REPORT

March 2018

REPORT ON

Preliminary Environmental Impact Statement and Tree Conservation Report Proposed Maple Grove Subdivision Part Lot 1, Concession 1 Geographic Township of Huntley, Ottawa, ON

Submitted to:
Mr. Jim Burghout
Claridge Homes Corporation
2001 - 210 Gladstone Avenue
Ottawa, Ontario K2P 0Y6

Report Number: 1776275

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1.0 INTRODUCTION

Golder Associates Ltd. (Golder) has been retained by Claridge Homes Corporation (Claridge) to complete a preliminary Environmental Impact Study (EIS) and Tree Conservation Report (TCR) for the draft plan of subdivision for the roughly 7.75 ha lot located in Part Lot 1, Concession 1, Geographic Township of Huntley, City of Ottawa, Ontario (the Site) (Figure 1). Golder's assessment included, to the extent possible, the area within 120 metres (m) of the Site (study area). Golder understands that the proposed works on the Site will include the construction of a new residential development.

This report has been prepared in accordance with the EIS guidelines in the City of Ottawa Official Plan (OP) (Ottawa, 2015a; 2013a), based on information gathered to date. Appendix D to this report is a Tree Conservation Report (TCR) (Golder, 2017a) which has been prepared for the Site in accordance with the City's Tree Conservation Report Guidelines (Ottawa, 2016), based on information available to date.

1.1 Site Description

The Site consists of 7.75 ha of semi-open and treed habitats. The Site is bounded on the east by natural areas and rural residential, to the north and west by natural areas and undeveloped lands, and to the south by Maple Grove Road and residential areas.

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 included the following:

- Provincial Policy Statement (MMAH, 2014)
- *Species at Risk Act* (Canada, 2002)
- *Endangered Species Act* (Ontario, 2007)
- *Fisheries Act* (Canada, 1985)
- *Migratory Birds Convention Act* (Canada, 1994)
- Ontario Regulation 153/06 *Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses* (Ontario, 2006), administered by the MVCA
- City of Ottawa OP (Ottawa, 2013a)

An overview of the above noted legislation and policy documents is discussed below.

2.1 Provincial Policy Statement

The Provincial Policy Statement (PPS) was issued under Section 3 of the *Planning Act* (MMAH, 2014).

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:

c) Significant wetlands in the Canadian Shield north of Ecoregions 5E, 6E and 7E

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

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

f) Significant wildlife habitat

g) Significant areas of natural and scientific interest

h) 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.

2.2 Species at Risk

2.2.1 Species at Risk Act (SARA)

At the 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) (Canada, 2002). On private or provincially-owned lands, only aquatic species and migratory birds listed as endangered, threatened or extirpated are protected under SARA, unless ordered by the Governor in Council, or unless the project is federally funded or federally governed.

2.2.2 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 Natural Resources and Forestry, species are added to the provincial *Endangered Species Act* (ESA) that 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 provides general habitat protection to all species listed as threatened or endangered. 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. There are exemptions under the Act for the treatment of certain species and their habitats for some activities.

2.3 Fisheries Act

The purpose of the *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. Fisheries and Oceans Canada (DFO) has project screening, reporting and mitigation tools that make regulatory requirements clear and consistent.

Projects affecting waterbodies supporting Canada's commercial, recreational and Aboriginal (CRA) fisheries must comply with the provisions of the *Fisheries Act*. The proponent is responsible for determining if the project is likely to cause impacts to CRA fisheries and if these impacts can be avoided or mitigated, but a request for project review can also be submitted to DFO if the proponent is unsure, or the project or works do not easily fall into prescribed DFO categories. The proponent must gather information on the type and scale of impact on the fishery and determine if the impacts will result in serious harm to fish. Proponents have a duty to maintain records of self assessments completed for projects they undertake, and need to provide this information to DFO upon request. Serious harm to fish is defined as the death of fish and/or any permanent alteration to, or destruction of, fish habitat. If it is determined that the impacts cannot be avoided or mitigated and will result in serious harm to fish, an application for authorization must be submitted to the DFO.

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 Mississippi Valley Conservation Authority

The Mississippi Valley Conservation Authority (MVCA) is the governing body that regulates flood potential and natural heritage features in the Mississippi River watershed. Development within regulated areas is governed by Regulation 153/06 *Development, Interference with Wetlands and Alterations to Shorelines and Watercourses* (Ontario, 2006).

Although development is not necessarily restricted within the MVCA regulated area, it designates an area that triggers the need for a permit and, in most cases, an accompanying EIS. Based on online mapping, no portion of the Site lies within the MVCA regulated area.

The MVCA has updated their policies to include regulation of non-provincially significant wetlands (PSW) and unevaluated wetlands greater than 0.5 ha in size and that have hydraulic connectivity to a waterbody or watercourse, and the area within 30 m of them. Development within any non-PSW, or the area within 30 m of a wetland, requires a permit from the MVCA under the *Development, Interference with Wetlands and Alterations to Shorelines and Watercourses* regulation, and must show that the lost wetland function can be mitigated or off-set through replacing the lost function. There are small wetlands on the Site, which will be discussed in the context of this regulation in Section 6.8. Development within unevaluated wetlands may trigger the need for a formal evaluation under the Ontario Wetland Evaluation System (OWES) (MNRF, 2014a).

2.6 City of Ottawa

Proponents are required, under the City OP (Ottawa, 2013a), to prepare an EIS following the City guidelines (Ottawa, 2015a), which documents the occurrence of significant natural heritage features in, and adjacent to, the proposed development area. The policies in the OP address both natural features and natural functions.

The Site is designated as General Urban Area on Schedule B (Urban Policy Plan) of the City OP. Surrounding undeveloped areas are also designated General Urban Area (and Expansion Area), but lands to the north are designated Enterprise Area. The City of Ottawa Urban Natural Areas Environmental Evaluation Study (Muncaster and Brunton, 2005) identified a portion of the Site as Urban Natural Area No. 32 ("North of Maple Grove"), and gave the feature a "moderate" environmental rating. This feature has not been included in the City's OP and therefore, no formal designations are associated with it. The City's Greenspace Master Plan (Ottawa, 2006) identifies the treed portions of the Site as "Contributing" linkage to the "Supporting" linkage areas to the west associated with Feedmill Creek and associated wetlands. According to the Master Plan, this designation indicates the Site "may play a role in the enhancement of natural landscapes and features".

3.0 DESCRIPTION OF DEVELOPMENT PROPOSAL

It is understood that the Site is proposed to be developed as a residential subdivision consisting of 57 detached homes, 101 town homes and 38 back-to-back homes (AOV, 2017). Also included in the plan is a park block occupying 0.68 ha, as well as roads and services within the subdivision. The proposed plan is provided on Figure 3.

4.0 METHODS

4.1 Background Review

Background data reviewed for this project included existing documents and a number of information sources. The review was also used to identify SAR that have been reported as occurring, or have the potential to occur, in the study area. Sources reviewed included:

- Ministry of Natural Resources and Forestry (MNRF) Make-a-Map Natural Areas Explorer (MNRF, 2017) for information on known occurrences of SAR and other significant natural features
- Characterization of Ottawa's Watersheds (Ottawa, 2011)
- Atlas of Breeding Birds of Ontario (Cadman et al., 2007)
- Atlas of the Mammals of Ontario (Dobbyn, 1994)
- Ontario Reptile and Amphibian Atlas (Ontario Nature, 2017)
- Ontario Butterfly Atlas (Jones et al., 2017)
- Bat Conservation International (BCI) range maps (BCI, 2013)
- eBird (Audubon and Cornell, 2017)
- MNRF Land Information Ontario (LIO) mapping (LIO, 2017)
- City of Ottawa OP (Ottawa, 2013a)
- Existing aerial photography

The MNRF was contacted by e-mail in order to obtain information on rare species and significant natural features in the study area. A response was received on July 13, 2017 and the information contained in the response was considered and incorporated into this report.

4.2 SAR Screening

An assessment was conducted to determine which species listed under the SARA or ESA have the potential to be located in the study area. The potential for SAR to occur was assessed based on species range information, known records, review of the habitat observations made during the site investigations, historic land use practices, and the preferred habitat requirements of these species. Species with ranges overlapping the study area, or recent occurrence records in the vicinity, were screened by comparing their habitat requirements to habitat conditions in the 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 study area and no specimens identified, or no habitat present and a specimen observed incidentally. 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 recorded, or a species was observed but no suitable habitat exists at the Site (e.g. fly-over). High potential indicates a known species record in the study area (including during site investigations or background data review) and good quality habitat is present. The rankings considered natural feature observations (i.e. habitat) made during the site investigations and background information obtained through the desktop review.

4.3 Site Investigations

The following sections outline the methods used for each of the site investigations conducted in the study area. Surveys were limited to the Site and surrounding areas with public access, and areas visible from public areas such as roads. During all site investigations, visual encounter surveys (VES) were conducted and any additional 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.

Table 1: Summary of Natural Environment Site Investigations in the Study Area

Year	Date	Type of Survey
2017	4 July	Breeding Bird Survey, Wildlife Visual Encounter Survey
	4 July	Bat habitat Survey, deploy bat detectors
	4 July	Ecological Land Classification/Botanical Survey
	21 September	Ecological Land Classification/Botanical Survey/Tree Conservation Survey
	7 November	Tree Conservation Survey
To be completed in 2018	TBD	Amphibian Call Count Surveys (April and May)
	TBD	Early Vegetation Survey (May / June)
	TBD	Eastern Whip-poor-will Surveys (3 in May / June)
	TBD	Breeding Bird Survey (June)
	TBD	Butternut Health Assessments (June)

Ecological Land Classification and Habitat Assessment

Plant communities were first delineated at a desktop level using aerial imagery, then further assessed in the field using the Ecological Land Classification (ELC) system for Southern Ontario (Lee *et al.,* 1998). The surveys were carried out by systematically traversing the study area, where access was available, for a thorough survey of species and plant communities. During all site investigations, information on plant community structure and composition was recorded in order to refine the plant community polygons. Based on the ELC polygons and the desktop SAR screening, potential habitats for SAR were searched for and suitability was assessed.

Botanical Surveys

Botanical surveys were completed concurrent with ELC surveys and included area searches in all accessible habitats in the study area. A list of all plant taxa identified during the surveys was compiled. Plants that were obviously planted for landscape purposes on residential and commercial properties were not included in this inventory. However, those landscape species or cultivars that appeared to be naturalized or escapees were included.

Efforts to locate butternut trees (*Juglans cinerea*) were concentrated in areas where development is proposed, and within 50 m of those areas. Searches for trees were conducted during all site investigations, and marked when found using a hand-held GPS unit. Butternut health assessments (BHA) will be performed in 2018 on all on-Site trees, and any trees on adjacent lands, within 50 m, where approval is granted. The assessments will be performed by a certified Butternut Health Assessor, according to standardized MNRF protocols (MNRF, 2013a) and using the methods as outlined in Butternut Health Assessment Guidelines (MNRF, December 2014a) and Butternut Health Assessment in Ontario (FGCA, August 2010), with all relevant information entered into the standard Butternut Data Collection Forms (1 and 2). The calculations and analysis will be performed using the Butternut Retainable Tree Analysis electronic table, updated by the MNRF in 2013.

Breeding Bird Surveys

Breeding bird point count surveys were conducted at three stations for songbirds and other diurnal birds (Figure 1). Surveys followed protocols adapted from Atlas of the Breeding Birds of Ontario (Cadman *et al.,* 2007). Point count stations were established within the study area, on accessible lands, at least 250 m apart, where possible. Surveys were conducted in the period between 30 minutes before sunrise and 10:00 am to encompass the period of maximum bird song. One survey was completed in 2017, and a second survey will be completed in 2018.

In 2018, three specific surveys for eastern whip-poor-will will be conducted on the Site, according to standard protocols (MNRF, December 2014b) to determine appropriate station locations and correct timing of the surveys.

All birds seen or heard were noted and observations were made regarding sex, age, breeding evidence, and notable behaviour, when possible. Additional observations of birds in the study area were made during all other surveys.

Bats

Daytime bat habitat surveys included assessment of each plant community for mature trees with potential to support bat maternity roosts. Areas with higher concentrations of cavity trees or foraging potential were targeted for acoustic surveys. Searches for hibernacula habitat were performed by searching for suitable structures or geology (e.g. caves, karst, and crevices).

Stationary acoustic surveys were performed to confirm the presence of any SAR bats, based on draft protocols prepared by the MNRF (undated). Frequent nightly passage by SAR bats would suggest that they are roosting within close proximity to the acoustic station. Bats will travel several kilometres in a night from their roost locations to feeding locations where they spend much of their time. Therefore, incidental recording of species does not necessarily indicate the presence of a maternity roost within the study area.

Two full-spectrum bat detectors (Wildlife Acoustics SM3BAT+®) were deployed on the Site (Figure 1). One detector recorded bat activity for 16 nights, and the other for 17 nights (July 4 – 19/20, 2017) during the maternity roosting season. Each station was located to provide coverage of the Site and target areas where bats would most likely be roosting, commuting or feeding. The U1 microphones were left open with no horn or windscreen for maximum recording capability. They were controlled to record from 30 minutes before sunset to 30 minutes after sunrise. The detectors were triggered by ultrasound (which may or may not be a bat). Once triggered, they recorded a file between 5 and 15 seconds in duration and then started a new recording (if ultrasound persisted) or slept until they were next triggered.

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 was 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, a subset of the files were reviewed (QA/QC'd) by an experienced and qualified bat acoustic specialist using the SonoVet tool. All recordings identified as high frequency calls were reviewed and a subset of the low frequency calls were also reviewed. For calls that were auto-classified to species by SonoBat but not reviewed, the SonoBat classification was accepted.

Herpetofaunal Surveys

Two anuran call-count surveys will be conducted during spring 2018 and will utilize a point count methodology (Bird Studies Canada, 2003). At least two stations will be located across the Site, based on the locations of potential breeding habitat, and following spacing requirements in the methodology. Surveys will be conducted between 30 minutes after sunset and midnight. At each station, a three minute survey will be completed with amphibian species identified by vocalization. The search area is generally identified by a 100 m radius semi-circle around the listening station. Amphibians heard beyond the 100 m survey plot will be noted along with any other wildlife encountered during the survey.

Wildlife Visual Encounter Surveys

VES for all wildlife, including reptiles, mammals, butterflies and dragonflies, were conducted throughout the study area, where access was available (MNRF, 2013b; McDiarmid, 2012; Bookhout, 1994). This included a search for tracks and other signs (e.g. scat, tree scrapes, predated turtle nests, etc.). In addition, attention was paid to searching for suitable wildlife habitat and micro-habitats (e.g. hollow trees, talus, vernal pools, etc.).

4.4 Analysis of Significance and Sensitivity

An assessment was conducted to determine the significance and sensitivity of designated features as well as significant species observed in the study area or determined to have potential to exist in the study area as inferred from the SAR screening. The assessment was completed by comparing natural environment data collected through background material and site investigations to published resources as described in Section 4.1, and through a detailed analysis using the methods and criteria outlined in the Natural Heritage Reference Manual (NHRM) (MNRF, 2010), Significant Wildlife Habitat Technical Guide (SWHTG) (MNRF, 2000) and the Significant Wildlife Habitat Ecoregion Criterion Schedules (SWHECS) (MNRF, 2015).

5.0 SITE DESCRIPTION

The Site is occupied by open and forested communities in an urbanizing landscape, with a small shed present at the far eastern boundary. The study area that surrounds the Site consists of urban residential developments to the south, rural residential to the east, and natural cover to the north and west. The Site is located in a rapidly developing urban area, with the remaining adjacent natural areas on the north and east identified primarily for development in the Kanata West Concept Plan.

5.1 Ecosystem Setting

The study area is within the Upper St. Lawrence sub-region of the Great Lake-St. Lawrence Forest Region. Trees characteristic of this sub-region include sugar maple, beech, red maple, yellow birch, basswood, white ash, largetooth aspen, and red and bur oak. Coniferous species include eastern hemlock, eastern white pine, white spruce and balsam fir (Rowe, 1977).

The Site is located in the Feedmill Creek catchment area within the larger Carp River subwatershed of the Mississippi Valley Watershed. According to information provided by the MVCA (August, 2016), this catchment area drains an area of 11.77 km^2. Forest cover in this catchment is 2.18 km^2, corresponding to 18.5% forest cover. There are no waterbodies or watercourses on the Site, and Feedmill Creek is located more than 120 m to the west, outside of the study area.

5.2 Geology and Hydrogeology

The Site lies within the Sand Plains section of the Ottawa Valley Clay Plains physiographic region (Chapman and Putnam, 1984), which is typically interrupted by ridges of rock or sand. In general, the subsurface conditions at the Site consisted of silty sand or sand over limestone bedrock. Practical refusal to excavating was encountered at depths varying from about 0.3 to 2.1 m below the existing ground surface (Golder, 2017b). Groundwater seepage and wet soil conditions were generally present at depths of about 1 to 2.1 metres below the existing ground surface (Golder, 2017b).

5.3 Ecological Land Classification

5.3.1 Plant Communities

Eight plant communities were delineated on the Site as part of the ELC assessment. These communities are shown on Figure 1 and described in Table 2. All of the plant communities are typical in the region and for the conditions on the Site, and none have been assigned provincial rarity ranks (SRANK) in the NHIC database.

Table 2: Plant Communities on the Site

Plant Community Type	Description
CUM1-1 Mixed Meadow	This community was a very small meadow at the southern edge of the Site. It was a mix of grasses and forbs such as smooth brome (*Bromus inermis*) and Canada goldenrod (*Solidago canadensis*).
CUT1 Buckthorn Juniper Mixed Thicket	This community was in the southern corner of the Site. It was dominated by alien buckthorns (*Rhamnus* spp.), interspersed with common juniper (*Juniperus communis*), and scattered other shrubs. Although shrub cover was dominant overall, there were open meadow and exposed bedrock patches throughout. Ground cover was a mix of grasses and forbs, such as yellow bedstraw (*Gallium verum*) and Canada bluegrass (*Poa compressa*).
CUW – Mixed Open Woodland	This community was a band through the middle of the Site that appeared to be a remnant of past anthropogenic uses (e.g. farming, forestry). It was a mix of open meadow and dense thicket interspersed with immature trees, becoming contiguous with the adjacent forest. Tree and shrub species included buckthorns, red raspberry (*Rubus idaeus*), white birch (*Betula papyrifera*) and white pine (*Pinus strobus*). Meadow patches included grasses and forbs such as Canada goldenrod and Kentucky bluegrass (*Poa pratensis*). Snags and downed woody debris were rare.
FOD5-1 Dry to Fresh Sugar Maple Deciduous Forest	This community was a small stand near the northern corner of the Site. It was immature, with a few individual mature trees. It was dominated in the canopy by sugar maple, with a few other species such as ironwood (*Ostrya virginiana*), and red oak (*Quercus rubra*). The canopy was primarily closed, with very little understory. The exception to this was a small opening, where shrubs such as glossy buckthorn (*Rhamnus frangula*) occurred. There were signs of historic logging. Snags and downed woody debris were rare, but there was one very large snag near the center.
FOM5-1a Dry to Fresh White Birch Mixed Forest	This community was in the western portion of the Site. It was immature overall, with scattered older trees throughout. The canopy was dominated by white birch, white pine, and white spruce, with a few other species present. The sub canopy was similar but included a higher proportion of other species such as white cedar (*Thuja occidentalis*) and trembling aspen (*Populus* tremuloides). There were patches of mature thicket, dominated by buckthorns throughout. There were also a few very small low-lying areas where water collects allowing water tolerant species, such as tamarack (*Larix laricina),* and black ash (*Fraxinus nigra*) to persist. These low-lying areas have wetland characteristics but were too small to be mapped or be considered separate communities (i.e. >0.1 ha). There were signs of historic logging. Snags and downed woody debris are occasional.
FOM5-1b Dry to Fresh White Birch Mixed Forest	This community was somewhat similar to FOM5-1a, however, there was a higher proportion of tall buckthorn shrubs and white pine. There was a patch of large, semi-mature white pines at the northern edge of this community.
FOC2-1 Dry to Fresh White Cedar Coniferous Forest	This community was present along the western edge of the Site. It was a small, dense, almost pure stand of immature eastern white cedar. There were occasional tree species associates, such as white birch. The canopy was almost closed, with very sparse understory and ground cover. Snags and downed wood debris were rare.
MAM2-2 Reed Canary Grass Meadow Marsh	This community was a very small, almost pure stand of reed canary grass (*Phalaris arundinacea*) growing on saturated soil. Other species observed included purple loosestrife (*Lythrum salicaria*) and american water horehound (*Lycopus americanus*). Although the soil was saturated, no pools or channels of standing water were observed.

Permission to access adjacent lands (study area) was not obtained for these surveys, so assessments were performed from the edge of the Site, and through review of aerial imagery. Vegetation communities in the study area appeared to include mixed forest to the east and north that exhibited similar characteristics to the FOD5-1 (a and b) found on the Site. To the west, cultural woodland interspersed with cultural thicket appeared to be the dominant plant community.

5.3.2 Vascular Plants

A total of 115 vascular plant taxa were noted during site investigations on the Site, excluding species planted for ornamental purposes (Appendix B). Generally, there was a mix of native and alien species in all plant communities, with alien species making up a significant portion of the understory in all forested areas.

A single butternut tree (seedling) was observed on the Site, as well as two mature butternuts near the Site boundary (Figure 2). One of the mature butternuts appeared to be on the property line, and it could not be determined with handheld GPS (accuracy of 3 m) if it is on the Site or the adjacent property. This will be determined upon further investigation in 2018. The second mature butternut is on the adjacent property, but within 50 m of the Site. Butternut is discussed further in Section 6.0. Other than butternut, no other SAR, provincially rare, or regionally significant plants were observed on the Site.

5.3.3 Wildlife

A list of wildlife species identified on the Site is provided in Appendix C.

Birds

Thirty-three bird species were identified during surveys (Appendix C). The majority of these were noted during the breeding bird point count surveys. The most abundant birds included those that are common in forested and edge habitats such as song sparrow (*Melospiza melodia*) and red-eyed vireo (*Vireo olivaceus*). A single male wood thrush, designated as special concern under the ESA, was heard singing just north of the Site, but in the study area. Four individual male ovenbirds were heard throughout the forested areas of the Site. Ovenbird is considered area sensitive by the MNRF. These species are further discussed in Section 6.0.

Mammals

Eight mammal species were identified on the Site (Appendix C). This included species that are common in the region and province such as white-tailed deer (*Odocoileus virginianus*) and grey squirrel (*Sciurus carolinensis*). Five species of bat were recorded at the Site through the acoustic surveys.

A total of 2075 bat calls were recorded during the acoustic survey, with big brown bat (*Eptesicus fuscus*) being the most abundant species, and hoary bat (*Lasiurus cinereus*), silver-haired bat (*Lasionycteris noctivagans*) and red bat (*Lasiurus borealis*) less frequently recorded. Of the calls recorded, six calls were of an unidentified *Myotis* sp. (i.e. SAR bat), representing 0.3% of calls recorded. Five of these six Myotis calls were recorded on a single evening, which likely corresponds to a single individual passing the detector multiple times. Based on the collected data, Golder is of the opinion that the Site does not provide roosting habitat for any SAR bats, and that the low number of SAR calls recorded represent very few, or a single individual, foraging at the Site on two separate nights. No other SAR mammals were identified on the Site, and based on these results, no further discussion is warranted.

Insects

Ten species of butterflies, dragonflies, and bumblebees were identified on the Site (Appendix C). Although no individual monarchs (*Danaus plexippus*) were observed, their food plants, common milkweed (*Asclepius syriaca*), were observed in the open areas of the Site. This species is further discussed in Section 6.7.4.

Herpetofauna

Four species of herpetiles were identified on the Site (Appendix C). A few individual frogs and a single eastern garter snake (*Thamnophis sirtalis*) were observed.

5.4 Fish and Aquatic Habitat

There are no watercourses or other fish habitat on the Site. Feedmill Creek lies approximately 157 m west of the Site. Based on monitoring completed in 2012 (Ottawa, 2013b), a total of 18 fish species were identified on Feedmill Creek. Among the more abundant species were blacknose dace (*Rhinichthys atratulus*), bluntnose minnow (*Pimephales notatus*), creek chub (*Semotilus atromaculatus*), Johnny or tessellated darter (*Etheostoma* sp.), and mottled sculpin (*Cottus bairdi*). Temperature monitoring has indicated that Feedmill Creek exhibits a coolwater thermal regime (Ottawa, 2013b).

No headwater drainage features were identified on the Site.

6.0 ASSESSMENT OF SIGNIFICANT NATURAL HERITAGE FEATURES

The following is a discussion of the significant natural features in, or likely to be on the Site or in the study area based on the review of background materials and results of the site investigations undertaken for this study. Also, included in this section is an assessment of the potential direct impacts of the proposed development on the significant natural heritage features in the study area.

6.1 Habitat of Endangered or Threatened Species

The following discussion of provincially endangered or threatened species is based on the SAR screening provided in Appendix A. Species with a low probability to occur in the Site are included in the screening, but are not discussed further in this report. Each of the species listed below has moderate or high potential to inhabit the Site, based on the desktop SAR screening and the results of the site investigations.

Eastern Whip-poor-will

Eastern whip-poor-will (*Caprimulgus vociferous*) is designated as threatened under the ESA, and as such it is afforded species and habitat protection. The structure of portions of the forested areas in the study area appear suitable for this species based on known habitat preferences of this species. Targeted surveys for this species will be performed in 2018 to confirm presence / absence.

Cerulean Warbler

The cerulean warbler (*Setophaga cerulea*) is designated as threatened under the ESA, and as such it is afforded species and habitat protection. The forested habitats in the study area appear suitable for this species, based on known habitat preferences of this species, although it was not observed during the single 2017 breeding bird survey. A second breeding bird survey will be performed in 2018 to confirm presence / absence.

Blanding's Turtle

Blanding's turtle (*Emydoidea blandingii*) is designated as threatened under the ESA, and as such it is afforded species and habitat protection. Several small wetland areas at the Site have been confirmed through site investigations in 2017 to be ephemeral, having little or no water in late fall. As such, they do not offer appropriate over-wintering habitat for turtles. The northern portions of the Site are heavily treed, and the scattered open areas within the forests are occupied by thick herbaceous cover, while the more open southern portions of the Site are very thin soils over bedrock, making the Site unsuitable for turtle nesting.

Given the known occurrence of Blanding's turtle in the local landscape, and in consideration of the habitats on the Site, a conservative approach has been taken by assuming that portions of the Site may provide habitat for this species moving through the landscape (i.e. Category 3 habitat). The extent of Category 3 habitat will need to be quantified through discussions with the MNRF, and development within these areas may require a permit under the ESA. In order to begin this discussion, an Information Gathering Form (IGF) will need to be prepared and submitted to the MNRF as the project planning progresses.

Butternut

Butternut is designated as endangered under the ESA, and as such it is afforded species and habitat protection. A single sapling was identified on the Site, with two mature trees located immediately adjacent to (one potentially on) the Site (Figure 2). The regulated habitat of this species is the area within 50 m of each trunk. A formal BHA will be performed on the on-Site tree, and adjacent trees (pending access to the adjacent site), and submitted to the MNRF for review. Once this is complete, next steps in terms of registration and/or permitting for removal of the on-Site tree and possible harm to the adjacent trees or their habitats, will be discussed with the MNRF. In order to begin this discussion, an IGF will need to be prepared and submitted to the MNRF as the project planning progresses.

6.2 Significant Wetlands and Coastal Wetlands

Wetlands are evaluated by the MNRF according to evaluation procedures established by the province, specifically, the Ontario Wetland Evaluation System (OWES) (MNRF, 2014a). Through this evaluation, wetlands are designated either provincially significant (PSW) or non-provincially significant (non-PSW). There are no identified PSW at the Site or in the study area.

There is a single small wetland on the Site (ELC code: MAM2-2), and several small wetland inclusions within the other vegetation communities on the Site. These features are proposed for removal as part of the proposed development. None of these features have previously been evaluated according to OWES. Development within unevaluated wetlands typically triggers the need for a formal evaluation under OWES, however, the wetlands at the Site are less than 2.0 ha. Wetlands of this size are generally not evaluated (MNRF, 2014a) unless they possess some unique characteristic and a rationale for evaluating them is prepared. Based on the characteristics of the wetland pockets observed in the field (i.e. low plant diversity, no connectivity, short hydro-period offering limited habitat potential) it is Golder's opinion that there is not sufficient rationale for evaluating these wetland pockets, and no further analysis is warranted.

Coastal wetlands are located on the shores of the Great Lakes, or their connecting channels. There are no coastal wetlands on the Site or in the study area.

6.3 Fish Habitat

There are no surface water features on the Site, and therefore no fish habitat is present on the Site. The nearest surface water feature is Feedmill Creek, which is located approximately 157 m west of the Site, outside of the study area. As this feature is well-separated from the Site, no impacts to it are expected to result from the proposed development.

6.4 Significant Woodlands

Significant woodlands are to be defined and designated by the local planning authority (MNRF, 2010). According to the PPS, significant woodlands are to be identified using criteria established by the MNRF in the Natural Heritage Reference Manual (NHRM) for Policy 2.3 of the PPS (MNRF, 2010). The City has updated their OP policies as they relate to determining woodland significance in the Urban Area to be in conformity with the direction given in the PPS. The revised policies indicate that woodlands within the Urban Area are significant if:

- They are 0.8 ha in size or larger
- They are 40 years of age or older at the time of evaluation

These policies are not applicable in Urban Areas where there is an existing or advanced Secondary Plan, Community Design Plan, Concept Plans or equivalents. The Site lies within the area covered under the Kanata West Concept Plan (Ottawa, 2002), and as such, these policies do not apply. No areas of significant woodland or other natural heritage preservation are identified in the Concept Plan for the Site or surrounding 120 m [see Sections 3.3.1(8) and 4.1.1(3)], therefore, there are no significant woodlands in the study area.

6.5 Significant Valleylands

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. Section 2.4.2 of the OP identifies significant valleylands as areas with slopes greater than 15% and a slope length of more than 50 m. There are no significant valleylands identified in the study area.

6.6 Significant Areas of Natural or Scientific Interest (ANSIs)

ANSIs are areas of land and water containing natural landscapes or features that have been identified as having life science or earth science values related to protection, scientific study or education. The MNRF is responsible for identifying ANSIs. There are no ANSIs in the study area.

6.7 Significant Wildlife Habitat

The Natural Heritage Reference Manual (MNRF, 2010) includes criteria and guidelines for designating significant wildlife habitat (SWH). There are two other documents, the SWHTG and the SWHECS, which provide specific values and criteria for identifying SWH and offer some general information and ideas regarding the consideration of thresholds for the definition of significance. The Significant Wildlife Habitat Mitigation Support Tool (SWHMiST; MNRF, 2014b) is also used in conjunction with the SWHECS to determine appropriate mitigation for disturbance or removal of SWH.

There are four general types of significant wildlife habitat: migration corridors, seasonal concentration areas, rare or specialized habitats, and species of conservation concern. Each of these types of significant wildlife habitat is discussed below in relation to the study area.

6.7.1 Migration Corridors

The SWHTG 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 study area is identified in the City's Greenspace Master Plan (Ottawa, 2006) as "Contributing" linkage to the "Supporting" linkage areas to the west associated with Feedmill Creek and associated wetlands. According to the Master Plan, this designation indicates the Site "may play a role in the enhancement of natural landscapes and features". The highly urbanized nature of the surrounding landscape, and the presence of Highway 417 to the north, indicates that the Site does not likely provide a significant linkage function, therefore no impacts to any local linkage function associated with the adjacent Feedmill Creek are likely to result from the proposed development.

6.7.2 Seasonal Concentration Areas

Seasonal concentration areas are those areas where large numbers of a species congregate at one particular time of the year. Examples include deer yards, amphibian breeding habitat, bird nesting colonies, bat hibernacula, raptor roosts, and passerine migration concentrations. If a species is at risk, 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 identifies the following 14 types of seasonal concentrations of animals that may be considered significant wildlife habitat, and outlines means of identifying such habitat. They are:

- Winter deer yards
- Moose late winter habitat
- Colonial bird nesting sites
- Waterfowl stopover and staging areas (aquatic and/or terrestrial)
- Waterfowl nesting areas
- Shorebird migratory stopover areas
- Landbird migratory stopover areas
- Raptor winter feeding and roosting areas
- Wild turkey winter range
- Turkey vulture summer roosting areas
- Reptile hibernacula (and turtle wintering areas)
- Bat hibernacula
- Bullfrog concentration areas
- Migratory butterfly stopover areas

In addition to the above list, the SWHECS considers bat maternity colonies and bat migratory stopover areas as seasonal concentration areas for wildlife.

Deer and moose management is an MNRF responsibility, and deer winter congregation areas considered significant are mapped by the MNRF. There are neither deer yards nor moose late winter habitat identified in the study area.

There are no banks, cliffs, rocky islands or peninsulas suitable for colonial bird nesting habitat within the study area. Further, no heronries were identified during the site investigations.

There are no wetlands that would provide significant support to waterfowl during nesting and migration times (stopover and staging) in the study area. No evidence of concentrated use within the Site by waterfowl was noted during the site investigations.

Shorebird stopover sites are typically well-known and have a long history of use. The study area does not have areas of suitable shorebird foraging habitat. In addition, no concentrations of shorebirds or presence of the listed species was identified during the site investigations.

The 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.

Ideal raptor winter roosting areas are generally located in mature mixed or coniferous woodlands that abut windswept fields that do not get covered by deep snow. Although the Site is occupied by mixed forest, adjacent lands are thicket and forest that do not represent suitable hunting habitat.

Suitable habitat for wild turkey includes a mix of forest and open land such as natural grassland or agriculture. For wintering, wild turkeys tend to prefer large dense coniferous forests adjacent to open land and close to both a food source and groundwater seeps. There is no suitable habitat for wild turkey in the study area.

No significant turkey vulture summer roosting habitat was observed in the study area.

Reptile hibernacula were searched for during site investigations in the study area. The shed present adjacent to the Site did not have a foundation, and no rock piles that penetrated the frost line were observed. Further, there are no buried rock or fill piles that would provide this habitat type.

No potential turtle over-wintering habitat was observed on the Site, as no standing water that persists over winter was present.

No suitable areas of bat hibernacula were identified during site investigations in the study area, despite the Site being mapped as inferred karst topography (OMNDM, 2016). Based on the site investigations, 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, some individual potential wildlife trees were identified scattered throughout the Site. No bat migratory stopover areas are identified in this eco-region.

No large bodies of standing water suitable for supporting bullfrogs are present at the Site.

The study area is not located within 5 km of Lake Ontario, and therefore does not meet the criteria for significant migratory butterfly stopover habitat.

6.7.3 Rare or Specialized Habitats

Rare Habitats

Rare habitats are those with plant communities that are considered rare in the province, such as sand barrens, alvars, old growth forests, 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. Based on review of historical imagery, all forested portions of the Site have been subject to disturbance such as selective logging during the past, so no old growth forests have been identified (although several very old individual trees are present).

Specialized Habitats

Specialized habitats are microhabitats that provide a critical resource to some groups of wildlife. The SWHTG-defines 14 specialized habitats that may be considered significant wildlife habitat, and outlines means of identifying such habitats. They are:

- Habitat for area-sensitive species
- Forests providing a high diversity of habitats
- Old-growth or mature forest stands
- Foraging areas with abundant mast
- Amphibian woodland breeding ponds
- Turtle nesting habitat
- Specialized raptor nesting habitat
- Moose calving areas
- Moose aquatic feeding areas
- Mineral licks
- Mink, otter, marten, and fisher denning sites
- Highly diverse areas
- Cliffs
- Seeps and springs

In addition to the above list, the SWHECS considers waterfowl nesting habitat, bald eagle and osprey nesting, foraging and perching habitat, woodland raptor nesting habitat, and amphibian wetland (i.e., non-woodland) breeding habitat as specialized habitat for wildlife. Waterfowl nesting was discussed under Section 6.7.2 (Seasonal Concentration Areas).

The woodlands on the Site are contiguous with large off-site forested areas that contain interior forest habitat, although there is no interior forest habitat on the Site itself (measured 200m from any edge). One species identified as a forest interior breeding bird habitat indicator (ovenbird) was recorded in the study area during the first round of surveys, the results of which will be confirmed in 2018.

The forested areas of the Site were not highly diverse in terms of habitat (i.e. relatively flat with only occasional pockets of wet habitat), nor was an abundance of mast producing trees present, therefore the forests at the Site are not considered forests providing a high diversity of habitats or foraging areas with abundant mast. As noted previously, the Site does not exhibit old growth forests.

Some small pockets of wetland at the Site may meet the size criteria (25m diameter) for consideration as significant amphibian breeding habitat (woodland or wetland) (including ELC Code: MAM2-2 and other wetland inclusions too small to map according to ELC protocols). These areas will be assessed for presence of amphibian breeding in 2018.

The SWHECS indicates that exposed mineral soils in open sunny areas must be present to support turtle nesting. The Site consists of areas with woody vegetation in the northern portion, and more open areas in the southern portion. The Site is in proximity to open water (stormwater management pond south of the Site), however no areas of the Site appear suitable for turtle nesting. The open portions of the Site are very shallow soils underlain by bedrock, while the remaining portions are treed and/or have thick, tall vegetation making them unsuitable for turtle nesting. No evidence of turtle nesting was observed during any of the site investigations.

Nesting habitat for raptors, as well as perching and foraging habitat for bald eagle and osprey, were not identified as no raptor nests were observed during site investigations. The Site does contain some super-canopy trees, however no large areas of open water suitable for bald eagle or osprey are nearby. 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.

No moose calving or aquatic feeding areas, mineral licks, or mink, otter, marten or fisher denning sites were observed during the site investigation in the study area.

Highly diverse areas are described in the SWHTG as areas with a high species or plant community diversity. The study area includes a mix of forested and open anthropogenic communities, but does not meet this criteria as the plant species and plant community diversity is typical of the local landscape.

There is no cliff / talus habitat on the Site, according to the criteria presented in the SWHECS.

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

6.7.4 Habitat for Species of Conservation Concern

Habitat for Species of Conservation Concern includes four types of species: those that are rare, those whose populations are significantly declining, those that have been identified as being at risk to certain common activities, and those with relatively large populations in Ontario compared to the rest of the world.

Rare species are considered at five levels: globally rare, nationally rare, provincially rare, regionally rare; and locally rare (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. Examples include species vulnerable to forest fragmentation and species such as woodland raptors that may be vulnerable to forest management or human disturbance. 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.

Through the desktop SAR screening and site investigations to date (Appendix A), eight species of conservation concern were identified as having potential to occur within the study area: western chorus frog (*Pseudacris triseriata*), monarch (*Danaus plexippus*), Canada warbler (*Cardellina canadensis*), eastern wood-pewee (*Contopus virens*), golden-winged warbler (*Vermivora chrysoptera*), olive-sided flycatcher (*Contopus cooperi*), red-headed woodpecker

(*Melanerpes erythrocephalus*), and wood thrush (*Hylocichla mustelina*). Western chorus frog may utilize the small ephemeral wetland pockets noted at the Site, while the open areas of the Site may provide habitat for monarch as nectar plants and larval host plants (*Asclepias* spp.) were observed. Canada warbler, eastern wood-pewee, olive-sided flycatcher, red-headed woodpecker and wood thrush may utilize the forested and forest edge habitats at the Site. Wood thrush was confirmed in the study area, but additional study will be required in 2018 to confirm its use of the Site. Golden-winged warbler may utilize the regenerating habitats at the south of the Site. Of these species, only wood thrush was observed on the Site during the 2017 surveys. Additional studies are proposed in 2018 to confirm presence / absence of these species. Regardless, habitat for these species is abundant and widespread in the planning area, particularly in more rural areas of the City. For this reason, no significant wildlife habitat for these species is considered to be present on the Site.

The SWHECS also considers shrub/early successional breeding bird habitat, open country breeding bird habitat, marsh breeding bird habitat, and presence of terrestrial crayfish as habitat for species of conservation concern. Based on the plant communities present, the Site does not meet the size criteria for shrub/early successional or open country breeding bird habitat. Additional surveys will be performed in 2018 to confirm absence of indicator species. No marsh breeding bird habitats are present at the Site. No evidence of terrestrial crayfish was observed during site investigations.

General mitigation measures to protect wildlife during construction are presented in Section 8.0.

6.8 Other Natural Features

The MVCA has updated their policies to include regulation of non-PSW and unevaluated wetlands greater than 0.5 ha in size and that have hydraulic connectivity to a waterbody or watercourse, and the area within 30 m of them. Several very small wetland pockets were identified at the Site, the largest of which is 0.17 ha in size. As none of these wetlands are 0.5 ha or larger, they are not subject to the policies of the MVCA.

7.0 POTENTIAL INDIRECT IMPACTS

7.1 Construction Impacts

In addition to the direct removal of natural features described in Section 6.0, construction activities on the Site have the potential to negatively affect the natural features in the study area, including loss of overall biodiversity on the Site through removal of vegetation and wildlife habitat.

Activities related to site preparation and development such as grading, filling, and presence of heavy machinery can cause soil erosion and compaction, while machinery can destroy over-hanging vegetation. Encroachment into adjacent natural areas can also occur by machinery, foot traffic, and discarding or storage of construction materials outside the development envelope. Standard construction best management practices will be employed to mitigate potential damage to the adjacent natural features, as outlined in Section 8.0.

Generally, construction noise represents a short-term disturbance to wildlife using the adjacent natural areas. It is expected that with the completion of construction, wildlife will quickly return to their normal use patterns within the natural areas adjacent to the development.

7.2 Human Impacts

Many of the chronic impacts that can occur in urban natural areas are not a result of degradation of the edge, but a dramatic increase in human use through the entire system. The development may result in a marginal increase in potential disturbance to the adjacent natural features through the following potential impacts:

- Light pollution
- Increased noise
- Introduction of exotic species
- Increased human influence

Given the nature of the Site in its current condition, and the surrounding urban uses, many, if not all, of the above potential impacts are already present at the Site and adjacent natural areas to some degree. The potential human impacts described above are unlikely to have a measurable impact on adjacent natural features given the existing human presence in the area. Any effect to wildlife on surrounding lands from the development are expected to be short-term. Mitigation of these potential indirect effects are discussed in Section 8.0.

8.0 MITIGATION AND MONITORING

Mitigation of the direct impacts (i.e. removal) on the natural features in the study area resulting from the footprint of the proposed development, as well as of the indirect impacts that may be associated with construction and operation of the new development, are described below.

8.1 Significant Natural Features

8.1.1 Endangered and Threatened Species

As noted in Section 6.0, the proposed development has the potential to impact endangered and threatened species, and their habitats. Additional study in 2018 will confirm the presence / absence of the species identified in this report, and further conference with the MNRF through an Information Gathering Form (IGF) will identify the need for registration and/or permitting under the ESA. Appropriate mitigation and/or monitoring will be developed at that time.

8.1.2 Significant Wildlife Habitat

The Site has the potential to support significant wildlife habitat including: interior forest habitat; amphibian breeding habitat, and; habitat for species of conservation concern. Additional study in 2018 will confirm the presence / absence of significant wildlife habitat at the Site. Appropriate mitigation and/or monitoring will be developed at that time, if required.

8.2 Construction Best Management Practices

Standard Best Management Practices to be followed during construction to mitigate damage to the adjacent natural features include the following:

- The development envelope be clearly demarcated and maintained.
- No removal of vegetation during the active season for breeding birds (April 1 – August 15), unless construction disturbance is preceded by a nesting survey conducted by a qualified biologist.
- Wildlife should be allowed the opportunity to leave the construction area safely by ensuring gaps in construction boundary fencing are maintained until vegetation clearing is complete.
- No storing or disposal of materials outside of the construction envelope.
- Implement standard best management practices, including sediment and erosion controls, spill prevention and response plan, etc., during the construction phase of the project.
- To protect all vegetation being retained, refer to the recommendations provided in the attached Tree Conservation Report (Golder, 2017a).
- Implement standard best management practices to mitigate noise and dust on the Site during the construction phase of the project.

8.3 Human Impacts

Potential human impacts to the adjacent natural features can be further mitigated through the following:

- Prepare a landscaping plan at the detailed design stage that incorporates use of native, non-invasive species.
- Avoid direct glare beyond the property boundaries that abut natural features by installing low intensity and downward pointing lights.
- Turn off outdoor lighting when not in use, except where used for security and safety.
- Consider the use of motion sensors on all safety and security lighting.

8.4 Monitoring

Monitoring programs are developed to assess the effectiveness of mitigation measures implemented at a project location. Monitoring requirements, if any, will be identified after the 2018 site investigations are complete.

9.0 CUMULATIVE EFFECTS

Cumulative effects assessment considers the potential for additive impacts to the local landscape due to existing and future development. The Site is located in a rapidly developing urban area, with the remaining adjacent natural areas on the north and east identified primarily for development in the Kanata West Concept Plan.

10.0 CONCLUSIONS AND RECOMMENDATIONS

10.1 Net Impacts

Based on information gathered to date, the Site provides habitat for endangered species (butternut), and may provide habitat for additional endangered or threatened species, as well as significant wildlife habitats. Removal of habitat for butternut can be undertaken provided the rules in regulation (Ontario, 2015) under the ESA are adhered to (or a permit under the ESA is obtained, whichever is appropriate). Once the additional 2018 site investigations and subsequent analysis is complete, the findings must be incorporated into an update or addendum to this preliminary EIS and the implications, if any, described.

10.2 Policy Compliance

Based on the information available at the time of authoring this report, the proposed development complies with the natural heritage policies of the PPS. In addition, it appears there will be no negative effects on the significant natural features associated with the Site, which satisfies the policies under Section 2.4.2 of the City of Ottawa OP. Completion of the 2018 site investigations and subsequent analysis is required to confirm these conclusions.

10.3 Recommendations

No negative impacts on significant natural environment features are expected to result from the proposed development. This conclusion is based on the following recommendations:

- Completion of additional 2018 site investigations, and subsequent analysis.
- Preparation of an IGF for butternut and Blanding's turtle (and any additional species identified during the 2018 surveys) and submission of the form to the MNRF for review and comment.
- The construction envelope must be clearly demarcated and fenced, with no intrusion into adjacent areas during construction.
- Protection of all vegetation to be retained should follow the guidelines provided in the attached TCR (Golder, 2017a).
- No removal of vegetation during the active season for breeding birds (April 1 – August 15).
- The City of Ottawa Protocol for Wildlife Protection during Construction (Ottawa, 2015b) must be reviewed by the contractor and adhered to.
- Best management practices, including sediment and erosion controls, spill prevention, etc., are implemented during the construction phase of the project.
- Preparation of a landscape plan at the detailed design stage that incorporates native and non-invasive species.

It is suggested that this EIS be accepted as a preliminary assessment of the existing natural features on the Site, and a high-level assessment of the potential impacts associated with the proposed development on those features. In light of the outstanding data collection and analysis noted in this report, an update to this EIS will be required. This update should be prepared in order to confirm or modify the conclusions and recommendations of this report.

11.0 LIMITATIONS AND USE OF REPORT

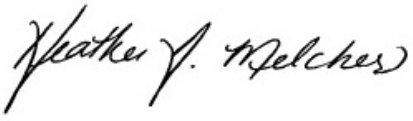
This report was prepared for the Claridge Homes Inc. The report, which specifically includes all tables, figures and appendices, is based on data and information collected by Golder, and reflects the conditions within the study area at the time of the site investigations, supplemented by data obtained by Golder from external sources as described in this report. Golder has exercised reasonable skill, care and diligence to assess the external data acquired during the preparation of this assessment, but makes no guarantees or warranties as to the accuracy, currency or completeness of this information. This report is based upon and limited by circumstances and conditions acknowledged herein, and upon information available at the time of authoring.

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 accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions taken based on this report.

12.0 CLOSURE

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

GOLDER ASSOCIATES LTD.



Gwendolyn Weeks, H.B.Sc.(env)
Ecologist / Project Manager

Heather Melcher, M.Sc.
Senior Ecologist / Associate

GW/HM/sg
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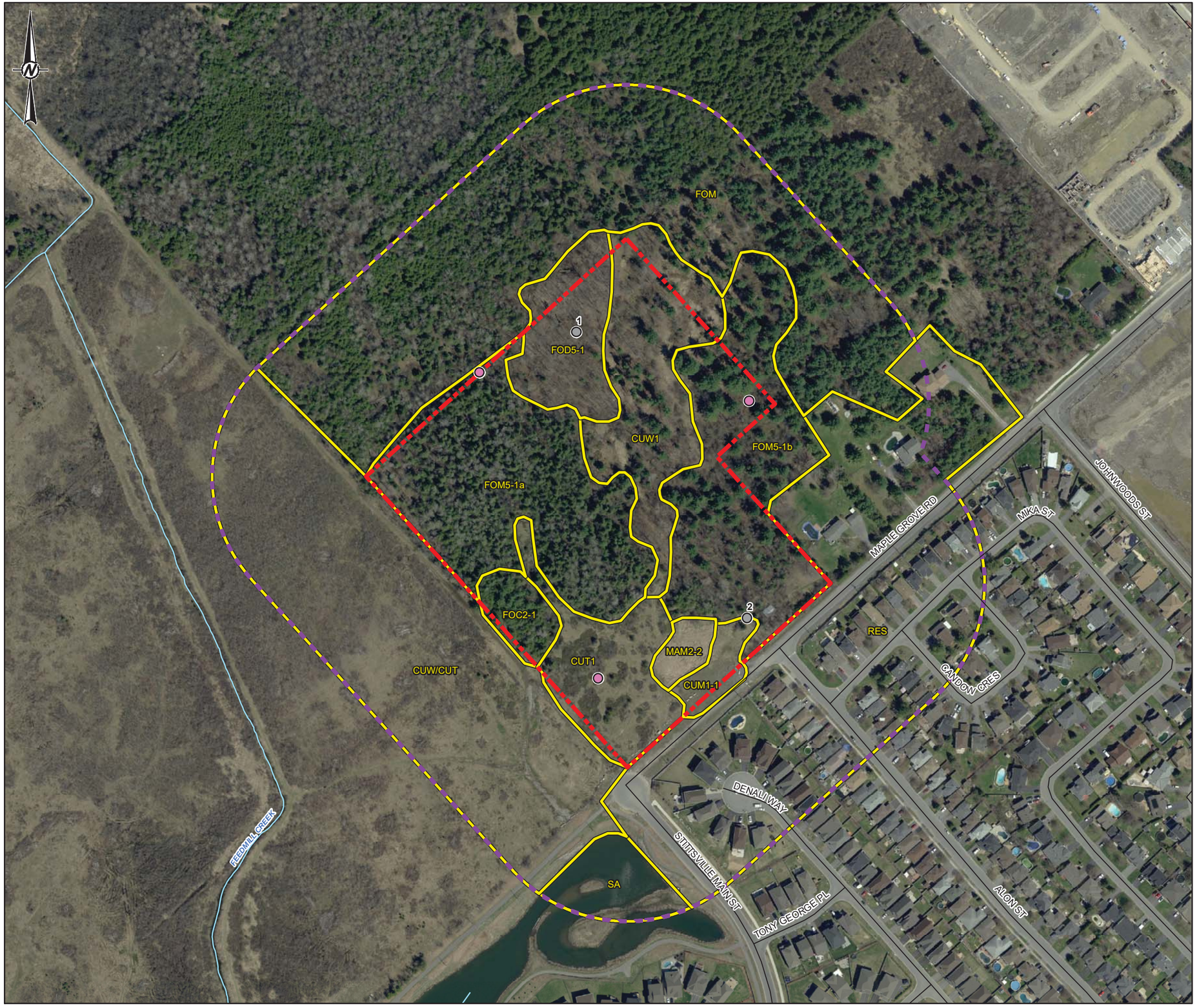

KEY MAP

SCALE 1:50,000

LEGEND

- BAT DETECTOR LOCATION
- BREEDING BIRD STATION
- WATERCOURSE
- ROADWAY
- SITE BOUNDARY
- 120 m STUDY AREA
- ECOLOGICAL LAND CLASSIFICATION

CUM1-1: MIXED MEADOW
CUT1: BUCKTHORN-JUNIPER MIXED THICKET
CUW/CUT: DECIDUOUS OPEN WOODLAND, DECIDUOUS THICKET COMPLEX
CUW1: MIXED OPEN WOODLAND
FOD5-1: DRY TO FRESH SUGAR MAPLE DECIDUOUS FOREST
FOM: MIXED FOREST
FOM5-1: DRY TO FRESH WHITE BIRCH MIXED FOREST TYPE
FOC2-1: DRY TO FRESH WHITE CEDAR CONIFEROUS FOREST
MAM2-2: REED CANARY GRASS MEADOW MARSH
RES: RESIDENTIAL
SA: SHALLOW OPEN WATER

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 2014
2. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83,
COORDINATE SYSTEM: MTM ZONE 9, VERTICAL DATUM: CGVD28

0 30 60 120
1:3,000 METRES

CLIENT
CLARIDGE HOMES CORPORATION

PROJECT
ENVIRONMENTAL IMPACT STATEMENT
1981 MAPLE GROVE ROAD, STITTSVILLE, ONTARIO

TITLE
ECOLOGICAL LAND CLASSIFICATION AND SURVEY LOCATIONS

CONSULTANT
Golder Associates

YYYY-MM-DD	2017-11-07
DESIGNED	----
PREPARED	JEM
REVIEWED	GW
APPROVED	HM

PROJECT NO.	CONTROL	REV.	FIGURE
1776275	0002	0	1

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

Path: \\golder.gds\ga1\Ottawa\Active\Spatial_IM\Cliyo\Ottawa\1981_MapleGrove_Rd\99_PRO\1776275_Claridge_GeoEnviroHD_PROD\0002_Environmental_Impact_Statement\1776275-0002-HN-0001.mxd

KEY MAP

SCALE 1:50,000

LEGEND

- WOOD THRUSH
- MATURE BUTTERNUT
- SEEDING BUTTERNUT
- WATERCOURSE
- ROADWAY
- SIGNIFICANT WOODLAND
- SITE BOUNDARY
- 120 m STUDY AREA

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 2014
2. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: MTM ZONE 9, VERTICAL DATUM: CGVD28

0 30 60 120
1:3,000 METRES

CLIENT
CLARIDGE HOMES CORPORATION

PROJECT
ENVIRONMENTAL IMPACT STATEMENT
1981 MAPLE GROVE ROAD, STITTSVILLE, ONTARIO

TITLE
SIGNIFICANT NATURAL FEATURES

CONSULTANT
Golder Associates

YYYY-MM-DD	2017-11-07
DESIGNED	----
PREPARED	JEM
REVIEWED	GW
APPROVED	HM

PROJECT NO.	CONTROL	REV.	FIGURE
1776275	0002	0	**2**

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

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KEY MAP

SCALE 1:50,000

LEGEND

- WATERCOURSE
- ROADWAY
- SITE BOUNDARY
- 120 m STUDY AREA

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 2014
2. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: MTM ZONE 9, VERTICAL DATUM: CGVD28

0 30 60 120

1:3,000 METRES

CLIENT
CLARIDGE HOMES CORPORATION

PROJECT
ENVIRONMENTAL IMPACT STATEMENT
1981 MAPLE GROVE ROAD, STITTSVILLE, ONTARIO

TITLE
DEVELOPMENT PLAN

CONSULTANT
Golder Associates

YYYY-MM-DD	2017-11-07
DESIGNED	----
PREPARED	JEM
REVIEWED	GW
APPROVED	HM

PROJECT NO.	CONTROL	REV.	FIGURE
1776275	0002	0	3

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

Path: \\golder.gds\ga\Ottawa\Active\Spatial_IM\Chpt\Ottawa\1981_MapleGrove_Rd\99_PRO\1776275_Claridge_GeoEnviro\40_PROD\0002_Environmental_Impact_Statement\1776275-0002-HN-0003.mxd

APPENDIX A

Species at Risk Screening

Taxon	Common Name	Scientific Name	Species Code[+]	Endangered Species Act, Reg. 230/08 SARO List Status[1]	Species at Risk Act Schedule 1 List of Wildlife SAR Status[2]	COSEWIC Status [3]	Global Rarity Rank[4]	Provincial Rarity Rank[5]	Source(s)[*]	Ontario Habitat Descriptions	Probability of Occurrence - Site Verified
Amphibian	Western chorus frog - Great Lakes St. Lawrence / Canadian Shield population	*Pseudacris triseriata*	CHFR	—	THR	THR	G5TNR	S3	ORAA	In Ontario, habitat of this amphibian species typically consists of marshes or wooded wetlands, particularly those with dense shrub layers and grasses, as this species is a poor climber. They will breed in almost any fishless pond including roadside ditches, gravel pits and flooded swales in meadows. This species hibernates in terrestrial habitats under rocks, dead trees or leaves, in loose soil or in animal burrows. During hibernation, this species is tolerant of flooding (Environment Canada 2015).	Moderate - Small pools and lowlying areas in the Study Area may provide habitat. Surveys will be done in early spring 2018.
Arthropod	Bogbean buckmoth	*Hemileuca sp.*		END	END	END	G1Q	S1	Range	In Ontario, bogbean buckmoth is found at two sites near Ottawa: the Richmond Fen Wetland and White Lake Wetland Complex. Bogbean buckmoth is found in open calcareous fens that have an abundance of its' primary plant host, bogbean, where caterpillars feed. These fens are typically low-shrub and have areas of peat moss hummocks for pupation sites nearby (Gradish and Tonge 2011).	Low - No Suitable fen or bog habitat in the Study Area
Arthropod	Monarch	*Danaus plexippus*		SC	SC	END	G5	S2N, S4B	OOA	In Ontario, monarch is found throughout the northern and southern regions of the province. This butterfly is found wherever there are milkweed (*Asclepius* 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).	Moderate - none were seen during surveys, however there is some suitable meadow habitat in the Study Area.
Arthropod	Mottled duskywing	*Erynnis martialis*		END	—	END	G3	S2	OOA	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 open sandy habitats. Usually seen nectaring on wildflowers, or on wet sandy roads in the company of other duskywing species (Linton 2015).	Low - Ceanothus spp. were searched for and not identified in the Study Area.
Bird	Bank swallow	*Riparia riparia*	BANS	THR	THR	THR	G5	S4B	OBBA	In Ontario, bank swallow breeds in a variety of natural and anthropogenic habitats, including lake bluffs, stream and river banks, sand and gravel pits, and roadcuts. Nests are generally built in a vertical or near-vertical bank. Breeding sites are typically located near open foraging sites such as rivers, lakes, grasslands, agricultural fields, wetlands and riparian woods. Forested areas are generally avoided (Garrison 1999).	Low - no suitable banks are present in the study area.
Bird	Barn swallow	*Hirundo rustica*	BARS	THR	THR	THR	G5	S4B	OBBA	In Ontario, barn swallow breeds in areas that contain a suitable nesting structure, open areas for foraging, and a body of water. This species nests in human made structures including barns, buildings, sheds, bridges, and culverts. Preferred foraging habitat includes grassy fields, pastures, agricultural cropland, lake and river shorelines, cleared right-of-ways, and wetlands (COSEWIC 2011). Mud nests are fastened to vertical walls or built on a ledge underneath an overhang. Suitable nests from previous years are reused (Brown and Brown 1999).	Low- there are no suitable nesting structures in the Study Area. Further, none were identified during targeted surveys.

Taxon	Common Name	Scientific Name	Species Code[+]	Endangered Species Act, Reg. 230/08 SARO List Status[1]	Species at Risk Act Schedule 1 List of Wildlife SAR Status[2]	COSEWIC Status [3]	Global Rarity Rank[4]	Provincial Rarity Rank[5]	Source(s)[*]	Ontario Habitat Descriptions	Probability of Occurrence - Site Verified
Bird	Black tern	*Chlidonias niger*	BLTE	SC	—	NAR	G4	S3B	eBird	In Ontario, black tern breeds in freshwater marshlands where it forms small colonies. It prefers marshes or marsh complexes greater than 20 ha in area and which are not surrounded by wooded area. Black terns are sensitive to the presence of agricultural activities. The black tern nests in wetlands with an even combination of open water and emergent vegetation, and still waters of 0.5-1.2 m deep. Preferred nest sites have short dense vegetation or tall sparse vegetation often consisting of cattails, bulrushes and occasionally burreed or other marshland plants. Black terns also require posts or snags for perching (Weseloh 2007).	Low- There are no suitable wetland habitats in the Study Area.
Bird	Bobolink	*Dolichonyx oryzivorus*	BOBO	THR	THR	THR	G5	S4B	OBBA	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- The meadow in the Study Area is too small to support this species. Further none were observed during surveys.
Bird	Canada warbler	*Cardellina canadensis*	CAWA	SC	THR	THR	G5	S4B	eBird	In Ontario, breeding habitat for Canada warbler consists of moist mixed forests with a well-developed shrubby understory. This includes low-lying areas such as cedar and alder swamps, and riparian thickets (McLaren 2007). It is also found in densely vegetated regenerating forest openings. Suitable habitat often contains a developed moss layer and an uneven forest floor. Nests are well concealed on or near the ground in dense shrub or fern cover, often in stumps, fallen logs, overhanging stream banks or mossy hummocks (Reitsma et al. 2010).	Low- Moderate - There is suitable forest habitat in the Study Area, however none were identified during bird surveys. An additional bird survey will be done in 2018 to confirm.
Bird	Cerulean warbler	*Setophaga cerulea*	CERW	THR	END	END	G4	S3B	eBird	In Ontario, breeding habitat of cerulean warbler consists of second-growth or mature deciduous forest with a tall canopy of uneven vertical structure and a sparse understory. This habitat occurs in both wet bottomland forests and upland areas, and often contains large hickory and oak trees. This species may be attracted to gaps or openings in the upper canopy. The cerulean warbler is associated with large forest tracks, but may occur in woodlots as small as 10 ha (COSEWIC 2010). Nests are usually built on a horizontal limb in the mid-story or canopy of a large deciduous tree (Buehler et al. 2013).	Low- Moderate - There is suitable forest habitat in the Study Area, however none were identified during bird surveys. An additional bird survey will be done in 2018 to confirm.
Bird	Chimney swift	*Chaetura pelagica*	CHSW	THR	THR	THR	G5	S4B, S4N	eBird	In Ontario, chimney swift breeding habitat is varied and includes urban, suburban, rural and wooded sites. They are most commonly associated with towns and cities with large concentrations of chimneys. Preferred nesting sites are dark, sheltered spots with a vertical surface to which the bird can grip. Unused chimneys are the primary nesting and roosting structure, but other anthropogenic structures and large diameter cavity trees are also used (COSEWIC 2007).	Low- There are no structures or other suitable nesting sites in the Study Area.
Bird	Common nighthawk	*Chordeiles minor*	CONI	SC	THR	THR	G5	S4B	eBird	In Ontario, these aerial foragers require areas with large open habitat. This includes farmland, open woodlands, clearcuts, burns, rock outcrops, alvars, bog ferns, prairies, gravel pits and gravel rooftops in cities (Sandilands 2007)	Low - There is no suitable large open habitat for this species in the Study Area.

Taxon	Common Name	Scientific Name	Species Code[+]	Endangered Species Act, Reg. 230/08 SARO List Status[1]	Species at Risk Act Schedule 1 List of Wildlife SAR Status[2]	COSEWIC Status [3]	Global Rarity Rank[4]	Provincial Rarity Rank[5]	Source(s)[*]	Ontario Habitat Descriptions	Probability of Occurrence - Site Verified
Bird	Eastern meadowlark	*Sturnella magna*	EAME	THR	THR	THR	G5	S4B	OBBA	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- The meadow in the Study Area is too small to support this species. Further none were observed during surveys.
Bird	Eastern whip-poor-will	*Antrostomus vociferus*	EWPW	THR	THR	THR	G5	S4B	OBBA, MNRF	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 - There is suitable forest habitat in the Study Area. Surveys will be completed in 2018.
Bird	Eastern wood-pewee	*Contopus virens*	EAWP	SC	SC	SC	G5	S4B	OBBA	In Ontario, eastern wood-pewee inhabits a wide variety of wooded upland and lowland habitats, including deciduous, coniferous, or mixed forests. It occurs most frequently in forests with some degree of openness. Intermediate-aged forests with a relatively sparse midstory are preferred. In younger forests with a relatively dense midstory, it tends to inhabit the edges. Also occurs in anthropogenic habitats providing an open forested aspect such as parks and suburban neighborhoods. Nest is constructed atop a horizontal branch, 1-2 m above the ground, in a wide variety of deciduous and coniferous trees.	Low- Moderate - There is suitable forest habitat in the Study Area, however none were identified during bird surveys. An additional bird survey will be done in 2018 to confirm.
Bird	Golden-winged warbler	*Vermivora chrysoptera*	GWWA	SC	THR	THR	G4	S4B	eBird	In Ontario, golden-winged warbler breeds in regenerating scrub habitat with dense ground cover and a patchwork of shrubs, usually surrounded by forest. Their preferred habitat is characteristic of a successional landscape associated with natural or anthropogenic disturbance such as rights-of-way, and field edges or openings resulting from logging or burning. The nest of the golden-winged warbler is built on the ground at the base of a shrub or leafy plant, often at the shaded edge of the forest or at the edge of a forest opening (Confer et al. 2011).	Low- Moderate - There is suitable regenerating habitat in the Study Area however none were identified during bird surveys. An additional bird survey will be done in 2018 to confirm.
Bird	Grasshopper sparrow *pratensis* subspecies	*Ammodramus savannarum* (*pratensis* subspecies)	GRSP	SC	SC	SC	G5	S4B	eBird	In Ontario, grasshopper sparrow is found in medium to large grasslands with low herbaceous cover and few shrubs. It also uses a wide variety of agricultural fields, including cereal crops and pastures. Close-grazed pastures and limestone plains (e.g. Carden and Napanee Plains) support highest density of this bird in the province (COSEWIC 2013).	Low- The meadow in the Study Area is too small to support this species. Further none were observed during surveys.
Bird	Least bittern	*Ixobrychus exilis*	LEBI	THR	THR	THR	G5	S4B	eBird	In Ontario, least bittern breeds in marshes, usually greater than 5 ha, with emergent vegetation, relatively stable water levels and areas of open water. Preferred habitat has water less than 1 m deep (usually 10 – 50 cm). Nests are built in tall stands of dense emergent or woody vegetation (Woodliffe 2007). Clarity of water is important as siltation, turbidity, or excessive eutrophication hinders foraging efficiency (COSEWIC 2009).	Low- There are no suitable wetland habitats in the Study Area.

Taxon	Common Name	Scientific Name	Species Code+	Endangered Species Act, Reg. 230/08 SARO List Status[1]	Species at Risk Act Schedule 1 List of Wildlife SAR Status[2]	COSEWIC Status [3]	Global Rarity Rank[4]	Provincial Rarity Rank[5]	Source(s)*	Ontario Habitat Descriptions	Probability of Occurrence - Site Verified
Bird	Olive-sided flycatcher	*Contopus cooperi*	OSFL	SC	THR	THR	G4	S4B	eBird	In Ontario, olive-sided flycatcher breeding habitat consists of natural openings in coniferous or mixed forests, including bogs, burns, riparian zones, and cutover areas. They are also found in semi-open forest stands and early successional forest when tall snags and residual live trees are present. In the boreal forest it is often associated with muskeg, bogs, fens and swamps dominated by spruce and tamarack. Open areas with tall trees or snags for perching are used for foraging (COSEWIC 2007). Nests are usually built on horizontal branches of conifers (Peck and James 1987).	Low- Moderate - There is suitable forest habitat in the Study Area, however none were identified during bird surveys. An additional bird survey will be done in 2018 to confirm.
Bird	Peregrine falcon (anatum subspecies)	*Falco peregrinus anatum*	PEFA	SC	SC	SC	G4	S3B	eBird	In Ontario, peregrine falcon breeds in areas containing suitable nesting locations and sufficient prey resources. Such habitat includes both natural locations containing cliff faces (heights of 50 - 200 m preferred) and also anthropogenic landscapes including urban centres containing tall buildings, open pit mines and quarries, and road cuts. Peregrine falcons nest on cliff ledges and crevices and building ledges. Nests consist of a simple scrape in the substrate (COSEWIC 2007).	Low - there is no suitable nesting or foraging habitat in the Study Area.
Bird	Red-headed woodpecker	*Melanerpes erythrocephalus*	RHWO	SC	THR	THR	G5	S4B	eBird	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- Moderate - There is suitable forest habitat in the Study Area, however none were identified during bird surveys. An additional bird survey will be done in 2018 to confirm.
Bird	Wood thrush	*Hylocichla mustelina*	WOTH	SC	THR	THR	G5	S4B	OBBA	In Ontario, wood thrush breeds in moist, deciduous hardwood or mixed stands that are often previously disturbed, with a dense deciduous undergrowth and with tall trees for singing perches. This species selects nesting sites with the following characteristics: lower elevations with trees less than 16 m in height, a closed canopy cover (>70 %), a high variety of deciduous tree species, moderate subcanopy and shrub density, shade, fairly open forest floor, moist soil, and decaying leaf litter (COSEWIC 2012).	Moderate to High - This species was observed during 2017 surveys in the Study Area but not the Site. An additional bird survey will be done in 2018 to confirm.
Fish	American eel	*Anguilla rostrata*	AMEL	END	—	THR	G4	S1?	Range	In Ontario, American eel is native to the Lake Ontario, St. Lawrence River and Ottawa River watersheds. Their current distribution includes lakes Huron, Erie, and Superior and their tributaries. The Ottawa River population is considered extirpated. The preferred habitat of the American eel is cool water of lakes and streams with muddy or silty substrates in water temperatures between 16 and 19°C. The American eel is a catadromous fish that lives in fresh water until sexual maturity then migrates to the Sargasso Sea to spawn (Burridge et al. 2010; Eakins 2016).	Low- There are no watercourses or water bodies in the Study Area.

Taxon	Common Name	Scientific Name	Species Code[+]	Endangered Species Act, Reg. 230/08 SARO List Status[1]	Species at Risk Act Schedule 1 List of Wildlife SAR Status[2]	COSEWIC Status [3]	Global Rarity Rank[4]	Provincial Rarity Rank[5]	Source(s)[*]	Ontario Habitat Descriptions	Probability of Occurrence - Site Verified
Fish	Lake sturgeon - Great Lakes / Upper St. Lawrence population	*Acipenser fulvescens*	LKST	THR	—	THR	G3G4TNR	S2	Range	In Ontario, lake sturgeon, a large prehistoric freshwater fish, is found in all the Great Lakes and in all drainages of the Great Lakes and of Hudson Bay. This species typically inhabits highly productive shoal areas of large lakes and rivers. They are bottom dwellers, and prefer depths between 5-10 m and mud or gravel substrates. Small sturgeons are often found on gravelly shoals near the mouths of rivers. They spawn in depths of 0.5 to 4.5 m in areas of swift water or rapids. Where suitable spawning rivers are not available, such as in the lower Great Lakes, they are known to spawn in wave action over rocky ledges or around rocky islands (Golder 2011).	Low- There are no watercourses or water bodies in the Study Area.
Fish	Northern brook lamprey - Great Lakes / Upper St. Lawrence population	*Ichthyomyzon fossor*	NBLM	SC	SC	SC	G4	S3	Range	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 watercourses or water bodies in the Study Area.
Fish	River redhorse	*Moxostoma carinatum*	RVRD	SC	SC	SC	G4	S2	Range	In Ontario, river redhorse is known to occur in the Mississippi River, Ottawa River, Madawaska River, Grand River, Trent River, and Thames River systems. They inhabit moderate to large rivers. The majority of their time is spent in pool habitats with slow-moving water and abundant vegetation. Spawning occurs in areas of shallow, moderate to fast-flowing waters in riffle-run habitats with coarse substrates of gravel and cobble (DFO 2011).	Low- There are no watercourses or water bodies in the Study Area.
Lichen	Pale-bellied frost lichen	*Physconia subpallida*		END	END	END	GNR	S1	Range	In Ontario, pale-bellied frost lichen grows on trees in mature, deciduous forests with relatively open understory, but moderate to high canopy cover. Common host trees include ash, black walnut, hop-hornbeam, and elm, although in Ontario, it is most often found on hop-hornbeam. This lichen has also been found growing on fence rails and rocks (Lewis 2011).	Low - the forest in the Study Area appears too immature for this species. Further it was searched for and not identified during surveys.
Mammal	Eastern small-footed myotis	*Myotis leibii*		END	—	—	G3	S2S3	BCI	This species is not known to roost within trees, but there is very little known about its roosting habits. The species generally roosts on the ground under rocks, in rock crevices, talus slopes and rock piles. It occasionally inhabits buildings. Areas near the entrances of caves or abandoned mines may be used for hibernaculum, where the conditions are drafty with low humidity, and may be subfreezing.	Low - There is no suitable maternity roosting habitat for this species in the Study Area.
Mammal	Little brown myotis	*Myotis lucifugus*		END	END	END	G5	S4	BCI	In Ontario, this specie's range is extensive and covers much of the province. It will roost in both natural and man-made structures. Roosing 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.	Low - Although some suitable habitat (trees) occur within the study area, acoustic monitoring indicates that no Myotis species are using the site for roosting, and rarely for foraging.

Taxon	Common Name	Scientific Name	Species Code[+]	Endangered Species Act, Reg. 230/08 SARO List Status[1]	Species at Risk Act Schedule 1 List of Wildlife SAR Status[2]	COSEWIC Status [3]	Global Rarity Rank[4]	Provincial Rarity Rank[5]	Source(s)[*]	Ontario Habitat Descriptions	Probability of Occurrence - Site Verified
Mammal	Northern myotis	*Myotis septentrionalis*		END	END	END	G4	S3	BCI	In Ontario, this species' range is extensive and covers much of the province. It will usually roost in hollows, crevices, and under loose bark of mature trees. Roosts may be established in the main trunk or a large branch of either living or dead trees. Caves or abandoned mines may be used as hibernacula, but high humidity and stable above freezing temperatures are required.	Low - Although some suitable habitat (trees) occur within the study area, acoustic monitoring indicates that no Myotis species are using the site for roosting, and rarely for foraging.
Mammal	Tri-colored bat	*Perimyotis subflavus*		END	END	END	—	S3?	BCI	In Ontario, tri-colored bat may roost in foliage, in clumps of old leaves, hanging moss or squirrel nests. They are occasionally found in buildings although there are no records of this in Canada. They typically feed over aquatic areas with an affinity to large-bodied water and will likely roost in close proximity to these. Hibernation sites are found deep within caves or mines in areas of relatively warm temperatures. These bats have strong roost fidelity to their winter hibernation sites and may choose the exact same spot in a cave or mine from year to year.	Low - Although some suitable habitat (trees) occur within the study area, acoustic monitoring indicates that no Myotis species are using the site for roosting, and rarely for foraging.
Reptile	Blanding's turtle - Great Lakes / St. Lawrence population	*Emydoidea blandingii*	BLAN	THR	THR	END	G4	S3	ORAA, MNRF, NHIC	In Ontario, Blanding's turtle will use a range of aquatic habitats, but favor those with shallow, standing or slow-moving water, rich nutrient levels, organic substrates and abundant aquatic vegetation. They will use rivers, but prefer slow-moving currents and are likely only transients in this type of habitat. This species is known to travel great distances over land in the spring in order to reach nesting sites, which can include dry conifer or mixed forests, partially vegetated fields, and roadsides. Suitable nesting substrates include organic soils, sands, gravel and cobble. They hibernate underwater and infrequently under debris close to water bodies (COSEWIC 2005).	Moderate - No suitable over-wintering or nesting habitat is present at the Site, however, individuals may travel through the Site during certain times of year.
Reptile	Eastern ribbonsnake - Great Lakes population	*Thamnophis sauritius*		SC	SC	SC	G5	S3	MNRF	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 - There are no suitable wetlands or waterbodies in the Study Area for this species.
Reptile	Northern map turtle	*Graptemys geographica*	NMTU	SC	SC	SC	G5	S3	Range	In Ontario, the northern map turtle prefers large waterbodies with slow-moving currents, soft substrates, and abundant aquatic vegetation. Ideal stretches of shoreline contain suitable basking sites, such as rocks and logs. Along Lakes Erie and Ontario, this species occurs in marsh habitat and undeveloped shorelines. It is also found in small to large rivers with slow to moderate flow. Hibernation takes place in soft substrates under deep water (COSEWIC 2012).	Low - There are no suitable wetlands or waterbodies in the Study Area for this species.
Reptile	Snapping turtle	*Chelydra serpentina*	SNTU	SC	SC	SC	G5	S3	ORAA, MNRF, NHIC	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 in the Study Area, and no nesting sites or potential nesting sites were identified
Reptile	Stinkpot or Eastern musk turtle	*Sternotherus odoratus*	STIN	SC	THR	SC	G5	S3	Range	In Ontario, eastern musk turtle is very rarely out of water and prefers permanent bodies of water that are shallow and clear, with little or no current and soft substrates with abundant organic materials. Abundant floating and submerged vegetation is preferred. Hibernation occurs in soft substrates under water. Eggs are sometimes laid on open ground, or in shallow nests in decaying vegetation, shallow gravel or rock crevices (COSEWIC 2012).	Low - There are no suitable waterbodies in the Study Area, and no nesting sites or potential nesting sites were identified

Taxon	Common Name	Scientific Name	Species Code[+]	Endangered Species Act, Reg. 230/08 SARO List Status[1]	Species at Risk Act Schedule 1 List of Wildlife SAR Status[2]	COSEWIC Status [3]	Global Rarity Rank[4]	Provincial Rarity Rank[5]	Source(s)[*]	Ontario Habitat Descriptions	Probability of Occurrence - Site Verified
Vascular Plant	American ginseng	*Panax quinquefolius*		END	END	END	G3G4	S2	Range	In Ontario, American ginseng is found in moist, undisturbed and relatively mature deciduous woods often dominated by sugar maple. It is commonly found on well-drained, south-facing slopes. American ginseng grows under closed canopies in neutral, loamy soils (COSEWIC 2000).	Low- This species was searched for and not identified in the Study Area.
Vascular Plant	Butternut	*Juglans cinerea*		END	END	END	G4	S3?	MNRF	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).	High - This species was identified during 2017 surveys in the Study Area.

Notes:

[1] *Endangered Species Act* (ESA), 2007 (O.Reg 242/08 last amended 14 Sept 2016 as O.Reg 308/16). Species at Risk in Ontario List, 2007 (O.Reg 230/08 last amended 2 June 2017 as O. Reg 167/17, 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 14 June 2017); 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 August 2011.

[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,

[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 B

Vascular Plants Recorded from the Site

Scientific Name	Common Name	Origin[a]	Global Rarity Status[b]	Ontario Rarity Status[b]	SARA[c]	ESA[d]
Abies balsamea	Balsam fir	N	G5	S5	–	–
Acer negundo	Manitoba maple	(N)	G5	S5	–	–
Acer saccharum	Sugar maple	N	G5	S5	–	–
Achillea millefolium	Common yarrow	I	G5T5?	SNA	–	–
Aegopodium podagraria	Goutweed	I	GNR	SNA	–	–
Ageratina altissima (Eupatorium)	White snakeroot	N	G5T5	S5	–	–
Agrimonia gryposepala	Common agrimony	N	G5	S5	–	–
Alliaria petiolata	Garlic mustard	I	GNR	SNA	–	–
Ambrosia artemisiifolia	Ragweed	N	G5	S5	–	–
Anemone cylindrica	Thimbleweed	N	G5	S4	–	–
Arctium minus	Common burdock	I	GNR	SNA	–	–
Asclepias syriaca	common milkweed	N	G5	S5	–	–
Betula alleghaniensis	Yellow birch	N	G5	S5	–	–
Betula papyrifera	White birch	N	G5	S5	–	–
Botrychium virginianum	Rattlesnake fern	N	G5	S5	–	–
Bromus inermis	Smooth brome	I	GNR	SNA	–	–
Carex communis	Common sedge	N	G5	S5	–	–
Chenopodium album	Lamb's-quarters	I	G5T5	SNA	–	–
Circaea lutetiana	Enchanter's nightshade	N	G5	S5	–	–
Cirsium arvense	Canada thistle	I	GNR	SNA	–	–
Conyza canadensis	Horseweed	N	G5	S5	–	–
Cornus alternifolia	Alternate leaved dogwood	N	G5	S5	–	–
Cornus stolonifera	Red osier dogwood	N	G5	S5	–	–
Dactylis glomerata	Orchard grass	I	GNR	SNA	–	–
Daucus carota	Wild carrot	I	GNR	SNA	–	–
Dichanthelium acuminatum	Small panic grass	N	G5T5	S4S5	–	–
Dryopteris intermedia	Evergreen wood fern	N	G5	S5	–	–
Dryopteris marginalis	Marginal wood fern	N	G5	S5	–	–
Echium vulgare	Viper's bugloss	I	GNR	SNA	–	–
Epipactis helleborine	Helleborine	I	GNR	SNA	–	–
Erigeron annuus	Daisy fleabane	N	G5	S5	–	–
Euthamia graminifolia	Grass-leaved goldenrod	N	G5	S5	–	–
Fragaria vesca	Woodland strawberry	N	G5	S5	–	–
Fragaria virginiana	Common strawberry	N	G5	S5	–	–
Fraxinus americana	White ash	N	G5	S5	–	–
Fraxinus nigra	Black ash	N	G5	S5	–	–
Fraxinus pennsylvanica	Green ash	N	G5	S5	–	–
Galium mollugo	White bedstraw	I	GNR	SNA	–	–
Galium verum	Yellow bedstraw	I	GNR	SNA	–	–
Geum aleppicum	Yellow avens	N	G5	S5	–	–
Glechoma hederacea	Ground-ivy	I	GNR	SNA	–	–
Hieracium caespitosum	Yellow hawkweed	I	GNR	SNA	–	–
Hypericum ellipticum	Pale St. John's-wort	N	G5	S5	–	–
Hypericum perforatum	Common St. John's-wort	I	GNR	SNA	–	–
Juglans cinerea	Butternut	N	G4	S3?	Endangered	Endangered
Juncus sp.	Rush	N	?	?	–	–
Juniperus communis	Common juniper	N	G5	S5	–	–
Larix laricina	Tamarack	N	G5	S5	–	–
Leonurus cardiaca	Common motherwort	I	GNR	SNA	–	–
Leucanthemum vulgare	ox-eye daisy	I	GNR	SNA	–	–
Lonicera tatarica	Tartarian honeysuckle	I	GNR	SNA	–	–
Lycopus americanus	American water horehound	N	G5	S5	–	–
Lysimachia nummularia	Moneywort	I	GNR	SNA	–	–
Lythrum salicaria	Purple loosestrife	I	G5	SNA	–	–
Maianthemum canadense	Canada mayflower	N	G5	S5	–	–
Malus pumila	Apple	I	G5	SNA	–	–
Malva neglecta	Common mallow	I	GNR	SNA	–	–
Medicago lupulina	Black medick	I	GNR	S5	–	–
Medicago sativa	Alfalfa	I	GNR	S5	–	–
Melilotus alba	White sweet clover	I	G5	SNA	–	–
Nepeta cataria	Catnip	I	GNR	SNA	–	–
Oenothera biennis	Common evening primrose	N	G5	S5	–	–
Ostrya virginiana	Ironwood	N	G5	S5	–	–
Parthenocissus inserta	Virginia creeper	N	G5	S5	–	–
Pastinaca sativa	Parsnip	I	GNR	SNA	–	–
Phalaris arundinacea	Reed canary grass	N	G5	S5	–	–
Phleum pratense	Timothy	I	GNR	SNA	–	–
Picea glauca	White spruce	N	G5	S5	–	–
Pinus strobus	White pine	N	G5	S5	–	–
Poa compressa	Canada bluegrass	I	GNR	SNA	–	–
Poa pratensis	Kentucky bluegrass	I	G5T5?	SNA	–	–
Populus tremuloides	Trembling aspen	N	G5	S5	–	–
Potentilla norvegica	Rough cinquefoil	I	G5	S5	–	–
Potentilla simplex	Old-field cinquefoil	N	G5	S5	–	–

Scientific Name	Common Name	Origin[a]	Global Rarity Status[b]	Ontario Rarity Status[b]	SARA[c]	ESA[d]
Prunus serotina	Black cherry	N	G5	S5	–	–
Prunus virginiana	Choke cherry	N	G5	S5	–	–
Quercus macrocarpa	Bur oak	N	G5	S5	–	–
Quercus rubra	Red oak	N	G5	S5	–	–
Rhamnus cathartica	Common buckthorn	I	GNR	SNA	–	–
Rhamnus frangula	Glossy buckthorn	I	GNR	SNA	–	–
Rhus radicans	Poison-ivy	N	G5T5	S5	–	–
Rhus typhina	Staghorn sumac	N	G5	S5	–	–
Ribes cynosbati	Prickly gooseberry	N	G5	S5	–	–
Ribes lacustre	Bristly black currant	N	G5	S5	–	–
Rorippa palustris	Marsh yellow-cress	N	G5T5	S5	–	–
Rubus idaeus	Red raspberry	N	G5T5	S5	–	–
Rubus occidentalis	Black raspberry	N	G5	S5	–	–
Rudbeckia hirta	Black-eyed susan	N	G5	S5	–	–
Salix discolor	Pussy willow	N	G5	S5	–	–
Sedge	Carex sp.	N	?	?	–	–
Setaria pumila	Yellow foxtail	I	GNR	SNA	–	–
Sinapis arvensis	Charlock	I	GNR	SNA	–	–
Solidago canadensis	Canada goldenrod	N	G5T5	S5	–	–
Solidago canadensis	Canada goldenrod	N	G5T5	S5	–	–
Solidago juncea	Early goldenrod	N	G5	S5	–	–
Solidago rugosa	Rough goldenrod	N	G5	S5	–	–
Sonchus asper	Spiny sow-thistle	I	GNR	SNA	–	–
Symphyotrichum ciliolatum	Blue aster	N	G5	S5	–	–
Symphyotrichum cordifolium	Heart-leaved aster	N	G5	S5	–	–
Symphyotrichum lanceolatum	Panicled aster	N	G5T5	S5	–	–
Symphyotrichum lateriflorum	Calico aster	N	G5T?	S5	–	–
Symphyotrichum novae-angliae	New England aster	N	G5	S5	–	–
Tanacetum vulgare	Common tansy	I	GNR	SNA	–	–
Taraxacum officinale	Common dandelion	I	G5	SNA	–	–
Thuja occidentalis	Eastern white cedar	N	G5	S5	–	–
Trifolium campestre	Large hop-clover	I	GNR	SNA	–	–
Trifolium pratense	Red clover	I	GNR	SNA	–	–
Trifolium repens	White clover	I	GNR	SNA	–	–
Tussilago farfara	Colt's-foot	I	GNR	SNA	–	–
Ulmus americana	White elm	N	G5?	S5	–	–
Veronica officinalis	Common speedwell	I	G5	SNA	–	–
Vicia cracca	Cow-vetch	I	GNR	SNA	–	–
Vincetoxicum sp.	Swallowwort	I	GNR	SNA	–	–
Viola sp.	Violet	N	?	?	–	–
Vitis riparia	Riverbank grape	N	G5	S5	–	–

Notes:

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

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

[c] Canada Species at Risk Act (Schedule 1; checked July 2015)

[d] Ontario Endangered Species Act

APPENDIX C

Wildlife Recorded from the Site

Common Name	*Scientific Name*	Origin[a]	Global Rarity Status[b]	Ontario Rarity Status[b]	SARA[c]	ESA
Mammals						
Coyote	*Canis latrans*	N	G5	S5		
Eastern chipmunk	*Tamias striatus*	N	G5	S5		
Red Squirrel	*Tamiasciurus hudsonicus*	n	G5	S5		
Grey squirrel	*Sciurus carolinensis*	N	G5	S5		
Meadow vole	*Microtus pennsylvanicus*	N	G5	S5		
Raccoon	*Procyon lotor*	N	G5	S5		
Striped skunk	*Procyon lotor*	N	G5	S5		
White-tailed deer	*Odocoileus virginianus*	N	G5	S5		
Birds						
American Crow	*Corvus brachyrhynchos*	N	S5B	G5		
American Goldfinch	*Carduelis tristis*	N	S5B	G5		
American Redstart	*Setophaga ruticilla*	N	S5B	G5		
American Robin	*Turdus migratorius*	N	S5B	G5		
American Woodcock	*Scolopax minor*	N	S4B	G5		
Black-capped Chickadee	*Poecile atricapilla*	N	S5	G5		
Blue Jay	*Cyanocitta cristata*	N	S5	G5		
Cedar Waxwing	*Bombycilla cedrorum*	N	S5B	G5		
Chestnut-sided Warbler	*Setophaga pensylvanica*	N	S5B	G5		
Chipping Sparrow	*Spizella passerina*	N	S5B	G5		
Common Grackle	*Quiscalus quiscula*	N	S5B	G5		
Common Yellowthroat	*Geothlypis trichas*	N	S5B	G5		
Cooper's Hawk	*Accipiter cooperii*	N	S4	G5		
Downy Woodpecker	*Picoides pubescens*	N	S5	G5		
Eastern Phoebe	*Sayornis phoebe*	N	S5B	G5		
Gray Catbird	*Dumetella carolinensis*	N	S4B	G5		
Great Crested Flycatcher	*Myiarchus crinitus*	N	S4B	G5		
Hairy Woodpecker	*Picoides villosus*	N	S5	G5		
House Finch	*Carpodacus mexicanus*	(N)	SNA	G5		
House Wren	*Troglodytes aedon*	N	S5B	G5		
Mourning Dove	*Zenaida macroura*	N	S5	G5		
Northern Cardinal	*Cardinalis cardinalis*	N	S5	G5		
Northern Flicker	*Colaptes auratus*	N	S4B	G5		
Ovenbird	*Seiurus aurocapilla*	N	S4B	G5		
Purple Finch	*Carpodacus purpureus*	N	S4B	G5		
Red-eyed Vireo	*Vireo olivaceus*	N	S5B	G5		
Rose-breasted Grosbeak	*Pheucticus ludovicianus*	N	S4B	G5		
Ruffed Grouse	*Bonasa umbellus*	N	S4	G5		
Song Sparrow	*Melospiza melodia*	N	S5B	G5		
White-breasted Nuthatch	*Sitta carolinensis*	N	S5	G5		
White-throated Sparrow	*Zonotrichia albicollis*	N	S5B	G5		
Wild Turkey	*Meleagris gallopava*	N	S5	G5		
Wood Thrush	*Hylocichla mustelina*	N	S4B	G5		
Herpetiles						
Eastern gartersnake	*Thamnophis sirtalis*	N	S5	G5T5		
Gray treefrog	*Hyla versicolor*	N	S5	G5		
Northern leopard frog	*Lithobates pipiens*	N	S5	G5		
Spring peeper	*Pseudacris crucifer*	N	S5	G5		
Dragonflies, Bumblebees, and Butterflies (15 Taxa)						
American painted lady	*Vanessa virginiensis*	N	S5	G5		
Autumn meadowhawk	*Sympetrum vicinum*	N	S5	G5		
Bluet	*Enallagma sp.*	N	?	?		
Cabbage white	*Pieris rapae*	I	G5	SNA		
Clouded sulphur	*Colias philodice*	I	G5	S5		
Common ringlet	*Coenonympha tullia*	N	G5	S5		
Dot-tailed whiteface	*Leucorrhinia intacta*	N	G5	S5		
Dun skipper	*Euphyes vestris*	N	G5	S5		
Ebony jewelwing	*Calopteryx maculata*	N	G5	S5		
Lance-tipped darner	*Aeshna constricta*	N	G5	S5		
Northern crescent	*Phycoides pascoensis*	N	G5	S5		
White-faced meadowhawk	*Sympetrum obtrusum*	N	G5	S5		
Wood satyr	*Megisto cymela*	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 (2017).

G = Global; S = Provincial; Ranks 1-3 are considered imperiled or rare; Ranks 4 and 5 are considered secure.

SNA = Not applicable for Ontario Ranking (e.g. Exotic species)

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

[d] Ontario *Endangered Species Act*

APPENDIX D

Tree Conservation Report (Golder, 2017a)

March 2018

REPORT ON

Tree Conservation Report
Proposed Development of 1981 Maple Grove
Part Lot 1, Concession 1
Geographic Township of Huntley
Ottawa, Ontario

Submitted to:
Claridge Homes (South Nepean) Inc.
2001-210 Gladstone Avenue
Ottawa, Ontario
K2P 0Y6

Attention: Mr. Jim Burghout

REPORT

Report Number: 1776275

Distribution:

5 copies - Claridge Homes Inc.
1 e-copy - Claridge Homes Inc.
1 copy - Golder Associates Ltd.

Golder Associates

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TABLES

FIGURES

1.0 INTRODUCTION

Golder Associates Ltd. (Golder) has been retained by Claridge Homes Inc. (Claridge) to complete a Tree Conservation Report (TCR) for a proposed development of the roughly 7.75 ha lot located in Part Lot 1, Concession 1, Geographic Township of Huntley, City of Ottawa, Ontario (the Site) (Figure 1, Figure 2). This TCR accompanies an Environmental Impact Statement (EIS), as part of a subdivision approval submission to the City of Ottawa.

This TCR has been prepared in accordance with the City of Ottawa's TCR Guidelines (Ottawa, 2016).

2.0 QUALIFICATIONS

This report was prepared by Fergus Nicoll, Terrestrial and Wetland Specialist at Golder.

Fergus Nicoll specializes in ecology with an emphasis on wetland and terrestrial ecosystems. Fergus has over 18 years of technical experience, which includes working for private consulting industry, non-government organizations, as well as the provincial and federal government. Fergus has extensive experience in collecting botanical and forest inventory data and conducting ecological land classification (ELC) for research projects, long term post-construction monitoring, environmental impact assessments, environmental effects monitoring projects, CEAA screenings, and species at risk inventories. Being adept in plant identification, he has conducted numerous plant community, tree, wetland, and habitat surveys for various types of research and monitoring projects throughout his career. He has worked across Canada in various ecoregions. While working on plant studies, he has been responsible for study design, data management, and the presentation of results. He is also provincially certified in Ecological Land Classification for Ontario, Ontario Wetland Evaluation System, and Butternut Health Assessments, and has been involved in several related workshops.

3.0 GENERAL SITE INFORMATION

Table 1: Site Information

Municipal Address	1981 Maple Grove Road, Ottawa, Ontario
Legal Description	Part of Lot 1, Concession 1, Geographic Township of Huntley, Ottawa, Ontario.
Current Zoning	DR – Development Reserve
Current Site Owner	Claridge Homes Inc.
Address of Site Owner	Claridge Homes Inc. 2001-210 Gladstone Avenue Ottawa, Ontario K2P 0Y6

4.0 PROPOSED WORKS AND SCHEDULE

It is understood that the Site is proposed to be developed as a residential subdivision consisting of 57 detached homes, 101 town homes and 38 back-to-back homes (AOV, 2017). Also included in the plan is a park block occupying 0.68 ha, as well as roads and services within the subdivision.

5.0 EXISTING PLANT COMMUNITIES AND TREE COVER ON THE SITE

The Site includes forested lands as well as small meadow, thicket, and open woodland. There is a very small (~0.17ha) wetland area near the southern boundary. Trees and shrubs on the Site include a variety of species, including some tree sized shrubs. A summary of the trees identified on the Site is included in Tables 2 and 3. This report focuses on trees and other woody vegetation. For more details on plant and wildlife communities on the Site, refer to the EIS.

5.1 Species at Risk

Butternut were observed on and adjacent to the Site (Figure 1.) Butternut is designated as endangered under the *Endangered Species Act*, and the *Species at Risk Act*. A single seedling butternut was observed on the Site (Figure 1), as well as two mature butternuts near the Site boundary (Figure 1). One of these appeared to be on the property line, and it could not be determined with handheld GPS (accuracy of 3m) if it is on the Site or on the adjacent property. This will be determined upon further investigation in 2018. The second mature butternut is on the adjacent property, but within 50 m of the Site.

Table 2: Individual Trees Identified on the Site (Figure 1)

Tree #	Species	Diameter at breast height (dbh; cm)	Condition	Notes
1	Sugar Maple (Acer saccharum)	93	Good	Very mature healthy super canopy tree. Full crown.
2	Sugar Maple	96	Good	Very mature healthy tree. 90% full crown. A view visible cavities, some peeling bark at base of stem.
3	Sugar Maple	77	Good	Very mature healthy tree. Full crown.
4	Sugar Maple	94	Good	Very mature healthy tree. Full crown. Some scarring and bark missing at base of stem.
5	Butternut (*Juglans cinerea*)	1	Good	Sapling butternut. No sign of butternut canker.
6	Butternut	unknown	Good	Large mature butternut. Needs to be assessed in 2018. It is right on the property line, and it could not be determined with handheld GPS (accuracy of 3m) if it is on the Site or the Adjacent property. To be determined in 2018.
7	Butternut	Unknown	Fair to Good	Large Mature butternut. Needs to be assessed in 2018 if access given (Within 50m of the Site). On adjacent property.

Table 3: Tree Groupings Identified on the Site (Figure 1)

Tree Grouping #	Stand Description*	Average range of dbh (cm)	Notes
1	White birch (*Betula papyrifera*) 40% White spruce (*Picea glauca*) 20% Eastern white cedar (*Thuja occidentalis*) 10% Trembling aspen (*Populus tremuloides*) 10% White elm (*Ulmus americana*) 10% Sugar maple (*Acer saccharum*) 5% Balsam fir (*Abies balsamea*) 3% Red Oak (*Quercus rubra*) 2% Tamarack (*Larix laricina*), Green ash (*Fraxinus pennsylvanica*), white pine (Pinus strobus) >1%	10 to 20 15 to 30 8 to 15 6 to 16 10 to 15 8 to 15 6 to 12 10 to 15 5 to 15	Immature mixed stand with occasional older tree, on fresh soils. Occasional older tree in fair poor condition including some snags, occasional elm dead or dying due to disease. Otherwise overall trees are in good condition. The occasional low-lying wetland area occurs.
2	Sugar maple 80% Ironwood (*Ostrya virginiana*) 10% Red oak 5% White birch 5%	9 to 18 12 to 15 10 to 12 10 to 22	Immature hardwood stand on dry to fresh rocky soils. A few larger very mature trees (see Table 2). Overall trees are in good condition.
3	White birch 30% White pine 30% White elm 20% Eastern white cedar 10% Common buckthorn (*Rhamnus cathartica*) 10% Apple (*Malus pumila*) >1%	15 to 20 20 to 40 8 to 15 6 to 12 6 to 12 10 to 15	Treed portion of open woodland. Immature and overall in good condition. Some elms showing signs of disease and dieback.
4	White Pine 100%	70 to 90	Small stand of large mature pines. Some signs of woodpecker holes, but overall trees in good condition.
5	White birch 50% Trembling aspen 10% White pine 10% White spruce 10% Red oak 10% Eastern white cedar 5% White elm 2% White ash 2% Common buckthorn 1%	10 to 18 20 to 25 15 to 35 15 to 20 9 to 14 10 to 15 10 to 15 8 to12 6 to 12	Immature mixed stand. Some trees showing top breakage and fallen but overall trees are in fair to good condition. Dense understory of buckthorn in some areas.
6	White pine 70% White elm 10% White birch 10% White spruce 5% Common buckthorn 5%	30 to 50 15 to 25 10 to 15 20 to 25 5 to 15	Immature mixed stand, with scattered semi-mature white pine and white spruce. Overall trees are in fair to good condition with occasional dead or dying elm.
7	Eastern white cedar 80% White birch 10% White pine 10%	10 to 16 15 to 30 10 to 18	Small dense almost pure stand of white cedar. Some anthropogenic damage such as cutting of branches and small trees. Otherwise trees are in good condition.

Note: *Dominant species and percent absolute cover, only live trees and tree-sized shrubs are included.

6.0 NATURAL ENVIRONMENT FEATURES ON-SITE

For details on natural heritage features, potential impacts, and recommended mitigation, including butternut, refer to the EIS.

7.0 PROPOSED ALTERATIONS TO TREE COVER AND POTENTIAL TREE RETENTION

There is no tree retention as part of the proposed design plan (Figure 2). A landscape plan will be prepared for the Site that addresses restoration requirements and include specific tree species, number of trees, and locations within the development. Some general recommendations are provided in Section 8.0.

8.0 RECOMMENDATIONS AND MITIGATION MEASURES

- For detailed recommendations and mitigation measures, related to natural heritage features on the Site, refer to the EIS.
- In order to protect birds that are protected under the *Migratory Birds Convention Act* (MBCA), no removal of vegetation during the active season for breeding birds (April 1–August 15), without input from a qualified biologist (i.e., nesting surveys). Note that even with input of a qualified biologist, scheduled clearing during the active season may lead to construction delays.
- Planting trees along streets, and additional plantings within park areas where feasible, will help to off-set the minimal tree loss associated with the proposed development. Replacement planting species and densities will be addressed through a site-specific landscape plan that takes into consideration and prioritizes the planting of native trees.
- Wherever tree planting is to take place on the Site, first consideration should be given to the use of native species that occur in the local landscape, such as: Sugar maple (*Acer saccharum*), white spruce (*Picea glauca*), eastern white cedar (*Thuja occidentalis*), white pine (*Pinus strobus*) and red oak (Quercus rubra). Cultivars of native species designed for urban conditions can be used as deemed suitable by the City. Alien non-invasive species and cultivars should only be used where it is not reasonable to use native species or native cultivars. Alien invasive species such as Norway maple (*Acer platanoides*) should not be used in any circumstance.
- For any trees that will be retained during development, the following measures, as recommended by the City of Ottawa, should be employed to ensure the protection and survival of trees to be retained:

  a) If trees occur close to construction areas, erect a fence at the critical root zone (CRZ) of trees to be retained.

  b) Do not place any material or equipment within the CRZ of the trees.

  c) Do not attach any signs, notices or posters to the trees.

  d) Do not raise or lower the existing grade within the CRZ without approval.

  e) Tunnel or bore when digging within the CRZ of the trees.

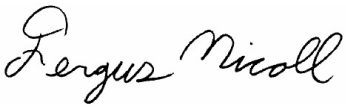
  f) Do not damage the root system, trunk or branches of the trees.

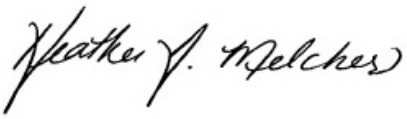
  g) Ensure that exhaust fumes from all equipment are not directed towards any trees canopy.

9.0 CLOSURE

We trust that the information presented in this report meets your requirements. Should you have any questions or concerns, please do not hesitate to contact the undersigned.

GOLDER ASSOCIATES LTD.





Fergus Nicoll Dip.T.
Terrestrial and Wetlands Technical Specialist

Heather Melcher, M.Sc.
Senior Ecologist / Associate

FN/HM/sg
https://golderassociates.sharepoint.com/sites/16628g/deliverables/natural environment/appendix d_claridge maple grove tcr_final.docx

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10.0 REFERENCES

Ottawa, City of. 2013. Annotated Version of the OP Showing Proposed Changes as per Amendment No. 150. Available: http://documents.ottawa.ca/en/node/5720.

Ottawa, City of. 2015. Tree Conservation Report Guidelines (Online). Available: http://ottawa.ca/en/residents/water-and-environment/trees-and-community-forests/tree-conservation-report-guidelines. Accessed: 2014.

KEY MAP

SCALE 1:50,000

LEGEND

- TREE
- MATURE BUTTERNUT
- SEEDING BUTTERNUT
- WATERCOURSE
- ROADWAY
- TREE GROUPING
- SITE BOUNDARY
- 120 m STUDY AREA

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 2014
2. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83,
COORDINATE SYSTEM: MTM ZONE 9, VERTICAL DATUM: CGVD28

0 30 60 120

1:3,000 METRES

CLIENT

CLARIDGE HOMES CORPORATION

PROJECT

TREE CONSERVATION REPORT
1981 MAPLE GROVE ROAD, STITTSVILLE, ONTARIO

TITLE

CURRENT VEGETATION

CONSULTANT

Golder Associates

YYYY-MM-DD	2017-11-07
DESIGNED	----
PREPARED	JEM
REVIEWED	FIN
APPROVED	HM

PROJECT NO.	CONTROL	REV.	MAP
1776275	0002	0	1

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

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KEY MAP

SCALE 1:50,000

LEGEND

- MATURE BUTTERNUT
- WATERCOURSE
- ROADWAY
- SITE BOUNDARY
- 120 m STUDY AREA

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

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

0 30 60 120

1:3,000 METRES

CLIENT
CLARIDGE HOMES CORPORATION

PROJECT
TREE CONSERVATION REPORT
1981 MAPLE GROVE ROAD, STITTSVILLE, ONTARIO

TITLE
DEVELOPMENT PLAN AND CONSERVED VEGETATION

CONSULTANT
Golder Associates

YYYY-MM-DD	2017-11-07
DESIGNED	----
PREPARED	JEM
REVIEWED	FIN
APPROVED	HM

PROJECT NO.	CONTROL	REV.	MAP
1776275	0002	0	2

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APPENDIX E

Curriculum Vitae

Education

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

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

Certifications

PADI Master Scuba Diver Trainer
2000

Small Craft Boat Operator
2003

PADI Medic First Aid (CPR, First Aid, Automatic Emergency Defibrillator) Instructor,
2003, 2009

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

Canadian Red Cross First Aid and CPR
2012

WHMIS Training
1990, 2001, 2004

Languages

English – Fluent

Golder Associates Ltd. – Mississauga

Associate, Senior Ecologist

Heather Melcher is an Associate, Senior Ecologist and Project Manager/Director with Golder Associates. Heather has 16 years of experience working in a number of sectors including power, aggregates, transportation, mining and land development. Her experience lies in designing, managing and carrying out field programs for natural environment components of projects of various size and complexity, analysing and interpreting data, integrating natural environment data with surface water and hydrogeological data in the development of technical impact assessment reports and developing rehabilitation plans. Heather also has extensive experience in managing multi-disciplinary Environmental Assessments, and has worked as a project manager and ecologist within provincial, federal and international frameworks, as well as with other environmental and land use policies. Heather is experienced in dealing with Species at Risk (SAR) issues and works with municipal, provincial and federal legislation, negotiating with regulatory agencies and developing compensation plans.

Employment History

Golder Associates Ltd. – Mississauga, Ontario

Associate, Senior Ecologist/Project Manager (2004 to Present)

Responsibilities include project management and preparation of environmental assessment reports, screening reports, and natural environment reports for private and public sectors, including land development, aggregate, and power. Development, implementation and coordination of terrestrial and aquatic field programs, coordination and management of activities and budgets of multi-disciplinary teams, and client and agency liaison. Management of the Bioscience GTA group, marketing and new client initiatives.

ESG International – Guelph, Ontario

Ecologist/Environmental Planner (2002 to 2003)

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

CBCL Ltd – Halifax, Nova Scotia

Ecologist/Environmental Planner (2001 to 2002)

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

Southeast Environmental Association – Montague, Prince Edward Island

Bacterial Water Quality Project Coordinator (2000 to 2002)

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

PROJECT EXPERIENCE – CONSTRUCTION MATERIALS

Lafarge Canada Ltd.
Various Locations, Ontario, Canada

Project Manager and Natural Environment Component Lead for a number of ongoing license applications for proposed new and expanded aggregate extraction operations (pits and quarries) in Ontario under the Aggregate Resources Act (ARA). Responsibilities include coordinating aquatic and terrestrial field data collection and analysis, coordinating and interpreting and integrating with hydrogeological and surface water data, as well as producing Level I & II Natural Environment Technical reports and developing rehabilitation plans. Project responsibilities also included negotiating with municipalities and agencies on SAR issues, submitting ESA permit applications and developing compensation plans; attending open houses and public forums, responding to public and agency comments following submission. Project manager roles and responsibilities include coordinating and managing the activities of a multi-disciplinary team including hydrogeologists, surface water engineers, and noise, air quality and blasting specialists.

CBM Ltd., Dance Pit Extension
North Dumfries, Ontario, Canada

Project Manager and Natural Environment Senior Reviewer and Technical Advisor for an above water Pit license application under the ARA. Responsibilities included working with the natural environment component lead to analyse and interpret terrestrial and aquatic data and integrate with hydrogeological and surface water data. Working with the planner in developing a rehabilitation plan, liaising with the Grand River Conservation Authority, the MNRF, the Region of Waterloo, the Municipality of North Dumfries and the City of Cambridge, and attending agency and public meetings. Project management roles and responsibilities include coordinating and managing the activities of a multi-disciplinary team including hydrogeologists, surface water engineers, noise and air quality scientists, public consultation and First Nation consultation specialists, and archaeologists.

CBM Ltd., Lanci Pit Extension
Aberfoyle, Ontario, Canada

Project Manager and Natural Environment Senior Reviewer and Technical Advisor for an above water Pit license application under the ARA. Responsibilities included working with the natural environment component lead to analyse and interpret terrestrial and aquatic data and integrate with hydrogeological and surface water data. Working with the planner in developing a rehabilitation plan, liaising with the Grand River Conservation Authority, the MNRF, the municipality, and attending agency and public meetings. Project management roles and responsibilities include coordinating and managing the activities of a multi-disciplinary team including hydrogeologists, surface water engineers, noise scientists and archaeologists.

Fowler Construction Ltd., Fleming Quarry Expansion
Washago, Ontario, Canada

Project Manager and Natural Environment Component Lead for a below water Quarry license application under the ARA. Responsibilities included coordinating aquatic and terrestrial field data collection and analysis, interpreting data and integrating with hydrogeological and surface water data, working with the planner in developing a rehabilitation plan, attending agency and public meetings as well producing a Level II Natural Environment Technical report and Environmental Impact Statement report for the municipality. Responsible for negotiations with the MNRF regarding SAR issues and working within the framework of the Provincial Policy Statement, as well as developing compensation plans. Project management roles and responsibilities include coordinating and managing the activities of a multi-disciplinary team including hydrogeologists, surface water engineers, and archaeologists.

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

Natural Environment Component Lead for a below water Quarry license application under the ARA. Responsibilities included coordinating aquatic and terrestrial field data collection and analysis, interpreting data and integrating with hydrogeological and surface water data, working with the planner in developing a rehabilitation plan, attending agency and public meetings as well producing a Level II Natural Environment Technical report and Environmental Impact Statement report for the municipality. Responsible for negotiations with the MNRF regarding SAR issues and developing compensation plans.

Tackaberry Sand and Gravel Ltd., Perth Quarry
Perth, Ontario, Canada

Natural Environment Component Lead for a below water Quarry license application under the ARA. Responsibilities included coordinating aquatic and terrestrial field data collection and analysis, interpreting data and integrating with hydrogeological and surface water data, working with the planner in developing a rehabilitation plan, attending agency and public meetings as well producing a Level II Natural Environment Technical report and Environmental Impact Statement report for the municipality. Responsible for negotiations with the MNRF regarding SAR issues and developing compensation plans.

Greenfield Aggregates Sherk Pit
Waterloo, Ontario, Canada

Natural Environment Component Lead for the below water Sherk Pit license application under the ARA. Responsibilities included terrestrial and aquatic data analysis, interpretation and integration with hydrogeological and surface water data, working with the planner to develop a rehabilitation plan as well as producing a Level I & II Natural Environment Technical report and an Environmental Impact Statement for the municipality. Responsibilities also included responding to public and agency comments following submission.

Lafarge Canada Inc., French Settlement Pit Ottawa, Ontario, Canada	Natural Environment Component Lead for the French Settlement Pit below water license application under the ARA. Responsibilities included coordinating aquatic and terrestrial field data collection and analysis, interpreting and integrating with hydrogeological and surface water data, working with the planner to develop a progressive and final rehabilitation plan (natural conditions) as well as producing a Level I & II Natural Environment Technical report and an Environmental Impact Statement for the municipality. Consulted with regulatory agencies, and attended public open houses.
Lafarge Canada Inc., Sunningdale Pit London, Ontario, Canada	Natural Environment Component Lead for the Sunningdale Pit below water license application under the ARA. Responsibilities included coordinating aquatic and terrestrial field data collection and analysis, interpreting and integrating with hydrogeological and surface water data, working with the planner to develop a progressive and final rehabilitation plan (natural conditions) as well as producing a Level I & II Natural Environment Technical report and an Environmental Impact Statement for the municipality. Consulted with regulatory agencies, and attended public open houses. Developed mitigation and habitat compensation plans under the Ontario Endangered Species Act for barn swallow.
Lafarge Canada Inc., Limebeer Pit Caledon, Ontario, Canada	Project Manager and Natural Environment Component Lead for the Limebeer Pit below water license application under the ARA. Responsibilities included coordinating aquatic and terrestrial field data collection and analysis, interpreting and integrating with hydrogeological and surface water data, working with the planner to develop a progressive and final rehabilitation plan (natural conditions) as well as producing a Level I & II Natural Environment Technical report and an Environmental Impact Statement (EIS) for the municipality. Consulted with regulatory agencies, attended public open houses, and addressed agency and public comments. Project manager roles and responsibilities included coordinating and managing the activities and budgets of a multi-disciplinary team including hydrogeologists, surface water engineers, and noise, and air quality specialists.
Lafarge Canada Inc., Oster Pit Creemore, Ontario, Canada	Project Manager and Natural Environment Component Lead for the Oster Pit above water license application under the ARA. Responsibilities included coordinating aquatic and terrestrial field data collection and analysis, interpreting and integrating with hydrogeological and surface water data, working with the planner and the agricultural subconsultant to develop a progressive and final rehabilitation plan (agricultural conditions) as well as producing a Level I & II Natural Environment Technical report and an Environmental Impact Statement for the municipality. Project manager roles and responsibilities included coordinating and managing the activities and budgets of a multi-disciplinary team including hydrogeologists, surface water engineers, and noise and air quality specialists.
Colacem Cement Plant L'Orignal, Ontario, Canada	Natural Environment Component Lead for the Colacem Cement Plant assessment. Responsibilities included designing and coordinating aquatic and terrestrial field data collection and analysis, interpreting and integrating with physical resource data, liaising with the planner and developing an Environmental Impact Statement (EIS) for the municipal approval process.

Floyd Preston Ltd.
Eastern Ontario, Canada

Natural Environment Component Lead for a proposed new quarry license application in eastern Ontario. Liaised with client, coordinated field data collection, mentored intermediate staff in data analysis and interpretation and preparing a Level I Natural Environment Technical Report under the Aggregate Resources Act (ARA), and reviewed reporting.

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

Natural Environment Component Lead for the McGill Pit below water license application under the ARA. Responsibilities included coordinating aquatic and terrestrial field data collection and analysis, interpreting data and integrating with hydrogeological and surface water data, working with the planner in developing progressive and final rehabilitation plans, attending agency and public meetings as well producing a Level II Natural Environment Technical report and Environmental Impact Statement report for the municipality. Responsible for negotiations with the MNRF regarding Species at Risk issues and developing mitigation and habitat compensation plans for butternut.

Amherst Quarries Inc.
Windsor, Ontario, Canada

Aquatic Ecology Component Lead for a proposed quarry expansion license application in southern Ontario. Coordinated and/or conducted field data collection, interpreted and analysed data, and provided the aquatic environment and other background data components for the Level I/II Natural Environment Technical Report under the ARA.

PROJECT EXPERIENCE – SPECIES AT RISK

TransCanada - Various Sites in Ontario
Ontario, Canada

Natural environment component lead for Species at Risk (SAR) monitoring at a number of sites across Ontario. Provided SAR advice and liaised with Ontario Ministry of Natural Resources (MNRF) to develop construction monitoring protocols for SAR and migratory birds.

Lafarge Canada Ltd.
Various Locations, Ontario, Canada

Natural environment component lead for a number of SAR surveys at aggregate sites across Ontario in support of Endangered Species Act (ESA) exemption agreements. Species surveys included Blanding's turtle, loggerhead shrike, least bittern and gray ratsnake. Developed survey protocols with a number of MNRF district offices, directed surveys and produced reports for submission.

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. Worked on ESA permitting applications and compensation plans.

Lafarge Canada Ltd.
Various Locations, Ontario, Canada

Project Manager and Natural Environment Component Lead for a number of license applications for proposed new and expanded aggregate extraction operations (pits and quarries) in Ontario under the Aggregate Resources Act (ARA). Responsibilities included working with the Ontario Endangered Species Act (ESA), developing survey protocols, negotiating with the MNRF, completing Information Gathering Forms (IGF), submitting permit applications and developing compensation plans.

PROJECT EXPERIENCE – TRANSMISSION

Hydro One Circuit B5C/B6C Line Refurbishment EA
Ontario, Canada

Natural Environment Component Lead for a provincial Class Environmental Assessment for a 40 km line refurbishment. Responsibilities included designing the field program (terrestrial and aquatic), analyzing data, integrating the ecological data with other discipline data, completing the effects assessment, consulting with regulatory agencies including two district MNRF offices, Hamilton Conservation Authority, Conservation Halton, Niagara Escarpment Commission, and participating in the public consultation process.

PROJECT EXPERIENCE – TRANSPORTATION

Ninth Line Municipal Class EA
Halton Region, Ontario, Canada

Senior technical lead for natural environment component. Responsibilities included overseeing field collection of terrestrial and aquatic data, analysis and interpretation, liaising with prime engineering firm and agencies, review of natural environment study report.

Regional Road 57 Municipal Class EA
Clarington, Ontario, Canada

Senior technical lead for natural environment component. Responsibilities included overseeing field collection of terrestrial and aquatic data, analysis and interpretation, liaising with prime engineering firm and agencies, review of natural environment study report.

Markham GO Station Road Realignment Municipal Class EA
Markham, Ontario, Canada

Senior technical lead for natural environment component. Responsibilities included overseeing field collection of terrestrial and aquatic data, analysis and interpretation, liaising with prime engineering firm and agencies, review of natural environment study report.

PROJECT EXPERIENCE – WASTE

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

Natural Environment Component Lead for a provincial Environmental Assessment for a resource recovery centre on a 175 hectare site), including a landfill, contaminated soil management and recycling components. Responsibilities included designing the field program (terrestrial and aquatic), analyzing data, integrating the ecological data with other discipline data, completing the effects assessment, consulting with regulatory agencies, and participating in the public consultation process.

PROJECT EXPERIENCE – POWER

Trillium Power Wind Corporation Lake Ontario, Ontario, Canada	Project Manager for an offshore wind power project in Lake Ontario under O. Reg. 359/09 Renewable Energy Approvals (REA). Responsibilities included coordinating and managing a multi-disciplinary team including noise specialists, biologists, archaeologists, public consultation specialists, aboriginal engagement specialists, visual impact assessment specialists and geophysicists. Liaised with client and agencies, attended regulatory agency meetings and participated in public open houses. Reporting satisfied both provincial and federal (CEAA) requirements.
Leader Resources Services Corporation Various Locations, Ontario, Canada	Project Manager and Project Director/senior technical advisor for a number of ongoing wind farm projects under O. Reg. 359/09 Renewable Energy Approvals (REA). Responsibilities include coordinating and managing a multi-disciplinary team including noise specialists, natural heritage specialists, archaeologists, cultural heritage specialists, public consultation specialists and aboriginal engagement specialists. Liaising with client and agencies, attended regulatory agency meetings and participated in public open houses.
Mann Engineering/EffiSolar Various Locations, Ontario, Canada	Natural Heritage Project Manager for four 10 MW ground-mounted PV solar farms in southeastern Ontario under O. Reg. 359/09 Renewable Energy Approvals (REA). Coordinated field programs, and carried out data analysis and report production. Liaised with client and agencies.
SkyPower Corp. Various Locations, Ontario, Canada	Project Manager for eight wind power park projects in Renfrew County, Prince Edward County and Parry Island, Ontario. Coordinated field programs and managed a multi-disciplinary team including hydrogeologists, biologists, surface water engineers, noise and air quality experts, socio-economic and public consultation coordinators, liaised with client and agencies, organized public open houses including assisting with preparation of panels, analysed data, and compiled results into an Environmental Screening Report/Environmental Impact Statement for submission to regulatory agencies.
Algonquin Power Amherst Island, Ontario, Canada	Project Manager and field coordinator for one wind power project in Prince Edward County. Coordinated field programs and multi-disciplinary team including hydrogeologists, biologists, surface water engineers, noise and air quality experts, socio-economic and public consultation coordinators, liaised with client and agencies, analysed data, and compiled results into documents to be submitted to regulatory agencies in support of the RES III RFP under the Ontario Power Authority Standing Offer Program.
SkyPower Corp. Various Locations, Ontario, Canada	Project Manager for several solar power projects across Ontario, including Napanee and Norfolk. Coordinated or conducted field programs and data collection, coordinated and managed the activities of a multi-disciplinary team. Completed reports addressing the Ministry of the Environment Screening Criteria for Energy Projects to be submitted to regulatory agencies.

OptiSolar Inc.
Various Locations, Ontario, Canada

Project Manager for several solar power projects across Ontario, including Sarnia, Tilbury and Petrolia. Coordinated or conducted field programs and data collection, coordinated and managed the activities of a multi-disciplinary team including noise, archaeology, surface water, traffic and natural environment assessments. Completed reports to be submitted to regulatory agencies in support of planning/zoning applications.

Port Granby Long-Term Waste Management Facility
Port Granby, Ontario, Canada

Coordinated aquatic field technicians and participated in the collection and analysis of fish samples in support of the human health assessment component of the project. Worked with a team of biologists in the interpretation of data and reporting.

Bruce Power Units 3&4 Restart
Kincardine, Ontario, Canada

Worked with a team to establish Valued Ecosystem Components and appropriate study areas. Coordinated bioscience field technicians and interpreted data on fish impingement, entrainment, fishing pressure and temperature and velocity effects on aquatic habitat and biota, including bass spawning surveys. Worked with a team of biologists to determine the potential for warm water discharges to affect waterfowl use of nearby areas, and evaluated effects on the white-tailed deer population due to vehicle strikes. Prepared technical reports.

Pickering Nuclear 'A' Return to Service Follow-up and Monitoring
Pickering, Ontario, Canada

Coordinated aquatic field technicians and interpreted data on impingement, entrainment, fishing pressure, waterfowl surveys, and temperature and velocity effects on aquatic habitat and biota, including bass spawning surveys. Worked with a team of biologists to evaluate the effects of wildlife-vehicle interactions on nearby roadways on terrestrial biota populations. Prepared annual monitoring reports.

PROJECT EXPERIENCE – MINING

EWL Dyno
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 in the aquatic workplan 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. As part of the terrestrial workplan, 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 Coldstream
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 in the aquatic work plan 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. As part of the terrestrial work plan, 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 Pipelines Inc. Line 9
Southern Ontario, Canada

Project manager for natural environment component of pipeline maintenance project in southern Ontario. Coordinated Species at Risk (SAR) screening and natural heritage feature mapping, site investigations, permit requirements and constraint mapping in support of brushing and other maintenance activities.

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). Responsibilities included designing the field program, analysing data, completing the baseline and effects assessment, liaising and negotiating with the Ministry of Natural Resources and Forestry (MNRF), Environment and Climate Change Canada (ECCC) and local Conservation Authorities, preparing permit applications, and addressing 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 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 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 National Energy Board (NEB).

TransCanada LNG Facility
Trois Rivieres, Quebec, Canada

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.

PROJECT EXPERIENCE – FISHERIES ENVIRONMENTAL ASSESSMENTS

Bruce Power Ltd
Kincardine, Ontario, Canada

Lead biologist for a Lake-wide whitefish distribution study. Tagged and collected meristic data on all whitefish captured using trap nets. Completed weekly summary reports in addition to a final fish effort report including recommendations.

Bruce Power Ltd., Ontario Power Generation
Kincardine, Ontario, Canada

Completed terrestrial and aquatic environment post-restart follow-up monitoring reports, including entrainment, impingement, fish habitat use, fishing pressure, bass spawning habitat, waterfowl surveys, roadkill surveys, and deer mortality surveys.

PROJECT EXPERIENCE – ENVIRONMENTAL IMPACT STATEMENTS

Biglieri Group
Ontario, Canada

Project Manager for a residential subdivision development application in southern Ontario. Responsibilities included coordinating and managing a multi-disciplinary team including surface water engineers and biologists. Tasks included designing and coordinating the terrestrial and aquatic field program, and completing an environmental impact study report. Liaised with client and agencies.

Brookfield Homes
Brantford, Ontario, Canada

Project Manager for a residential subdivision development application in southern Ontario. Responsibilities included coordinating and managing a multi-disciplinary team including hydrogeologists, surface water engineers and geomorphologists. Tasks included designing and coordinating the terrestrial and aquatic field program, and completing a constraints analysis report and map, and environmental impact study report. Liaised with client and agencies, and attended regulatory agency meetings and participated in negotiations.

Maldives Fishery Infrastructure - Feasibility Study
Maldives, Asia

Responsibilities included writing a preliminary environmental screening assessment of eight proposed fishery infrastructure projects, including aquaculture, upgrading existing processing plants and marinas in the Maldives and completing a feasibility study of these projects. Tasks included completing a desktop background assessment of the natural environment, collecting in-situ water quality data, mapping marine fish habitat, corals and terrestrial habitats. In addition, collection of socio-economic data - both desktop and personal interviews was included in the study. Compilation and analysis of the data was completed, and recommendations and mitigation measures were provided in the report. Follow-up included designing the environmental impact assessment required for the chosen project.

Oak Hills Golf Course - Permit to Take Water
Stirling, Ontario, Canada

Project Manager for a golf course Permit to Take Water (PTTW) renewal application. Designed aquatic and hydrology field program and carried out fish habitat assessments. Analysed data and determined aquatic habitat critical low flows. Compiled supporting documentation for the permit application and prepared a client report including recommendations for continued monitoring.

TRAINING

Microsoft Project Level 1 Training
2008

Royal Ontario Museum (ROM) Fish ID Workshop
2005

Introduction and Intermediate MapInfo Professional Training
2000

PROFESSIONAL AFFILIATIONS

Professional Association of Diving Instructors (PADI)

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

PUBLICATIONS

Conference Proceedings

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

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

Other

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

Education

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

Certifications

MNRF Ecological Land Classification - Training Certificate 2004

MNRF Ontario Wetland Evaluation System - Training Certificate 2005

MNRF Butternut Health Assessor 2011

Canadian Environmental Assessment Act Orientation - Training Certificate 2011

Languages

English – Fluent

Golder Associates Ltd. – Ottawa

Terrestrial Ecologist

Gwendolyn has been providing ecological consulting services since 2004, with particular knowledge in the field of terrestrial ecology. 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.

Gwendolyn has strong field skills in plant and wildlife identification, terrestrial monitoring, applying ELC and wetland evaluation principles, and she possesses a strong understanding of planning regulations and policies in a natural heritage context. She is experienced in a broad range of environmental services, including terrestrial monitoring and assessment, wildlife inventory, floral inventory, habitat assessment, agency liaison and client relations.

Gwendolyn has authored numerous environmental impact statements, species at risk studies, natural heritage assessments, environmental constraints analyses, and letters of compliance for a variety of sectors, including residential developments, recreational developments, aggregates and energy projects (including renewable energy). She has also provided terrestrial ecology expertise on a wide range of projects, including work for government agencies and peer review services.

Employment History

Golder Associates Ltd. – Ottawa, ON
Ecologist and Project Manager (2011 to Present)

Stantec Consulting Ltd. – Guelph, ON
Ecologist and Project Manager (2004 to 2011)

Provided a range of terrestrial ecology services, including managing projects and natural heritage components of Environmental Assessments for numerous sectors, including land development, transportation, renewable energy and aggregate industries, as well as government agencies.

Hamilton Region Conservation Authority – Hamilton, ON
Ecological Land Classification Technician (2004 to 2004)

Conservation Halton – Milton, ON
Student Ecologist (2003 to 2003)

PROJECT EXPERIENCE – ENERGY

Hydro One - Bruce to Milton Transmission Reinforcement Project
Ontario, Canada

This project required a complete Environmental Assessment (EA) for the proposed installation of a new 180 km long double-circuit 500kV transmission line from the Bruce Power Complex to Hydro One's existing Milton Switching Station. Gwendolyn assisted in the preparation of the Natural Heritage component of the EA through planning and execution of various ecology field surveys, and through liaison with First Nations stakeholders. Work included Ecological Land Classification, wetland boundary delineation according to OWES, wildlife and plant inventory, and identification of significant wildlife habitat or habitat for species at risk within the proposed corridor and adjacent lands. Provided input as to suitable mitigation for sensitive environmental features along the proposed route.

TransCanada - Eastern Mainline Project
Ontario, Canada

TransCanada Pipelines Limited proposes to construct and operate new natural gas pipeline facilities along its existing Canadian Mainline between Markham, Ontario and the community of Iroquois, Ontario. The preliminary scope of the Project includes up to approximately 370 km of pipeline and related components, including valve sites and new and modified compression facilities at existing compressor stations along the proposed route. Work included designing and undertaking portions of the environmental field program, as well as contributing to reporting for the Environmental Assessment (EA) pursuant to the requirements of the National Energy Board Act and CEAA 2012.

PROJECT EXPERIENCE – AGGREGATES

Canaan Quarry
Ontario, Canada

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
Ontario, Canada

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.

PROJECT EXPERIENCE – ECOLOGY PEER REVIEW SERVICES

City of Kingston
Kingston, Ontario, Canada

Retained by the City of Kingston to provide environmental peer review services. Reviewed 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, Ontario, Canada

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, Ontario, Canada

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 – ECOLOGY

Des Allumettes Bridge Replacement
Ottawa, ON, Canada

Golder was retained to review the existing natural environment conditions in the study area, to identify potential interactions between the project and those natural features, and to recommend appropriate mitigation measures to be employed prior to and during construction.

Jean D'Arc Boulevard (North Service Road) Sidewalk Installation
Ottawa, ON, Canada

Golder was retained to undertake a Species at Risk (SAR) Screening for the Site in order to identify potential interactions between the project and SAR, and to identify appropriate mitigation measures for implementation prior to and during construction.

Prince of Wales Drive - Coordinated Network Modifications
Ottawa, ON, Canada

Golder was retained to assess the existing natural environment within the study area, identify potential impacts to those features, and recommend mitigation measures for implementation prior to and during construction.

Jockvale Bridge SAR Study
Ottawa, ON, Canada

When a Species at Risk (barn swallow) was confirmed by construction staff at the bridge construction site, Golder was retained to engage with the Ministry of Natural Resources and Forestry in order to chart a path forward for construction, while respecting the Endangered Species Act.

Species at Risk Studies - Various Projects
Various Location, 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, Peregrine Falcon, Least Bittern, West Virginia White, American Badger, Little Brown Bat and Northern 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.

O'Brien House Bat Maternity Colony Study
Gatineau Park, QC, Canada

Golder was retained to assess the presence or absence of SAR bats using this historic building for maternity roosting. The study included daytime surveys to assess potential habitat and search for evidence of bats, while night time surveys focused on visually locating bats exiting the structure, according to standard protocols. Remote acoustic detection units were used to determine species present. Collaborated with the National Capital Commission (NCC), who is the landowner.

Former CFB Rockcliffe
Ottawa, Ontario, Canada

Golder provided multi-disciplinary support to the redevelopment of the former CFB Rockcliffe site to a multi-use urban development. In support of the application to the City of Ottawa by Canada Lands Company, the Natural Environment team prepared the environmental impact statement and the tree conservation report, based on the proposed development plan. The evaluation of natural heritage features for this project site included the integration of provincial and federal regulations and associated best practices for mitigation of potential impacts. Adjacent lands owned by the National Capital Commission were also reviewed as part of this project.

National Equestrian Park
Ottawa, Ontario, Canada

The National Equestrian Park in Ottawa is undergoing some exciting changes under new management by Wesley Clover Parks. Golder has been supporting the natural environment studies to meet the needs of municipal, provincial and federal stakeholders, including development of the compensation plan for Bobolink. The recent developments have included an outdoor festival and concert venue and a FIFA 2-Star Soccer facility.

Greystone Village - Former Oblates Property
Ottawa, Ontario, Canada

Golder worked with the Regional Group on this exciting redevelopment of the historic Oblates property in Ottawa, along the Rideau River. The site was assessed for natural heritage values, and an Environmental Impact Study and Tree Conservation Report were prepared.

Connaught Range Turtle Nesting Study
Ottawa, ON, Canada

Golder was retained by PWGSC to assess current SAR turtle nesting at the Connaught Range, and design a strategy to prevent future nesting, while at the same time offering alternate nesting habitat. Golder's plan was designed in consideration of rigorous shooting range requirements, while offering a safe nesting area for turtles away from the active range.

Environmental Management Plan for Urban Expansion Lands Areas 9a and 9b
Ottawa, Ontario, Canada

Prepared an Environmental Management Plan (EMP) for two parcels of land, which included coordination and incorporation of materials from a number of external partners. The EMP provided a framework for future development of the area through a range of detailed studies, and included extensive consultation with City and Conservation Authority staff.

Brockville Employment Lands
Brockville, Ontario, Canada

Designed a natural heritage study of a 130 acre property in the City of Brockville, with the intention of determining the potentially developable area in consideration of the natural environment features present at the Site, on behalf of the City of Brockville. Results were presented in a preliminary Environmental Impact Study for consideration as part of a Secondary Plan study for the Site.

Claridge Lands - 4789 Bank Street
Ottawa, Ontario, Canada

Golder was retained by Claridge Homes to prepare an Environmental Impact Study (EIS) and Tree Conservation report, including all necessary fieldwork, for this Site. Golder worked with the client, City of Ottawa, South Nation Conservation and the Ministry of Natural Resources and Forestry to provide solutions that met the client's needs as well as natural heritage policy requirements at the municipal and provincial levels.

Remer Lands EIS and Environmental Management Plan
Ottawa, Ontario, Canada

Golder provided natural heritage expertise in assisting the Regional Group to clear conditions for this draft-approved subdivision in Ottawa. This challenging project included a full inventory of the flora and fauna at the site in order to prepare an Environmental Management Plan, Environmental Impact Study and Tree Conservation Report for the site. Golder worked with the client, City of Ottawa, South Nation Conservation and the Ministry of Natural Resources and Forestry to navigate this challenging project and provide solutions that met the client's needs as well as natural heritage policy requirements at the municipal and provincial levels.

McMachen Pit - SAR Works
Rideau Lakes, Ontario, Canada

Designed and undertook a baseline study and transplantation plan for a sensitive plant Species at Risk on the client's proposed aggregate pit expansion lands in accordance with O.Reg. 242/08 under the Endangered Species Act. This project will involve annual follow-up monitoring of the transplanted individuals to assess their health and continued vigour. This project requires a detailed understanding of plant physiology and ecology, as well as a firm grasp of provincial legislation and regulations associated with Species at Risk.

Dallan Lands - EIS
Guelph, Ontario, Canada

Prepared an Environmental Impact Study for this proposed residential development. Multi-year field inventories related to flora and fauna were performed, including species at risk (Jefferson Salamander), and wetland boundaries were evaluated in co-operation with the Grand River Conservation Authority. Review of potential impacts was undertaken and presented in an Environmental Impact Statement. On-going consultation with public interest groups, University of Guelph experts, and City staff to develop a design plan in respect of complicated natural heritage features.

Richmond Hill Subdivisions - Monitoring
Richmond Hill, Ontario, Canada

Collected data and samples for an on-going monitoring program. Tasks included undertaking annual vegetation monitoring using a standardized methodology, analyzing collected data and comparing it with previous year's results to identify changes.

Activa Waterloo West Side Lands - Monitoring
Waterloo, Ontario, Canada

Pre-construction monitoring on the subject lands was initiated in 1999 and continued during pre-construction years, with the intention of providing baseline environmental information prior to area grading and construction. This program addressed the City of Waterloo's development monitoring requirements, implemented for Laurel Creek and other watercourses within the City. The scope of work for the terrestrial monitoring included photographic and descriptive inventories of 22 stations on the subject lands. Terrestrial monitoring was conducted once per year with results analyzed, catalogued and compared with previous observations where applicable.

Simpson Lands EIS and Terrestrial Monitoring
Waterloo, Ontario, Canada

Designed an on-going terrestrial monitoring program for the subject lands based on City of Waterloo and GRCA guidelines. Monitoring of vegetation communities, changes in species compositions, and disturbance levels was undertaken, interpreted, and reported. Requirements for the EIS field program were designed and discussed with relevant agencies. An EIS was prepared that considered the proposed plan of development, the potential environmental impacts related to the plan, and discussed mitigation measures for each potential impact.

Buffalo Springs EIS Update and Homeowners' Manual
Oro-Medonte, Ontario, Canada

Prepared an EIS as well as an Environmental Stewardship Guide for new homeowners, which aimed to acquaint residents with their natural surroundings and educate them as to how to protect those areas through their daily actions. Liaised with the Ministry of Natural Resources and local Conservation Authority throughout this project. Conducted surveys using standardized methodology for Butternut.

Gordon Creek Developments - EIS
Guelph, Ontario, Canada

Designed a fieldwork program in order to assess natural heritage features within the study area, and presented the Terms of Reference for the study to the City of Guelph Environmental Advisory Committee. Provided input to the project design based on findings of the field program, and authored an Environmental Impact Statement for the proposed development. The site contained a number of significant features, including Provincially Significant Wetland and wildlife corridors. Liaised with the City of Guelph and the Conservation Authority.

Clerview Environmental Constraints Analysis and EIS
Guelph, Ontario, Canada

Performed a preliminary environmental constraints analysis for the subject lands, using published resources and an initial field investigation to identify constraints to development. Wetland boundaries on site were delineated according the methodology outlined in the Ontario Wetland Evaluation System. Information was presented to the client in report format. The constraints analysis was used in the production of the draft plan of subdivision, for which an EIS was prepared. The field program and report format for the EIS was presented to and negotiated with the Guelph Environmental Advisory Committee (EAC). A full three-season field program was undertaken, and findings were reported in the EIS. The draft plan was reviewed to identify potential environmental impacts to the adjacent natural areas, and mitigation measures were recommended. The final EIS will be presented to the Guelph EAC.

University of Waterloo Northwest Campus EIS
Waterloo, Ontario, Canada

Undertook a review and assessment of the natural heritage components associated with the subject lands, including floral, faunal and community investigations. The information gathered was used to create an updated Greenspace System on the subject lands and to propose trail linkages between the site and adjacent lands. Reviewed the draft plan of development in relation to the subject lands in order to identify potential environmental effects and recommend mitigation measures.

Activa Branchton - Dundas Lands EIS
Cambridge, Ontario, Canada

Compiled three seasons worth of field data, including information on flora and fauna. Reviewed field data in conjunction with the preliminary design plan in order to recommend changes to elements of the plan to reflect consideration for the surrounding natural environment. Identified potential environmental effects related to the final design plan and recommended mitigation measures in the final Environmental Impact Statement.

Victoria South Golf Course Environmental Constraints Analysis and EIS
Guelph, Ontario, Canada

Completed a natural heritage review of the subject lands, and inventoried the site using Ecological Land Classification, as well as collecting data on flora and fauna. Completed an Environmental Constraints Analysis to present the findings of both the review and field inventories for consideration during preliminary site design for a recreational golf facility. Upon receipt of the preliminary design plan, a Terms of Reference was prepared and submitted to the City of Guelph Environmental Advisory Committee outlining the proposed approach for a complete Environmental Assessment for the proposed development. Review of potential impacts was undertaken and presented in an Environmental Impact Statement.

City of Hamilton Nature Counts Program
Ontario, Canada

Performed ELC within the City of Hamilton's boundary, from Ancaster to Puslinch. Designated Areas of Natural and Scientific Interest (ANSI) were inventoried for flora, fauna and disturbance level, and classified using ELC. Other tasks included air photo interpretation, field navigation and leadership.

PROJECT EXPERIENCE – RENEWABLE ENERGY

Clarington Wind Power Project
Clarington, Ontario, Canada

Retained by Leader Resources Services Corp. to complete various studies in support of the REA application for an onshore Class 4 wind turbine generating project. These included a Natural Heritage Assessment, a Water Body Assessment, Endangered Species Act Permit Applications, Environmental Effects Monitoring Plan and a Noise Study Report. Golder successfully completed a thorough records review as well as field investigations. Wildlife and wildlife habitat investigations focused on bat maternity roosting habitat, grassland bird habitat, landbird migratory stopover areas, marsh bird breeding habitat, amphibian breeding habitat and snake hibernacula. Use of the property by avian wildlife was assessed over several years during various seasons including breeding and migration. Species at risk (SAR) habitat was identified and focused field surveys were completed as required. Completion of the Natural Heritage Assessment was approved by the MNR.

Lindsay-Ops Landfill Site Renewable Energy Generation Facility
Kawartha Lakes, Ontario, Canada

Retained by the City of Kawartha Lakes to conduct the site investigation component of a Natural Heritage Assessment (NHA) as per section 26 of Ontario Regulation (O. Reg.) 359/09 for a proposed biogas facility at the Lindsay-Ops Landfill site, City of Kawartha Lakes, Ontario. A Site Investigation Report was prepared based on these investigations, followed by an Evaluation of Significance (EOS) and Environmental Impact Statement (EIS) report as per sections 27 and 38 (2) of O. Reg. 359/09.

South Branch Wind Farm
South Dundas, Ontario, Canada

Environmental compliance monitoring during construction of this wind project for EDP Renewables - North America. Undertook a review of all environmental approvals and permits associated with the Project and prepared a comprehensive Compliance Manual based on the review. Golder also reviewed construction plans and procedures prepared by the Contractor for the Project in order to assess their compliance with agency guidelines and their related Acts, Codes and Regulations. Golder conducted monthly construction monitoring events to monitor compliance. Following the completion of Project construction, and all associated monitoring events, Golder will be preparing a Compliance Assessment Summary Report.

Melancthon II - Natural Heritage Component
Shelburne, Ontario, Canada

Completed a review of the natural heritage features within the study area for the Melancthon II Wind Project for Canadian Hydro Developers Inc. Work included contact and discussion with various agencies to obtain information on significant natural features. Also, field reconnaissance was undertaken within the study area to apply Ecological Land Classification for Southern Ontario. Prepared a Technical Appendix on the Natural Heritage features of the study area, to support the Environmental Screening Report for this project. This project was undertaken prior to implementation of the REA process.

Kingsbridge II - Natural Heritage Component
Goderich, Ontario, Canada

Undertook a review of natural heritage features within the study area for the Kingsbridge II Wind Project near Goderich, Ontario. Various agencies were contacted to obtain information on significant natural features within the study area. This information, along with data collected in the field, was presented in a Technical Appendix that formed part of the larger Environmental Screening Report for this project. This project was undertaken prior to implementation of the REA process.

Multiple Renewable Energy Projects
Multiple Location, Ontario, Canada

Assisted in design and implementation of field programs and subsequent reporting in support of REA applications for a number of wind farms in Ontario, including: Wolfe Island Wind Project (Wolfe Island, ON); Port Alma Wind Farm (Port Alma, ON); Grand Renewable Energy Park (Haldimand County, ON); St. Columban Wind Farm (Huron County, ON); Summerhaven Wind Energy Centre (Haldimand County, ON); Suncor Energy Adelaide Wind Power Project (Middlesex County, ON); and Armow Wind Project (Bruce County, ON). Many of these projects included surveys for species at risk utilizing standardized protocols.

PROJECT EXPERIENCE – TRANSPORTATION

Highway 11/17 Route Planning - MTO
Kakabeka Falls, Ontario, Canada

Route Planning Study for the future four-laning of Highway 11/17 between Kakabeka Falls and Shabaqua Corners. The purpose of the study was to review and evaluate various route alternatives for a new four-lane divided Highway 11/17. At completion of the study, a preferred route will be selected and designated. Terrestrial investigations characterized vegetation communities in the study area according to Ecological Land Classification (ELC) for southern Ontario, and the Forest Ecosystems of Central Ontario. Observations of ecological linkages, wildlife and wildlife habitats were also made. Sensitive vegetation communities within a provincial park were reviewed. Fieldwork and reporting were undertaken according to MTO regulations and guidelines.

Highway 11 Access Review - MTO
Muskoka, Ontario, Canada

Planning, preliminary design and environmental assessment study to upgrade Highway 11 to a fully controlled access freeway, from Muskoka Road 117 to north of Alpine Ranch Road, in the Town of Bracebridge and the District Municipality of Muskoka. The study included identifying a plan to eliminate all at grade intersections and entrances and providing access to the highway at interchange locations only. Terrestrial investigations characterized vegetation communities in the vicinity of each interchange location according to Ecological Land Classification (ELC) for southern Ontario, and the Forest Ecosystems of Central Ontario. Observations of ecological linkages, wildlife and wildlife habitats were also made. Fieldwork and reporting were undertaken according to MTO regulations and guidelines.

Highway 69 Site Selection of Highway Maintenance Patrol Yards – MTO
Parry Sound to Sudbury, Ontario, Canada

This study was undertaken in order to assess a number of alternative locations for patrol yards within the study area, and to identify preferred alternatives at three locations. Performed Ecological Land Classification within each identified patrol yard alternative. Identification of flora and fauna, and habitat descriptions. The study area contained significant features including Provincially Significant Wetlands and required surveys and habitat assessments for Massassauga Rattlesnake, which was present in the study areas. Fieldwork and reporting conducted in accordance with MTO regulations and guidelines. Concurrent with the submission of the Fisheries and Aquatic Ecosystems Report, a Terrestrial Ecosystems Report was submitted to characterize existing conditions, and to address predicted impacts and required mitigation to on-site vegetation communities, terrestrial wildlife and their habitats, and adjacent ecological linkages.

Highway 11 at the South Entrance of Powassan – MTO
Powassan, Ontario, Canada

This study was carried out to update a Preliminary Design Report that recommended interchange locations for this stretch of Highway 11. Performed Ecological Land Classification along the study corridor. Identification of flora and fauna, and habitat description. The study area contained significant features, a variety of habitats, and cultural communities. Fieldwork and reporting conducted in accordance with MTO regulations and guidelines. Concurrent with the submission of the Fisheries and Aquatic Ecosystems Report, a Terrestrial Ecosystems Report was submitted to characterize existing conditions, and to address predicted impacts and required mitigation to on-site vegetation communities, terrestrial wildlife and their habitats, and adjacent ecological linkages.

Veuve River Bridge and Amable du Fond River Bridges in Sudbury and North Bay - MTO
Multiple Sites, Ontario, Canada

This study was carried out as part of the preliminary design for improvements to these two bridges located on Highways 535 and 630, respectively. Terrestrial investigations characterized vegetation communities in the vicinity of each bridge according to Ecological Land Classification (ELC) for southern Ontario, and the Forest Ecosystems of Central Ontario. Observations of ecological linkages, wildlife and wildlife habitats were also made. Fieldwork and reporting were undertaken according to MTO regulations and guidelines. Concurrent with the submission of the Fisheries and Aquatic Ecosystems Report, a Terrestrial Ecosystems Report was submitted to characterize existing conditions, and to address predicted impacts and required mitigation to on-site vegetation communities, terrestrial wildlife and their habitats, and adjacent ecological linkages. Fieldwork and reporting were undertaken according to MTO regulations and guidelines.

Highway 6 (Hanlon Expressway) Improvements from South of Maltby Road to the Speed River – MTO
Sudbury, Ontario, Canada

The purpose of this study was to identify the location and configuration for new interchanges to provide access to the Hanlon Expressway. Performed Ecological Land Classification along the study corridor. Identification of flora and fauna, and habitat description. The study area contained a wide range of upland forest habitats, wetlands and cultural communities. Fieldwork and reporting conducted in accordance with MTO regulations and guidelines. Concurrent with the submission of the Fisheries and Aquatic Ecosystems Report, a Terrestrial Ecosystems Report was submitted to characterize existing conditions, and to address predicted impacts and required mitigation to on-site vegetation communities, terrestrial wildlife and their habitats, and adjacent ecological linkages.

Highway 17 at the West Junction of Municipal Road 55 - MTO
Sudbury, Ontario, Canada

The purpose of this study was to identify the location and configuration for a new interchange to provide access to the west junction of Sudbury Municipal Road 55 from Highway 17. This work also included the planning for the future four-lane alignment of Highway 17, and the preliminary design of an interim two-lane Highway 17. Performed Ecological Land Classification along the study corridor. Identification of flora and fauna, and habitat description. The study area contained a wide range of upland forest habitats, wetlands, an agricultural reserve, and cultural communities. Fieldwork and reporting conducted in accordance with MTO regulations and guidelines. Concurrent with the submission of the Fisheries and Aquatic Ecosystems Report, a Terrestrial Ecosystems Report was submitted to characterize existing conditions, and to address predicted impacts and required mitigation to on-site vegetation communities, terrestrial wildlife and their habitats, and adjacent ecological linkages.

Highway 17 Southwest By-Pass - MTO
Sudbury, Ontario, Canada

The purpose of this study was to identify a four-lane highway plan for this section of Highway 17, through the Sudbury area, with access restricted to interchange locations only. Performed Ecological Land Classification along the study corridor. Identification of flora and fauna, and habitat description. The study area contained a variety of upland and wetland habitats, including Areas of Natural and Scientific Interest. Fieldwork and reporting conducted in accordance with MTO regulations and guidelines. Concurrent with the submission of the Fisheries and Aquatic Ecosystems Report, a Terrestrial Ecosystems Report was submitted to characterize existing conditions, and to address predicted impacts and required mitigation to on-site vegetation communities, terrestrial wildlife and their habitats, and adjacent ecological linkages.

Future Highway 11/17 – MTO
North Bay, Ontario, Canada

This study was carried out to update previous studies that have been undertaken since the early 1960s to investigate ways to increase safety and efficiency on Highway 11/17 through the North Bay area. Performed Ecological Land Classification along the study corridor. Identification of flora and fauna, and habitat description. The study area contained significant features including Provincially Significant Wetlands, a variety of upland habitats, and cultural communities. Fieldwork and reporting conducted in accordance with MTO regulations and guidelines. Concurrent with the submission of the Fisheries and Aquatic Ecosystems Report, a Terrestrial Ecosystems Report was submitted to characterize existing conditions, and to address predicted impacts and required mitigation to on-site vegetation communities, terrestrial wildlife and their habitats, and adjacent ecological linkages.

Highway 23 Widening - MTO
Palmerston to Harriston, Ontario, Canada

The purpose of this project was to identify any improvements necessary to ensure that Highway 23, between Palmerston and the West limits of Harriston, met expected operational needs and standards. Performed Ecological Land Classification along the study corridor, identification of flora and fauna, and habitat description. The study area consisted mainly of agricultural land with remnant upland deciduous forest. Fieldwork and reporting conducted in accordance with MTO regulations and guidelines. Concurrent with the submission of the Fisheries and Aquatic Ecosystems Report, a Terrestrial Ecosystems Report was submitted to characterize existing conditions, and to address predicted impacts and required mitigation to on-site vegetation communities, terrestrial wildlife and their habitats, and adjacent ecological linkages.

Highway 26 Widening - MTO
Thornbury to Meaford, Ontario, Canada

Retained by the Ministry to assess possible design alternatives and develop the preliminary design for recommended improvements to Highway 26 in the study area. The project included the review and assessment of pavement condition, drainage, intersections, entrances, illumination, and highway alignment. Performed Ecological Land Classification along the study corridor. Identification of flora and fauna, and habitat description. The study area contained Areas of Natural and Scientific Interest, prominent valleys, cliff features, and high quality fruit-crop lands. Fieldwork and reporting conducted in accordance with MTO regulations and guidelines. Concurrent with the submission of the Fisheries and Aquatic Ecosystems Report, a Terrestrial Ecosystems Report was submitted to characterize existing conditions, and to address predicted impacts and required mitigation to on-site vegetation communities, terrestrial wildlife and their habitats, and adjacent ecological linkages.

Aquatic and Terrestrial Biology Retainer Services - MTO
Southern Ontario, Canada

Provided terrestrial biology support for Natural Sciences work associated with ten proposed culvert repair projects, located throughout the Southwestern Region. The purpose of the assignment was to document the existing aquatic ecological features and to provide an assessment of migratory bird use in the vicinity of each culvert. Agency and field data were then considered in terms of the proposed culvert repairs, and recommendations for appropriate environmental protection measures were provided.

TRAINING

Wetland Creation Workshop
Toronto Zoo, 2010

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

Habitat Restoration Planning and Implementation
Northwest Environmental Training Centre, 2014

St. John's Ambulance First Aid Training
2017

PROFESSIONAL AFFILIATIONS

Ontario Vernal Pool Association

Field Botanists of Ontario

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For more information, visit golder.com

Africa	+ 27 11 254 4800
Asia	+ 86 21 6258 5522
Australasia	+ 61 3 8862 3500
Europe	+ 44 1628 851851
North America	+ 1 800 275 3281
South America	+ 56 2 2616 2000

solutions@golder.com
www.golder.com

Golder Associates Ltd.
1931 Robertson Road
Ottawa, Ontario, K2H 5B7
Canada
T: +1 (613) 592 9600

Golder Associates