturbed sites and biodiversity plans that integrate the ecology of a smaller site into the regional system as well as developing compensation habitat plans and mitigation plans for SAR. Heather is also a recognized expert witness for Local Planning Appeal Tribunal (LPAT) hearings in Ontario.

Education

M.Sc. Applied Marine Science, University of Plymouth, Devon, UK, 1998

B.Sc. (Honours) Biology, Laurentian University, Sudbury, Ontario, 1996

Certifications

PADI Master Scuba Diver Trainer, 2000

Small Craft Boat Operator, 2003

Small Non-pleasure Vessel Basic Safety - MED A3, 2011

Canadian Red Cross First Aid and CPR, 2012

WHMIS Training, 1990, 2001, 2004, 2016

Languages

English – Fluent

Employment History

WSP Canada Inc. (Golder Associates Ltd. prior to 2023) – Mississauga, Ontario
Principal, Senior Ecologist (2004 to Present)

Project manager, project director and/or technical lead or advisor on multi-disciplinary projects of varying size and complexity. Leads a team of ecologists in Ontario and responsible for business development as a global client lead.

ESG International – Guelph, Ontario
Ecologist/Environmental Planner (2002 to 2003)

Specialized in resource management and land use planning. Worked with clients, residential and commercial land developers, land planners and regulatory agencies to obtain permits and approvals, specifically within the framework of Niagara Escarpment and Oak Ridges Moraine legislation. Compiled, assessed and reported on marine data collected for international projects.

CBCL Ltd – Halifax, Nova Scotia
Ecologist/Environmental Planner (2001 to 2002)

Intermediate project manager responsible for designing and implementing environmental effects monitoring, environmental impact assessment, and natural heritage projects. Developed and implemented marine and freshwater fisheries and benthic investigations, aquatic habitat assessments, and water quality and sediment assessments. Liaised with clients and regulatory agencies (federal and provincial), to obtain development permits and approvals.

Southeast Environmental Association – Montague, Prince Edward Island
Bacterial Water Quality Project Coordinator (2000 to 2002)

Responsible for collection of freshwater samples and laboratory analysis of faecal coliform bacteria to determine the effects of livestock farming runoff on the shellfish industry. Liaised with landowners and the agricultural engineer to establish effective remediation efforts, and developed education initiatives involving the general public, farmers and shell fishers. Reported to a multi-stakeholder board.

PROJECT EXPERIENCE – CONSTRUCTION MATERIALS

CBM Aggregates (a division of St. Marys Cement Inc. (Canada)), Caledon Quarry
Caledon, Ontario, Canada

Project manager and natural environment component lead for a below water quarry licence application under the Aggregate Resources Act (ARA). Surveys completed to support the natural environment component included fish and fish habitat, breeding birds, bats, anuran (frog and toad), turtle, species at risk, vegetation community, botanical, wetland and woodland delineation. As project manager, coordinated schedules and budget, and led public, Indigenous and agency consultation. Other discipline studies to support the project included hydrogeology, resource evaluation, karst assessment, surface water, blasting design, noise, air quality, archaeology, cultural heritage, visual assessment.

Alamos Island Gold, Aggregate Pit T06-07
Dubreuilville, Ontario, Canada

Senior advisor/technical reviewer for a below water pit permit application under the ARA. Provided direction and oversight for terrestrial and aquatic studies, including the following surveys: nightjar passive acoustic, amphibian call count, fish and fish habitat, breeding bird, vegetation community and botanical. Reviewed all draft and final deliverables.

Scotian Materials Limited
Halifax, Nova Scotia, Canada

Senior technical lead (biophysical) for the provincial environmental assessment to support the expansion of an existing quarry. Studies completed to support the project included fish and fish habitat, species at risk, flora and fauna and wetland surveys. The technical lead for the impact assessment for the natural environment and the completion of supporting permit/approval applications. Scope included the completion of wetland and wildlife management plans.

EWL Ltd., Gordon Lake Quarry and Borrow Area
Kenora, Ontario, Canada

Natural environment component lead for permit applications under the Aggregate Resources Act (ARA). The aggregate areas are in support of rehabilitation activities associated with the decommissioning of the former Gordon-Werner Lake Mine. Coordinated aquatic and terrestrial field data collection and analysis, interpreted and integrated data with hydrogeological and surface water components, and developed a Natural Environment Level 1/2 (NEL 1/2) technical report. Responsible for negotiations with the Ministry of Natural Resources and Forestry (MNRF) and Ministry of Environment, Conservation and Parks (MECP) regarding woodland caribou and SAR bats. Prepared and submitted permitting applications under the Endangered Species Act (ESA), developed mitigation plans and coordinated with construction team.

Lafarge Canada Inc., McGill Pit
Kemptville, Ontario, Canada

Natural environment component lead for a below water pit licence application under the ARA. Coordinated aquatic and terrestrial field data collection and analysis, interpreted and integrated data with hydrogeological and surface water components and completed a comprehensive, integrated impact assessment. Developed progressive and final rehabilitation plans, participated in agency and public consultation and produced an NEL 1/2 report and municipal Environmental Impact Study (EIS) report. Led negotiations with the MNRF regarding SAR issues and developed mitigation and habitat compensation plans for butternut. Participated in an Ontario Municipal Board (OMB) hearing as an expert witness.

Colacem Cement
L'Orignal, Ontario, Canada

Natural environment component lead for the Colacem Cement Plant assessment. Designed and coordinated aquatic and terrestrial field data collection and analysis, interpreted and integrated data with physical resource components. Developed an EIS for the municipal approval process. Worked with MNRF and South Nation Conservation on significant natural heritage feature and SAR issues and with Fisheries and Oceans Canada (DFO) on a Fisheries Act authorization for removal of fish habitat. Currently preparing for participation in a LPAT (formerly the OMB) hearing as an expert witness.

CBM Aggregates (a division of St. Marys Cement Inc. (Canada)), Dance Pit Expansion
North Dumfries, Ontario, Canada

Project manager and natural environment technical advisor for an above water pit licence application under the ARA. Worked with the natural environment component lead to collect, analyse, interpret and integrate terrestrial and aquatic data with hydrogeological and surface water components. Developed a rehabilitation plan, consulted with the Grand River Conservation Authority, the MNRF and MECP, the Region of Waterloo, the Municipality of North Dumfries and the City of Cambridge, and participated in agency and public consultation. Coordinated and managed the activities of a multi-disciplinary team including hydrogeologists, surface water engineers, noise, air quality, visual assessment and vibration specialists, public consultation and Indigenous community engagement specialists, and archaeologists. Managed and tracked overall project budget and schedule.

CBM Aggregates (a division of St. Marys Cement Inc. (Canada)), Lanci Pit Expansion
Aberfoyle, Ontario, Canada

Project manager and natural environment technical advisor for an above water pit licence application under the ARA. Worked with the natural environment component lead to analyse, interpret and integrate terrestrial and aquatic data with hydrogeological and surface water components. Developed a rehabilitation plan, consulted with the Grand River Conservation Authority, the MNRF, the municipality, and participated in agency and public consultation. Coordinated and managed the activities of a multi-disciplinary team including hydrogeologists, surface water engineers, noise scientists, archaeologists, and an Indigenous Community engagement team. Managed and tracked overall project budget and schedule.

Cavanagh Construction Ltd., Henderson II Quarry
Ottawa, Ontario, Canada

Natural environment component lead for a below water quarry licence application under the ARA. Coordinated aquatic and terrestrial field data collection and analysis, interpreted and integrated data with hydrogeological and surface water components and completed a comprehensive integrated impact assessment. Developed a rehabilitation plan, participated in agency and public consultation and developed an NEL 1/2 report and municipal EIS report. Led negotiations with the MNRF regarding SAR issues and developed compensation plans.

Tackaberry Sand and Gravel Ltd., Perth Quarry Perth, Ontario, Canada	Natural environment component lead for a below water quarry licence application under the ARA. Coordinated aquatic and terrestrial field data collection and analysis, interpreting and integrated data with hydrogeological and surface water components. Developed a rehabilitation plan, participated in agency and public consultation and developed an NEL 1/2 report and municipal EIS. Led negotiations with the MNRF regarding SAR issues and developed compensation plans for the removal of habitat. Worked with Rideau Valley Conservation Authority and Mississippi Valley Conservation Authority on headwater drainage feature assessment and mitigation plans.
Greenfield Aggregates Sherk Pit Waterloo, Ontario, Canada	Natural environment component lead for a below water pit licence application under the ARA. Analysed and integrated terrestrial and aquatic data with hydrogeological and surface water components, completed a comprehensive and integrated impact assessment. Developed a rehabilitation plan and an NEL 1/2 report and municipal EIS report. Participated in consultation with the Region and the Ecological and Environmental Advisory Committee (EEAC).
Lafarge Canada Inc., French Settlement Pit Ottawa, Ontario, Canada	Natural environment component lead for a below water pit licence application under the ARA. Coordinated aquatic and terrestrial field data collection and analysis. Interpreting and integrated data with hydrogeological and surface water components. Developed a progressive and final rehabilitation plan and an NEL 1/2 report and municipal EIS report. Consulted with regulatory agencies and participated in public consultation process.
Lafarge Canada Inc., Sunningdale Pit London, Ontario, Canada	Natural environment component lead for a below water pit licence application under the ARA. Coordinated aquatic and terrestrial field data collection and analysis. Interpreting and integrated data with hydrogeological and surface water components. Completed a comprehensive and integrated impact assessment. Developed a progressive and final rehabilitation plan and an NEL 1/2 report and EIS. Consulted with regulatory agencies and participated in public consultation process. Developed mitigation and habitat compensation plans under the ESA for barn swallow.
Lafarge Canada Inc., Limebeer Pit Caledon, Ontario, Canada	Project manager and natural environment component lead for a below water pit licence application under the ARA. Coordinated aquatic and terrestrial field data collection and analysis. Interpreting and integrated data with hydrogeological and surface water components. Completed a comprehensive and integrated impact assessment. Developed a progressive and final rehabilitation plan and an NEL 1/2 report and EIS. Consulted with regulatory agencies, participated in public consultation process. Coordinated and managed the activities, schedule and budget of a multi-disciplinary team including hydrogeologists, groundwater modelling experts, surface water engineers, and noise and air quality specialists.
Lafarge Canada Inc., Avening Pit Extension Creemore, Ontario, Canada	Project manager and natural environment component lead for an above water pit licence application under the ARA. Coordinated aquatic and terrestrial field data collection and analysis. Interpreting and integrated data with hydrogeological and surface water components. Completed a comprehensive and integrated impact assessment. Developed a progressive and final rehabilitation plan and an NEL 1/2 report and EIS. Coordinated and managed the activities, schedule and budget of a multi-disciplinary team including hydrogeologists, surface water engineers, and noise and air quality specialists.

Floyd Preston Ltd. Eastern Ontario, Canada	Natural environment component lead for a quarry licence application under the ARA. Liaised with client, coordinated field data collection, mentored intermediate staff in data analysis and interpretation and prepared an NEL 1 report.

PROJECT EXPERIENCE – SPECIES AT RISK

EWL Management Ltd Madawaska Mine Decommissioning Faraday, Ontario, Canada	Natural environment component lead for SAR permitting for bats, including little brown myotis (Myotis lucifugus), northern myotis (Myotis septentrionalis) and tricolor bat (Perimyotis subflavus). Prepared and submitted permitting documents under the ESA, led consultation with the MNRF and MECP, developed a mitigation plan and provided direction to the construction team.
TransCanada - Various Sites in Ontario Ontario, Canada	Natural environment component lead for multi-year annual SAR and migratory bird monitoring at numerous sites across Ontario since 2012. In support of TransCanada's right-of-way maintenance brushing program. Provide SAR advice and liaise with MNRF to develop construction monitoring protocols for SAR and migratory birds. Lead crews to complete monitoring on an annual basis.
Lafarge Canada Ltd. Various Locations, Ontario, Canada	Natural environment component lead for multi-year annual SAR monitoring and reporting at aggregate sites across Ontario following registration. Species surveys include Blanding's turtle, loggerhead shrike, least bittern and gray ratsnake. Developed survey protocols with several MNRF district offices and lead crews to complete monitoring.
Leader Resources Services Ltd. Various Locations, Ontario, Canada	Project manager for a number of wind power projects under the Ontario Renewable Energy Approvals Act (REA). Worked with the client and the MNRF to develop protocols and coordinate field surveys. Completed and submitted ESA permitting applications and compensation plans.
Lafarge Canada Ltd. Various Locations, Ontario, Canada	Project manager and natural environment component lead for a number of licence applications for proposed new and expanded aggregate extraction operations (pits and quarries) in Ontario under the ARA. Developed survey protocols, consulted with the MNRF, registered for activities under the ESA (Notice of Activity), completed Information Gathering Forms (IGF), prepared and submitted permit applications and developed compensation plans.

TRAINING

Microsoft Project Level 1 Training
2008

Royal Ontario Museum (ROM) Fish ID Workshop
2005

Introduction and Intermediate MapInfo Professional Training
2000

PROFESSIONAL AFFILIATIONS

Professional Association of Diving Instructors (PADI)

Director, Ontario Stone Sand and Gravel Association (OSSGA) Board of Directors

PUBLICATIONS

Conference Proceedings

Melcher, Heather. 2021. *Public Engagement in the Time of COVID-19*. Ontario Stone Sand and Gravel Annual General Meeting and Conference, February. Online.

Melcher, Heather and Amber Sabourin. 2019. *The Use of Remote Sensing in Natural Environment Surveys*. Ontario Stone Sand and Gravel Association Annual General Meeting and Conference, February. Niagara Falls, Canada.

Melcher, Heather. 2015. *Bats and the Aggregate Industry*. Ontario Stone Sand and Gravel Association Annual General Meeting and Conference, February. Toronto, Canada.

Melcher, Heather. 2014. *Changes to the Ontario Endangered Species Act and Implications to the Aggregate Industry*. Ontario Stone Sand and Gravel Association Annual General Meeting and Conference, February. Ottawa, Canada.

Other

Melcher, Heather. 2001; 2002. Effects of Agricultural Inputs of Faecal Coliforms on the Shellfish Industry in Prince Edward Island. Annual Monitoring Report. Prince Edward Island.

Education

H.B.Sc. (Env) Honours Environmental Science, University of Guelph, Guelph, ON, 2004

Certifications

Federal Reliability Level Clearance, 2019

MNRF Ecological Land Classification - Training Certificate, 2004

MNRF Ontario Wetland Evaluation System - Training Certificate, 2005

MNRF Butternut Health Assessor, 2011

Languages

English – Fluent

WSP Canada Inc. – Ottawa

Lead Terrestrial Ecologist and Project Manager

Gwendolyn has been providing ecological consulting services since 2004, with particular knowledge in the field of terrestrial ecology. Supported by her depth of experience, Gwendolyn thrives on anticipating and providing pro-active solutions for clients' needs as they navigate the natural environment approvals process. She is skilled at agency and community liaison, and prides herself on providing creative, efficient and positive outcomes for her clients.

Gwendolyn has authored numerous environmental impact statements, species at risk studies, natural heritage assessments, and due diligence reports for a variety of sectors, including residential development, recreational development, aggregates, energy projects (transmission lines, pipelines and renewable energy), as well as for municipalities, and federal and provincial agencies. She has also provided terrestrial ecology peer review services.

Gwendolyn's expertise is founded on years of direct in-field experience, where she gained extensive skills in identifying and understanding the ecology of Ontario's flora, fauna, and plant communities. Gwendolyn is certified in both the Ministry of Natural Resources and Forestry (MNRF) Ecological Land Classification (ELC) and Wetland Evaluation systems, as well as being an MNRF certified Butternut Health Assessor.

Employment History

WSP Canada Inc. (Golder Associates Ltd. prior to 2023) – Ottawa, ON

Lead Ecologist and Project Manager (2011 to Present)

Gwendolyn is the senior ecologist located in the Ottawa office where she provides a range of terrestrial ecology services, including designing field programs and managing projects for numerous client sectors. Gwendolyn also manages the Ottawa biology team, and is responsible for pursuing opportunities and building client relationships in Eastern Canada.

Stantec Consulting Ltd. – Guelph, ON

Ecologist and Project Manager (2004 to 2011)

Gwendolyn provided a range of terrestrial ecology services, including: designing and carrying out detailed field programs; natural features monitoring and species at risk surveys. Gwendolyn was also responsible for managing projects for a range of client sectors.

PROJECT EXPERIENCE – AGGREGATES

Gilbert Quarry South Frontenac, ON	Prepared a Natural Environment Report for G. Tackaberry and Sons Construction Company Ltd.'s proposed Gilbert Quarry extraction area expansion. Gwendolyn acted as the Lead Ecologist.
Stittsville II Quarry Extension Ottawa, ON	Preparing a Natural Environment Report for R.W. Tomlinson Ltd. according to the Aggregate Resources Act for a limestone quarry expansion. Work included discussions with the MNRF and MECP, field studies, and authoring the reporting. Integration of various studies by multiple disciplines to determine potential impacts of extraction and preparation of appropriate mitigation plans. Gwendolyn is acting as the natural environment component lead.
Bank Street Quarry Extension Ottawa, ON	Prepared a Natural Environment Level II report for Thomas Cavanagh Construction Ltd. according to the Aggregate Resources Act for a small limestone quarry expansion. Work included discussions with the MNRF and MECP, field studies, and authoring the reporting. Integration of various studies by multiple disciplines to determine potential impacts of extraction and preparation of appropriate mitigation plans. Gwendolyn acted as the natural environment component lead.
Picton Terminals Quarry Picton, ON	Prepared a draft Natural Environment Level II report for Picton Terminals Inc. according to the Aggregate Resources Act for a proposed new limestone quarry at the existing Picton Terminals site. Work included discussions with the MNRF and MECP, field studies, and authoring the draft reporting. Integration of various studies by multiple disciplines to determine potential impacts of extraction and preparation of appropriate mitigation plans. Gwendolyn acted as the natural environment component lead.
Highland Line Pit Lanark, ON	Prepared a Natural Environment Report for Thomas Cavanagh Construction Ltd. according to the Aggregate Resources Act for a new sand pit operation. Work included discussions with the MNRF and MECP, field studies, and authoring the reporting. Integration of various studies by multiple disciplines to determine potential impacts of extraction and preparation of appropriate mitigation plans. Gwendolyn acted as the natural environment component lead.
Woods Quarry Extensions Elizabethtown-Kitley, ON	Prepared a Natural Environment Report for G. Tackaberry & Sons Ltd. according to the Aggregate Resources Act for two large limestone quarry expansions. Work included discussions with the MNRF and MECP, field studies, and authoring the reporting. Integration of various studies by multiple disciplines to determine potential impacts of extraction and preparation of appropriate mitigation plans. Gwendolyn acted as the natural environment component lead.
West Carleton Quarry Extension Ottawa, ON	Prepared a Natural Environment Report for Thomas Cavanagh Construction Ltd. according to the Aggregate Resources Act for a small limestone quarry expansion. Work included discussions with the MNRF and MECP, field studies, and authoring the reporting. Integration of various studies by multiple disciplines to determine potential impacts of extraction and preparation of appropriate mitigation plans. Gwendolyn acted as the natural environment component lead.

Navan Quarry Extension Ottawa, ON	Prepared a Natural Environment Level II report for R.W. Tomlinson Ltd. according to the Aggregate Resources Act for a limestone quarry expansion. Work included discussions with the MNRF and MECP, field studies, and authoring the reporting. Integration of various studies by multiple disciplines to determine potential impacts of extraction and preparation of appropriate mitigation plans. Gwendolyn acted as the natural environment component lead.
Arnott Pit Lanark, ON	Prepared a Natural Environment Level II report for Thomas Cavanagh Construction Ltd. according to the Aggregate Resources Act for an aggregate pit. Work included discussions with the MNRF, field studies, and authoring the final report. Integration of various studies by multiple disciplines to determine potential impacts of extraction and preparation of appropriate mitigation plans. Gwendolyn acted as the natural environment component lead.
Rideau Road Quarry Extension Ottawa, ON	Prepared a Natural Environment Level II report for R.W. Tomlinson Ltd. according to the Aggregate Resources Act for a small limestone quarry expansion. Work included discussions with the MNRF, field studies, and authoring the final report. Integration of various studies by multiple disciplines to determine potential impacts of extraction and preparation of appropriate mitigation plans. Gwendolyn acted as the natural environment component lead.
Canaan Quarry Extension Ottawa, ON	Prepared a Natural Environment Level I report for Cornwall Sand and Gravel according to the Aggregate Resources Act for a limestone quarry expansion. Work included a review of all published materials relating to the natural heritage features at the site, undertaking a scoped in-field review of the on-site features, and authoring the final report. Gwendolyn acted as the natural environment component lead.
Karson Kennedy Pit Ottawa, ON	Prepared a Natural Environment Level II report for Karson Aggregates according to the Aggregate Resources Act for a small sand pit project. Work included discussions with the MNRF, designing and undertaking the field studies, and authoring the final report. Integration of various studies by multiple disciplines to determine potential impacts of extraction and preparation of appropriate mitigation and rehabilitation plans. Worked with the Mississippi Valley Conservation Authority to develop an environmental monitoring program. Gwendolyn acted as the natural environment component lead.
McMachen Pit Species at Risk Rideau Lakes, ON	Designed and undertook a baseline study and mitigation plan for a sensitive Species at Risk on G. Tackaberry and Sons Construction Company Ltd.'s proposed aggregate pit expansion lands in accordance with O.Reg. 242/08 under the Endangered Species Act. Gwendolyn acted as the natural environment component lead.

TRAINING

Ontario Stream Assessment Protocol (OSAP) - Headwater Drainage Features
Ministry of Natural Resources and Forestry, 2017

Habitat Restoration Planning and Implementation
Northwest Environmental Training Centre, 2014

Wetland Creation Workshop
Toronto Zoo, 2010

MNRF Data Sensitivity Training
Ministry of Natural Resources and Forestry, 2014

St. John's Ambulance First Aid Training
2020

Defensive Driver Training
2021

Surface Miner Training
2021

PROFESSIONAL AFFILIATIONS

Ontario Vernal Pool Association

Field Botanists of Ontario

wsp.com