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TECHNICAL REPORT

Natural Environment Report

Proposed West Carleton Quarry Extension, City of Ottawa, Ontario

Submitted to:

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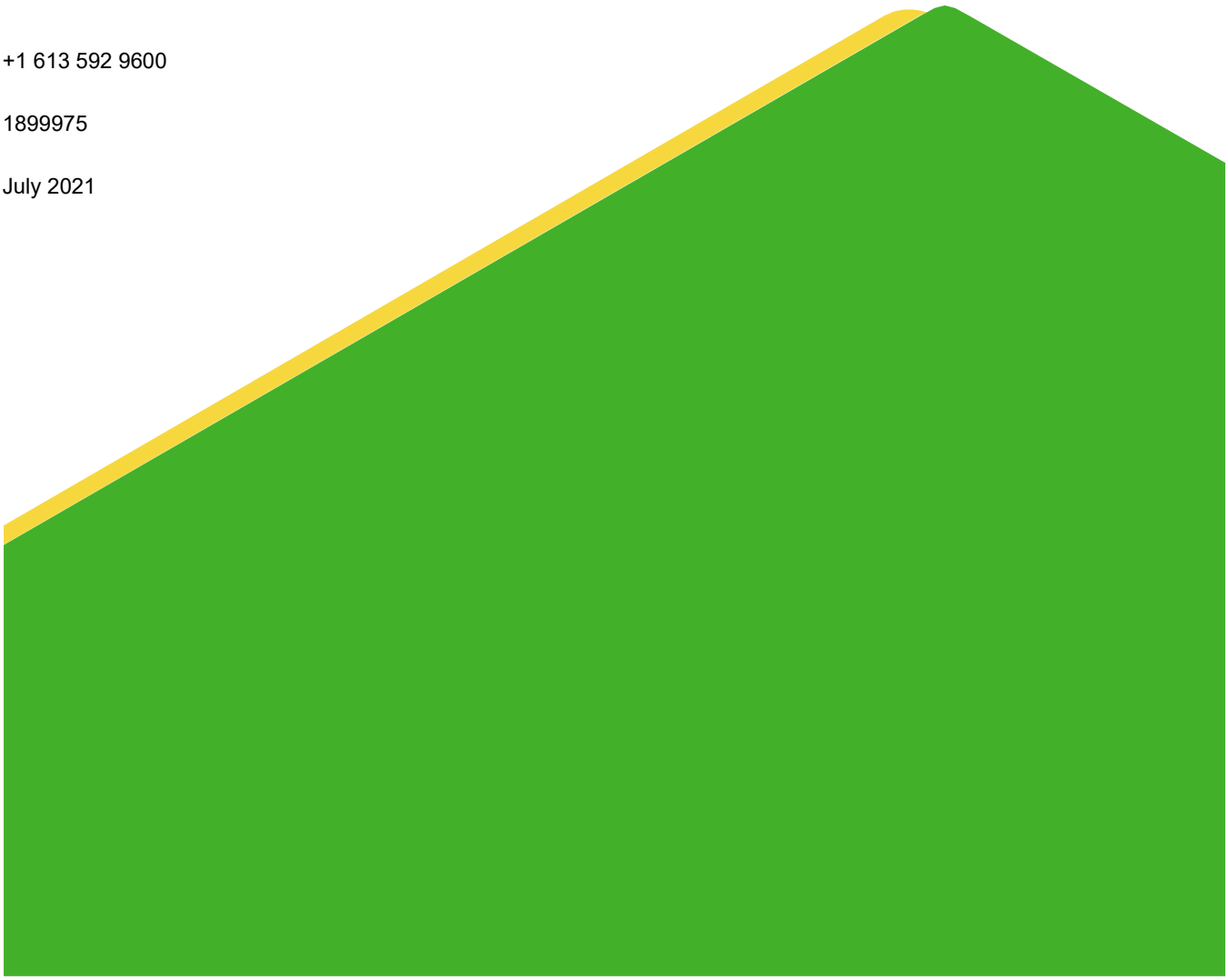

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1.0 INTRODUCTION

Golder Associates Ltd. (Golder) has been retained by Thomas Cavanagh Construction Limited (Cavanagh) to undertake natural environment studies to accompany the application for a Category 2 Class 'A' Quarry Below Water under Ontario Regulation 244/97 of the *Aggregate Resources Act* (ARA); Ontario 1990a) for the proposed extension to the West Carleton Quarry, located on Part Lot 15, Concession 11, Former Geographic Township of Huntley, City of Ottawa, Ontario (the Site; Figure 1).

1.1 Purpose

This report specifically addresses the requirements of a Section 2.2 (Natural environment report) of the Aggregate Resources of Ontario: Technical reports and information standards (Ontario August 2020). This Natural Environment Report (NER) assessment is also meant to satisfy the City of Ottawa (the City) Official Plan requirements for an Environmental Impact Statement (EIS; Ottawa 2015).

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

Site – The total land area owned by Cavanagh that is proposed for licensing under the ARA [18.2 hectares (ha); Figure 1].

Extraction Limit – The total area within the Site proposed for extraction (16.5 ha; Figure 1). This area represents the area of the Site less a 30 metre (m) setback along March Road to the north, and 15 m setback along the western boundary. There will be no setback adjacent to the existing West Carleton Quarry.

Study Area – The Study Area for the NER assessment is defined in the Aggregate Resources of Ontario: Technical reports and information standards (Ontario August 2020) as the Site and surrounding 120 m. The potential incremental drawdown cone resulting from extraction of the Site, where it extends beyond the 120 m, has been included as part of the Study Area (Figure 1).

The purpose of this report is to assess potential impacts to natural heritage features as a result 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 March Road, west of Upper Dwyer Hill Road, abutting the existing Cavanagh West Carleton Quarry immediately to the east, in the City of Ottawa (Figure 1). The Site consists of coniferous and mixed forests, unevaluated wetlands, small meadows, roads and unvegetated disturbed areas, as well as a gravel strip running along the western boundary of the Site that provides access by Ontario Provincial Police to a shooting range just south of the Site (also on Cavanagh lands). There is a large earth berm on either side of the access road leading to the shooting range. The Site overlaps a portion of the Burnt Lands Alvar life science area of natural and scientific interest (ANSI).

1.2.1 Adjacent Land Use

Surrounding land uses off-Site in the Study Area include existing licenced Cavanagh aggregate extraction operations to the east and south (West Carleton Quarry), March Road and forest to the north, and natural areas to the west comprising a portion of the Burnt Lands Provincial Park and Area of Natural and Scientific Interest (ANSI). As noted, the Burnt Lands Alvar ANSI includes most of the Site, and extends over much of the landscape surrounding the Site, excluding the existing quarry operation and the remaining Cavanagh lands abutting Upper Dwyer Hill Road. The lands beyond the Study Area include quarry, forests, wetlands [including Provincially Significant Wetlands (PSW)], meadows, alvar, agriculture and rural residential properties.

2.0 ENVIRONMENTAL POLICY CONTEXT

The Site is located in the City of Ottawa. Documents reviewed to gain an understanding of the natural heritage features and regulations that are relevant to the Site and Study Area consisted of the following:

- The ARA (Ontario 1990a) Aggregate Resources of Ontario: Technical reports and information standards (Ontario August 2020) – Category 2 – Class 'A' Quarry Below Water;
- The Provincial Policy Statement (PPS; MMAH 2020);
- The *Fisheries Act* (Canada 1995);
- The *Migratory Birds Convention Act* (Canada 1994);
- The *Species at Risk Act* (Canada 2002);
- The *Endangered Species Act* (Ontario 2007);
- City of Ottawa Official Plan (Ottawa 2003); and,
- The Mississippi Valley Conservation Authority (MVCA) 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 2.6.

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 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* (Canada 1985), work in and near water must comply with the fish and fish habitat protection provisions of the *Fisheries Act* by incorporating measures to avoid (DFO 2019):

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

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

2.4 Migratory Birds Convention Act

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

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. As of June 30, 2008, the Species at Risk Ontario (SARO) list is contained in O. Reg. 230/08.

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

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

2.6 City of Ottawa

The Site and the Study Area to the north, west and south are identified as Natural Environment Area on Schedule A (Rural Policy Plan) of the City of Ottawa Official Plan (Ottawa 2003), and as Natural Heritage System on Schedule L3 (Natural Heritage System Overlay – West). The existing aggregate extraction operation to the east is identified as Bedrock Resource Area. An official plan amendment and a zoning amendment will be required to permit aggregate extraction on the Site.

The Site also lies within Area 406 identified within the Natural Areas Systems Strategy (NESS), which was prepared as part of a planning exercise undertaken by the former Regional Municipality of Ottawa-Carleton (White 1997). The NESS was foundational in the development of the City's Natural Environment Area designation.

2.7 Mississippi Valley Conservation Authority (MVCA)

The Study Area is located within the jurisdiction of the MVCA. Although there are wetlands on the Site that are not currently mapped as regulated by the MVCA (MVCA 2018a), if they are 0.5 ha or larger in size, or they are hydraulically connected to other surface water features, they will be considered to be regulated. There appear to be wetlands on the Site that are regulated by the MVCA (MVCA 2018a), since they are hydraulically connected to other surface water features.

3.0 PROPOSED QUARRY DEVELOPMENT AND REHABILITATION

The development of the Site is anticipated to occur simultaneously with the operation of the existing adjacent West Carleton Quarry and will ultimately be operated as one combined extraction area. To remain consistent with the development plan for the existing West Carleton Quarry, the Site would be extracted in a series of five lifts to a final base elevation of 107 m above sea level (ASL). The various lifts may be operated simultaneously depending on rock quality and market demand. It is anticipated that any water collecting within the excavation on the Site will flow by gravity into the existing West Carleton Quarry. The existing West Carleton Quarry has a Permit to Take Water (PTTW) Number 4175-AB4RS4 that authorizes dewatering of the extraction area and an Environmental Compliance Approval (ECA) Number 5863-6TSPZ3 that authorizes discharge of water off-site.

Following the completion of site operations, the proposed rehabilitation of the Site involves backfilling to existing ground surface. As per the ARA site plans, the existing West Carleton Quarry to the east and south of the Extension Lands will be rehabilitated as a lake. Along these boundaries, 2:1 slopes down to the lake will be constructed and some shallow littoral zones will be created along the lake edge.

During progressive and final rehabilitation, the backfilled portion of the site including the above water slopes will be seeded with a mix of grasses and forbs consisting of non-invasive species to prevent erosion. Examples of

suitable species of grass and forbs include, but are not limited to, Kentucky bluegrass (*Poa pratensis*), creeping red fescue (*Festuca rubra*), perennial ryegrass (*Lolium perenne*) and white clover (*Trifolium repens*). Native species will be also included in the seed mix, such as black-eyed susan (*Rudbeckia hirta*), New England aster (*Symphyotrichum novae-angliae*), Canada wild rye (*Elymus canadensis*) and little bluestem (*Schizachyrium scoparium*) (as available from suppliers). Final rehabilitation will include the creation of shallow littoral zones at select locations where the slopes from the Site meet the rehabilitated lake level in the existing West Carleton Quarry to create more diverse aquatic habitat. Shallow emergent marsh vegetation will be planted in water +/- 0.15 m deep and extend +/-5 m from the shore and will be interspersed with cover structures (e.g., boulders and root wads). In addition, basking logs, woody debris and nesting platforms will be installed for wildlife habitat.

Nodal plantings will also be completed within selected areas around the lake and will include edge, submergent and emergent species such as red-osier dogwood (*Cornus stolonifera*), slender willow (*Salix petiolaris*) and herbaceous plants such as water plantain (*Alisma triviale*), lake sedge (*Carex lacustris*), swamp milkweed (*Asclepias incarnata*), softstem bulrush (*Schoenoplectus tabernaemontani*) and common cattail (*Typha latifolia*).

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:

- Online Make-A-Map Natural Heritage Explorer maintained by the MNRF (MNRF 2019a)
- Information request from the Natural Heritage Information Centre Database (NHIC, received May 2019)
- Land Information Ontario (LIO) geospatial data (MNRF 2019b)
- Species at Risk Public Registry (ECCC 2019)
- Species at Risk in Ontario (SARO) List (MNRF 2019c)
- DFO Aquatic Species at Risk Maps (DFO 2018)
- Breeding Bird Atlas of Ontario (OBBA) (Cadman et al. 2007)
- Atlas of the Mammals of Ontario (Dobbyn 1994)
- Ontario Reptile and Amphibian Atlas (Ontario Nature 2019)
- Bat Conservation International (BCI) range maps (BCI 2019)
- Ontario Butterfly Atlas (Jones et al. 2019)
- eBird species maps (eBird 2019)
- City of Ottawa Official Plan (Ottawa 2003)
- Natural Area Data and Evaluation Record for the Natural Environment Systems Strategy for the Regional Municipality of Ottawa-Carleton (White 1997)
- MVCA regulation limit mapping (MVCA 2018a)
- Aerial imagery

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 in November 2018 (Appendix A). A response was received in April 2019, and the information provided was incorporated in this report and is provided in Appendix A.
A pre-consultation meeting was held with the City of Ottawa on December 14, 2020, and comments received during that discussion on the Terms of Reference for this report were incorporated into this report, as appropriate.

4.2 SAR Screening

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

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

Searches were conducted during field surveys for suitable habitats and signs of all SAR identified through the desktop screening. If the potential for the species to occur at the Site and in the Study Area was moderate or high, 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). Some field surveys were completed in the Study Area where land access was granted (e.g., public roadside). 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 2015, 2017, 2018 and 2019

Year	Date	Type of Survey
2015	17 June	Breeding Birds, Plant Community Assessment and Botanical Inventory, Wildlife Habitat, Visual Encounter Survey (VES)
	2 July	Breeding Birds, VES
	21 August	Plant Community Assessment and Botanical Inventory, Wildlife Habitat, VES
2017	30 August	Site visit with MNRF to review plant communities on the Site
	12 October	Site visit with MNRF to review plant communities on the Site
2018	23 April	Snake and Turtle (Reptile) Survey #1, VES
	26 April	Anuran Point Count #1
	1 May	Reptile Survey #2, VES
	11 May	Reptile Survey #3, Plant Community Assessment and Botanical Inventory, VES
	17 May	Reptile Survey #4, Anuran Point Count #2, Plant Community, VES
	24 May	Eastern Whip-poor-will (EWPW) Survey #1, Crepuscular Survey, Turtle Nesting Survey
	2 June	Reptile Survey # 5, EWPW Survey #2, Crepuscular Survey, Turtle Nesting
	21 June	Bat Detectors Set Up, EWPW Survey #3, Crepuscular Survey, Turtle Nesting, Plant Community Assessment and Botanical Inventory, VES
	5 July	Plant Community Assessment and Botanical Inventory, VES
	18 August	Plant Community Assessment and Botanical Inventory, VES
	20 September	Plant Community Assessment and Botanical Inventory, VES
2019	4 February	Deeryard Survey
	6 March	Deeryard Survey

4.4 Plant Community Assessment and Botanical Surveys

4.4.1 Ecological Land Classification

Ecological land classification (ELC) mapping and data in the Site were gathered in 2015 and 2018 surveys according to standard protocols (Lee et al. 1998). ELC was completed over two visits in 2015 (spring and late summer) and three visits in 2018 (spring, early summer, and late summer) to capture seasonal variability in the dominant plant forms. ELC mapping of the Study Area was completed through interpretation of aerial imagery, and observations made from public access points (e.g., roadside) and from the edge of the Site.

4.4.2 Botanical Inventory

A botanical inventory was completed concurrent with the 2015 and 2018 plant community assessments, with a running list compiled of all plants encountered on the Site. An effort was made to search for SAR, provincially rare plants (ranked as S1 to S3 by NHIC), as well as food plants for any SAR insects. Regional rarity of plants follows Brunton (2005). Incidental information on plant species was also collected during all field surveys.

4.4.3 Wetlands

On-Site wetlands were delineated and classified using the protocols of the Ontario Wetland Evaluation System (OWES; MNRF 2014a) by a certified wetland evaluator.

4.5 Wildlife and Wildlife Habitat Surveys

4.5.1 Herpetile Surveys

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

Following the Occurrence Survey Protocol for Blanding's Turtle (*Emydoidea blandingii*) in Ontario (Ontario 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 salamander and frog egg mass surveys during the April/May field surveys (wading through wetland areas searching for egg-masses), as well as 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 in 2015 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. Given that the habitats at the Site did not change since those surveys were completed, no repeat of the breeding bird surveys were completed in 2018. However, during all surveys that overlapped the breeding bird season (late May to early July), any birds heard or seen were noted.

During all field surveys, VES for bird species not well covered by point count surveys, such as raptors, were completed, and all bird observations were documented.

4.5.2.1 Eastern Whip-poor-will

Eastern whip-poor-will (*Caprimulgus vociferus*) is known to occur in the local landscape surrounding the Site (eBird, 2018). Surveys for this species were conducted over three nights from late May to late June, following MNRF protocols (MNRF 2014b). These surveys took place 30 minutes after sunset within 10 days on either side of the full moon, on relatively clear nights with little wind.

When an eastern whip-poor-will was heard at a specific survey station, an azimuth of the calling bird was noted, using a compass. Additional azimuths to the specific calling eastern whip-poor-will were taken at several locations within 50-100 m of each station, for greater accuracy of triangulation.

Data collected during the surveys were used to triangulate the approximate locations of calling eastern whip-poor-will. This information was then used to map habitat as described in the General Habitat Description (Ontario 2013b). According to the General Habitat Description: Category 1 habitat is the location of a nest or the area within 20 m of the nest; Category 2 includes the area between 20 m and 170 m from the nest, or from the centre of approximated defended territory; and Category 3 includes the area of suitable habitat between 170 m and 500 m of the nest or from the centre of approximated defended territory.

As searching for individual nests is difficult, risky to the nest, and not recommended by the MNRF, Category 1 habitat was not searched for. The centre of approximated defended territory was determined by using the centroid of triangulated locations of individual eastern whip-poor-will. Data from all three surveys were used to determine these locations. The centroids and survey stations are show on Figure 2 and are the basis for the habitat mapping.

Surveys for crepuscular species [e.g., common nighthawk (*Chordeiles minor)* and short-eared owl (*Asio flammeus*)] were also conducted on the same days, but earlier in the evening (around dusk).

4.5.3 Mammal Surveys

4.5.3.1 Bat Surveys

Bat surveys were conducted on the Site between late May and early July 2018. These surveys included a daytime habitat assessment (e.g., searching for suitable roosting habitat, such as trees with cavities, loose bark or clumps of dead leaves) and acoustic bat surveys. Two acoustic bat detectors (Wildlife Acoustics) were deployed on the Site. Each station was located to provide coverage and target areas where bats would most likely be roosting, commuting or feeding. The U1 microphones were programmed to record from 30 minutes before sunset to 30 minutes after sunrise. Sonobat Data Wizard was used to attribute file names and scrub the data set of noise files. The high-grade noise scrubber setting was used. The data were analyzed and auto-classified using SonoBat 4.2.1 nnE. The Sonobat program is specifically intended for discrimination of bats to the species level wherever possible, and validation of the species-level classification was conducted by Golder's bat acoustic specialist. The results of the species classification were tallied on a per-night basis for each station for each species or species group. Once automated classification was complete, all high frequency files and a percentage of low frequency files were reviewed (QA/QC'd) by an experienced and qualified bat acoustic specialist using the SonoVet tool.

4.5.3.2 Winter Deeryard Surveys

Winter deeryard surveys were performed on two different locations when snow depths in open areas on the Site were 40 cm or greater, and involved a biologist performing a wandering transect through treed areas of the Site. The surveys were timed to occur as soon as possible after a snowfall to allow for easy identification of tracks, and to quantify use by deer since the last snowfall. Any evidence of use by deer (tracks, trails, scat, bed or browse) was recorded, and an estimate of number of individuals was made, where possible.

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., tracks, scats, hair, tree scrapes, etc.) were identified to a species, if possible, and recorded.

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 site investigations to published resources as described in Section 3.1, 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 2015).

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.

5.0 EXISTING CONDITIONS

5.1 Ecosystem Setting and Regional Context

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

The Study Area lies within the Smith's Falls Limestone Plain physiographic region in an area dominated by limestone plain, with areas of clay plain and peat / muck to the east (Chapman and Putnam 1984). The limestone plains are characterized by thin soils over limestone bedrock.

The Study Area is located within the Mississippi Valley River watershed, specifically the Lower Mississippi Off-Shield subwatershed. This subwatershed is characterized by 71% forest cover, 10% wetland cover and has been graded 'B' level (fair) for surface water quality (MVCA 2018b). The Site is located in the Ottawa West planning area that has been identified by the City for the purposes of determining significance of woodlands. Forest cover in the Ottawa West planning area is 38.4% (Ottawa November 2018).

5.2 Hydrology and Hydrogeology

The existing West Carleton Quarry and the Site drain east to the Manion Corners Long Swamp Wetland Complex, which forms part of the Cody Creek Watershed (Golder 2021). Cody Creek has a watershed area of approximately 104 square kilometres (km^2). Cody Creek flows northwards to its confluence with the Mississippi River near Pakenham.

Based on available groundwater level data from monitoring wells and water supply wells, the water table in the vicinity of the proposed extension is interpreted to be within the bedrock between 0.5 m to 4 m below the bedrock surface (Golder 2021). At most locations, the water table is at least 2 m below ground surface. During wet times of the year, it is expected that water would be found at the overburden/bedrock interface (i.e., perched on top of the lower hydraulic conductivity bedrock) (Golder 2021). The measured hydraulic gradients in the vicinity of the Site are typically downward (i.e., recharging conditions) (Golder 2021). Local surface water features and seasonally wet areas in the vicinity of the Site are not interpreted to be supported by significant groundwater

discharge (Golder 2021). The local water features are interpreted to be primarily surface water fed with limited groundwater input (Golder 2021). The predicted zone of incremental drawdown in the water table (1 m) is illustrated on Figure 1.

5.3 Surface Water Resources

Surface water features on the Site are limited to ditches along access roads, flooding in disturbed areas, and unevaluated wetlands. Water pools and/or flows through these features during freshet, but based on observations during the 2018 field surveys, they were almost dried up with no flow by the end of April.

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 and coniferous forest, small unevaluated wetlands, small meadows, and disturbed (unvegetated) areas. Some areas are in various stages of regeneration from recent disturbance. The Study Area includes the Site, plus additional forest, active aggregate extraction, alvar communities in Burnt Lands Provincial Park, and small wetland pockets.

During the field surveys conducted on Site, four upland plant communities were identified based on the ELC system (Lee et al. 1998), and four wetland communities were identified based on the OWES system (MNRF 2014a), in addition to disturbed areas. No rare plant communities were identified, although a few individual and scattered plants that are known to occur in alvars were identified. Based on a review of imagery and a letter from MNRF plant specialist Wasyl Bakowsky dated October 23, 2017, it is possible alvar occurred on or near the Site historically, prior to agricultural settlement, however; there was no evidence that alvar existed on the Site in recent years. Plant communities are shown on Figure 1 and are described in Table 2 and Table 3.

Table 2: Upland Plant Communities on the Site

Plant Community	Description	SRANK[a]
TERRESTRIAL		
CUM1-1 Mixed Meadow	This community includes several small meadows and habitat edges throughout the Site. These areas are a mix of remnant old fields (likely post-agriculture) and regenerating disturbed areas. Dominant plants include a mix of grasses and forbs such as Timothy (*Phleum pretense*), poverty oat grass (*Danthonia spicata),* gray goldenrod (*Solidago nemoralis*), and asters (*Symphyotrichum* spp.). There are scattered shrubs and seedling/sapling trees throughout. There are occasional common alvar/limestone bedrock associated species such as wiry panic grass (*Panicum flexile),* and it is possible that historically some areas were alvars or alvar-like, prior to agricultural settlement.	N/A
FOC2-2 Dry to Fresh White Cedar-White Spruce Coniferous Forest	This community is a semi-mature forest near the eastern edge of the Site. The canopy is open to partially open and is dominated by white cedar (*Thuja occidentalis*) and white spruce (*Picea glauca*), with the occasional deciduous associate such as trembling aspen (*Populus tremuloides*). The understory and groundcover ranges from sparse to moderate with a mix of shrubs, grasses, and forbs such as sweet blueberry (*Vaccinium angustifolium*), wild sarsaparilla (*Aralia nudicaulis*), and ivory sedge (*Carex eburnea*). There are occasional openings throughout due to a mix of relatively shallow bedrock and historic disturbance. Downed woody debris is occasional and snags and cavity trees are rare.	N/A
FOC4-3 Fresh to Moist White Cedar-Balsam Fir-White Spruce Coniferous Forest	This community is a small patch of semi-mature forest near the middle of the Site. The canopy is partially closed and is dominated by white cedar and white spruce with associates such as white pine and balsam fir. The understory and groundcover ranges from sparse to moderate with a mix of small trees, shrubs, grasses, and forbs such as balsam fir, common buckthorn (*Rhamnus cathartica*), and Canada mayflower (*Maianthemum canadense*). The soil is moist in some areas, due to shallow soils, and moss is abundant. Downed woody debris is occasional and snags and cavity trees are rare.	N/A
FOM4-2 Dry to Fresh White Cedar-White Spruce-Poplar Mixed Forest	This community consists of two areas of semi-mature forest at the northern and southern edges of the Site. The canopy is partially open and is dominated by white cedar, white spruce, and trembling aspen, with associates such as balsam fir, white birch (*Betula papyrifera*), and white pine. The understory and groundcover ranges from sparse to moderate with a mix of small trees, shrubs, grasses, and forbs such as balsam fir, poison ivy (*Rhus radicans*), bracken (*Pteridium aquilinum),* common sedge (*Carex communis*), and large-leaved aster (*Eurybia macrophylla*). There are occasional openings throughout due to relatively shallow soil, or historic disturbance. There is the occasional low, poorly drained area where moisture tolerant species occur, that are too small to be mapped as separate communities. Downed woody debris is occasional and snags and cavity trees are rare.	N/A
ANTHROPOGENIC		
DIST - Disturbed	This community includes roadways and other areas where soil has been stripped. There is a mix of bare soil and bedrock. Some plants do occur in these areas but are primarily “waste area” alien species such as lamb’s-quarters (*Chenopodium album*) and colt’s-foot (*Tussilago farfara*).	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 2015). 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.

Table 3: Wetland Plant Communities on the Site

Wetland Unit	Dominant Forms	Dominant Species	Description
lsS1	ls, re, ts c	*Rhamnus frangula*, *Rhamnus alnifolia*, *Cornus stolonifera, Scirpus cyperinus, Typha latifolia, Thuja occidentalis*, *Picea glauca*	Relatively open portion of mineral swamp at the northern edge of Site. This community has more open water in spring than the rest of wetlands on the Site, including some pooling and small channels of water. It has a notable component of marsh plant forms, although overall it is swamp. Soils are a moderate layer of organics over silt and rock.
dcS2	dc, ts, c, ls	Dead *Thuja occidentalis, Rhamnus frangula, Salix spp., Thuja occidentalis, Picea glauca, Fraxinus nigra, Cornus stolonifera, Rhamnus alnifolia.*	Continuation of lsS1 southeast into the Site. This community is dominated by dead and dying conifers and tall shrubs interspersed with live shrubs and scattered live conifers. Some shallow surface water flooding occurs in early spring, with low visible flow present that dries up by late spring/early summer. Soils are a thin layer of organic over sandy loam, silt, and rock, including bedrock.
CS3	c, ts, gc, m	*Picea glauca, Thuja occidentalis, Rhamnus frangula, Salix spp., Fraxinus pennsylvanica, Rubus pubescens, Lythrum salicaria*, mosses	A relatively dry band of swamp adjacent to lsS1 and dcS2. This community is dominated by conifer trees and transitions to a larger forest off-site to the west. Flooding occurs in early spring in small areas of this swamp. Overall, the soils are saturated and thin over bedrock and rock.
tsS4	ts, c, dc, gc	*Rhamnus frangula, Salix spp., Thuja occidentalis, Abies balsamea, Rubus pubescens, Lycopus americana, Equisetum scirpoides*	A band of swamp where some minor flooding occurs in early spring, but is primarily dry the rest of the year. Soils are saturated and thin organics and sand over bedrock and rock.
cS5	c, ts, gc	*Thuja occidentalis, Picea glauca, Rhamnus frangula, Alnus incana, Rubus pubescens,* ferns.	Similar to cS3, but with more cedar and less moss.
tsS6	ts, ne, gc	*Alnus incana, Salix spp., Rhamnnus frangula, Phalaris arundinacea, Juncus sp., Eutrochium maculatum, Eupatorium perfoliatum, Lyhrum salicaria*	A dense patch of thicket swamp interspersed with marsh vegetation, and regenerating trees. Soil is saturated, and floods in spring, becoming dryer later in summer. Soils are a moderate layer of organic over sandy loam over bedrock.

5.4.3 Vascular Plants

A total of 157 vascular plants were identified on the Site during the field surveys. For a list of plants identified within the Site refer to Appendix C. No SAR or provincially rare plant species were observed. A single species considered regionally rare (Brunton 2005), *Carex umbellata*, was observed on the Site in low numbers, within the open areas.

5.5 Wildlife

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

5.5.1 Herpetiles

A total of five herpetile species were identified in the Study Area. Three species of frogs were identified in the wetlands on the Site. This included a full chorus of spring peepers (*Pseudacris crucifer*) in swamp tsS6, and a few individual western chorus frogs (*Pseudacris triseriata*) and leopard frogs (*Lithobates pipiens).* In the Study Area, a full chorus of western chorus frogs was heard in a small marsh northwest of the intersection of March Road, and Burnt Lands Road, and within the forest immediately west of the Site. Many other full choruses of western chorus frogs were heard outside of the Study Area in the adjacent landscape, primarily within Burnt Lands Provincial Park (heard from the roads). A single American toad (*Anaxyrus americanus*) was observed within the Study Area just north of the Site. Two individual garter snakes (*Thamnophis sirtalis*) were observed in September 2018 on the Site. No turtles were observed on the Site or in the Study Area.

5.5.2 Birds

A total of 43 bird species were identified in the Study Area. This includes a mix of edge and forest species such as song sparrow (*Melospiza melodia*) and chestnut-sided warbler (*Setophaga pensylvanica*). A single common nighthawk was observed flying high above the Site during crepuscular surveys on May 24, 2018. No signs of nesting common nighthawk were observed on the Site during any surveys. On May 24, 2018, a single eastern whip-poor-will was heard east of the Site, at the outer edge of the Study Area. This bird called briefly and was not heard again on that night or during any other survey events and was therefore assumed to not be a bird on territory. A few additional eastern whip-poor-will were heard outside of the Study Area in the forests to the southwest. Although these individuals were observed outside the Study Area during all survey events, there is habitat that overlaps the Study Area, as defined within the MNRF habitat description for eastern whip-poor-will (Ontario 2013b). For more information on common nighthawk and eastern whip-poor-will, including an assessment of eastern whip-poor-will defined habitat, refer to Section 6.0.

5.5.3 Mammals

A total of twelve 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. No concentrations of mammals were noted.

5.5.3.1 Bats

The acoustic detectors were set to record at two stations on the Site (Figure 1) for a period of 14 consecutive nights. Five to six species of bats were recorded at each station, most commonly big brown bat (*Eptesicus fuscus*), hoary bat (*Lasiurus cinereus*) and silver-haired bat (*Lasionycteris noctivagans*), followed by very few recordings of eastern red bat (*Lasiurus borealis*), little brown myotis (*Myotis lucifugus*) and eastern small-footed

myotis (*Myotis leibii*). Overall, bat activity across the Site was low to moderate compared to other Sites Golder has surveyed in the local landscape.

Of the 467 total bat passes recorded at Station 01, there were five SAR or potential SAR bat passes at this station (1.1% of recorded calls), including: one unknown myotis species; one little brown myotis; one eastern small-footed myotis; and two passes identified as high-frequency unknown bat.

Of the 714 total bat passes recorded at Station 02, there were three SAR or potential SAR bat passes at this station (0.3% or recorded calls), including: two little brown myotis and one high frequency unknown species.

5.5.3.2 Winter Deeryards

During winter deeryard surveys, very minimal use of the Site by deer was observed, and included a single track observed during the first survey, and two individual tracks during the second visit. No well-used trails, evidence of browsing, beds, scat or urine were observed. Snow depths in the open areas were measured at 50 – 70 cm, and snow within the treed areas was 30 – 50 cm. The results of these surveys suggest that there is very little winter deer use of the Site.

5.5.4 Bumblebees, Dragonflies, and Butterflies

A total of 23 insect species were identified during the field surveys. This included primarily common species such as mourning cloak (*Nymphalis antiopa*) and white-faced meadowhawk (*Sympetrum obtrusum*). The majority of individuals observed were associated with the meadows and disturbed areas, and no unusual concentrations were noted. No SAR, provincially rare, or regionally significant insect species were observed.

5.6 Aquatic Habitat and Fish

No fish habitat was identified on the Site or in the Study Area.

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 (NHRM; MNRF 2010);
- Significant Wildlife Habitat Technical Guide (SWHTG; MNRF 2000a);
- Significant Wildlife Habitat Mitigation Support Tool (SWHMiST; MNRF 2014c); and,
- Significant Wildlife Habitat Criteria Schedules for Ecoregions 6E (SWHECS; MNRF 2015a).

6.1 Habitat of Endangered or Threatened Species

Based on the background review and field surveys, four endangered or threatened species and/or their defined habitat were identified on the Site and/or in the Study Area (Appendix B). This included eastern whip-poor-will, little brown myotis, eastern small-footed myotis, and Blanding's turtle.

Eastern Whip-poor-will

Eastern whip-poor-will is designated as threatened under the ESA. Territories of two individual eastern whip-poor-wills were identified during the surveys on lands to the southwest of the Study Area and are shown on Figure 2. Additional eastern whip-poor-will were heard in this general direction, but these were calling too far away and/or detected too infrequently to triangulate or determine habitat use. One eastern whip-poor-will was heard calling

briefly during one survey east of the Site in the existing West Carleton Quarry licenced area, but it was not heard again that night or during any other surveys. Therefore, it is highly likely that this bird was not on territory and does not represent habitat as protected by the ESA.

Based on the habitat descriptions in the General Habitat Description for this species (Ontario July 2013a), there is a very small area of Category 3 habitat of two individual eastern whip-poor-will that overlaps with the Site (Figure 2). The total area of Category 3 habitat on the Site is 2.2 ha. No Category 1 or Category 2 habitat or individuals were identified on the Site.

Approximately 0.5 ha of the Category 3 habitat on the Site will be maintained in the setback area (Section 8.0). A total of 1.7 ha of the Category 3 habitat will be removed as part of the proposed aggregate extraction. This represent 1.9% of the overall mapped Category 3 habitat, the rest of which is located on the adjacent Provincial Park to the west of the Site.

Since the portion of Category 3 habitat on the Site is already disturbed (i.e., unvegetated), the proposed extraction will not alter any plant community and will not negatively impact the ability of the remaining Category 3 habitat to function. The quarry operations will not impact the ability of eastern whip-poor-will to forage in this area and there will be no extraction or processing of aggregate material at the Site at night (after 7:00 pm and before 7:00 am), when eastern whip-poor-will are active. Materials may periodically be shipped off-Site between 7:00 pm and 11:00 pm, as is currently the case in the existing quarry, so no new impacts relating to noise or lighting are anticipated to result from the proposed extraction. Further analysis is not warranted.

Based on this analysis, Golder's opinion is that no permit under the ESA is required for this species.

Little Brown Myotis and Eastern Small-footed Myotis

Little brown myotis and eastern small-footed myotis are both designated as endangered under the ESA. Both species were recorded on the Site during acoustic surveys and have a high potential to be present in the Study Area. In natural habitats, little brown myotis shows preference for roosting in hollow trees and under peeling bark; whereas eastern small-footed bat shows preference for roosting in rock piles, talus or crevices in rock faces, although it has been known to occasionally use trees (ECCC 2015; Humphrey 2017). Both species may use caves or abandoned mines for hibernaculum, but high humidity and stable above freezing temperatures are required (ECCC 2015; Humphrey 2017).

During the acoustic surveys, these species were recorded after the first hour after sunset, which indicates that they are likely roosting off-Site and moving to the Site as part of their nightly foraging. There were very few cavity trees suitable for maternity roosting for little brown myotis on the Site. In addition, appropriate roost habitat for eastern small-footed bat was rare. No hibernaculum for these species is present in the Study Area. There is suitable maternity roosting habitat for both of these species off-Site in the Study Area. Further analysis is not warranted.

Based on this analysis, Golder's opinion is that no permit under the ESA is required for these species.

Blanding's Turtle

Blanding's turtle is designated as threatened under the ESA. Blanding's turtle habitat, as protected under the ESA, is defined in the General Habitat Description (Ontario 2019) as the following:

- Category 1 – Nest and the Area within 30 m or overwintering sites and the area within 30 m
- Category 2 – The wetland complex (i.e., all suitable wetlands or waterbodies within 500 m of each other) that extends up to 2 km from an occurrence, and the area within 30 m around those suitable wetlands or waterbodies.
- Category 3 – Area between 30 m and 250 m around suitable wetlands/waterbodies identified in Category 2, within 2 km of an occurrence.

No Blanding's turtles or evidence of nesting was identified on the Site or in the Study Area during targeted surveys following MNRF protocols. Further, the wetlands on Site are not suitable as overwintering habitat due to their limited water depths and short hydroperiod, and there is minimal available nesting habitat on the Site. Based on this, Golder has not identified any Category 1 habitat at the Site. The NHIC has documented three elemental occurrences (EO) of Blanding's turtles on lands adjacent to the Site (Figure 2). This includes two that overlap with a centroid along Golden Line (1.24 km from the Site), and one with a centroid along March Road (618 m from the Site). The EO along March Road was an individual turtle observed either crossing the road, or along the side of the road, but not associated with a wetland. Given the location of these records, and the results of the field surveys, it is likely that these turtles are associated with wetlands that are off the Site (i.e., traveling between wetlands within Burnt Lands Provincial Park) and not those on the Site itself. The wetlands on the Site are within 2 km of these EOs, but are not within 500 m of any other wetlands. Therefore, the wetlands on Site do not meet the criteria to be considered Category 2 Blanding's turtle habitat. No Category 3 habitat (250 m from Category 2 habitat) overlaps the Site.

Based on this analysis, Golder's opinion is that no permit under the ESA is required for this species.

6.2 Significant 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 2014a).

The closest mapped provincially significant wetland to the Site is the Manion Corners (Long Swamp) Wetland (the PSW). The on-Site wetlands are unmapped and unevaluated and are not contiguous with the PSW (Figure 1). However, the potential for the on-Site wetlands to be complexed with the PSW was assessed.

According to OWES there are three rules for delineating a wetland complex as summarized below:

- Wetlands must not be complexed across watersheds except in rare circumstances;
- Wetlands must be within 750 m of each other; and,
- Special rules for lacustrine (lake) wetlands exist.

The mapped Manion Corners (Long Swamp) PSW, located outside of the Study Area, is approximately 1.2 km to the east of the on-Site wetlands (Figure 3). However, additional unevaluated wetlands are mapped contiguous with the PSW, extending beyond the official PSW boundary to within approximately 640 m of the on-Site wetlands (Figure 3). It is highly likely that the MNRF would consider these contiguous unevaluated wetlands, that are a part of the PSW, given that they are contiguous with it. Therefore, for the purpose of this analysis we are assuming that these contiguous unevaluated wetlands are part of the PSW.

The on-Site wetlands are within 750 m of the assumed boundary of the PSW (640 m as noted above). However, the OWES manual clearly states that not all wetlands in close proximity should be considered as a complex, depending on the functional circumstances, location in the landscape and other characteristics (MNRF 2014a).

The functional circumstances, location in the landscape, and other characteristics of the on-Site wetlands were assessed as follows. The on-Site wetlands are separated from the PSW by a significant elevation change, and the existing West Carleton Quarry which is heavily disturbed and unvegetated. No defined channel between the on-Site wetlands and the PSW was observed. During very early spring, for a brief period, water flows from off-Site to the west, through the on-Site wetlands in a roadside drainage ditch, then over the steep quarry edge into the existing quarry. This water flows east across the disturbed land in the existing quarry, then into the PSW. However, some of this flow is overland flow, with no defined channel, and no movement of aquatic organisms or transport of sediment can occur between the on-Site wetlands and the PSW. The existing quarry also acts as a barrier for the movement of wildlife and plants. In addition, there is no hydrological connection between the on-Site wetlands and the lands north of March Road where additional wetlands may occur (but are not mapped), and March Road acts as a barrier to movement of plants and wildlife in this direction. Therefore, the only functional contribution identified between the on-Site wetlands and the PSW was the seasonal movement of water.

A full OWES evaluation of the on-Site wetlands was not completed. The OWES manual was used as a guide to further assess the function and significance of the on-Site wetlands. The following assessment is divided into each of the main components as outlined in the OWES.

6.2.1 Biological Component

The Biological Component includes several features that measure productivity and biodiversity, as well as the overall size of the wetland (MNRF 2014a). This includes substrate characteristics, wetland types, site type, plant communities, diversity of adjacent habitat, proximity to other wetlands and waterbodies, interspersion, and the percentage and type of open water present.

The substrate of the on-Site wetlands is dominated by silt, limestone and sand, which supports moderate to low productivity. The wetland type is swamp, and the site type is palustrine. Swamp can support relatively moderate productivity compared to other wetland types, and palustrine wetlands support relatively low productivity.

The plant community is relatively low in diversity, with only one plant community having four dominant plant forms and the rest having three. Open water is limited to some areas of flooding that occur in early spring, and an area that pools water at the northern edge of the Site, along March Road. The surrounding habitat is moderately diverse, and wetlands on Site are likely intermittently hydrologically connected to other wetlands that have similar plant communities, within relatively close proximity. The on-Site wetlands are relatively small and are within the lowest scoring category in the OWES manual (<20 ha).

Overall, the on-Site wetlands do not have the characteristics to support high productivity or diversity and would score relatively low in the Biological Component. There are many other wetlands in the watershed that are likely more important for this function.

6.2.2 Social Component

The Social Component focuses on the features that support direct human use of a wetland. This includes economically valuable products, recreational activities, landscape aesthetics, and education and public awareness (MNRF 2014a).

The on-Site wetlands are on private property that is not available for public use. Given the current land use on adjacent lands (i.e., aggregate operation), the on-Site wetlands are not used for recreational or any other purposes. Trees are not dominant overall, and those that do occur are too small and slow growing to have value as wood products. Only one fur bearer was observed, red squirrel (*Tamiasciurus hudsonicus*), but trapping is prohibited on the Site and there are no other economic products in the on-Site wetlands. There is no known cultural value. Further, the on-Site wetlands have been disturbed historically, have an increasing percentage of invasive species (e.g., buckthorn) and are not distinctive compared to other wetlands in the watershed.

The on-Site wetlands exhibit little to no social function and would score very low in the Social Component.

6.2.3 Hydrological Component

The Hydrological Component focuses on flood attenuation, water quality improvement, carbon sink, shoreline erosion control, and groundwater recharge (MNRF 2014a).

The on-Site wetlands are palustrine wetlands with an intermittent surface water inflow and outflow. Inflow appears to be sourced by a combination of direct precipitation and surface water runoff, with most of the flow coming from off-Site to the west, flowing across the wetlands on the Site. There are no signs of groundwater upwelling, seeps, or springs. It is relatively small with a small catchment area compared to other wetlands in the watershed.
The on-Site wetlands have minimal to no carbon sink function, flood attenuation and water quality improvement function, no shoreline erosion control, and no groundwater discharge function.

The wetland has limited hydrological function, especially compared to the other large wetlands in the watershed and would score low in the Hydrological Component.

6.2.4 Special Features Component

The Special Features Component includes the rarity of wetlands in general and of the wetland type in the Ecodistrict. It also includes: dependence on the wetland by significant species (e.g. threatened, endangered, or regional or provincially significant); the presence of certain types of significant wildlife habitat; and the presence and type of fish habitat (MNRF 2014a).

The wetland is within Ecodistrict 6E-11 and contains marsh and swamp communities. The OWES manual states that wetlands are not rare in this Ecodistrict, and swamps score low for rarity. In addition, no significant wildlife habitat or fish habitat was identified, and the only significant species identified as present was western chorus frog. A few individual western chorus frogs were identified on the thicket swamp on the Site. However, this species is not rare in the landscape and large numbers were identified outside of the Site.

Based on the background review, there is an element occurrence of Blanding's turtle to the west of the Site (MNRF 2018a). No Blanding's turtle, or any other species of turtle were identified in the on-Site wetlands during any of the field surveys. In addition, given the lack of notable standing water in the wetland, outside of early spring, the on-Site wetlands are not suitable habitat for over-wintering or breeding turtles.

As described above, the on-Site wetlands have a limited Special Features Function and would score low.

6.2.5 Summary of Wetland Significance

It is the professional opinion of Golder certified OWES evaluators that the on-Site wetlands should not be complexed with the Manion Corners (Long Swamp) PSW. The only functional contribution identified between the on-Site Wetlands and the PSW was the movement of surface water in the early spring, from the Site to the PSW.

The proposed extraction will not result in any encroachment into a PSW, and it will not negatively impact the Manion Corners (Long Swamp) PSW. The functional contribution of water that moves across the Site, through the existing quarry into the PSW, will be maintained through surface water management, as discussed in Section 8.0. As noted in Section 5.2, surface water features are inferred to be primarily supported by surface water inputs, rather than groundwater. For this reason, the anticipated drawdown in the water table is not expected to result in negative impacts to the wetlands in the Study Area.

6.3 Fish Habitat

No fish habitat was identified on the Site or in the Study Area. No further analysis is warranted.

6.4 Significant Woodlands

According to the PPS, significant woodlands are to be identified using criteria established by the MNRF in the NHRM for Policy 2.3 of the PPS (MMAH 2020).

The City has updated their Official Plan policies as they relate to determining woodland significance in the Rural Area to be in conformity with the direction given in the PPS. As part of this, the City has prepared criteria for determining woodland significance in their jurisdiction. The criteria indicate that woodlands within the Rural Area are significant if they exhibit any one of the NHRM criteria and meet a minimum size threshold for each of those criteria. The criteria and associated thresholds are provided below in Table 4, as approved by City Council in March 2019 (Ottawa November 2018).

Table 4: City of Ottawa Significant Woodland Evaluation Criteria and Size Thresholds (Rural)

Woodland Cover in Planning Area (%):		5% or less	5%-15%	15%-30%	30%-60%	> 60%
Category	Criteria				Minimum Size to be Considered for Criteria	
Size	Minimum Size	2 ha	4 ha	20 ha	50 ha	N/A
Ecological Functions	Woodland Interior	Any	Any	2 ha	8 ha	20 ha
	Proximity	0.8 ha	2 ha	5 ha	10 ha	20 ha
	Linkages	0.8 ha	2 ha	5 ha	10 ha	20 ha
	Water Protection	0.8 ha	2 ha	5 ha	10 ha	20 ha
	Woodland Diversity	0.8 ha	2 ha	5 ha	10 ha	20 ha
Uncommon Characteristics	Unique Species Composition	0.8 ha	0.8 ha	0.8 ha	0.8 ha	0.8 ha
	Provincially Significant Vegetation Community	0.8 ha	0.8 ha	0.8 ha	0.8 ha	0.8 ha
	Rare, Uncommon or Restricted Plant Species	0.8 ha	0.8 ha	0.8 ha	0.8 ha	0.8 ha
	Older Woodlands	0.8 ha	1 ha	2.5 ha	5 ha	10 ha
Economic and Social Values	Economic and Social Values	0.8 ha	2 ha	5 ha	10 ha	20 ha

For those criteria listed under Ecological Functions, the specified distance for Proximity and Water Protection is 30 m. For linkages, there are no minimum distances as any woodland meeting the minimum size threshold shall be considered significant if it falls within a core natural area or natural landscape linkage area shown in Appendix E of the guidelines (Ottawa November 2018), or has been identified as a natural linkage in another Council-approved planning study.

Based on the definition of a break in canopy cover (i.e., 20 m per the NHRM), there are three distinct woodlands on the Site (Woodlands 1, 2 and 3; Figure 3). The Study Area contains woodlands contiguous with Woodland 1, and additional woodlands north of March Road. Forest cover in the Ottawa West planning area is 38.4% (see green highlighted column in Table 4).

Woodland 1 is contiguous with off-Site woodlands to the west. The combined on- and off-Site woodlands are >50 ha in size and meet the minimum size threshold for the Size criteria and are considered significant. To understand the features and functions of the on-Site portion of Woodland 1, and how or if the on-Site portions contribute to the form or function of the larger off-Site portions of Woodland 1, Golder has assessed the on-Site portion in the context of the City's criteria for determining woodland significance. The on-Site portion of Woodland 1 is approximately 3.6 ha in size. The on-Site portion of Woodland 1 only meets the minimum size thresholds for the following criteria listed in Table 4:

- Unique Species Composition – The species assemblages observed on the Site are common and widespread in the local landscape.
- Provincially Significant Vegetation Community – No provincially significant vegetation communities are present on the Site (S1-S3).
- Rare, Uncommon or Restricted Species – No provincially rare (S1-S3 or tracked S4 species) or any species known to have restricted distributions, were observed on the Site.

Based on this analysis, the on-Site portions of Woodland 1 would not meet the City definition of significant woodlands, when considered in isolation of the contiguous off-Site woodlands. Based on this, the on-Site portion of Woodland 1 does not exhibit any significant features or functions when considered in isolation of the off-Site portions. 2.8 ha of the on-Site portion of Woodland 1 will be removed as part of the proposed project. The removal of the on-Site portions of Woodland 1 will not impact the form, function or significance (i.e., any criteria listed in Table 4 that may be present off-Site) of the off-Site portions of Woodland 1, including any habitats the woodland may provide (e.g., potential bat maternity roosting habitat; interior forest habitat, etc.).

Woodland 2 is approximately 4.1 ha in size, and is separated from Woodland 1 at the north edge of the Site by a roadway that is greater than 20 m in width. Woodland 2 only meets the minimum size thresholds for the following criteria listed in Table 4:

- Unique Species Composition – The species assemblages observed at the Site are common and widespread in the local landscape.
- Provincially Significant Vegetation Community – No provincially significant vegetation communities are present at the Site (S1-S3).
- Rare, Uncommon or Restricted Species – No provincially rare (S1-S3 or tracked S4 species) or any species known to have restricted distributions, were observed at the Site.

Based on this analysis, Woodland 2 does not meet the City definition of a significant woodland.

Woodland 3 is located entirely on-Site, is approximately 2.4 ha in size and therefore only meets the minimum size threshold for the following criteria listed in Table 4:

- Unique Species Composition – The species assemblages observed on the Site are common and widespread in the local landscape.
- Provincially Significant Vegetation Communities – No provincially significant vegetation communities are present on the Site (S1-S3).
- Rare, Uncommon or Restricted Plant Species – No provincially rare (S1-S3 or tracked S4 species) or any species known to have restricted distributions, were observed on the Site.

Based on this analysis, Woodland 3 does not meet the City definition of a significant woodland.

The off-Site woodlands north of March Road meet the minimum size threshold for the Size criteria (among others) and are therefore considered significant woodlands. The proposed extraction will not impact the woodlands north of March Road because the woodlands are currently separated from the Site by existing disturbance (e.g., March Road). These communities are bedrock-dominated, which means they are heavily reliant on snow melt and rain for water inputs rather than groundwater. This is evidenced by the health and persistence of the existing forests and other vegetation communities immediately adjacent to the current extraction. As noted in Section 5.2, the water table in the Study Area is interpreted to be within the bedrock between 0.5 m to 4 m below the bedrock surface. At most locations, the water table is at least 2 m below ground surface. The anticipated incremental drawdown of 1-2 m is not expected to result in any negative impacts to surface vegetation since, as noted, these communities are reliant on surface water inputs rather than groundwater. Implementation of standard mitigation measures and setbacks as outlined in Section 8.0 will further protect these woodlands.

Based on this analysis, only Woodland 1 is considered significant. The on-Site portions of Woodland 1 to be removed do not contribute to the significance of the off-Site portions, and their removal will not impact the form, function or significance of the off-Site portions. Off-Site woodlands north of March Road are also considered significant but will not be impacted by the proposed extraction. No further analysis is warranted.

Discussion of linkages is provided in Section 6.7.2.

6.5 Significant Valleylands

Significant valleylands should be defined and designated by the planning authority. General guidelines for determining significance of these features are presented in the NHRM for Policy 2.3 of the PPS (MNRF 2010). Recommended criteria for designating significant valleylands under the PPS include prominence as a distinctive landform, degree of naturalness, importance of its ecological functions, restoration potential, and historical and cultural values.

There are no significant valleylands on the Site or in the Study Area. 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. The Site is located within the mapped boundaries of the Burnt Lands Alvar provincially significant ANSI (Figure 3), which includes a mosaic of ecosystems including bare rock, alvar meadow and mature bedrock forests (Ontario Parks 2001).

Based on the Natural Heritage Reference Manual (MNR 2010), Life science ANSIs are defined as:

> *"… significant representative segments of Ontario's biodiversity and natural landscapes, including specific types of forests, valleys, prairies, savannahs, alvars and wetlands, their native plants and animals, and their supporting environments. They contain relatively undisturbed vegetation and landforms, and their associated species and communities. Provincially significant life science ANSIs include the most significant and best examples of the natural heritage features in the province …"*

Accordingly, ANSIs are selected based on quality of representation and meant to include the most significant or best examples of each type of environment being represented. The five criteria that are used to evaluate potential ANSIs include:

1) Representation – the representation of geological themes or landform-vegetation features in an ecodistrict;

2) Condition – existing and past land uses, which are used to assess the degree of human-induced disturbances;

3) Diversity – the number of assessed high-quality, representative features that exist within a site;

4) Other ecological considerations – ecological and hydrological functions, connectivity, size, shape, proximity to other important areas, etc.; and,

5) Special features – for example, populations of species at risk, special habitats, unusual geological or life science features, and educational or scientific value.

The description of the Burnt Lands Alvar ANSI in this report was summarized from a number of sources, including the following:

- Conserving Great Lakes Alvars – Final Technical Report of the International Alvar Conservation Initiative (Nature Conservancy 1999);
- Area of Natural and Scientific Interest – Life Science Checksheet for the Burnt Lands Alvar (MNRF 2000b);
- A review of the alvars of the Great Lakes region: Distribution, floristic composition, biogeography and protection (Catling and Brownell 1995);
- The Alvars of Ontario (Brownell and Riley 2000); and,
- The Burnt Lands Interim Management Statement (Ontario Parks 2001).

An alvar ecosystem is characterized by grassland, savannah and sparsely vegetated rock barrens that develop on flat limestone or dolostone bedrock where soils are very shallow. The Burnt Lands Alvar Life Science ANSI is unique and has specific characteristics for which it was designated as an ANSI. There are a variety of alvar related plant community types across the Burnt Lands Alvar including herbaceous alvar-specific vegetation and mixed and coniferous forest. The mixed and coniferous forests that grow in between the bare areas are dominated by cedar, white spruce, balsam fir and poplar and support a distinct understory community. There is relatively little wetland habitat on this alvar, which is predominantly ephemeral and irregular in occurrence. There are a number of globally significant alvar plant communities associated with the Burnt Lands Alvar including annual alvar pavement grassland and poverty grass dry alvar grassland. The alvar also supports a number of provincially and regionally significant plant, insect and bird species. Specifically, plant species which are characteristic in this ANSI include Crawe's sedge (*Carex crawei*), Richardson's sedge (*Carex richardsonii*), prairie smoke (*Geum triflorum*), early buttercup (*Ranunculus fascicularis*), prairie dropseed (*Sporobolus heterolepis*), sideoats grama (*Bouteloua curtipendula*), spurred-gentian (*Halenia deflexa*), and Cooper's milkvetch (*Astragalus neglectus*).

The following is a summary of the Burnt Lands Alvar ANSI checklist (MNRF 2000b) and how the ANSI meets each of the five criteria.

Representation

The Burnt Lands Alvar ANSI is the best representative alvar in this ecoregion, both in size and in diversity of community types. There is a large concentration of high quality globally rare vegetation communities within it. Two alvar communities – annual alvar pavement grassland and poverty grass dry alvar grassland are the best examples in North America.

Condition

The ANSI includes lands ranging from largely undisturbed to areas that are highly disturbed. The disturbed areas include those removed for development and aggregate extraction as well as areas used for recreational uses (i.e., trails, ATV use and horseback riding). Areas of the southernmost portion of the ANSI have been damaged by fires and some have been planted with a jack pine plantation.

Diversity

The ANSI is highly diverse and includes developed land, abandoned agricultural land, intolerant mixed forest, intolerant deciduous forest, intolerant coniferous forest, rock flats, alvar meadows, upland thickets, tolerant coniferous forest, lowland intolerant deciduous forest, and wet meadow. In addition, this ANSI is known for its juniper alvar shrubland, annual alvar pavement grassland, alvar nonvascular pavement, little bluestem alvar grassland, and poverty grass dry alvar grassland. The insect community is particularly rich and diverse as is the plant community.

Ecological Considerations

Although there are protected areas of the ANSI, a large portion of the ANSI are located on private lands. The unique alvar communities in the ANSI are maintained by the ephemeral water regime, with flooding in the spring and dry conditions in the summer, as well as fire. Soil depth is another important determinant of species richness and composition.

Special Features

There are several significant and unusual insect species and globally rare land snail species in this ANSI. There are also a number of significant bird species and rare prairie plant species associated with the Burnt Lands Alvar ANSI.

Using the data collected through the desktop assessment and the field surveys, the Site was assessed against the NHRM (MNR 2010) criteria for defining ANSIs. In addition, the existing conditions on Site were compared to the ANSI criteria for the Burnt Lands Alvar ANSI (MNRF 2000b) to help determine whether or not the Site exhibits the characteristics specific to this ANSI. Based on Golder's knowledge of the Site, it does not warrant inclusion in the ANSI for the following reasons:

- The Site does not include the high-quality features that are intended to be represented in the Burnt Lands Alvar ANSI and is not contributing any ecological benefits in terms of ANSI values;
- Wetlands are generally not associated with the Burnt Lands Alvar ANSI. If present at all, they tend to be temporary and ephemeral. The results of both the desktop assessment and the field investigations indicate that the wetlands on the Site are permanent, and not characteristic of an alvar or the ephemeral wetlands intended to be represented in the Burnt Land ANSI;

- There are no alvar plant communities on the Site, nor any communities that are indicative of the Burnt Lands Alvar ANSI, specifically. In addition, the rare plant species that are characteristic of the Burnt Lands Alvar ANSI are not present on the Site;
- Overall, diversity of plant and wildlife species on the Site was low and although there was some suitable habitat for SAR, none were observed. None of the listed insect species that are expected in the Burnt Lands Alvar ANSI were observed; and,
- The Site is heavily disturbed and although there are forested communities that can be associates of alvar, the understory is not indicative of this alvar and there are permanent wetlands and communities that are not characteristic of the Burnt Lands Alvar ANSI. There are no alvar plant communities, rare plant communities, or other features on the Site that are characteristic of the Burnt Lands Alvar ANSI.

Further to the above, Golder is of the opinion that the proposed extraction at the Site will not affect the form or function of the adjacent, significant areas of the ANSI. This opinion is based on the following.

The natural areas (i.e., vegetated areas) on the Site and within the limit of extraction cover 10.8 ha, or 0.5% of the approximately 2246 ha ANSI. The plant communities and plant species in these vegetated areas are common and well-represented throughout the ANSI. There are no alvar communities present on the Site. The functions of these vegetated areas are discussed throughout this report (e.g., significant wildlife habitat; habitat of endangered and threatened species; etc.) and no significant functions were attributed to them based on Golder's analysis. For these reasons, removal of this small area of the ANSI is not expected to have a measurable impact on the form or function of the ANSI.

In Golder's opinion, protection of disturbed areas or areas with regeneration or restoration potential is not the intent of the PPS, regardless of their inclusion within the boundaries of landscape-level natural features. Removal of this small, disturbed area will not affect the forms or functions for which the ANSI was identified.

The Site is located between the active aggregate extraction operations to the east, and large portions of the ANSI to the west, providing physical distance between the two. The Site abuts the active quarry edge, and no impacts to the habitats on the Site were noted: no dust accumulation was noted; the habitat is regularly used by wildlife; signs of plant stress were not noted (e.g., yellowing, die-off, etc.), indicating little measurable disturbance from the adjacent extraction operations. These communities are bedrock-dominated, which means they are heavily reliant on snow melt and rain for water inputs rather than groundwater. This is evidenced by the health and persistence of the existing forests and other vegetation communities immediately adjacent to the current extraction. As noted in Section 5.2, the water table in the Study Area is interpreted to be within the bedrock between 0.5 m to 4 m below the bedrock surface. At most locations, the water table is at least 2 m below ground surface. The anticipated incremental drawdown of 1-2 m is not expected to result in any negative impacts to surface vegetation since, as noted, these communities are reliant on surface water inputs rather than groundwater. Based on these observations, it does not appear that proximity to the active extraction operations has negatively impacted the Site, and there is no reason to infer that the Site is providing significant buffering services to the lands to the west. Appropriate buffering of adjacent lands will be achieved through standard mitigation measures and setbacks as described in Section 8.0.

The presence of significant wildlife habitat (including linkages) and habitat for endangered and threatened species are discussed individually in this report (Sections 6.7 and 7.1).

Based on this analysis, the Site does not warrant inclusion in the ANSI and no impacts to the ANSI will result from the proposed project.

6.7 Significant Wildlife Habitat

Significant wildlife habitat (SWH) is one of the more complicated natural heritage features to identify and evaluate. The NHRM includes criteria and guidelines for designating SWH. There are two other documents, the Significant Wildlife Habitat Technical Guide (SWHTG) and the Significant Wildlife Habitat Mitigation Support Tool (SWHMiST) (MNR 2000 and MNRF 2014a), that can be used to help decide what areas and features should be considered significant wildlife habitat. These documents were used as reference material for this study.

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

6.7.1 Seasonal Concentration Areas

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

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

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

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

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

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

No suitable areas of bat hibernacula were observed in the Study Area, although the Site and Study Area are mapped as inferred karst topography (OMNDM 2016). Based on the field surveys, no portions of the Site provide the necessary number (>10/ha) of large (>25cm DBH) wildlife trees to be considered significant maternity roost habitat; however, this habitat type may be present within the mature forests within the Study Area (off-Site). Potential impacts of the proposed aggregate extraction to the off-Site bat maternity roost habitat are discussed under the blanket of Significant Woodlands (Section 7.0).

No potential turtle over-wintering habitat was observed on the Site or in the Study Area, as no standing water of suitable depth or hydroperiod was present.

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

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

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

The Site and Study Area are not located within 5 km of Lake Ontario, and therefore does not meet the criteria for significant migratory butterfly stopover habitat.

The Site and Study Area is not located in close enough proximity (i.e., within 5 km) to the Great Lakes to provide suitable landbird migratory stopover areas.

Deer management is an MNRF responsibility. A 492 ha significant deer winter congregation area is mapped by MNRF extending onto the Site and Study Area (Figure 3). According to the MNRF (1997), the key features of a deer wintering area are traditional use, cover and browse. Deer show affinity to the deer wintering areas within their ranges, and do not readily change their migration habits. The best winter cover for deer is provided by hemlock (*Tsuga canadensis*) and cedar (*Thuja occidentalis*), however; spruce (*Picea*), pine (*Pinus*) and balsam fir (*Abies balsamea*) also provide suitable cover. Areas with lower concentrations of conifers intermixed with browse species are used for feeding areas, while more dense areas of conifer are used for movement between feeding areas, sleeping, and protection during winter storms. Deer require diverse browse opportunities (generally three or more suitable species), including cedar, hemlock, viburnums, red maple (*Acer rubrum*), striped maple (*Acer pennsylvanicum*), mountain maple (*Acer spicatum*), red oak (*Quercus rubra*), sugar maple (Acer saccharinum), dogwood (*Cornus* spp.), beaked hazel (*Corylus cornuta*), yellow and white birch (*Betula* spp.), cherry (*Prunus* spp.), ground yew (*Taxus canadensis*), white pine (*Pinus strobus*), and arboreal lichens. To be accessible to deer, browse should be within 30 m of suitable cover in yards where snow depths exceed 50 centimeters (cm), or as far as 100 m or more in southern yards with less snow or on south-facing slopes. (MNRF, 1997). The Site does contain suitable cover and browse species, however; no evidence of concentrated use by deer were observed

during targeted surveys. It is Golder's opinion that this area does not provide over-wintering habitat for deer, and removal of the Site will not impact adjacent areas that may perform that function.

With the exception of potential off-Site bat maternity roosting habitat (see Section 6.4), further analysis of seasonal concentration areas is not 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 are ranked S1 to S3 by the NHIC, nor were any old growth forests identified. The northwestern portion of the Study Area contains part of the Burnt Lands Alvar ANSI, which is known to contain provincially rare alvar communities. Potential impacts from the proposed project on the ANSI and the vegetation communities it contains was discussed in Section 6.6.

In addition to those communities considered rare by the NHIC, old-growth forests are considered rare. No old growth forests identified on the Site or in the Study Area.

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 6E defines specialized habitats that may be considered significant wildlife habitat, and outlines means of identifying such habitats. They are:

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

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

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

Woodland raptor nesting habitat was not identified as no raptor nests were observed during field surveys. Further, to meet the SWHECS criteria for this habitat type, there must be > 10 ha of interior forest habitat (measured 200 m from any edge) present. This is not present on the Site or in the Study Area.

The SWHECS indicates that exposed mineral soils in open sunny areas must be present to support turtle nesting. The Site and Study Area consists mainly of shallow soils over bedrock, with some areas of soil stockpiles and berms on the Site. Surface water features on the Site and in the Study Area were seen to hold water only in early spring, and no evidence of turtle nesting was observed during field surveys.

No evidence of groundwater seepage or springs were observed on the Site or in the Study Area.

To be considered woodland or wetland amphibian breeding habitat according to the SWHECS, wetlands must be at least 500 m^2 in area and contain certain species richness and abundance. It was determined that wetlands on the Site and in the Study Area are considered 'woodland' breeding habitat, according to the SWHECS. Wetlands on the Site and in the Study Area were surveyed for breeding amphibians, and it was determined that none of these features meet the criteria for significant amphibian breeding habitat (woodland).

There are no forested areas on the Site that provide habitat for area-sensitive breeding birds (measured 200 m from the edge), and any removal of forested habitat on the Site will not affect the availability of interior forest habitat in the Study Area. Forests in the Study Area contribute to interior forest habitat outside of the Study Area.

Further analysis of specialized habitats for wildlife is not 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.

Two SOCC were assessed to have potential to occur on the Site or in the Study Area (Appendix B): western chorus frog and common nighthawk. As noted, western chorus frogs were observed within the small thicket swamp on the Site in low numbers (tsS6), and a full chorus was observed off-Site north of March Road, in the northwestern corner of the Study Area. Common nighthawk was observed foraging over the Site and Study Area, but no evidence of breeding on-Site or in the Study Area was observed. Based on the observed minimal use of the Site by chorus frog and use of the Site by common nighthawk for foraging only, no significant habitat for either species is considered by Golder to be present.

One regionally rare species (Brunton 2005), *Carex umbellata*, was observed in the open areas of the Site. This species is well-represented elsewhere in the Burnt Lands ANSI and also within the province (considered S5). It is Golder's opinion that the Site does not provide significant habitat for this species.

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

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

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, or containing the required species as listed in the SWHECS are present on the Site or in the Study Area. No evidence of terrestrial crayfish was identified on the Site or in the Study Area during the field surveys.

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.
- Deer movement corridors: to be identified when deer wintering habitat is present.

None of these SWH were identified on the Site or in the Study Area, therefore, no animal movement corridors are identified.

The Study Area is not adjacent to any major watercourse or major landscape feature that would act as a natural corridor for wildlife. The Study Area is located in a local landscape characterized by a flat topography and a matrix of open and forested habitats, and so does not provide a linkage between different habitat types, or habitats providing different seasonal requirements for wildlife. For this reason, no migration corridors have been identified on the Site or in the Study Area.

The Site does not provide an important linkage given the orientation of the Site next to a physical barrier (active extraction) and other available habitats in the landscape (Figure 4). Very few species of wildlife move exclusively through forested corridors, and the majority of plant species rely on wind or animal vectors for seed dispersal. For this reason, there is no evidence to suggest that wildlife would not utilize the open habitats associated with the Burnt Lands Alvar to move through the ANSI, or the other forested habitats in the ANSI, adjacent to the Site. The northern edge of the Site, and a portion of the western boundary will be occupied by setbacks as discussed in Section 8.0, where no extraction will occur and wildlife will still be able to move through the Site. Based on this, extraction at the Site will not negatively impact the ability of wildlife or plants to disperse through the ANSI.

Further, March Road currently acts as a partial barrier to dispersal of some wildlife and plant species (e.g., plants that do not rely on wind or animal vectors, small mammals, herpetiles, etc.).

Further analysis of animal movement corridors is not warranted.

6.8 Other Natural Features or Designations

According to the City of Ottawa official plan, the Site is designated as Natural Environment Area. This designation relates to the NESS (White 1997) that was prepared for the former Regional Municipality of Ottawa-Carleton. The NESS identifies the Site as being within 'Area 406 – Burnt Lands', which encompasses the Burnt Lands ANSI and additional natural areas on the periphery of the ANSI, totalling 1438 ha. Area 406 was assessed as having a 'High' significance (White 1997), mainly for the presence of rare plant communities (e.g., alvar), rare plant and animal species (e.g., alvar specialists).

As discussed in Section 6.6, the Site does not represent any of the significant features for which the ANSI was designated, including significant flora, fauna or vegetation communities. Much of the Site is disturbed, and the areas that are not disturbed consist of small patches of plant communities that are well-represented elsewhere within the ANSI and Area 406. None of the regionally rare wildlife noted in White (1997) for Area 406 were observed during targeted surveys at the Site. One plant identified in White (1997) as regionally rare (*Carex umbellata*) was observed at the Site. This plant is also considered regionally rare by Brunton (2005) but is found throughout the Burnt Lands area (i.e., it is not restricted to the Site). Extraction at the Site would remove a very small portion of Area 406 (1.1%) and would not result in the loss of any features for which the Area was designated 'High' significance. Based on this, no negative impact to Area 406 is expected to result from the proposed extraction, and no further analysis is warranted.

7.0 MITIGATION AND MONITORING

Below is a discussion of the mitigation and monitoring proposed for the Site. Specific wording relating to mitigation and monitoring to be applied to the Site Plans for the project are provided in Section 8.0.

7.1 Mitigation

The rehabilitation plan presented in Section 3.0 will provide some mitigation for lost habitats at the Site. As noted, the Site will be rehabilitated to a vegetated slope, incorporating new shoreline habitat.

The proposed limit of extraction will be buffered from March Road by a 30 m setback area, and from the lands to the west by a 15 m setback area. It is understood that a berm will need to be created in these areas. Existing vegetation north and west of the berm will be retained where feasible, and unvegetated areas or areas where vegetation was removed for berm creation should be replanted, where feasible. These natural / naturalized setbacks will provide a buffer to the adjacent ANSI and significant woodlands, and maintain natural area on the Site that may provide for movement of wildlife in the local landscape. As an added precaution, during construction and earth-moving operations, sediment control measures will be in place to prevent the runoff of suspended solids from entering the setback areas wherever existing vegetation is proposed for retention. Dust suppression protocols will be developed to minimize nuisance dust emissions.

Surface water that currently flows seasonally from the west, across the wetland and other areas of the Site, through the existing quarry, into the PSW, will be maintained.

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 15) unless a nesting survey has been completed by a qualified biologist within 24 hours of the clearing, and no active nests were observed. If an active nest is observed, the area must be buffered and vegetation clearing at that location postponed until the nest is no longer active.

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

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

7.2 Monitoring

Based on the findings of this Natural Environment Report, no monitoring is required or recommended.

8.0 SUMMARY AND RECOMMENDATIONS

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

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

- Establish a minimum 30 m setback to March Road and 15 m along the western boundary of the Site, to be clearly demarcated and respected. It is understood that a berm will need to be created in the setback areas. Existing vegetation north and west of the berm should be retained where feasible, and unvegetated areas or areas where vegetation was removed for berm creation should be replanted, where feasible.
- No clearing of vegetation within the core breeding bird season (April 1 – August 15) unless a nesting survey has been completed by a qualified biologist within 24 hours of the clearing, and no active nests were observed.
- Surface water that currently flows from the west, across the wetland and other areas of the Site, through the existing quarry, into the PSW, should be maintained.
- Preparation of an Awareness Package highlighting SAR that may be present at or near the Site, including information on identification, legal protection, and encounter procedures to be followed in the event that a SAR or any wildlife is encountered. The Awareness Package is to be available at the Site, and all staff should be made aware of the content through specific training.
- Standard best management practices to reduce dust and noise mitigation at the quarry, as are currently implemented in the adjacent operation, will be continued during operation of the project.

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.

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

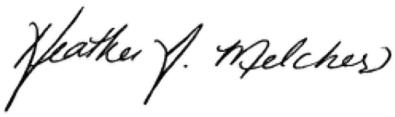
The findings and conclusions of this report are valid only as of the date of this report. If new information is discovered in future work, including excavations, borings, or other studies, Golder Associates Ltd. should be requested to re-evaluate the conclusions of this report, and to provide amendments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

Golder Associates Ltd.

Gwendolyn Weeks, H.B.Sc.Env
Ecologist



Heather Melcher, M.Sc.
Associate, Senior Ecologist

GAW/FN/HM/KAM/sg

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409250 409500 409750 410000 410250 410500 410750 411000 411250

5013250 5013000 5012750 5012500 5012250 5012000 5011750 5011500

BURNT LANDS ROAD

MARCH ROAD

GOLDEN LINE ROAD

FOC/FOM

FOM

ALO/ALS/ALT

FOM4-2

FOM4-2

STATION 1

DIST

lsS1

dcS2

cS3

tsS4

FOC2-2

CUM1-1

cS5

FOC4-3

FOC4-3

CUM1-1

tsS6

FOM4-2

STATION 2

CUM1-1

DIST

QUARRY

FOC/FOM

1

0 80 160 320

1:8,000 METRES

KEY MAP

SCALE 1:150,000

LEGEND

- EXPECTED 1 METRE INCREMENTAL WATER TABLE DRAWDOWN
- ROADWAY
- TRAIL
- SITE
- STUDY
- EXTRACTION LIMIT
- BAT DETECTOR
- BREEDING BIRD STATION
- ANURAN POINT COUNT STATION
- PLANT COMMUNITIES

TERRESTRIAL PLANT COMMUNITIES

ALO/ALS/ALT: MIXED

CUM1-1: Mixed Meadow

DIST: DISTURBED

FOC/FOM: CONIFEROUS FOREST/MIXED

FOC2-2: DRY TO FRESH WHITE CEDAR-WHITE SPRUCE CONIFEROUS

FOC4-3: FRESH TO MOIST WHITE CEDAR-BALSAM FIR-WHITE SPRUCE CONIFEROUS FOREST

FOM4-2: DRY TO FRESH WHITE CEDAR-WHITE SPRUCE-POPLAR MIXED

FOM: MIXED FOREST

QUARRY: EXISTING QUARRY

WETLAND PLANT COMMUNITIES

cS3: WHITE CEDAR CONIFER SWAMP

cS5: WHITE CEDAR CONIFER SWAMP

dcS2: DEAD CONIFER SWAMP

lsS1: LOW SHRUB SWAMP

tsS4: TALL SHRUB BUCKTHORN-WILLOW

tsS6: TALL SHRUB ALDER

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

1. LAND INFORMATION ONTARIO (LIO) DATA PRODUCED BY GOLDER ASSOCIATES LTD. UNDER LICENCE FROM ONTARIO MINISTRY OF NATURAL RESOURCES, © QUEENS PRINTER 2016
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3. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: MTM ZONE 9, VERTICAL DATUM: CGVD28

CLIENT

THOMAS CAVANAGH CONSTRUCTION LIMITED

PROJECT

PROPOSED WEST CARLETON QUARRY EXTENSION
NATURAL ENVIRONMENT REPORT

TITLE

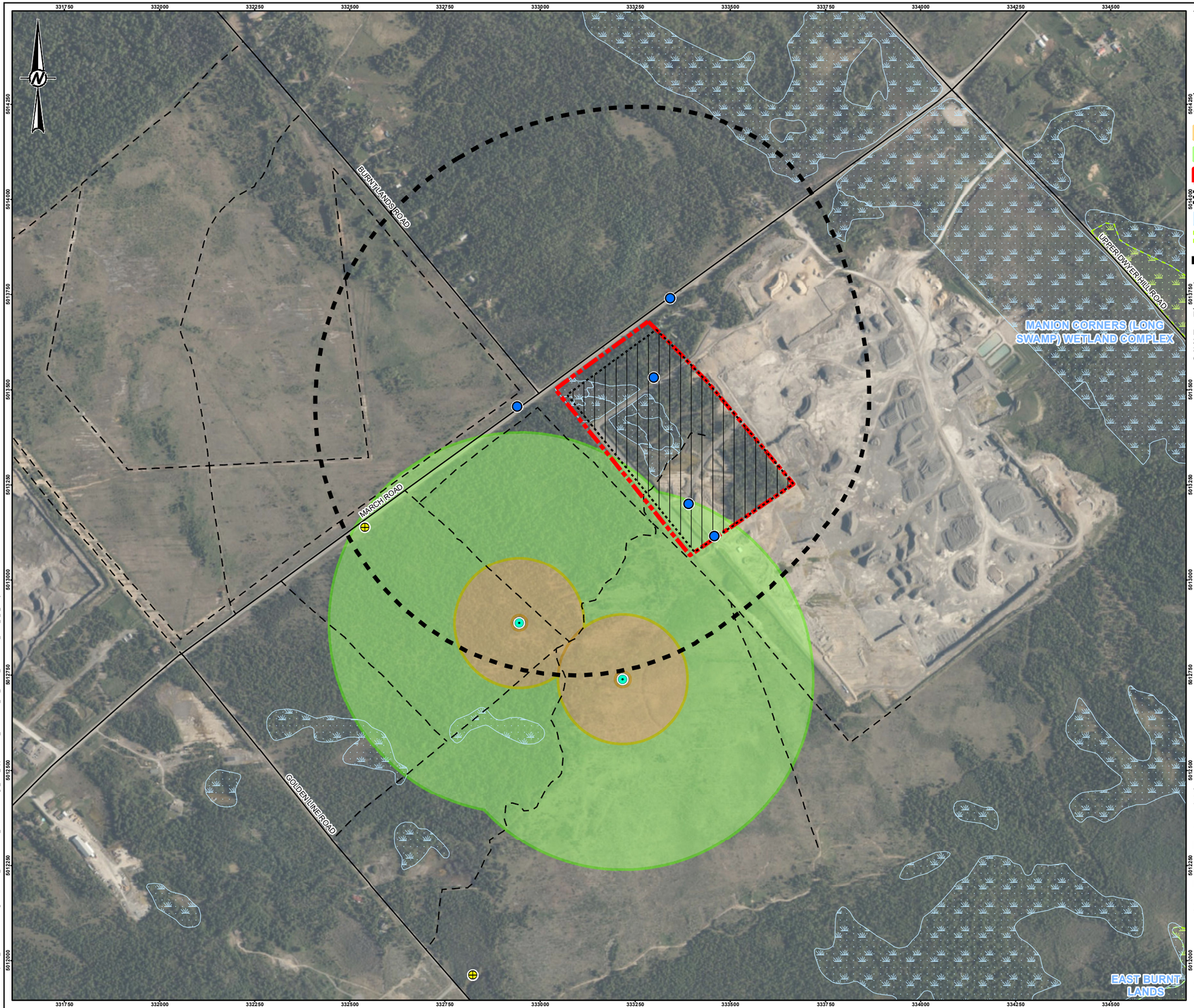
ECOLOGICAL LAND CLASSIFICATION AND SURVEY STATIONS

CONSULTANT

GOLDER

YYYY-MM-DD	2021-03-08
DESIGNED	----
PREPARED	BR
REVIEWED	GW
APPROVED	HM

PROJECT NO.	CONTROL	REV.	FIGURE
1899975	0003	0	1



LEGEND

- CENTROID OF NHIC BLANDING'S TURTLE ELEMENTAL OCCURRENCE (EO)
- EASTERN WHIP-POOR-WILL SURVEY STATION
- EASTERN WHIP-POOR-WILL ESTIMATED HABITAT CENTROID
- ROADWAY
- TRAIL
- CATEGORY 2 HABITAT
- CATEGORY 3 HABITAT
- SITE
- EXTRACTION LIMIT
- WETLAND
- SIGNIFICANT WETLAND
- STUDY AREA

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

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3. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: MTM ZONE 9, VERTICAL DATUM: CGVD28

0 100 200 400
1:10,000 METRES

CLIENT
THOMAS CAVANAGH CONSTRUCTION LIMITED

PROJECT
PROPOSED WEST CARLETON QUARRY EXTENSION
NATURAL ENVIRONMENT REPORT

TITLE
EASTERN WHIP-POOR-WILL AND BLANDINGS TURTLE

CONSULTANT
GOLDER

YYYY-MM-DD	2021-03-08
DESIGNED	---
PREPARED	BR
REVIEWED	GW
APPROVED	HM

PROJECT NO.	CONTROL	REV.	FIGURE
1899975	0003	0	**2**

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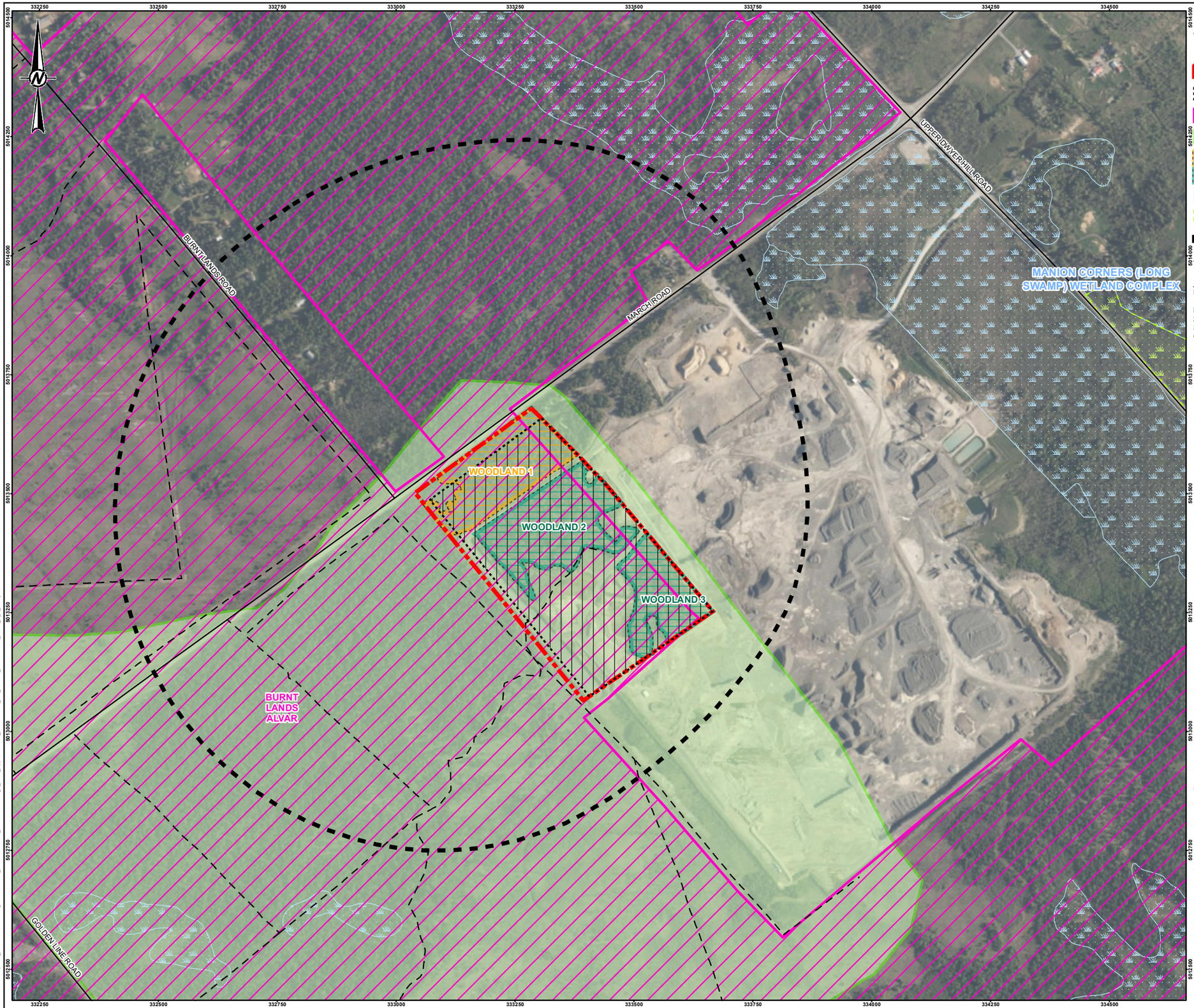

LEGEND

- ROADWAY
- TRAIL
- SITE
- EXTRACTION LIMIT
- AREA OF NATURAL AND SCIENTIFIC INTEREST
- MNRF MAPPED WINTER DEER
- SIGNIFICANT WOODLAND
- WOODLAND
- WETLAND
- SIGNIFICANT WETLAND
- STUDY AREA

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

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2. SERVICE LAYER CREDITS:
3. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: MTM ZONE 9, VERTICAL DATUM: CGVD28

0 100 200 400

1:8,000 METRES

CLIENT
THOMAS CAVANAGH CONSTRUCTION LIMITED

PROJECT
PROPOSED WEST CARLETON QUARRY EXTENSION
NATURAL ENVIRONMENT REPORT

TITLE
SIGNIFICANT NATURAL FEATURES

CONSULTANT
GOLDER

YYYY-MM-DD	2021-03-08
DESIGNED	----
PREPARED	BR
REVIEWED	GW
APPROVED	HM

PROJECT NO.	CONTROL	REV.	FIGURE
1899975	0003	0	3

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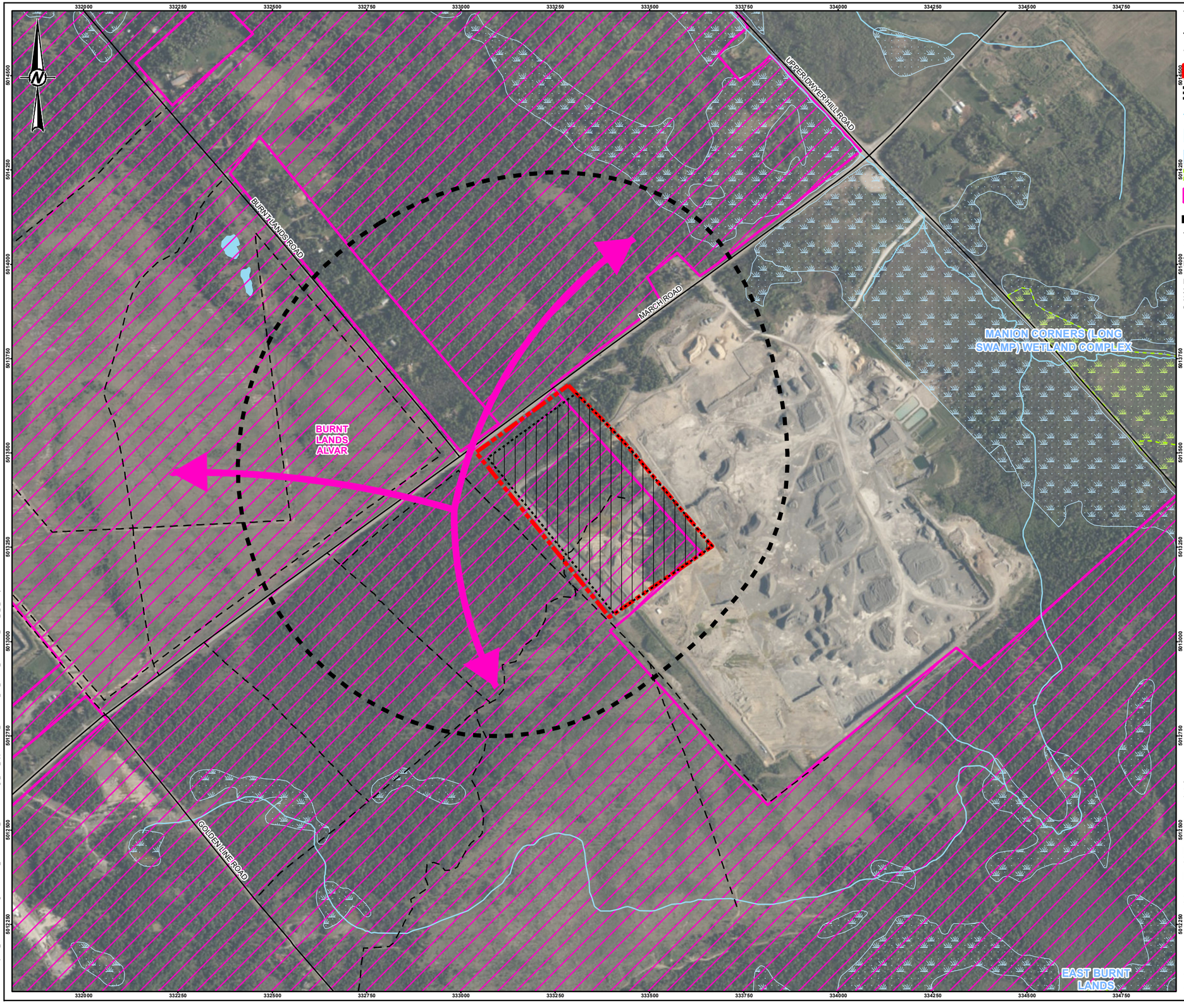

LEGEND

- ROADWAY
- TRAIL
- SITE
- EXTRACTION LIMIT
- WATERBODY
- WATERBODY
- WETLAND
- SIGNIFICANT WETLAND
- AREA OF NATURAL AND SCIENTIFIC INTEREST
- STUDY

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

1. LAND INFORMATION ONTARIO (LIO) DATA PRODUCED BY GOLDER ASSOCIATES LTD. UNDER LICENCE FROM ONTARIO MINISTRY OF NATURAL RESOURCES, © QUEENS PRINTER 2016
2. SERVICE LAYER CREDITS:
3. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: MTM ZONE 9, VERTICAL DATUM: CGVD28

0 100 200 400

1:10,000 METRES

CLIENT
THOMAS CAVANAGH CONSTRUCTION LIMITED

PROJECT
PROPOSED WEST CARLETON QUARRY EXTENSION
NATURAL ENVIRONMENT REPORT

TITLE
LINKAGES

CONSULTANT
GOLDER

YYYY-MM-DD	2021-03-08
DESIGNED	---
PREPARED	BR
REVIEWED	GW
APPROVED	HM

PROJECT NO.	CONTROL	REV.	FIGURE
1899975	0003	0	**4**

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APPENDIX A

Correspondence with the MNRF

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.

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

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]	Ontario Habitat Descriptions	Probability of Occurrence at the Site	Probability of Occurrence in the Study Area	ESA Habitat Protection Provisions[6]	Date Added to ESA
Amphibian	Western chorus frog - Great Lakes St. Lawrence / Canadian Shield population	*Pseudacris triseriata*	—	THR	THR	G5TNR	S3	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).	High - a few individuals were observed during surveys within the thicket swamp on the Site	High - full chorus were observed during surveys within the Study Area.		
Arthropod	Monarch	*Danaus plexippus*	SC	SC	END	G4	S2N, S4B	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 - although there is some habitat on the Site, it is limited and this species was not identified during surveys.	Low - although there is some habitat in the Study Area it is limited and this species was not identified during surveys.		Current Designation: June 30, 2008 Previous: SC when ESA came into effect
Arthropod	Mottled duskywing	*Erynnis martialis*	END	—	END	G3	S2	In Ontario, the mottled duskywing is found in the same habitat as its food plant Ceanothus spp.: open or partially open, dry, sandy areas, or limestone alvars. These habitats are relatively uncommon and include dry open pine and pine oak woodland, other open dry woodlands, alvars, savannah and other dry oper sandy habitats. Usually seen nectaring on wildflowers, or on wet sandy roads in the company of other duskywing species (Linton 2015).	Low - neither this species or its food plant was identified on the Site.	Low - neither this species or its food plant was identified in the Study Area	General	Current Designation: June 27, 2014 Previous: none
Arthropod	West Virginia white	*Pieris virginiensis*	SC	—	—	G3?	S3	In Ontario, west Virginia white is found primarily in the central and southern regions of the province. This butterfly lives in moist, mature, deciduous and mixed woodlands, and the caterpillars feed only on the leaves of toothwort (Cardamine spp.), which are small, spring-blooming plants of the forest floor. These woodland habitats are typically maple-beech-birch dominated. This species is associated with woodlands growing on calcaerous bedrock or thin soils over bedrock (Burke 2013).	Low - the forests on Site do not contain suitable habitat, and none were observed during surveys.	Low - the forests in the Study Area do not contain suitable habitat, and none were observed during surveys.		Current Designation: June 30, 2008 Previous: SC when ESA came into effect
Bird	Bald eagle	*Haliaeetus leucocephalus*	SC	—	NAR	G5	S2N,S4B	In Ontario, bald eagle nests are typically found near the shorelines of lakes or large rivers, often on forested islands. The large, conspicuous nests are typically found in large super-canopy trees along water bodies (Buehler 2000).	Low- no suitable habitat or stick nests were observed during surveys.	Low- no suitable habitat or stick nests were observed during surveys.		Current Designation: June 30, 2008 Previous: SC when ESA came into effect
Bird	Bank swallow	*Riparia riparia*	THR	THR	THR	G5	S4B	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 bluff or bank habitat occurs on the Site, and none were observed during surveys.	Low - no suitable bluff or bank habitat occurs in the Study Area and none were observed during surveys.	General (Draft) Category 1 – Breeding colony, including burrows and substrate between them Category 2 – Area within 50 m of the front of breeding colony face Category 3 – Area of suitable foraging habitat within 500 m of the outer edge of breeding colony	Current Designation: June 27, 2014 Previous: None
Bird	Barn swallow	*Hirundo rustica*	THR	THR	THR	G5	S4B	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).	Low- no suitable structures were observed on the Site and none were observed during surveys.	Low- no suitable structures were observed in the Study Area and none were observed during surveys.	General Category 1 – Nest Category 2 – Area within 5 m of the nest Category 3 – Area between 5-200 m of the nest	Current Designation: Jan 13, 2012 Previous: none

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]	Ontario Habitat Descriptions	Probability of Occurrence at the Site	Probability of Occurrence in the Study Area	ESA Habitat Protection Provisions[6]	Date Added to ESA
Bird	Black tern	*Chlidonias niger*	SC	—	NAR	G4	S3B	In Ontario, black tern breeds in freshwater marshlands where it forms small colonies. It prefers marshes or marsh complexes greater than 20 ha in area and which are not surrounded by wooded area. Black terns are sensitive to the presence of agricultural activities. The black tern nests in wetlands with an even combination of open water and emergent vegetation, and still waters of 0.5-1.2 m deep. Preferred nest sites have short dense vegetation or tall sparse vegetation often consisting of cattails, bulrushes and occasionally burreed or other marshland plants. Black terns also require posts or snags for perching (Weseloh 2007).	Low - no large suitable marshes occur on the Site, and none were observed during surveys.	Low - no large suitable marshes occur in the Study Area, and none were observed during surveys.		Current Designation: June 30, 2008 Previous: SC when ESA came into effect
Bird	Bobolink	*Dolichonyx oryzivorus*	THR	THR	THR	G5	S4B	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 - no suitable fields occur on the Site, and none were observed during surveys.	Low - no suitable fields occur in the Study Area, and none were observed during surveys.	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	Current Designation: Sep 28, 2010 Previous: none
Bird	Canada warbler	*Cardellina canadensis*	SC	THR	THR	G5	S4B	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 - the forests on Site are not of the right structure, and none were observed during surveys.	Low - the forests on Site are not of the right structure, and none were observed during surveys.		Current Designation: Sep 10, 2009 Previous: None
Bird	Chimney swift	*Chaetura pelagica*	THR	THR	THR	G5	S4B, S4N	In Ontario, chimney swift breeding habitat is varied and includes urban, suburban, rural and wooded sites. They are most commonly associated with towns and cities with large concentrations of chimneys. Preferred nesting sites are dark, sheltered spots with a vertical surface to which the bird can grip. Unused chimneys are the primary nesting and roosting structure, but other anthropogenic structures and large diameter cavity trees are also used (COSEWIC 2007).	Low - no suitable structures or large cavity trees were observed on the Site, and none were observed during surveys.	Low - no suitable structures or large cavity trees were observed in the Study Area and none were observed during surveys.	General Category 1 – Human-made nest/roost, or natural nest/roost cavity and area within 90 m of natural cavity	Current Designation: Sep 10, 2009 Previous: none
Bird	Common nighthawk	*Chordeiles minor*	SC	THR	SC	G5	S4B	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)	High - an individual was observed flying high over the Site during surveys, however no evidence of nesting on the Site was observed.	High - an individual was observed flying high over the Study Area during surveys, however no evidence of nesting in the Study Area was observed.		Current Designation: Sep 10, 2009 Previous: None
Bird	Eastern meadowlark	*Sturnella magna*	THR	THR	THR	G5	S4B	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 - no suitable fields occur on the Site, and none were observed during surveys.	Low - no suitable fields occur in the Study Area, and none were observed during 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	Current Designation: Jan 13, 2012 Previous: none

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]	Ontario Habitat Descriptions	Probability of Occurrence at the Site	Probability of Occurrence in the Study Area	ESA Habitat Protection Provisions[6]	Date Added to ESA
Bird	Eastern whip-poor-will	*Antrostomus vociferus*	THR	THR	THR	G5	S4B	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).	Moderate - although none were observed on the Site, there is Category 3 habitat, as identified by MNRF, therefore this species may use the Site for foraging.	High - a single individual was observed in the Study Area outside of the Site during surveys. However, this individual only called once, and was not heard again, therefore it is unlikely that it is on habitat. Further there is Category 3 habitat in the Study Area, so this species may forage over it.	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	Current Designation: Sep 10, 2009 Previous: none
Bird	Eastern wood-pewee	*Contopus virens*	SC	SC	SC	G5	S4B	In Ontario, eastern wood-pewee inhabits a wide variety of wooded upland and lowland habitats, including deciduous, coniferous, or mixed forests. It occurs most frequently in forests with some degree of openness. Intermediate-aged forests with a relatively sparse midstory are preferred. In younger forests with a relatively dense midstory, it tends to inhabit the edges. Also occurs in anthropogenic habitats providing an open forested aspect such as parks and suburban neighborhoods. Nest is constructed atop a horizontal branch, 1-2 m above the ground, in a wide variety of deciduous and coniferous trees (COSEWIC 2012).	Low- although there is some forest habitat on Site, this species was not observed during surveys.	Low- although there is some forest habitat in the Study Area, this species was not observed during surveys.		Current Designation: June 27, 2014 Previous: none
Bird	Golden-winged warbler	*Vermivora chrysoptera*	SC	THR	THR	G4	S4B	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 - the regenerating habitat on the Site was limited, and this species was not observed during surveys.	Low - the regenerating habitat in the Study Area was limited, and this species was not observed during surveys.		Current Designation: June 30, 2008 Previous: SC when ESA came into effect
Bird	Grasshopper sparrow *pratensis* subspecies	*Ammodramus savannarum* (pratensis subspecies)	SC	SC	SC	G5	S4B	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 - no suitable fields occur on the Site, and none were observed during surveys.	Low - no suitable fields occur in the Study Area, and none were observed during surveys.		Current Designation: March 31, 2015 Previous: none
Bird	Least bittern	*Ixobrychus exilis*	THR	THR	THR	G5	S4B	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 - there are no suitable marshes on the Site, and none were observed during surveys.	Low - there are no suitable marshes on in the Study Area, and none were observed during surveys.	General (as of June 30, 2013)	Current Designation: June 30, 2008 Previous: THR when ESA came into effect
Bird	Loggerhead shrike	*Lanius ludovicianus (migrans subsp)*	END	END	END	G4	S2B	In Ontario, loggerhead shrike breeds in open country habitat characterized by short grasses with scattered shrubs or low trees. Unimproved pasture containing scattered hawthorns (Crataegus spp.) on shallow soils over limestone bedrock is the preferred habitat. Preferred nest sites include isolated hawthorns or red cedar. Males defend large territories of approximately 50 ha (Chabot 2007).	Low - open country habitat was very small and limited on the Site, and none were observed during surveys.	Low - open country habitat was very small and limited on in the Study Area, and none were observed during surveys.	General Category 1 – Nest, nesting tree, and the area of suitable habitat within 200 m of the nesting tree Category 2 – Area of suitable habitat between 200 – 400 m of the nesting tree	Current Designation: June 30, 2008 Previous: END when ESA came into effect

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]	Ontario Habitat Descriptions	Probability of Occurrence at the Site	Probability of Occurrence in the Study Area	ESA Habitat Protection Provisions[6]	Date Added to ESA
Bird	Olive-sided flycatcher	*Contopus cooperi*	SC	THR	SC	G4	S4B	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 - the forest on Site were only moderately suitable habitat, and none were observed during surveys.	Low - the forest on Site were only moderately suitable habitat, and none were observed during surveys.		Current Designation: Sep 10, 2009 Previous: none
Bird	Peregrine falcon (anatum/tundrius subspecies)	*Falco peregrinus anatum/tundrius*	SC	SC	Not at Risk	G4	S3B	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- there are no cliffs, structures or other potential nesting sites on the Site, and none were observed during surveys.	Low- there are no cliffs, structures or other potential nesting sites in the Study Area, and none were observed during surveys.		Current Designation: Nov 30, 2011 (re-assessed Jan 24, 2013) Previous: June 30, 2008 (THR)
Bird	Red-headed woodpecker	*Melanerpes erythrocephalus*	SC	END	END	G5	S4B	In Ontario, red-headed woodpecker breeds in open, deciduous woodlands or woodland edges and are often found in parks, cemeteries, golf courses, orchards and savannahs (Woodliffe 2007). They may also breed in forest clearings or open agricultural areas provided that large trees are available for nesting. They prefer forests with little or no understory vegetation. They are often associated with beech or oak forests, beaver ponds and swamp forests where snags are numerous. Nests are excavated in the trunks of large dead trees (Smith et al. 2000).	Low -there were no suitable deciduous woodlands or other habitats on the Site, and none were observed during surveys.	Low -there were no suitable deciduous woodlands or other habitats in the Study Area, and none were observed during surveys.		Current Designation: June 30, 2008 Previous: SC when ESA came into effect
Bird	Short-eared owl	*Asio flammeus*	SC	SC	SC	G5	S2N,S4B	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 - suitable grassland habitat on the Site is limited, and none were observed during surveys.	Low - suitable grassland habitat in the Study Area is limited, and none were observed during surveys.		Current Designation: June 30, 2008 Previous: SC when ESA came into effect
Bird	Wood thrush	*Hylocichla mustelina*	SC	THR	THR	G4	S4B	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 - the forests on Site are not ideal for this species, and none were observed during surveys.	Low - the forests in the Study Area are not ideal for this species, and none were observed during surveys.		Current Designation: June 27, 2014 Previous: none
Bird	Yellow rail	*Coturnicops noveboracensis*	SC	SC	SC	G4	S4B	In Ontario, yellow rail breeds mainly in sedge-dominated marshes with wet substrates or standing water up to 15 cm in depth. This species will also breed in wet hayfields. This species may be absent from historically used breeding territories on years when water levels are unsuitable, as habitat must remain wet throughout the nesting season to be used. This species breeds mainly in wetlands larger than 10 ha in area, but may breed in much smaller wetlands and will nest colonially (COSEWIC 2009).	Low - there are no suitable marshes or other habitats on the Site, and none were observed during surveys.	Low - there are no suitable marshes or other habitats on in the Study Area, and none were observed during surveys.		Current Designation: June 30, 2008 Previous: SC when ESA came into effect

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]	Ontario Habitat Descriptions	Probability of Occurrence at the Site	Probability of Occurrence in the Study Area	ESA Habitat Protection Provisions[6]	Date Added to ESA
Fish	American eel	*Anguilla rostrata*	END	—	THR	G4	S1?	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 - There are no suitable surface water features on the Site.	Low - there are no suitable surface water features in the Study Area.	General (as of June 30, 2013)	Current Designation: June 30, 2008 Previous: END when ESA came into effect
Fish	Channel darter - St. Lawrence populations	*Percina copelandi*	SC	SC	SC	G4TNR	S2	In Ontario, channel darter is found in the lower Great Lakes basin along the shores of Lake Erie, Detroit River, St. Clair River, Lake St. Clair, Ottawa River and some of its tributaries, and in drainages of the Bay of Quinte. Channel darter is a freshwater member of the perch family of fishes. Channel darter can be found in three general types of habitats, depending on which aquatic system they occupy: 1) in lakes, they are found in gravel and coarse sand beach areas; 2) in large river systems, they are typically found in gravel and cobble shoals and riffles; and, 3) in small- to medium-sized rivers, they are typically found in the riffles and pools. Communal spawning occurs in the spring and early summer in upstream areas with moderate to fast current and over fine gravel or small rocks (COSEWIC 2016).	Low - There are no suitable surface water features on the Site.	Low - there are no suitable surface water features in the Study Area.	General (as of June 30, 2013)	Current Designation: Aug 1, 2018 Previous: THR when ESA came into effect (June 30, 2008)
Fish	Lake sturgeon - Great Lakes / Upper St.Lawrence population	*Acipenser fulvescens*	END	—	THR	G3G4TNR	S2	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 - There are no suitable surface water features on the Site.	Low - there are no suitable surface water features in the Study Area.	General	Current Designation: Aug 1, 2018 Previous: June 30, 2008 (SC - general pop); Sep 10, 2009 (THR)
Fish	Northern brook lamprey - Great Lakes / Upper St.Lawrence population	*Ichthyomyzon fossor*	SC	SC	SC	G4	S3	In Ontario, northern brook lamprey occurs in rivers draining into Lakes Superior, Huron and Erie, as well as in the Ottawa and St. Lawrence Rivers. It is found in clear streams of varying sizes. Adults prefer riffle and run areas of coldwater streams and rivers with gravel and sand substrates. Spawning habitat usually includes a swift current and coarse gravel or rocky substrate, with which males construct inconspicuous nests (COSEWIC 2007).	Low - There are no suitable surface water features on the Site.	Low - there are no suitable surface water features in the Study Area.		Current Designation: June 30, 2008 Previous: SC when ESA came into effect
Fish	River redhorse	*Moxostoma carinatum*	SC	SC	SC	G4	S2	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 - There are no suitable surface water features on the Site.	Low - there are no suitable surface water features in the Study Area.		Current Designation: Status Confirmed June 2016 Previous: June 30, 2008 (SC when ESA came into effect)

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]	Ontario Habitat Descriptions	Probability of Occurrence at the Site	Probability of Occurrence in the Study Area	ESA Habitat Protection Provisions[6]	Date Added to ESA
Lichen	Pale-bellied frost lichen	*Physconia subpallida*	END	END	END	GNR	S2S3	In Ontario, pale-bellied frost lichen grows on trees in mature, deciduous forests with relatively open understory, but moderate to high canopy cover. Common host trees include ash, black walnut, hop-hornbeam, and elm, although in Ontario, it is most often found on hop-hornbeam. This lichen has also been found growing on fence rails and rocks (Lewis 2011).	Low - there are no suitable deciduous forests on the Site.	Low - there are no suitable deciduous forests in the Study Area.	Regulated In the geographic areas of: Algonquin Provincial Park, counties of Haliburton, Hastings, Lanark, Lennox and Addington, Peterborough and Renfrew; townships of Central Frontenac, North Frontenac, and South Frontenac within County of Frontenac, townships of Athens, Elizabethtown-Kitley, Merrickville-Wolford and Rideau Lakes within County of Leeds and Grenville, and township of South Algonquin in District of Nipissing; Municipalities of Central Frontenac, Northern Frontenac, Lanark Highlands, Addington Highlands and Greater Madawaska Regulated Habitat: • host tree on which the lichen exists and area within 50 m of trunk • area within 100 m of lichen that falls within water body, watercourse, or area belonging to ELC community and that is (i) suitable for natural colonization from existing population of lichen or (ii) contributes to maintenance of suitable microsite characteristics for the lichen to exist	Current Designation: March 18, 2010 Previous: none
Mammal	Eastern small-footed myotis	*Myotis leibii*	END	—	—	G4	S2S3	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)	High - Individuals of this species were identified during bat surveys (in very small numbers). However, suitable maternity roosting habitat was limited and it is likely that this species is using the Site to forage only.	High - Individuals of this species were identified during bat surveys (In very small numbers). There may be suitable maternity roost habitat in the portions of the Study Area that are outside of the Site.	General	Current Designation: June 27, 2014 Previous: None
Mammal	Little brown myotis	*Myotis lucifugus*	END	END	END	G3	S4	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 (Environment Canada 2015).	High - this species was identified during bat surveys (in very small numbers). However, there were very few suitable cavity trees and no suitable structures on the Site, therefore this species is likely only using the Site to forage.	High - Individuals of this species were identified during bat surveys. There may be suitable maternity roost habitat in the portions of the Study Area that are outside of the Site.	General	Current Designation: Jan 24, 2013 Previous: none
Mammal	Northern myotis	*Myotis septentrionalis*	END	END	END	G1G2	S3	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 (Environment Canada 2015).	Low - suitable maternity roosting habitat for this species was very limited on the Site and none were observed during surveys.	Low - suitable maternity roosting habitat for this species was limited in the Study Area and none were observed during surveys.	General	Current Designation: Jan 24, 2013 Previous: none
Mammal	Tri-colored bat	*Perimyotis subflavus*	END	END	END	G2G3	S3?	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 (Environment Canada 2015).	Low- very little is known about the maternity roost behaviour of this species, except that it is within forests. However, none were observed during surveys.	Low- very little is known about the maternity roost behaviour of this species, except that it is within forests. However, none were observed during surveys.	General	Current Designation: June 15, 2016 Previous: none

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]	Ontario Habitat Descriptions	Probability of Occurrence at the Site	Probability of Occurrence in the Study Area	ESA Habitat Protection Provisions[6]	Date Added to ESA
Reptile	Blanding's turtle - Great Lakes / St.Lawrence population	*Emydoidea blandingii*	THR	THR	END	G4	S3	In Ontario, Blanding's turtle will use a range of aquatic habitats, but favor those with shallow, standing or slow-moving water, rich nutrient levels, organic substrates and abundant aquatic vegetation. They will use rivers, but prefer slow-moving currents and are likely only transients in this type of habitat. This species is known to travel great distances over land in the spring in order to reach nesting sites, which can include dry conifer or mixed forests, partially vegetated fields, and roadsides. Suitable nesting substrates include organic soils, sands, gravel and cobble. They hibernate underwater and infrequently under debris close to water bodies (COSEWIC 2016).	Low - this species was not observed during targeted surveys at the Site. Records do not indicate that any regulated habitat for this species is present.	Low - this species was not observed during targeted surveys. Records do not indicate that any regulated habitat for this species is present.	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	Current Designation: June 30, 2008 Previous: THR when ESA came into effect
Reptile	Eastern ribbonsnake - Great Lakes population	*Thamnophis sauritius*	SC	SC	SC	G5	S4	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 - habitat for this species on the Site is very limited and none were observed during surveys.	Low - habitat for this species in the Study Area is very limited and none were observed during surveys.		Current Designation: Status confirmed Jan 2013 Previous: June 30, 2008 (SC when ESA came into effect)
Reptile	Milksnake	*Lampropeltis triangulum*	NAR	SC	SC	G5	S4	In Ontario, milksnake uses a wide range of habitats including prairies, pastures, hayfields, wetlands and various forest types, and is well-known in rural areas where it frequents older buildings. Proximity to water and cover enhances habitat suitability. Hibernation takes place in mammal burrows, hollow logs, gravel or soil banks, and old foundations (COSEWIC 2014).	Moderate - although none were observed on the Site, this species is a habitat generalist and may occur on the Site.	Moderate - habitat for this species is present throughout the Study Area.		
Reptile	Northern map turtle	*Graptemys geographica*	SC	SC	SC	G5	S3	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 - there are no suitable large waterbodies on the Site, and none were observed during surveys.	Low - there are no suitable large waterbodies in the Study Area, and none were observed during surveys.		Current Designation: Status Confirmed Jan 2013 Previous: June 30, 2008 (SC when ESA came into effect)
Reptile	Snapping turtle	*Chelydra serpentina*	SC	SC	SC	G5	S3	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 - there are no suitable waterbodies on the Site, and none were observed during surveys.	Low - there are no suitable waterbodies in the Study Area and none were observed during surveys.		Current Designation: Sep 10, 2009 Previous: none
Reptile	Stinkpot or Eastern musk turtle	*Sternotherus odoratus*	SC	THR	SC	G5	S3	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 - there are no suitable waterbodies on the Site, and none were observed during surveys.	Low - there are no suitable waterbodies in the Study Area and none were observed during surveys.		Current Designation: June 27, 2014 Previous: June 30, 2008 (THR)
Vascular Plant	American ginseng	*Panax quinquefolius*	END	END	END	G3G4	S2	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 - the forests on the Site were not suitable for this species, and none were observed during surveys.	Low - the forests in the Study Area were not suitable for this species, and none were observed during surveys.	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	Current Designation: June 30, 2008 Previous: END when ESA came into effect

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]	Ontario Habitat Descriptions	Probability of Occurrence at the Site	Probability of Occurrence in the Study Area	ESA Habitat Protection Provisions[6]	Date Added to ESA
Vascular Plant	Butternut	*Juglans cinerea*	END	END	END	G4	S2?	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 surveys.	Low - none were observed during surveys.	General (as of June 30, 2013)	Current Designation: June 30, 2008 Previous: END when ESA came into effect
Vascular Plant	Eastern prairie fringed-orchid	*Platanthera leucophaea*	END	END	END	G2G3	S2	In Ontario, eastern prairie fringed-orchid grows in wet prairies, fens, bogs, wet meadows, and wet successional fields. It grows in full sun in neutral to mildly calcareous substrates, and occasionally grows along roadsides or lake margins (Eastern Prairie Fringed-orchid Recovery Team 2010). This species is found only in southern Ontario, and only two locations are currently known on sand spits along the shore of Lake Erie.	Low - no suitable habitat was identified and none were observed during surveys.	Low - no suitable habitat was identified and none were observed during surveys.	Regulated In the geographic areas of: the City of Ottawa; Counties of Bruce, Essex, Grey, Lambton, Lanark, Lennox and Addington, and Simcoe; Municipality of Chatham-Kent; Regional Municipality of York; and United Counties of Leeds and Grenville, and United Counties of Stormont, Dundas and Glengarry. Regulated Habitat: • fens, tallgrass prairies, and moist old fields	Current Designation: June 30, 2008 Previous: END when ESA came into effect

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 13 June 2018); 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.

[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)

General References:

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

[+]Species Codes derived from the following sources: Birds – 53rd AOU Supplement (2012); Amphibians – Marsh Monitoring Program (Bird Studies Canada 2003); Fish – Golder; Reptiles – Golder.
*NHIC (Natural Heritage Information Centre); ROM (Royal Ontario Museum); OBBA (Ontario Breeding Bird Atlas); Herp Atlas (Reptiles and Amphibians of Ontario); Odonata Atlas (of Ontario); Mammal Atlas (of Ontario); BCI (Bat Conservation International); Butterfly Atlas (Ontario Butterfly Atlas)
'—' No status

APPENDIX C

List of Vascular Plants

APPENDIX C
Plant Species List

Scientific Name	Common Name	Origin[a]	Global Rarity Status[b]	Ontario Rarity Status[b]	SARA[c]	ESA[d]	Regional Significance[e]
Abies balsamea	Balsam fir	N	G5	S5	–	–	No
Achillea millefolium	Common yarrow	I	G5T5?	SNA	–	–	No
Agalinis tenuifolia	Slender gerardia	N	G5	S4S5	–	–	No
Ageratina altissima	White snakeroot	N	G5T5	S5	–	–	No
Agrostis sp.	Bentgrass	N	?	?	–	–	No
Alnus incana	Speckled alder	N	G5	S5	–	–	No
Ambrosia artemisiifolia	Ragweed	N	G5	S5	–	–	No
Amelanchier laevis	Smooth juneberry	N	G4G5Q	S5	–	–	No
Anaphalis margaritacea	Pearly everlasting	N	G5	S5	–	–	No
Anemone virginiana	Thimbleweed	N	G5	S5	–	–	No
Antennaria neglecta	Field pussytoes	N	G5	S5	–	–	No
Apocynum androsaemifolium	Spreading dogbane	N	G5	S5	–	–	No
Aralia nudicaulis	Wild sarsaparilla	N	G5	S5	–	–	No
Arctostaphylos uva-ursi	Bearberry	N	G5	S5	–	–	No
Asclepias incarnata	Swamp milkweed	N	G5	S5	–	–	No
Asclepias syriaca	Common milkweed	N	G5	S5	–	–	No
Aquilegia canadensis	Wild columbine	N	G5	S5	–	–	No
Atriplex prostrata	Spear-leaved orache	N	G5	S5	–	–	No
Betula papyrifera	White birch	N	G5	S5	–	–	No
Bidens cernua	Nodding beggar-ticks	N	G5	S5	–	–	No
Bromus inermis	Smooth brome	I	GNR	SNA	–	–	No
Bromus kalmii	Kalm's brome	N	G5	S4	–	–	No
Calamagrostis canadensis	Canada blue-joint	N	G5	S5	–	–	No
Caltha palustris	Marsh-marigold	N	G5	S5	–	–	No
Campanula rotundifolia	Harebell	N	G5	S5	–	–	No
Carex communis	Common sedge	N	G5	S5	–	–	No
Carex eburnea	Ivory sedge	N	G5	S5	–	–	No
Carex spp.	Sedges	N	?	?	–	–	No
Carex umbellata	**Parasol sedge**	**N**	**G5**	**S5**	–	–	**Yes**
Carex utriculata	Bladder sedge	N	G5	S5	–	–	No
Carex vulpinoidea	Fox sedge	N	G5	S5	–	–	No
Celastrus scandens	Climbing bittersweet	N	G5	S5	–	–	No
Chenopodium album	Lamb's-quarters	I	G5T5	SNA	–	–	No
Cichorium intybus	Chicory	I	GNR	SNA	–	–	No
Cicuta bulbifera	Bulb-bearing water-hemlock	N	G5	S5	–	–	No
Cirsium arvense	Canada thistle	I	GNR	SNA	–	–	No
Cirsium vulgare	Bull thistle	I	GNR	SNA	–	–	No
Clematis virginiana	Virgin's-bower	N	G5	S5	–	–	No
Clinopodium vulgare	Wild basil	N	G5	S5	–	–	No
Coptis trifolia	Goldthread	N	G5	S5	–	–	No
Cornus canadensis	Bunchberry	N	G5	S5	–	–	No
Cornus stolonifera	Red osier dogwood	N	G5	S5	–	–	No
Danthonia spicata	Poverty oat-grass	N	G5	S5	–	–	No
Daucus carota	Wild carrot	I	GNR	SNA	–	–	No
Dichanthelium acuminatum	Small panic grass	N	G5T5	S4S5	–	–	No
Diervilla lonicera	Bush-honeysuckle	N	G5	S5	–	–	No
Echium vulgare	Viper's bugloss	I	GNR	SNA	–	–	No
Eleocharis sp.	Spikerush	N	G5	S5	–	–	No
Elymus repens	Quack grass	I	GNR	SNA	–	–	No
Epipactis helleborine	Helleborine	I	GNR	SNA	–	–	No
Equisetum arvense	Field horsetail	N	G5	S5	–	–	No
Equisetum scirpoides	Dwarf scouring-rush	N	G5	S5	–	–	No
Eupatorium perfoliatum	Boneset	N	G5	S5	–	–	No
Eurybia macrophylla	Large-leaved aster	N	G5	S5	–	–	No
Euthamia graminifolia	Grass-leaved goldenrod	N	G5	S5	–	–	No
Eutrochium maculatum	Joe-pye weed	N	G5TNR	S5	–	–	No
Fragaria virginiana	Common strawberry	N	G5	S5	–	–	No
Fraxinus nigra	Black ash	N	G5	S5	–	–	No
Fraxinus pennsylvanica	Green ash	N	G5	S5	–	–	No
Galium palustre	Marsh bedstraw	N	G5	S5	–	–	No
Galium triflorum	Sweet-scented bedstraw	N	G5	S5	–	–	No
Gaultheria procumbens	Wintergreen	N	G5	S5	–	–	No
Gentianopsis crinita	Fringed gentian	N	G5	S5	–	–	No
Geranium robertianum	Herb-robert	I	G5	SNA	–	–	No
Glyceria striata	Fowl manna grass	N	G5T5	S4S5	–	–	No
Hieracium aurantiacum	Orange hawkweed	I	GNR	SNA	–	–	No
Hieracium pilosella	Mouse-ear hawkweed	I	GNR	SNA	–	–	No
Hieracium piloselloides	King devil	I	GNR	SNA	–	–	No
Hydrocharis morsus-ranae	Frogbit	I	GNR	SNA	–	–	No
Hypericum perforatum	Common St. John's-wort	I	GNR	SNA	–	–	No
Ilex verticillata	Winterberry	N	G5	S5	–	–	No

Scientific Name	Common Name	Origin[a]	Global Rarity Status[b]	Ontario Rarity Status[b]	SARA[c]	ESA[d]	Regional Significance[e]
Juncus effusus	Soft rush	N	G5	S5	–	–	No
Juncus sp.	Rush	N	G5	?	–	–	No
Juniperus communis	Common juniper	N	G5	S5	–	–	No
Larix laricina	Tamarack	N	G5	S5	–	–	No
Leucanthemum vulgare	Ox-eye daisy	I	GNR	SNA	–	–	No
Lilium philadelphicum	Wood lily	N	G5	S5	–	–	No
Lycopus uniflorus	Northern water-horehound	N	G5	S5	–	–	No
Lythrum salicaria	Purple loosestrife	I	G5	SNA	–	–	No
Maianthemum canadense	Canada mayflower	N	G5	S5	–	–	No
Maianthemum racemosum	False Solomon's-seal	N	G5	S5	–	–	No
Maianthemum stellatum	Starry Solomon's-seal	N	G5	S5	–	–	No
Matricaria discoidea	Pineapple-weed	I	G5	SNA	–	–	No
Medicago sativa	Alfalfa	I	GNR	S5	–	–	No
Melilotus alba	White sweet clover	I	G5	SNA	–	–	No
Mentha arvensis	Field mint	N	G5	S5	–	–	No
Muhlenbergia glomerata	Muhly grass	N	G5	S5	–	–	No
Onoclea sensibilis	Sensitive fern	N	G5	S5	–	–	No
Oreganum vulgare	Wild oregano	I	GNR	SNA	–	–	No
Packera paupercula	Balsam ragwort	N	G5	S5	–	–	No
Panicum capillare	Witch grass	N	G5	S5	–	–	No
Panicum flexile	Wiry panic grass	N	G5	S4	–	–	No
Parthenocissus inserta	Virginia creeper	N	G5	S5	–	–	No
Penstemon hirsutus	Hairy beard-tongue	N	G4	S4	–	–	No
Petasites frigidus	Sweet coltsfoot	N	G5	S5	–	–	No
Phalaris arundinacea	Reed canary grass	N	G5	S5	–	–	No
Phleum pratense	Timothy	I	GNR	SNA	–	–	No
Phragmites australis	Common reed	N	G5	S5	–	–	No
Picea glauca	White spruce	N	G5	S5	–	–	No
Pinus banksiana	**Jack pine**	**N**	**G5**	**S5**	–	–	**Yes***
Pinus strobus	White pine	N	G5	S5	–	–	No
Poa compressa	Canada bluegrass	I	GNR	SNA	–	–	No
Polygala senega	Seneca-snakeroot	N	G4G5	S4	–	–	No
Populus balsamifera	Balsam poplar	N	G5	S5	–	–	No
Populus grandidentata	Large-toothed aspen	N	G5	S5	–	–	No
Populus tremuloides	Trembling aspen	N	G5	S5	–	–	No
Potentilla argentea	Silvery cinquefoil	I	GNR	SNA	–	–	No
Potentilla recta	Rough-fruited cinquefoil	I	GNR	SNA	–	–	No
Prunella vulgaris	Heal-all	N	G5T5	S5	–	–	No
Pteridium aquilinum	Bracken	N	G5	S5	–	–	No
Quercus macrocarpa	Bur oak	N	G5	S5	–	–	No
Rhamnus alnifolia	Alder-leaved buckthorn	N	G5	S5	–	–	No
Rhamnus cathartica	Common buckthorn	I	GNR	SNA	–	–	No
Rhamnus frangula	Glossy buckthorn	I	GNR	SNA	–	–	No
Rhus radicans	Poison-ivy	N	G5T5	S5	–	–	No
Ribes cynosbati	Prickly gooseberry	N	G5	S5	–	–	No
Ribes triste	Swamp red currant	N	G5	S5	–	–	No
Rosa acicularis	Prickly rose	N	G5	S5	–	–	No
Rubus allegheniensis	Mountain blackberry	N	G5	S5	–	–	No
Rubus idaeus	Red raspberry	N	G5T5	S5	–	–	No
Rubus odoratus	Purple-flowering raspberry	N	G5	S5	–	–	No
Rubus pubescens	Dwarf raspberry	N	G5	S5	–	–	No
Rudbeckia hirta	Black-eyed Susan	N	G5	S5	–	–	No
Salix discolor	Pussy willow	N	G5	S5	–	–	No
Salix petiolaris	Slender willow	N	G5	S5	–	–	No
Schoenoplectus tabernaemontani	Softstem bulrush	N	G5	S5	–	–	No
Scirpus atrovirens	Green bulrush	N	G5	S5	–	–	No
Scirpus cyperinus	Wool-grass	N	G5	S5	–	–	No
Setaria pumila	yellow foxtail	I	GNR	SNA	–	–	No
Silene vulgaris	Bladder campion	I	GNR	SNA	–	–	No
Solidago canadensis	Canada goldenrod	N	G5T5	S5	–	–	No
Solidago juncea	Early goldenrod	N	G5	S5	–	–	No
Solidago nemoralis	Gray goldenrod	N	G5T5	S5	–	–	No
Solidago ptarmicoides	White goldenrod	N	G5	S5	–	–	No
Solidago rugosa	Rough goldenrod	N	G5	S5	–	–	No
Spiraea alba	Meadowsweet	N	G5	S5	–	–	No
Symphoricarpos albus	Snowberry	N	G5T5	S4S5	–	–	No
Symphyotrichum ciliolatum	Blue aster	N	G5	S5	–	–	No
Symphyotrichum cordifolium	Heart-leaved aster	N	G5	S5	–	–	No
Symphyotrichum lanceolatum	Panicled aster	N	G5T5	S5	–	–	No
Symphyotrichum lateriflorum	Calico aster	N	G5T?	S5	–	–	No
Symphyotrichum puniceum	Red-stemmed aster	N	G5	S5	–	–	No

Scientific Name	Common Name	Origin[a]	Global Rarity Status[b]	Ontario Rarity Status[b]	SARA[c]	ESA[d]	Regional Significance[e]
Taraxacum officinale	Common dandelion	I	G5	SNA	–	–	No
Thalictrum sp.	Meadow-rue	N	G5	S5	–	–	No
Thelypteris palustris	Marsh fern	N	G5	S5	–	–	No
Thuja occidentalis	Eastern white cedar	N	G5	S5	–	–	No
Trientalis borealis	Starflower	N	G5	S5	–	–	No
Trifolium aureum	Yellow hop-clover	I	GNR	SNA	–	–	No
Trifolium repens	White clover	I	GNR	SNA	–	–	No
Tussilago farfara	Colt's-foot	I	GNR	SNA	–	–	No
Typha latifolia	Common cattail	N	G5	S5	–	–	No
Vaccinium angustifolium	Sweet blueberry	N	G5	S5	–	–	No
Verbascum thapsus	Common mullein	I	GNR	SNA	–	–	No
Veronica officinalis	Common speedwell	I	G5	SNA	–	–	No
Vicia cracca	Cow-vetch	I	GNR	SNA	–	–	No
Viola pubescens	Yellow violet	N	G5T5	S5	–	–	No
Vitis riparia	Riverbank grape	N	G5	S5	–	–	No

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

[e] For City of Ottawa, as assessed by Brunton 2015

*Jack pine appears to be planted on the Site, and therefore is not actually significant.

APPENDIX D

List of Wildlife

Wildlife Species 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	–	–
Eastern red bat	*Lasiurus borealis*	N	G5	S4	–	–
Eastern small-footed myotis	***Myotis leibii***	**N**	**G3**	**S2S3**	**Endangered**	**Endangered**
Hoary bat	*Lasiurus cinereus*	N	G5	S4	–	–
Little brown myotis	***Myotis lucifugus***	**N**	**G5**	**S4**	**Endangered**	**Endangered**
Meadow vole	*Microtus pennsylvanicus*	N	G5	S5	–	–
Red squirrel	*Tamiasciurus hudsonicus*	N	G5	S5	–	–
Silver-haired bat	*Lasionycteris noctivagans*	N	G5	S4	–	–
Snowshoe hare	*Lepus americanus*	N	G5	S5	–	–
White-tailed deer	*Odocoileus virginianus*	N	G5	S5	–	–
Birds						
Alder flycatcher	*Empidonax alnorum*	N	G5	S5B	–	–
American crow	*Corvus brachyrhynchos*	N	G5	S5B	–	–
American goldfinch	*Carduelis tristis*	N	G5	S5B	–	–
American redstart	*Setophaga ruticilla*	N	G5	S5B	–	–
American robin	*Turdus migratorius*	N	G5	S5B	–	–
American woodcock	*Scolopax minor*	N	G5	S4B	–	–
Black-and-white warbler	*Mniotilta varia*	N	G5	S5B	–	–
Black-capped chickadee	*Poecile atricapilla*	N	G5	S5	–	–
Blue jay	*Cyanocitta cristata*	N	G5	S5	–	–
Chipping sparrow	*Spizella passerina*	N	G5	S5B	–	–
Common grackle	*Quiscalus quiscula*	N	G5	S5B	–	–
Common nighthawk	***Chordeiles minor***	**N**	**G5**	**S4B**	**Threatened**	**Special Concern**
Common raven	*Corvus corax*	N	G5	S5	–	–
Common yellowthroat	*Geothlypis trichas*	N	G5	S5B	–	–
Chestnut-sided warbler	*Setophaga pensylvanica*	N	G5	S5B	–	–
Downy woodpecker	*Picoides pubescens*	N	G5	S5	–	–
Eastern whip-poor-will	***Antrostomus vociferus***	**N**	**G5**	**S4B**	**Threatened**	**Threatened**
European starling	*Sturnus vulgaris*	I	G5	SNA	–	–
Field sparrow	*Spizella pusilla*	N	G5	S4B	–	–
Gray catbird	*Dumetella carolinensis*	N	G5	S4B	–	–
Great-crested flycatcher	*Myiarchus crinitus*	N	G5	S4B	–	–
Golden-crowned Kinglet	*Regulus satrapa*	N	G5	S5B	–	–
Hairy woodpecker	*Picoides villosus*	N	G5	S5	–	–
Hermit thrush	*Catharus guttatus*	N	G5	S5B	–	–
House wren	*Troglodytes aedon*	N	G5	S5B	–	–
Killdeer	*Charadrius vociferus*	N	G5	S5B, S5N	–	–
Least flycatcher	*Empidonax minimus*	N	G5	S4B	–	–
Mourning dove	*Zenaida macroura*	N	G5	S5	–	–
Nashville warbler	*Oreothlypisa ruficapilla*	N	G5	S5B	–	–
Northern flicker	*Colaptes auratus*	N	G5	S4B	–	–
Pine warbler	*Setophaga pinus*	N	G5	S5B	–	–
Purple finch	*Carpodacus purpureus*	N	G5	S4B	–	–
Ring-billed gull	*Larus delawarensis*	N	G5	S5B, S4N	–	–
Red-eyed vireo	*Vireo olivaceus*	N	G5	S5B	–	–
Red-winged blackbird	*Agelaius phoeniceus*	N	G5	S4	–	–
Song sparrow	*Melospiza melodia*	N	G5	S5B	–	–
Swamp sparrow	*Melospiza georgiana*	N	G5	S5B	–	–
Swainson's thrush	*Catharus ustulatus*	N	G5	S4B	–	–
Wild turkey	*Meleagris gallopava*	N	G5	S5	–	–
White-throated sparrow	*Zonotrichia albicollis*	N	G5	S5B	–	–
Yellow warbler	*Setophaga petechia*	N	G5	S5B	–	–
Yellow-rumped warbler	*Setophaga coronata*	N	G5	S5B	–	–
Herpetiles						
American toad	*Anaxyrus americanus*	N	G5	S5	–	–
Eastern gartersnake	*Thamnophis sirtalis*	N	G5T5	S5	–	–
Northern leopard frog	*Rana pipiens*	N	G5	S5	–	–
Spring peeper	*Pseudacris crucifer*	N	G5	S5	–	–
Western chorus frog	***Pseudacris triseriata***	**N**	**G5TNR**	**S3**	**Threatened**	**–**
Bumblebees, Butterflies, and Dragonflies						
Beaverpond baskettail	*Epitheca canis*	N	G5	S5	–	–
Black swallowtail	*Papilio polyxenes*	N	G5	S5	–	–
Bluet	*Enallagma* sp.	N	?	?	–	–
Cabbage white	*Pieris rapae*	I	G5	SNA	–	–
Canada darner	*Aeshna canadensis*	N	G5	S5	–	–
Canadian tiger swallowtail	*Papilio canadensis*	N	G5	S5	–	–
Common eastern bumblebee	*Bombus impatiens*	N	G5	S4S5	–	–
Clouded sulphur	*Colias philodice*	N	G5	S5	–	–
Common ringlet	*Coenonympha tullia*	N	G5	S5	–	–

Wildlife Species List

Common Name	Scientific Name	Origin[a]	Global Rarity Status[b]	Ontario Rarity Status[b]	SARA[c]	ESA[d]
Dun skipper	*Euphyes vestris*	N	G5	S5	–	–
Eastern comma	*Polygonia comma*	N	G5	S5	–	–
Eastern forktail	*Ischnura verticalis*	N	G5	S5	–	–
Eastern-tailed blue	*Everes comyntas*	N	G5	S5	–	–
European skipper	*Thymelicus lineola*	N	G5	SNA	–	–
Halloween pennant	*Celithemis eponina*	N	G5	S4	–	–
Mourning cloak	*Nymphalis antiopa*	N	G5	S5	–	–
Meadow fritillary	*Boloria bellona*	N	G5	S5	–	–
Northern crescent	*Phycoides pascoensis*	N	G5	S5	–	–
Peck's skipper	*Polites peckius*	N	G5	S5	–	–
Slender spreadwing	*Lestes rectangularis*	N	G5	S5	–	–
White admiral	*Limenitis arthemis*	N	G5	S5	–	–
White-faced meadowhawk	*Sympetrum obtrusum*	N	G5	S5	–	–
Yellow-legged meadowhawk	*Sympetrum vicinum*	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 (2015)
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; checked December 2015)

[d] Ontario Endangered Species Act (O.Reg.230/08; checked December 2015)

APPENDIX E

Curriculum Vitae

Golder Associates Ltd. – Mississauga

Principal, Senior Ecologist

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

Education

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

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

Certifications

PADI Master Scuba Diver Trainer,
2000

Small Craft Boat Operator,
2003

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

Canadian Red Cross First Aid and CPR,
2012

WHMIS Training,
1990, 2001, 2004, 2016

Languages

English – Fluent

Employment History

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.

PROJECT EXPERIENCE – CONSTRUCTION MATERIALS

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. Participated in a LPAT (formerly the OMB) hearing as an expert witness.

CBM (a division of St. Marys Cement Inc. (Canada)), Dance Pit Extension
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 (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.

PROJECT EXPERIENCE – SERVICING/INFRASTRUCTURE

Peel Wastewater Treatment Plan
Region of Peel, Ontario, Canada

Project manager and senior advisor and technical reviewer for the natural environment component for a Schedule C Environmental Assessment for the capacity expansion of the central Mississauga wastewater system. Managed a multi-disciplinary team including natural environment, archaeology, cultural heritage, and geotechnical engineering. Designed the natural environment field program and worked with the component lead to analyse and interpret data. Provided senior leadership and technical guidance and review for all natural environment deliverables.

Niagara Falls Wastewater Servicing Strategy
Niagara Falls, Ontario, Canada

Natural environment component lead for a Class Environmental Assessment for a Niagara Falls wastewater servicing strategy for a new south Niagara Falls wastewater treatment plant. Developed ecological matrices for determining the short-list of alternative sites, including constraints analyses, designed field program and managed a team of ecologists. Analysed, interpreted and integrated data with physical resource components. Completed impact assessment, developed reports and participated in the public consultation process.

Clarksburg Master Servicing Plan
Clarksburg, Ontario, Canada

Senior advisor and technical reviewer for the natural environment component for a Class Environmental Assessment. Worked with the component lead to design field program and analyse and interpret data. Provided senior leadership and technical guidance and review for all deliverables.

Cambridge Zone 3
Cambridge, Ontario, Canada

Senior advisor and technical reviewer for the natural environment component for a Class Environmental Assessment for regional water system upgrades in Cambridge and North Dumfries. Worked with the component lead to design field program and analyse and interpret data. Provided senior leadership and technical guidance and review for all deliverables.

Town of Blue Mountains Water Supply Master Plan
Blue Mountains, Ontario, Canada

Senior advisor and technical reviewer for the natural environment component for a Class B Environmental Assessment. Worked with the component lead to design field program and analyse and interpret data. Provided senior leadership and technical guidance and review for all deliverables.

Region of Peel East to West Wastewater Diversion Strategy
Peel Region, Ontario, Canada

Senior advisor and technical reviewer for the natural environment component for a Class Environmental Assessment. Worked with the component lead to design field program and analyse and interpret data. Provided senior leadership and technical guidance and review for all deliverables.

PROJECT EXPERIENCE – WASTE

County of Simcoe Landfills and Transfer Stations
Various Sites in the County of Simcoe, Ontario, Canada

Senior natural environment technical lead for a number of landfill sites. Assisted the County with landuse planning, due diligence for new properties, approvals and permits for expansions and changing uses. Coordinated field investigations including wetland boundary delineation. Consulted with Conservation Authorities, Niagara Escarpment Commission and MNRF.

Humberstone Landfill
Niagara, Ontario, Canada

Senior advisor and technical reviewer for a provincial EA in support of a landfill expansion. Worked with the natural environment component lead to design field programs, consult with provincial agencies and prepare technical reports. Provided senior leadership and technical guidance and review for all deliverables.

Capital Region Resource Recovery Centre (CRRRC)
Ottawa, Ontario, Canada

Natural environment component lead for a provincial EA for a resource recovery centre on a 175 hectare site), including a landfill, contaminated soil management and recycling components. Designed the field program (terrestrial and aquatic), analysed and integrated data with other disciplines, completed an impact assessment. Consulted with regulatory agencies including the Conservation Authority, MNRF and DFO. Provided input to the project design, obtained permits and participated in the public consultation process.

PROJECT EXPERIENCE – MINING

EWL Management Ltd. Dyno Mine Rehabilitation
Bancroft, Ontario, Canada

Natural environment component lead for an environmental and health risk assessment of decommissioned uranium mine. Worked with a multi-disciplinary team including surface water engineers, geotechnical engineers, and risk specialists. Designed and coordinated bioscience field technicians to carry out the natural environment workplan. Tasks included fish habitat assessment and characterization of the aquatic environment, and collection of benthic, fish, sediment and aquatic plant tissue samples in affected and reference lakes and watercourses in support of the human health and ecological risk assessment. In addition, collection of small mammal and plant tissue samples and characterization of wildlife habitat was included. Responsible for analysis and interpretation of data, as well as report preparation and liaising with stakeholders and government agencies.

EWL Management Ltd. Coldstream \ Mine Rehabilitation
Thunder Bay, Ontario, Canada

Natural environment component lead for an environmental and health risk assessment of a decommissioned copper mine. Worked with a multi-disciplinary team including surface water engineers, geotechnical engineers, and risk specialists. Designed and coordinated bioscience field technicians to carry out the natural environment work plan. Tasks included fish habitat assessment and characterization of the aquatic environment, and collection of benthic, fish, sediment and aquatic plant tissue samples in affected and reference lakes and watercourses in support of the human health and ecological risk assessment. In addition, collection of plant tissue samples and characterization of wildlife habitat was included. Responsible for analysis and interpretation of data, as well as report preparation and liaising with stakeholders and government agencies.

PROJECT EXPERIENCE – OIL & GAS

Enbridge Bayview Avenue Pipeline Replacement Ontario, Canada	Natural environment component lead for pipeline replacement project. Coordinated SAR screening, natural heritage feature mapping, site investigations, impact assessment, tree inventory, DFO self-assessment, consultation with MECP, registration of activities (NoA) under the Endangered Species Act and development of mitigation plan. Worked with team to obtain Toronto and Region Conservation Authority (TRCA) permits.
Enbridge Pipelines Inc. Line 9 Southern Ontario, Canada	Project manager for natural environment component of pipeline maintenance project in southern Ontario. Coordinated SAR screening and natural heritage feature mapping, site investigations, identification of permit requirements and constraint mapping in support of brushing and other maintenance activities.
TransCanada Bear Creek Rehabilitation Ontario, Canada	Natural environment component lead for Bear Creek rehabilitation following washout and exposure of the pipeline in the creek bed. Completed baseline existing conditions reporting including fish and fish habitat, SAR and riparian habitat to meet Conservation Authority, MNRF and DFO requirements. Worked with Golder's hydrology team to obtain Conservation Authority permits, develop a rehabilitation plan suitable for the existing conditions and fish community, and recommended appropriate mitigation during construction.
TransCanada Greater Golden Horseshoe Facilities Modifications Ontario, Canada	Natural environment component lead for an environmental and socio-economic assessment for modifications to a number of facilities under the National Energy Board (NEB). Responsibilities included designing the field program (vegetation, wetlands, wildlife, fish and fish habitat), analysing data, completing the baseline and effects assessment, liaising with agencies and permitting.
TransCanada Eastern Mainline Project Ontario, Canada	Vegetation and wetland component lead for an environmental and socio-economic assessment for a 392 km new construction pipeline in southern Ontario under the National Energy Board (NEB). Designed the field program, analysed data, completed the baseline and effects assessment and reporting. Consulted and negotiated with the MNRF, Environment and Climate Change Canada (ECCC) and local Conservation Authorities, prepared permit applications, and addressed Information Requests (IRs).
TransCanada Parkway West Connection Milton, Ontario, Canada	Natural environment component lead for an environmental and socio-economic assessment for a new pipeline connection under the NEB. Designed the field program (vegetation, wetlands, wildlife, fish and fish habitat), analysed data, completed the baseline and effects assessment, led consultation with agencies and obtained permits.
TransCanada Vaughan Mainline Extension Ontario, Canada	Senior technical reviewer and advisor for the vegetation, wetland and wildlife components for an environmental and socio-economic assessment for a new construction pipeline in southern Ontario under the NEB. Consulted with provincial and federal agencies, designed and coordinated baseline, construction and post-construction monitoring programs and developed environmental protection plans.

TransCanada Kings North Connection
Ontario, Canada

Senior technical reviewer and advisor for the vegetation, wetland and wildlife components for an environmental and socio-economic assessment for a new construction pipeline in southern Ontario under the NEB. Consulted with provincial and federal agencies, designed compensation habitat for SAR, designed and coordinated baseline, construction and post-construction monitoring programs and developed environmental protection plans.

TransCanada LNG Facility
Trois Rivieres, Quebec, Canada

Aquatic technical component lead. Designed and conducted inland fisheries field programs for a liquefied natural gas facility and associated distribution pipelines. The programs included aquatic habitat assessments of all watercourse pipeline crossings, and an assessment of habitat and water quality of inland lakes in the vicinity of the facility. Interpreted data and prepared technical reports.

Education

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

Certifications

PWGSC 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

Golder Associates Ltd. – Ottawa

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

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

Stittsville Quarry Extension
Ottawa, ON

Preparing 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.

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.

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.

Highland Line Pit
Lanark, ON

Prepared a Natural Environment Level II 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.

Woods Quarry Extensions
Elizabethtown-Kitley, ON

Prepared a Natural Environment Level II 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.

Almonte 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.

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.

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.

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.

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.

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.

McMachen Pit Species at Risk
Rideau Lakes, ON

Designed and undertook a baseline study and mitigation plan for a sensitive Species at Risk on the client's proposed aggregate pit expansion lands in accordance with O.Reg. 242/08 under the Endangered Species Act.

PROJECT EXPERIENCE – ECOLOGY PEER REVIEW SERVICES

Ottawa International Airport Pit
Ottawa, ON

Retained in 2020 by Thomas Cavanagh Construction Ltd. to provide a peer review of a Natural Environment Level II report prepared for the proposed aggregate pit to be developed on the Ottawa International Airport Lands. The site is on federal lands so federal policies had to be addressed in the typically provincial context of an NELII report. Provided a letter commenting on the adequacy of scope and appropriateness of conclusions made in the report.

City of Kingston - Davis Tannery Lands
Kingston, ON

Retained in 2019 by the City of Kingston to review an Environmental Impact Study (EIS) for the proposed remediation and development of the former Davis Tannery lands on the Cataraqui River in the City of Kingston. Provided a letter commenting on the adequacy of scope and appropriateness of conclusions made in the report.

City of Kingston - CRCA Severance
Kingston, ON

Retained by the City of Kingston to provide environmental peer review services. Retained in 2016 by the City of Kingston to review an Environmental Impact Study (EIS) for the severance of a parcel of land from the Little Cataraqui Creek Conservation Area, and provided comments with respect to the adequacy of scope and appropriateness of conclusions made in the report.

County of Peterborough
Peterborough, ON

Retained in 2010 by the County of Peterborough to provide environmental peer review services. Reviewed Environmental Impact Studies (EIS) for residential and recreational developments within the County, and provided comments with respect to the adequacy of scope, and appropriateness of conclusions made in the reports.

County of Frontenac
Frontenac, ON

Retained in 2008/2009 by the County of Frontenac to provide environmental peer review services. Reviewed Environmental Impact Studies (EIS) for residential and recreational developments within the County, and provided comments with respect to the adequacy of scope, and appropriateness of conclusions made in the reports.

PROJECT EXPERIENCE – SPECIES AT RISK

Species at Risk Studies - Various Projects
Various Locations, Ontario, Canada

Gwendolyn has been involved in the design and undertaking of numerous studies for various Species At Risk in Ontario, and assessments of their habitats. Surveys followed accepted, standardized protocols and habitats were assessed against established criteria, where available. Species for which these types of studies have been undertaken include, but are not limited to: Fowler's Toad, Western Chorus Frog, Jefferson Salamander, Black Rat Snake, Eastern Hog-nosed Snake, Massassauga Rattlesnake, Short-eared Owl, Barn Swallow, Bobolink, Eastern Meadowlark, Eastern Whip-poor-will, Peregrine Falcon, Least Bittern, American Badger, Little Brown Bat, Northern Myotis, Tri-coloured Bat, Small-footed Myotis, Eastern Foxsnake, Spiny Softshell, Blanding's Turtle, Butternut, American Hart's Tongue Fern, and American Ginseng, Gwendolyn has successfully navigated the over-all benefit permitting process under the Endangered Species Act for butternut and has performed work under the new O.Reg. 242/08 for American Ginseng. Gwendolyn's work with SAR has involved close liaison with the MNR, experts from academia, and involvement of public interest groups such as the Sierra Club of Canada and local Field Naturalist clubs.

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

PROFESSIONAL AFFILIATIONS

Ontario Vernal Pool Association

Field Botanists of Ontario

golder.com