



CLARIDGE HOMES

760 River Road Subdivision Development

Environmental Impact Statement &
Tree Conservation Report

Project No. 191-06688-00 | December 2019



**Prepared for:
Claridge Homes**

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December 03, 2019

Confidential

CLARIDGE HOMES
210 Gladstone Avenue
Ottawa, Ontario K2P 0Y6

Subject: 760 River Road – Addendum Environmental Impact Statement and Tree Conservation Report (Draft)

Dear: Vincent,

The following Environmental Impact Study (EIS) and Tree Conservation Report (TCR) for the proposed subdivision development at 760 River Road, Ottawa has been prepared in accordance with the City of Ottawa's EIS guidelines (2015).

This report is intended to provide a comprehensive assessment of potential impacts and proposed mitigation measures based on the findings from ecological field investigations and desktop screenings.

Yours sincerely,

A handwritten signature in blue ink, appearing to read 'Alex Zeller'.

Alex Zeller
Sr Ecologist

WSP ref.: 191-06688-00

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EXECUTIVE SUMMARY

WSP Canada Inc. (WSP) was retained by Claridge Homes to undertake an Environmental Impact Statement (EIS) and Tree Conservation Report (TCR) for the proposed residential development, located at 760 River Road in Ottawa (ON). The primary objective of this EIS and TCR is to evaluate the environmental impacts associated with the proposed development.

Natural heritage field investigations for the Project was conducted between May and June 2019 and consisted of: Ecological Land Classification (ELC); tree inventory; significant woodland evaluation; amphibian breeding surveys; breeding bird surveys; bat maternity roost surveys; Species at Risk (SAR); and general wildlife habitat assessment. Results from the field investigations are summarized below:

- 1) No Provincially Significant Wetlands (PSW), Significant Woodlands, Significant Valleylands, Areas of Natural and Scientific Interest (ANSI), or any other designated natural heritage system features occur within 120 m of the Study Area.
- 2) One watercourse with indirect fish habitat is located within the Study Area.
- 3) The forest communities within the Project footprint are not considered locally or provincially significant.
- 4) The vegetation communities recorded during field investigations are commonly found throughout Ottawa and eastern Ontario.
- 5) Remnant deciduous forests occurred within the Study Area and contain occasional mature trees. Eleven trees were identified to be Distinctive [i.e. ≥ 50 cm diameter at breast height (DBH)]. Overall, trees were in good condition with few individuals showing evidence of decline.
- 6) To offset the impacts associated with the removal of native vegetation, landscaping with native vegetation within the areas surrounding the development has been recommended.
- 7) Tree mitigation measures have been recommended to limit the number of Distinctive trees requiring removal and to provide suitable protection techniques for trees being retained.
- 8) Installation of bat boxes has been recommended to offset the impacts associated with the removal of potential bat maternity roost habitat.
- 9) Additional mitigation measures have been recommended to limit the development impacts on terrestrial environments and wildlife.

The compensation measures proposed should help offset the negative impacts associated with this development while helping enhance and retain valuable natural heritage assets for the future residential development. The additional negative impacts noted in this report, primarily associated with the construction of the development, can be mitigated with the proposed mitigation measures. As such, any residual impacts resulting from this development can be mitigated and compensated for and should not pose any impediments to development.

If the recommended compensation and/or mitigation measures are implemented accordingly, it is our opinion that the residential development at 760 River Road can be approved.

1 INTRODUCTION

1.1 PURPOSE

Claridge Homes retained WSP Canada Inc. (WSP) to complete an Addendum Environmental Impact Statement (EIS) and Tree Conservation Report (TCR) for the proposed subdivision development at 760 River Road (herein known as “the Project”). This property is located on a parcel of land with frontage on River Road, in the City of Ottawa (**Figure 1**).

This addendum EIS has been prepared to describe the existing natural heritage features within the Study Area and to evaluate the potential environmental impacts associated with the proposed development based on field investigations and desktop screening results. Mitigation measures will be provided to offset the anticipated environmental impacts.

For this report, the Study Area includes the area within 120 metres (m) of the Project footprint to account for policy requirements and setback distances outlined in the *Provincial Policy Statement (PPS)* (Ministry of Municipal Affairs and Housing, 2014) and the accompanying *Natural Heritage Reference Manual (NHRM)* (MNR, 2010).

The “Study Area” for this project includes the Project footprint, plus a 120 m buffer from this area (see **Figure 1**). In addition, specific species and features will be considered up to two kilometre (km) from the proposed development as it may relate to specific environmental policy or legislation.

1.2 BACKGROUND

Claridge Homes is submitting a Plan of Subdivision application for the development located at 760 River Road just north of Manotick, Ottawa, Ontario. The Project will consist of 55 development blocks intended for the construction of single family homes.

Within the City of Ottawa, an EIS is required when development or site alteration, as defined in Section 4.7.8 of the Official Plan (OP) (City of Ottawa, 2003), is proposed or adjacent to environmentally designated lands or other features of the City’s natural heritage system (NHS). In this case, the woodlands and a watercourse identified within the property and the proximity to the Rideau River triggered the need for an EIS and TCR.

Formerly, the *Environmental Impact Statement and Tree Conservation Report for the Riverside South Stormwater Management Pond 5* (Stantec, 2017) was created for, and approved by the City of Ottawa. As such, the Stormwater Management (SWM) Pond 5 is currently being developed within the subject property of 760 River Road, directly west of the proposed subdivision development discussed herein. During the commencement of natural heritage field investigations, active construction of the SWM Pond 5 was occurring. Due to the overlap of two development projects within the same property parcel, the methods and results of the Headwater Drainage Features (HDF) assessment and fish habitat/sampling surveys conducted by Stantec (2017) will be used exclusively for the purpose of the Project.

This report has been prepared to consider federal, provincial, and municipal policies and regulations from relevant regulatory agencies in order to maintain compliance with the governmental legislation that pertain to the Project.

In addition, this report has been prepared to support the Project in the following ways: 1) to not contravene the *Endangered Species Act, 2007 (ESA)*; 2) to evaluate environmental impacts; and, 3) to develop mitigation plan addressing potential impacts.



Legend

-  Project Footprint
-  Study Area (120 m)



Client/Project Name:
Claridge Homes
760 River Road Subdivision Development

Title:
Study Area

Prepared By:


Project No: 191-06688-00	Drafter: SQ	Reviewer: AO
Scale: 1:9,000	Source: Bing Maps Aerial, ESRI World Topographic Map	
Coordinate System: NAD 1983 UTM Zone 18N		
Date: December 2019		
© Queen's Printer for Ontario	Figure: 1	

1.3 PROPERTY INFORMATION

Owner:	Claridge Homes
Address:	760 River Road, Ottawa, Ontario
Lot and concession:	Lot 22, Concession: Broken Front from Rideau River
Property Identification Number(s):	045891857
Zoning:	DR1 – Development Reserve Subzone (Sections 237-238)
Official Plan designation (Schedule B):	General Urban Area
Existing Land Uses:	Greenfield – Forested Land

1.4 STUDY APPROACH

The following approach has been developed to provide a clear methodological direction towards characterizing the natural environment and assessing the potential for significant species and habitats within the Study Area.

- Policy Framework:** This section outlines the policies and legislation that apply to the protection of natural heritage features within the Study Area as it relates the Project.
- Natural Heritage Screening:** This section provides the detailed background information collected from a variety of publicly accessible resource databases to describe the natural heritage features and significant features that may occur within the Study Area.
- Methodology:** This section provides a summary of the specific protocols and methods used to evaluate potential natural heritage features and species identified within the natural heritage screening.
- Survey Results:** This section provides the results from the field surveys. This also includes any incidental observations or notable observations made by the field biologists.
- Description of the Proposed Project:** This section provides a summary of the Project, including the construction activities and other activities which may have an impact on the natural environment.
- Impact Assessment and Mitigation:** This section provides the assessment of potential environmental impacts associated with the Project on the natural heritage system, including the natural heritage features and species surveyed in this study.

The mitigation measures proposed in this section are aimed at reducing or eliminating potential impacts to natural heritage features. Where mitigation may not be possible, compensation may be proposed.

This section will also identify any future permitting or agency authorizations that may be required before the Project may proceed.

Summary and Conclusions:

This section provides a summary of the Study’s findings, outlines any notable provisions, and provides WSP’s general recommendation on whether this project should proceed as planned.

TREE CONSERVATION REPORT REQUIREMENTS



For the purposes of this integrated report, the Tree Conservation Report (TCR) requirements will be addressed throughout this report. To aid in the review, sections which address specific **requirements under the TCR guidelines will be marked with the “tree” symbol** as illustrated to the left.

2 POLICY FRAMEWORK

This study references the regulatory agencies and legislative authorities mandated to protect different elements of the NHS, features, and functions within the City of Ottawa, Ontario, and Canada. **Table 1** provides a list of the applicable policies and legislation for the protection of natural heritage features and SAR either municipally, provincially, and/or federally. The scope of this report evaluates the natural heritage features and SAR governed by the policies outlined in the table below.

Table 1 Policies, Legislation and Background Sources

Policy/Regulations	Reference Materials and Supporting Documents
Federal Government of Canada	
<i>Migratory Birds Convention Act (MBCA, 1994) (S.C. 1994, c. 22)</i>	Environment and Climate Change Canada (ECCC) – online resources
<i>Species at Risk Act (SARA, 2002) (S.C. 2002, c. 29)</i>	Federal Species at Risk Public Registry: <ul style="list-style-type: none"> • <i>Distribution of Aquatic Species at Risk mapping (Accessed: 07/16/2019)</i>
<i>Fisheries Act (1985) (R.S.C., 1985, c. F-14)</i>	Fisheries and Oceans Canada – online resources
Province of Ontario	
Provincial Policy Statement (2014), under <i>Planning Act</i>, R.S.O. (1990) c. P.13 AND Ontario <i>Endangered Species Act</i> (2007) (S.O. 2007, c. 6)	Ministry of Natural Resources and Forestry (MNRF) – Kemptville District Main Contact: <ul style="list-style-type: none"> • Natural heritage and species at risk information request was received from Erin Seabert (Management Biologist) on December 28, 2016 (Stantec, 2017).
	MNRF Natural Heritage Information Centre (NHIC) – Online (Accessed: 07/16/2019): <ul style="list-style-type: none"> • <i>Species at Risk occurrence records</i> • <i>Species of Conservation Concern</i> • <i>Natural Heritage Features</i>
	NHRM (MNR, 2010)
	Significant Wildlife Habitat Technical Guide (MNR, 2000): <ul style="list-style-type: none"> • <i>Significant Wildlife Habitat Eco-region 6E Criterion Schedules (MNRF, 2015)</i>
	Ministry of the Environment, Conservation and Parks (MECP): <ul style="list-style-type: none"> • <i>Species at Risk in Ontario (SARO) List (O.Reg. 230/08)</i>
	Ecological Land Classification for Southern Ontario, First Approximation and its Application (Lee, et al., 1998)
	Ontario Breeding Bird Atlas (OBBA) – Online (Accessed: 07/16/2019)
	Ontario Reptile and Amphibian Atlas (ORAA) – Online (Accessed: 08/08/2019)
	Ontario Butterfly Atlas (OBA) – Online (Accessed: 08/07/2019)

Policy/Regulations	Reference Materials and Supporting Documents
	Atlas of the Mammals of Ontario (AMO) (Dobbyn, 1994)
City of Ottawa	
City of Ottawa Official Plan (2003) 	Official Plan; Schedules B (Urban Policy Plan), K (Environmental Constraints), and L2 (Natural Heritage System Overlay (South) – Online (Accessed: 07/16/2019)
	Environmental Impact Statement Guidelines (2015)
	City of Ottawa Tree Conservation Report Guidelines – Online (Accessed: 07/16/2019)
	Site Alteration By-Law (2018) – Online (Accessed: 07/16/2019)
	Protocol for Wildlife Protection During Construction (2015)
Rideau Valley Conservation Authority (RVCA)	
Rideau Valley Conservation Authority: Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses (Ontario Regulation 174/06), under Conservation Authorities Act, (R.S.O. 1990, c. C.27)	RVCA Regulations Mapping – Online (Accessed: 07/16/2019)

2.1 ONTARIO ENDANGERED SPECIES ACT, 2007

The Ontario ESA prohibits the killing or harming of species identified as Threatened or Endangered under the Act. Section 10 of the ESA prohibits the damage or destruction of a species’ habitat that have been classified as Endangered or Threatened on the Species at Risk in Ontario (SARO) List in Ontario Regulation (O. Reg.) 230/08.

Under the ESA “habitat” is defined as:

“with respect to any other species of animal, plant or other organism, an area on which the species depends, directly or indirectly, to carry on its life processes, including life processes such as reproduction, rearing, hibernation, migration or feeding.”

General habitat protection is afforded to all species once they become listed as Threatened or Endangered and remains in place until regulated habitat is designated.

Regulated habitat is defined as:

“with respect to a species of animal, plant or any other organism for which a regulation made under Clause 55 (1) (a) is in force, the area prescribed by that regulation as the habitat of the species.”

Regulated habitat provides more precise details on the species-specific habitats such as specific features, geographic boundaries, or unique requirements of a species.

3 DESCRIPTION OF THE NATURAL ENVIRONMENT

The following sections provide a desktop screening of the existing natural environment features identified within the Study Area. This information provides the background information upon which the EIS and TCR will be based.

3.1 HISTORIC LAND USE

A desktop review of recent and historic aerial images highlights the land use within and adjacent to the Study Area (geoOttawa, 2019) (**Figure 2**). From this review, the landscape was largely dominated by agricultural land use until approximately the year of 1999 and 2019. From here, agricultural lands to the east of the property were left fallow and natural succession of a forested vegetation community began to develop. In 2018 – 2019, this area was cleared for the extension of Riverside South subdivision development. Likewise, a portion of the 760 River Road property continued to be farmed until just recently, where it was cleared for the SWM Pond 5. Remnant and isolated forested hedgerows remain within the property.

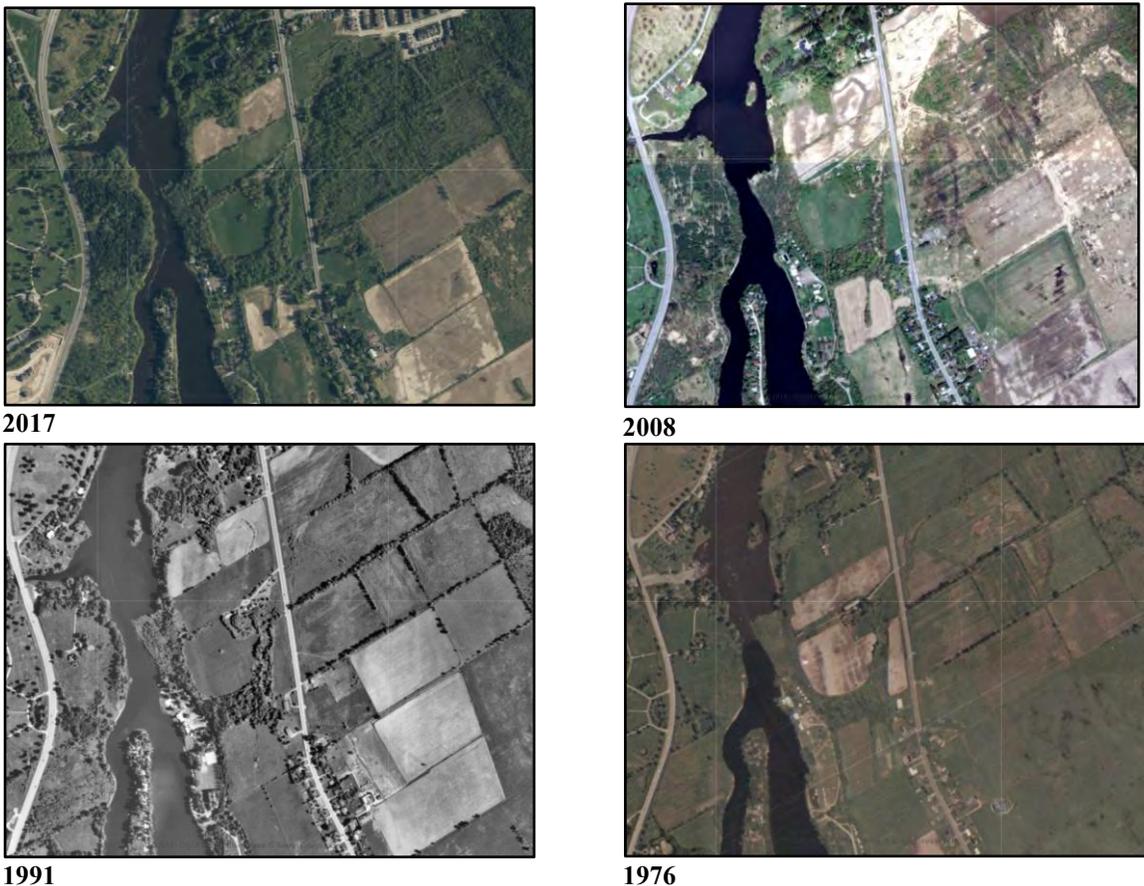


Figure 2 Land Use Change

3.2 LANDFORM, GEOLOGY AND SOILS

The geology and topography within the Study Area has been described as a tableland feature with steep valley slopes associated with the Rideau River and on-site tributary. The Study Area lies within the Ottawa Valley Clay Plains physiographic region (Ontario Geological Survey, 2016). The surficial geology consists of fine-textured glaciomarine deposits. The underlying bedrock is part of the Oxford Formation, consisting of dolomite and limestone (Natural Resources Canada, 2016).

3.3 AQUATIC ENVIRONMENT

The Study Area is within the Rideau Valley watershed jurisdiction. More specifically, within the Lower Rideau River sub-watershed and Rideau River – Hogs Back catchment (Rideau Valley Conservation Authority, 2012). This catchment area contains warm/cool water recreational and baitfish fishery with 40 fish species. The water quality has been rated good to fair in 2011 (Rideau Valley Conservation Authority, 2012). One permanent Rideau River tributary (Tributary #2) originates east of River Road and traverses north/south through the Study Area (**Figure 3**).

3.3.1 FLOODPLAIN AND REGULATED LIMIT

The RVCA is the governing body that regulates flood potential, protects natural heritage features, and enhances the ecosystems within the Rideau Valley watershed. Development within regulated areas is governed by O. Reg. 174/06 *Development, Interference with Wetlands, and Alterations to Shorelines and Watercourses*. RVCA also maintains, monitors, and collects information related to water quality/quantity, fisheries resources, forestry, land use, and wetlands.

The RVCA and City of Ottawa OP (2003) has identified Regulated Limits and Floodplain areas throughout the Study Area and Project footprint.

3.3.2 HEADWATER DRAINAGE FEATURES

Headwater Drainage Features (HDF) assessment was conducted by Stantec in 2014 and 2016 for the purpose of evaluating the impacts of the proposed Storm Water Management Pond #5 (Stantec Consulting Ltd., 2017). The assessment followed the *Evaluation, Classification, and Management of Headwater Drainage Features Guidelines* (Toronto and Region Conservation Authority and Credit Valley Conservation Authority, 2014). These guidelines use standardized survey methods and a tiered study design to determine the risk of functional impairment to an HDF through land development.

It was concluded that two unnamed tributaries of the Rideau River are present within the Study Area. The thermal regimes are unknown. Both tributaries were exhibiting baseflow conditions during the assessment. The HDF assessment identified two HDFs to occur within the Study Area. HDF 1 consisted of three separate Reaches and HDF 2 consisted of two Reaches (Stantec Consulting Ltd., 2017).

Both Reaches occur within the Study Area, however only Reach 2B occurs within the Project footprint. Stantec has identified this as HDF 2 – Tributary to Rideau River #2 (Reach 2A and 2B). Reach 2A has ‘Protection’ recommendations, while Reach 2B has ‘Mitigation’ recommendations. WSP has retained the same tributary nomenclature used within Stantec (2017) for consistency. However, since the time of the Stantec evaluation, Reach 2B has been realigned to flow adjacent to River Road before flowing west into a culvert where it reconnects with Reach 2A outside of the Project footprint. This watercourse realignment was approved by the RVCA prior to construction of the tributary diversion. However, the construction on this realignment had not started at the time of the field surveys for this study.

Reach 2A and 2B are both shown in **Figure 4**, in addition to other watercourses outside of the Project footprint. A Management Protection Recommendation has been applied to Reach 2A as it is a feature within forested valleylands

that are considered to have important riparian functions contributing to downstream fish habitat. A Management Mitigation Recommendation has been applied to Reach 2B as it is considered to have valued hydrology, terrestrial functions, and contributing fish habitat (Stantec, 2017).

For a complete description of Reach characteristics and the evaluation of each HDF on the Site, please refer to **Appendix E** within Stantec (2017).



Legend

-  Project Footprint
-  Study Area (120 m)

Natural Features

-  Drainage Ditch
-  Unevaluated Wetlands (MNRF 2019)
-  Waterbodies
-  Watercourse
-  Urban Natural Features



Client/Project Name:		
Claridge Homes		
760 River Road Subdivision Development		
Title:		
Existing Natural Heritage Features		
Prepared By:		
		
Project No: 191-06688-00	Drafter: SQ	Reviewer: AO
Scale: 1:5,000	Source: Bing Maps Aerial, ESRI World Topographic Map, LIO, MNRF, RVCA hazards public service, City of Ottawa-Urban Policy Plan, Schedule B(10/2018).	
Coordinate System: NAD 1983 UTM Zone 18N		Figure: 3
Date: December 2019		
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Legend

-  Project Footprint
-  Study Area (120 m)
-  Culvert
-  Tributary 1 (Reach A, B, & C)
-  Reach 2B (Mitigation - Removed)
-  Reach 2A (Protection)
-  Reach 2A (Protection - Removed)
-  Reach 2B (New Realignment)
-  Watercourse
-  Watercourse (30 m)
-  Waterbodies



Client/Project Name:
Claridge Homes
760 River Road Subdivision Development

Title:
Headwater Drainage Feature Assessment Reach

Prepared By:


Project No: 191-06688-00	Drafter: CP	Reviewer: AO
Scale: 1:3,000	Source: Bing Maps Aerial, ESRI World Topographic Map, LIO	
Coordinate System: NAD 1983 UTM Zone 18N		
Date: December 2019		
© Queen's Printer for Ontario	Figure: 4	

3.4 NATURAL HERITAGE FEATURES

Natural heritage features that may be present within the Study Area are summarized in **Figure 3**:

- Unevaluated wetlands
- Woodlands and forest communities
- Natural habitats that may provided ‘Significant Wildlife Habitat’ (SWH) (e.g. woodlands, wetlands, thickets, meadows, etc).
- Candidate fish habitat (Direct and Indirect)

Natural heritage features that are absent from the Study Area include; PSWs; ANSIs; and the National Capital Commission (NCC) Greenbelt lands. Also, no natural heritage features identified within the City of Ottawa’s OP (2003) are known to occur within the Study Area (i.e. Significant Woodlands, Natural Heritage System, Urban Natural Features, Natural Environment Areas, and Linkage Features).

3.4.1 UNEVALUATED WETLAND

Unevaluated wetlands are mapped by MNRF. One unevaluated wetland occurs within the Study Area and is associated with a Rideau River tributary, which originates east of River Road and traverses north/south of the Study Area. The riparian zone of this tributary has thus received the designation of an unevaluated wetland by the MNRF (Figure 3).

3.4.2 SIGNIFICANT WILDLIFE HABITAT

The MNRF has identified four categories of SWH within the *SWH Criteria Schedules for Ecoregion 6E* (MNRF, 2015). They include:

- Seasonal Concentration Areas of Animals
- Rare Vegetation Communities or Specialized Habitat for Wildlife
- Habitat for Species of Conservation Concern (excluding Endangered or Threatened Species)
- Animal Movement Corridors

A preliminary assessment of candidate SWH categories to be found within the Study Area was conducted prior to field surveys in order to design an ecological field program for the Project. The potential for candidate SWH was reviewed using MNRF (2015), available background information, and air-photo interpretation. From the preliminary assessment, there is potential for candidate SWH of: *Seasonal Concentration Areas of Animals*, *Specialized Habitat for Wildlife*, and *Habitat for Species of Conservation Concern*.

SEASONAL CONCENTRATION AREAS OF ANIMALS

Seasonal Concentration Areas are where a large abundance of a species gathers together at one time of year, or where several species congregate (MNRF, 2015). One wildlife habitat within this category has been identified as potentially occurring within the Study Area and includes candidate Bat Maternity Colonies. This is due to the presence of remnant forest communities within the subject property.

SPECIALIZED HABITAT FOR WILDLIFE

Specialized Habitat for Wildlife are areas that provide suitable habitat for the species’ long-term survival and require contiguous areas that are not fragmented (MNRF, 2015). Based on the criteria for candidate SWH (MNRF, 2015) the following Specialized Habitat for Wildlife have potential to occur within the Study Area:

- Amphibian Breeding Habitat (woodland): The presence of a forest community associated with vernal pools may provide suitable conditions
- Amphibian Breeding Habitat (Wetlands): A reed-canary meadow marsh associated with the Rideau River tributary may provide suitable conditions.

HABITAT FOR SPECIES OF CONSERVATION CONCERN

The SWH Technical Guide (MNR, 2000) defines Species of Conservation Concern (SCC) as globally, nationally, provincially, regionally, or locally rare but does not include Species at Risk [listed as Endangered or Threatened under the ESA (2007) or SARA (2002)]. A review of background data suggests that SWH for insects, amphibians, reptiles, fish, and breeding birds have potential to occur. Such species will be evaluated as potentially occurring based on their habitat suitability within the Study Area. **Table 2** below provides a list of such species.

3.4.3 FISH HABITAT

Fish habitat assessments and fish community sampling was completed on Site between 1991 and 2007 by Niblett Environmental Associates, Totten Simms Hubicki, Muncaster Environmental Planning, and Stantec (Stantec Consulting Ltd., 2017).

“No fish were captured during sampling events within the Site; however, it was concluded that most tributaries provide indirect fish habitat” (Stantec Consulting Ltd., 2017).

In 2014, Stantec also conducted a fish community inventory and no fish were captured or observed at that time. It was further concluded that the Rideau River tributary within the Study Area does not provide direct fish habitat due to the lack of fish, intermittent flow regimes, and absence of instream cover (i.e. large woody debris and vascular plants) (Stantec Consulting Ltd., 2017).

3.5 SPECIES AT RISK AND SPECIES OF CONSERVATION CONCERN

Background data was collected and reviewed to identify SAR and SCC with occurrence records within the Study Area. Publicly available databases (**Table 1**) were consulted to develop a list of SAR that have a record within a 1 km² or 10 km² grid (dependent on the database being consulted) encompassing the Project area. Due to natural changes and anthropogenic developments in the Project Study Area, the background review collected current records (i.e. ≤ 30 years) that occurred within the Study Area.

Table 2 provides a list of these species along with corresponding federal, provincial, SAR and/or SCC designations (i.e. S-Ranks). S-Ranks are a provincial status used by the NHIC to set protection priorities for rare species and is based on the number of occurrences in Ontario. The MNR tracks species with S1 to S3 (vulnerable to critically imperiled) designations and are therefore considered provincially rare and/or SCC.

Furthermore, species listed within **Table 2** were further evaluated based on their habitat preferences and likelihood of occurrence for the Study Area. The habitat screening was built on habitat requirements defined by the MNR (2000), background records, and air-photo interpretation in order to identify the presence of suitable habitat for SAR/SCC within the Study Area. The results of the screening are documented in **Appendix E – Species at Risk Screening**.

Table 2 Species at Risk and Species of Conservation Concern Wildlife Records



Scientific Name	Common Name	S-Rank ¹	SARA (Schedule 1)	ESA	Info. Source ²
Vascular Plants					
<i>Juglans cinerea</i>	Butternut	S3?	END	END	City of Ottawa
Insects					
<i>Danaus plexippus</i>	Monarch	S2N, S4B	SC	SC	OBA
Reptiles					
<i>Chelydra serpentina</i>	Snapping Turtle	S4	SC	SC	NHIC, ON
<i>Graptemys geographica</i>	Northern Map Turtle	S3	SC	SC	ON
Fish					
<i>Moxostoma valenciennesi</i>	Greater Redhorse	S3	---	---	NHIC
Birds					
<i>Asio flammeus</i>	Short-eared Owl	S2N,S4B	SC	SC	OBBA
<i>Chaetura pelagica</i>	Chimney Swift	S4B,S4N	THR	THR	OBBA
<i>Contopus virens</i>	Eastern Wood-Pewee	S4B	SC	SC	OBBA
<i>Riparia riparia</i>	Bank Swallow	S4B	THR	THR	OBBA
<i>Hirundo rustica</i>	Barn Swallow	S4B	THR	THR	OBBA
<i>Hylocichla mustelina</i>	Wood Thrush	S4B	THR	SC	OBBA
<i>Ammodramus savannarum</i>	Grasshopper Sparrow	S4B	SC	SC	OBBA
<i>Dolichonyx oryzivorus</i>	Bobolink	S4B	THR	THR	OBBA
<i>Sturnella magna</i>	Eastern Meadowlark	S4B	THR	THR	OBBA
Mammals					
<i>Myotis lucifugus</i>	Little Brown Myotis	S3	END	END	AMO
<i>Myotis leibii</i>	Eastern Small-footed Myotis	S2S3	END	END	AMO
<i>Myotis septentrionalis</i>	Northern Myotis	S3	END	END	AMO
<i>Perimyotis subflavus</i>	Tricolored Bat	S3?	END	END	AMO
<p>¹S-Rank is an indicator of commonness in the Province of Ontario. A scale between 1 and 5, with 5 being very common and 1 being the least common. ²Information sources include: NHIC = Natural Heritage Information Centre; OBBA = Ontario Breeding Bird Atlas; ON = Ontario Nature: Ontario Reptile and Amphibian Atlas; OBA = Toronto Entomologists' Association: Ontario Butterfly Atlas; AMO = Atlas of the Mammals of Ontario; City of Ottawa: MacPherson, 2018; --- denotes no information or not applicable.</p>					

4 METHODOLOGY

4.1 SCOPE OF WORK

Based on the background information of the Project's natural heritage features and wildlife occurrence records, ecological surveys outlined below were conducted to assess the impacts of the Project on the natural environment. These surveys follow industry standard protocols and are intended to establish baseline conditions. Such baseline conditions were then used to evaluate the potential for negative impacts, which may occur as a result of the Project development. Surveys were undertaken only within the subject property. If possible, natural features within the larger Study Area were evaluated from a distance or via air-photo interpretation. The locations of field surveys are shown in **Figure 5**.

NATURAL HERITAGE FEATURES

- Ecological Land Classification (ELC), including:
 - Vegetation survey
 - Woodland delineation
- Identification of potential SWH including:
 - Breeding bird surveys
 - Amphibian breeding surveys
 - Bat maternity roost surveys
 - General habitat assessment for SCC

SPECIES AT RISK

- Breeding bird surveys
- SAR bat habitat assessment (Eastern Small-footed Myotis, Little Brown Bat, Northern Myotis, Tricolored Bat)
- Butternut tree search
- Incidental SAR and SAR habitat observations



TREES

- Inventory of trees within the Study Area:
 - Distinctive tree assessment

INCIDENTAL WILDLIFE

- Visual and auditory observations of wildlife during all field studies

4.2 NATURAL HERITAGE FEATURES

4.2.1 VEGETATION COMMUNITIES

Vegetation communities within the Study Area were characterized and mapped using the ELC system for southern Ontario (Lee, et al., 1998). Vegetation communities were first delineated by air-photo interpretation and then verified while on-site.

The ELC protocol recommends that a vegetation community be a minimum of 0.5 ha in size before they are defined as a discrete community. Unique communities less than 0.5 ha or disturbed/planted vegetation were described to the community level only. In some instances, where vegetation is less than 0.5 ha, but appears relatively undisturbed and clearly fits within an ELC vegetation type, the more refined classification was used.

In 2007, the MNRF refined their original vegetation type codes to more fully encompass the vast range of natural and cultural communities across southern Ontario. Through this process many new codes have been added while some have changed slightly. These new ELC codes have been used for reporting purposes for the Project as they are more representative of the vegetation communities within the Study Area.

VEGETATION SURVEY

Vegetation was inventoried in conjunction with ELC surveys and a list of vascular plant species was compiled. In addition, this inventory was also used to screen for any SAR and/or provincially rare species not previously identified within the Study Area.

Scientific nomenclature, English colloquial names, and scientific binomials of plant species generally followed Newmaster et. al. (2005), with updates taken from published volumes of the Flora of North America Editorial Committee (2000 + accessed 2015) and Michigan Flora Online (2015).

4.2.2 WETLAND IDENTIFICATION AND MAPPING

The delineation of wetland features within the Study Area was conducted by using ELC to map wetland attributes and vegetation.



4.2.3 WOODLANDS

The remnant woodlands within the Study Area were assessed for significance following the updated guidelines outlined in the City of Ottawa Official Plan Amendment No. 179 [Section 2.4.4 of the Official Plan (City of Ottawa, 2003)].

1. *Any treed area meeting the definition of woodlands in the Forestry Act, R.S.O 1990, c.F.26 or forest in Ecological Land Classification for southern Ontario*
2. *In the rural area, meeting any one of the criteria in the Natural Heritage Reference Manual (MNR, 2010), as assessed in a subwatershed planning context and applied in accordance with Council-approved guidelines, where such guidelines exist*
3. *In the urban area, any area 0.8 hectares in size or larger, supporting woodland 60 years of age and older at the time of evaluation*

For the woodlands within this Study Area, criteria #1 and #3 will be used to determine significance. The ELC delineation will be used to determine the size of the woodland and historic aerial images will be used to estimate the age.

4.2.4 SIGNIFICANT WILDLIFE HABITAT

Breeding bird and amphibian breeding surveys were conducted to identify candidate and/or confirmed SWH within the Study Area. Results of the surveys will also provide a baseline assessment of the relative abundance of birds and amphibians within the area.

BREEDING BIRD SURVEY

Diurnal breeding bird surveys were conducted within the Study Area and followed methods outlined in the *Ontario Breeding Bird Atlas Guide for Participants* (Bird Studies Canada, 2001). Two surveys were completed during the bird breeding season on June 13 and June 28, 2019.

Each survey consisted of five-minute point counts to establish quantitative estimates of bird abundance in habitat types within the Study Area (**Figure 5**). Due to the small size of the natural communities within the Study Area, only a single point count location was established. To supplement the surveys, area searches of the habitat were completed using binoculars to observe species presence and breeding activity. Area searches involved noting all individual bird species and their corresponding breeding evidence while traversing the habitat on foot.

AMPHIBIAN BREEDING SURVEY

The SWH preliminary assessment identified the potential for candidate amphibian breeding habitat to occur within the Study Area. Therefore, amphibian breeding surveys were conducted and followed the *Marsh Monitoring Program - Participant's Handbook for Surveying Amphibians* (Bird Studies Canada, 2008). In accordance with the survey protocol, three different surveys were conducted between April 1st and June 30th, with at least two weeks between each visit. Surveys began at least one-half hour after sunset during evenings with a minimum night temperature of 5°C, 10°C, and 17°C for each of the three respective surveys. Survey points aligned with the wetland features within the Study Area (**Figure 5**). Due to the small size of the natural areas within the property parcel, only one survey station was established.

Each amphibian survey involved standing at a predetermined station for three (3) minutes and listened for amphibian calls. The calling activity of individuals estimated to be within 100 m of the observation point were documented. All individuals beyond 100 m were recorded as outside the count semi-circle. Calling activity was then ranked using one of the three abundance code categories:

Code 1: Number of individuals can be accurately counted

Code 2: Calls are distinguishable and some calls simultaneous, number of individuals can be reliably estimated

Code 3: Full chorus; calls continuous and overlapping, number of individuals cannot be estimated

In areas where candidate amphibian woodland habitat exists, vernal pools (if present) were visually examined for egg masses and amphibian larvae in conjunction with other field surveys. These searches occurred between May and June when amphibians were concentrated around suitable breeding habitat.

BAT MATERNITY COLONIES

The SWH preliminary assessment identified the potential for candidate bat maternity colony habitat to occur within the Study Area. Therefore, a snag/cavity tree count was conducted within the forested habitats and followed the methodology outlined in the *Bat Survey Methodology – Hibernacula and Maternity Roosts* informal publication distributed by the MNRF (MNRF, 2015).

The survey was intended to count snag/cavity trees to ascertain whether the habitat is candidate SWH for maternity colony habitat for several non-SAR and SAR bats, including; Little Brown Myotis (*Myotis lucifungus*), Eastern Small-footed Myotis (*Myotis leibii*), Northern Myotis (*Myotis septentrionalis*), and Tricolored Bat (*Perimyotis subflavus*). The four bat SAR are all listed as Endangered, federally and provincially.

A search for cavity trees was conducted during the leaf-on period in conjunction with the tree inventory. The maternity roosting period is throughout the months of June and July and trees suitable for maternity colonies consist of larger snags or trees displaying cavities with a DBH \geq 25 cm. Large cavity trees were noted when it met the following criteria:

- Tree exhibits cavities or crevices most often originating as cracks, scars, knot holes, or woodpecker cavities
- Tree contains a large DBH (\geq 25 cm)
- Tree contains large amounts of loose, peeling bark
- Cavity/crevice is high in cavity tree (\geq 10 m)
- Tree exhibits early stages of decay (decay class 1-3) (Watt, 1999)

To supplement the snag/cavity tree surveys, an acoustic survey for bats was conducted using a Wildlife Acoustic's Echo Meter Touch 2 Pro ultrasonic module. The survey consisted of listening for bat calls for ten minutes throughout the Study Area. The survey was conducted a half-hour after sunset when bats typically emerge from roosts to forage. Results of the acoustic survey was then used to identify the presence/absence and species of bats within the Survey Area.

HABITAT FOR SPECIES OF CONSERVATION CONCERN

Summarized below are the SCC with a likelihood of occurrence based on current records and the presence of suitable habitat within the Project Study Area (**Appendix E**). They include: **Eastern Wood-pewee, Wood Thrush, and Monarch.**

Wildlife surveys of breeding birds and vegetation inventory were used to identify the presence/absence of SCC within the Study Area. General habitat observations were also noted as it relates to SCC with potential to occur (**Table 2**) and their associated habitat requirements (**Appendix E**).

INCIDENTAL OBSERVATIONS OF SIGNIFICANT WILDLIFE HABITAT

Incidental observation of other candidate SWH were also undertaken during all site visits. Specifically, the presence of features that are not easily identifiable via aerial photography. This included; the presence of candidate reptile hibernacula, seeps/springs, turtle nesting areas, and stick nests. If required, species-specific surveys will be conducted following consultation with the MNRF and the City of Ottawa.

4.2.5 SPECIES AT RISK AND SPECIES AT RISK HABITAT

Summarized below are the SAR with a likelihood of occurrence based on current records and the presence of suitable habitat within the Project Study Area (**Appendix E**). They include: **Tricolored Bat, Little Brown Myotis, Northern Myotis, Eastern Small-footed Myotis, and Butternut.**

Such species will be evaluated during the wildlife field surveys. Methodologies to determine these species presence and abundance is described below. Incidental observations of SAR and SAR habitat will also be recorded.

SPECIES AT RISK BATS

The presence or absence of SAR bat habitat was evaluated by using methods described in **Section 4.2.4**. Subsequently, one round of acoustic detection was performed for the incidental documentation of SAR bats. As suitable habitat is present in the Study Area in the form of woodlands (for roosting) and open areas over water (for foraging), it is anticipated for bats to be present in the Study Area.



BUTTERNUT

A search for Butternut (*Juglans cinerea*) trees was included in the tree and vegetation inventories. The survey consisted of walking through the Study Area and identifying any Butternut specimens. The general health, DBH, and GPS coordinates of all Butternut trees encountered were recorded. If necessary, a Butternut Health Assessment (BHA) was completed to fully assess the condition of the tree.

INCIDENTAL SPECIES AT RISK AND SPECIES AT RISK HABITAT OBSERVATIONS

In addition to those species surveys noted above, incidental SAR and SAR habitat observations were noted during all site visits.

Should any SAR or SAR habitat be identified within or adjacent to the site during field surveys, appropriate measures will be proposed to reduce or eliminate the impact of the proposed development on the observed species or habitat. This may include further consultation with the MECP and/or additional species-specific surveys.



4.2.6 TREES

Following the City of Ottawa's *Tree Conservation Report Guidelines* (City of Ottawa, 2019), trees > 10 cm DBH were surveyed. Large stands of trees were assessed as a group based on species composition and density as per standard protocols. All Distinctive trees (≥ 50 cm DBH) were surveyed by an approved professional as outlined in the City guidelines. The survey for the Distinctive trees include the species, DBH, condition, height, and location.

4.2.7 INCIDENTAL WILDLIFE

A wildlife assessment within the property was completed through incidental observations while on site. Any incidental observations of wildlife as well as other wildlife evidence such as dens, tracks, and scat were documented by means of observational notes, photos, and UTM coordinates. Such observations were used to substantiate baseline conditions and gather conclusions on the overall ecological function of the Study Area.

4.3 AQUATIC ENVIRONMENT

4.3.1 HEADWATER DRAINAGE FEATURES ASSESSMENT

The HDF assessment was conducted for the *Environmental Impact Statement and Tree Conservation Report for the Riverside South Stormwater Management Pond 5* (Stantec Consulting Ltd., 2017) project. The HDF assessment used the approved methodology described in the *Evaluation, Classification, and Management of Headwater Drainage Features Guidelines* (Toronto and Region Conservation Authority and Credit Valley Conservation Authority, 2014).

5 RESULTS

The following sections outline the findings from the field surveys and characterize the existing conditions within the Study Area. Survey results are discussed below and illustrated in **Figure 5**, depending on survey context.

5.1 SITE INVESTIGATIONS

Field surveys conducted for the Project occurred between May and June 2019. Surveys were undertaken during suitable weather conditions and timing was based on the survey protocols being implemented. As required, resumes of key staff involved in the project have been included in **Appendix A**. A total of five site visits were made to assess for the ecological features and functions identified in the background records review. The dates, times, surveyor names, and weather conditions for all surveys are listed in **Table 3**.

Table 3 Field Survey Details (2019)

Date	Surveyor	Start Time	End Time	Weather Conditions	Survey Type
May 22	A.Orr and C.Burt	21:00	22:00	15°C, 0 wind (beaufort scale), 80% cloud cover, light drizzle	Site reconnaissance and Amphibian Visit 1
June 6	A.Orr	21:20	22:10	17°C, 0 wind (beaufort scale), 0% cloud cover, no precipitation	Amphibian Visit 2 and Bat Acoustics
June 13	A.Orr	07:45	09:00	17°C, 1 wind (beaufort scale), 75% cloud cover, no precipitation	Breeding Bird Visit 1
June 24	A.Orr and J. Trus	21:00	21:30	23°C, 3 wind (beaufort scale), 10% cloud cover, no precipitation	Amphibian Visit 3
June 28	A.Orr	06:50	10:00	21°C, 1 wind (beaufort scale), 0% cloud cover, no precipitation	Breeding Bird Visit 2; ELC; Tree Inventory; SAR habitat and incidentals

5.2 NATURAL HERITAGE FEATURES

5.2.1 VEGETATION COMMUNITIES

The ELC survey identified a total of four vegetation communities within the Study Area. Other communities included developed areas that consisted of either agricultural lands or areas currently undergoing development.

Due to the current SWM Pond 5 development within the property parcel, remnant vegetation communities consisted of forest, woodland, and meadow marsh. All vegetation communities surveyed within the Study Area are considered common within Ontario. **Table 4** outlines the communities documented during ELC surveys and summarizes the

abundant vegetation cover. The location, type, and boundaries of vegetation communities are delineated in **Figure 5**. Reference photos for the vegetation communities are included in **Appendix B**.

VEGETATION SURVEY

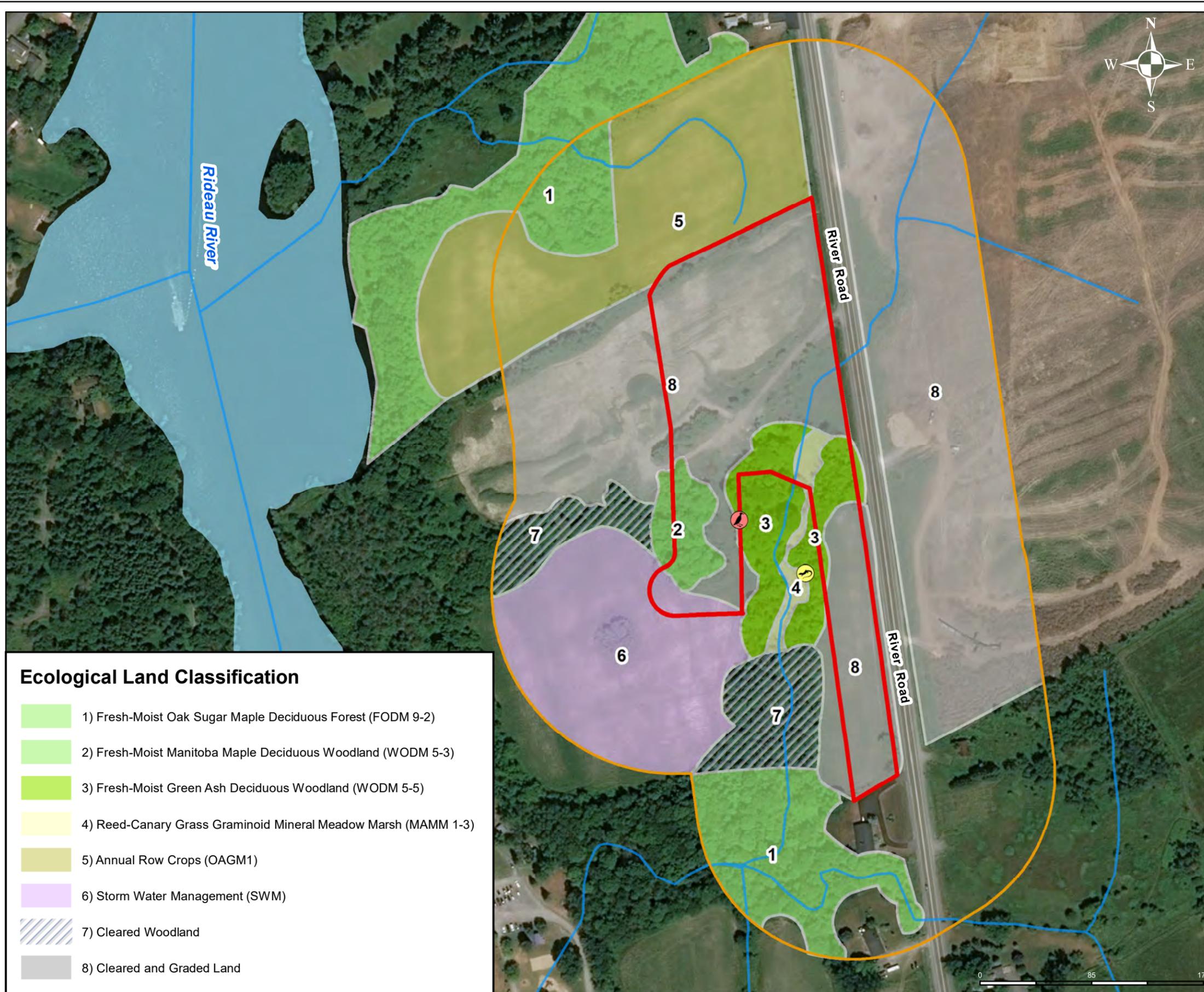
The vegetation survey identified 38 vegetation species within the Survey Area. Majority of the vascular plants inventoried are common throughout Ontario.

No provincial or federal SAR were recorded during the inventory. However, black ash (*Fraxinus nigra*) occurred within the woodland features. This species has an S-Rank of S3 and is listed as Threatened by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). It currently does not have any federal or provincial status under SARA or ESA.

The vascular plant species list is included in **Appendix C**.

Table 4 Ecological Land Classification Results

ELC Type	Total Area (ha)	Community Description
Deciduous Forest (FOD)		
FODM9-2 Fresh-Moist Oak-Maple Deciduous Forest Type	4.14	A portion of the community has been removed for development of the SWM Pond 5. The community occurs outside the Project footprint but is associated with the Rideau River tributary and contains unstable, highly-incised valley slopes. Bur oak, sugar maple, basswood, and black cherry are abundant in the canopy.
Deciduous Woodland (WOD)		
WODM5-3 Fresh-Moist Manitoba Maple Deciduous Woodland Type	0.36	A portion of this community has been removed for development of SWM Pond 5. What remains is an isolated woodland with a canopy of mature Manitoba maple [Invasive].
WODM5-5 Fresh-Moist Green Ash Deciduous Woodland Type	0.64	This community occurs along the Rideau River tributary and contains an abundant canopy of green ash and Manitoba maple. American elm occurs in the sub-canopy. The understorey is abundant with glossy buckthorn [Invasive], common buckthorn, and red raspberry. The ground layer was prevalent with virginia creeper, lady fern, garlic mustard [Invasive], and dame's rocket.
Meadow Marsh (MAM)		
MAMM1-3 Reed-canary Grass Graminoid Mineral Meadow Marsh Type	0.18	This feature is associated with the Rideau River tributary and is a representative riparian area. Reed-canary grass dominates the community with the presence of few standing snags. Water was present in the watercourse at time of survey.



Ecological Land Classification

- 1) Fresh-Moist Oak Sugar Maple Deciduous Forest (FODM 9-2)
- 2) Fresh-Moist Manitoba Maple Deciduous Woodland (WODM 5-3)
- 3) Fresh-Moist Green Ash Deciduous Woodland (WODM 5-5)
- 4) Reed-Canary Grass Graminoid Mineral Meadow Marsh (MAMM 1-3)
- 5) Annual Row Crops (OAGM1)
- 6) Storm Water Management (SWM)
- 7) Cleared Woodland
- 8) Cleared and Graded Land

Legend

- Project Footprint
- Study Area (120 m)
- Watercourse
- Amphibian Survey Station
- Breeding Bird Point Count Location



Client/Project Name:
Claridge Homes
760 River Road Subdivision Development

Title: **Ecological Land Classification and Survey Location**

Prepared By:

Project No: 191-06688-00	Drafter: AZ	Reviewer: CP
Scale: 1:3,000	Source: Bing Maps Aerial, ESRI World Topographic Map, LIO	
Coordinate System: NAD 1983 UTM Zone 18N		
Date: December 2019	Figure: 5	
© Queen's Printer for Ontario		

WETLANDS

The community of MAMM1-3 was identified and delineated within the Study Area. The meadow marsh community is associated with the Rideau River tributary within the Project footprint.

Provincially Significant Wetlands (PSW) are absent from the Study Area.



5.2.2 WOODLANDS

The forest (FODM9-2) and woodlands (WODM5-3 and WODM5-5) that occur within the Study Area all meet the woodland definition as per the Forestry Act, R.S.O 1990, c.F.26.

The Manitoba Maple Deciduous woodland (WODM5-3), referred to as “Area 1” on **Figure 6**, is 0.37 ha in size and does not meet the size criteria for significance.

The Green Ash Deciduous Woodland (WODM5-5), referred to as “Area 2” on **Figure 6** is 1.05 ha in size and does not meet the size criteria for significance. This woodland is bisected by Tributary 2 and the area represents a sum of both woodland polygons. However, this woodland community is an early successional Green Ash stand and was not present in the 1976 aerial photos (see **Figure 2**). Therefore this woodland does not meet the criteria for significance.

The other forest community (FODM9-2) located outside the Project footprint exceeds the 0.8 ha has portions of the woodland that are at least 60 years old (see **Figure 2**). Therefore, parts of this woodland may be considered significant as defined by the City of Ottawa Official Plan Amendment No. 179 [Section 2.4.4 of the Official Plan (City of Ottawa, 2003)].

Significant woodlands do not occur within the Project footprint, but may be present within 120 m of the proposed subdivision plan.

5.2.3 SIGNIFICANT WILDLIFE HABITAT

The MNRF outlines the criteria for areas to be considered SWH in the *Ecoregion 6E Criterion Schedule* (MNRF, 2015). The results of the field surveys intended to identify candidate and/or confirmed SWH are detailed below.

BREEDING BIRD SURVEYS

Two surveys were conducted to determine the presence and relative abundance of breeding birds within the Survey Area. The survey results are shown below in **Table 5**. A total of 15 bird species were recorded during the surveys. Birds observed either as occurring within suitable nesting habitat where singing males were present (representing Possible breeders); pairs of a species were observed in suitable nesting habitat (representing Probable breeders); and/or territorial behaviours were observed between birds in suitable nesting habitat (representing Probable breeders). No Confirmed breeders were observed within the Study Area during the two survey events.

No SAR or SCC were identified to occur within the Study Area. Based on results, SWH for breeding bird species is absent for the Study Area.

Table 5 Breeding Bird Survey Results

Scientific Name	Common Name	S-Rank ¹	Breeding Status	Observation
<i>Spinus tristis</i>	American Goldfinch	S5B	Probable	Pair observed in suitable nesting habitat
<i>Setophaga ruticilla</i>	American Redstart	S5B	Probable	Pair observed in suitable nesting habitat
<i>Poecile atricapillus</i>	Black-capped Chickadee	S5	Possible	Singing male present in suitable nesting habitat

Scientific Name	Common Name	S-Rank ¹	Breeding Status	Observation
<i>Bombycilla cedrorum</i>	Cedar Waxwing	S5B	Probable	Pair observed in suitable nesting habitat
<i>Geothlypis trichas</i>	Common Yellowthroat	S5B	Probable	Pair observed in suitable nesting habitat
<i>Picoides pubescens</i>	Downy Woodpecker	S5	Probable	Pair observed in suitable nesting habitat
<i>Tyrannus tyrannus</i>	Eastern Kingbird	S4B	Probable	Pair observed in suitable nesting habitat
<i>Sayornis phoebe</i>	Eastern Phoebe	S5B	Possible	Singing male in suitable breeding habitat
<i>Sturnus vulgaris</i>	European Starling	SNA	Possible	Singing male in suitable breeding habitat
<i>Dumetella carolinensis</i>	Gray Catbird	S4B	Possible	Singing male in suitable breeding habitat
<i>Anas platyrhynchos</i>	Mallard	S5	Possible	Species observed in suitable nesting habitat
<i>Vireo olivaceus</i>	Red-eyed Vireo	S5B	Possible	Singing male in suitable breeding habitat
<i>Melospiza melodia</i>	Song Sparrow	S5B	Probable	Territorial behaviour
<i>Sitta carolinensis</i>	White-breasted Nuthatch	S5	Possible	Singing male in suitable breeding habitat
<i>Setophaga petechia</i>	Yellow Warbler	S5B	Possible	Singing male in suitable breeding habitat

¹S-Rank is an indicator of commonness in the Province of Ontario. A scale between 1 and 5, with 5 being very common and 1 being the least common.

AMPHIBIAN BREEDING SURVEYS

In accordance with the *Ecoregion 6E Criterion Schedule* (MNRF, 2015), amphibian breeding surveys were completed to determine the presence of Amphibian Breeding Habitat for woodlands and wetlands within the Survey Area. Wetland Amphibian Breeding Surveys were conducted in a meadow marsh adjacent to a Rideau River tributary containing water. No vernal pools were identified to occur within the forest communities and therefore, amphibian woodland breeding habitat is considered absent from the Study Area.

A total of three amphibian species were observed within the Study Area. A full chorus of Gray Treefrog (*Hyla versicolor*) were heard during the second visit. The remainder survey dates only contained individuals of American Toad (*Pseudacris crucifer*) and Gray Treefrog. A full chorus of Spring Peeper (*Anaxyrus americanus*) was noted outside 100 m of the survey point in the adjacent property. Table 6 summarizes the amphibian survey results.

Based on the results, significant habitat for amphibian breeding (wetland) is absent from the Study Area.

Table 6 Amphibian Breeding Survey Results

Scientific Name	Common Name	# of Observations ¹	S-Rank ²	Comments
<i>Pseudacris crucifer</i>	American Toad	Code 1: 1 individual	S5	Outside of 100 metres and Survey Area; on adjacent property
<i>Hyla versicolor</i>	Gray Treefrog	Code 3: Full Chorus	S5	Full chorus heard on Visit 2.
<i>Anaxyrus americanus</i>	Spring Peeper	---	S5	Outside of 100 metres and Survey Area; on adjacent property

¹Code 1: Calls not simultaneous, number of individuals can be accurately counted; Code 2: Some calls simultaneous, number of individuals can be reliably estimated; Code 3: Calls continuous and overlapping, number of individuals cannot be estimated. ²S-Rank is an indicator of commonness in the Province of Ontario. A scale between 1 and 5, with 5 being very common and 1 being the least common.

BAT MATERNITY COLONY SURVEY

Only a few suitable cavity trees were present in the woodlands of WODM5-3 and WODM5-5. However, as the survey was limited to the leaf-on period, cavities high up in the canopy may have been missed due to visual obstructions.

The acoustic surveys detected a total of four species. They included; Hoary Bat (*Lasiurus cinereus*), Eastern Red Bat (*Lasiurus borealis*), Tricolored Bat, and unknown *Myotis* species. The Tricolored Bat and unknown *Myotis* species are both listed as Endangered, federally and provincially. **Due to these results, it is possible for the woodlands in the Study Area to contain Bat Maternity Colony habitat for SAR.**

HABITAT FOR SPECIES OF CONSERVATION CONCERN

Potential habitat for three SCC (**Appendix E**) were confirmed during the ELC assessment. Results of suitable habitat and the presence/absence of SCC within the Study Area include:

- **Eastern Wood-pewee:** Fragmented deciduous forests/woodlands are present in the Study Area. This species was not detected during the breeding bird surveys.
- **Wood Thrush:** Deciduous forests are present within the Study Area but do not occur within the Project footprint. This species was not detected during the breeding bird surveys.
- **Monarch:** Milkweed plants were observed within the Study Area and Project footprint. However, there was no direct observations of Monarch caterpillars and/or butterflies at time of field surveys.

There is habitat for SCC within the Study Area. However, no SCC individuals were observed during field survey events. No impact is anticipated.

INCIDENTAL OBSERVATIONS OF SIGNIFICANT WILDLIFE HABITAT

No other observations of candidate SWH were identified to occur within the Study Area based on field survey results.

5.2.4 SPECIES AT RISK AND SPECIES AT RISK HABITAT

Potential habitat for five SAR (**Appendix E**) were confirmed during the ELC assessment. Results of suitable habitat and the presence/absence of SAR within the Study Area include:

- **SAR bats** (Eastern Small-footed Myotis, Little Brown Myotis, Northern Myotis, and Tricolored Bat): Forest/woodlands with cavity trees are present in the Study Area and Project footprint. Tricolored Bat and an unknown Myotis species were detected during the acoustic monitoring event.

- **Butternut:** Moist, riparian forested areas are present in the Study Area. No butternut trees were observed at the time of field surveys.

Two SAR were detected within the Study Area during the bat acoustic surveys and include: Tricolored Bat and an unknown Myotis species. Both species are Endangered under the SARA (2002) and the ESA (2007). **No other SAR were identified to occur.**



5.3 TREES

As per the TCR Guidelines (City of Ottawa, 2019), large stands of trees were inventoried and assessed as a group. Two stands were identified in the Study Area and are consistent with vegetation community boundaries (see **Figure 6**). **Appendix D** provides a more detailed summary of tree species and abundance within the Survey Area.

The group of trees within Area 1 (Manitoba Maple Woodland) consisted of three species and approximately 34 individuals within the DBH size class of 10 cm – 50 cm. The overall health of the trees was in fair condition. The green ash (*Fraxinus pennsylvanica*) individuals were observed as dead.

The group of trees within Area 2 (Green Ash Woodland) consisted of seven species and approximately 139 individuals within the DBH size class of 10 cm – 50 cm. The overall health of the trees was generally in good condition. Approximately 10 green ash individuals were observed as dead.

An inventory of Distinctive trees (i.e. ≥ 50 cm DBH) throughout the Survey Area recorded 11 trees, comprised of three species. Manitoba maple (*Acer negundo*) was the most abundant Distinctive tree, followed by Freeman’s maple (*Acer xfreemanii*), and green ash. All trees assessed were in good condition.

The locations of the Distinctive trees are shown in **Figure 1**. Detailed tree inventory lists are included in **Appendix D**.

5.4 INCIDENTAL WILDLIFE

Incidental wildlife species and general wildlife observations were documented during the field survey program and included; eastern chipmunk, black squirrel, wild turkey, and coyote tracks.

Stantec (2017) also noted the presence of white-tailed deer, red squirrel, river otter scat, and several mammal burrows. Fox dens were also noted with one individual red fox observed within the greater Study Area.

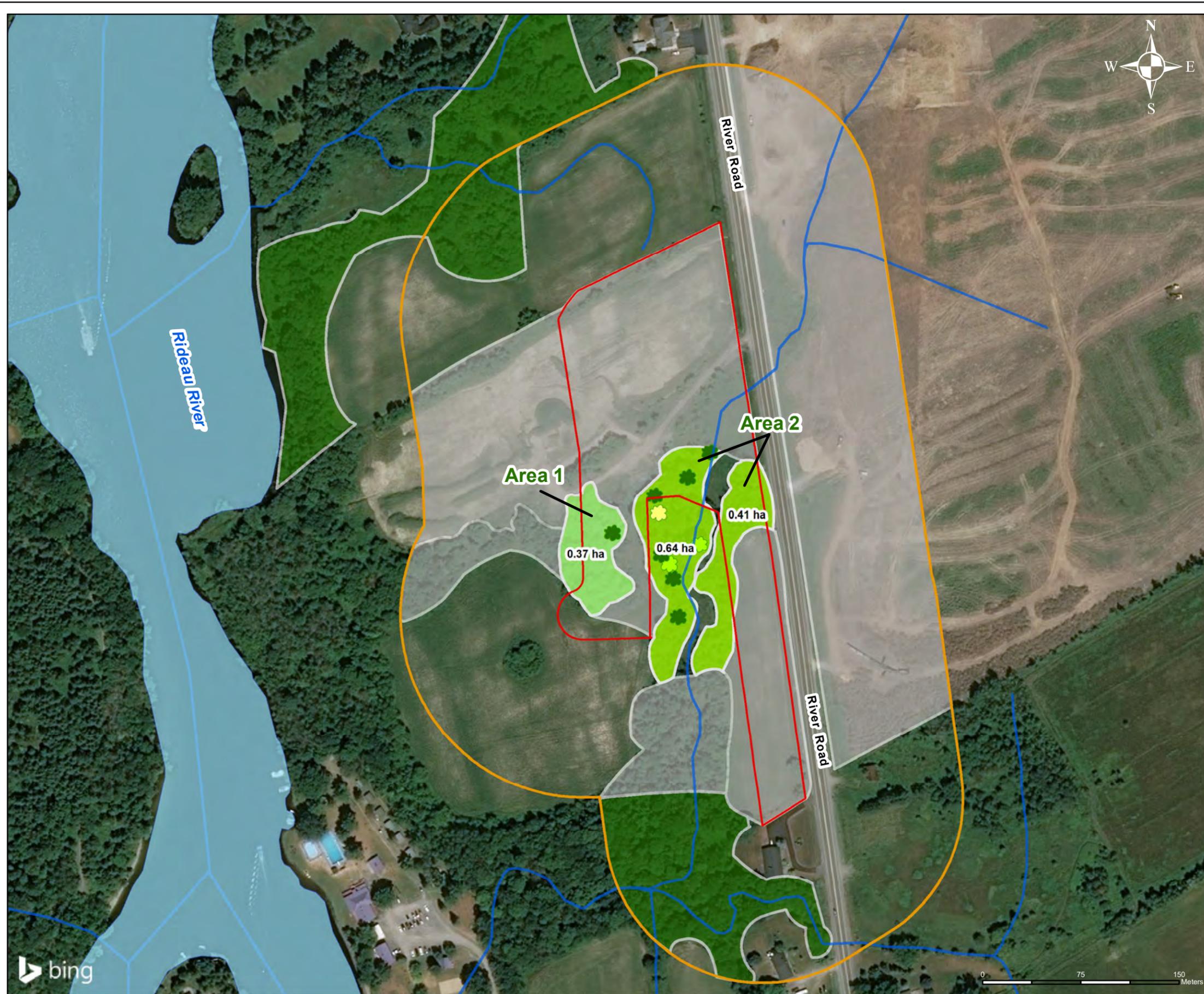
All species observed are common in Ontario and the City of Ottawa and appeared as residents to the Study Area.

5.5 AQUATIC ENVIRONMENT

5.5.1 HEADWATER DRAINAGE FEATURES ASSESSMENT

As described in **Section 3.3.2**, only Reach 2B is located within the Project footprint and a management recommendation of ‘Mitigation’ was proposed in the HDF assessment Stantec (Stantec Consulting Ltd., 2017). Based on this recommendation, and approved by RVCA, approximately 98 m of this tributary reach has since been realigned to accommodate development. The realigned tributary currently flows south in a roadside ditch adjacent to River Road and enters the recently constructed 600 millimetres (mm) concrete culvert. The tributary flows west through the culvert for 49 metres (m), before exiting to the existing Reach 2A. As recommended by the RVCA, the culvert outflow has been intentionally perched to create a pool enhancing habitat for breeding amphibians.

Additionally, approximately 20 m of Reach 2A has also been realigned into a 600 mm CSP culvert to accommodate the installation of a construction access road. This section is downstream and outside of the Project footprint. The previous and current tributary alignments and re-alignments are illustrated in **Figure 4**.



Legend

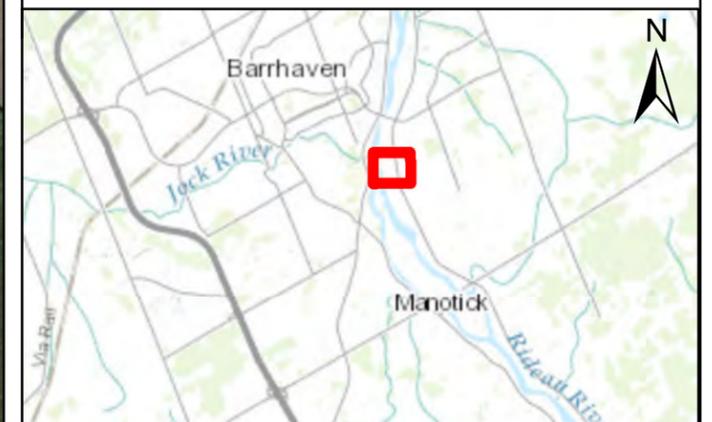
- Project Footprint
- Study Area (120 m)
- Waterbodies
- Watercourse

Woodlands

- Area 1: Manitoba Maple Deciduous Woodland
- Area 2: Green Ash Deciduous Woodland
- Oak-Maple Deciduous Forest
- Cleared

Distinctive Trees

- Freeman's Maple
- Green Ash
- Manitoba Maple



Client/Project Name:
Claridge Homes
760 River Road Subdivision Development

Title: **Tree Inventory**

Prepared By:

Project No: 191-06688-00	Drafter: AZ	Reviewer: CP
Scale: 1:3,000	Source: Bing Maps Aerial, ESRI World Topographic Map, LIO	
Coordinate System: NAD 1983 UTM Zone 18N		

Date: December 2019
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Figure: 6



6 DESCRIPTION OF THE PROPOSED PROJECT

Claridge Homes is proposing to develop a residential subdivision intended for the construction of single family homes within the subject property of 760 River Road. The total site area is approximately 3.9 ha. The draft site plan illustrating the proposed layout of the development is shown on **Figure 7**. It is anticipated that individual lots currently shown in **Figure 7** Proposed Site Plan will be removed/altered to accommodate the watercourse buffer of 30 m.

6.1 CONSTRUCTION ACTIVITIES

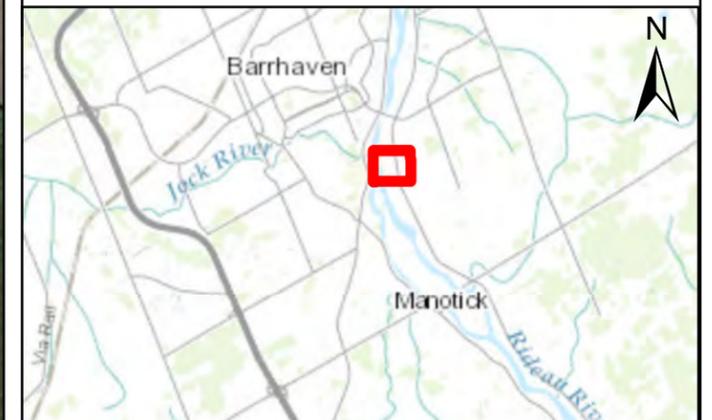
It is assumed the development of this property will include the following major project components:

- Surveying and staking out the development
- Clearing, excavation, and grading property to accommodate construction
- Installation of storm water drainage network and related infrastructure;
- Excavation to accommodate underground utilities including water, sewer, gas, and hydro
- Construction of buildings, driveways, and access roads
- Paving parking areas and access roads
- Landscaping and fencing
- On-going usage and maintenance



Legend

-  Culvert
-  Removed Watercourse
-  Realigned Watercourse
-  Proposed Site Plan
-  Project Footprint
-  Watercourse Buffer (30 m)
-  Watercourse
-  Study Area (120 m)



Client/Project Name:
Claridge Homes
760 River Road Subdivision Development

Title: **Site Plan**

Prepared By: 

Project No: 191-06688-00	Drafter: AZ	Reviewer: CP
Scale: 1:3,000	Source: Bing Maps Aerial, ESRI World Topographic Map, LIO	
Coordinate System: NAD 1983 UTM Zone 18N		
Date: December 2019		
© Queen's Printer for Ontario	Figure: 7	

7 IMPACT ASSESSMENT AND MITIGATION

The following sections describe the anticipated environmental impacts associated with the proposed development and the general measures that should be considered to mitigate the associated impacts. The impact assessment and associated mitigation considers both construction-related impacts and impacts associated with the occupation of the development. The anticipated impacts are illustrated in **Figure 8**.

7.1 AQUATIC ENVIRONMENT

The proposed subdivision development is located adjacent Tributary to Rideau River #2 and is located within the RVCA's jurisdiction and will require consultation and authorization from the RVCA under the *Conservation Authorities Act*, Section 28, O. Reg. 174/06 to develop within the regulated limits. The proposed development will accommodate a 30 m average setback around the tributary and it is anticipated that the watercourse feature will not be further diverted or enclosed, aside from previous realignment of Reach 2B.

The proposed development will have an indirect impact on the Tributary to Rideau River #2. As discussed in **Section 5.5**, the HDF assessment identified the following Reaches and their associated management recommendations that occur within the Project footprint:

HDF 2 – Tributary to Rideau River #2

- Reach 2A – Protection (generally retained; approximately 20 m removed following RVCA approval)
- Reach 2B – Mitigation (approximately 98 m removed following RVCA approval)

The realignment of Reach 2B achieves the 'mitigation' recommendation through the conveyance of flows into more natural and viable downstream reaches. It is expected that the loss of 20m of HDF with the 'protection' recommendation will be offset through the creation of a deeper pool at the base of the parched culvert.

Generally, it is anticipated that construction activities will have an indirect impact on the aquatic environment and indirect fish habitat associated with the Rideau River tributary immediately adjacent to the Project footprint. Indirect impacts associated with the proposed development and associated construction activities may include the following:

- Overland transport of sediment into the tributary and associated habitats resulting from construction activities
- Potential impacts on the tributary and other adjacent habitats resulting from spills and other contaminants
- Sedimentation and erosion impacts resulting from potential dewatering activities that may be required during construction
- Transport of sediment and other pollutants into the tributary from the proposed development
- Increased amount and rate of storm water runoff from the impermeable surfaces of the proposed development

PROPOSED MITIGATION MEASURES

The following general mitigation measures are recommended to address impacts on the aquatic environment adjacent to the development area:

- ✓ Light-duty silt fencing (OPSD 219.110) and/or other equivalent erosion and sediment control measures should be installed round the perimeter of the work area to clearly demarcate the development area and

prevent erosion and sedimentation into adjacent habitats. Erosion and sediment control measures should be monitored regularly to ensure they are functioning properly and if issues are identified should be dealt with promptly

- ✓ Heavy duty silt fencing (OPSD 219.130) and/or other equivalent erosion and sediment control measures should be installed adjacent to the tributary and associated wetland habitats to clearly demarcate the development area and prevent erosion and sedimentation into adjacent habitats. Erosion and sediment control measures should be monitored regularly to ensure they are functioning properly and if issues are identified should be dealt with promptly
- ✓ Stockpiling of excavated material should not occur outside the delineated work area. If stockpiling is to occur outside of this area, silt fencing should be used to contain any spoil piles to prevent sedimentation into adjacent areas
- ✓ A spill response plan should be developed and implemented as required
- ✓ Avoid the use of heavy equipment in the wetland and watercourse during the winter when fish, amphibians and reptiles may be hibernating
- ✓ It is recommended that dewatering ponds (OPSD219.240) or similar standards should be implemented to avoid sedimentation and erosion in adjacent areas. If dewatering requires more than 50,000 L of water to be pumped per day, appropriate permits must be obtained from the Ministry of the Environment, Conservation and Parks (MECP) prior to the dewatering.

With the successful implementation of the mitigation measures outlined above, impacts from the proposed development on the Aquatic Environment and indirect fish habitat are expected to be negligible.



Legend

- Proposed Site Plan
- ▭ Project Footprint
- ▭ Study Area (120 m)
- - - Watercourse Setback (30 m)
- ⊕ Culvert
- Watercourse
- Realigned Watercourse
- ⊕ Stormwater Management Pond (under construction)
- ▭ Regulation Limit (RVCA Hazards) - Conflict (0.13 ha)
- ⊕ Retainable Distinctive Tree
- ⊕ Removable Manitoba Maple
- ▭ Removed Woodland [WODM 5-3] (0.27 ha)
- ▭ Removed Woodland [WODM 5-5] (0.40 ha)



Client/Project Name:
Claridge Homes
760 River Road Subdivision Development

Title:
Environmental Impacts

Prepared By:


Project No: 191-06688-00	Drafter: AZ	Reviewer: CP
Scale: 1:3,000	Source: Bing Maps Aerial, ESRI World Topographic Map, LIO, RVCA hazard public service - regulation limit	
Coordinate System: NAD 1983 UTM Zone 18N		
Date: December 2019	Figure: 8	
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7.2 NATURAL HERITAGE FEATURES

7.2.1 VEGETATION COMMUNITIES

It is anticipated to accommodate the construction of single family homes, including driveways and access roads, portions of the Study Area and associated vegetation communities will be cleared and graded. The impacts associated with this clearing will include:

- The permanent loss of or disturbance to native vegetation is approximately 0.42 ha of native vegetation (see **Figure 8**). This disturbance is directly associated with the clearing required to accommodate the Project. The area of vegetation planned for removal is separated below per ELC community:
 - 0.27 ha of Fresh-Moist Manitoba Maple [invasive] Deciduous Woodland (WODM5-3)
 - 0.40 ha of Fresh-Moist Green Ash Deciduous Woodland (WODM5-5)
- Accidental damage or loss of trees and other vegetation features because of site alteration or construction activities
- The permanent loss of habitat for wildlife dependent upon the terrestrial communities
- Changes in natural drainage
- Decreased biodiversity, reduced number of species, or abundance of species
- Erosion and sedimentation into adjacent vegetation communities
- Permanent loss of native vegetation due to increased potential for non-native and invasive vegetation species after development

The magnitude of these impacts is lessened by the presence of invasive species throughout the subject property. This includes the Manitoba Maple which dominates one of the woodland communities and found generally throughout the site. Other invasive species found in abundance throughout the site included; garlic mustard and glossy buckthorn.

PROPOSED MITIGATION MEASURES – CONSTRUCTION IMPLEMENTATION

The following general mitigation measures are recommended to address impacts on the terrestrial environment adjacent to the development area:

- ✓ Orange snow fencing or other suitable security fencing should be used to delineate the construction limits from the adjacent habitat. This will prevent encroachment of construction activities into the adjacent natural features. This fencing should be monitored regularly to ensure it is functioning properly. Any deviancy in the fencing should be dealt with promptly
- ✓ Erosion and sediment control plan should be implemented to prevent sedimentation outside of work areas
- ✓ Landscaping plans should consider use of appropriate native species to offset the loss of species and biodiversity from vegetation removals
- ✓ Machinery will arrive on site in a clean condition and will be free of fluid leaks, invasive species, and noxious weeds
- ✓ All excess construction material will be removed from site and the area restored with seeding of native species upon project completion as required
- ✓ Riparian vegetation within 30 m of the Rideau River tributary should be preserved. If removal of vegetation cannot be avoided during construction, this area should be restored and revegetated with suitable native seeding mix.

PROPOSED MITIGATION MEASURES - AFTER CONSTRUCTION

- ✓ Installation of garbage bins in public spaces is recommended to limit trash habitats adjacent to the development area
- ✓ 'No Littering' signage is recommended around the property to discourage littering

With the successful implementation of the mitigation measures outlined above, a moderate decrease in low-quality native terrestrial vegetation is anticipated.



7.2.2 WOODLANDS

The woodlands within the Project footprint were deemed not significant based on the City of Ottawa's guidelines. However, it is anticipated that site clearing for construction of the residential dwellings, driveways, and access roads will still result in negative impacts to the woodlands within the proposed Project footprint. The impacts include:

- The permanent loss of, or disturbance to, approximately 0.42 ha of woodlands within the proposed development area, including;
 - 0.27 ha of Manitoba Maple [invasive] Woodland (WODM5-3)
 - 0.40 ha of Green Ash Deciduous Woodland (WODM5-5)
- Decreased biodiversity, reduced species abundance, and reduced urban canopy
- The permanent loss of habitat for wildlife dependent upon these woodlands
- Changes in natural drainage
- Habitat fragmentation

PROPOSED MITIGATION MEASURES – PLANNING AND DESIGN STAGE

The following general mitigation measures are recommended to address impacts on the woodlands within the proposed development area:

- ✓ Tree retention should be prioritized where possible along the work areas for the proposed driveways and access roads
- ✓ Landscaping plans for areas adjacent to access roads should consider use of appropriate native species to offset loss of species and biodiversity from vegetation removals.

With the successful implementation of the mitigation measures outlined above, it is anticipated there will be a minor permanent loss of woodlands within the Study Area. Tree-specific mitigation measures are described below in Section 7.2.10.

7.2.3 SIGNIFICANT WILDLIFE HABITAT

No direct or indirect impacts to SWH are anticipated as a result from the proposed development as no confirmed SWH was identified to occur within the Study Area.

7.2.4 BREEDING BIRDS

It is expected that the removal and disturbance to woodland habitats within the proposed development area will result in loss of potential nesting and foraging habitat for birds. The following direct and indirect impacts on breeding birds are a possible result of the proposed development:

- The permanent loss of nesting and foraging habitat will likely result from the clearing of vegetation within the property
- Potential physical harm to birds or birds’ nests during clearing and construction activities
- Reduced diversity and abundance of a bird species within the area
- The increased potential for fatal bird collisions associated with building windows following construction

PROPOSED MITIGATION MEASURES – PLANNING AND DESIGN STAGE

- ✓ “Bird-friendly” building design principals should be considered in the design of the development. The following specific mitigation is recommended where applicable:
 - General building design should incorporate the *Bird-friendly Building Design* standards where possible (Canadian Standards Association, 2019).

PROPOSED MITIGATION MEASURES – CONSTRUCTION IMPLEMENTATION

The following mitigation measures are intended to address potential impacts to breeding birds resulting from the proposed development:

- ✓ Clearing of vegetation should be avoided during the breeding bird season, between April 1st and August 31st. Should any clearing be required during the breeding bird season, nest searches conducted by a qualified person must be completed 48 hours prior to clearing activities. If nests are found, an appropriate setback will be established by the qualified professional. No work will be permitted within this setback in accordance with the federal MBCA, 1994
- ✓ A qualified bird rehabilitation centre should be contacted if any birds are injured or found injured during construction activity. Injured birds should be transported to a qualified care facility (i.e. *Ottawa Valley Wild Bird Care Centre*)
- ✓ The construction area should be pre-stressed prior to any vegetation clearing within the proposed development area
- ✓ Other mitigation measures outlined in the *Protocol for Wildlife Protection during Construction* (City of Ottawa, 2015) should be considered prior to construction of the proposed development

With the successful implementation of the mitigation measures outlined above, it is anticipated that there will be negligible impacts to breeding bird populations within the Study Area.

7.2.5 AMPHIBIANS

The proposed development is expected to have a negligible impact on amphibians within the Study Area. The following impacts on amphibians is a possible result from the proposed development:

- Potential physical harm to amphibians during clearing and construction activities
- Potential harm to amphibians resulting from sediments and pollutants transported into the adjacent wetland habitat associated with the Rideau River tributary from the proposed development
- Negligible loss of woodland amphibian habitat

PROPOSED MITIGATION MEASURES – CONSTRUCTION IMPLEMENTATION

- ✓ Silt fencing should be installed around the perimeter of the project area prior to site activities as part of erosion and sediment control measures, to prevent amphibians and other wildlife from entering the site. Fencing should be maintained throughout the life cycle (until land is permanently stabilized) of the project and repaired if damaged by machinery

- ✓ Avoid the use of heavy equipment in wetlands and watercourses during the winter as amphibians and reptiles may be hibernating
- ✓ Other mitigation measures outlined in the *Protocol for Wildlife Protection during Construction* should be considered prior to construction of the proposed development (City of Ottawa, 2015).

Furthermore, the culvert for the realigned watercourse has been perched to create a pond at the culvert outlet to enhance amphibian breeding habitat within the Study Area. With the successful implementation of the mitigation measures outlined above, the proposed development is not anticipated to negatively affect breeding amphibians within the Study Area.

7.2.6 BAT MATERNITY ROOST HABITAT

It is anticipated that the proposed development will have negligible impacts to bat maternity roost habitat as the proposed development may remove candidate cavity trees. Additionally, light emitting from the residential dwellings and proposed streets will likely attract insects and provide foraging opportunity for bats. The following impacts on bat maternity roost habitat are anticipated as a result of the Project:

- Permanent loss of candidate roost trees within woodland habitats due to vegetation removals
- Accidental displacement, injury, or death of bats which may be using woodlands as temporary roosting habitat during roosting period

PROPOSED MITIGATION MEASURES – CONSTRUCTION IMPLEMENTATION

- ✓ Clearing of vegetation should be avoided during the general active and maternity roosting periods for bats (May 1st to October 15th)
- ✓ Installation of approximately four large bat boxes, placed on two poles; placed in appropriate open areas, adjacent to the forested areas in the northern and southern boundaries of the property to enhance potential roosting habitat for resident bats

With the successful implementation of the mitigation measures outlined above, it is anticipated that the proposed development will result in a negligible impact to bats and bat habitat within the Study Area.

7.2.7 HABITAT FOR SPECIES OF CONSERVATION CONCERN

No SCC were observed within the Study Area during field surveys. Potential habitat has been identified for: Eastern Wood-pewee, Wood Thrush, and Monarch.

- Site clearing and construction activities have the potential to disturb Eastern Wood-pewee and Wood Thrush
- Indirect impacts of site clearing and construction activities have potential to disturb Monarch. Rare occurrences of Milkweed plants have been identified within the Study Area, which is sole food source of the larval (caterpillar) stage. If Milkweed is removed during site clearing, there is potential loss of individual Monarch, eggs, larvae, or pupae. However, as meadow habitats are absent from the Study Area and only rare amounts of the Milkweed plant was observed, it is anticipated that the Project will result in a negligible impact to Monarchs.

PROPOSED MITIGATION MEASURES – CONSTRUCTION IMPLEMENTATION

- ✓ General mitigation for breeding birds, including Eastern Wood-pewee and Wood Thrush, is described in **Section 7.2.4.**
- ✓ General mitigation for Monarch should follow vegetation removal mitigation is described in **Section 7.2.1**

With the successful implementation of the mitigation measures outlined above, it is anticipated that there will be negligible impacts to potential habitat of SCC.

7.2.8 SPECIES AT RISK

Two bat SAR (i.e. Tricolored Bat and unknown *Myotis* species) were observed within the Study Area at the time of field surveys and therefore have potential to be impacted by the proposed construction activities. The proposed residential dwellings and access roads will remove candidate roost habitat within the woodlands WODM5-3 and WODM5-5. Potential impacts on SAR bats impacts include;

- Permanent loss of potential roost trees within the woodland habitats from vegetation removals. However, given the proximity of higher quality mature forest communities associated with the Rideau River corridor, and the foraging potential over the Rideau River, the habitat loss is expected to be non-limiting and will have negligible impact on overall bat habitat availability.
- Accidental displacement, injury, or death of bats which may be using woodlands as either bat maternity colony roosts and/or general roosting.

PROPOSED MITIGATION MEASURES – CONSTRUCTION IMPLEMENTATION

- ✓ Clearing of vegetation should be avoided during the general active and maternity roosting periods for bats (May 1st to October 15th)
- ✓ Installation of bat boxes as per the recommendations in **Section 7.2.6**

With the successful implementation of the mitigation measures outlined above, it is anticipated that the proposed development will result in a negligible impact to SAR bats and SAR bat habitat within the Study Area.

7.2.9 WILDLIFE

The proposed development is expected to have negative impact on local wildlife due to the general loss of natural habitat and direct impacts related to construction activities. Potential impacts to wildlife resulting from the proposed development include the following:

- Displacement, injury, or death resulting from contact with heavy equipment during clearing and grading activities
- Loss of general natural habitat suitable for the life processes of common urban and rural wildlife
- Disturbance to wildlife resulting from noise associated with construction activities, particularly during breeding periods
- Outdoor lighting may result in disturbance to wildlife within woodland habitats
- Conflict between wildlife and humans following development, including mortality from vehicles

PROPOSED MITIGATION MEASURES – CONSTRUCTION IMPLEMENTATION

The best practices outlined in the *Protocol for Wildlife Protection during Construction* (City of Ottawa, 2015) should be followed during all construction activities associated with the development. The following measures are consistent with the protocol:

- ✓ Pre-stress the area on a regular basis leading up to construction to encourage wildlife to leave the area before construction starts. Other recommendations for pre-stressing are outlined in the *Protocol for Wildlife Protection During Construction* (City of Ottawa, 2015)

- ✓ Orange snow fencing should be installed around the perimeter of the work area to clearly demarcate the development area and prevent wildlife from entering the construction zone. Fencing should be monitored regularly to ensure they are functioning properly and if issues are identified should be dealt with promptly
- ✓ Perimeter fencing should not prevent wildlife from leaving the site during clearing activities by clearing the area prior to installing the fence
- ✓ Wildlife located within the construction area will be relocated to an area outside of the development into an area of appropriate habitat by a qualified professional, as necessary
- ✓ Avoid vegetation clearing during sensitive times of year for local wildlife (e.g. spring and early summer)
- ✓ Construction crews working on site should be educated on local wildlife and take appropriate measures for avoiding wildlife
- ✓ A qualified wildlife rehabilitation centre should be contacted if any animals are injured or found injured during construction. Injured animals should be transported to an appropriate wildlife rehabilitation, such as the Rideau Valley Wildlife Sanctuary

With the mitigation measures outlined above, it is anticipated that the proposed development will result in a negligible impact to wildlife within the Study Area.



7.2.10 TREES

The proposed development of single-family residential dwellings and proposed streets will require tree clearing and grading within the Project footprint. It is assumed an area of 2 metres on either side of the road will be used for machinery and equipment access and work areas. It is anticipated that trees within the proposed Project footprint will require removals for site grading and construction activities.

The proposed development is expected to have an impact on overall tree cover within the Study Area. Eleven Distinctive trees were identified during field surveys and it is anticipated that four invasive Manitoba Maple trees will be subject to removal for the development of the Project.

Trees outside of the construction footprint and have sufficient setback from the development footprint are recommended to be preserved. However, these trees would require protection measures due to their proximity to construction activities.

The trees that will require removal or protection to accommodate the proposed development are shown in **Figure 8**. The trees likely requiring removal have been identified in the inventory table in **Appendix D**. The following recommendations are based on standard best management practices.

PROPOSED MITIGATION MEASURES – PLANNING AND DESIGN STAGE

- ✓ The City of Ottawa's 2015-2018 Strategic Plan (City of Ottawa, 2015) recommends that a 2:1 ratio (or greater) between trees planted and trees removed annually should be followed where possible. Furthermore, the Official Plan (City of Ottawa, 2003) policies 2.4.5 (7) for Green Space and policies 2.7.2 for Protection of Vegetation Cover recommend reaching the City's target of 30% tree cover for the entire City.
- ✓ The landscape plan should include tree planting recommendations consistent with the City of Ottawa's target for increased canopy cover to the extent possible within the property.
- ✓ Landscaping plans for areas adjacent to driveway should consider use of appropriate native species to offset loss of species and biodiversity from vegetation removals.
- ✓ Prior to construction activities, overhanging limbs and any exposed tree roots of trees to be retained should be pruned in a manner that minimizes physical damage and promotes quick wound closure and regeneration. Maintenance of roots or limbs should be carried out by an ISA Certified Arborist or a tree care specialist under the supervision of an ISA Certified Arborist.

PROPOSED MITIGATION MEASURES – CONSTRUCTION IMPLEMENTATION

- ✓ Tree retention should be prioritized where possible along the work areas for the proposed driveway and parking facilities
- ✓ Trees to be removed should be clearly marked and work crews should be informed of the importance of only removed marked/approved trees
- ✓ Tree protection fencing should be installed around all trees that will be retained within and around work areas
- ✓ Protection fencing around trees shall be installed at the critical root zone (CRZ) to ensure no impacts to this area. The CRZ is calculated as the DBH x 10 cm:
 - Groups of trees can be fenced together if the fencing still meets the recommended placement described above
 - Fencing should be installed following the City of Ottawa’s Tree Protection Specification (City of Ottawa, 2019)
- ✓ Tree protection fencing should be inspected as required to ensure no deviancy from the intended location and to record any deficiencies
- ✓ Do not place any material or equipment within the CRZ of any trees to be preserved
- ✓ Do not attach any signs, notices, or posters to any tree
- ✓ Do not raise or lower the existing grade within the CRZ of trees without approval
- ✓ Do not tunnel or bore when digging within the CRZ of a tree
- ✓ Excavation activities around trees shall not damage the root system, trunk or branches of any tree to be preserved
- ✓ Exhaust fumes from all heavy machinery, vehicles, generators, and other equipment shall not be directed towards any trees for prolonged periods of time
- ✓ Tree removals should be avoided during the breeding bird season (April 1st to August 31) to limit disturbance to breeding birds, nests, or young and comply with the MBCA, 1994:
 - If trees are to be removed during the breeding bird season, it should be preceded by a nest survey by a qualified avian biologist. Surveys should be undertaken a maximum of 48 hours prior to the commencement of removals. If nests are found during a survey, or during construction, an appropriate buffer must be applied and the nest must not be disturbed until the young have fledged.
- ✓ All green ash trees removed should be treated as infected by the Emerald Ash Borer beetle and appropriately disposed of so not to infect other areas of the city.

PROPOSED MITIGATION MEASURES - AFTER CONSTRUCTION

- ✓ Post-construction tree maintenance methods should be used to repair any damage caused to trees by construction activities. These may include, but is not limited to: treating trunk and crown injuries, irrigation and drainage, mulching, and aeration of root zone
- ✓ Within 12 months of completion of construction, an assessment of preserved trees should be conducted. Trees that are dead, in poor health, or hazardous should be removed or pruned, as determined by an ISA Certified Arborist. Tree removal, if necessary, should occur promptly to avoid foreseeable risk of trees falling and causing damage or harm to people and/or property

With the successful implementation of the mitigation measures recommended above, it is anticipated that the proposed development will result in minimal impacts to trees within the Study Area.

7.3 CUMULATIVE IMPACTS

The proposed development is part of a rapidly expanding Riverside South community in Ottawa. Cumulative impacts must be considered in the context of the local and regional environment in which the site is situated. The following outlines the anticipated cumulative impacts associated with the proposed development.

Corridors and Linkages: The Rideau River corridor provides a highly valuable ecological linkage for flora and fauna in the region. This feature connects core habitats within and adjacent Rideau river corridor. The proposed development is situated between this linkage and River Road & Row Crops. Impacts to the Rideau River corridor should not be impacted by the proposed development.

However, Tributary #2 bisects the proposed development and may provided marginal ecological connectivity across the site. The functionality as a true functional corridor is highly limited due to the limited upstream habitat potential.

Biodiversity: Based on the ecological field assessments and available information, the removal of natural habitats within the subject property will have a marginal negative impact on the biodiversity of the Rideau River watershed and overall surrounding landscape due to ongoing/existing development activities.

Urban Forest Cover: The proposed development will negatively impact the general urban forest cover through the removal of the two woodlands noted above in addition to other incidental trees. This is mitigated to a large extent by the retention of the 30-meter riparian habitat associated with Tributary #2 and the fact that many the trees identified are invasive Manitoba Maple or Green Ash (highly susceptible to Emerald Ash Borer).

Hydrologic Function: Conversion of this property from agricultural/natural land cover to residential single-family homes will negatively impact the hydraulic functions within this portion of the watershed. The increase of impervious services associated with roads and driveways will reduce infiltration and increase runoff.

Landscape Context: Much of the land surrounding the proposed development is currently undergoing development from agricultural land to residential communities, including associated infrastructure (e.g. SWM Pond 5 and arterial/residential roads). The proposed development is consistent with the general change in land use in this region and the cumulative impacts on the natural environment reflect this change.

Proposed Mitigation Measures – Planning and Design Stage

In addition to the mitigation measures listed above, the following mitigation should be considered to address the cumulative impacts resulting from the proposed development:

- ✓ Enhancement of the vegetation buffer between the proposed development and Rideau River Tributary #2.
- ✓ Promote the use of permeable landscaping materials and rain capture systems like rain barrels
- ✓ The planting and retention of native trees should be prioritized in the landscape design. See mitigation recommendations in Section 7.2.10 above.

8 SUMMARY AND CONCLUSIONS

This report provides an evaluation of the anticipated environmental impacts associated with the construction and long-term occupation of the single-family residential dwellings located at 760 River Road (**Figure 1**). The anticipated environmental impacts are based on field investigation results completed in the spring and summer of 2019 and previous desktop screening review.

Notable observations during the field surveys included the presence SAR bats (i.e. Tricolored Bat and unknown *Myotis* species) and 11 Distinctive trees within the Study Area. However, the loss of habitat is non-limiting and is not expected to negatively impact habitat availability. No further SAR authorizations are required.

It is expected that construction activities and occupation of the proposed development will result in the removal or disturbance to vegetation communities of WODM5-3 and WODM5-5. Based on the proposed site plan and avoidance of the watercourse (30 m), it is expected that four Distinctive trees will be removed to accommodate development.

The mitigation measures described in this report, and summarized in **Table 7**, have been developed to avoid and/or minimize environment impacts associated with the Project.

Based on the information available, it is our opinion that this proposed residential development can be accepted with the condition that all mitigation measures recommended herein will be implemented.

The results and findings of this study have been reported without bias or prejudice. Thus, conclusions have been based on our own professional opinion, substantiated by the results of this study, and have not been influenced in any way.

Table 7 Summary of Anticipated Impacts and Mitigation Recommendations

Natural Heritage Feature/Function	Summary of Potential Impacts	Constraint to Development	Summary of Proposed Mitigation	Residual Effect
Terrestrial Vegetation	Loss of natural vegetation	Low	None required	Minor permanent loss of native and non-native woodland vegetation
	Loss of habitat for wildlife	Low	None required	Permanent loss of foraging or nesting habitat
	Decreased biodiversity or species abundance	Low	Landscaping plans should consider use of appropriate native species to offset loss of species or general abundance	No residual effect anticipated
	Increased risk of invasive species	Low	Machinery should arrive on site in clean condition; site should be restored with native species where appropriate following construction	No residual effect anticipated
	Changes to natural drainage	Low	None required	Altered drainage patterns within and around project areas
	Erosion and sedimentation	Low	Erosion and sediment control measures should be installed prior to construction. This typically involves the installation of silt fencing	No residual effect anticipated
Woodlands	Loss of forested habitat and vegetation	Low	Tree retention should be prioritized where possible	Minor permanent loss of trees within woodlands
	Decreased biodiversity or species abundance	Low	Landscaping plans should consider use of appropriate native species	No residual effect anticipated
	Loss of habitat for wildlife	Low	None required	Minor loss of available habitat
	Habitat fragmentation	Low	None required	No residual effect anticipated
	Changes to natural drainage	Low	None required	Altered drainage patterns within and around project areas
	Erosion and sedimentation	Low	Erosion and sediment control plan as described above	No residual effect anticipated
Breeding Birds	Loss of nesting and foraging habitat	Low	Clearing of vegetation should be limited to a reasonable footprint to accommodate the proposed site plan	Minor loss of potential habitat
	Physical harm to birds or nests resulting from construction activities	Low	Clearing of vegetation should be avoided during the breeding bird period (April 1 st – August 31 st). Area should be pre-stressed prior to vegetation clearing.	No residual effect anticipated
	Reduced diversity or species abundance	Low	None required	Minor reduction in bird abundance and diversity
	Physical harm or displacement resulting from construction activities	Low	Clearing of vegetation should be avoided during the breeding bird period (April 1 st – August 31 st)	No residual effect anticipated

Natural Heritage Feature/Function	Summary of Potential Impacts	Constraint to Development	Summary of Proposed Mitigation	Residual Effect
Amphibians	Loss of breeding and general habitat	Low	Clearing of vegetation should be limited to a reasonable footprint to accommodate the proposed site plan	No residual effect anticipated
	Physical harm or displacement resulting from construction activities	Low	Silt fencing should be installed around wetlands and watercourses. Avoid the use of heavy equipment in wetlands and watercourses	No residual effect anticipated
Species at Risk – SAR Bats	Loss of candidate roost trees	Low	Installation of 4 bat boxes adjacent to forested areas	Permanent loss of native habitat – Non-limiting
	Physical harm or displacement resulting from construction activities	Low	Clearing of vegetation should be avoided during general active and maternity roosting periods (March 15 th to September 15 th)	No residual effect anticipated
Trees	Removal of approximately 2 Distinctive trees	Low	None required	Permanent loss of distinctive trees
	Injury or harm to retained trees	Low	Implementation of tree protection measures such as protection fencing and pruning	No residual effect anticipated
Wildlife (General)	Physical harm or displacement resulting from construction activities	Low	Perimeter fencing should be installed around the site to prevent wildlife from entering the work area. Work area should be pre-stressed to allow wildlife to safely flee the area. Avoid vegetation clearing during sensitive times of the year.	No residual effect anticipated
	Loss of general natural habitat for wildlife	Low	None required	Minor loss of available habitat
	Disturbance to wildlife resulting from noise and construction activities	Low	Perimeter fencing should be installed around the site to prevent wildlife from entering the work area. Work area should be pre-stressed to allow wildlife to safely flee the area.	No residual effect anticipated
	Conflict between wildlife and humans	Low	Safety and awareness training provided to construction staff	No residual effect anticipated
Cumulative Impacts	General loss of biodiversity and available habitat	Low	Landscaping plans should consider use of appropriate native species	No residual effect anticipated
	Increase in impervious surfaces	Low	Promote the use of permeable landscaping materials and rain capture systems	Net increase in impermeable surfaces

9 REFERENCES

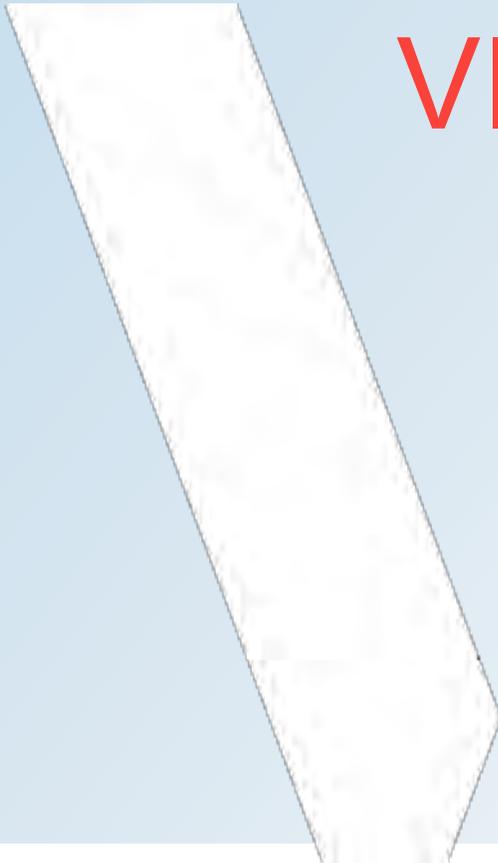
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APPENDIX

A CURRICULUM VITAE





ALEXANDER ZELLER, M.Sc.

Senior Ecologist, Environment

Areas of practice

Environmental Impact Assessments

Environmental Policy and Approvals

Environmental Assessments

SAR Surveys and Permitting

Terrestrial and Aquatic Surveys

Spatial Ecology & GIS

Public Consultation

Indigenous Knowledge Consultation

Languages

English

PROFILE

Alexander is a Project Manager and Senior Ecologist with over seventeen years of professional experience in terrestrial and aquatic ecology, open space planning, and natural heritage authorizations. Alex has led and managed many challenging natural heritage projects throughout eastern Ontario and across Canada, including; land development projects, regional planning studies, environmental monitoring programs, environmental assessments, indigenous knowledge studies, and renewable energy authorizations. His broad knowledge of ecology, environmental policy, and agency consultation has proved a successful complement to multi-disciplined and large-scale environmental planning projects.

EDUCATION

Masters of Science in Biology, Lakehead University 2007

Honours Bachelor Environmental Science, Lakehead University 2003

PROFESSIONAL DEVELOPMENT

Supervisor/Management Training (University of Ottawa) 2019

Expert Witness Training (Gowlings, Toronto) 2015

Ecological Land Classification Certification (MNR) 2010

CAREER

Senior Ecologist, Environment, WSP (Ottawa, ON) 2018 – Present

Associate, Dillon Consulting Limited (Ottawa, ON) 2013 – 2018

Ecologist, Dillon Consulting Limited (Ottawa, ON) 2006 – 2013

Research Technician - Contract Positions, Ontario Ministry of Natural Resources and Forestry (Thunder Bay, ON) 2001 – 2006

Teaching Assistant – Geography and Biology Departments, Lakehead University (Thunder Bay, ON) 2003 – 2005

PROFESSIONAL EXPERIENCE

INFRASTRUCTURE

- Energy Services Acquisition Program, PSPC (2019 – Now): Lead Project Ecologist responsible for overseeing all ecological studies, reporting requirements, agency consultation, and associated permitting and authorizations required to facilitate the design and construction of 14 kilometers of district heating/cooling pipeline and associated plants.
- Centre Block Rehabilitation Project, PSPC (2018 - now): Lead Project Ecologist responsible for; all ecological studies, development and management mitigation and compensation measures, reporting requirements, and agency consultation required to facilitate the Centre Block Rehabilitation project, on Parliament Hill in Ottawa.



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- Confederation Line Extension light rail, City of Ottawa (2019 – now): Lead Ecologist responsible for the implementing the established management recommendations and facilitating the outstanding permitting requirements to accommodate detail design phase of the project.
- West Transitway Extension, Phase 11 – Stillwater Creek, City of Ottawa (2018): Project manager and lead ecologist for the post-construction monitoring for the realignment of Stillwater Creek required to accommodate the West Transitway Extension. This project included; a species at risk screening, amphibian breeding surveys, breeding bird surveys, vegetation community inventories, fish community sampling, aquatic habitat assessment, water quality parameters, fluvial geomorphology studies.
- Riverview to Overbrook: transmission line upgrade, Hydro One (2016): Lead Ecologist for an Class Environmental Assessment in support of a transmission line upgrade between Overbrook and Riverview facilities in Ottawa. Alexander was responsible for coordinating and undertaking field surveys, participating in public consultation, reporting writing, impact assessment, and developing mitigation and avoidance measures.
- Innes Road Reinforcement Pipeline Project: Environmental Monitoring and Environmental Awareness Training, Enbridge Gas Distribution Inc. (2014-2016): Project manager and lead biologist for the Environmental monitoring and environmental awareness in support of the 2.8 km pipeline installation along Innes Road in Ottawa. This installation included 580m of horizontal directional drilling of NPS12 steel pipe under Highway 417. The project included the development and delivery of a bespoke environmental awareness training program and the on-going environmental monitoring during construction.
- Innes Road Reinforcement Pipeline Project: Environmental Assessment, Enbridge Gas Distribution Inc. (2014): Lead biologist for the class environmental assessment for the 2.8 km Enbridge Gas Distribution pipeline installation along Innes Road in Ottawa. Alexander was responsible for coordinating and undertaking biophysical field surveys, reporting writing, impact assessment, and developing mitigation and avoidance measures.
- Ottawa West Reinforcement Pipeline Environmental Assessment, Enbridge Gas Distribution Inc. (2011-2013): The local biologist for a multidisciplinary team of biologists, planners and engineers working on environmental and cumulative effects assessment for the installation of 20 km of 24-inch natural gas pipeline in Western Ottawa. Took over project management role for the construction phase of the project. This phase included the more detailed biophysical surveys to support environmental authorizations, pre- and post-construction water well monitoring, and development of a detailed mitigation strategy. These mitigation measures included; physical mitigation measures, environmental awareness training, daily on-site environmental monitoring, environmental compensation; and an assessment of agricultural crop loss and associated compensation.
- GTA Reinforcement Pipeline Environmental Assessment, Enbridge Gas Distribution Inc. (2011): Acting as both an ecologist and spatial analyst for a multidisciplinary team of biologists, planners, and engineers working on an environmental and cumulative effects assessment for the pipeline reinforcement in the Greater Toronto Area. Responsibilities include managing a majority of the GIS mapping pertaining to the three large study areas, conducting terrestrial biology surveys, and liaising with the client when required.



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- Infrastructure Master Plan, Town of Perth (2009-2010): Completed the ecological assessment and natural heritage inventory for an infrastructure master plan in the Town of Perth. This study involved a full vegetation survey of the study area, identification of soils, observations of wildlife and detailed mapping of the existing ecosystems within the study area. Additional responsibilities included maintaining the GIS library, consulting with stakeholders and producing GIS figures for report.
- Truck Inspection Station Assessment, Ministry of Transportation, Ontario (2008): Completed the ecological assessment and resource inventories for nine different truck inspection stations throughout northern Ontario. This study involved a full vegetation survey of the study areas, identification of soils, observations of wildlife, detailed mapping of the existing ecosystems within the study areas and publishing all mapping for reports. Additional responsibilities included maintaining the GIS library, consulting with stakeholders and producing GIS figures for report.

LAND DEVELOPMENT

- 760 River Road, Claridge Homes Group of Companies (2019); Project manager and lead ecologist for the environmental impact statement and an Environmental Impact Statement and Tree Conservation Study for a development in south Ottawa. This study was completed in support of plan of subdivision for a residential development.
- 323 Jockvaile Road, Minto Communities (2018); Project manager and lead ecologist for the environmental impact statement and tree conservation report for a proposed residential development in the Barrhaven Community. These reports were completed following the City of Ottawa guidelines.
- Riverview Lane, Urbandale Construction (2018 to now): Project manager and lead ecologist for natural heritage approvals associated with a residential subdivision in Kemptville, Ontario. Scope of work included SAR authorizations, Fisheries authorizations, wetland design and restoration plans; watercourse and fish habitat design and plans, and general agency consultation.
- SAR Permit Implementation and Monitoring, KNL Developments (2017 to now): Project manager and lead biologist for the management and implementation of one of the most complex Species at Risk (SAR) permits issued in Ontario. Responsible for; establishing habitat creation plans, negotiating revisions to permit, coordination of environmental monitoring and species surveys, fisheries authorizations, design of habitat compensation features, consultation with relevant agencies and stakeholders, and all associated reporting and documentation.
- 800 Eagleson Road EIS and TCR, Ironclad Developments (2018): Project manager and lead ecologist responsible for completing an Environmental Impact Statement and Tree Conservation Study for a development in west Ottawa. The proposed project will consist of a six-story rental apartment building with approximately 150 units with access from Eagleson Road.
- Barrhaven South Community Design Plan, Minto (2015-2017): Project manager and lead biologist on the multi-disciplined consulting team undertaking the Barrhaven South Community Design Plan. Responsible for managing the natural heritage related studies, reports, and public consultation contributions. Also responsible for consulting with stakeholders to ensure the community design plan meets their expectations and requirements.
- Phase 12, 14, 15, and 16; Environmental Impact Statement, Riverside South Development Corporation (2014-2017): Project manager and lead biologist for a series of Environmental Impact Statements and Tree Conservation Studies for a



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several primarily residential developments in southern Ottawa. Terrestrial and aquatic environments were evaluated and impacts assessed for each development. Mitigation measures and management recommendations were developed to address the identified environmental impacts associated with the proposed development.

- McArthur Island Developments, Carleton Place, ON (2015-now): Project manager and lead biologist for the natural heritage compliance requirements supporting a multi-phase residential/retirement complex located on McArthur Island within the Mississippi River. This project will include the redevelopment of an historic woollen mill and the construction of several other multi-story buildings. The scope of environmental services provided included Environmental Impact Studies and associated field surveys, arborist reports, specific wildlife surveys, and environmental compensation design.
- Clark Lands Development, Environmental Impact Statement, Minto (2013-2017): Project manager and lead biologist for an Environmental Impact Statement and Tree Conservation Study for a development in west Ottawa. This study was completed in support of plan of subdivision for a residential development.
- Potter's Key Development, Environmental Impact Statement, Minto (2013 to now): Project manager and lead biologist for an Environmental Impact Statement, Tree Conservation Report, Species at Risk Permitting, Fisheries approvals, and on-going environmental monitoring for a development in Stittsville, Ontario (City of Ottawa). The study was completed as part of an application for residential development.
- Fernbank Lands Development Environmental Impact Statement, Richcraft (2013 - 2017): Project manager and lead biologist for an Environmental Impact Statement, Tree conservation Report, and Species at Risk Permitting for a development in Stittsville, Ontario (City of Ottawa). The study was completed as part of an application for residential development.
- Environmental Screening Study, Walton Developments (2012-2014): Project manager and terrestrial ecologist for a natural heritage screening study for Walton Developments. The project is aimed at identifying any natural heritage constraints that may affect the ability to develop a number of properties in southwest Ottawa. Responsibilities include project management, reporting, terrestrial field surveys, avian surveys and GIS mapping.
- Scoped Environmental Impact Statement, City of Ottawa (2011): Project manager for a scoped environmental impact statement. The project was scoped to specifically address the concern for the impact of a rural residential development in south Ottawa on Species at Risk. Responsibilities include managing budget, invoicing, field survey, report writing and communicating with the client.
- Chapman Mills Environmental Impact Statement Addendum, Minto (2011): Project manager for an addendum to an environmental impact statement assessing the impact of a residential development on trees and local hydrology within a small woodlot south of Ottawa. Responsibilities included managing budget, invoicing, field survey, report writing and communicating with the client.

NATURAL RESOURCES STUDIES

- Kizell Wetland Trail - SAR Authorizations, City of Ottawa (2019): Project manager and lead ecologist for the Species at Risk authorizations required for the construction of a Pedestrian trail network within the conservation forest around the Kizell wetland in Kanata, ON.



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- Goulbourn Wetland Re-delineation, City of Ottawa (2015-2016): Project manager for the re-delineation of the Goulbourn Provincially Significant Wetland, located in west Ottawa. The objective of this project was to undertake a boundary re-delineation of the provincially significant wetland (PSW) known as the Goulbourn Wetland Complex. Alexander was responsible for ensuring the quality of the re-delineation and associated report, consulting with land owners, and reviewing the approach and findings with the city and the Ontario Ministry of Natural resources.
- Feedmill Creek Species at Risk Screening, City of Ottawa (2017): Project manager and lead ecologist for a species at risk screening of Feedmill Creek in support of the proposed restoration efforts. Specific surveys included; bat habitat surveys, Blanding's turtle basking surveys, butternut Screening, and other incidental observations.
- Ecological Land Classification, National Capital Commission (NCC) (2015): Project manager and lead Biologist for project to map all the ecotypes within the NCC's urban and greenbelt lands. Ecological mapping was done using Ontario Ecological Land Classification and covers an area of approximately 62 km². The mapping will be used to for various future ecological landscape management projects.
- Species at Risk Survey, Defence Construction Canada (DCC) – CFB Shilo Range Training Area (2014): GIS analyst and Biologist responsible for the species at risk habitat suitability modelling used in the Environmental Assessment Report. This modelling was used to establish the potential threats to SAR across the base and in turn recommend best management practices for training in SAR habitat.
- 2014 Species at Risk Screening, City of Ottawa (2014): Project manager and lead biologist for a Species at Risk screening study for the City of Ottawa's Infrastructure Branch. The objective of this study was to identify the potential threat various planned infrastructure projects had to Species at Risk. In total 489 projects were evaluated over the course of the project. A new risk assessment approach and a series of management tools were developed to aid City project managers. Many of these tools continue to be used by the city for subsequent SAR Screenings. These tools included; standardized risk categories, a suite of standardized mitigation recommendations, a GIS database of the screening results, a document summarizing and illustrating the Species at Risk that may be found within the city, and a SAR screening process flowchart to assist City project managers.
- Natural Heritage Study, County of Frontenac (2011-2012): Lead landscape ecologist for the County of Frontenac's Natural Heritage Study. This study will form the major piece of the county's Official Plan (OP) and will provide policy and zoning recommendations for future OP schedules. Marxan and corridor design modelling was done to assist in the development of ecologically sound natural heritage zoning. Responsibilities include public consultation, managing the GIS and spatial analysis, assisting with policy development, and managing GIS modelling.
- Rideau Canal Landscape Strategy, Parks Canada (2012): Lead ecologist for the Rideau Canal Landscape Strategy study being conducted to characterize the landscape and develop policy recommendations along the Rideau Canal in support on the UNESCO World Heritage Status. Personal responsibilities include public consultation, ecological characterization and recommendations, GIS mapping, field survey, report writing and communicating with the client.
- Birds Creek Secondary Plan, Municipality of Hastings Highlands (2011-2012): Working with the Municipality of Hastings Highlands to produce/develop a secondary plan for the community of Birds Creek, north of Bancroft. The plan will



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promote a healthy living philosophy and promote sustainable development practices. Responsibilities include consultation with public and client, assessing the existing natural resources, assisting in incorporating natural heritage features into the plan and developing GIS mapping for study area.

- Solar Farm Site Assessment, SkyPower (2010): Assisting with the environmental impact evaluation of proposed solar farms as part of an environmental assessment for renewable energies. Duties included conducting and writing records review report, amphibian survey, Ecological Land Classification and general ecological field surveys.
- Regional Ecology Planning Framework, Regional Municipality of Wood Buffalo (RMWB) (2008): Working with RMWB to develop an ecological planning framework that will aid the municipality in balancing development pressures with municipal-specific environmental conservation goals. Responsible for developing the GIS-based ecological planning model and decision support tools created specifically for the municipality.
- Terry Fox Drive Environmental Construction Monitoring, City of Ottawa (2010-2012): Assisted with the on-going environmental monitoring of the Terry Fox Drive road construction project, to ensure compliance of environmental mitigation. Duties included water quality monitoring, sediment and erosion control recommendations, wildlife observations, species at risk monitoring and environmental awareness training.
- Terry Fox Drive Environmental Assessment, City of Ottawa (2007 – 2010): Completed the assessment of natural features along the future Terry Fox Drive corridor in west Ottawa. This included the electrofishing of aquatic habitat, salamander survey and general ecological observations. In addition to the field assessments, also coordinated the GIS analysis and map production for various environmental assessment reports.
- Yellowknife Smart Growth Plan: Ecological Preservation Study, City of Yellowknife (2007-2010): Working with a team of planners to advance Yellowknife's existing Ecological Resource Inventory which will allow for greater public engagement on the quality of life impacts of 40 natural sites. Personal duties include GPS data collection, GIS mapping, Remote Sensing Landcover Classification, and consultation with public and other stakeholders.
- Satellite Image Classification, Tsuu T'ina First Nation (2007): Conducted a satellite image classification to update outdated vegetation mapping. Landsat-7 TM data was classified using IDRISI Andes software. Training areas were delineated to represent the various vegetation communities in the image, and a maximum likelihood classification method was used to classify the image. The results of the image classification proved to be excellent and corresponded to ground-truth landcover classes very well.
- Tliche Land Use Plan, Tliche Government (2006-2009): Lead Ecologist for the Tliche Land Use Plan in the Northwest Territories. Personal responsibilities include the development of the GIS database and spatial model within the GIS to aid in the production of the final land use plan. This model incorporates traditional indigenous knowledge and ecological features with economic and social influences to identify suitable land use zones. The emphasis of the Tliche Land Use Plan is on mitigating the cumulative effects of development on the natural and social environment while still promoting sustainable economic development.



ALEXANDER ZELLER, M.Sc.

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- Mathews Lake Habitat Restoration, Public Works Government Services Canada (2008): Assisted with the 2008 post-construction monitoring of the fish habitat enhancement in the Mathews Lake watershed in the Northwest Territories. This rehabilitation work was done to improve the fish habitat in the immediate vicinity of Salmita Mine and Tundra Mine. Duties included seine netting and fish identification, construction of new fish habitat structures, benthos and water quality assessments.
- Aquatic Habitat Assessment, Canadian Pacific Rail (2007): Assisting in aquatic habitat assessment for a water crossing along the CPR tracks in Peterborough, Ontario. The objective of the study is to improve habitat for native brook trout and other resident fish by providing in-stream habitat in the vicinity of the crossing.
- Westside Creek and Marsh Reconfiguration, St Mary's Cement (2006): Developed a GIS database to incorporate the annual environmental monitoring data for the reconfiguration of Westside Creek and Marsh. Produced a landcover classification from satellite imagery to assess the vegetation change within the marsh and the surrounding area.

OTHER RELEVANT EXPERIENCE

- Masters of Biology thesis examined understory forest regeneration after wildfire in the boreal forest of northwestern Ontario. The thesis utilized GIS and remote sensing to model landscape characteristics related to species regeneration in the boreal forest.
- Undergraduate thesis utilized GIS to examine the impact of intensive harvesting on littoral deposition rates. A soil erosion model of an intensively harvested watershed was produced in GIS. The results from this model were correlated to measure deposition around the small inland lakes within the watershed.

PUBLICATIONS

- Zeller, A., N. Stow, S. Young, S. Boudreau, B. Aird. 2019. Connectivity for Landscape (Re)Generation. Presentation and Panel discussion at the Canadian Institute of Planners (CIP) Annual Conference, July 2019. Ottawa, Ontario
- Gleeson, J., A. Zeller and J.W. McLaughlin. 2006. Peat as a Fuel Source in Ontario: A Preliminary Literature Review, Ontario Forest Research Institute, Forest Research Information Paper 161, Sault Ste. Marie, Ontario.
- Zeller, A.J. 2005. Using landscape indices to model environmental gradients within the Mixedwood Boreal Forests of northwestern Ontario, Canada. Poster Presentation at Ontario Ecology and Ethology Colloquium, 2005. Ottawa, Ontario



ANDREA ORR, B.Sc.

Terrestrial Ecologist, Environment - Ecology

Areas of practice

Forest and Plant Ecology

Ornithology

Wetland Evaluation

Wildlife Habitat Assessment

Species at Risk legislation

Languages

English

PROFILE

Andrea Orr is a Terrestrial Ecologist who has gained experience and knowledge of ecosystem monitoring techniques and natural heritage field investigations for multiple projects across a variety of development sectors including; transportation, renewable energy, and oil/gas.

As Terrestrial Lead for many projects, Andrea is adept with the ecological components necessary to complete Class Environmental Assessments, Environmental Impact Statements, and Renewable Energy Approvals. She has demonstrated knowledge and experience of federal and provincial acts: *Species at Risk Act*, *Endangered Species Act*, and *Migratory Bird Convention Act*.

Andrea specializes in forest and plant ecology, ornithology, and wildlife habitat assessments. Andrea is certified in the Ontario Ministry of Natural Resources and Forestry (MNR) Ecological Land Classification (ELC), Ontario Wetland Evaluation System (OWES) and is a certified Butternut Health Assessor (BHA). Her experience ranges from conducting various forestry practices; botanical inventories; soil analysis; entomological surveys; bat habitat assessments and acoustic monitoring; migratory and avian surveys; as well as various Species at Risk (SAR) target surveys and permitting applications.

EDUCATION

Biology and Environmental Studies, B.Sc., Trent University 2008

Forestry Technician, Diploma, Sir Sandford Fleming College 2003

PROFESSIONAL DEVELOPMENT

CPR and First Aid, St. John Ambulance 2019

Butternut Health Assessor, Ministry of the Environment, Conservation and Parks 2019

Ontario Wetland Evaluation System, Ministry of Natural Resources and Forestry 2018

Ecological Land Classification, Ministry of Natural Resources and Forestry 2012

PROFESSIONAL ASSOCIATIONS

Mississippi Valley Field Naturalists, 2018 MVFN

Field Botanists of Ontario, 2013 FBO

Ontario Field Ornithologists. 2013 OFO

CAREER

Terrestrial Ecologist, Environment - Ecology, WSP 2019 – Present



ANDREA ORR, B.Sc.

Terrestrial Ecologist, Environment - Ecology

Senior Environmental Scientist, Planning. Parsons, Ottawa, Ontario, Canada	2017 – 2019
Terrestrial Ecologist, Ecology. Stantec, Stoney Creek, Ontario, Canada	2012 - 2017
Natural Areas Inventory Assistant. Credit Valley Conservation, Mississauga, Ontario, Canada	2011 - 2012
Biologist, Renewable Energy. M.K. Ince and Associates Ltd. Dundas, Ontario, Canada	2008 - 2009

PROFESSIONAL EXPERIENCE

Renewable Energy

- Port Ryerse Wind Farm, Haldimand and Norfolk County, Ontario, Canada (2014): Terrestrial Ecologist. Conducted pre-construction field investigations as part of the Natural Heritage Assessment process. Corresponding field surveys included; Bald Eagle (SAR) nest monitoring throughout the breeding and brood rearing process. Client: Boralex.
- Amherst Island Wind Energy Project, Lennox and Addington County, Ontario, Canada (2014): Terrestrial Ecologist. Conducted pre-construction field investigations as part of the Natural Heritage Assessment process. Corresponding field surveys included; weekly winter raptor searches that consisted of driving surveys with point counts, walking surveys with transects to detect Short-eared Owl roosts, and dusk surveys to target active Short-eared Owls. Client: Algonquin Power/Windlectric.
- Port Dover and Nanticoke Wind Project, Haldimand and Norfolk County, Ontario, Canada (2015): Terrestrial Ecologist. Conducted post-construction monitoring of tundra swan migration, amphibian call counts, Bald Eagle (SAR) nest monitoring, and mortality monitoring at turbines (i.e. searcher efficiency trials). Client: Capital Power Corporation.
- Niagara Region Wind Corporation, Niagara Region and Haldimand County, Ontario, Canada (2013): Terrestrial Ecologist. Conducted pre-construction field investigations as part of the Natural Heritage Assessment process. Corresponding field surveys included, snake hibernacula observations and Species at Risk identification, bat maternity colony assessments, landbird fall migration surveys, and turtle overwintering habitat assessment for Species at Risk. Client: Boralex.
- Grand Valley Wind Project, Phase 3, Dufferin County, Ontario, Canada (2013): Terrestrial Ecologist. Conducted and coordinated various aspects of the Natural Heritage Assessment process. Including field program coordination, data analysis and contributing author to the Natural Heritage Assessment/Environmental Impact Study report. Author to the Evaluation of Significance Addendum report. Field surveys included; Ecological Land Classification (ELC) and mapping, significant wildlife habitat assessment, waterfowl migration and nesting, Species at Risk Butler's Gartersnake cover-board surveys, Species at Risk Bobolink and Eastern Meadowlark breeding bird surveys, and bat maternity colony surveys. Aboriginal consultation and relations with Saugeen-Ojibway Nation was also provided during site-walk visit. Client: Veresen Inc.



ANDREA ORR, B.Sc.

Terrestrial Ecologist, Environment - Ecology

- Napier Wind Project, Middlesex County, Ontario, Canada (2012): Terrestrial Ecologist. Agency liaison with MNR included provision of comments regarding Species at Risk report, with focus on wildlife biology and habitat assessment. Client: wpd Canada Corporation.
- Grand Renewable Energy Park, Haldimand County, Ontario, Canada (2012): Terrestrial Ecologist. Managed and conducted terrestrial field surveys which included wetland delineation and mapping, and spring/fall landbird migration surveys. Author to the subsequent Pre-Construction Monitoring Bird Report, which included field data analysis and interpretation. In 2014, participated in environmental monitoring and bird nest sweeps during construction. Client: Samsung Renewable Energy.

Transportation

- Baseline Road Bus Rapid Transit Corridor, Ottawa, Ontario, Canada (2017): Senior Environmental Scientist. Coordinated and performed field investigations for Species at Risk screening, which included identification, analysis of habitat suitability and mitigation measures. Co-author to the Natural Environment Overview Report. Analyzed and incorporated field data into the above report, while providing an assessment for potential impacts to Species at Risk and mitigation measures. Client: City of Ottawa.
- Slater/Albert/Bronson Street Renewals, Ottawa, Ontario, Canada (2017): Senior Environmental Scientist. Performed field investigations of Ecological Land Classification (ELC) and mapping, tree inventory, and Species at Risk identification, analysis of habitat suitability and mitigation measures. Author to the Natural Environment Existing Conditions Report. Analyzed and incorporated field data into the above report, while providing an assessment for potential impacts to Species at Risk and mitigation measures. Client: City of Ottawa.
- Leitrim Road Realignment and Widening, Ottawa, Ontario, Canada (2018): Senior Environmental Scientist. Contributing author to the Natural Sciences Existing Conditions Report. Provided an assessment of significant wildlife habitat based on previous field studies. Client: City of Ottawa.
- Kanata Light Rail Transit, Ottawa, Ontario, Canada (2018). Senior Environmental Scientist. Coordinated and performed field investigations of Ecological Land Classification (ELC) and mapping, significant wildlife habitat assessment, and Species at Risk identification, analysis of habitat suitability and mitigation measures. Contributing author to the Natural Environment Existing Conditions Report. Analyzed and incorporated field data into the above report, while providing an assessment for potential impacts to Species at Risk and mitigation measures. Client: City of Ottawa.
- Earl Armstrong Road Extension, Ottawa, Ontario, Canada (2018). Senior Environmental Scientist. Coordinated and performed field investigations of Ecological Land Classification (ELC), soil analysis, and delineation mapping; amphibian call surveys; breeding bird and marsh bird call-back surveys to identify sensitive species; significant wildlife habitat assessment; and Species at Risk identification and habitat suitability assessment. Author to the Natural Environment Overview Report, with a subsequent technical memorandum summarizing field investigation methodologies and results.



ANDREA ORR, B.Sc.

Terrestrial Ecologist, Environment - Ecology

- Metrolinx Regional Express Rail – Lakeshore West Infrastructure Improvements, Greater Toronto Area, Ontario, Canada (2018). Coordinated and performed field investigations of Ecological Land Classification (ELC) and delineation mapping; tree inventories; amphibian call surveys; breeding bird surveys; significant wildlife habitat assessment; and Species at Risk identification and habitat suitability analysis. Contributing author to numerous Natural Environment Screening Memorandums. Analyzed and incorporated field data into the above reports where Species at Risk impacts were also assessed, and mitigation measures developed if applicable. Client: Metrolinx.
- Dundas Street (Regional Road 5) Widening, Brant Street to Bronte Road, City of Burlington/Town of Oakville, Ontario, Canada (2017). Lead Terrestrial Ecologist. Coordinated and performed field investigations of bat habitat assessment for significant wildlife habitat and Species at Risk habitat using accepted MNRF protocols for cavity tree presence and acoustic monitoring. Client: City of Burlington.
- Mega Culverts Rehabilitation/Replacement Contract 2, Southwestern Ontario, Canada (2013). Lead Terrestrial Ecologist. Author to the Terrestrial Ecosystems Existing Conditions and Impact Assessment Report. Analyzed and incorporated field data into the above report, while providing an assessment for habitat suitability for species at risk occurring within the study area. Client: Ministry of Transportation Ontario (MTO).
- Mega Culverts Rehabilitation/Replacement Contract 3, Southwestern Ontario, Canada (2014). Lead Terrestrial Ecologist. Coordinated and performed field investigations of Ecological Land Classification (ELC) and mapping, significant wildlife habitat assessment, and Species at Risk identification and mitigation. Author to the Terrestrial Ecosystems Existing Conditions and Impact Assessment Report. Analyzed and incorporated field data into the above report, while providing an assessment for habitat suitability for species at risk occurring within the study area. Client: Ministry of Transportation Ontario (MTO).
- Highway 17 and Highway 101 Rehabilitation, Wawa, Ontario, Canada (2014). Lead Terrestrial Ecologist. Author to the Terrestrial Ecosystems Existing Conditions and Impact Assessment Report – Detail Design. Coordinated the corresponding field program and performed field surveys of Ecological Land Classification (ELC) and mapping, significant wildlife habitat assessment, and Species at Risk identification and mitigation. Field data was then analyzed and incorporated into the above report. Client: Ministry of Transportation Ontario (MTO).
- Highway 3 from Carter Road to John Road, Elgin and Oxford County, Ontario, Canada (2014). Lead Terrestrial Ecologist. Author to the Terrestrial Ecosystems Existing Conditions and Impact Assessment Report – Detailed Design. Coordinated the corresponding field program and performed field surveys of Ecological Land Classification (ELC) and mapping, significant wildlife habitat assessment, and Species at Risk identification and mitigation. Field data was then analyzed and incorporated into the above report. Client: Ministry of Transportation Ontario (MTO).
- Highway 401 from Hespeler Road to Townline Road, Cambridge, Ontario, Canada (2014). Lead Terrestrial Ecologist. Coordinated and performed field investigations of Ecological Land Classification (ELC) and mapping, significant wildlife habitat assessment, and Species at Risk identification and mitigation for detailed design. Client: Ministry of Transportation Ontario (MTO).



ANDREA ORR, B.Sc.

Terrestrial Ecologist, Environment - Ecology

- Highway 401 Reconstruction Chatham-Kent Part A, Contract 1, Southwestern Ontario, Canada (2014). Lead Terrestrial Ecologist. Coordinated and performed field investigations of Ecological Land Classification (ELC) and mapping, significant wildlife habitat assessment, and Species at Risk identification and mitigation for detailed design. Author to the corresponding report of Terrestrial Ecosystems Existing Conditions and Impact Assessment. Author to the Species at Risk Mitigation Plan required by policy under the *Endangered Species Act*. Client: Ministry of Transportation Ontario (MTO).
- Highway 401 Reconstruction Chatham-Kent Part B, Contract 2, Southwestern Ontario, Canada (2015). Lead Terrestrial Ecologist. Coordinated and performed field investigations of Ecological Land Classification (ELC) and mapping, significant wildlife habitat assessment, and Species at Risk identification and mitigation for detailed design. Author to the corresponding report of Terrestrial Ecosystems Existing Conditions and Impact Assessment. Author to the Species at Risk Mitigation Plan required by policy under the *Endangered Species Act*. Client: Ministry of Transportation Ontario (MTO).
- Highway 400 North Canal Rehabilitation, Holland Marsh, Simcoe County, Ontario, Canada (2015). Terrestrial Ecologist. Coordinated and performed field investigations of Ecological Land Classification (ELC) and mapping, significant wildlife habitat assessment, and Species at Risk identification and mitigation. Client: Ministry of Transportation Ontario (MTO).
- New North Oakville Transportation Corridor, Halton Region, Ontario, Canada (2013). Terrestrial Ecologist. Assessed Species at Risk Bobolink and Eastern Meadowlark breeding habitat and created survey protocol based on findings. Bobolink and Eastern Meadowlark surveys were conducted with subsequent data analysis and mapping. Client: Town of Oakville.
- Highway 17B CNR Overhead Bridge and Highway 17B Resurfacing, North Bay, Ontario, Canada (2013). Terrestrial Ecologist. Author to the Terrestrial Ecosystems Existing Conditions and Impact Assessment Report. Performed the corresponding field surveys of Ecological Land Classification (ELC) and mapping, significant wildlife habitat assessment, and Species at Risk identification and mitigation. Field data was then analyzed and incorporated into the above report. Consultation and engagement to Nipissing First Nations was also provided at time of field investigations. Client: Ministry of Transportation Ontario (MTO).
- Highway 11 Chippewa Creek Bridge and Duchesnay Creek Bridge Replacement/Rehabilitation, North Bay, Ontario, Canada (2013). Terrestrial Ecologist. Author to the Terrestrial Ecosystems Existing Conditions and Impact Assessment Report. Performed the corresponding field surveys of Ecological Land Classification (ELC) and mapping, significant wildlife habitat assessment, and Species at Risk identification and mitigation. Field Data was then analyzed and incorporated into the above report. Client: Ministry of Transportation Ontario (MTO).
- Holland Drain Canal Bridge Replacement on Highway 9, Ontario, Canada (2012). Terrestrial Ecologist. Contributing author to Existing Conditions and Impact Assessment reports. Performed ELC community classification and mapping, and Species at Risk identification and mitigation, as well as field data analysis and reporting. Client: Ministry of Transportation Ontario (MTO).

- Highway 7 and 35 Structure Replacement/Rehabilitation, Ontario, Canada (2012). Terrestrial Ecologist. Contributing author to Existing Conditions and Impact Assessment reports. Performed ELC community classification and mapping, and Species at Risk identification and mitigation, as well as field data analysis and reporting. Client: Ministry of Transportation Ontario (MTO).
- Highway 6/10 from Chatsworth to Owen Sound, Ontario, Canada (2012). Terrestrial Ecologist. Contributing author to Existing Conditions and Impact Assessment reports. Performed ELC community classification and mapping, and Species at Risk identification and mitigation, as well as field data analysis and reporting. Client: Ministry of Transportation (MTO)
- GO Transit Hamilton Expansion – CN Yard Track Expansion, Hamilton, Ontario, Canada (2014). Terrestrial Ecologist. Contributing author to the Environmental Evaluation Report and performed the corresponding field investigations of Ecological Land Classification (ELC), mapping, and significant wildlife habitat assessments. Background information, identification, and mitigation for Species at Risk was also provided and incorporated into the above report. Client: Metrolinx.

Restoration, Remediation and Redevelopment

- Annual Monitoring and Adaptive Management of Beaverdams Channel, Thorold, Ontario, Canada (2013). Terrestrial Ecologist. Author to the 2013 Annual Monitoring and Adaptive Management Report and performed the corresponding field investigations of spring and summer vegetation restoration monitoring. Survivorship data of vegetation was collected, analyzed, and incorporated into the above report with invasive species management recommendations. Client: Georgia Pacific.
- Restoration and Vegetation Monitoring of Former Spill Pond, Thorold, Ontario, Canada (2016). Terrestrial Ecologist. Author to the 2016 Vegetation Monitoring and Adaptive Management report. Survivorship data of vegetation was analyzed and incorporated into the above report recommendations of a watering and tending program. Client: Georgia Pacific.

Oil and Gas Pipelines

- Spencer Creek Pipeline Repair, Flamborough, Ontario, Canada (2014). Terrestrial Ecologist. Conducted field investigations of summer botanical inventory, with a subsequent technical memo. This involved data collected, mitigation measures for regionally rare species, and restoration. Client: Enbridge.
- Energy East Pipeline, Ontario, Canada (2015). Terrestrial Ecologist. Coordinated and prepared field packages/itinerary for vegetation and wildlife surveys from Kenora to Cornwall, Ontario. Performed gap analysis of Ecological Land Classification (ELC) using ArcGIS and aerial photography to determine survey locations, level of effort, and species at risk analysis. Client: TransCanada Corporation.



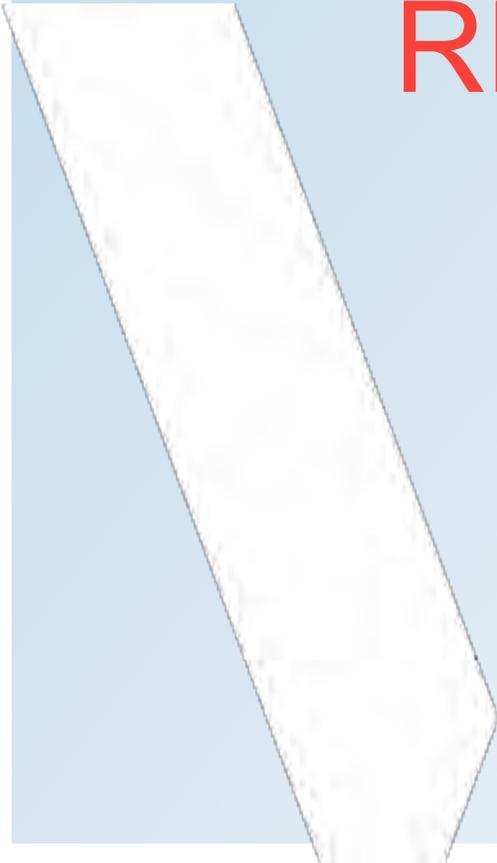
ANDREA ORR, B.Sc.

Terrestrial Ecologist, Environment - Ecology

- Integrity Digs – Line 9 between Hilton and Westover, Mississauga, Pickering, Hamilton, Oakville, Ontario, Canada (2013). Terrestrial Ecologist. Conducted tree inventory surveys in various locations along the Line 9 Pipeline. Identified Species at Risk (SAR) Butternut trees and any mid-age to mature trees that may be impacted. Also conducted significant wildlife habitat and turtle habitat assessments. Complete botanical inventories were also conducted at some sites with emphasis on locating regionally rare plant species within the construction area. Technical memos were then created based on findings and mitigation measures were provided as needed. Mitigation measures performed involved transplanting rare plants and ensuring their survival. Client: Enbridge.
- Woodbine and Cedar Ridge Road Exposure, Gormley, Ontario, Canada (2013). Terrestrial Ecologist. Conducted field investigations of Ecological Land Classification (ELC) and mapping, significant wildlife habitat assessment, and Species at Risk identification and mitigation. A technical memo was then prepared. Client: Union Gas.

APPENDIX

B PHOTOGRAPHIC REPORT



APPENDIX B

Photo 1

May 22, 2019

Notes: WODM5-5 and Watercourse. West of River Road, facing Northeast.



Photo 2

May 22, 2019

Notes: Construction of SWM Pond 5



APPENDIX B

Photo 3

June 28, 2019

Notes: Edge of WODM5-3, facing West [45.25843, -75.70084].



Photo 4

June 28, 2019

Notes: Mallard perching on a fallen, dead tree within watercourse, facing Northwest [45.2581, -75.70071].



APPENDIX B

Photo 5

June 28, 2019

Notes: Edge of WODM5-5 and watercourse, facing Northeast [452811, -75.70067].



APPENDIX B

Photo 6

June 28, 2019

Notes: Cavity tree within woodland
[452895, -75.70087].



APPENDIX B

Photo 7

June 28, 2019

Notes: MAMM1-3 and watercourse, facing North [45.25813, -75.70037].



Photo 8

June 28, 2019

Notes: Northern extent of property, West of River Road and facing North [45.25819, -75.70028].



APPENDIX B

Photo 9

June 28, 2019

Notes: Graded area adjacent to WODM5-5, facing West.



APPENDIX

C VASCULAR PLANT LIST

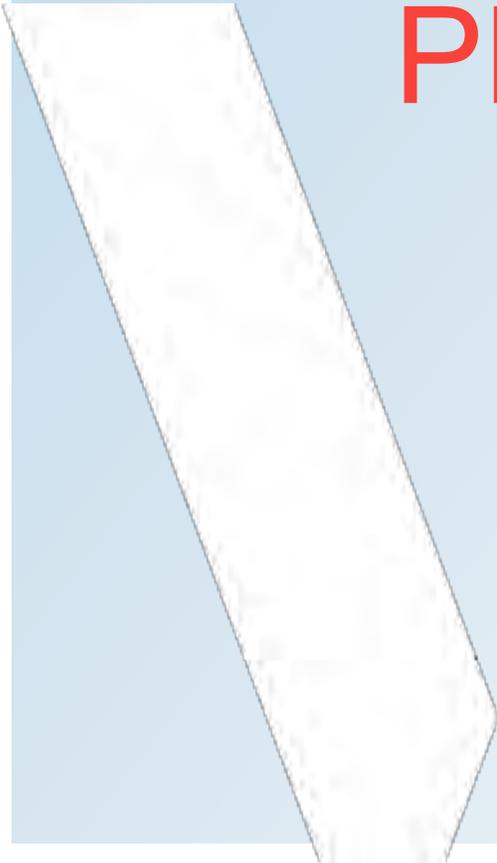


Table C1: Vacular Plant List

Common Name	Scientific Name	Author	COSEWIC	SARA	SARO	S-Rank	Exotic	Order	Family	Coefficients of Conservatism [C]
Field Horsetail	<i>Equisetum arvense</i>	L.				S5		Equisetales	Equisetaceae	0
Common Lady Fern	<i>Athyrium filix-femina</i>	(L.) Roth				S5		Filicales	Dryopteridaceae	4
Ostrich Fern	<i>Matteuccia struthiopteris</i> var. <i>pensylvanica</i>	(Willd.) Morton				S5		Filicales	Dryopteridaceae	5
Blue Spruce	<i>Picea pungens</i>	Engelm.				SNA	SE1	Pinales	Pinaceae	
Eastern White Cedar	<i>Thuja occidentalis</i>	L.				S5		Pinales	Cupressaceae	4
Common Red Raspberry	<i>Rubus idaeus</i>	L.				S5		Rosales	Rosaceae	2
Bur Oak	<i>Quercus macrocarpa</i>	Michx.				S5		Fagales	Fagaceae	5
American Elm	<i>Ulmus americana</i>	L.				S5		Urticales	Ulmaceae	3
Canada Anemone	<i>Anemonastrum canadense</i>	(Linnaeus) Mosyakin				S5		Ranunculales	Ranunculaceae	3
Garlic Mustard	<i>Alliaria petiolata</i>	(Bieb.) Cavara & Grande				SNA	SE5	Capparales	Brassicaceae	
Dame's Rocket	<i>Hesperis matronalis</i>	L.				SNA	SE5	Capparales	Brassicaceae	
Prickly Gooseberry	<i>Ribes cynosbati</i>	L.				S5		Rosales	Grossulariaceae	4
Black Raspberry	<i>Rubus occidentalis</i>	L.				S5		Rosales	Rosaceae	2
American Witch-hazel	<i>Hamamelis virginiana</i>	L.				S4S5		Hamamelidales	Hamamelidaceae	6
Choke Cherry	<i>Prunus virginiana</i>	L.				S5		Rosales	Rosaceae	2
Tufted Vetch	<i>Vicia cracca</i>	L.				SNA	SE5	Fabales	Fabaceae	
Manitoba Maple	<i>Acer negundo</i>	L.				S5		Sapindales	Aceraceae	0
Silver Maple	<i>Acer saccharinum</i>	L.				S5		Sapindales	Aceraceae	5
(Acer rubrum X Acer saccharinum)	<i>Acer x freemanii</i>	E. Murr.				SNA		Sapindales	Aceraceae	6
Spotted Jewelweed	<i>Impatiens capensis</i>	Meerb.				S5		Geraniales	Balsaminaceae	4
Common Buckthorn	<i>Rhamnus cathartica</i>	L.				SNA	SE5	Rhamnales	Rhamnaceae	
Glossy Buckthorn	<i>Frangula alnus</i>	P. Mill.				SNA	SE5	Rhamnales	Rhamnaceae	
Virginia Creeper	<i>Parthenocissus quinquefolia</i>	(L.) Planch.				S4?		Rhamnales	Vitaceae	6
Riverbank Grape	<i>Vitis riparia</i>	Michx.				S5		Rhamnales	Vitaceae	0
Red-osier Dogwood	<i>Cornus sericea</i>	L.				S5		Cornales	Cornaceae	2
White Ash	<i>Fraxinus americana</i>	L.				S4		Scrophulariales	Oleaceae	4
Black Ash	<i>Fraxinus nigra</i>	Marsh.	THR			S3		Scrophulariales	Oleaceae	7
Green Ash	<i>Fraxinus pennsylvanica</i>	Marsh.				S4		Scrophulariales	Oleaceae	3
Common White Snakeroot	<i>Ageratina altissima</i>	(L.) King & H.E. Robins.				S5		Asterales	Asteraceae	5
Common Milkweed	<i>Asclepias syriaca</i>	L.				S5		Gentianales	Asclepiadaceae	0
Stiff Marsh Bedstraw	<i>Galium tinctorium</i>	(L.) Scop.				S5		Rubiales	Rubiaceae	5
Northern Bush-honeysuckle	<i>Diervilla lonicera</i>	P. Mill.				S5		Dipsacales	Caprifoliaceae	5
Wild Mock-cucumber	<i>Echinocystis lobata</i>	(Michx.) Torr. & Gray				S5		Violales	Cucurbitaceae	3
Common Burdock	<i>Arctium minus</i>	Bernh.				SNA	SE5	Asterales	Asteraceae	
Tall Goldenrod	<i>Solidago altissima</i>	L.				S5		Asterales	Asteraceae	1
Creeping Thistle	<i>Cirsium arvense</i>	(L.) Scop.				SNA	SE5	Asterales	Asteraceae	
Common Dandelion	<i>Taraxacum officinale</i>	G.H. Weber ex Wiggers				SNA	SE5	Asterales	Asteraceae	
Reed Canary Grass	<i>Phalaris arundinacea</i> var. <i>arundinacea</i>					S5		Cyperales	Poaceae	0

Acronyms and References**Provincial (S-Rank) Status**

S1: Critically Imperiled - Critically imperiled in the nation or state/province because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the province

S2: Imperiled - Imperiled in the province because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors such as very steep declines making it very vulnerable to extirpation from the province

Table C1: Vacular Plant List

S3: Vulnerable - Vulnerable in the province due to restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation	
S4: Apparently Secure - Uncommon but not rare; some cause for long-term concern due to declines or other factors	
S5: Secure - Common, widespread, and abundant in the province	
SNR: Unranked - Province conservation status not yet assessed	
SNA: Not Applicable - A conservation status rank is not applicable because the species is not a suitable target for conservation activities	
SU: Unrankable - Currently unrankable due to lack of information or due to substantially conflicting information about status or trends	
Rank ranges (i.e. S2S3) indicate that the rank is either S2 or S3, but current information is insufficient to determine	
COSEWIC: Committee on the Status of Endangered Wildlife in Canada	
SARA: (Species at Risk Act) Schedule 1 Status (federal status - listed) (Government of Canada 2018)	
SARO: (Species at Risk in Ontario) Status (provincial status - listed) (Government of Ontario 2018)	
Extinct: A species that no longer exists anywhere	
Extirpated (EXT): Lives somewhere in the world, and at one time lived in the wild in Ontario, but no longer lives in the wild in Ontario	
Endangered (END): Lives in the wild in Ontario but is facing imminent extinction or extirpation	
Threatened (THR): Lives in the wild in Ontario, is not endangered, but is likely to become endangered if steps are not taken to address factors threatening it	
Special Concern (SC): Lives in the wild in Ontario, is not endangered or threatened, but may become threatened or endangered due to a combination of biological characteristics and identified threats	
Not at Risk (NAR): A species that has been evaluated and found to be not at risk	
Data Deficient (DD): A species for which there is insufficient information for a provincial status recommendation	
Coefficients of Conservatism [C]: range from 0 to 10 and represent an estimated probability that a plant is likely to occur in a landscape relatively unaltered from what is believed to be pre-European settlement conditions. A plant species with a higher score (e.g. 10) has a lower tolerance to environmental degradation and is naturally restricted to undisturbed habitats. Exotic plants are either assigned a C value of 0 or are excluded from the assessment. Plants with a C value < 4 rarely naturally populate disturbed lands.	
C 0 to 3:	lowest sensitivity
C 4 to 6:	moderate sensitivity
C 7 to 8:	high sensitivity
C 9 to 10:	highest sensitivity
Newmaster, S.G., A. Lehela, P.W.C Uhlig, S. McMurray and M.J. Oldham. 1998. Ontario Plant List. Ontario Ministry of Natural Resources, Ontario Forest Research Institute, Sault Ste. Marie, ON. Forest Research Information Paper No. 123. 550 pp. + appendices	
Natural Heritage Information Centre (NHIC). 2000. Provincial Status of plants, wildlife, and vegetation community database. http://www.gisapplication.lrc.gov.on.ca/mamnh/Index.html?site=MNR_NHLUPS_NaturalHeritage&viewer=NaturalHeritage&locale=en-US	

APPENDIX

D TREE INVENTORY RESULTS

Table D1 760 River Road Tree Inventory

Scientific Name	Common Name	Area 1 (WODM5-3)	Area 2 (WODM 5-5)	Total
<i>Acer negundo</i>	Manitoba Maple	30	69	99
<i>Fraxinus pennsylvanica</i>	Green Ash	2	39	41
<i>Ulmus americana</i>	American Elm	2	6	8
<i>Acer x freemanii</i>	Freeman’s Maple	0	11	11
<i>Thuja occidentalis</i>	Eastern White Cedar	0	11	11
<i>Picea pungens</i>	Blue Spruce	0	2	2
<i>Quercus macrocarpa</i>	Bur Oak	0	1	1
TOTAL		34	139	173

Table D2 Distinctive Trees (>50 cm DBH)

Tree ID	Scientific Name	Common Name	DBH (cm)	Condition	Eastings	Northing	Removed (Y/N)
1	<i>Acer negundo</i>	Manitoba maple	72	Good	445025	5011919	N
2	<i>Acer x freemanii</i>	Freeman's maple	50	Good	445022	5011930	N
3	<i>Acer negundo</i>	Manitoba maple	50	Good	445016	5011937	N
4	<i>Fraxinus pennsylvanica</i>	Green ash	84.5	Good, multi-stemmed	445014	5011969	N
5	<i>Acer negundo</i>	Manitoba maple	55	Good	445011	5011982	Y
6	<i>Acer negundo</i>	Manitoba maple	50	Good	445036	5011996	N
7	<i>Acer negundo</i>	Manitoba maple	56	Good	445036	5011996	N
8	<i>Acer negundo</i>	Manitoba maple	79.3	Good	445053	5012015	N
9	<i>Acer x freemanii</i>	Freeman's maple	150	Good, multi-stemmed	445045	5011945	N
10	<i>Acer negundo</i>	Manitoba maple	76.8	Good	445029	5011890	N
11	<i>Acer negundo</i>	Manitoba maple	58.8	Good	444979	5011954	Y

APPENDIX

E

SPECIES AT
RISK
SCREENING

Table E1: 760 River Road Subdivision Development - Species at Risk Screening

Scientific Name	Common Name	General Habitat According to the MNR Technical Guide (MNR, 2000)	Conservation Status			Source ³	Potential for Habitat Within Study Area	Rationale	Development Impacts
			Federal (SARA, 2002) ¹	Provincial (ESA, 2007)	S-Rank ²				
Birds									
<i>Riparia riparia</i>	Bank Swallow	Sand, clay, or gravel river banks or steep riverbank cliffs; lakeshore bluffs of easily crumbled sand or gravel; gravel pits.	THR	THR	S4B	OBBA	No	No vertical faces in silt/sand were observed within or adjacent to the Study Area.	No impact
<i>Hirundo rustica</i>	Barn Swallow	Farmlands or rural areas; cliffs, caves, rock niches; buildings or other man-made structures for nesting; open country near body of water.	THR	THR	S4B	OBBA	No	Houses, barn structures, and box culverts are absent from the Study Area.	No impact
<i>Dolichonyx oryzivorus</i>	Bobolink	Large, open expansive grasslands with dense ground cover; hayfields, meadows or fallow fields; marshes; requires tracts of grassland >50 hectares (ha).	THR	THR	S4B	OBBA	No	Graminoid meadows are absent from the Study Area.	No impact
<i>Chaetura pelagica</i>	Chimney Swift	Commonly found in urban areas near buildings; less commonly, nests in large hollow trees (> 60 cm DBH), crevices or rock cliffs, chimneys; highly gregarious; feeds over open water.	THR	THR	S4B,S4N	OBBA	No	Historic buildings containing chimneys is absent from the Study Area	No impact
<i>Sturnella magna</i>	Eastern Meadowlark	Open, grassy meadows, farmland, pastures, hayfields or grasslands with elevated singing perches; cultivated land and weedy areas with trees; old orchards with adjacent, open grassy areas >10 ha in size	THR	THR	S4B	OBBA	No	Graminoid meadows are absent from the Study Area.	No impact
<i>Contopus virens</i>	Eastern Wood-pewee	Open, deciduous, mixed or coniferous forest; predominated by oak with little understory; forest clearings, edges; farm woodlots, parks.	SC	SC	S4B	OBBA	Yes	Suitable habitat is present in the Study Area in the form of forest edges and farm woodlots. However, this species was not detected during breeding bird surveys and therefore is considered absent from the Study Area.	No impact
<i>Ammodramus savaannarum</i>	Grasshopper Sparrow	Nests in open grasslands, hayfields, pastures, alvars, and prairies. Preferably areas that are sparsely vegetated.	SC	---	S4B	OBBA	No	Open grasslands are absent from the Study Area	No impact
<i>Asio flammeus</i>	Short-eared Owl	Grasslands, meadows, and marshes; requires 75 – 100 ha of contiguous open habitat.	SC	SC	S2N,S4B	OBBA	No	Suitable habitat of grasslands of 75-100 ha is absent from the Study Area.	No impact
<i>Hylocichla mustelina</i>	Wood Thrush	Carolinian and Great Lakes-St. Lawrence forest zones; undisturbed moist mature deciduous or mixed forest with deciduous sapling growth; near pond or swamp; hardwood forest edges; must have some trees higher than 12 m.	THR	SC	S4B	OBBA	Yes	Suitable habitat in the form of moist mature forests (i.e. FODM9-2) is present in the Study Area but not within the Project footprint.	Habitat occurs outside the developable area and therefore no impacts are anticipated.
Reptiles									
<i>Chelydra serpentina</i>	Snapping Turtle	Permanent, semi-permanent freshwater; marshes, swamps or bogs; rivers and streams with soft muddy banks or bottoms; often uses soft soil or clean dry sand on south-facing slopes for nest sites; may nest at some distance from water; often hibernate together in groups in mud under water; home range size ~28 ha.	SC	SC	S3	NHIC, ON	No	The tributary within the Study Area does not provide suitable habitat as the substrate is composed of cobble stones and gravel.	No impact
<i>Graptemys geographica</i>	Northern Map Turtle	Large bodies of water with soft bottoms and abundant aquatic vegetation; uses soft soil or clean dry sand for nesting; streams are required for general movement.	SC	SC	S3	ON	No	Suitable habitat in the form of large bodies of water with soft mud bottoms are absent from the Study Area.	No impact

Scientific Name	Common Name	General Habitat According to the MNR Technical Guide (MNR, 2000)	Conservation Status			Source ³	Potential for Habitat Within Study Area	Rationale	Development Impacts
			Federal (SARA, 2002) ¹	Provincial (ESA, 2007)	S-Rank ²				
Insects (Lepidoptera)									
<i>Danaus plexippus</i>	Monarch	The habitat is typically a combination of field and forest, and provides the butterflies with a location to rest. Caterpillars eat exclusively milkweed and adults require the nectar of wildflowers to feed.	SC	SC	S2N, S4B	OBA	Yes	Marginal milkweed recorded during vegetation inventory. This species was not observed during surveys.	No impact
Mammals									
<i>Myotis leibii</i>	Eastern Small-footed Myotis	Roosts in caves, mine shafts, crevices or buildings that are in or near woodland; hibernates in cold dry caves or mines; maternity colonies in caves or buildings; hunts in forests.	END	END	S2, S3	AMO	Yes	Forest habitat may provide foraging habitat for this species.	Loss of available habitat from vegetation removals; direct impacts can be mitigated.
<i>Myotis lucifugus</i>	Little Brown Myotis	Uses caves, quarries, tunnels, hollow trees or buildings for roosting; winters in humid caves; maternity sites in dark warm areas such as attics and barns; feeds primarily in wetlands, forest edges	END	END	S3	AMO	Yes	Cavity trees in forested areas may provide roosting habitat.	Loss of available habitat from vegetation removals; direct impacts can be mitigated.
<i>Myotis septentrionalis</i>	Northern Myotis	Hibernates during winter in mines or caves; during summer males roost alone and females form maternity colonies of up to 60 adults; roosts in houses, man-made structures but prefers hollow trees or under loose bark; hunts within forests, below canopy.	END	END	S3	AMO	Yes	Cavity trees in the forested areas may provide roosting habitat.	Loss of available habitat from vegetation removals; direct impacts can be mitigated.
<i>Perimyotis subflavus</i>	Tri-colored Bat	Found in a variety of forested habitats during summer, forms day roosts and maternity colonies in older forest and occasionally in barns or other structures; forage over water and along forested streams; hibernates in a cave or underground structure and roost individually.	END	END	S3?	AMO	Yes	Cavity trees in the forested areas may provide roosting habitat.	Loss of available habitat from vegetation removals; direct impacts can be mitigated.
Vascular Plants									
<i>Juglans cinerea</i>	Butternut	Grows alone or in small groups in deciduous forests; prefers moist, well-drained soil and is often found along streams, also occurs on well-drained gravel sites and rarely on dry rocky soil; does not grow well in shade and will often grow in sunny openings and near forest edges	END	END	S2?	City of Ottawa	Yes	Suitable habitat is present in the Study Area in the form of moist riparian forested habitats. However, this species was not detected during the vegetation inventories and therefore considered absent from the Study Area.	No impact
Fish									
<i>Moxostoma valenciennesi</i>	Greater Redhorse	Found in clear, fast-moving rivers; and in both shallow and deep waters in lakes.	---	---	S3	NHIC	No	Suitable habitat of fast-moving rivers is absent from the Study Area.	No impact.
¹ END = Endangered, THR = Threatened, SC = Special Concern ² S-Rank is an indicator of commonness in the Province of Ontario. A scale between 1 and 5, with 5 being very common and 1 being the least common. ³ Information sources include: NHIC = Natural Heritage Information Centre; OBBA = Ontario Breeding Bird Atlas; ON = Ontario Nature: Ontario Reptile and Amphibian Atlas; OBA = Toronto Entomologists' Association: Ontario Butterfly Atlas; AMO = Atlas of the Mammals of Ontario; City of Ottawa: MacPherson, 2018; --- denotes no information or not applicable.									

760 River Road Subdivision Development
Environmental Impact Statement & Tree Conservation Report

Project No. 191-06688-00
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