TECHNICAL REPORT

Natural Environment Report

Proposed Highland Line Pit, Lanark County, Ontario

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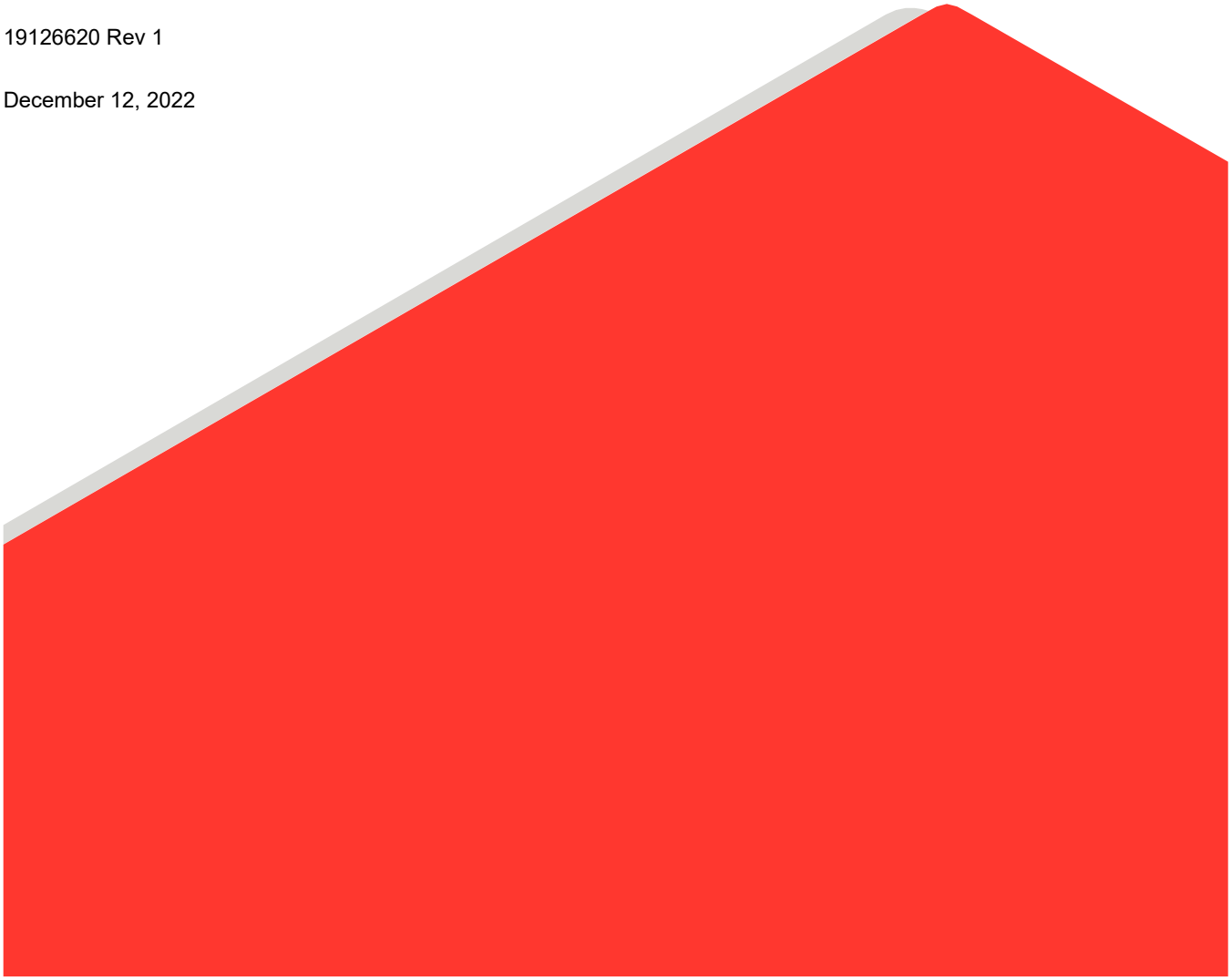

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1.0 INTRODUCTION

Golder Associates Ltd. (Golder) has been retained by Thomas Cavanagh Construction Limited (Cavanagh) to undertake natural environment studies to accompany the application for a Class A Pit Below Water under the *Aggregate Resources Act* (ARA; Ontario 1990a) for the proposed Highland Line Pit, located on Part Lot 5, Concession 10, Township of Lanark Highlands, Lanark 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 August 2020). This NER is also intended to satisfy the Corporation of the Township of Lanark Highlands (the Township) Official Plan (TLH 2016) and the County of Lanark Official Plan (McIntosh Perry 2012) requirements for an Environmental Impact Statement (EIS).

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

Site – The total land area owned by Cavanagh that is proposed for licensing under the ARA [50.6 hectares (ha); Figure 1].

Extraction Limit – The total area within the Site proposed for extraction (35.1 ha; Figure 2). This area represents the area of the Site less a 30 metre (m) setback along roads, road allowances and wetlands, and a 15 m setback along the remaining Site boundary where Cavanagh does not own the adjacent property. A 1.3 ha Natural Environment Exclusion Area is excluded from the Extraction Limit.

Study Area – The Study Area for the NER is defined in the Aggregate Resources of Ontario Provincial Standards as the Site and surrounding 120 m. The potential incremental drawdown cone resulting from extraction of the Site does not extend beyond 120 m (Figure 1).

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:

- The environmental features and functions on the Site and in the Study Area;
- The influence of extraction on the surrounding natural environment; and,
- The rehabilitation potential of the Site after extraction.

1.2 Site Description

The Site is located on the south side of Highland Line, west of Leo Jay Lane in the Township of Lanark Highlands, Lanark County, Ontario (Figure 1). The Site consists of deciduous and mixed forests, unevaluated wetlands, small meadows and active agricultural fields.

1.2.1 Adjacent Land Use

Surrounding land uses off-Site in the Study Area include existing Wheeler's Maple Sugarbush to the west, deciduous, mixed and coniferous forest and wetland to the south, east and north, interspersed with small patches of active agriculture. Immediately southeast of the Site is Barber's Lake. A small sand extraction operation is located north of the Site, on the north side of Highland Line.

2.0 ENVIRONMENTAL POLICY CONTEXT

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) and the Provincial Standards of Ontario –Class 'A' Pit Below Water (Ontario August 2020)
- The Provincial Policy Statement (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)
- Lanark County Sustainable Communities Official Plan (McIntosh Perry 2012)
- The Corporation of the Township of Lanark Highlands Official Plan (TLH 2016)
- The Mississippi Valley Conservation Authority (MVCA) O. Reg. 153/06 - Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses (Ontario 2006).

An overview of the above noted legislation and policy documents are discussed in Sections 2.1 to 2.8.

2.1 Aggregate Resources Act

Applicants are required under the Aggregate Resources of Ontario: Technical reports and information standards (Ontario August 2020) to prepare a NER that must identify significant natural environment features that occur on, or in proximity (i.e., within 120 m) to 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 2000a; MNFR 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*, 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.

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 listed in O. Reg. 230/08. 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 Lanark

The Site is designated as “Rural Area” in the County of Lanark Sustainable Communities Official Plan (SCOP). Lands to the north are identified as “Licensed Aggregate Extraction Area”, lands to the south are identified as significant woodland, and the remainder of the Study Area is identified as “Rural Area” (Schedule A). According to the SCOP, the County’s objectives for the Rural Area are:

- To ensure that residential and non-residential development is consistent with rural service levels;
- To maintain the distinct character of rural, waterfront and settlement areas; and,
- To ensure that development is compatible with natural heritage features and natural resource uses.

The SCOP states that: “The establishment of new [mineral extraction] related activities shall be…subject to local Official Plan policies and local Zoning By-law regulations”.

2.7 Township of Lanark Highlands

The Site is designated as “Rural Communities” in the Township of Lanark Highlands OP (TLH 2016; Schedule A), with three areas extending south from Highland Line identified as “Mineral Aggregate Reserve” (Schedule B).

According to the OP, permitted uses and activities within the Rural Communities designation will relate to the management or use of resources, resource-based recreational activities, limited residential development and other land uses, with Section 3.2.3 of the OP listing various non-residential land uses permitted in the Rural Communities. Aggregate extraction, with the exception of wayside pits and quarries, is not permitted. Establishment of mineral aggregate operations on lands with this designation will require an amendment to the OP.

The Mineral Aggregate Reserve designation identifies potential pit and quarry resources. These areas are to be protected from development that would prelude eventual resource use, unless that land use serves a greater long-term public interest. Establishment of mineral aggregate operations on lands with this designation will require an amendment to the OP.

Within the Study Area, areas on all-sides of the Site are identified as “Rural Communities” with areas of “Mineral Aggregate Reserve”. An area of “Organic Soils” is also identified north of Highland Line.

2.8 Mississippi Valley Conservation Authority (MVCA)

The Study Area is located within the jurisdiction of the MVCA (MVCA 2022), but this is not applicable to ARA applications, as ARA licenses do not require permits from conservation authorities.

3.0 PROPOSED DEVELOPMENT AND REHABILITATION

Based on the nature of the subsurface materials, Cavanagh has advised that the approximate pit base elevation will be 176 m above sea level (asl), which is equivalent to a depth of extraction of 8 to 40 m. Only unconsolidated materials (sand, gravel, etc.) will be removed from the Site. Any bedrock encountered on the Site will remain in place. It is understood from Cavanagh that extraction operations below the groundwater table will not involve dewatering of the excavation.

The final rehabilitation plan includes permanent ponds located within the proposed limit of extraction areas. Based on the groundwater level data collected at the Site, the predicted elevation of the permanent pond will be approximately 186 masl based on the lowest elevation of the ground surface on the perimeter of the proposed extraction area (near Barber’s Lake). The slopes of the final excavation will generally be 3:1 and areas above the water level will be seeded with non-invasive grasses and forbs. In some areas, 5:1 slopes will be implemented to support shallow littoral zones to increase habitat diversity. In these areas, emergent marsh vegetation will be planted in shallow water extending approximately 5 m from shore, and habitat features such as boulders, root wads, basking logs and nesting platforms will be installed. Nodal plantings of edge, submergent and emergent species such as red-osier dogwood (*Cornus stolonifera*), slender willow (*Salix petiolaris*), water plantain (*Alisma* spp.), lake sedge (*Carex lacustrix*), swamp milkweed (*Asclepias incarnata*), softstem bulrush (*Schoenoplectus tabernaemontani*) and common cattail (*Typha latifolia*) will also be incorporated in selected areas around the resulting ponds.

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 2022a)
- Environment and Climate Change Canada's (ECCC) SAR Public Registry (ECCC 2022) including COSEWIC status reports, assessments, and recovery strategies
- SAR in Ontario List (O. Reg. 230/08) (MNRF 2022b) including COSSARO species assessment reports
- DFO Aquatic Species at Risk Maps (DFO 2022)
- 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 2022)
- Bat Conservation International (BCI) range maps (BCI 2022)
- Ontario Butterfly Atlas (Jones et al. 2022)
- eBird species maps (eBird 2022)
- Vascular Plants at Risk (Leslie 2018)
- MNRF Land Information Ontario Aquatic Resources Area Layer (MNRF 2022c)
- Information contained in natural heritage related map layers from Land Information Ontario (LIO; 2022) and the Ontario Land Cover Compilation (MNRF 2022d)
- 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 (km) of the Site. A formal information request was also submitted to the MNRF and Ministry of the Environment, Conservation and Parks (MECP) in September 2020. A response was received from the MNRF and MECP in October 2020 (Appendix A), and the information provided was considered 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 on the Site and in the 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, 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 2020

Year	Date	Type of Field Survey
2020	April 24	Nocturnal Amphibian Survey, Turtle Survey, Bat Habitat Survey, VES*
	May 6	Turtle Survey, VES
	May 13	Turtle Survey, Plant Community Survey, Aquatic Survey, VES
	May 30	Nocturnal Amphibian Survey, Turtle Survey, Eastern Whip-poor-will Survey, VES
	June 1	Breeding Bird Survey, Turtle Survey, VES
	June 8	Eastern Whip-poor-will Survey, VES
	June 22	Breeding Bird Survey, Plant Community Survey, VES
	June 30	Nocturnal Amphibian Survey, Eastern Whip-poor-will Survey, VES
	July 1	Breeding Bird Survey, Plant Community Survey, VES
	August 31	Plant Community Survey, Aquatic Survey, VES

* VES – visual encounter survey

4.4 Plant Community Assessment and Botanical Surveys

4.4.1 Ecological Land Classification

Three plant community surveys were conducted between May and July. During these surveys, the Site and visible portions of the Study Area were assessed using Ecological Land Classification (ELC) standard protocols (Lee et al. 1998) to map the plant communities. General notes on near-surface soil characteristics were collected, as per the methodologies of ELC.

In addition to the ELC and plant community surveys, habitat structure and features specific to the habitat requirements of the SAR identified in the desktop assessment on the Site were noted.

4.4.2 Botanical Inventory

A botanical inventory was completed concurrent with the plant community surveys, 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. Locations of any plant SAR encountered were mapped using a hand-held GPS. Incidental information on plant species was also collected during all field surveys.

4.5 Wildlife and Wildlife Habitat Surveys

4.5.1 Herpetile Surveys

To document use of the wetlands on-Site and in the Study Area by breeding amphibians, three rounds of anuran point-counts were conducted. Surveys followed standardized Marsh Monitoring Program (MMP) protocols (BSC 1995) and included evening call-count surveys, as well as visual encounter surveys (VES), in areas where access was permitted.

Following the Occurrence Survey Protocol for Blanding's Turtle in Ontario (MNRF 2015b), five rounds of VES surveys for turtles were completed when air temperatures reached at least 10°C. These protocols are appropriate for searching for a range of turtle species, since most turtle species that have potential to occur on the Site or in the Study Area have similar ecologies. In addition, during all crepuscular and nocturnal bird surveys noted below, the Site was searched for nesting turtles or evidence of recent nesting.

During all field surveys, VES for herpetiles on the Site were conducted following recommended MNRF protocols (MNRF 2015b; MNRF 2013; McDiarmid 2012). This included snake surveys (scanning with binoculars for basking snakes) during all turtle surveys.

4.5.2 Breeding Bird Surveys

Diurnal breeding bird point counts were completed on the Site and in portions of the Study Area 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 were timed to encompass the period of maximum bird song. During all surveys that overlapped the breeding bird season (late May to early July), any birds heard or seen were noted.

Three grassland bird surveys were completed in the open habitats at the Site within the dates of May 21 to July 7, each separated by at least one week. Two of these surveys were completed concurrently with the diurnal breeding bird surveys, with one additional survey. The surveys followed the guidance provided by the document draft Survey Methodology Under the *Endangered Species Act*, 2007: *Dolichonyx Oryzixorous* (Bobolink) (MNRF 2011a). These surveys were completed using a combination of point count surveys and walking transects. The plots were spatially distributed throughout the open habitat on the Site and each plot centre was separated by a

distance of 250 m. When walking between plots the observer watched for cues from birds (e.g., protective behavior, scold calls, flushing) to identify potential nest locations. The surveys began as early as sunrise and ended no later than four hours past sunrise. Each survey location consisted of a 50 m radius circular-plot; with an additional 50 m radius buffer (i.e., a total of 100 m radius will be surveyed). Prior to the start of the survey at each plot, the observer waited two minutes to allow the birds to habituate to their presence. The surveys lasted for a 10-minute period, and all birds heard or seen in the survey area were recorded.

Eastern whip-poor-will (*Caprimulgus vociferus*) is known to occur in the vicinity of the Site and based on a review of aerial imagery, a portion of the Site may provide suitable habitat for this species, in combination with larger off-site habitats. Three crepuscular/nocturnal breeding bird surveys were completed on the Site. These surveys are point counts conducted during twilight or after dark and focused on species such as eastern whip-poor-will and common nighthawk (*Chordeiles minor*) following current draft MNRF methodology (MNRF 2014a).

4.5.3 Mammal Surveys

4.5.3.1 Bat Surveys

Bat surveys were conducted on the Site and included a habitat assessment and the use of acoustic bat detectors (Wildlife Acoustics SM3BAT+®). Concurrent with day-time surveys in April and May, a survey for suitable roost trees was performed, and included searching for trees with suitable cavities, cracks, peeling bark, presence of squirrel nests or dead, retained leaf clusters. Trees that were deemed to provide potential suitable maternity roosting habitat were inspected for any visual signs of bats (e.g., guano).

Three bat detectors were be deployed in June. Two of the detectors (stations 01 and 02) were programmed to record bat calls for at least 10 consecutive nights, as per MNRF recommended protocols (MNRF 2011b). The third detector (station 03) was disabled by wildlife shortly after being deployed. Each station was located to provide coverage of the Site and target areas where bats would most likely be roosting, commuting or feeding. The U1 microphones were left open with no horn or windscreen for maximum recording capability and 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 (Sonobat 2019). To identify calls to the species level, SonoBat measures numerous variables of call sequences (e.g., maximum frequency, minimum frequency, duration, and call slope; Table 1). SonoBat regional classifiers are based on the most robust, species-confirmed full-spectrum reference library available and integrates quantitative machine learning with algorithms that incorporate more than two decades of expert acoustic classification (SonoBat 2018). Manual call analysis of a portion of the calls was performed to determine at what threshold the software's species attributions become unreliable. Manual call analysis was also performed to test attribution of call sequences to the non-bat category (i.e., birds, rodents or static discharge). The same call analysis criteria used by SonoBat 4.4.5 was applied during manual analysis in addition to visual comparison to reference files. Call analysis software may give false positive identifications or false negative non-identifications and the likelihood of these erroneous identifications is related to the presence of various factors, including echoes, multiple bats, naturally overlapping call characteristics and poor recording quality. 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 (MNRF 2013; McDiarmid 2012; Bookhout 1994). 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 mammals 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., scats, hair, tree scrapes, etc.) were identified to a species, if possible, and recorded.

4.5.5 Fish and Fish Habitat

Golder conducted a fisheries habitat assessment to characterize aquatic features and potential fish habitat on the Site. Habitat features that were documented include:

- channel unit type (riffle, run, pool, flat, etc.)
- location of potential obstacles and barriers to fish passage
- representative bankfull widths, wetted widths and water depths
- evidence of groundwater seeps
- dominant substrate type
- in-stream cover, overhead cover
- aquatic macrophyte growth
- riparian cover and surrounding land use

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 Natural Heritage Reference Manual (NHRM) (MNRF 2010), Significant Wildlife Habitat Technical Guide (SWHTG) (MNRF 2000) and the Significant Wildlife Habitat Ecoregion Criterion Schedules (SWHECS) (MNRF 2015a).

An assessment was then conducted to determine whether the project would negatively impact surrounding significant natural features or SAR. Preventative, mitigative and remedial measures were considered in assessing the net effects of the proposed project 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

A photographic inventory of the Site is provided in Appendix B.

5.1 Ecosystem Setting and Regional Context

The Study Area is located in Ecoregion 5E (Georgian Bay Ecoregion), within the Ontario Shield Ecozone. This Ecoregion covers approximately 7.5% of the province (Crins et al. 2009) and is situated at the southern edge of the Precambrian shield. The soils in this Ecoregion are dominated by Humo-ferric Podzols, with acidic bedrock, Mesisols and Melanic Brunisols making up the balance. Forest is the dominant land cover (approximately 78.5%), with water and pasture lands comprising approximately 13% (Crins et al. 2009).

The Study Area is located in the Algonquin Highlands physiographic region, with the eastern half of the Site identified as a kame moraine and the western half identified as shallow till and rock ridges (Chapman and Putnam 1984). Due to the soil conditions, little of this region is actively farmed.

The Study Area is located within the Mississippi Valley River watershed, specifically the Central Mississippi subwatershed. This subwatershed is characterized by 76.7% forest cover, 14.5% wetland cover and has been graded ‘Excellent’ for surface water quality (MVCA 2018).

5.2 Hydrology and Hydrogeology

Six groundwater monitoring wells were installed at various locations around the Site. The pre-development groundwater elevations, which represent reference groundwater elevation conditions in the vicinity of the Site, ranged from a low of 182.4 m asl to a high of 195.4 m asl. Groundwater depths range from 1.5 to 4.6 m below ground surface (bgs) across the Site. Groundwater elevations in all monitoring wells show seasonal variations, with the highest elevations observed in late spring/early summer, and the lowest generally observed during summer months (July and August).

Based on groundwater elevation data collected during the pre-development period, the general groundwater flow direction in the vicinity of the Site is influenced by the topography of the Site and seasonal water table fluctuations. Groundwater generally flows from southwest to east across the Site, and toward the topographic low near Barber’s Lake.

The Site is split into three surface water catchments separated by a roadway (Anderson Lane). The total Site area is approximately 50.6 ha. Long Sault Creek (located to the south of the Site) is a tributary of Clyde River. Under pre-development conditions, runoff from approximately 46% of the Site flows north to a ditch along Highland Line Road (23.1 ha) and approximately 30% of the Site flows southeast into Barber’s Lake (15.3 ha). A third, smaller portion comprising approximately 24% of the Site (12.2 ha) flows southwest into the unevaluated wetland eventually discharging into Long Sault Creek.

5.3 Surface Water Resources

Surface water features on the Site include a single small intermittent watercourse that flows to Barber’s Lake and unevaluated wetlands, which lies outside of the proposed extraction area. The watercourse on the Site originates from two seepage areas (Figure 1). There are seeps and low-moist areas throughout some of the forests on the Site, including a small wetland inclusion/pond in the mixed forest (ELC Code: FOM2-2; Figure 1). Barber’s Lake is not on the Site, but it is immediately adjacent and within the Study Area.

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, including yellow birch (*Betula alleghaniensis*), white ash (*Fraxinus americana*), green ash (*Fraxinus pennsylvanica*), eastern hemlock (*Tsuga canadensis*), white pine (*Pinus strobus*) and balsam fir (*Abies balsamea*), sugar maple (*Acer saccharum*) and American beech (*Fagus grandifolia*) in combination with basswood (*Tilia americana*), red maple (*Acer rubrum*), red oak (*Quercus rubra*), white oak (*Quercus alba*), and bur oak (*Quercus macrocarpa*), bitternut hickory (*Carya cordiformis*), butternut (*Juglans cinerea*), and silver maple (*Acer saccharinum*) (Rowe 1972).

5.4.2 Ecological Land Classification

Overall, the Site consists of mixed, deciduous forest, and coniferous forest, as well as unevaluated wetlands, agricultural fields, open woodland, and thicket. Much of the forests have undergone intensive selective logging in recent years. The Study Area includes the Site, plus additional forests, fields, wetlands, and a portion of Barber's Lake.

During the field surveys conducted on Site, eight upland plant communities and four wetland communities were identified based on the ELC system (Lee et al. 1998). No 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		
CUM1a Agricultural Field	This community includes several recently fallow agricultural fields on dry sandy soil across the entire Site. The fields were plowed in spring of 2020, but they were not planted. Plants were restricted to a few early successional meadow and weedy species such as lamb's-quarters (*Chenopodium album*), yellow foxtail (*Setaria pumila*), and red-root pigweed (*Amaranthus retroflexus).*	N/A
CUM1b Mixed Meadow	This community is a small meadow on shallow loamy soil near the southern corner of the Site. It appears to be a remnant disturbed area and is dominated by grasses and forbs such as meadow fescue (*Schedonorus pratensis*) and Canada goldenrod (*Solidago canadensis*); with shrubs and immature trees such as red raspberry (*Rubus idaeus*) and trembling aspen (*Populus tremuloides*), and slowly colonizing the outer edges. There is scattered household junk that has been dumped here in the past.	N/A
CUT1 Prickly Ash Deciduous Thicket	This community is a relatively small old-field thicket on shallow rocky soil, near the northeastern corner of the Site. It is covered in a very dense stand of prickly ash (*Zanthoxylum americanum*), as well as a few other species such as mountain blackberry (*Rubus allegheniensis*), and Canada bluegrass (*Poa compressa*).	N/A

Plant Community	Description	SRANK[a]
CUW1 Open Woodland	This community is two areas along the northern edge of the Site. One appears to be an old homestead area on sandy soil, and the other an old field on rocky/sandy soil. Both of these areas are a mosaic of mixed meadows, thickets, and patches of trees. There is a variety of species present such as Kentucky bluegrass (*Poa pratensis*), early goldenrod (*Solidago juncea),* hoary vervain (*Verbena stricta*), common juniper (*Juniperus communis*), black raspberry (*Rubus occidentalis*), and white elm (*Ulmus americana*). The homestead area includes tree species that may have been introduced historically such as black locust (*Robinia pseudoacacia*), and apple (*Malus sylvestris*). Snags and cavity trees are rare.	N/A
FOC4-1 Fresh to Moist White Cedar Coniferous Forest	This community is two sections of portion on sandy and sandy loamy soil, near the northwestern corner of the Site, and the southern edge of the Site. They are almost pure stands of eastern white cedar (*Thuja occidentalis*), with a closed canopy and very little understory or groundcover. There are a few other plants scattered here and there, such as white birch (*Betula papyrifera*), wild sarsaparilla (*Aralia nudicaulia*). and helleborine (*Epipactis helleborine*). Downed woody debris is rare, and snags and cavity trees are absent.	N/A
FOD5-4 Logged/regenerating Sugar Maple – Ironwood – Mixed Hardwood – Deciduous Forest	This community is two sections of the upland forest on the Site on rocky-silty loam. It has been heavily logged in recent years and is a mixture of disturbed areas, and immature trees. It was likely dominated by sugar maple (*Acer saccharum*), before logging, but now is dominated by ironwood (*Ostrya virginiana*), with some other species such as black cherry (*Prunus serotina*) and white ash (*Fraxinus americana*). Understory is seedling trees, as well as shrubs and forbs such as fly-honeysuckle (*Lonicera canadensis*), and hairy Solomon's seal (*Polygonatum pubescens*). Downed woody debris is abundant, and snags and canopy trees are rare.	N/A
FOM2-2 Logged/regenerating Dry to Fresh White Pine – Sugar Maple Mixed Forest	This community is a large portion of the upland forest on the Site, on rocky sandy loam. The deciduous component has been heavily logged in recent years and is a mixture of disturbed areas and immature trees. It is dominated in the canopy by white pine (*Pinus strobus*), ironwood, white birch (Betula papyrifera), eastern white cedar, and white ash. Sugar maple is primarily in the understory and ground cover. Other species in the understory and ground cover include shrubs, graminoids, and forbs such as partridgeberry (*Mitchella repens*), bottlebrush grass (*Elymus patula*), and wild sarsaparilla. Downed woody debris is abundant, and snags and cavity trees are rare. Within this community is a small wetland inclusion/pond. This pond had shallow water throughout most of the spring and summer, and was vegetated with emergent and floating plants such as cypress-like sedge (*Carex pseudocyperus*), green-fruited burreed (*Sparganium emersum)*, frogbit (*Hydrocharis morsus-ranae*), and duckweed (*Lemna minor*). There were a few trees and shrubs along the shallow edges such as red maple (*Acer rubrum*), and speckled alder (*Alnus incana*).	N/A
FOM5 Logged/regenerating Dry to Fresh White Birch – Poplar – Conifer - Mixed Forest	This community is very similar to the FOM 2-2 but with a higher component of white birch, trembling aspen, and white spruce (*Picea glauca*).	N/A

Plant Community	Description	SRANK[a]
WETLAND		
MAS1 Mixed Mineral Shallow Marsh	This community is a small wetland on a mix of mineral soil and organic substrate, at the northern corner of the Site. It is connected via culvert to a larger wetland north of Highland Line. It has a relative diverse plant community with graminoids, forbs, and shrubs such as purple loosestrife (*Lythrum salicaria),* Canada blue-joint (*Calamagrostis canadensis*), and speckled alder. This wetland had some channels of water during spring, although it appeared to have primarily dried up by late summer.	N/A
MAS3-1 Cattail Organic Shallow Marsh	This community is a band of shallow lacustrine marsh on organic substrate, along the edge of Barber's Lake. It is dominated by common cattail (*Typha latifolia*), with patches of sedges such as wire sedge (*Carex lasiocarpa*) closer to the open water of the lake. There also various other plants present including common bladderwort (*Utricularia vulgaris*), and marsh bedstraw (*Galium palustre*). Much of this wetland is flooded, with water levels being higher in early the spring.	N/A
MAS3-10 Forb Organic Shallow Marsh	This community is a wetland on organic substrate near the southern corner of the Site. It is contiguous off-site with a much larger wetland. It appears to have been a treed swamp in the past, but due to flooding many of the trees are dead, allowing a marsh community to thrive. Overall, it is dominated by forbs such as Joe-Pye weed (*Eutrochium maculatum*), with a smaller proportion of graminoids, shrubs, and trees such as rice cut-grass (*Leersia oryzoides*), willows (*Salix* spp.), and black ash (*Fraxinus nigra*). Some flooding occurs in early spring, but no notable channels or pools of water were identified on the portion of this wetland that is on the Site. Snags and downed woody debris are abundant.	N/A
SWC3-1 White Cedar Organic Coniferous Swamp	This community is two swamps on organic substrate, one of which is near Barber's Lake, and the other is a tiny portion of a swamp that is contiguous off-site at the southern edge of the Site. The canopy is closed to partially open and dominated by eastern white cedar with associates such as black ash. The ground cover and understory ranges from sparse to moderate with species such as swamp red currant (*Ribes triste*), sensitive fern (*Onaclea sensibilis*), sedges (*Carex* spp.), and naked mitrewort (*Mitella nuda).* Moss cover is abundant throughout. Snags and downed woody debris are occasional, cavity trees are rare. Signs of flooding and are not apparent, however there are several seepage areas, where pooling of water occurs.	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 2022). 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 2000a). 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 203 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, provincially rare, or regionally significant plant species were observed.

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

Seven herpetile species were identified in the Study Area. Five species of frogs were identified in the wetlands on the Site. This included full choruses of spring peepers (*Pseudacris crucifer*), and varying numbers of other species. A few midland painted turtles (*Chrysemys picta*) were observed basking in the inlet of Barber's Lake. A few individual eastern garter snakes were seen on the Site and one milksnake (*Lampropeltis triangulum*) was observed in a forest opening near the southern edge of the Site. No SAR herpetiles were identified on the Site.

5.5.2 Birds

A total of 63 bird species were identified in the Study Area. This includes a mix of meadow, wetland and forest species such as savannah sparrow (*Passerculus sandwichensis*), Virginia rail (*Rallus limicola*), and red-eyed vireo (*Vireo olivaceus*). A single eastern wood-pewee (*Contopus virens*) was observed singing on territory in a forest near the southern edge of the Site. Eastern wood-pewee is designated as special concern under the SARA and the ESA. Barn swallow (*Hirundo rustica*) were observed foraging over the Site, but no suitable nesting habitat is present on the Site. Barn swallow is designated as threatened under the SARA and ESA. An eastern meadowlark (*Sturnella magna*) was heard signing off-site, but within the Study Area, ~200m to the north of the Site. No eastern meadowlark was observed on the Site itself. Eastern meadowlark is designated as threatened under the SARA and the ESA. The SAR birds are discussed further in Section 6.1 and 6.7.3.

5.5.3 Mammals

Seventeen species of mammals were identified on the Site. This included species that are common in the region such as white-tailed deer (*Odocoileus virginianus*) and coyote (*Canis latrans*). With the exception of the bat species discussed below, no SAR or provincially rare mammals were identified on the Site.

5.5.3.1 Bats

Although three acoustic detectors were set to record on the Site, one of the detectors was disabled by wildlife and no data were collected from this station. Six to seven species of bats were recorded at stations 01 and 02, most commonly big brown bat (*Eptesicus fuscus*), hoary bat (*Lasiurus cinereus*) and silver-haired bat (*Lasionycteris noctivagans*), followed by fewer recordings of eastern red bat (*Lasiurus borealis*), little brown myotis (*Myotis lucifugus*), northern myotis (*Myotis septentrionalis*) and tri-coloured bat (*Perimyotis subflavus*).

Of the 3842 total bat passes recorded at station 01, there were five SAR or potential SAR bat passes at this station (0.1% of recorded calls), including: three unknown myotis species; one little brown myotis; and one tri-coloured bat. An additional eight unknown high-frequency calls were recorded at this station, which could be red bat (non-SAR) or one of the SAR bats.

Of the 3000 total bat passes recorded at station 02, there were 87 SAR or potential SAR bat passes at this station (4.2% or recorded calls), including: six unknown myotis species; 33 little brown myotis, one northern myotis, and 47 tri-coloured bats. An additional 45 unknown high-frequency calls were recorded at this station, which could be red bat (non-SAR) or one of the SAR bats.

The SAR bats recorded on the Site are discussed further in Section 6.1.

5.5.4 Bumblebees, Dragonflies, and Butterflies

A total of 16 insect species were identified during the field surveys. This included common species such as mourning cloak (*Nymphalis antiopa*) and widow skimmer (*Libellula luctuosa*). No unusual concentrations were noted. No SAR or provincially rare insect species were identified on the Site.

5.6 Aquatic Habitat and Fish

There is a small intermittent watercourse in the northeastern portion of the Site (Figure 1). This watercourse appears to originate from two seepage/spring areas then flows through a cedar swamp into a small inlet of Barber's Lake. There are several locations where this watercourse flows underground, resurfacing a metre or two downstream. During the field surveys, it was noted to have a wetted width of 0.5 to 1 m, and a depth of 2-5 centimetres (cm) during periods of high water. Substrate was organic muck, and there was woody detritus throughout. There was no instream vegetation, and riparian vegetation included primarily trees, with occasional patches of forbs and grasses, where the forest canopy is open. Although no fish were observed, given the barriers to movement (underground flow), if fish do occur, it is likely only in the lower reach, near Barber's Lake.

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. The following sources were used during the assessment of features:

- Natural Heritage Reference Manual (MNRF 2010)
- Significant Wildlife Habitat Technical Guide (MNRF 2000a)
- Significant Wildlife Habitat Criteria Schedules for Ecoregions 5E (MNRF 2015a)

Any significant natural heritage features or SAR that were anticipated to be impacted by the proposed project were carried forward to the impact assessment. An assessment was then conducted to determine how the proposed project would negatively impact significant natural features or SAR. Preventative, mitigative and remedial measures were considered in assessing the net effects of the proposed project 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 2014a).

6.1 Habitat of Endangered or Threatened Species

Based on the background review and field surveys, five endangered or threatened species and/or their defined habitat were identified on the Site and/or in the Study Area (Appendix E). This included barn swallow, eastern meadowlark, little brown myotis, northern myotis, and tri-coloured bat.

Barn Swallow

Barn swallow is designated as threatened under the ESA. Individual barn swallows were observed flying over the Site during several field surveys, but no structures suitable for nesting, nor any evidence of nesting, was present on the Site. Structures suitable for nesting may be present in the Study Area but will not be affected by the proposed project. Based on this analysis, Golder's opinion is that no permit under the ESA is required for this species. No further analysis of this species is warranted.

Eastern Meadowlark

Eastern meadowlark is designated as threatened under the ESA. An eastern meadowlark was heard singing in the Study Area ~200 m to the north of the Site. No suitable nesting habitat for this species is present on the Site. Suitable nesting habitat for this species is present in open meadows within the Study Area but will not be affected by the proposed project. Based on this analysis, Golder's opinion is that no permit under the ESA is required for this species. No further analysis of this species is warranted.

Little Brown Myotis, Northern Myotis and Tri-coloured Bat

Little brown myotis, northern myotis and tri-coloured bat are all designated as endangered under the ESA. All three 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 and northern myotis shows preference for roosting in hollow trees and under peeling bark (ECCC 2019); whereas tri-coloured bat roosts primarily in clumps of dead leaves on trees, squirrel nests, or clusters of hanging moss (ECCC 2019). These species may use caves or abandoned mines for hibernaculum, but high humidity and stable above freezing temperatures are required (ECCC 2019)

Time of detection for SAR and potential SAR bat passes was charted (for all nights combined). Detections within the first hour of sunset can indicate bats emerging from roosts. At station 01 there were few overall SAR and potential SAR bat passes detected and no detections within the first hour after sunset. Based on the level of SAR bat activity and the time of detections at station 01, it is unlikely that there is a maternity roost for any SAR bats in the vicinity of the station.

At station 02 there was consistent SAR and potential SAR bat activity throughout the nighttime hours (all nights combined) including within the first hour after sunset. At this station, the highest peak of activity of tri-colored bat was between 4 and 5 am, when bats are expected to be returning to roost. A smaller peak of tri-colored bat activity was observed between sunset and 10 pm when bats are expected to be leaving roosts. The combined little brown myotis and unknown myotis activity was lower overall than the tri-colored bat activity and was not concentrated in peaks around dusk and dawn. There were no little brown myotis or unknown myotis bat passes recorded at this station between sunset and 10 pm. Based on the level of tri-colored bat activity and the times of detection, it is possible that there is a tri-colored bat maternity roost in the vicinity of station 02. Within the immediate vicinity of station 02, a large squirrel nest was observed in the top of a white spruce. This nest was about 40 cm in diameter and comprised of a dense bunch of twigs and leaves. No other potential maternity roost features were identified in the vicinity of station 02, and it is possible that this represents a tri-colored bat roost.

At present, there is no habitat regulation under the ESA for this species, and it instead receives general habitat protection under the ESA. According to the provincial recovery strategy for this species (MECP 2019), it is recommended that maternity habitat be identified based on the contiguous ecosite where all known observations of roosting adult females and juveniles between May 15 and July 31 have been made, unless the habitat is no longer suitable or bats are no longer roosting at the Site. It is further recommended that foraging areas (as defined in MECP 2019) within 920 m of the boundary of a maternity site for tri-colored bat be identified as supporting foraging habitat, with the combined maternity roosting and foraging habitat not exceeding 265 ha in total. The contiguous ecosite associated with the potential roost has been mapped on Figure 3. In addition, foraging habitat is identified as wetlands and waterbodies, moist riparian forests, meadows, savannahs and thickets within 920 m of the contiguous ecosite (Figure 3). Active agriculture does not constitute suitable foraging habitat.

The ecosite contiguous with the potential roost is included in the license area but is identified as a Natural Environment Exclusion Area that is excluded from the extraction area (Figure 2). This area will not be extracted. A small portion of foraging habitat in the eastern portion of the Site lies within the extraction area.

Habitat is not a limiting factor for this species, as it can roost in any forested habitat where foliage, clumps of leaves, squirrel nests or exfoliating bark may be found; and such habitats, as well as extensive foraging habitats, are abundant in the local landscape surrounding the Site. Further, the roosting habitat identified on the Site (squirrel nest) is a transient feature and may not persist for more than a few years. Review of aerial imagery for lands surrounding the Site indicates that there are extensive forested areas that would provide suitable roosting habitat; and there are extensive wetlands and meadow habitats that would provide suitable foraging habitat. Based on this, it is Golder's opinion that no permitting under the ESA is required for this species to allow for the proposed removal of a small area of foraging habitat (Figure 3). No extraction is proposed in the roosting habitat (Figure 2). No further analysis of this species is warranted.

There is suitable maternity roost habitat for these species off-Site within the Study Area; however, no impacts to these habitats are anticipated to result from the proposed project. No hibernaculum for SAR bats are present on the Site or in the Study Area.

Blanding's Turtle

Blanding's turtle (*Emydoidea blandingii*) is listed as threatened under the ESA, and there are known occurrences within 2 km of the Site. Targeted surveys did not identify use of the Site by this species. According to the General Habitat Description for this species (MECP 2021), all wetlands within 500 m of each other within a 2 km radius of the observation record, plus the area 30 m around each of the wetlands, are to be considered Category 2 habitat. All wetlands on the Site, including a 30 m buffer, are excluded from the extraction area and no significant impacts to these features are anticipated.

The area between 30 m and 250 m from Category 2 habitat is considered Category 3 habitat. Based on this, Category 3 habitat overlaps the majority of the Site. Category 3 habitat has the highest tolerance to alteration (MECP 2021). Although the proposed extraction will represent a temporary loss of Category 3 habitat on the Site, after rehabilitation, the Site will again be suitable to perform this function. The Site will be rehabilitated as a lake with littoral zones and therefore may serve a new, vital function for this species beyond what is currently present on the Site (i.e., Category 1 over-wintering).

It is Golder's opinion that no permit under the ESA is required for this species, provided the buffers described are employed and mitigation for this species as presented in Section 7.1 is implemented. No further analysis is warranted.

Black Ash

Black ash was observed on the Site within the wetlands. This species was added to O.Reg. 230/08 in January 2022 as endangered, however; the province has implemented a temporary suspension of protections for black ash afforded under the ESA for a period of two years from January 2022. After that time, the intent is that O. Reg. 242/08 will be amended to include exemptions that would allow proponents to carry out eligible activities without having to obtain an ESA permit or agreement. The habitats for this species will not be directly impacted by the proposed extraction, and a 30 m buffer has been applied to them. No permit under the ESA is required for this species. No further analysis is warranted.

Endangered and Threatened Species off-Site in the Study Area

In addition to the species discussed above, there is potential for seven additional endangered or threatened species to be present in the Study Area (Appendix E), including: bobolink (*Dolichonyx oryzivorus*), chimney swift (*Chaetura pelagica*), least bittern (*Ixobrychus exilis*), pale-bellied frost lichen (*Physconia subpallida*), American ginseng (*Panax quinquefolius*), and butternut (*Juglans cinerea*). These species and their habitats are not expected to be impacted by the proposed extraction.

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 2014c).

There are no provincially significant wetlands (PSW) on the Site or in the Study Area. Unevaluated wetlands are mapped on the Site and in the Study Area (Figure 1). These wetlands will be buffered from extraction by a 30 m setback (Figure 2), so there will be no physical intrusion into the wetlands.

The water balance assessment completed as part of the hydrological assessment for the proposed pit suggests that overall, there will be a decrease in water surplus of 10% for the Site under operational conditions. Rehabilitated conditions are expected to have a similar decrease in surplus compared to existing conditions. Runoff volumes to Barber's Lake and Long Sault Creek are expected to decline; however, baseflow to these waterbodies is expected to slightly increase as a result of the increase in infiltration at the pit. This change from site runoff to infiltration is expected to decrease peak flow contributed from the Site and slightly increase a steadier base flow from the Site.

Overall, the surface water impacts associated with the proposed pit are not considered to be significant. Changes in contributing catchment to the locations discussed are on the order of 2%, while infiltration is still estimated to report to the adjacent waterbodies as baseflow.

There are no coastal wetlands on the Site or in the Study Area.

No further analysis of wetlands is warranted.

6.3 Fish Habitat

No fish habitat was identified on the Site, however, within the Study Area, Barber's Lake provides fish habitat.

As discussed in Section 6.2, the water balance assessment completed as part of the hydrological assessment for the proposed pit suggests that overall, surplus within the Site will decrease by 10% as a result of aggregate extraction under operational and rehabilitated conditions. Under operational and rehabilitation conditions, runoff volumes to Barber's Lake are expected to decrease as a result of catchment loss, however, an outlet to Barber's Lake will be placed at the east edge of the proposed pit (at an elevation of 186 masl) to offset the loss in runoff. Under operational and rehabilitation conditions, runoff volumes to Long Sault Creek are also expected to decrease as a result of catchment loss, however, the initial contributing Site catchment was 24% of the total Site area and less than 2% of its total catchment (850 ha) before its confluence with Barber's Lake. Although the pit area will no longer be directing a substantial amount of runoff to either waterbody, the water surplus collected within the pit will also infiltrate and continue downgradient to these two waterbodies as shallow groundwater flow. This change from site runoff to infiltration is expected to decrease peak flow contributed from the Site and slightly increase a steadier base flow from the Site.

Overall, the surface water impacts associated with the proposed pit are not considered significant. Changes in contributing catchment to the locations discussed are on the order of 2%, while infiltration is still estimated to report to the adjacent waterbodies as baseflow. Based on this, no substantial changes to existing fish habitat are expected as a result of this decrease (i.e., lake morphology and water levels are anticipated to remain the same). No further analysis is warranted.

6.4 Significant Woodlands

Woodlands can vary in their level of significance at the local, regional and provincial levels. According to the PPS, there are no provincially significant woodlands in ecoregion 5E.

The Township of Lanark Highlands state in their OP (TLH 2016) that: “Council shall designate areas where development must be controlled on Schedule B. These include Areas of Natural or Scientific Interest (ANSI’s), fish habitat, significant woodlands and riparian zones.” No regionally or locally significant woodlands are mapped on the Site or in the Study Area on Schedule B of the OP.

Further analysis is not warranted.

6.5 Significant Valleylands

According to the PPS, there are no provincially significant valleylands in ecoregion 5E.

No locally or regionally significant valleylands are mapped on the Site or in the Study Area in the Township of Lanark Highlands Official Plan (TLH 2010; Schedule B) or in the Lanark County SCOP (McIntosh Perry 2017; Schedule A). Further analysis is not warranted.

6.6 Significant Areas of Natural or Scientific Interest (ANSIs)

Significant 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

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 are evaluated based on the criteria outlined in the SWHECS for ecoregion 5E (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 SWHECS for ecoregion 5E 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)
- Deer yarding areas

No areas suitable for supporting waterfowl during migration times (stopover and staging) were identified 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, with a combined habitat size of >20 ha. There are no suitable habitats on the Site or in the Study Area for raptor winter feeding and roosting.

No potential turtle over-wintering habitat was observed on the Site, as no standing water of suitable depth or hydroperiod was present. Barber's Lake and other wetlands in the Study Area may provide this habitat type. Overall, the surface water impacts associated with the proposed pit are not significant. Changes in contributing catchment to the locations discussed are on the order of 2%, while infiltration is still estimated to report to the adjacent waterbodies as baseflow. Based on this, no impacts to potential turtle over-wintering habitat are expected.

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. There are no structures on the Site and no natural hibernacula, such as areas of broken or fissured bedrock were noted. Suitable habitat of this type may be present in the Study Area, however; the proposed extraction is not expected to impact this habitat type, if present.

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 bat maternity roost habitat; however, this habitat type may be present within the mature forests within the Study Area (off-Site). The proposed extraction is not expected to impact this habitat type, if present.

There are no banks or cliffs suitable for colonial bird nesting habitat on the Site or in the Study Area.

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. Suitable habitat of this type may be present in the Study Area, however; the proposed extraction is not expected to impact this habitat type, if present.

Deer management is an MNRF responsibility, and deer yarding areas considered significant are mapped by the MNRF. There are no deer yarding areas identified on the Site or in the Study Area. A deer wintering area is present outside the Study Area (Figure 2).

Based on this assessment, those seasonal concentration areas that may be present will not be impacted by the proposed extraction, and no further analysis is warranted.

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. None of the plant communities identified on the Site or in the Study Area are ranked S1 to S3 by the NHIC.

In addition to those communities considered rare by the NHIC, old-growth forests are considered rare vegetation communities. Rare forest types identified for this ecoregion include red spruce forest and white oak forest. No old growth forests, red spruce or white oak forests were identified on the Site. These forest types may be present in the Study Area, however; the proposed extraction is not expected to impact this habitat type, if present.

Further analysis of rare vegetation communities is not warranted.

Specialized Habitats for Wildlife

Specialized habitats for wildlife are microhabitats that provide a critical resource to some groups of wildlife. The SWHTG for ecoregion 5E 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 and lizard nesting areas
- Seeps and springs
- Aquatic feeding habitat
- Mineral licks
- Denning sites (for mink, otter, marten, fisher or eastern wolf)
- Amphibian breeding habitat (woodland)
- Amphibian breeding habitat (wetland)
- Mast producing areas

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.

Nesting habitat for woodland raptors were not identified on the Site as no raptor nests were observed during field surveys. Suitable habitat of this type may be present in the Study Area, however; the proposed extraction is not expected to impact this habitat type, if present.

The SWHECS indicates that exposed mineral soils in open sunny areas near water and away from roads must be present to support turtle nesting (nesting on the sides of municipal or provincial roads are not SWH). Skinks will nest under logs, in stumps or under loose rock in partially wooded areas. No suitable turtle nesting habitat was observed on the Site, and no evidence of turtle nesting was observed during field surveys. Suitable habitat of this type may be present in the Study Area, however; the proposed extraction is not expected to impact this habitat type, if present. The Site and Study Area is outside the range for skinks in Ontario.

The wetland area on the Site north of Barber's Lake extending down to the lakeshore contained numerous seeps. The seeps lie outside of the proposed extraction area. The small pond feature is also associated with groundwater seepage. The small pond feature will be removed during operations. Additional seeps or springs may be present in the Study Area. The outflow from the lake that will develop in the proposed pit during the operational period and throughout the rehabilitated period will discharge into the wetland area on the Site north of Barber's Lake.

The MNRF maps moose and deer aquatic feeding habitat, which typically consist of wetlands and isolated embayments in rivers or lakes with an abundance of submerged aquatic vegetation. Adjacent stands of lowland conifer or mixed woods provide cover. Mineral licks, wherever they occur, are considered significant, and the SWH includes surrounding habitats. No mapped aquatic feeding habitat is present on the Site or in the Study Area, and no mineral licks were observed during field surveys.

Denning sites for mink and otter typically occur in undisturbed, forested shorelines, but otter will also use beaver lodges, log jams or crevices in rock piles. Marten and fisher both require large tracts of coniferous or mixed forests of mature or old growth age classes. Eastern wolf similarly den in large forest tracts. Any active den of these species, plus a radius of surrounding habitat, is considered SWH. No dens of any of these species were observed on the Site. Although suitable habitat of this type may be present in the Study Area, the proposed extraction is not expected to impact this habitat type, if present.

To be considered woodland or wetland amphibian breeding habitat according to the SWHECS, wetlands must be at least 500m^2 in area and contain certain species richness and abundance. All wetlands on the Site meet the size criteria and are considered woodland breeding habitats according to the SWHECS. Wetlands on the Site and in the Study Area were surveyed for breeding amphibians, and it was determined that none of these features meet the criteria for significant amphibian breeding habitat (woodland). Although suitable habitat of this type may be present in the Study Area, the proposed extraction is not expected to impact this habitat type, if present.

Significant mast producing areas are identified as those forests >0.5 ha with >50% large diameter (>40 cm DBH) beech, basswood, black cherry, ironwood, mountain ash, pin cherry, butternut, hickory or oak species; or clearings containing >1.0 ha with >50% ground cover of berry or nut producing shrub species. The Site does not

provide this habitat type. Although suitable habitat of this type may be present in the Study Area, the proposed extraction is not expected to impact this habitat type, if present.

Based on this assessment, those specialized habitats for wildlife that may be present will not be impacted by the proposed extraction, and no further analysis is warranted.

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.

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.

One SOCC was assessed to have potential to occur on the Site (Appendix E): eastern wood-pewee. As noted, this species was observed in the southwest forested portion of the Site (Figure 2). Based on the observed minimal use of the Site by this species, and the extensive high-quality habitat off-Site in the landscape, it is Golder's opinion that the Site does not provide significant habitat for it. A total of ten SOCC were confirmed or identified as having moderate potential to be present in the Study Area (Appendix E). No impacts to the habitats of these species is anticipated to result from the proposed extraction, therefore, no further analysis is warranted.

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

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

There is no marsh habitat suitable for marsh breeding birds on the Site or in the Study Area. No open country or shrub/early successional breeding bird habitat meeting the size criteria is present at the Site, or containing the required species as listed in the SWHECS are present on the Site or in the Study Area.

Further analysis of habitat for species of conservation concern is not warranted.

6.7.4 Animal Movement Corridors

The SWHTG (MNRF 2000a) 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 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.
- Cervid movement corridors: to be identified when deer wintering habitat, moose aquatic feeding areas or mineral licks are present.
- Furbearer movement corridors: to be identified when denning sites for mink, otter, marten, fisher or eastern wolf are present.

None of these SWH were identified on the Site, therefore, no animal movement corridors are identified. No further analysis of animal movement corridors is warranted.

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 is provided in Section 8.1.

7.1 Mitigation

The significant features and functions on the Site will be avoided through implementation of setbacks from the extraction area and protection of the Natural Environment Exclusion Area, and indirect impacts relating to surface water and groundwater are unlikely to be significant. Measures to be employed to mitigate other potential impacts to the natural environment are discussed below.

To avoid direct or indirect impacts to wildlife, 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 prior to 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.

Fence and protect the area identified as maternity roost habitat for tri-coloured bat (Natural Environment Exclusion Area) to prevent intrusion into this area and avoid placing lighting in the vicinity of this area.

To mitigate the potential for turtles, especially Blanding's turtle, to be harmed on the Site during extraction, Golder recommends the following mitigation be undertaken:

- Encounter Protocol: The protocol will include information on how to identify Blanding's turtle, how to protect a nest, how to report sightings to the NHIC, and instructions on what to do in the event that a turtle or nest is found on-Site.
- All on-Site staff are to be familiar with and trained on the components of the Encounter Protocol described above.
- If Blanding's turtle is identified on the Site, all work shall stop and the species shall be protected from harm. MECP shall be notified immediately to seek guidance on ways to avoid impacts under the ESA (e.g., mitigation, conditional exemption) prior to resuming work.

An Awareness Package, SAR Encounter Protocol and SAR Training Program is to be prepared that lists the SAR that may be present on the Site or in the local landscape, and identifies what to do if one is observed on the Site. The Awareness Package will include:

- Information / training on identifying SAR;
- What to do if a SAR is observed (moving, injured, dead or nesting);
- How to protect a turtle or bird nest;
- Information on how to report a SAR sighting to the NHIC; and,
- instructions that if a SAR is found on the Site, all work must stop and the species shall be protected from harm. MECP shall be notified immediately to seek guidance on ways to avoid impacts under the ESA (e.g., mitigation, conditional exemption) prior to resuming work.

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 NER, no monitoring is required or recommended.

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, as well as other relevant municipal, provincial and federal 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 setbacks as shown on Figure 2.
- 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 prior to the clearing, and no active nests were observed.
- Fence and protect the area identified as maternity roost habitat for tri-coloured bat (Natural Environment Exclusion Area) to prevent intrusion into this area. Avoid placing lighting in the vicinity of this area.
- An Awareness Package, SAR Encounter Protocol and SAR Training Program is to be prepared that lists the SAR that may be present on the Site or in the local landscape and identifies what to do if one is observed on the Site.

8.1 Site Plan Notes

- Significant natural features confirmed on-Site: Habitat for endangered species (Blanding's turtle, tri-coloured bat and black ash); unevaluated wetlands; significant wildlife habitat (seeps).
- Significant natural features off-Site, with 120 m of the Site: Potential habitat for endangered and threatened species; unevaluated wetlands; fish habitat; potential significant wildlife habitat.

- No clearing of vegetation should take place within the core breeding bird season (April 1 – August 31) unless a nesting survey has been completed by a qualified biologist prior to the clearing, and no active nests were observed.
- Fence and protect the area identified as maternity roost habitat for tri-coloured bat (Natural Environment Exclusion Area) to prevent intrusion into this area. Avoid placing lighting in the vicinity of this area.
- An Awareness Package, SAR Encounter Protocol and SAR Training Program is to be prepared that lists the SAR that may be present on the Site or in the local landscape, and identifies what to do if one is observed on the Site. The Awareness Package will include:
    i) Information / training on identifying SAR;
    ii) What to do if a SAR is observed (moving, injured, dead or nesting);
    iii) How to protect a turtle or bird nest;
    iv) Information on how to report a SAR sighting to the NHIC; and,
    v) instructions that if a SAR is found on the Site, all work must stop and the species shall be protected from harm. MECP shall be notified immediately to seek guidance on ways to avoid impacts under the ESA (e.g., mitigation, conditional exemption) prior to resuming work.

9.0 LIMITATIONS AND USE OF REPORT

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

Golder Associates Ltd. 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.

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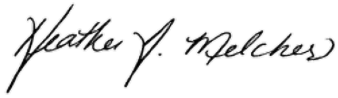
The findings and conclusions of this report are valid only as of the date of this report. If new information is discovered in future work, including excavations, borings, or other studies, Golder Associates Ltd. should be requested to re-evaluate the conclusions of this report, and to provide amendments 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. Curriculum vitae of the authors are provided in Appendix F.

Golder Associates Ltd.

Gwendolyn Weeks, H.B.Sc.Env
Lead Ecologist



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GAW/ HM/sg

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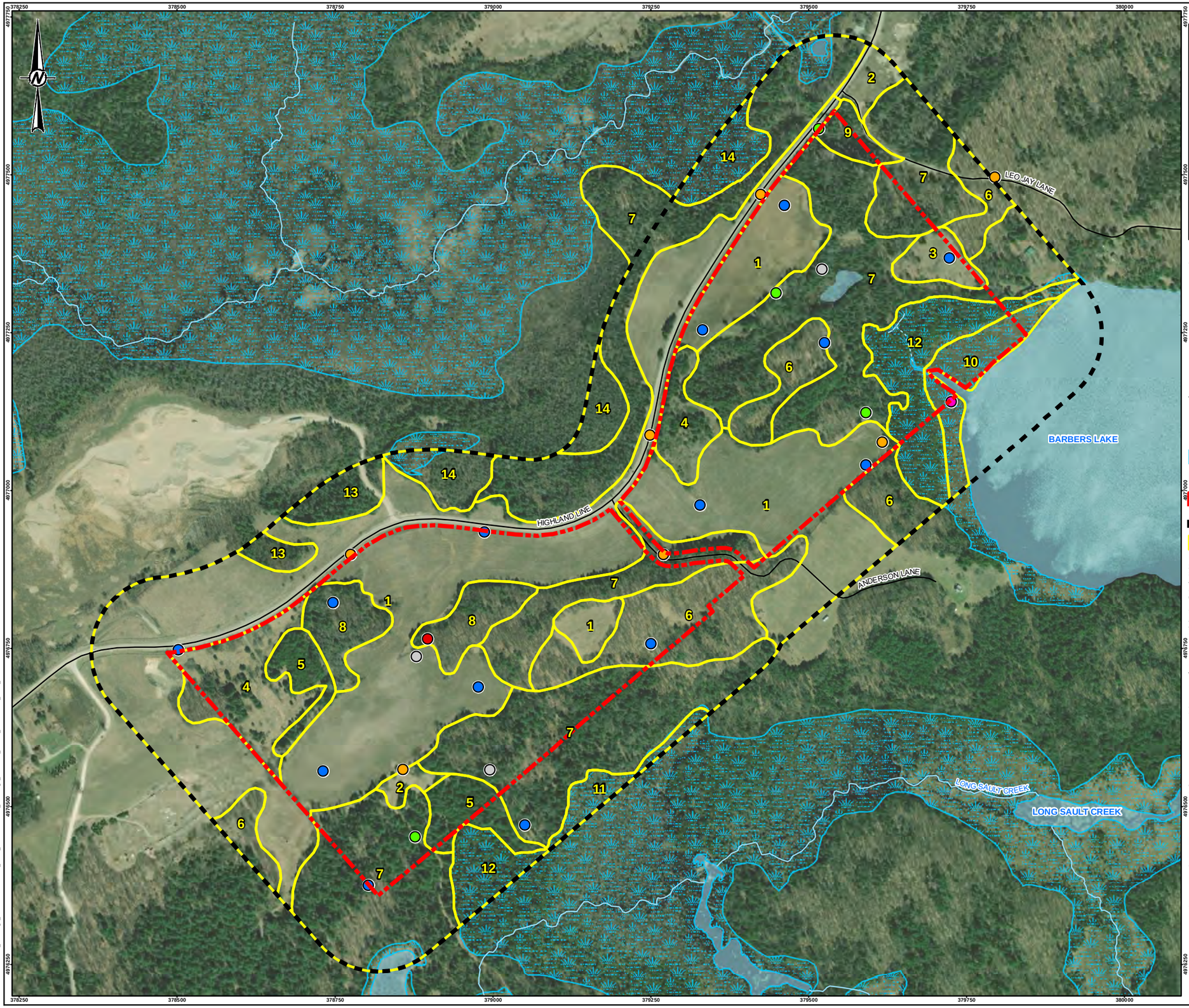

KEY MAP

SCALE 1:100,000

LEGEND

- POTENTIAL TRI-COLOURED BAT MATERNITY ROOST
- BREEDING BIRD SURVEY STATION
- MARSH MONITORING STATION
- BAT DETECTOR LOCATION
- EASTERN WHIP-POOR-WILL STATION
- NOCTURNAL AMPHIBIAN STATION
- ROADWAY
- INTERMITTENT STREAM
- PERMANENT WATERCOURSE
- WETLAND (UNEVALUATED)
- WATERBODY
- SITE
- STUDY AREA
- ECOLOGICAL LAND CLASSIFICATION

1. CUM1A: FALLOW AGRICULTURAL FIELD
2. CUM1B: MIXED MEADOW
3. CUT1: PRICKLY ASH DECIDUOUS THICKET
4. CUW1: OPEN WOODLAND
5. FOC4-1: FRESH TO MOIST WHITE CEDAR CONIFEROUS FOREST
6. FOD5-4: LOGGED/REGENERATING SUGAR MAPLE – IRONWOOD – MIXED HARDWOOD – DECIDUOUS FOREST
7. FOM2-2: LOGGED/REGENERATING DRY TO FRESH WHITE PINE – SUGAR MAPLE MIXED FOREST
8. FOM5: LOGGED/REGENERATING DRY TO FRESH WHITE BIRCH – POPLAR – CONIFER - MIXED FOREST
9. MAS1: MIXED MINERAL SHALLOW MARSH
10. MAS3-1: CATTAIL ORGANIC SHALLOW MARSH
11. MAS3-10: FORB ORGANIC SHALLOW MARSH
12. SWC3-1: WHITE CEDAR ORGANIC CONIFEROUS SWAMP
13. FOC: CONIFEROUS FOREST
14. FOC/SWC CONIFEROUS FOREST/SWAMP

REFERENCE(S)

1. LAND INFORMATION ONTARIO (LIO) DATA PRODUCED BY GOLDER ASSOCIATES LTD. UNDER LICENCE FROM ONTARIO MINISTRY OF NATURAL RESOURCES, © QUEENS PRINTER 2014
2. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: UTM ZONE 18, VERTICAL DATUM: CGVD28

0 60 120 240

1:6,000 METRES

CLIENT
THOMAS CAVANAGH CONSTRUCTION LIMITED

PROJECT
NATURAL ENVIRONMENT LEVEL 1/2 ASSESSMENT
HIGHLAND LINE PIT, LANARK, ONTARIO

TITLE
ECOLOGICAL LAND CLASSIFICATION AND SURVEY STATIONS

CONSULTANT
WSP GOLDER

YYYY-MM-DD	2019-09-18
DESIGNED	----
PREPARED	JEM
REVIEWED	GW
APPROVED	HM

PROJECT NO.	CONTROL	REV.	FIGURE
19126620	0001	0	1

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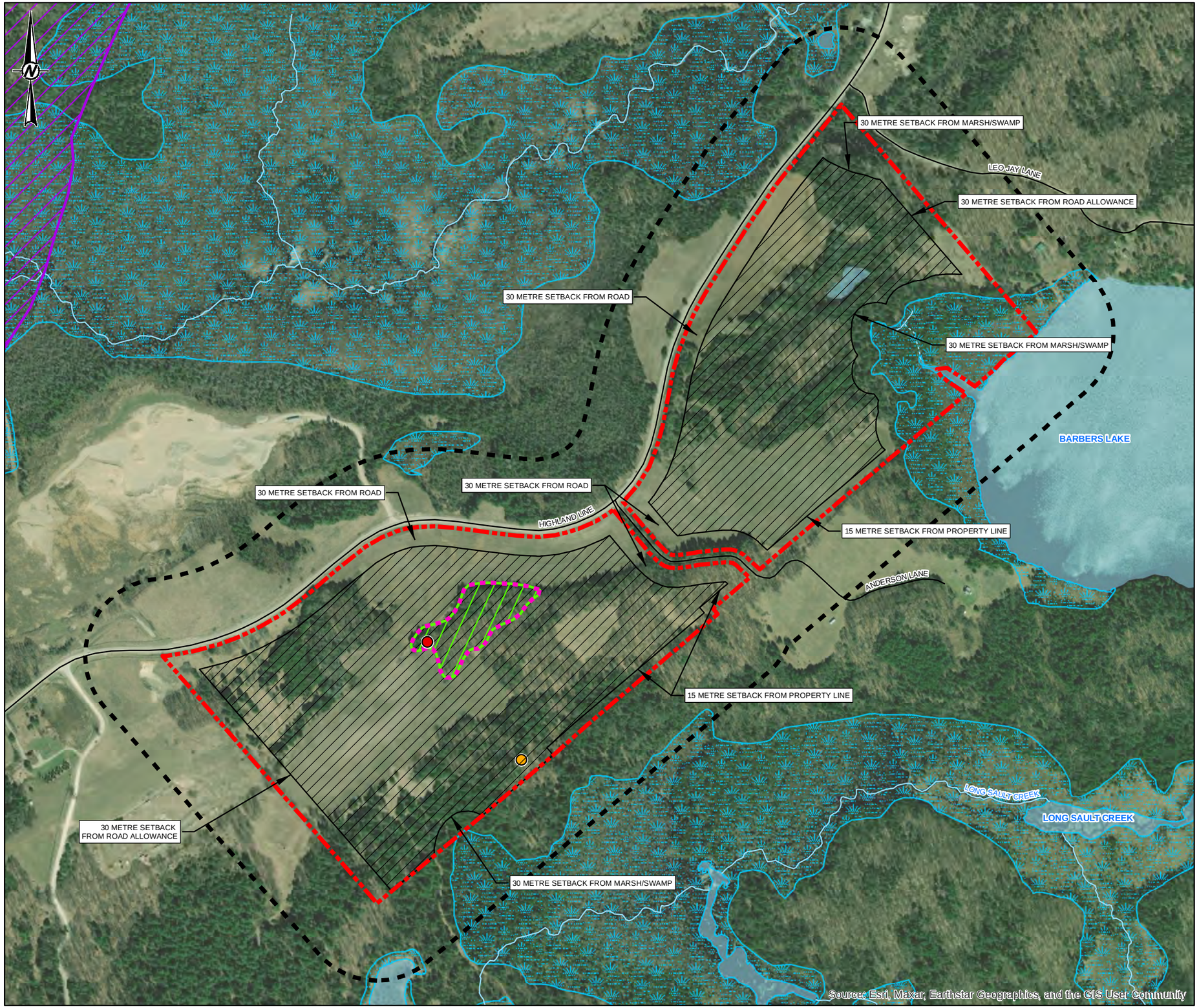

LEGEND

- POTENTIAL TRI-COLOURED BAT MATERNITY ROOST
- EASTERN WOOD-PEWEE
- ROADWAY
- INTERMITTENT STREAM
- PERMANENT WATERCOURSE
- WETLAND (UNEVALUATED)
- WATERBODY
- DEER WINTERING AREA
- POTENTIAL TRI-COLOURED BAT ROOST HABITAT
- NATURAL ENVIRONMENT EXCLUSION AREA
- PROPOSED EXTRACTION AREA
- SITE
- STUDY AREA

REFERENCE(S)

1. LAND INFORMATION ONTARIO (LIO) DATA PRODUCED BY GOLDER ASSOCIATES LTD. UNDER LICENCE FROM ONTARIO MINISTRY OF NATURAL RESOURCES, © QUEENS PRINTER 2014
2. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: UTM ZONE 18, VERTICAL DATUM: CGVD28

0 60 120 240

1:6,000 METRES

CLIENT
THOMAS CAVANAGH CONSTRUCTION LIMITED

PROJECT
NATURAL ENVIRONMENT LEVEL 1/2 ASSESSMENT
HIGHLAND LINE PIT, LANARK, ONTARIO

TITLE
SIGNIFICANT NATURAL FEATURES AND SITE PLAN

CONSULTANT
WSP GOLDER

YYYY-MM-DD	2019-09-18
DESIGNED	----
PREPARED	JEM
REVIEWED	GW
APPROVED	HM

PROJECT NO.	CONTROL	REV.	FIGURE
19126620	0001	0	**2**

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM:
25mm
0

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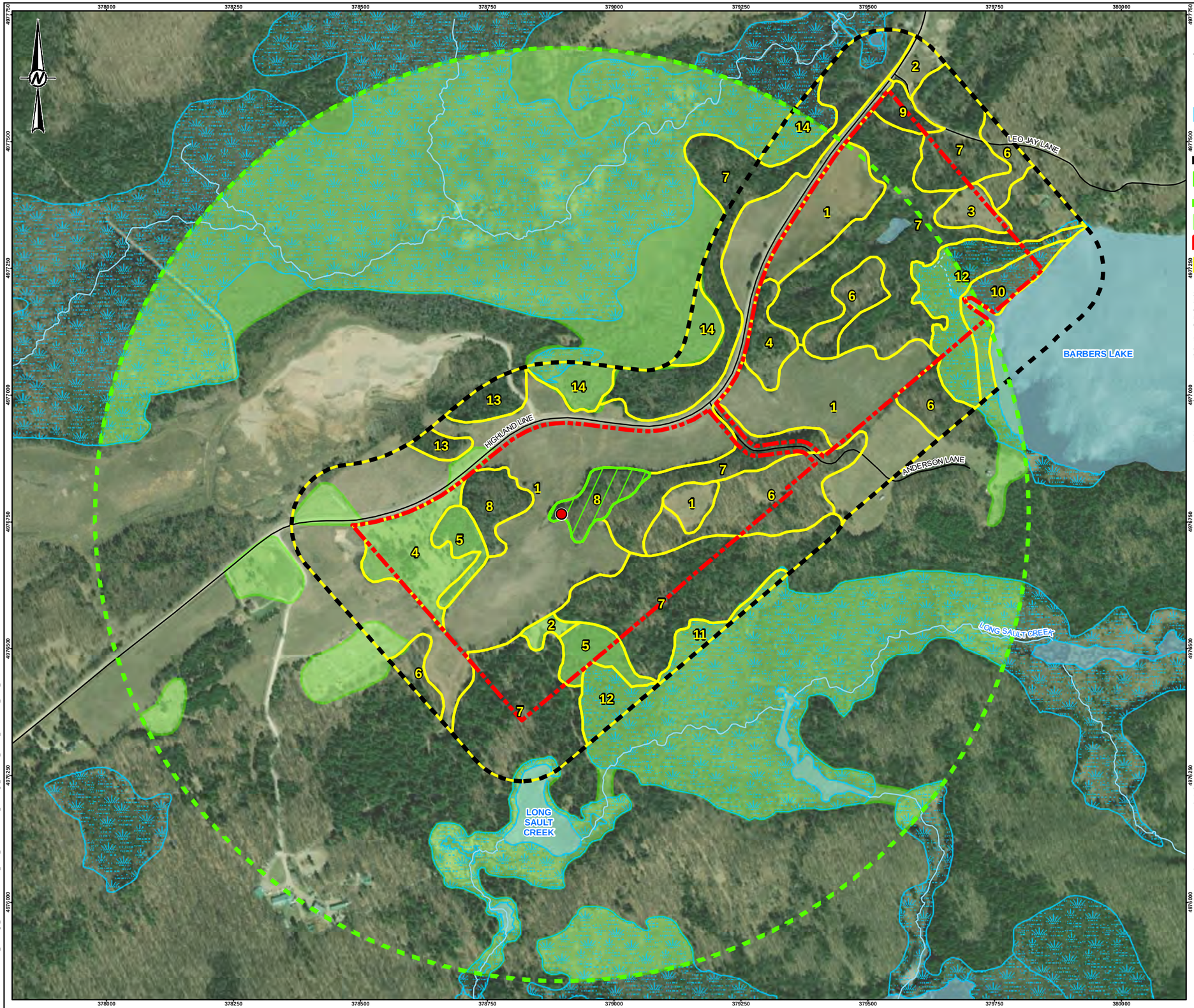

LEGEND

- POTENTIAL TRI-COLOURED BAT MATERNITY ROOST
- ROADWAY
- INTERMITTENT STREAM
- PERMANENT WATERCOURSE
- WETLAND (UNEVALUATED)
- WATERBODY
- STUDY AREA
- POTENTIAL TRI-COLOURED BAT ROOST HABITAT
- 920 m RADIUS
- POTENTIAL TRI-COLOURED BAT FORAGING HABITAT
- LICENSED BOUNDARY
- ECOLOGICAL LAND CLASSIFICATION

1. CUM1A: FALLOW AGRICULTURAL FIELD
2. CUM1B: MIXED MEADOW
3. CUT1: PRICKLY ASH DECIDUOUS THICKET
4. CUW1: OPEN WOODLAND
5. FOC4-1: FRESH TO MOIST WHITE CEDAR CONIFEROUS FOREST
6. FOD5-4: LOGGED/REGENERATING SUGAR MAPLE – IRONWOOD – MIXED HARDWOOD – DECIDUOUS FOREST
7. FOM2-2: LOGGED/REGENERATING DRY TO FRESH WHITE PINE – SUGAR MAPLE MIXED FOREST
8. FOM5: LOGGED/REGENERATING DRY TO FRESH WHITE BIRCH – POPLAR – CONIFER - MIXED FOREST
9. MAS1: MIXED MINERAL SHALLOW MARSH
10. MAS3-1: CATTAIL ORGANIC SHALLOW MARSH
11. MAS3-10: FORB ORGANIC SHALLOW MARSH
12. SWC3-1: WHITE CEDAR ORGANIC CONIFEROUS SWAMP
13. FOC: CONIFEROUS FOREST
14. FOC/SWC CONIFEROUS FOREST/SWAMP

REFERENCE(S)

1. LAND INFORMATION ONTARIO (LIO) DATA PRODUCED BY GOLDER ASSOCIATES LTD. UNDER LICENCE FROM ONTARIO MINISTRY OF NATURAL RESOURCES, © QUEENS PRINTER 2014
2. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: UTM ZONE 18, VERTICAL DATUM: CGVD28

0 75 150 300
1:7,500 METRES

CLIENT
THOMAS CAVANAGH CONSTRUCTION LIMITED

PROJECT
NATURAL ENVIRONMENT LEVEL 1/2 ASSESSMENT
HIGHLAND LINE PIT, LANARK, ONTARIO

TITLE
POTENTIAL HABITAT OF ENDANGERED AND THREATENED SPECIES

CONSULTANT
WSP GOLDER

YYYY-MM-DD	2019-09-18
DESIGNED	----
PREPARED	JEM
REVIEWED	GW
APPROVED	HM

PROJECT NO.	CONTROL	REV.	FIGURE
19126620	0001	0	3

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: 25mm

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APPENDIX A

Agency Correspondence

Natural Heritage Information Request Response

Thank you for your request for information on natural heritage features. In order to provide the most efficient service possible, the attached *Natural Heritage Information Request Guide* has been developed to assist you with accessing natural heritage data and values from convenient online sources.

It remains the proponent's responsibility to complete a preliminary screening for each project, to obtain available information from multiple sources, to conduct any necessary field studies, and to consider any potential environmental impacts that may result from an activity. We wish to emphasize the need for the proponents of development activities to complete screenings prior to contacting the Ministry or other agencies for more detailed technical information and advice.

The Ministry continues to work on updating data housed by Lands Information Ontario and the Natural Heritage Information Centre, and ensuring this information is accessible through online resources. Species at risk data is regularly being updated. In order to ensure access to reliable and up to date information, the attached list provides a summary of species at risk that have been observed, or may potentially be present, at a geographic township / municipal level.

This information will assist in scoping the necessary field assessments for an area if development or site alteration is proposed. This information is not meant to circumvent the responsibility of the proponent to undertake species and / or habitat surveys. Surveys or additional site level assessment are often required to confirm presence or absence of natural heritage features and values. Environmental consulting firms have the professional and technical expertise to assess sites for natural heritage features and can gauge the potential for such features to exist.

Absence or lack of information for a given geographic area does not necessarily mean the absence of natural heritage features. Many areas in Ontario have never been surveyed and new plant and animal species records are still being discovered for many localities. In addition, new species may be listed and new natural heritage features may be defined over time. For these reasons, the Ministry cannot provide a definitive statement on the presence, absence or condition of natural heritage features in all parts of Ontario.

Thank you for your inquiry.

Ministry of Natural Resources and Forestry

Kemptville District

10 Campus Drive
Postal Box 2002
Kemptville ON K0G 1J0
Tel.: 613 258-8204
Fax: 613 258-3920

Ministère des Richesses naturelles et des Forêts

District de Kemptville

10, promenade Campus
Case postale, 2002
Kemptville ON K0G 1J0
Tél.: 613 258-8204
Téléc.: 613 258-3920

Ontario

Last Revised: February 27, 2018

SUBJECT: UPDATED IN-WATER WORK TIMING GUIDELINES IN KEMPTVILLE DISTRICT

To: all interested parties

The Ministry of Natural Resources and Forestry Kemptville District Office has recently reviewed and updated its In-water Work Timing Guidelines. These guidelines are intended to provide the timing for in-water work related to an activity, in order to protect fish during spawning and other critical life stages. Timing guidelines are based on species* presence and are therefore subject to change if new information becomes available.

Timing Guidelines in Kemptville District are:

Waterbody (and applicable geography or Fisheries Management Zone)	Timing Guidelines (no in-water works)
○ St. Lawrence River (FMZ 20)	March 15 – July 15 (Spring spawning species)
○ Ottawa River – Lac Des Chats (FMZ 12)	October 1 to July 15 (Spring and fall spawning species, including Lake Trout and Lake Whitefish)
○ Ottawa River – Lac Deschenes (FMZ 12)	October 15 to July 15 (Spring and fall spawning species, including Cisco)
○ Ottawa River – Lac Dollard des Ormeaux (FMZ 12)	January 1 to July 15 (Winter and spring spawning species, including Burbot)
○ Big Rideau Lake (South Burgess, North Burgess, Bastard and South Elmsley Twps) ○ Charleston Lake (Lansdowne and Escott Twps) ○ Crow Lake (South Crosby Twp)	October 1 to June 30 (Spring and fall spawning species, including Lake Trout)
○ Bass Lake (South Elmsley Twp) ○ Lower Rideau Lake (South Elmsley Twp) ○ Bob's Lake (South Sherbrooke Twp) ○ Christie Lake (South Sherbrooke Twp) ○ Dalhousie Lake (Dalhousie Twp) ○ Davern Lake (South Sherbrooke Twp) ○ Farren Lake (South Sherbrooke Twp) ○ Grippen Lake (Leeds Twp) ○ Indian Lake (South Crosby Twp) ○ Little Long Lake (Lansdowne Twp) ○ Millpond Lake (South Burgess) ○ Otter Lake (South Elmsley, South Burgess and Bastard Twps)	October 15 to June 30 (Spring and Fall spawning species, including Lake Whitefish and Cisco)

○ Otty Lake (North Burgess and North Elmsley Twps) ○ Pike Lake (North Burgess Twp) ○ Silver Lake (South Sherbrooke Twp) ○ Redhorse Lake (Lansdowne Twp) ○ Tay River (South Sherbrooke, Bathurst, Drummond and North Elmsley Twps) ○ Wolfe Lake (North Crosby Twp)	
○ Bennett Lake (Bathurst Twp) ○ Crosby Lake (North Crosby Twp) ○ Gananoque River (Leeds Twp) ○ Lac Georges (Plantagenet and Alfred Twps) ○ Gillies Lake (Lanark Twp) ○ Little Crosby Lake (North Crosby Twp) ○ McLaren Lake (North Burgess Twp) ○ Mississippi Lake (Drummond, Beckwith and Ramsay Twps) ○ Mississippi River (Beckwith, Ramsay, Pakenham and Fitzroy Twps) ○ Raisin River below Martintown dam (Charlottenburgh Twp) ○ Rideau River (Wolford, Oxford, Montague, Marlborough, South Gower, North Gower, Osgood, Nepean and Gloucester Twps) ○ South Lake (Leeds Twp) ○ South Nation River below Plantagenet weir (Plantagenet Twp) ○ Upper Rideau Lake (North Crosby Twp) ○ Westport Sand Lake (North Crosby Twp)	January 1 – June 30 (Winter and spring spawning species, including Burbot)
○ Small rivers and streams (denoted on 1:50,000 National Topographic System maps as being one-lined) ○ All other waterbodies in FMZ 18	March 15 to June 30 (Spring spawning species)

**Additional timing guidelines may apply as they relate to endangered and threatened species for works in both water and wetland areas. Timing guidelines are subject to change, depending on species found in a given waterbody.*

Should you have any questions, please do not hesitate to contact Joffre Côté, Management Biologist (at 613-258-8214 or joff.cote@ontario.ca) or Jane Devlin, Management Biologist (at 613-258-8418 or jane.devlin@ontario.ca).

Sincerely,

John Boos

Resources Management Supervisor
Kemptville District Office
Ministry of Natural Resources and Forestry

From: Hann, Carolyn (MECP) <Carolyn.Hann@ontario.ca>
Sent: 15-Oct-20 3:23 PM
To: Weeks, Gwendolyn
Subject: 2020-10-15_ARA - Information Request

EXTERNAL EMAIL

Hi Gwendolyn,

I have no additional species at risk occurrences to add to your attached list of reviewed species at risk occurrences in the area that you have provided in Lanark County.

However, there is also potential for the following species at risk in the area of the proposed project:

- Pale-bellied Frost Lichen

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.

If you would like to discuss this further please contact me directly.

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: September-30-20 4:43 PM
To: Species at Risk (MECP) <SAROntario@ontario.ca>
Subject: ARA - Information Request

Hi There,
We are preparing a natural environment report for the attached Site, located in Lanark County.
Below is our list of SAR identified as potentially present in the vicinity of the Site.
Please provide any information available for the Site.
Many thanks,
-Gwendolyn

Western chorus frog - Great Lakes St. Lawrence / Canadian Shield population
Monarch
Bank swallow
Barn swallow
Bobolink
Canada warbler
Chimney swift
Common nighthawk
Eastern meadowlark
Eastern whip-poor-will
Eastern wood-pewee
Golden-winged warbler
Grasshopper sparrow pratensis subspecies
Least bittern
Olive-sided flycatcher
Peregrine falcon (anatum/tundrius subspecies)
Short-eared owl
Wood thrush
American Eel
Lake sturgeon - Great Lakes / Upper St.Lawrence population
River redhorse
Flooded jellyskin
Eastern small-footed myotis
Little brown myotis
Northern myotis
Tri-colored bat
Blanding's turtle - Great Lakes / St. Lawrence population
Eastern ribbonsnake- Great Lakes population
Milksnake
Northern map turtle
Snapping turtle
Stinkpot
American ginseng
Butternut

Gwendolyn Weeks
Terrestrial Ecologist

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Golder Associates Ltd.
1931 Robertson Road, Ottawa, Ontario, Canada, K2H 5B7
T: +1 613 542 0029 | **D:** +1 (613) 592-9600 x4234 | **C:** +1 (613) 913-1179 | **golder.com**
LinkedIn | Instagram | Facebook | Twitter

La sécurité partout et avant tout | Work Safe, Home Safe

From: Smithers, Scott (MNRF) <scott.smithers@ontario.ca>
Sent: 1-Oct-20 3:55 PM
To: Weeks, Gwendolyn
Subject: FW: ARA Information Request
Attachments: InfoRequestGuide_2018-12-18-FINAL.PDF; InformationRequest-ResponseLetter.pdf; KVD_In_Water_Work_Timing_Guidelines_2018-02-27.pdf; TownshipsSAR_KemptvilleDistrict_Nov2018.pdf

EXTERNAL EMAIL

Thank you for your request.
Please find attached your Response Letter, Work in Water Timing Guidelines, Species at Risk Lists by Township and an Information Request Guide.
Feel free to contact me if you have any questions

Scott

Scott Smithers
Management Biologist
Kemptville District Office
Ministry of Natural Resources and Forestry
613-504-2207
Scott.smithers@ontario.ca

From: Weeks, Gwendolyn <Gwendolyn_Weeks@golder.com>
Sent: September-30-20 4:49 PM
To: Inforequest, Kemptville (MNRF) <Kemptville.Inforequest@ontario.ca>
Subject: ARA Information Request

Hi There,
Please find attached a completed information request form for the Site shown on the attached image.
We have contacted the MECP for information related to species at risk.
Many thanks,
-Gwendolyn

Gwendolyn Weeks
Terrestrial Ecologist

Golder Associates Ltd.
1931 Robertson Road, Ottawa, Ontario, Canada, K2H 5B7
T: +1 613 542 0029 | **D:** +1 (613) 592-9600 x4234 | **C:** +1 (613) 913-1179 | **golder.com**
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Kemptville District Species at Risk, Listed by Geographic Township

The following lists have been created to supplement the Species at Risk Occurrence information available in Natural Heritage Make a Map, and provide summaries of species at risk that have been observed, or may potentially be present, at a geographic township / municipal level in Kemptville District. Species with historical observations may not be included. The full Species at Risk in Ontario list can be found in *Ontario Regulation 230/08* (*ESA* , 2007) and on our website (www.ontario.ca/page/species-risk-ontario). The lists below were last updated in November 2018, and include amendments to *O. Reg.230/08* on/up to August 1, 2018.

Geographic Townships:

ALFRED	FINCH	NORTH CROSBY
AUGUSTA	FITZROY	NORTH GOWER
BASTARD	GLOUCESTER	NORTH SERBROOKE
BATHURST	GOULBOURN	OSGOODE
BECKWITH	HUNTLEY	OSNABRUCK
BURGESS	KENYON	OXFORD
CALEDONIA	KITLEY	PAKENHAM
CAMBRIDGE	LANARK	PLANTAGENET
CHARLOTTENBURGH	LANCASTER	RAMSAY
CLARENCE	LANSDOWNE	ROXBOROUGH
CORNWALL	LAVANT	RUSSELL
CUMBERLAND	LEEDS	SOUTH CROSBY
DALHOUSIE	LOCHIEL	SOUTH GOWER
DARLING	LONGUEUIL	SOUTH SHERBROOKE
DRUMMOND	MARCH	TORBOLTON
EAST HAWKESBURY	MARLBOROUGH	WEST HAWKESBURY
EDWARDSBURGH	MATILDA	WILLIAMSBURGH
ELIZABETHTOWN	MONTAGUE	WINCHESTER
ELMSLEY	MOUNTAIN	WOLFORD
ESCOTT	NEPEAN	YONGE

ALFRED	AUGUSTA	BASTARD
American Eel	American Eel	American Eel
American Ginseng	American Ginseng	Bald Eagle
Bald Eagle	Bald Eagle	Bank Swallow
Bank Swallow	Bank Swallow	Barn Swallow
Barn Swallow	Barn Swallow	Black Tern
Black Tern	Black Tern	Blanding's Turtle
Blanding’s Turtle	Blanding's Turtle	Bobolink
Bobolink	Bobolink	Bridle Shiner
Butternut	Bridle Shiner	Butternut
Canada Warbler	Butternut	Cerulean Warbler
Channel Darter	Cerulean Warbler	Chimney Swift
Chimney Swift	Chimney Swift	Eastern Meadowlark
Common Nighthawk	Eastern Meadowlark	Eastern Musk Turtle
Cutlip Minnow	Eastern Musk Turtle	Eastern Ribbonsnake
Eastern Meadowlark	Eastern Ribbonsnake	Eastern Small-footed Myotis
Eastern Musk Turtle	Eastern Small-footed Myotis	Eastern Whip-poor-will
Eastern Ribbonsnake	Eastern Whip-poor-will	Eastern Wood-pewee
Eastern Small-footed Myotis	Eastern Wood-pewee	Golden-winged Warbler
Eastern Wood Pewee	Grass Pickerel	Grass Pickerel
Evening Grosbeak	Gray Ratsnake	Gray Ratsnake
Hickorynut	Least Bittern	Least Bittern
Lake Sturgeon	Little Brown Myotis	Little Brown Myotis
Least Bittern	Loggerhead Shrike	Loggerhead Shrike
Little Brown Myotis	Louisiana Waterthrush	Monarch
Monarch	Monarch	Northern Map Turtle
Northern Map Turtle	Northern Map Turtle	Northern Myotis
Northern Myotis	Northern Myotis	Pugnose Shiner
Peregrine Falcon	Short-eared Owl	Snapping Turtle
River Redhorse	Snapping Turtle	Tri-colored Bat
Rusty Blackbird	Transverse Lady Beetle	Wood Thrush
Short-eared Owl	Tri-colored Bat	
Silver Lamprey	Wood Thrush	
Snapping Turtle	Yellow-banded Bumblebee	
Spotted Turtle		
Tri-colored Bat		
West Virginia White		
Whip poor will		
Wood Thrush		

BATHURST	BECKWITH	BURGESS
American Eel	American Eel	American Eel
American Ginseng	Bald Eagle	American Ginseng
Bald Eagle	Bank Swallow	Bald Eagle
Bank Swallow	Barn Swallow	Bank Swallow
Barn Swallow	Black Tern	Barn Swallow
Black Tern	Blanding's Turtle	Blanding's Turtle
Blanding's Turtle	Bobolink	Bobolink
Bobolink	Butternut	Bridle Shiner
Butternut	Chimney Swift	Butternut
Cerulean Warbler	Eastern Meadowlark	Canada Warbler
Chimney Swift	Eastern Musk Turtle	Cerulean Warbler
Eastern Meadowlark	Eastern Small-footed Myotis	Chimney Swift
Eastern Musk Turtle	Eastern Whip-poor-will	Common Five-lined Skink
Eastern Small-footed Myotis	Eastern Wood-pewee	Common Nighthawk
Eastern Whip-poor-will	Least Bittern	Eastern Meadowlark
Eastern Wood-pewee	Little Brown Myotis	Eastern Musk Turtle
Golden-winged Warbler	Loggerhead Shrike	Eastern Ribbonsnake
Gray Ratsnake	Monarch	Eastern Small-footed Myotis
Least Bittern	Northern Myotis	Eastern Whip-poor-will
Little Brown Myotis	Snapping Turtle	Eastern Wood-pewee
Little Brown Myotis	Tri-colored Bat	Golden-winged Warbler
Monarch	Wood Thrush	Gray Ratsnake
Northern Map Turtle		Least Bittern
Northern Myotis		Little Brown Myotis
Rusty Blackbird		Loggerhead Shrike
Snapping Turtle		Monarch
Tri-colored Bat		Northern Map Turtle
Wood Thrush		Northern Myotis
		Olive-sided Flycatcher
		Peregrine Falcon
		Pugnose Shiner
		Snapping Turtle
		Tri-colored Bat
		Wood Thrush

CALEDONIA	CAMBRIDGE	CHARLOTTENBURGH
American Ginseng	American Brook Lamprey	American Eel
Amphibians	American Eel	American Ginseng
Bald Eagle	Bald Eagle	Bald Eagle
Bank Swallow	Bank Swallow	Bank Swallow
Barn Swallow	Barn Swallow	Barn Swallow
Black Tern	Black Tern	Black Tern
Blanding’s Turtle	Blanding's Turtle	Blanding’s Turtle
Bobolink	Bobolink	Bobolink
Butternut	Branching Burreed	Bridle Shiner
Canada Warbler	Butternut	Butternut
Chimney Swift	Chimney Swift	Canada Warbler
Common Nighthawk	Eastern Meadowlark	Chimney Swift
Eastern Meadowlark	Eastern Small-footed Myotis	Common Nighthawk
Eastern Ribbonsnake	Eastern Whip-poor-will	Cutlip Minnow
Eastern Small-footed Myotis	Eastern Wood-pewee	Eastern Meadowlark
Eastern Wood Pewee	Evening Grosbeak	Eastern Musk Turtle
Evening Grosbeak	Horned Grebe	Eastern Ribbonsnake
Golden Eagle	Lake Sturgeon	Eastern Small-footed Myotis
Little Brown Myotis	Little Brown Myotis	Eastern Wood Pewee
Monarch	Monarch	Evening Grosbeak
Northern Myotis	Northern Map Turtle	Grass Pickerel
Peregrine Falcon	Northern Myotis	Gray Fox
Rusty Blackbird	Short-eared Owl	King Rail
Short-eared Owl	Snapping Turtle	Lake Sturgeon
Snapping Turtle	Tri-colored Bat	Least Bittern
Spotted Turtle	Wood Thrush	Little Brown Myotis
Tri-colored Bat	Yellow-banded Bumblebee	Monarch
West Virginia White		Northern Map Turtle
Whip poor will		Northern Myotis
Wood Thrush		Northern Sunfish
		Olive-sided Flycatcher
		River Redhorse
		Rusty Blackbird
		Silver Lamprey
		Snapping Turtle
		Tri-colored Bat
		West Virginia White
		Whip poor will
		Wood Thrush
		Yellow Rail

CLARENCE	CORNWALL	CUMBERLAND
American Brook Lamprey	American Eel	American Brook Lamprey
American Eel	Bald Eagle	American Eel
Bald Eagle	Bank Swallow	Bald Eagle
Bank Swallow	Barn Swallow	Bank Swallow
Barn Owl	Blanding's Turtle	Barn Swallow
Barn Swallow	Bobolink	Black Tern
Black Tern	Butternut	Blanding's Turtle
Blanding's Turtle	Chimney Swift	Bobolink
Bobolink	Cutlip Minnow	Butternut
Butternut	Eastern Meadowlark	Channel Darter
Channel Darter	Eastern Musk Turtle	Chimney Swift
Chimney Swift	Eastern Silvery Minnow	Common Nighthawk
Eastern Meadowlark	Eastern Small-footed Myotis	Eastern Meadowlark
Eastern Ribbonsnake	Eastern Wood-pewee	Eastern Silvery Minnow
Eastern Silvery Minnow	Lake Sturgeon	Eastern Small-footed Myotis
Eastern Small-footed Myotis	Least Bittern	Eastern Whip-poor-will
Eastern Whip-poor-will	Little Brown Myotis	Eastern Wood-pewee
Eastern Wood-pewee	Monarch	Henslow's Sparrow
Lake Sturgeon	Northern Map Turtle	Horned Grebe
Least Bittern	Northern Myotis	Lake Sturgeon
Little Brown Myotis	Peregrine Falcon	Little Brown Myotis
Monarch	Pugnose Shiner	Monarch
Northern Map Turtle	River Redhorse	Northern Brook Lamprey
Northern Myotis	Silver Lamprey	Northern Map Turtle
Olive-sided Flycatcher	Snapping Turtle	Northern Myotis
River Redhorse	Spotted Turtle	Peregrine Falcon
Short-eared Owl	Tri-colored Bat	Short-eared Owl
Silver Lamprey	Wood Thrush	Silver Lamprey
Snapping Turtle	Yellow Rail	Snapping Turtle
Transverse Lady Beetle		Spotted turtle
Tri-colored Bat		Tri-colored Bat
Wood Thrush		Wood Thrush
		Yellow-banded Bumblebee

DALHOUSIE	DARLING	DRUMMOND
American Eel	American Eel	American Eel
American Ginseng	American Ginseng	American Ginseng
Bald Eagle	Bald Eagle	Bald Eagle
Bank Swallow	Bank Swallow	Bank Swallow
Barn Swallow	Barn Swallow	Barn Swallow
Black Tern	Blanding's Turtle	Black Tern
Blanding's Turtle	Bobolink	Blanding's Turtle
Bobolink	Bogbean Buckmoth	Bobolink
Butternut	Butternut	Butternut
Cerulean Warbler	Chimney Swift	Chimney Swift
Chimney Swift	Eastern Meadowlark	Eastern Meadowlark
Common Five-lined Skink	Eastern Silvery Minnow	Eastern Musk Turtle
Eastern Meadowlark	Eastern Small-footed Myotis	Eastern Small-footed Myotis
Eastern Musk Turtle	Eastern Whip-poor-will	Eastern Whip-poor-will
Eastern Ribbonsnake	Eastern Wood-pewee	Eastern Wood-pewee
Eastern Silvery Minnow	Little Brown Myotis	Golden-winged Warbler
Eastern Small-footed Myotis	Monarch	Gray Ratsnake
Eastern Whip-poor-will	Northern Map Turtle	Least Bittern
Eastern Wood-pewee	Northern Myotis	Little Brown Myotis
Little Brown Myotis	Pale-bellied Frost Lichen	Loggerhead Shrike
Loggerhead Shrike	Snapping Turtle	Monarch
Monarch	Tri-colored Bat	Northern Myotis
Northern Map Turtle	Wood Thrush	Rusty Blackbird
Northern Myotis	Wood Turtle	Snapping Turtle
Pale-bellied Frost Lichen		Tri-colored Bat
Snapping Turtle		Wood Thrush
Snapping Turtle		
Tri-colored Bat		
Wood Thrush		

EAST HAWKESBURY	EDWARDSBURGH	ELIZABETHTOWN
American Eel	American Eel	American Eel
American Ginseng	Bald Eagle	American Ginseng
Bald Eagle	Bank Swallow	American Water-willow
Bank Swallow	Barn Swallow	Bald Eagle
Barn Swallow	Black Tern	Bank Swallow
Black Tern	Blanding's Turtle	Barn Swallow
Blanding’s Turtle	Bobolink	Black Tern
Bobolink	Butternut	Blanding's Turtle
Bridle Shiner	Chimney Swift	Bobolink
Butternut	Cutlip Minnow	Bridle Shiner
Canada Warbler	Eastern Meadowlark	Butternut
Channel Darter	Eastern Small-footed Myotis	Cerulean Warbler
Chimney Swift	Eastern Whip-poor-will	Chimney Swift
Common Nighthawk	Eastern Wolf	Common Nighthawk
Cutlip Minnow	Eastern Wood-pewee	Cutlip Minnow
Eastern Meadowlark	Gypsy Cuckoo Bumble Bee	Eastern Meadowlark
Eastern Musk Turtle	Henslow's Sparrow	Eastern Musk Turtle
Eastern Ribbonsnake	Horned Grebe	Eastern Pondmussel
Eastern Small-footed Myotis	Little Brown Myotis	Eastern Prairie Fringed Orchid
Eastern Wood Pewee	Monarch	Eastern Ribbonsnake
Evening Grosbeak	Northern Map Turtle	Eastern Silvery Minnow
Hickorynut	Northern Myotis	Eastern Small-footed Myotis
Lake Sturgeon	Pugnose Shiner	Eastern Whip-poor-will
Least Bittern	Snapping Turtle	Eastern Wood-pewee
Little Brown Myotis	Tri-colored Bat	Golden-winged Warbler
Mammals	Wood Thrush	Grass Pickerel
Monarch		Gray Fox
Northern Map Turtle		Gray Ratsnake
Northern Myotis		Henslow's Sparrow
River Redhorse		King Rail
Rusty Blackbird		Least Bittern
Short-eared Owl		Little Brown Myotis
Silver Lamprey		Loggerhead Shrike
Snapping Turtle		Monarch
Tri-colored Bat		Northern Map Turtle
West Virginia White		Northern Myotis
Whip poor will		Short eared Owl
Wood Thrush		Snapping Turtle
		Spotted Turtle
		Transverse Lady Beetle
		Tri-colored Bat
		Wood Thrush
		Yellow Rail

ELMSLEY	ESCOTT	FINCH
American Eel	American Eel	American Eel
Bald Eagle	American Ginseng	Bald Eagle
Bank Swallow	Bald Eagle	Bank Swallow
Barn Swallow	Bank Swallow	Barn Swallow
Black Tern	Barn Swallow	Blanding's Turtle
Blanding's Turtle	Black Tern	Bobolink
Bobolink	Blanding's Turtle	Butternut
Bridle Shiner	Bobolink	Chimney Swift
Butternut	Bridle Shiner	Eastern Meadowlark
Chimney Swift	Butternut	Eastern Small-footed Myotis
Common Nighthawk	Cerulean Warbler	Eastern Wood-pewee
Eastern Meadowlark	Chimney Swift	Little Brown Myotis
Eastern Musk Turtle	Common Five-lined Skink	Loggerhead Shrike
Eastern Ribbonsnake	Common Nighthawk	Monarch
Eastern Small-footed Myotis	Eastern Meadowlark	Northern Map Turtle
Eastern Whip-poor-will	Eastern Musk Turtle	Northern Myotis
Eastern Wood-pewee	Eastern Ribbonsnake	Short-eared Owl
Golden-winged Warbler	Eastern Silvery Minnow	Snapping Turtle
Grasshopper Sparrow	Eastern Small-footed Myotis	Tri-colored Bat
Gray Ratsnake	Eastern Whip-poor-will	Wood Thrush
Least Bittern	Eastern Wood-pewee	Yellow-banded Bumblebee
Little Brown Myotis	Golden-winged Warbler	
Loggerhead Shrike	Grass Pickerel	
Monarch	Gray Fox	
Northern Map Turtle	Gray Ratsnake	
Northern Myotis	Henslow's Sparrow	
Peregrine Falcon	Horned Grebe	
Snapping Turtle	Lake Sturgeon	
Tri-colored Bat	Least Bittern	
Wood Thrush	Little Brown Bat	
	Loggerhead Shrike	
	Monarch	
	Northern Map Turtle	
	Northern Myotis	
	Olive-sided Flycatcher	
	Peregrine Falcon	
	Piping Plover	
	Pugnose Shiner	
	Red-headed Woodpecker	
	Snapping Turtle	
	Tri-colored Bat	
	Wood Thrush	

FITZROY	GLOUCESTER	GOULBOURN
American Eel	American Eel	Bald Eagle
American Ginseng	American Ginseng	Bank Swallow
Bald Eagle	Bald Eagle	Barn Swallow
Bank Swallow	Bank Swallow	Blanding's Turtle
Barn Swallow	Barn Swallow	Bobolink
Blanding's Turtle	Black Tern	Bogbean Buckmoth
Bobolink	Blanding's Turtle	Butternut
Butternut	Bobolink	Chimney Swift
Canada Warbler	Butternut	Common Nighthawk
Chimney Swift	Canada Warbler	Eastern Meadowlark
Common Nighthawk	Channel Darter	Eastern Prairie Fringed Orchid
Eastern Meadowlark	Chimney Swift	Eastern Small-footed Myotis
Eastern Musk Turtle	Common Nighthawk	Eastern Whip-poor-will
Eastern Ribbonsnake	Eastern Meadowlark	Eastern Wood-pewee
Eastern Silvery Minnow	Eastern Musk Turtle	Gypsy Cuckoo Bumble Bee
Eastern Small-footed Myotis	Eastern Ribbon Snake	Horned Grebe
Eastern Whip-poor-will	Eastern Small-footed Myotis	Least Bittern
Eastern Wood-pewee	Eastern Whip-poor-will	Little Brown Myotis
King Rail	Eastern Wood-pewee	Loggerhead Shrike
Lake Sturgeon	Evening Grosbeak	Monarch
Least Bittern	Gypsy Cuckoo Bumble Bee	Northern Myotis
Little Brown Myotis	Henslow's Sparrow	Red-headed Woodpecker
Loggerhead Shrike	Hickorynut	Snapping Turtle
Monarch	Lake Sturgeon	Tri-colored Bat
Northern Map Turtle	Least Bittern	Wood Thrush
Northern Myotis	Little Brown Myotis	Yellow Rail
Olive-sided Flycatcher	Loggerhead Shrike	
Peregrine Falcon	Monarch	
Red-headed Woodpecker	Northern Brook Lamprey	
River Redhorse	Northern Map Turtle	
Short-eared Owl	Northern Myotis	
Snapping Turtle	Peregrine Falcon	
Transverse Lady Beetle	Red-headed Woodpecker	
Tri-colored Bat	River Redhorse	
Wood Thrush	Rusty Blackbird	
	Short-eared Owl	
	Silver Lamprey	
	Snapping Turtle	
	Spotted Turtle	
	Transverse Lady Beetle	
	Tri-colored Bat	
	Wood Thrush	

HUNTLEY	KENYON	KITLEY
Bald Eagle	American Eel	Bald Eagle
Bank Swallow	American Ginseng	Bank Swallow
Barn Swallow	Bank Swallow	Barn Swallow
Blanding's Turtle	Barn Swallow	Black Tern
Bobolink	Black Tern	Blanding's Turtle
Butternut	Blanding’s Turtle	Bobolink
Chimney Swift	Bobolink	Butternut
Eastern Meadowlark	Bridle Shiner	Cerulean Warbler
Eastern Ribbonsnake	Butternut	Chimney Swift
Eastern Silvery Minnow	Canada Warbler	Eastern Meadowlark
Eastern Small-footed Myotis	Chimney Swift	Eastern Musk Turtle
Eastern Whip-poor-will	Common Nighthawk	Eastern Small-footed Myotis
Eastern Wood-pewee	Cutlip Minnow	Eastern Whip-poor-will
Golden-winged Warbler	Eastern Meadowlark	Eastern Wood-pewee
Least Bittern	Eastern Prairie Fringed-orchid	Golden-winged Warbler
Little Brown Myotis	Eastern Ribbonsnake	Grasshopper Sparrow
Loggerhead Shrike	Eastern Small-footed Myotis	Gray Ratsnake
Monarch	Eastern Wood Pewee	Least Bittern
Mottled Duskywing	Evening Grosbeak	Little Brown Myotis
Northern Myotis	Gray Fox	Loggerhead Shrike
Snapping Turtle	Least Bittern	Monarch
Spotted Turtle	Little Brown Myotis	Northern Myotis
Tri-colored Bat	Monarch	Snapping Turtle
Wood Thrush	Northern Myotis	Tri-colored Bat
	Rusty Blackbird	Wood Thrush
	Snapping Turtle	
	Tri-colored Bat	
	West Virginia White	
	Whip poor will	
	Wood Thrush	

LANARK	LANCASTER	LANSDOWNE
American Eel	American Eel	American Eel
American Ginseng	American Ginseng	American Ginseng
Bald Eagle	Bald Eagle	Bald Eagle
Bank Swallow	Bank Swallow	Bank Swallow
Barn Swallow	Barn Swallow	Barn Swallow
Black Tern	Black Tern	Black Tern
Blanding's Turtle	Blanding’s Turtle	Blanding's Turtle
Bobolink	Bobolink	Blunt-lobed Woodsia
Butternut	Bridle Shiner	Bobolink
Chimney Swift	Butternut	Bridle Shiner
Eastern Meadowlark	Canada Warbler	Broad Beech Fern
Eastern Musk Turtle	Chimney Swift	Butternut
Eastern Small-footed Myotis	Common Nighthawk	Cerulean Warbler
Eastern Whip-poor-will	Cutlip Minnow	Chimney Swift
Eastern Wood-pewee	Eastern Meadowlark	Common Five-lined Skink
Least Bittern	Eastern Musk Turtle	Common Nighthawk
Little Brown Myotis	Eastern Ribbonsnake	Cutlip Minnow
Monarch	Eastern Small-footed Myotis	Eastern Meadowlark
Northern Map Turtle	Eastern Wood Pewee	Eastern Musk Turtle
Northern Myotis	Evening Grosbeak	Eastern Ribbonsnake
Olive-sided Flycatcher	Golden Eagle	Eastern Small-footed Myotis
Snapping Turtle	Grass Pickerel	Eastern Whip-poor-will
Transverse Lady Beetle	Gray Fox	Eastern Wood-pewee
Tri-colored Bat	King Rail	Golden-winged Warbler
Wood Thrush	Lake Sturgeon	Grass Pickerel
	Least Bittern	Gray Fox
	Little Brown Myotis	Gray Ratsnake
	Monarch	Henslow's Sparrow
	Northern Map Turtle	Lake Sturgeon
	Northern Myotis	Least Bittern
	Northern Sunfish	Little Brown Myotis
	Olive-sided Flycatcher	Loggerhead Shrike
	Rusty Blackbird	Monarch
	Silver Lamprey	Northern Map Turtle
	Snapping Turtle	Northern Myotis
	Tri-colored Bat	Peregrine Falcon
	West Virginia White	Piping Plover
	Whip poor will	Pugnose Shiner
	Wood Thrush	Red-headed Woodpecker
		Short-eared Owl
		Snapping Turtle
		Tri-colored Bat
		West Virginia White
		Yellow-banded Bumblebee
		Yellow-breasted Chat

LAVANT	LEEDS	LOCHIEL
American Eel	American Eel	American Eel
American Ginseng	American Ginseng	American Ginseng
Bald Eagle	Bald Eagle	Bank Swallow
Bank Swallow	Bank Swallow	Barn Swallow
Barn Swallow	Barn Swallow	Black Tern
Blanding's Turtle	Black Tern	Blanding’s Turtle
Bobolink	Blanding's Turtle	Bobolink
Butternut	Bobolink	Bridle Shiner
Chimney Swift	Bridle Shiner	Butternut
Common Five-lined Skink	Butternut	Canada Warbler
Eastern Meadowlark	Cerulean Warbler	Chimney Swift
Eastern Ribbonsnake	Chimney Swift	Common Nighthawk
Eastern Silvery Minnow	Common Five-lined Skink	Cutlip Minnow
Eastern Small-footed Myotis	Eastern Meadowlark	Eastern Meadowlark
Eastern Wood-pewee	Eastern Musk Turtle	Eastern Ribbonsnake
Little Brown Myotis	Eastern Pondmussel	Eastern Small-footed Myotis
Monarch	Eastern Prickly Pear Cactus	Eastern Wood Pewee
Northern Map Turtle	Eastern Ribbonsnake	Evening Grosbeak
Northern Myotis	Eastern Small-footed Myotis	Gray Fox
Pale-bellied Frost Lichen	Eastern Whip-poor-will	Little Brown Myotis
Short-eared Owl	Eastern Wood-pewee	Monarch
Snapping Turtle	Golden-winged Warbler	Northern Myotis
Tri-colored Bat	Grass Pickerel	Northern Sunfish
Wood Thrush	Gray Fox	Rusty Blackbird
	Gray Ratsnake	Short-eared Owl
	Henslow's Sparrow	Snapping Turtle
	Lake Sturgeon	Tri-colored Bat
	Least Bittern	West Virginia White
	Little Brown Myotis	Whip poor will
	Loggerhead Shrike	Wood Thrush
	Monarch	
	Northern Map Turtle	
	Northern Myotis	
	Olive-sided Flycatcher	
	Peregrine Falcon	
	Pugnose Shiner	
	Snapping Turtle	
	Tri-colored Bat	
	Wood Thrush	

LONGUEUIL	MARCH	MARLBOROUGH
American Eel	American Eel	American Ginseng
American Ginseng	American Ginseng	Bald Eagle
Bank Swallow	Bald Eagle	Bank Swallow
Barn Swallow	Bank Swallow	Barn Swallow
Black Tern	Barn Swallow	Black Tern
Blanding’s Turtle	Black Tern	Blanding's Turtle
Bobolink	Blanding's Turtle	Bobolink
Butternut	Bobolink	Bogbean Buckmoth
Canada Warbler	Butternut	Bridle Shiner
Channel Darter	Canada Warbler	Butternut
Chimney Swift	Chimney Swift	Chimney Swift
Common Nighthawk	Eastern Meadowlark	Common Nighthawk
Cutlip Minnow	Eastern Musk Turtle	Eastern Meadowlark
Eastern Meadowlark	Eastern Small-footed Myotis	Eastern Musk Turtle
Eastern Musk Turtle	Eastern Whip-poor-will	Eastern Prairie Fringed Orchid
Eastern Ribbonsnake	Eastern Wood-pewee	Eastern Small-footed Myotis
Eastern Small-footed Myotis	Hickorynut	Eastern Whip-poor-will
Eastern Wood Pewee	Horned Grebe	Eastern Wood-pewee
Evening Grosbeak	Lake Sturgeon	Grasshopper Sparrow
Golden Eagle	Least Bittern	King Rail
Hickorynut	Little Brown Myotis	Least Bittern
Lake Sturgeon	Loggerhead Shrike	Little Brown Myotis
Least Bittern	Monarch	Loggerhead Shrike
Little Brown Myotis	Northern Map Turtle	Monarch
Monarch	Northern Myotis	Northern Map Turtle
Northern Map Turtle	Peregrine Falcon	Northern Myotis
Northern Myotis	River Redhorse	Red-headed Woodpecker
River Redhorse	Rusty Blackbird	Snapping Turtle
Rusty Blackbird	Rusty-patched Bumble Bee	Spotted Turtle
Short-eared Owl	Silver Lamprey	Tri-colored Bat
Silver Lamprey	Snapping Turtle	Wood Thrush
Snapping Turtle	Transverse Lady Beetle	Yellow Rail
Spotted Turtle	Tri-colored Bat	
Tri-colored Bat	Wood Thrush	
West Virginia White	Yellow-banded Bumblebee	
Whip poor will		
Wood Thrush		

MATILDA	MONTAGUE	MOUNTAIN
American Eel	Bald Eagle	Bank Swallow
Bald Eagle	Bank Swallow	Barn Swallow
Bank Swallow	Barn Swallow	Blanding’s Turtle
Barn Swallow	Black Tern	Bobolink
Bobolink	Blanding's Turtle	Butternut
Butternut	Bobolink	Canada Warbler
Chimney Swift	Butternut	Chimney Swift
Cutlip minnow	Chimney Swift	Common Nighthawk
Eastern Meadowlark	Common Nighthawk	Eastern Meadowlark
Eastern Musk Turtle	Eastern Meadowlark	Eastern Small-footed Myotis
Eastern Small-footed Myotis	Eastern Musk Turtle	Eastern Wood-pewee
Eastern Wood-pewee	Eastern Prairie Fringed Orchid	Evening Grosbeak
Evening Grosbeak	Eastern Small-footed Myotis	Little Brown Myotis
Henslow's Sparrow	Eastern Whip-poor-will	Monarch
Lake Sturgeon	Eastern Wood-pewee	Northern Myotis
Little Brown Myotis	Golden-winged Warbler	Peregrine Falcon
Loggerhead Shrike	Grasshopper Sparrow	Rusty Blackbird
Monarch	Gray Ratsnake	Short-eared Owl
Northern Map Turtle	Least Bittern	Snapping Turtle
Northern Myotis	Little Brown Myotis	Tri-colored Bat
Peregrine Falcon	Loggerhead Shrike	Wood Thrush
Rusty Blackbird	Monarch	Yellow-banded Bumblebee
Short-eared Owl	Northern Myotis	
Snapping Turtle	Snapping Turtle	
Tri-colored Bat	Tri-colored Bat	
Wood Thrush	Wood Thrush	
Yellow-banded Bumblebee		

NEPEAN	NORTH CROSBY	NORTH GOWER
American Eel	American Eel	Bald Eagle
Bald Eagle	Bald Eagle	Bank Swallow
Bank Swallow	Bank Swallow	Barn Swallow
Barn Owl	Barn Swallow	Blanding's Turtle
Barn Swallow	Black Tern	Bobolink
Black Tern	Blanding's Turtle	Bridle Shiner
Blanding's Turtle	Blunt-lobed Woodsia	Butternut
Bobolink	Bobolink	Chimney Swift
Butternut	Bridle Shiner	Eastern Meadowlark
Chimney Swift	Butternut	Eastern Musk Turtle
Eastern Meadowlark	Cerulean Warbler	Eastern Small-footed Myotis
Eastern Small-footed Myotis	Chimney Swift	Eastern Wood-pewee
Eastern Whip-poor-will	Eastern Meadowlark	Evening Grosbeak
Eastern Wood-pewee	Eastern Musk Turtle	Gypsy Cuckoo Bumble Bee
Evening Grosbeak	Eastern Ribbonsnake	Henslow's Sparrow
Gypsy Cuckoo Bumble Bee	Eastern Small-footed Myotis	Least Bittern
Hickorynut	Eastern Wood-pewee	Little Brown Myotis
Horned Grebe	Golden-winged Warbler	Loggerhead Shrike
Lake Sturgeon	Gray Ratsnake	Monarch
Least Bittern	King Rail	Northern Map Turtle
Little Brown Myotis	Least Bittern	Northern Myotis
Loggerhead Shrike	Little Brown Myotis	Peregrine Falcon
Monarch	Loggerhead Shrike	Red-headed Woodpecker
Northern Map Turtle	Monarch	Rusty Blackbird
Northern Myotis	Northern Map Turtle	Rusty-patched Bumble Bee
Peregrine Falcon	Northern Myotis	Short-eared Owl
Piping Plover	Olive-sided Flycatcher	Snapping Turtle
Red Knot *rufa* subspecies	Red-headed Woodpecker	Tri-colored Bat
Red-necked Phalarope	Snapping Turtle	Wood Thrush
River Redhorse	Tri-colored Bat	Yellow-banded Bumblebee
Rusty Blackbird	Wood Thrush	
Rusty-patched Bumble Bee	Yellow Rail	
Silver Lamprey		
Snapping Turtle		
Transverse Lady Beetle		
Tri-colored Bat		
Wood Thrush		
Yellow-banded Bumblebee		

NORTH SERBROOKE	OSGOODE	OSNABRUCK
Bald Eagle	Bald Eagle	American Eel
Bank Swallow	Bank Swallow	Bald Eagle
Barn Swallow	Barn Swallow	Bank Swallow
Blanding's Turtle	Blanding's Turtle	Barn Swallow
Bobolink	Bobolink	Blanding's Turtle
Butternut	Bridle Shiner	Bobolink
Cerulean Warbler	Butternut	Butternut
Chimney Swift	Canada Warbler	Chimney Swift
Eastern Meadowlark	Cerulean Warbler	Cutlip Minnow
Eastern Musk Turtle	Chimney Swift	Eastern Meadowlark
Eastern Small-footed Myotis	Common Nighthawk	Eastern Small-footed Myotis
Eastern Wood-pewee	Eastern Meadowlark	Eastern Wood-pewee
Little Brown Myotis	Eastern Musk Turtle	Lake Sturgeon
Monarch	Eastern Ribbonsnake	Least Bittern
Northern Map Turtle	Eastern Small-footed Myotis	Little Brown Myotis
Northern Myotis	Eastern Whip-poor-will	Monarch
Snapping Turtle	Eastern Wood-pewee	Northern Map Turtle
Tri-colored Bat	Evening Grosbeak	Northern Myotis
Wood Thrush	Henslow's Sparrow	Pugnose Shiner
	Least Bittern	Red Knot *rufa* subspecies
	Little Brown Myotis	Red-headed Woodpecker
	Monarch	Red-necked Phalarope
	Northern Map Turtle	Snapping Turtle
	Northern Myotis	Tri-colored Bat
	Rusty Blackbird	Wood Thrush
	Rusty-patched Bumble Bee	Yellow Rail
	Snapping Turtle	
	Tri-colored Bat	
	Wood Thrush	

OXFORD	PAKENHAM	PLANTAGENET
American Ginseng	American Eel	American Eel
Bald Eagle	American Ginseng	American Ginseng
Bank Swallow	Bald Eagle	Bald Eagle
Barn Swallow	Barn Swallow	Bank Swallow
Black Tern	Blanding's Turtle	Barn Swallow
Blanding's Turtle	Bobolink	Black Tern
Bobolink	Bogbean Buckmoth	Blanding’s Turtle
Bridle Shiner	Butternut	Bobolink
Butternut	Chimney Swift	Butternut
Chimney Swift	Eastern Meadowlark	Canada Warbler
Eastern Meadowlark	Eastern Musk Turtle	Channel Darter
Eastern Musk Turtle	Eastern Ribbonsnake	Chimney Swift
Eastern Small-footed Myotis	Eastern Silvery Minnow	Common Nighthawk
Eastern Whip-poor-will	Eastern Small-footed Myotis	Cutlip Minnow
Eastern Wood-pewee	Eastern Whip-poor-will	Eastern Meadowlark
Grasshopper Sparrow	Eastern Wood-pewee	Eastern Musk Turtle
Gray Ratsnake	Evening Grosbeak	Eastern Ribbonsnake
Gypsy Cuckoo Bumble Bee	Grasshopper Sparrow	Eastern Small-footed Myotis
Least Bittern	Least Bittern	Eastern Wood Pewee
Little Brown Myotis	Little Brown Myotis	Evening Grosbeak
Monarch	Loggerhead Shrike	Hickorynut
Northern Map Turtle	Monarch	Lake Sturgeon
Northern Myotis	Northern Map Turtle	Least Bittern
Snapping Turtle	Northern Myotis	Little Brown Myotis
Tri-colored Bat	Rapids Clubtail	Monarch
Wood Thrush	Red-headed Woodpecker	Northern Myotis
	River Redhorse	River Redhorse
	Short-eared Owl	Rusty Blackbird
	Snapping Turtle	Silver Lamprey
	Tri-colored Bat	Snapping Turtle
	Wood Thrush	Tri-colored Bat
		West Virginia White
		Whip poor will
		Wood Thrush

RAMSAY	ROXBOROUGH	RUSSELL
American Eel	American Ginseng	Bald Eagle
American Ginseng	Bald Eagle	Bank Swallow
Bald Eagle	Bank Swallow	Barn Swallow
Bank Swallow	Barn Swallow	Bobolink
Barn Swallow	Bobolink	Butternut
Black Tern	Butternut	Chimney Swift
Blanding's Turtle	Chimney Swift	Eastern Meadowlark
Bobolink	Cutlip Minnow	Eastern Small-footed Myotis
Butternut	Eastern Meadowlark	Eastern Wood-pewee
Chimney Swift	Eastern Small-footed Myotis	Horned Grebe
Common Nighthawk	Eastern Wood-pewee	Little Brown Myotis
Eastern Meadowlark	Golden-winged Warbler	Monarch
Eastern Musk Turtle	Least Bittern	Northern Myotis
Eastern Ribbonsnake	Little Brown Myotis	Red Knot *rufa* subspecies
Eastern Small-footed Myotis	Monarch	Red-necked Phalarope
Eastern Wood-pewee	Northern Myotis	Snapping Turtle
Golden-winged Warbler	Red-headed Woodpecker	Tri-colored Bat
Gray Ratsnake	Snapping Turtle	Wood Thrush
Gypsy Cuckoo Bumble Bee	Spotted Turtle	
Horned Grebe	Tri-colored Bat	
Least Bittern	Wood Thrush	
Little Brown Myotis	Yellow Rail	
Loggerhead Shrike		
Monarch		
Mottled Duskywing		
Northern Myotis		
Rapids Clubtail		
Red-headed Woodpecker		
River Redhorse		
Short-eared Owl		
Snapping Turtle		
Transverse Lady Beetle		
Tri-colored Bat		
Wood Thrush		
Yellow Rail		

SOUTH CROSBY	SOUTH GOWER	SOUTH SHERBROOKE
American Eel	Bald Eagle	American Eel
American Ginseng	Bank Swallow	American Ginseng
Bald Eagle	Barn Swallow	Bald Eagle
Bank Swallow	Blanding's Turtle	Bank Swallow
Barn Swallow	Bobolink	Barn Swallow
Black Tern	Bridle Shiner	Black Tern
Blanding's Turtle	Butternut	Blanding's Turtle
Bobolink	Chimney Swift	Bobolink
Bridle Shiner	Eastern Meadowlark	Butternut
Butternut	Eastern Musk Turtle	Common Five-lined Skink
Cerulean Warbler	Eastern Small-footed Myotis	Common Nighthawk
Chimney Swift	Eastern Whip-poor-will	Eastern Meadowlark
Common Five-lined Skink	Eastern Wood-pewee	Eastern Musk Turtle
Eastern Meadowlark	Evening Grosbeak	Eastern Ribbonsnake
Eastern Musk Turtle	Least Bittern	Eastern Small-footed Myotis
Eastern Pondmussel	Little Brown Myotis	Eastern Whip-poor-will
Eastern Ribbonsnake	Monarch	Eastern Wood-pewee
Eastern Small-footed Myotis	Northern Map Turtle	Golden-winged Warbler
Eastern Whip-poor-will	Northern Myotis	Gray Ratsnake
Eastern Wood-pewee	Rusty Blackbird	Least Bittern
Golden-winged Warbler	Short-eared Owl	Little Brown Myotis
Grass Pickerel	Snapping Turtle	Loggerhead Shrike
Gray Ratsnake	Tri-colored Bat	Monarch
Gypsy Cuckoo Bumble Bee	Wood Thrush	Northern Map Turtle
Least Bittern		Northern Myotis
Little Brown Myotis		Snapping Turtle
Monarch		Tri-colored Bat
Mottled Duskywing		Wood Thrush
Northern Map Turtle		
Northern Myotis		
Prothonotary Warbler		
Rusty-patched Bumble Bee		
Snapping Turtle		
Transverse Lady Beetle		
Tri-colored Bat		
Wood Thrush		
Yellow-banded Bumblebee		

TORBOLTON	WEST HAWKESBURY	WILLIAMSBURGH
American Eel	American Eel	American Eel
American Ginseng	American Ginseng	Bald Eagle
Bald Eagle	Bank Swallow	Bank Swallow
Bank Swallow	Barn Swallow	Barn Swallow
Barn Swallow	Black Tern	Blanding’s Turtle
Blanding's Turtle	Blanding’s Turtle	Bobolink
Bobolink	Bobolink	Butternut
Butternut	Bridle Shiner	Canada Warbler
Chimney Swift	Butternut	Cerulean Warbler
Eastern Meadowlark	Canada Warbler	Chimney Swift
Eastern Musk Turtle	Channel Darter	Cutlip Minnow
Eastern Small-footed Myotis	Chimney Swift	Eastern Meadowlark
Eastern Wood-pewee	Common Nighthawk	Eastern Musk Turtle
Hickorynut	Cutlip Minnow	Eastern Ribbonsnake
Horned Grebe	Eastern Meadowlark	Eastern Small-footed Myotis
Lake Sturgeon	Eastern Musk Turtle	Eastern Wood-pewee
Least Bittern	Eastern Ribbonsnake	Evening Grosbeak
Little Brown Myotis	Eastern Small-footed Myotis	Grass Pickerel
Monarch	Eastern Wood Pewee	Lake Sturgeon
Mottled Duskywing	Evening Grosbeak	Least Bittern
Northern Barrens Tiger Beetle	Hickorynut	Little Brown Myotis
Northern Map Turtle	Lake Sturgeon	Monarch
Northern Myotis	Least Bittern	Northern Map Turtle
Red-headed Woodpecker	Little Brown Myotis	Northern Myotis
River Redhorse	Mammals	Pugnose Shiner
Rusty-patched Bumble Bee	Monarch	Rusty Blackbird
Silver Lamprey	Northern Map Turtle	Snapping Turtle
Snapping Turtle	Northern Myotis	Tri-colored Bat
Transverse Lady Beetle	River Redhorse	Wood Thrush
Tri-colored Bat	Rusty Blackbird	
Wood Thrush	Silver Lamprey	
Yellow-banded Bumblebee	Snapping Turtle	
	Tri-colored Bat	
	West Virginia White	
	Whip poor will	
	Wood Thrush	

WINCHESTER	WOLFORD	YONGE
American Eel	Bald Eagle	American Eel
Bank Swallow	Bank Swallow	American Ginseng
Barn Swallow	Barn Swallow	Bald Eagle
Blandings Turtle	Black Tern	Bank Swallow
Bobolink	Blanding's Turtle	Barn Swallow
Butternut	Bobolink	Blanding's Turtle
Canada Warbler	Butternut	Bobolink
Chimney Swift	Canada Warbler	Bridle Shiner
Common Nighthawk	Chimney Swift	Broad Beech Fern
Eastern Meadowlark	Common Nighthawk	Butternut
Eastern Musk Turtle	Eastern Meadowlark	Cerulean Warbler
Eastern Small-footed Myotis	Eastern Musk Turtle	Chimney Swift
Eastern Wood-pewee	Eastern Small-footed Myotis	Common Five-lined Skink
Evening Grosbeak	Eastern Whip-poor-will	Common Nighthawk
Little Brown Myotis	Eastern Wood-pewee	Eastern Meadowlark
Monarch	Golden-winged Warbler	Eastern Musk Turtle
Northern Map Turtle	Grasshopper Sparrow	Eastern Pondmussel
Northern Myotis	Gray Ratsnake	Eastern Ribbonsnake
Peregrine Falcon	Least Bittern	Eastern Small-footed Myotis
River Redhorse	Little Brown Myotis	Eastern Whip-poor-will
Rusty Blackbird	Loggerhead Shrike	Eastern Wood-pewee
Snapping Turtle	Monarch	Golden-winged Warbler
Tri-colored Bat	Northern Map Turtle	Grass Pickerel
Wood Thrush	Northern Myotis	Gray Ratsnake
	Snapping Turtle	Henslow's Sparrow
	Tri-colored Bat	Lake Sturgeon
	Wood Thrush	Least Bittern
	Yellow-breasted Chat	Little Brown Myotis
		Monarch
		Northern Map Turtle
		Northern Myotis
		Piping Plover
		Pugnose Shiner
		Red-headed Woodpecker
		Silver Lamprey
		Snapping Turtle
		Tri-colored Bat
		Wood Thrush

APPENDIX B

Photographic Inventory

Photo 1: CUM1a Fallow Agricultural Field

Photo 2: CUT1 Prickly Ash Deciduous Thicket

Photo 3: FOD5-4 Logged/regenerating Sugar Maple – Ironwood – Mixed Hardwood – Deciduous Forest

Photo 4: MAS3-10 Forb Organic Shallow Marsh

Photo 5: MAS3-1 Cattail Organic Shallow Marsh

Photo 6: SWC3-1 White Cedar Organic Coniferous Swamp

Photo 7: Small Wetland Inclusion in FOM 2-2

Photo 8: Intermittent Watercourse

APPENDIX C

List of Vascular Plants

Plant Species List

Scientific Name	Common Name	Origin[a]	Global Rarity Status[b]	Ontario Rarity Status[b]	SARA[c]	ESA[d]
Abies balsamea	Balsam fir	N	G5	S5	–	–
Acer negundo	Manitoba maple	(N)	G5	S5	–	–
Acer pensylvanicum	Striped maple	N	G5	S5	–	–
Acer rubrum	Red maple	N	G5	S5	–	–
Acer saccharinum	Silver maple	N	G5	S5	–	–
Acer saccharum	Sugar maple	N	G5	S5	–	–
Acer spicatum	Mountain maple	N	G5	S5	–	–
Actaea pachypoda	Doll's-eyes	N	G5	S5	–	–
Actaea rubra	Red baneberry	N	G5	S5	–	–
Ageratina altissima	White snakeroot	N	G5T5	S5	–	–
Agrostis gigantea	Red top	I	G4G5	SNA	–	–
Alisma triviale	Small-flowered water plantain	N	G5	S5	–	–
Alnus incana	Speckled alder	N	G5	S5	–	–
Amaranthus retroflexus	Redroot pigweed	I	GNR	SNA	–	–
Ambrosia artemisiifolia	Ragweed	N	G5	S5	–	–
Anemone virginiana	Tall thimbleweed	N	G5	S5	–	–
Antennaria neglecta	Field pussytoes	N	G5	S5	–	–
Aralia nudicalia)	Wild sarsaparilla	N	G5	S5	–	–
Arisaema triphyllum	Jack-in-the-pulpit	N	G5	S5	–	–
Asclepias syriaca	Common milkweed	N	G5	S5	–	–
Athyrium filix-femina	Lady fern	N	G5T5	S5	–	–
Betula alleghaniensis	Yellow birch	N	G5	S5	–	–
Betula papyrifera	White birch	N	G5	S5	–	–
Bidens cernua	Nodding beggar-ticks	N	G5	S5	–	–
Bidens frodosa	Beggar-ticks	N	G5	S5	–	–
Botrychium virginianum	Rattlesnake fern	N	G5	S5	–	–
Bromus ciliatus	Fringed brome	N	G5	S5	–	–
Bromus inermis	Smooth brome	I	GNR	SNA	–	–
Calamagrostis canadensis	Canada blue-joint	N	G5	S5		
Carex bebbii	Bebb's sedge	N	G5	S5	–	–
Carex communis	Common sedge	N	G5	S5	–	–
Carex flava	Yellow sedge	N	G5	S5	–	–
Carex intumescens	Bladder sedge	N	G5	S5	–	–
Carex lacustris	Lake sedge	N	G5	S5	–	–
Carex lasiocarpa	Wire sedge	N	G5	S5	–	–
Carex lupulina	Hop sedge	N	G5	S5	–	–
Carex pseudocyperus	Cyperus-like sedge	N	G5	S5	–	–
Carex spp.	Sedges	N	?	?	–	–
Carex utriculata	Bladder sedge	N	G5	S5	–	–
Carya cordiformis	Bitternut hickory	N	G5	S5	–	–
Centaurea stoebe	Spotted knapweed	I	GNR	SNA	–	–
Chenopodium album	Lamb's-quarters	I	G5T5	SNA	–	–
Circaea alpina	Dwarf enchanter's nightshade	N	G5	S5	–	–
Cirsium arvense	Canada thistle	I	GNR	SNA	–	–
Cirsium vulgare	Bull thistle	I	GNR	SNA	–	–
Clematis virginiana	Virgin's-bower	N	G5	S5	–	–
Clintonia borealis	Blue-bead lily	N	G5	S5	–	–
Conyza canadensis	Horseweed	N	G5	S5	–	–
Coptis trifolia	Goldthread	N	G5	S5	–	–
Cornus stolonifera	Red osier dogwood	N	G5	S5	–	–
Cystopteris bulbifera	Bulblet fern	N	G5	S5	–	–
Dactylis glomerata	Orchard grass	I	GNR	SNA	–	–
Danthonia spicata	Poverty oat-grass	N	G5	S5	–	–
Daucus carota	Wild carrot	I	GNR	SNA	–	–
Digitaria sanguinalis	Large crab-grass	I	G5	SNA	–	–
Doellingeria umbellata	Flat-topped aster	N	G5T5	S5	–	–
Echinochloa crusgalli	Barnyard grass	I	GNR	SNA	–	–
Echium vulgare	Viper's bugloss	I	GNR	SNA	–	–
Elodea canadensis	Canada waterweed	N	G5	S5	–	–
Elymus patula	Bottlebrush grass	N	G5	S5	–	–
Elymus repens	Quack grass	I	GNR	SNA	–	–
Epilobium parviflorum	Small-flowered willowherb	I	GNR	SNA	–	–
Epipactis helleborine	Helleborine	I	GNR	SNA	–	–

Plant Species List

Scientific Name	Common Name	Origin[a]	Global Rarity Status[b]	Ontario Rarity Status[b]	SARA[c]	ESA[d]
Equisetum scirpoides	Dwarf scouring-rush	N	G5	S5	–	–
Erigeron annus	Daisy fleabane	N	G5	S5	–	–
Erigeron philadelphicus	Philadelphia fleabane	N	G5	S5	–	–
Eupatorium perfoliatum	Boneset	N	G5	S5	–	–
Euphorbia esula	Leafy spurge	I	GNR	SNA	–	–
Euthamia graminifolia	Grass-leaved goldenrod	N	G5	S5	–	–
Eutrochium maculatum	Joe-Pye weed	N	G5	S5	–	–
Fragaria vesca	Woodland strawberry	N	G5	S5	–	–
Fragaria virginiana	Common strawberry	N	G5	S5	–	–
Fraxinus americana	White ash	N	G5	S5	–	–
Fraxinus nigra	Black ash	N	G5	S5	–	–
Fraxinus pennsylvanica	Green ash	N	G5	S5	–	–
Galium mollugo	White bedstraw	I	GNR	SNA	–	–
Galium palustre	Marsh bedstraw	N	G5	S5	–	–
Gaultheria hispidula	Creeping snowberry	N	G5	S5	–	–
Glyceria striata	Fowl meadowgrass	N	G5	S5	–	–
Gymnocarpium dryopteris	Oak fern	N	G5	S5	–	–
Hydrocharis morsus-ranae	Frogbit	I	GNR	SNA	–	–
Hypericum canadense	Canada St. John's-wort	N	G5	S4?	–	–
Hypericum ellipticum	Pale St. John's-wort	N	G5	S5	–	–
Hypericum perforatum	Common St. John’s-wort	I	GNR	SNA	–	–
Impatiens capensis	Spotted jewelweed	N	G5	S5	–	–
Juniperus communis	Common juniper	N	G5	S5	–	–
Lactuca serriola	Prickly lettuce	I	GNR	SNA	–	–
Laportea canadensis	Wood nettle	N	G5	S5	–	–
Leersia oryzoides	Rice cut-grass	N	G5	S5	–	–
Linnaea borealis	Twinflower	N	G5	S5	–	–
Lobelia kalmii	Kalm's lobelia	N	G5	S5	–	–
Lonicera canadensis	Fly-honeysuckle	N	G5	S5	–	–
Lonicera tatarica	Tartarian honeysuckle	I	GNR	SNA	–	–
Lycopus americana	American water horehound	N	G5	S5	–	–
Lycopus uniflorus	Northern water horehound	N	G5	S5	–	–
Lythrum salicaria	Purple loosestrife	I	G5	SNA	–	–
Malus sylvestris	Apple	I	GNR	SNA		
Maianthemum canadense	Canada mayflower	N	G5	S5	–	–
Maianthemum racemosum	False Solomon's-seal	N	G5	S5	–	–
Maianthemum trifolium	Three-leaved solomon's-seal	N	G5	S5	–	–
Matricaria discoidea	Pineapple-weed	I	G5	SNA	–	–
Matteuccia struthiopteris	Ostrich fern	N	G5	S5	–	–
Medicago lupulina	Black medick	I	GNR	S5	–	–
Medicago sativa	Alfalfa	I	GNR	S5	–	–
Melilotus alba	White sweet clover	I	G5	SNA	–	–
Melilotus officinalis	Yellow sweet-clover	I	GNR	SNA	–	–
Mitchella repens	Partridge-berry	N	G5	S5	–	–
Mitella nuda	Naked mitrewort	N	G5	S5	–	–
Myrica gale	Sweet gale	N	G5	S5	–	–
Oenothera biennis	Common evening-primrose	N	G5	S5	–	–
Onoclea sensibilis	Sensitive fern	N	G5	S5	–	–
Osmunda cinnamomea	Cinnamon fern	N	G5	S5	–	–
Osmunda regalis	Royal fern	N	G5	S5	–	–
Ostrya virginiana	Ironwood	N	G5	S5	–	–
Oxalis stricta	Upright wood-sorrel	N	G5	S5	–	–
Panicum capillare	Witch grass	N	G5	S5	–	–
Persicaria amphibium	Water smartweed	N	G5	S5	–	–
Persicaria maculosa	Lady's-thumb	I	G3G5	SNA	–	–
Petasites frigidus	Sweet coltsfoot	N	G5	S5	–	–
Phalaris arundinacea	Reed canary grass	N	G5	S5	–	–
Phleum pratense	Timothy	I	GNR	SNA	–	–
Physalis heterophylla	Clammy ground-cherry	N	G5	S4	–	–
Picea glauca	White spruce	N	G5	S5	–	–
Pilea pumila	Clearweed	N	G5	S5	–	–
Pinus strobus	White pine	N	G5	S5	–	–
Plantago lanceolata	Narrow-leaved plantain	I	G5	SNA	–	–

Plant Species List

Scientific Name	Common Name	Origin[a]	Global Rarity Status[b]	Ontario Rarity Status[b]	SARA[c]	ESA[d]
Plantago major	Common plantain	I	G5	SNA	–	–
Poa annua	Annual bluegrass	I	GNR	SNA	–	–
Poa compressa	Canada bluegrass	I	GNR	SNA	–	–
Poa palustris	Fowl bluegrass	N	G5	S5	–	–
Poa pratensis	Kentucky bluegrass	I	G5T5?	SNA	–	–
Polygonatum pubescens	Hairy Solomon's seal	N	G5	S5	–	–
Pontederia cordata	Pickerelweed	N	G5	S5	–	–
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	–	–
Prunella vulgaris	Heal-all	N	G5T5	S5	–	–
Prunus serotina	Black cherry	N	G5	S5	–	–
Pteridium aquilinum	Bracken	N	G5	S5	–	–
Quercus rubra	Red oak	N	G5	S5	–	–
Rhamnus cathartica	Common buckthorn	I	GNR	SNA	–	–
Rhus radicans	Poison ivy	N	G5	S5	–	–
Rhus typhina	Staghorn sumac	N	G5	S5	–	–
Ribes americana	American black currant	N	G5	S5	–	–
Ribes cynosbati	Prickly gooseberry	N	G5	S5	–	–
Ribes triste	Swamp red currant	N	G5	S5	–	–
Robinia pseudoacacia	Black locust	I	G5	SNA	–	–
Rubus allegheniensis	Mountain blackberry	N	G5	S5	–	–
Rubus canadensis	Smooth blackberry	N	G5	S4?	–	–
Rubus idaeus	Red raspberry	N	G5T5	S5	–	–
Rubus occidentalis	Black raspberry	N	G5	S5	–	–
Rubus pubescens	Dwarf raspberry	N	G5	S5	–	–
Rumex acetosella	Sheep sorrel	I	GNR	SNA	–	–
Rumex crispus	Curled dock	I	GNR	SNA	–	–
Salix bebbiana	Beaked willow	N	G5	S5	–	–
Salix discolor	Pussy willow	N	G5	S5	–	–
Salix humilis	Upland willow	N	G5	S5	–	–
Schedonorus pratensis	Meadow fescue	I	GNR	SNA	–	–
Scirpus atrovirens	Green bulrush	N	G5?	S5	–	–
Scutellaria galericulata	Marsh scullcap	N	G5	S5	–	–
Setaria faberi	Giant foxtail	I	GNR	SNA	–	–
Setaria pumila	Yellow foxtail	I	GNR	SNA	–	–
Solanum carolinense	Carolina nightshade	I	G5	SNA	–	–
Solanum dulcamara	Climbing nightshade	I	GNR	SNA	–	–
Solanum ptycanthum	Eastern black nightshade	N	G5	S5	–	–
Solidago canadensis	Canada goldenrod	N	G5T5	S5	–	–
Solidago juncea	Early goldenrod	N	G5	S5	–	–
Solidago nemoralis	Gray goldenrod	N	G5T5	S5	–	–
Solidago rugosa	Rough goldenrod	N	G5	S5	–	–
Sonchus asper	Spiny sow-thistle	I	GNR	SNA	–	–
Sparganium emersum	Green-fruited burreed	N	G5	S5	–	–
Symphyotrichum ciliolatum	Blue aster	N	G5	S5	–	–
Symphyotrichum cordifolium	Heart-leaved aster	N	G5	S5	–	–
Symphyotrichum lanceolatum	Panicled aster	N	G5T5	S5	–	–
Symphyotrichum lateriflorum	Calico aster	N	G5T?	S5	–	–
Symphyotrichum novae-angliae	New England aster	N	G5	S5	–	–
Taxus canadensis	Canada yew	N	G5	S4	–	–
Thelypteris noveboracensis	New York fern	N	G5	S4S5	–	–
Thelypteris palustris	Marsh fern	N	G5	S5	–	–
Thuja occidentalis	Eastern white cedar	N	G5	S5	–	–
Tilia americana	Basswood	N	G5	S5	–	–
Trientalis borealis	Starflower	N	G5	S5	–	–
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	–	–
Tsuga canadensis	Eastern hemlock	N	G4G5	S5	–	–

Plant Species List

Scientific Name	Common Name	Origin[a]	Global Rarity Status[b]	Ontario Rarity Status[b]	SARA[c]	ESA[d]
Typha latifolia	Common cattail	N	G5	S5	–	–
Typha latifolia	Common cattail	N	G5	S5	–	–
Ulmus americana	White elm	N	G5?	S5	–	–
Urtica dioica	Stinging nettle	N	G5T?	S5	–	–
Utricularia vulgaris	Common bladderwort	N	G5	S5	–	–
Verbascum thapsus	Common mullein	I	GNR	SNA	–	–
Verbena hastata	Blue vervain	N	G5	S5	–	–
Verbena stricta	Hoary vervain	N	G5	S4	–	–
Veronica officinalis	Common speedwell	I	G5	SNA	–	–
Vicia cracca	Cow-vetch	I	GNR	SNA	–	–
Viola pubescens	Yellow violet	N	G5T5	S5	–	–
Violet	Viola sp.	N	G5	S5	–	–
Vitis riparia	Riverbank grape	N	G5	S5	–	–
Zanthoxylum americanum	Prickly-ash	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

APPENDIX D

List of Wildlife

Higland Wildlife List

Common Name	*Scientific Name*	Origin[a]	Global Rarity Status[b]	Ontario Rarity Status[b]	SARA[c]	ESA[d]
Mammals						
Big brown bat	*Eptesicus fuscus*	N	G5	S5	—	—
Coyote	*Canis latrans*	N	G5	S5	—	—
Eastern chipmunk	*Tamias striatus*	N	G5	S5	—	—
Grey squirrel	*Sciurus carolinensis*	N	G5	S5	—	—
Hoary bat	*Lasiurus cinereus*	N		S5	—	—
Little brown myotis	*Myotis lucifugus*	N	G5	S4	—	END
Meadow vole	*Microtus pensylvanicus*	N	G5	S5	—	—
Muskrat	*Ondatra zibethicus*	N	G5	S5	—	—
Northern myotis	*Myotis septentrionalis*	N	G4	S3	—	END
Porcupine	*Erethizon dorsatum*	N	G5	S5	—	—
Red bat	*Lasiurus borealis*	N	G5	S4	—	—
Red fox	*Vulpes vulpes*	N	G5	S5	—	—
Red squirrel	*Tamiasciurus hudsonicus*	N	G5	S5	—	—
Silver-haired bat	*Lasionycteris noctivagans*	N	G5	S4	—	—
Striped skunk	*Mephitis mephitis*	N	G5	S5	—	—
Tri-colored bat	*Perimyotis subflavus*	N	G5	S3?	—	END
White-tailed deer	*Odocoileus virginianus*	N	G5	S5	—	—
Birds						
American Bittern	*Botaurus lentiginosus*	N	G5	S4B	—	—
American Crow	*Corvus brachyrhynchos*	N	G5	S5B, S5N	—	—
American Goldfinch	*Carduelis tristis*	N	G5	S4B	—	—
American Kestrel	*Falco sparverius*	N	G5	S5B	—	—
American Robin	*Turdus migratorius*	N	G5	S5B	—	—
American Woodcock	*Scolopax minor*	N	G5	S4B	—	—
Barn Swallow	*Hirundo rustica*	N	G5	S5	—	—
Black-and-white Warbler	*Mniotilta varia*	N	G5	S5B	—	—
Black-billed Cuckoo	*Coccyzus erythropthalmus*	N	G5	S5B	—	—
Black-capped Chickadee	*Poecile atricapilla*	N	G5	S4B	—	—
Blue Jay	*Cyanocitta cristata*	N	G5	S5B	—	—
Blue-headed Vireo	*Vireo solitarius*	N	G5	S5B	—	—
Canada goose	*Branta canadensis*	N	G5	S5	—	—
Cedar Waxwing	*Bombycilla cedrorum*	N	G5	S5B	—	—
Chestnut-sided Warbler	*Setophaga pensylvanica*	N	G5	S5B	—	—
Chipping Sparrow	*Spizella passerina*	N	G5	S5	—	—
Common Grackle	*Quiscalus quiscula*	N	G5	S4B	—	—
Common Raven	*Corvus corax*	N	G5	S4	—	—
Common Yellowthroat	*Geothlypis trichas*	N	G5	S5	—	—
Downy Woodpecker	*Picoides pubescens*	N	G5	S4B	—	—
Eastern Wood-Pewee	*Contopus virens*	N	G5	S4B	Special Concern	Special Concern
Great Blue Heron	*Ardea herodias*	N	G5	S5B	—	—
Great Crested Flycatcher	*Myiarchus crinitus*	N	G5	S5B	—	—
Green Heron	*Butorides virescens*	N	G5	S5	—	—
Hairy Woodpecker	*Picoides villosus*	N	G5	S5	—	—
Hermit Thrush	*Catharus guttatus*	N	G5	S5	—	—
Herring Gull	*Larus argentatus*	N	G5	S5B	—	—
Hooded Merganser	*Lophodytes cucullatus*	N	G5	S4B	—	—
Indigo Bunting	*Passerina cyanea*	N	G5	S5	—	—
Killdeer	*Charadrius vociferus*	N	G5	S5B	—	—
Magnolia Warbler	*Setophaga magnolia*	N	G5	S5B	—	—
Mallard	*Anas platyrhynchos*	N	G5	S5	—	—
Mourning Dove	*Zenaida macroura*	N	G5	S5B	—	—
Nashville Warbler	*Oreothlypisa ruficapilla*	N	G5	S5B	—	—
Northern Flicker	*Colaptes auratus*	N	G5	S4B	—	—
Ovenbird	*Seiurus aurocapilla*	N	G5	S4B	—	—
Pileated Woodpecker	*Dryocopus pileatus*	N	G5	S5B	—	—
Purple Finch	*Carpodacus purpureus*	N	G5	S4B	—	—
Red-breasted Nuthatch	*Sitta canadensis*	N	G5	S5B	—	—
Red-eyed Vireo	*Vireo olivaceus*	N	G5	S4	—	—

Higland Wildlife List

Common Name	*Scientific Name*	Origin[a]	Global Rarity Status[b]	Ontario Rarity Status[b]	SARA[c]	ESA[d]
Red-tailed Hawk	*Buteo jamaicensis*	N	G5	S4B	—	—
Red-winged Blackbird	*Agelaius phoeniceus*	N	G5	S5B	—	—
Rock Pigeon	*Columba livia*	I	G5	S5B	—	—
Rose-breasted Grosbeak	*Pheucticus ludovicianus*	N	G5	S5B	—	—
Ruffed Grouse	*Bonasa umbellus*	N	G5	S4B	—	—
Savannah Sparrow	*Passerculus sandwichensis*	N	G5	S4B	—	—
Scarlet Tanager	*Piranga olivacea*	N	G5	S5	—	—
Sharp-shinned Hawk	*Accipiter striatus*	N	G5	S5	—	—
Song Sparrow	*Melospiza melodia*	N	G5	S5B	—	—
Swamp Sparrow	*Melospiza georgiana*	N	G5	S4	—	—
Tree Swallow	*Tachycineta bicolor*	N	G5	S5	—	—
Turkey Vulture	*Cathartes aura*	N	G5	S4B	—	—
Veery	*Catharus fuscescens*	N	G5	S5B	—	—
Vesper Sparrow	*Pooecetes gramineus*	N	G4	S4B	—	—
Virginia Rail	*Rallus limicola*	N	G5	S5B, S5N	—	—
White-breasted Nuthatch	*Sitta carolinensis*	N	G5	SNA	—	—
White-throated Sparrow	*Zonotrichia albicollis*	N	G5	S5	—	—
Wild Turkey	*Meleagris gallopava*	N	G5	S5	—	—
Wilson's snipe	*Gallinago delicata*	N	G5	S5B	—	—
Winter Wren	*Troglodytes hiemalis*	N	G5	S5B	—	—
Yellow warbler	*Setophaga petechia*	N	G5	S5B, S5N	—	—
Yellow-bellied Sapsucker	*Sphyrapicus varius*	N	G5	S4	—	—
Yellow-rumped Warbler	*Setophaga coronata*	N	G5	S5B	—	—
Herpetiles						
Eastern gartersnake	*Thamnophis sirtalis*	N	G5T5	S5	—	—
Gray tree frog	*Hyla versicolor*	N	G5	S5	—	—
Green frog	*Lithobates clamatins*	N	G5	S5	—	—
Midland painted turtle	*Chrysemys picta*	N	G5T5	S5	—	—
Milksnake	*Lampropeltis triangulum*	N	G5	S4	Special Concern	—
Northern leopard frog	*Lithobates pipiens*	N	G5	S5	—	—
Spring peeper	*Pseudacris crucifer*	N	G5	S5	—	—
Wood frog	*Lithobates sylvatica*	N	G5	S5	—	—
Butterflies, Bumblebees, and Dragonflies						
Black swallowtail	*Papilio polyxenes*	N	G5	S5	—	—
Canada darner	*Aeshna canadensis*	N	G6	S6	—	—
Cabbage white	*Pieris rapae*	I	G5	SNA	—	—
Clouded sulphur	*Colias philodice*	N	G5	S5	—	—
Common eastern bumblebee	*Bombus impatiens*	N	G5	S5	—	—
Common green darner	*Anax junius*	N	G6	S6	—	—
Common ringlet	*Coenonympha tullia*	N	G5	S5	—	—
Dot-tailed whiteface	*Leucorrhinia intacta*	N	G5	S5	—	—
Dun skipper	*Euphyes vestris*	N	G5	S5	—	—
European skipper	*Thymelicus lineola*	I	G5	SNA	—	—
Mourning cloak	*Nymphalis antiopa*	N	G5	S5	—	—
Red admiral	*Vanessa atalanta*	N	G5	S5	—	—
Eastern tiger swallowtail	*Papilio glaucus*	N	G5	S5	—	—
White admiral	*Limenitis arthemis*	N	G5	S5	—	—
White-faced meadowhawk	*Sympetrum obtrusum*	N	G5	S5	—	—
Widow skimmer	*Libellula luctuosa*	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)

APPENDIX E

Species at Risk Screening

APPENDIX E
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 the Site	Probability of Occurrence in the Study Area	ESA Habitat Protection Provisions[6]
Amphibian	Western chorus frog Great Lakes St. Lawrence / Canadian Shield population	*Pseudacris triseriata*	—	THR	THR	G5TNR	S3	ORAA	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.	Moderate - the Study Area contains potentially suitable wetlands.	
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 are 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).	Low - none were observed during targeted surveys.	Moderate - the Study Areas appear to contain suitable areas that may support flowering plants and larval host plants (i.e. milkweed) for this species.	
Bird	Bank swallow	*Riparia riparia*	THR	THR	THR	G5	S4B	*OBBA*	In Ontario, bank swallow breeds in a variety of natural and anthropogenic habitats, including lake bluffs, stream and river banks, 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 - no suitable banks or bluffs are present at the Site and none were observed during targeted surveys.	Low - no suitable banks or bluffs appear to be present in the Study Area.	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
Bird	Barn swallow	*Hirundo rustica*	THR	THR	THR	G5	S4B	OBBA	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 right-of-ways, 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 1999).	High - individuals were observed foraging over the open habitats on the Site, however, no nesting structures occur.	High - individuals were observed during targeted surveys, and there are buildings that may be suitable nesting habitat within the Study Area.	General Category 1 – Nest Category 2 – Area within 5 m of the nest Category 3 – Area between 5-200 m of the nest
Bird	Bobolink	*Dolichonyx oryzivorus*	THR	THR	THR	G5	S4B	OBBA; NHIC	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, and the fallow fields on Site are not ideal habitat.	Moderate - the agricultural fields in the Study Area may be suitable nesting 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
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 - the forests in the Study Area may be suitable habitat for this species..	
Bird	Chimney swift	*Chaetura pelagica*	THR	THR	THR	G5	S4B, S4N	OBBA	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 - none were observed during targeted surveys and no suitable structures or large cavity trees for nesting were observed.	Moderate - there are a number of man-made structures in the Study Area that may provide suitable nesting habitat for this species.	General Category 1 – Human-made nest/roost, or natural nest/roost cavity and area within 90 m of natural cavity

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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 on Site during targeted surveys.	High - one foraging individual was observed outside of the Site but in the Study Area during targeted surveys.	
Bird	Eastern meadowlark	*Sturnella magna*	THR	THR	THR	G5	S4B	OBBA; NHIC	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 2003). They prefer well drained sites or slopes, and sites with different cover layers (Roseberry and Klimstra 1970)	Low - none were observed during targeted surveys.	High - an individual singing male was observed off-Site but within the Study Area during targeted surveys.	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
Bird	Eastern whip-poor-will	*Antrostomus vociferus*	THR	THR	THR	G5	S4B	OBBA	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 - none were observed during targeted surveys.	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
Bird	Eastern wood-pewee	*Contopus virens*	SC	SC	SC	G5	S4B	*OBBA*	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).	High - an individual male was observed singing on the Site during targeted surveys.	High - individuals were observed during targeted surveys.	
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 - the shrubby areas adjacent to forests in the Study Area may be suitable breeding habitat for this species.	
Bird	Grasshopper sparrow *pratensis* subspecies	*Ammodramus savannarum* (pratensis subspecies)	SC	SC	SC	G5	S4B	eBird	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 - the agricultural fields in the Study Area may be suitable nesting habitat.	
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 - none were observed during targeted surveys.	Moderate - wetlands in the Study Area may be suitable nesting habitat for this species.	General (as of June 30, 2013)
Bird	Olive-sided flycatcher	*Contopus cooperi*	SC	THR	SC	G4	S4B	eBird	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 - the forests in the Study Area may be suitable habitat for this species..	

APPENDIX E
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 the Site	Probability of Occurrence in the Study Area	ESA Habitat Protection Provisions[6]
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 also 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 2007).	Low - no suitable cliffs or tall structures are present.	Low - no suitable cliffs or tall structures are present.	
Bird	Short-eared owl	*Asio flammeus*	SC	SC	SC	G5	S2N,S4B	eBird	In Ontario, short-eared owl breeds in a variety of open habitats including grasslands, tundra, bogs, marshes, clearcuts, 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 - the agricultural fields and wetlands in the Study Area may be suitable nesting habitat.	
Bird	Wood thrush	*Hylocichla mustelina*	SC	THR	THR	G4	S4B	OBBA	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 - the forests in the Study Area may be suitable habitat for this species..	
Fish	American Eel	*Anguilla rostrata*	END	—	THR	G4	S1?	Range	In Ontario, American eel is native to the Lake Ontario, St. Lawrence River and Ottawa River watersheds. Their current distribution includes lakes Huron, Erie, and Superior and their tributaries. The Ottawa River population is considered extirpated. The preferred habitat of the American eel is cool water of lakes and streams with muddy or silty substrates in water temperatures between 16 and 19°C. The American eel is a catadromous fish that lives in fresh water until sexual maturity then migrates to the Sargasso Sea to spawn (Burridge et al. 2010; Eakins 2016).	Low - surface water features on the Site do not appear to be suitable.	Low - surface water features in the Study Area do not appear to be suitable habitat for this species.	General (as of June 30, 2013)
Fish	Lake sturgeon - Great Lakes / Upper St.Lawrence population	*Acipenser fulvescens*	END	—	THR	G3G4TNR	S2	Range	In Ontario, lake sturgeon, a large prehistoric freshwater fish, is found in all the Great Lakes and in all drainages of the Great Lakes and of Hudson Bay. This species typically inhabits highly productive shoal areas of large lakes and rivers. They are bottom dwellers, and prefer depths between 5-10 m and mud or gravel substrates. Small sturgeons are often found on gravelly shoals near the mouths of rivers. They spawn in depths of 0.5 to 4.5 m in areas of swift water or rapids. Where suitable spawning rivers are not available, such as in the lower Great Lakes, they are known to spawn in wave action over rocky ledges or around rocky islands (Golder 2011).	Low - surface water features on the Site do not appear to be suitable.	Low - surface water features in the Study Area do not appear to be suitable habitat for this species.	General
Fish	River redhorse	*Moxostoma carinatum*	SC	SC	SC	G4	S2	Range	In Ontario, river redhorse is known to occur in the Mississippi River, Ottawa River, Madawaska River, Grand River, Trent River, and Thames River systems. They inhabit moderate to large rivers. The majority of their time is spent in pool habitats with slow-moving water and abundant vegetation. Spawning occurs in areas of shallow, moderate to fast-flowing waters in riffle-run habitats with coarse substrates of gravel and cobble (DFO 2011).	Low - surface water features on the Site do not appear to be suitable.	Low - surface water features in the Study Area do not appear to be suitable habitat for this species.	
Lichen	Pale-bellied frost lichen	*Physconia subpallida*	END	END	END	GNR	S2S3	MECP	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-hornbream. This lichen has also been found growing on fence rails and rocks (Lewis 2011).	Low - this species was not observed during targeted surveys.	Moderate - this species may be present within the forested portions of the study area.	

APPENDIX E
Species at Risk Screening

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Mammal	Eastern small-footed myotis	*Myotis leibii*	END	—	—	G4	S2S3	BCI	This species is not known to roost within 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. It occasionally inhabits buildings. Areas near the entrances of caves or abandoned mines may be used for hibernaculum, where the conditions are drafty with low humidity, and may be subfreezing (Humphrey 2017)	Low - None were identified during acoustic surveys.	Low - suitable habitat was not identified within the Study Area.	General
Mammal	Little brown myotis	*Myotis lucifugus*	END	END	END	G3	S4	BCI	In Ontario, this specie's 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 - confirmed using the Site for foraging during targeted surveys.	Moderate - potentially suitable forested habitats are present in the Study Area, and may contain potential maternity roost trees.	General
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).	High - confirmed using the Site for foraging during targeted surveys.	Moderate - potentially suitable forested habitats are present in the Study Area, and may contain potential maternity roost trees.	General
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).	High - confirmed using the Site for roosting and foraging during targeted surveys.	Moderate - potentially suitable forested habitats are present in the Study Area, and may contain potential maternity roost trees.	General
Reptile	Blanding's turtle Great Lakes / St. Lawrence population	*Emydoidea blandingii*	THR	THR	END	G4	S3	NHIC	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).	Moderate - although this species was not observed on the Site during targeted surveys, Category 2 and Category 3 habitat are present based on known occurrences of this species in the local landscape.	High - there are records of this species in the local landscape.	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
Reptile	Eastern ribbonsnake Great Lakes population	*Thamnophis sauritius*	SC	SC	SC	G5	S4	ORAA	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 - wetlands bordered by dense vegetation appears to be present in the Study Area.	
Reptile	Northern map turtle	*Graptemys geographica*	SC	SC	SC	G5	S3	Range	In Ontario, the 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 large bodies of water are present and none were observed during targeted surveys	Moderate - suitable open water habitat may be present in the Study Area.	

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Reptile	Snapping turtle	*Chelydra serpentina*	SC	SC	SC	G5	S3	ORAA	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).	Low - none were observed during targeted surveys.	Moderate - this species may utilize a range of aquatic habitats, such as those in the Study Area.	
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.	Moderate - shallow water habitats in the Study Area may provide suitable habitat for this species.	
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 glaciary origin that have a neutral pH (ECCC 2018).	Low - none were observed during targeted surveys.	Moderate - potentially suitable forested habitats are present in the Study Area.	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
Vascular Plant	Black Ash	*Fraxinus nigra*	END	—	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).	High - observed during site investigations.	Moderate - suitable habitats are present in the Study Area.	No protection until Jan 2024 per temporary suspension order
Vascular Plant	Butternut	*Juglans cinerea*	END	END	END	G4	S2?	NHIC	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 at the Site or within 50m of the Site.	Moderate - this species may be present within the treed and open areas of the Study Area.	General (as of June 30, 2013)

Notes:

[1] Endangered Species Act (ESA), 2007 (O.Reg 242/08 last amended 27 March 2018 as O.Reg 219/18). Species at Risk in Ontario List, 2007 (O.Reg 230/08 last amended 1 Aug 2018 as O. Reg 404/18, s. 1.); 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 21 May 2019); 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 2017.

[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.

General References:

[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

Committee on the Status of Endangered Wildlife in Canada (COSEWIC). 2017. Status Reports. COSEWIC. Available from: http://www.cosewic.gc.ca/eng/sct2/index_e.cfm

Environment and Climate Change Canada (ECCC). 2018. Species at Risk Public Registry. Available: http://www.registrelep-sararegistry.gc.ca/sar/index/default_e.cfm

Fisheries and Oceans Canada (DFO). 2017. Aquatic Species at Risk. Available at: http://www.dfo-mpo.gc.ca/species-especes/index-eng.htm

Oldham, M.J., and S.R. Brinker. 2009. Rare Vascular Plants of Ontario, Fourth Edition. Natural Heritage Information Centre, Ontario Ministry of Natural Resources. Peterborough, Ontario. 188 pp.

Ontario Ministry of Natural Resources and Forestry (MNRF). 2017. Species at Risk in Ontario List. Queen's Printer for Ontario. Available at: https://www.ontario.ca/environment-and-energy/species-risk-ontario-list

Ontario Ministry of Natural Resources (MNR). 2000. Significant Wildlife Habitat Technical Guide (SWHTG). 151 pp.

APPENDIX F

Curriculum Vitae

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

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.

Employment History

Golder Associates Ltd. – 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

Golder Associates Ltd. – 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

golder.com