Riverside South Development Corporation - Earl Amstrong Plaza

Environmental Impact Statement & Tree Conservation Report

Submitted to Urbandale Corporation
by Arcadis IBI Group
March 2023

Prepared for:
Marcel Denomme
Urbandale Corporation 2193 Arch Street,
Ottawa, ON K1G2H5 613-731-6712 ext. 1230
mdenomme@urbandale.com

Prepared by:
Lindsay Jackson
Arcadis IBI Group
Suite 400, 333 Preston Street, Ottawa, ON K1S 5N4
613-225-1311 ext 64067
lindsay.jackson@ibigroup.com

File No. D07-12-22-0169

File No. D07-12-22-0169

Environmental Impact Study and Tree Conservation Report

Earl Armstrong Plaza

ARCADIS
IBI GROUP

Prepared for Urbandale Corporation
by Arcadis | IBI Group
March 30, 2023

Document Control Page

CLIENT:	Urbandale Corporation
PROJECT NAME:	Earl Armstrong Plaza
REPORT TITLE:	Environmental Impact Study and Tree Conservation Report
IBI REFERENCE:	137705
VERSION:	1.0
DIGITAL MASTER:	J:\137705_RSDC-NH_Cons
ORIGINATOR:	Lindsay Jackson, Sr. Ecologist
REVIEWER:	Alex Zeller, Associate – Manager, Natural Systems
AUTHORIZATION:	Alex Zeller, Associate – Manager, Natural Systems
CIRCULATION LIST:	Marcel Denomme

Table of Contents

Table of Contents (continued)

List of Tables:

1 Introduction

1.1 Purpose

IBI Group (IBI) was retained by Urbandale Corporation (Urbandale) to complete an Environmental Impact Study (EIS) and Tree Conservation Report (TCR) for the proposed Earl Armstrong Plaza development, located at 1515 Earl Armstrong Road, in the City of Ottawa's Riverside South Community. (**Figure 1**).

This EIS and TCR has been prepared to describe the natural heritage features within the Study Area and to evaluate the potential for environmental impacts associated with the proposed development and to recommend mitigation measures to offset those impacts. The findings in this report are based on field investigations and desktop screening results.

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 outlines in the *Provincial Policy Statement (2020)* and the accompanying *Natural Heritage Reference Manual (MNRF, 2010)* (see **Figure 1**). In addition, specific Species at Risk (SAR) and natural heritage features will be considered up to two kilometres (km) from the proposed development as it may relate to specific environmental policy or legislation.

1.2 Background

The City of Ottawa requires that a scoped EIS and TCR be completed when development or site alteration is proposed on or adjacent to environmentally sensitive lands or other features outlined in the City's Natural Heritage System (NHS). This site is located next to a Natural Heritage Feature that corresponds with the Mosquito Creek corridor, which is identified within the City's Official Plan Schedule C11-C – Natural Heritage System (East) (City of Ottawa, 2021), with contributing tributaries transecting the Property. In addition to this major feature, there are also woodlands and an unevaluated wetland located within, or adjacent to, the Project footprint. This report has been prepared to consider federal, provincial, and municipal policies and regulations that may pertain to the Project.

A pre-consultation meeting was held on February 23rd, 2022 where requirements of the EIS and TCR were discussed with the City of Ottawa. This meeting identified the requirements to complete the following Species at Risk surveys:

- → Grassland Breeding Bird Surveys;
- → Amphibian Breeding Surveys.

The EIS and TCR has been prepared to; ensure the development does not contravene the Endangered Species Act (ESA, 2007), support the retention of natural vegetation where possible, evaluate potential environmental impacts, and develop mitigation plans addressing potential impacts.

1.3 Property Information

Owner:	Urbandale Corporation
Address:	1515 Earl Armstrong Road, Ottawa, Ontario
Lot and concession:	Part Lot 20, Part Lot 21, Concession 1
Zoning:	Mixed Use/Commercial Zone
Official Plan designation (Schedule B):	General Urban Area
Existing Land Uses:	Rural field

Location

The Study Area is located in the community of Riverside South and is located at 1515 Earl Armstrong Road. It is situated at the northwest corner of Earl Armstrong Road and Limebank Road, extending west to the limits of a residential development, and north towards a stormwater management facility and a multiuse path (**Figure 1**)

Land Use and Zoning

The study Area falls withing the Riverside South Community Design Plan (CDP), the City of Ottawa's Official Plan (OP) has designated the Study Area as Mixed Use/Commercial Zone. The property is zoned as General Urban Area.

N

Maxar, Microsoft

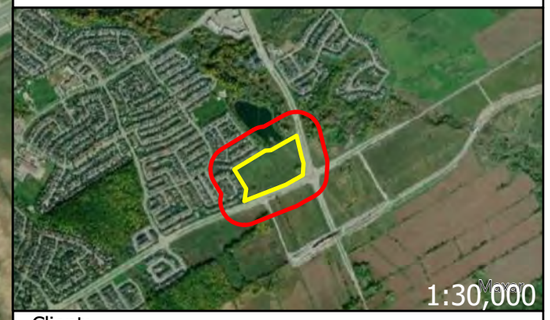
Legend

- Study Area
- Subject Property
- Woodland
- Storm Water Management Pond
- Wetland

0 0.01 0.03 0.05 0.08 0.1

Kilometers

Scale: 1:2,150



Client:

Riverside South Development Corporation (RSDC)

Title:

Earl Armstrong Plaza: Study Area and Natural Heritage Constraints

Prepared By:

IBI Defining the cities of tomorrow

Project: 137705

Date: 2022-10-05

Figure: 1

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 ay notable provisions, and provides Arcadis | IBI Group'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** below 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: Applicable policies, guidelines, and standards.

POLICY	GUIDELINES AND SUPPORTING DOCUMENTS
Federal Government of Canada	
Migratory Birds Convention Act (MBCA, 1994) (S.C. 1994, c. 22)	Environment and Climate Change Canada (ECCC) – online resources
Species at Risk Act (SARA, 2002) (S.C. 2002, c. 29)	Federal Species at Risk Public Registry: - Distribution of Aquatic Species at Risk mapping (Accessed: 04/2022)
Fisheries Act (1985) (R.S.C., 1985, c. F-14)	Fisheries and Oceans Canada – online resources
Province of Ontario	
Provincial Policy Statement (2020)	Ministry of Natural Resources and Forestry (MNRF) – Kemptville District
	MNRF Natural Heritage Information Centre (NHIC) - *Species at Risk occurrence records* - *Species of Conservation Concern* - *Natural Heritage Features*
	Significant Wildlife Habitat Technical Guide (MNRF, 2000): - Significant wildlife Habitat Eco-region 6E Criterion Schedule (MNRF, 2015).
	Ministry of the Environment, Conservation and Parks (MECP): - Species ad Risk in Ontario (SARO) List (O.Reg. 230.08)
	Ecological Land Classification for Southern Ontario, First Approximation, and its Application (Lee, et al., 1998)
	Ontario Breeding Bird Atlas (OBBA) – Online (Accessed: 04/2022)
	Ontario Reptile and Amphibian Atlas (ORAA) – Online (Accessed: 04/2022)
	Ontario Butterfly Atlas (OBA) – Online
	iNaturalist Observation Records – Online
	Atlas of the Mammals of Ontario (AMO) (Dobbyn, 1994)

POLICY	GUIDELINES AND SUPPORTING DOCUMENTS
City of Ottawa	
	Environmental Impact Statement Guidelines
	City of Ottawa Tree Conservation Report Guidelines – Online
	Site Alteration By-Law
	Protocol for Wildlife Protection During Construction
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)	- Floodplain mapping - Evaluation, Classification and Management of Headwater Drainage Features Guidelines

2.1 Ontario Endangered Species Act, 2007

The Ontario ESA (Government of Ontario, 2007) prohibits the killing or harming of species identified as Threatened and 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.

To balance social and economic considerations with protection and recovery goals, the ESA also enables the Ministry of Environment, Conservation and Parks (MECP) to issue permits or enter into agreements with proponents to authorize activities that would otherwise be prohibited by subsections 9(1) or 10(1) of the Act provided the legal requirements of the Act are met.

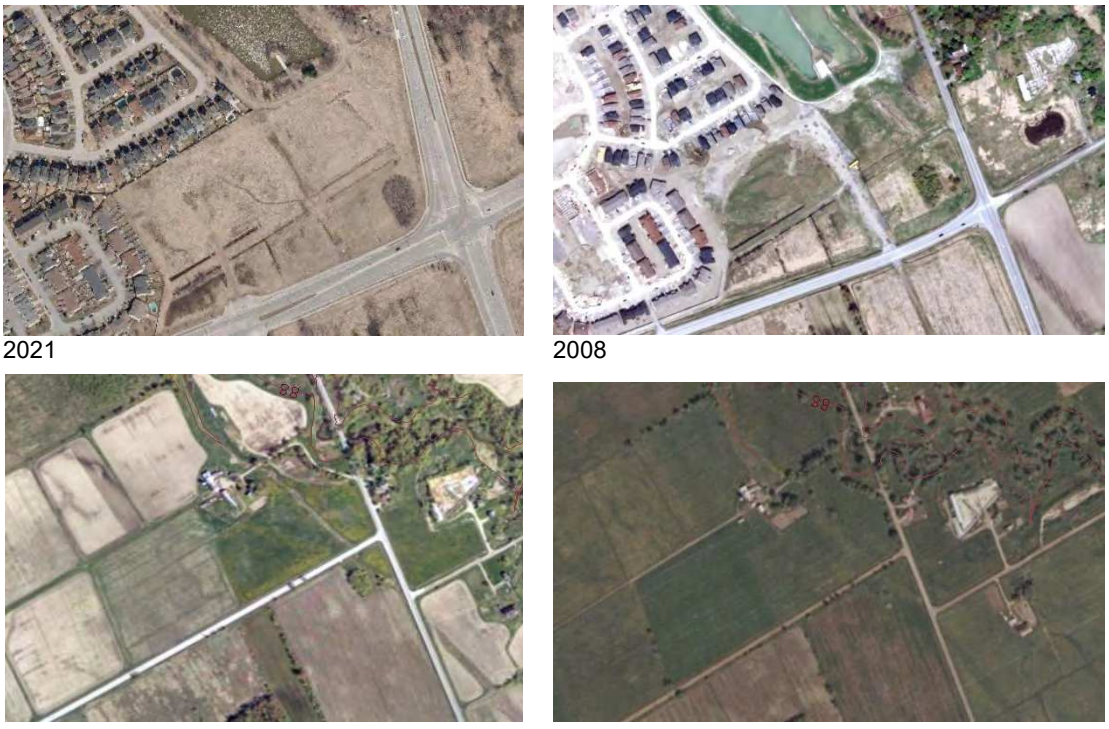
If Ontario designated Endangered/Threatened species or their habitat are believed to be directly harmed on non-federally owned land, an ESA authorization and/or permit may be required.

3 Description of the Natural Environment

A desktop review of the existing natural environment features identified within the Study Area was completed prior to field investigations to inform the studies require for this EIS and TCR. This section outlines the relevant natural heritage background.

3.1 Historic Land Use

A desktop review of recent and historic aerial imagery highlights the land uses within and adjacent to the Study Area (City of Ottawa, 2022) (**Figure 2**). From this review, the landscape has been predominantly agricultural dating back to 1976. Residential developments to the west and north of the Study Area have expanded beginning around the mid 1990's to the present day. Within the Property the land use has been used for agricultural purposes, as well as appearing to have been excavated for materials between 2005 and 2007, related to the construction of the adjacent subdivision. The Study Area has been allowed to re-naturalize and has continued to be a maintained meadow with re-generating hedgerows and a small forest stand at the southeastern extent.



2021 2008

1999 1976

Figure 2: Land use change

3.2 Landform, Soils and Geology

The Study Area is situated within the Ottawa Valley Clay Plains physiographic region (Ministry of Northern Development and Mines, 2017).

The surficial geology of the Study Area is composed of fine-textured glaciomarine deposits that are primarily silt and clay, with minor sand and gravel deposits. This material is generally well drained.

The underlying bedrock of the Study Area is part of the Oxford Formation, consisting of dolomite and limestone (Natural Resources Canada, 2016).

Overall, the Study Area is comprised of neutral, fine textured materials, with layers of silty sediments. It is likely that due to the soil and physiographic conditions withing the Study Area, that there are lower rates of infiltration, with damp to wet soils.

3.3 Aquatic Environment

3.3.1 Floodplain and Regulated Limit

The RVCA is the governing body that regulates zones with potential for flooding, protects associated natural features, and restores and enhances ecosystems within the Rideau Valley watershed. Development within these 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 floodplain mapping confirms that this property is not located within the Regulated Limits areas.

3.3.2 Fish Habitat

There is no fish habitat located within the boundaries of the Study Area. A stormwater management pond is located northeast of the Study Area and may provide some incidental fish habitat.

3.3.3 Headwater Drainage Features

Mapping by the RVCA and the City of Ottawa indicates that there are no watercourses within the Study Area. A stormwater management pond is located to the northeast of the Study Area and appears to discharge northward into Mosquito Creek.

3.4 Natural Heritage Features

Several specific natural heritage features require consideration for protection under the Ontario PPS (Ministry of Municipal Affairs and Housing, 2020). The protection of these features is generally administered by the City of Ottawa, consistent with relevant provincial and federal legislation. These features are:

- Provincially Significant Wetlands.
- Significant Woodlands.
- Significant Valleylands;
- Areas of Natural and Scientific Interest (ANSI);
- Significant Wildlife Habitat (SWH);
- Species at Risk (SAR) habitat; and,
- Fish habitat.

The section below provides a review of available background records to determine the potential presence of these natural heritage features within the Study Area. Where possible, natural heritage features have been illustrated in **Figure 1.**

3.4.1 Wetlands

A review of the City of Ottawa online mapping services (geoOttawa) and provincial natural heritage mapping (NHIC) indicates that there are no mapped wetlands within the limits of development. A portion of mapped wetland is located within Study Area, south of Earl Armstrong Road.

3.4.2 Woodlands

A review of the City of Ottawa online mapping services and provincial natural heritage mapping indicates the presence of tree cover within the Study Area.

3.4.3 Areas of Natural and Scientific Interest

No ANSI's are present within or adjacent to the Study Area.

3.4.4 Significant Wildlife Habitat

Four categories of Significant Wildlife Habitat (SWH) exist within the eastern Ontario ecoregion 6E (MNRF, 2015). These include:

- Seasonal Concentration Areas of Animals.
- Rare Vegetation Communities or specialized Habitat Wildlife.
- Habitat for Species of Conservation Concern (not including Threatened or Endangered Species); and,
- Animal Movement Corridors.

The potential for the presence of habitats matching the description of these SWH within and adjacent to the Study Area was reviewed using available background information, and aerial imagery. It was determined that there may be presence of "Specialized Habitat of Wildlife", and "Habitat for Species of Conservation Concern". The following sections describe the candidate SWH categories that may be present.

SPECIALIZED HABITAT FOR WILDLIFE

Based on the criteria established for Candidate SWH, the following specialized habitat for wildlife may be found within the Study Area:

- Amphibian Breeding Habitat: the presence of the stormwater management pond to the northeast of the Study Area may provide amphibian breeding habitat.

HABITAT FOR SPECIES OF CONSERVATION CONCERN

The Significant Wildlife Habitat Technical Guide (MNR, 2000) defines Species of Conservation Concern as globally, nationally, provincially, regionally, or locally rare (S-Rank of S2 or S3). S-Ranks are an indicator of commonness within the province of Ontario, on a scale of 1-5. S2 represents a species that is considered imperiled within Ontario. S3 represents a species considered as vulnerable within Ontario. Species of Conservation Concern does not include SAR (listed as Endangered or Threatened under the ESA, 2007). A review of background data suggests that candidate SWH for breeding birds, reptiles, and insects may occur within or adjacent to the Study Area. Those species identified have potential to be associated with the meadow community, as well as the habitat provided by the stormwater pond to the northeast of the Subject Property. **Table 2** provides a list of Species of Conservation Concern with occurrence records within and/or adjacent to the Study Area.

3.5 Species at Risk and Species at Risk Habitat

A desktop review identified the potential for several Species at Risk (SAR) to occur within and adjacent to the Study Area. Under the ESA, all species listed as Threatened or Endangered in Ontario receive immediate ‘general habitat protection’. This includes places that are used as dens, nests, hibernacula, or other residences. For some species, agencies have defined general habitat descriptions that provide science-based criteria for the habitat to be protected for some SAR species.

A review of aerial imagery was used to identify general candidate habitat for SAR based on the description of habitat provided. **Table 2** provides a list of species identified as having potential to occur withing the vicinity of the Study Area, and an assessment of habitat potential based on the MNRF’s habitat description. Based on the habitat requirements described in the table, the following species may be present withing the Study Area:

- Bobolink (D*olichonyx oryzivorus*)
- Eastern Meadowlark (*Sturnella magna*)
- Midland Painted Turtle (*Chrysemys picta marginata*)
- Snapping Turtle (*Chelydra serpentina*)
- Monarch (*Danaus plexippus*)
- Butternut (*Juglans cinerea*)

3.6 Trees

A review of aerial imagery suggests that the Study Area contains a small woodlot area at the southeast extent that is approximately 0.2 ha in size. A hedgerow extends from eat to west and appears to have some larger diameter trees.

3.7 Wildlife Habitat

In addition to the SAR noted above, a review of current and historic aerial photos of the Study Area were used to identify potential wildlife habitat. Several species of fauna common to the City of Ottawa rural and urban areas are known to live in the habitats present within the Study Area. These species may include, but are not limited to:

- **Mammals**: Raccoon (*Procyon lotor*), White-tailed deer (*Odocoileus virginianus*), Eastern Gray Squirrel (*Sciurus carolinensis*), Eastern Cottontail (*Sylvilagus floridanus*), among others.
- **Reptiles & Amphibians**: Eastern Garter Snake (Thamnophis sirtalis), American Toads (*Anaxyrus americanus*), Green Frog (*Rana clamitans*), Leopard Frog (*Lithobates pipiens*), Gray Tree Frog (*Hyla versicolor*), among others.
- **Birds**: American Crow (*Corvus brachyrhynchos*), American Goldfinch (*Spinus trtitis*), Black-capped Chickadee (*Poecile atricapillus*), Blue Jay (*Cyanocitta cristata*), Canada Goose (*Branta canadensis*), Downy Woodpecker (*Picoides pubescens*), Song Sparrow (*Melospiza melodia*), among others.

3.8 Ecological Linkages

Upon a review of aerial imagery, the function of the Study Area as an ecological linkage is likely limited to the general movement of common Ottawa wildlife throughout the landscape. Additionally, this property is not identified within an ecological linkage by the City of Ottawa (City of Ottawa, 2013).

3.9 Other Development Constraints

No other development constraints have been identified through a review of background information and aerial imagery.

Table 2: Species of Conservation Concern, and Species at Risk may be found within the Study Area.

COMMON NAME	SCIENTIFIC NAME	HABITAT DESCRIPTION	CONSERVATION STATUS			SOURCE	HABITAT PRESENT WITHIN STUDY AREA?	RATIONALE
			Federal (SARA, 2002)	Provincial (ESA, 2007)	S-Rank			
Birds								
Grasshopper Sparrow	*Ammodramus savannarum*	well-drained grassland or prairie with low cover of grasses, taller weeds on sandy soil; hayfields or weedy fallow fields; uplands with ground vegetation of various densities; perches for singing; requires tracts of grassland > 10 ha.	SC	SC	S4	OBBA	No	Grasslands within the Study Area are not > 10 ha.
Short-eared Owl	*Asio flammeus*	Grasslands, open areas or meadows that are grassy or bushy; marshes, bogs or tundra; both diurnal and nocturnal habits; ground nester; destruction of wetlands by drainage for agriculture is an important factor in the decline of this species; home range 25 -125 ha; requires 75-100 ha of contiguous open habitat	SC	SC	S2	OBBA	No	Grasslands within the Study Area are not 75 ha of contiguous habitat.
Herpetozoa								
Blanding's Turtle	*Emydoidea blandingii*	Shallow water marshes, bogs, ponds or swamps, or coves in larger lakes with soft muddy bottoms and aquatic vegetation; they frequently move from aquatic habitat to terrestrial habitats; hibernates in bogs; not readily observed.	END	THR	S3	ON	No	Study Area does not provide connectivity to hibernating habitat. Mosquito Creek corridor connects to Rideau River. The Study Area does not contain shallow water marshes, bogs, ponds, or coves of larger lakes.
Midland Painted Turtle	***Chrysemys picta marginata***	**Quiet, warm, shallow water with abundant aquatic vegetation such as ponds, large pools, streams, ditches, swamps, marshy meadows; eggs are laid in sandy places, usually in a bank or hillside, or in fields; basks in groups; not territorial**	**SC**	**N/A**	**S4**	**ON**	**Yes**	**Stormwater management pond provides quiet, warm, shallow water with abundant aquatic vegetation. Soft substrate within the Study Area may provide nesting habitat.**

Northern Map Turtle	*Graptemys geographica*	Large bodies of water with soft bottoms, and aquatic vegetation; basks on logs or rocks or on beaches and grassy edges, will bask in groups; uses soft soil or clean dry sand for nest sites; may nest at some distance from water; home range size is larger for females (about 70 ha) than males (about 30 ha) and includes hibernation, basking, nesting and feeding areas; aquatic corridors (e.g. stream) are required for movement; not readily observed	SC	SC	S3	ON	No	The Study Area does not provide appropriate nesting habitat for Northern Map Turtles. The SWMP does not provide suitable aquatic habitat.
Snapping Turtle	***Chelydra serpentina***	**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**	**S4**	**ON**	**Yes**	**Permanent freshwater occurs within the SWMP within the Study Area. Soft substrate within the Study Area may provide nesting habitat.**
Insects								
Monarch	***Danaus plexippus***	**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.**	**END**	**SC**	**S2**	**BA**	**Yes**	**Meadow communities within the Study Area contains milkweed plants that potentially provide feeding and breeding habitat.**
Vascular Plants								
Butternut	***Juglans cinerea***	**In Ontario, Butternut usually grows alone or in small groups in deciduous forests. It prefers moist, well-drained soil and is often found along streams. It is also found on well-drained gravel sites and rarely on dry rocky soil. This species does not do well in the shade, and often grows in sunny openings and near forest edges.**	**END**	**END**	**S2**	**NHIC**	**Yes**	**Property has suitable soils for butternut trees to thrive. Records confirm the presence of butternuts within the vicinity of the Study Area.**

4 Methodology

4.1 Scope of Work

Based on the description of the existing natural environment outlined above, the natural heritage surveys outlined below have been scoped to assess the impacts of the proposed development on the natural environment. These surveys followed industry standard protocols and are intended to establish baseline conditions.

These surveys are used to evaluate the potential for negative impacts which may occur as a result from the proposed development project. 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.

NATURAL HERITAGE FEATURES

- Ecological Land Classification (ELC), including:
  - Vegetation survey
  - Woodland delineation and evaluation
- Identification of potential SWH, including:
  - Breeding Bird Surveys
  - Amphibian Breeding Surveys
  - General habitat assessment for Species of Conservation Concern
  - Incidental SWH observations

SPECIES AT RISK

- Identification of potential Species at Risk and Species at Risk habitat

TREES

- Tree inventory and assessment

INCIDENTAL WILDLIFE

- Visual and auditory observations of wildlife during all field studies

4.2 Natural Heritage Features

4.2.1 Vegetation Community

Vegetation communities within the Study Area were characterized and mapped using the ELC system for Southern Ontario (Lee, et al., 1988). The ecological community boundaries were determined through the review of aerial photography and then further refined through on-site vegetation surveys as specified by the protocol. For areas where access was not granted, observations were conducted from either the road right-of-way or the property edge to the extent visible.

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 have been described to the community level only or have been described as an inclusion or complex to an exiting vegetation community. 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 in this study as they are more representative of the vegetation communities within the Study Area.

Vegetation Survey

Vegetation was inventoried in tandem with ELC surveys and a corresponding vascular plant list was compiled. All other plant species identified from other survey results are also included in the list. In addition, the vascular plants observed at the time of survey have been used to screen for any provincially rare species or SAR 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 (2005) and Michigan Flora Online (2015).

4.2.2 Woodlands

The woodlands within the Study Area were assessed for significant following the updates guidelines provided by the City of Ottawa in the Significant Woodlands: Guidelines for Identification, Evaluation, and Impact Assessment. In the urban expansion areas, significant woodlands are evaluated using criteria under the ‘Established Urban Process’ (City of Ottawa, 2021). If the following criteria is met, the woodland is considered significant:

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; and*
2. *In the rural area, meeting any one of the criteria in the Natural Heritage Reference Manual, as assessed in a subwatershed planning context and applied in accordance with Council-approved guidelines, where such guidelines exist; or*
3. *In the urban area, any contiguous area 0.8 hectares in size or larger, supporting woodland 60 years of age and older at the time of evaluation.*

The significance of woodlands within this Study Area will be determined using criteria #1 and #3. The ELC delineation was used to determine the size of woodlands and historic aerial imagery and tree inventories were used to estimate the age.

However, as outlined in the City's *Significant Woodlands: Guidelines for Identification, Evaluation, and Impact Assessment* (2019b), new significant woodlands will not be identified in urban areas where the NHS was already identified through Secondary Plans. As no Secondary Plans exist for this site, this policy would not apply.

4.2.3 Significant Wildlife Habitat

Breeding bird and amphibian breeding surveys were conducted in order to establish baseline conditions within the Study Area.

Breeding Bird Survey

Diurnal breeding bird surveys conducted within the Study Area followed the methods outlined in the *Ontario Breeding Bird Atlas Guide for Participants* (Cadman et al 2007) and were completed between late May and early July (three surveys). Specifically, breeding bird surveys consisted of three-minute point counts that were used to establish quantitative estimates of bird abundance in habitat types within the Study Area (see **Figure 4** for survey locations). 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

Amphibian monitoring will follow *the Marsh Monitoring Program Participant's Handbook for Surveying Amphibians protocol* (Bird Studies Canada, 2009 Edition). In accordance with the survey protocol, three different surveys will be conducted between April 15th and June 30th, with at least two weeks between each visit (see **Figure 4** for survey locations). Surveys begin at least one-half hour after sunset during evenings with a minimum night temperature of 5ºC, 10ºC, and 17ºC for each of the three respective surveys.

Each amphibian survey generally involves standing at a predetermined station for three minutes and listening for frog calls. The calling activity of individuals estimated to be within 100 m of the observation point is documented. All individuals beyond 100 m are recorded as outside the count circle and calling activity was not recorded. Calling activity is then ranked using one of the three abundance code categories:

- Code 1: Calls not simultaneous, number of individuals can be accurately counted;
- Code 2: Some calls simultaneous, number of individuals can be reliably estimated; and,
- Code 3: Calls continuous and overlapping, number of individuals cannot be estimated.

In areas where candidate amphibian habitat exists, vernal pools will be visually examined for egg masses and amphibian larvae in conjunction with other field surveys. These searches will occur between April and June when amphibians were concentrated around suitable breeding habitat.

Habitat for Species of Conservation Concern

In addition to the targeted wildlife and vegetation community surveys described above, general habitat observations will be noted as it relates to the habitat requirements for Species of Conservation Concern identified in **Table 2**.

Incidental Observations of Significant Wildlife Habitat

Any incidental observations of other candidate SWH features will be documented during all site visits. Specifically, observations associated with Seasonal Concentrations of Wildlife Habitat and Specialized Habitat for Wildlife will be made during all site visits.

4.3 Species at Risk and Species at Risk Habitat

Targeted SAR surveys for Monarch and Butternut were completed. The surveys also included general breeding bird surveys to record any potential SAR birds, specifically grassland birds. The bird survey is described in section 4.4.4.

Monarch

Monarch detection and habitat assessment surveys were completed throughout the Study Area. The survey focused on areas with suitable habitat conditions (e.g. areas with abundant Milkweed (Asclepias sp.) and nectar producing plants. Surveys were completed between June and August2022.

Butternut

IBI biologist conducted systematic searches for Butternut throughout the Study Area between July and August 2022. In addition, searches for Butternuts were also simultaneously completed during wildlife and vegetation surveys within Study Area during the 2022 field program.

The survey consisted of walking throughout the Study Area and identifying Butternut specimens. Once located, qualified biologist performed a preliminary Butternut Health Assessment (BHA) and followed guidelines outlined in Butternut Health Assessor's Field Guide (MNRF, 2015) and Butternut Assessment Guidelines: Assessment of Butternut Tree Health for the Purposes of the Endangered Species Act, 2007 (MNRF, 2014).

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.

4.4 Trees

Following the City of Ottawa's *Tree Conservation Report Guidelines* (City of Ottawa, 2019a), a tree inventory was completed in July 2022. The survey area consists of a 0.2 ha woodlot with low species abundance. As discussed with the City forester, two 10 m diameter plots were surveyed within the woodlot.

Within each plot, any tree or shrub species that were 10 cm diameter at breast height (DBH) or greater were recorded and assessed. Each tree assessment recorded the following; species, DBH, health condition (trunk integrity, canopy structure, canopy vigor), UTM coordinate, and any other defects.

To identify Distinctive trees (≥50 cm DBH) on site, the Study Area was scoped on foot by walking transects throughout and recording the location, species, DBH, and health conditions of all Distinctive trees. Such surveys were conducted by an approved professional as outlined in the City guidelines.

4.5 Incidental Wildlife

A wildlife assessment within the property was completed through incidental observations during all site visits. Any incidental observations of wildlife as well as other wildlife evidence such as dens, tracks, and scat were documented by means of observational notes, and photographed. Such observations help validate our conclusions on the ecological function of the Study Area.

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 **Figures 3 and 4** depending on survey context.

Table 3: Summary of survey dates and weather conditions.

PURPOSE OF VISIT	DATE	TIME	PERSONNEL	WEATHER CONDITIONS	AIR TEMP (C)
Amphibian Survey #1	04/05/2022	8:30 PM - 10:00 PM	L.Jackson	Clear skies, calm winds	12
Amphibian Survey #2	31/05/2022	8:30 PM - 10:30 PM	L.Jackson & B.Semmler	Light rain, 10% cloud cover, gentle breeze	18
Breeding Bird Point Count Survey #1/ELC	25/05/2022	9:00 AM - 12:30 PM	L. Jackson & B.Semmler	Cloudy/overcast, Slight breeze	12
Amphibian Survey #3,	19/06/2022	9:30 AM - 10:30 PM	L. Jackson & B.Semmler	Hazy, 40% cloud cover, calm winds	13
Breeding Bird Point Count Survey #2	22/06/2022	8:00 AM - 10:00 AM	L.Jackson	Partly cloudy, Light breeze	20
Breeding Bird Point Count Survey #3	30/06/2022	9:00 AM - 10:00 AM	L.Jackson	Cloudy/overcast, calm breeze	18
Tree Inventory/ELC	05/08/2022	10:00 AM - 3:00 PM	B.Semmler	Overcast, slight breeze	22

5.1 Site Investigations

Fieldwork conducted for the EIS and TCR took place between April 2022, and August 2022, when weather conditions and timing were deemed suitable based on the survey protocols being implemented. Fieldwork consisted of ELC of vegetation communities, Tree Inventory, HDF Assessment, breeding bird surveys, and amphibian breeding surveys. Any incidental wildlife observations made during the surveys were also documented. Curricula Vitae of key staff involved in the project have been included in **Appendix A.** The dates, times, surveyor names, and weather conditions for all surveys are listed in **Table 3** above**.**

5.2 Natural Heritage Features

5.2.1 Ecological Land Classification

The ELC survey identified a total of three (3) vegetation communities within the Study Area.

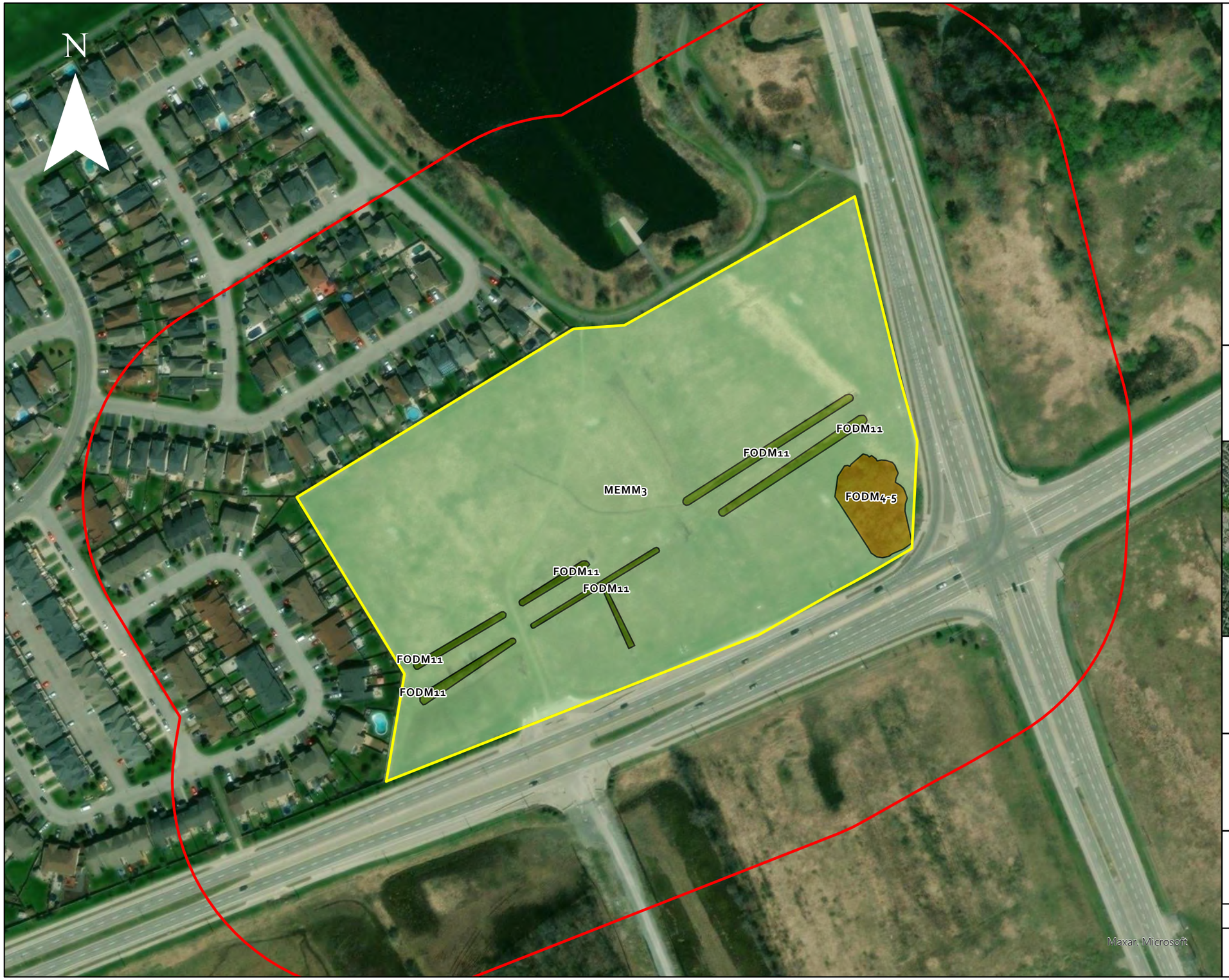
The prominent vegetation community within the Survey Area is a meadow, along with a small woodlot. All vegetation communities surveyed within the Survey Area are considered common within Ontario. **Table 4** below outlines the communities documented during ELC surveys and summarizes the abundant vegetation cover. The location, type, and boundaries of vegetation communities are delineated in **Figure 3**. Reference photos for the vegetation communities are included in **Appendix B**.

VEGETATION SURVEY

The vegetation survey identified 30 vegetation species within the Survey Area. 80% of the species identified were evaluated as being common within Ontario, having S-Ranks of S4 or S5. Nearly 20% of the species identified are considered as non-native or invasive in Ontario.

Table 4: Summary of ELC communities found within the Study Area

ELC TYPE	TOTAL AREA	COMMUNITY DESCRIPTION
Deciduous Forest (FOD)		
FODM4-5 Dry-Fresh Manitoba Maple Deciduous Forest Type	0.2	This forest community is present at the south-east corner of the Study Area. The forest is a stand of pre-dominantly Manitoba maple (*Acer negundo*) trees, and some green ash (*Fraxinus pensylvanica*). The under-story of the forest is composed of invasive species such as common buckthorn (*Rhamnus cathartica*), and amur honeysuckle (*Lonicera maackii*) as well as hawthorne species (*Crataegus Spp.*).
FODM11 Naturalized Deciduous Hedge-row Ecosite	0.19	These communities are located in areas that were previously adjacent to a right-of-way that existed within the Study Area, and previously acted as hedgerows between agricultural fields. Species include trees such as Burr oak (*Quercus macrocarpa*), American elm (*Ulmus americana*) and green ash (*Fraxinus pensylvanica*), shrubs such as common buckthorn, red-osier dogwood (*Cornus stolonifera)*, cranberry viburnum (*Viburnum opulus*) and chokecherry (*Prunus virginiana*).
Mixed Meadow (MEM)		
MEMM3 Dry-Fresh Mixed Meadow Ecosite	5.76	A naturalized meadow inclusive of Canada goldenrod (*Solidago canadensis*) common vetch (*Vicia sativa*), common dandelion (*Taraxacum officinale*), poison ivy (*Toxicodendron radicans*), wild strawberry (*Fragaria virginiana*), horsetail , field mustard (*Brassica rapa)* and a variety of graminoid species. This area was noted to have been maintained throughout the field season.



Legend

- Study Area
- Subject Property

Layer

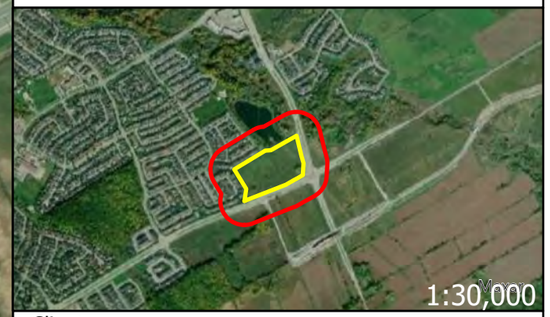
ELC Deliniation

- FODM11
- FODM4-5
- MEMM3

0 0.01 0.03 0.05 0.08 0.1

Kilometers

Scale: 1:2,150



Client:

Riverside South Development Corporation (RSDC)

Title:

Earl Armstrong Plaza: Ecological Land Classification

Prepared By:

IBI Defining the cities of tomorrow

Project: 137705

Date: 2022-10-05

Figure: 3

5.2.2 Woodlands

A Dry-Fresh Manitoba Maple Deciduous Forest Type exists in the southeast corner of the Study Area. It does not meet the prerequisite woodland designation as set out in the Forestry Act, R.S.O 1990, c.F.26.

In reviewing historic aerial imagery dating back to 1976 (46 years, current to 2022), the imagery suggests that the tree stand persisted within the northern extent of an agricultural field until 2002, when a right-of-way was built through the southern edge of the Study Area, just north of the forested area. In 2005, Earl Armstrong Road was then re-aligned to the south of the forested area. The area is approximately 0.2 ha in size, therefore does not meet the minimum size requirement to be considered significant as per the City of Ottawa's Significant Woodlands: Guidelines for Identification, Evaluation, and Impact Assessment.

5.2.3 Significant Wildlife Habitat

Breeding bird and amphibian breeding surveys were conducted to establish baseline conditions within the Study Area.

Breeding Bird Survey

A total of 20 species were recorded during the surveys, survey points can be found in **Figure 4**. A record of the bird species observed within the Study Area, and their conservation status can be found in **Appendix D**. Of the species recorded, the majority exhibited probable or confirmed breeding evidence. Many of the birds recorded are common within the City of Ottawa. Only one (1) SAR bird, Bobolink, was recorded during the surveys. Some birds were considered to be fly-overs and were not using the study area as nesting habitat. Most birds observed on-site are common in Ottawa and have generally secure populations within Ontario.

Though Bobolinks were observed during field visit #1 (BBS-1 and BBS-2), significant habitat requires >50 ha of contiguous suitable habitat (meadows, grasslands, fallow fields) which are not present within the Study Area. It is possible that Bobolinks are using the fields to the east of Limebank Road where suitable habitat exists.

Based on surveys conducted by IBI, the Study Area contains suitable habitat conditions to support breeding birds common to Ottawa and eastern Ontario. However, the results indicate that the Study Area is not considered SWH for breeding birds.

Amphibian Breeding Survey

In accordance with the Ecoregion 6E Criterion Schedule (MNRF, 2015b), three amphibian breeding surveys were completed to determine the presence of Amphibian Breeding Habitat for the stormwater pond feature within the Study Area (**Figure 4**). Amphibian Breeding Surveys were conducted for permanent water features that occurred within or in proximity to the 120 m Study Area.

One (1) station was monitored on three (3) separate occasions for frog calls. the Study Area upon field visits.

N

AMP-1

BBS-1

BBS-2

2

1

1

Maxar, Microsoft

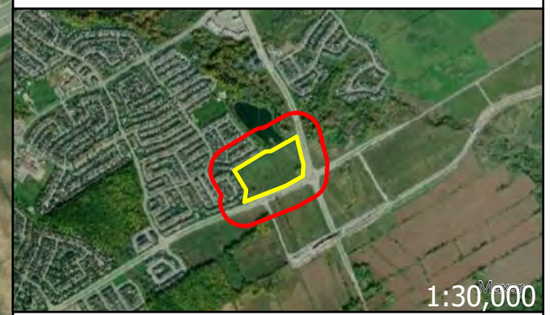
Legend

- Study Area
- Subject Property
- Amphibian Breeding Survey Point
- Breeding Bird Survey Point
- Tree Inventory Survey Plot
- Distinctive Tree

0 0.01 0.03 0.05 0.08 0.1

Kilometers

Scale: 1:2,150



Client:

Riverside South Development Corporation (RSDC)

Title:

Earl Armstrong Plaza: Field Survey Points

Prepared By:

IBI Defining the cities of tomorrow

Project: 137705

Date: 2022-10-05

Figure: 4

Table 5: Summary of Amphibian Call Surveys completed within the Study Area.

PURPOSE OF VISIT	DATE	TIME	WEATHER CONDITIONS	AIR TEMP (C)	SPECIES RECORDED	CALL CODE
Amphibian Survey #1	04/05/2022	10:00 PM – 10:15 PM	Clear skies, calm winds	12	N/A	N/A
Amphibian Survey #2	31/05/2022	10:30 PM – 10:35 PM	Light rain, 10% cloud cover, gentle breeze	18	Green Frog	2 - Simultaneous
Amphibian Survey #3	19/06/2022	10:45 PM –11:00 PM	Hazy, 40% cloud cover, calm winds	13	Green Frog	2 - Simultaneous

In addition to those observations made during the formal surveys, amphibian species such as spring peepers, American toads and gray treefrogs were heard calling at the time of surveys, but never within the Study Area. Amphibian species such as the gray treefrogs, spring peepers, American toads, were heard calling from within the property east of Limebank Road.

Based on the results of the amphibian surveys and general field observations in 2022, it is likely that the stormwater management pond at the north east of the Study Area provides breeding habitat for some amphibian species, however is not considered to be significant under provincial criteria.

Habitat for Species of Conservation Concern

Potential habitat for four (4) SCC (***Table 2***) were confirmed during the ELC assessment. Results of suitable habitat and the presence/absence of SCC within the Study Area include:

- **Monarch**: no monarchs were observed directly during field surveys, however several areas of suitable habitat containing Milkweed were recorded throughout the Study Area. It is likely that the Study Area contains breeding and feeding habitat for Monarch.
- **Midland Painted Turtle:** no Midland Painted Turtles were observed directly during field surveys, however the stormwater management pond directly to the northeast of the project footprint could provide basking and feeding habitat. In addition, loose substrate near the multi-use path, and within the Study Area could be used as nesting habitat.
- **Snapping Turtle:** no snapping turtles were observed directly during field surveys, however the stormwater management pond directly to the northeast of the project footprint could provide basking and feeding habitat. In addition, loose substrate near the multi-use path, and within the Study Area could be used as nesting habitat.

Incidental Observations of Significant Wildlife Habitat

There were no incidental observations of SWH during the preliminary site visit or ELC and tree surveys.

5.3 Species at Risk

The following section described the findings of the targeted SAR surveys.

Bobolink and Eastern Meadowlark

Three (3) breeding bird surveys were completed in suitable grassland habitat throughout the Study Area for Bobolink and Eastern Meadowlark (see **Figure 4**). Five (5) male Bobolink were observed and heard calling at BBS-1 and BBS-2 at the time of the first survey on May 25, 2022, however no nesting activity/behaviours were observed at the time of survey. Subsequent targeted surveys (or incidental observations) in this area did not identify further observations of Bobolink. As there were no substantive change to the available habitat, it is assumed that these birds chose other habitats/regions to pursue nesting.

No Eastern Meadowlark were observed during the targeted surveys or incidentally during other site visits.

Results from targeted field surveys indicated that no Bobolink nesting activity or courtship behaviours was occurring within the Study Area. This suggests that that Bobolink were simply using the habitat within the property for forging or as a stop over prior to the breeding season. Therefore, no “general habitat” is located within the Study Area.

Monarch

During all field investigations, surveys were conducted for Common Milkweed. Through the meadow appeared to be maintained, Common Milkweed plants were observed during field visits and may provide appropriate breeding ang feeding habitat for the Monarch.

Butternut

A search for Butternut trees was conducted during the tree inventory, no Butternut trees were identified within the Study Area.

5.4 Trees

The woodland at the south-eastern extent of the Study Area and the hedgerows, were inventoried using groupings in forests with similar assemblages to characterize impacted trees.

One (1) distinctive tree was identified within the hedgerow during the tree inventory and is listed within **Table 6 and Figure 4**.

Ten (10) tree species were observed within the Subject Property and are listed below (trees marked with an asterisk (*) are non-native or invasive):

- **Bur Oak** (*Quercus macrocarpa*)
- **Canada Plum** (*Prunus nigra)*
- **Ironwood** (*Ostrya virginiana*)
- **Manitoba Maple** (*Acer negund*o)
- **American elm** (*Ulmus americana*)
- **Trembling Aspen** (*Populus tremuloides*)
- **Common Buckthorn** (*Rhanmnus cathartica*)*
- **Green Ash** (*Fraxinus pennsylvanica*)
- **Large Tooth Aspen** (*Populus gradidentata*)

Randomly selected tree inventory plots (10'x10') were surveyed within areas of anticipated vegetation removal in the 0.2 ha woodlot at the southeast extent of the Study Area and hedgerows (**Figure 4**). The tree composition within the woodlot was dominated by Manitoba maple (70%), with presence of green ash (23%), and American elm (7%). DBH measurements indicate a young to mid-aged stand.

Trees within the hedgerows are smaller trees and shrubs such as Manitoba maples, green ash, American elm, and large tooth aspen. with the exception of the distinctive Bur Oak.

Table 6: Summary of distinctive trees found within the Study Area.

TREE ID	COMMON NAME	SCIENTIFIC NAME	DBH (CM)	CONDITION	EASTING	NORTHING
1	Burr Oak	*Quercus macrocarpa*	58	Very Good	447372	5014272

5.5 Ecological Linkages

The function of the Study Area as an ecological linkage is limited to the general movement of common Ottawa wildlife throughout the landscape.

5.6 Incidental Wildlife

No incidental wildlife observations were made during field visits.

6 Description of the Proposed Project

Urbandale Corporation is proposing to develop a multi-land use development including eleven (11) retail buildings, one (1) multilevel office building, and 722 parking stalls. A right-of-way transects the property extending from Earl Armstrong Road, towards Limebank Road. The Site Plan and Limit of Development and proposed impacts are illustrated in **Figure 5.**

The development also provides pedestrian access to a broader system of multi-use path system and provides connectivity to the broader active transportation network.

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.

N

Maxar, Microsoft

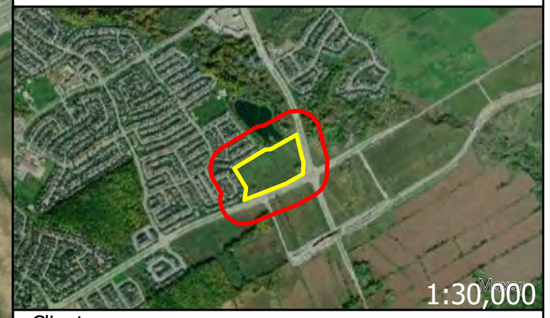
Legend

- Study Area
- Subject Property
- Hedgerow
- Woodland
- Distinctive Tree
- Vegetation/Tree Removals
- City Tree - Quercus rubra, Dia= 5 cm DBH

0 0.01 0.03 0.05 0.08 0.1

Kilometers

Scale: 1:2,150



Client:

Riverside South Development Corporation (RSDC)

Title:

Earl Armstrong Plaza: Development Overlay And Impacted Areas

Prepared By:

IBI Defining the cities of tomorrow

Project: 137705

Date: 2023-03-30

Figure: 5

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 temporary (i.e. construction related) impacts and permanent impacts associated with the occupation of the development. The anticipated impacts are illustrated in **Figure 5**.

7.1 Natural Heritage Features

7.1.1 Vegetation Communities

It is anticipated to accommodate the construction of the residential and commercial development, including parking 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 6.15 ha of native vegetation. 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:
    - 5.76 ha of Mixed Meadow;
    - 0.19 ha of Hedgerows; and
    - 0.20 ha of Manitoba Maple forest type.
- 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.

Proposed Mitigation Measures – Planning and Design Stage

- ✓ Landscaping plans shall incorporate native vegetation and plantings where feasible. For example, a naturalized pollinator garden or rain gardens should be considered adjacent to parking lots to provide native vegetation as well as an opportunity for infiltration of stormwater run off.
- ✓ Incorporate permeable, or light-coloured surfaces wherever possible to reduce heat retention and encourage natural infiltration of stormwater.
- ✓ Low-impact design (LID) such as green roofs or grey roofs can be considered at the detailed design stage.

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 shall be used to delineate the construction limits from the adjacent habitat. This will prevent encroachment of construction activities into the adjacent natural feature. This fencing should be monitored weekly to ensure it is functioning properly. Any deficiency in the fencing should be dealt with within 48 hours of notification;
- ✓ Erosion and sediment control plan shall be implemented to prevent sedimentation outside of work areas;
- ✓ Landscaping plans shall make use of appropriate native species to offset the loss of species and biodiversity from vegetation removals;
- ✓ Invasive species to be removed shall be done so using species-appropriate methods to prevent further contamination, and comply with invasive species legislation;
- ✓ Machinery will arrive on site in a clean condition and will be free of fluid leaks, invasive species, and noxious weeds;
- ✓ **Machinery shall remain within the limit of development and shall be stored in an area that is isolated from the stormwater management pond to ensure that no deleterious substances enter the adjacent watercourse;**
- ✓ All excess construction material will be removed from site and the area restored with seeding of native species upon project completion as required.

Proposed Mitigation Measures – Post-Construction

- ✓ Naturalized features such as pollinator gardens, rain gardens and native tree and shrub planting shall be monitored according to the developed monitoring plans;
- ✓ Installation of garbage bins in public spaces is recommended to limit trash in habitats adjacent to the development area; and,
- ✓ 'No Littering' signage is recommended around the property to discourage littering.

With the successful implementation of the mitigation measures outlined above, a low decrease in native terrestrial vegetation is anticipated due to a minor amount of vegetation proposed for removal.

7.1.2 Woodlands

It is expected that approximately 0.20 ha of Manitoba maple forest will be cleared to accommodate the development of the retail and office spaces and accompanying parking stalls.

This woodland has some remaining mature and healthy trees, but is dominated by Manitoba maples, a short-lived, opportunist tree, as well as green ash trees with widespread evidence of Emerald Ash Borer damage. Additionally, there is a large presence of common buckthorn.

Woodland removal in this area will decrease canopy cover and permeable surfaces and reduce available terrestrial habitat for wildlife. The reduction of vegetative cover has he potential to cause an urban heat island.

To offset the loss of woodlands within the subject property, it is recommended to develop an enhanced planting plan with native trees and shrubs throughout the edge of the proposed project footprint, along the established residential subdivision and along the multi-use path at the northern edge of the Study Area. Additionally, the incorporation of street trees along the rights-of-way can also contribute to an increase in tree cover.

Re-planting and vegetating the edge of the development with native vegetation with appropriate native species would improve the biodiversity and ecological functions of these areas, as well as improve the social functions and benefits (i.e. aesthetic appeal, opportunities for interaction) for nearby residents.

The development of a planting plan should be done in coordination with the City of Ottawa to identify targets for planting and appropriate species.

The anticipated impacts to woodlands include:

- The permanent loss of approximately 0.39 ha of non-significant woodlands within the proposed development area, including;
  - 0.19 ha of Hedgerows; and,
  - 0.20 ha of dry-fresh Manitoba maple deciduous forest.
- Decreased biodiversity, reduced number of species, or abundance of species;
- The permanent loss of habitat for wildlife dependent upon these woodlands;
- Decrease of permeable surfaces and surface drainage;
- Reduced canopy cover; and,
- Erosion and sedimentation into adjacent habitats.

Proposed Mitigation Measures – Planning and Design Stage

- ✓ Development of enhanced tree planting plan as compensation for tree cover loss, as described in Section 7.1.1;
- ✓ Development of site plan to provide for energy conservation through appropriate location and choice of species to provide shade and cooling during summer, and wind protection in winter;
- ✓ Development of planting plan to utilize native species and species with low watering requirements

Proposed Mitigation Measures - Construction Stage

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

- ✓ General project landscaping plans should consider use of appropriate native species to offset loss of species, biodiversity, and canopy cover from vegetation removals; and,
- ✓ General mitigation for vegetation removals as described in Section 7.1.1.

It is anticipated that the clearing of woodland and hedgerows within the subject property will result in an overall reduction of woodland habitat within the property; although this will be offset by an increase of native plant diversity and a large reduction of non-native, or weedy vegetation.

7.1.3 Significant Wildlife Habitat

BREEDING BIRDS

It is expected that the removal and disturbance to forest, hedgerows and meadow within the proposed development area will result in a 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 composition, distribution, and abundance of a bird species within the area;
- Predation by domestic cats during occupation; and,
- 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. Potential measures may include the following:

- ✓ General building design should incorporate the City of Ottawa's bird-friendly design guidelines where possible (City of Ottawa, 2020);
- ✓ Enhanced tree planting and reforestation measures should consider bird breeding and foraging habitat within the subject property.

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 15th and August 15th. Should any clearing be required during the breeding bird season, nest searches shall be 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 Migratory Birds Convention Act (MBCA) (Government of Canada, 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 for care with a small donation of money to help pay for the care (a local facility is the *Ottawa Valley Wild Bird Care Centre*);
- ✓ The construction area should be pre-stressed prior to any vegetation clearing within the proposed development area; and,
- ✓ 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 recommended mitigation, a temporary site-wide loss of breeding and foraging habitat for birds is expected.

HABITAT FOR SPECIES OF CONSERVATION CONCERN

Habitat for one (1) Species of Conservation Concern (Monarch) was encountered on-site during field investigations and candidate habitat for five other Species of Conservation Concern was identified within the Study Area. The following impacts to Species of Conservation Concern are expected:

- Disturbance or removal of suitable marginal breeding and feeding habitat for Monarch;

— Accidental harm or injury to Monarch during construction activities.

Proposed Mitigation Measures – Planning and Design Stage

✓ Development and implementation of invasive species management plan, specifically addressing dog strangling vine (*Cynanchum rossicum*), should be implemented to limit risk of harmful plants to Monarch and Species of Conservation Concern birds.

Proposed Mitigation Measures – Construction Implementation

✓ Clearing of vegetation should be avoided between April 15th and September 15th, to avoid potential physical harm to Monarch and Species of Conservation Concern birds during breeding and foraging seasons; and,

✓ Construction areas should be pre-stressed during clearing to allow Species of Conservation Concern to safely leave the area.

Proposed Mitigation Measures – Post-Construction

✓ Pesticide use should be limited, or avoided when possible, in landscape maintenance to reduce risk of exposure to Monarch.

With the successful implementation of the mitigation measures outlined above, it is anticipated that there will be minimal impacts to Species of Conservation Concern.

7.2 Species at Risk

Bobolink and Eastern Meadowlark

It is anticipated that vegetation clearing and construction within the meadow habitat within the development area will result in the permanent but non-limiting removal of foraging habitat for Bobolink and Eastern Meadowlark. It is also possible that vegetation clearing may result in the displacement, injury, or death of Bobolink or Eastern Meadowlark which may occur within the Survey Area.

Mitigation During Construction

✓ Vegetation clearing should be avoided between April 15th and August 15th to avoid potential physical harm to Bobolink and Eastern Meadowlark; and

✓ Environmental awareness information package should be delivered to construction staff to make them aware of potential presence of SAR and protocols if SAR are found incidentally during work activities.

With the successful implementation of the recommended mitigation, it is expected that the proposed development will have no direct impacts to Bobolink or Eastern Meadowlark.

7.3 Trees

It is understood that the site development will require grading and will therefore require tree clearing, including all trees within the Study Area. The tree removals will result in a permanent decrease in primarily young to mid-aged trees, and one distinctive tree. As described in **Section 5.4**, the tree community within the limit of development consists mainly of less desirable native and/or invasive species with an average DBH 15 cm (see **Figure 5** for anticipated impacts to trees).

To offset the loss of trees within the subject property, it is recommended to incorporate native tree plantings throughout the edge of development. This includes streetscape and plantings to buffer the existing residential development from the proposed plaza development, as well as increased tree planting within along the multi-use path and in appropriate areas around the development. Replanting native trees throughout the subject property will increase the overall diversity, mitigate against the encroachment, and spread of non-native tree and shrub species such as Buckthorn, and generally improve the long-term health and function of trees.

Proposed Mitigation Measures – Planning and Design Stage

- ✓ 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;
- ✓ Invasive species, such as Buckthorn should be prioritized for removal and replacement with suitable native species; and,
- ✓ Prior to construction activities, overhanging limbs and any exposed tree roots of trees to be retained (property boundary) 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 removals should occur throughout the subject property at the same time rather than in a phased approach;
- ✓ Trees protection fencing should be installed around all trees that will be retained (i.e. property boundary) within and around work areas;
    - Protection fencing around trees that will be retained 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 as long as 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);
- ✓ 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 nesting birds and their nests or young and comply with the MBCA, 1994;
    - o 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; and,
- ✓ 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 – Post-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; and,
- ✓ 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 an overall decrease in young to mid-aged low quality native and invasive trees.

7.4 Incidental 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; and,
- — Conflict between wildlife and humans following development, including mortality from vehicles.

Proposed Mitigation Measures – Planning and Design Stage

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);
- ✓ Due to the proximity to the stormwater pond, wildlife exclusion fencing should be installed at the northern extent of the work area to ensure turtles cannot enter the work site as exposed substrate could provide appropriate nesting sites. Fencing should be monitored weekly to ensure that it is functioning as intended, and if issues are identified, should be dealt with promptly;
- ✓ 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 centre for care with a small donation of money to help pay for the care (a local facility is the Rideau Valley Wildlife Sanctuary).

With the mitigation measures outlined above, it is anticipated that the proposed development will result in a net loss of urban wildlife habitat.

8 Cumulative Impacts

The proposed development is within urban Ottawa and cumulative impacts must be considered in the context of the local and regional environment in which the site is situated. Much of the land surrounding the Study Area is a mix of residential, commercial, industrial and agricultural uses, with most of the impacts to the larger natural heritage system occurring during area development over 20 years ago. The subject property itself had previously been used for agricultural land-use with portions being naturalized following the discontinuation of agricultural land-use practices throughout portions of the Study Area.

Based on field assessments and available information, the removal of the natural heritage features within the subject property will have a negligible negative impact on the natural heritage system. Potential cumulative impacts to the natural heritage system resulting from the proposed development include the following:

- General loss of biodiversity and available habitat; and,
- Increase in impervious surfaces increasing runoff potential.

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:

- ✓ Landscaping plans should intend to compensate for the removal of natural heritage features and vegetation; and,
- ✓ Promote the use of permeable landscaping materials and rain capture systems like rain gardens and permeable pavers.

9 Summary and Conclusions

This report provides an evaluation of the anticipated impacts associated with the construction and long-term occupation of the proposed retail and office spaces located at 1515 Earl Armstrong Road (**Figure 1**). The environmental impacts and mitigation are based off field investigations completed in 2022, and a review of available desktop and background information.

The SAR study found that **Monarch habitat was present in the meadows** throughout the Study Area. While Bobolink were observed during the initial breeding bird survey, it was determined that **the property did not provide suitable nesting habitat for Bobolink or Eastern Meadowlark**.

The **woodland and hedgerows present within the Study Area are not considered to be significant** due to the size and age and are exempt from the significant woodlands policy as per section 6.4.4.1 of the guidelines. The woodlands within the Study Area show signs of disturbance due to the presence of invasive buckthorn.

The ELC survey noted **three (3) vegetation communities common within Ottawa**. The vegetation survey results indicate an **abundance of non-native species** within the property in concentrated areas, invasive and non-native species comprise approximately 20 percent of the vegetation species recorded.

Ten (10) species of trees were recorded in the Study Area. Trees that are predicted to be impacted are generally young to mid-aged (average DBH 15 cm). The **most abundant species are primarily Manitoba maple, green ash and common buckthorn with negligible community value**.

Evidence of tree pests (Emerald Ash Borer) is evident throughout the Study Area. One (1) distinctive tree was recorded during the tree survey, which is predicted to be removed.

The field evaluation suggests that **natural features do not provide any important ecological linkage**, and likely serves as general movement corridors for urban wildlife.

Based on this evaluation, there are opportunities for habitat compensation and enhancement, particularly along the edge of the development footprint, within the parking lot, as well as planting opportunity along the multi-use path adjacent to the development. This includes the following:

- ✓ Enhanced tree planting and reforestation along the perimeter of the development to provide a buffer between the trail and office spaces and existing residential neighbourhood. Additional tree planting will increase diversity and canopy cover, reduce invasive species abundance, and provide habitat for urban wildlife;
- ✓ Creation of pollinator gardens and rain gardens to enhance habitat for wild bees and other pollinators species as well as provide opportunity for infiltration; and,
- ✓ In addition to the expected ecological benefits from the above recommendations, it is anticipated that these features will provide social and educational value to local residents.

The mitigation and compensation measures described in this report have been developed to avoid or limit negative environmental impacts associated with the proposed development. 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 are implemented.

9.1 Standard of Care and Limitations

Field surveys have been carried out using investigation techniques and ecological methods consistent with those ordinarily exercised by IBI Group and other scientific practitioners, working under similar conditions and subject to the time, financial and physical constraints applicable to these investigations. Survey results presented in this report are based on work undertaken by trained professionals and technical staff and the reasonable and professional interpretation using acceptable scientific practices current at the time the work was performed.

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.

Prepared by:

Lindsay Jackson, HBSc
Sr. Ecologist
Phone: 613 225 1311 x 6406
email:
Lindsay.jackson@ibigroup.com

Reviewed by:

Alex Zeller, MSc
Associate – Manager, Natural Systems
Phone:343 997 6648
email: Alex.zeller@ibigroup.com

C.C. Marcel Denomme, Urbandale Corporation

10 References

Bird Studies Canada. (2001). *Ontario Breeding Bird Atlas: Guide for Participants.* Guelph: University of Guelph. Retrieved from http://www.birdsontario.org

Bird Studies Canada. (2009 Edition). Marsh Monitoring Program Participant's Handbook for Surveying. Bird Studies Canada in cooperation with Environment Canada and the U.S. Environmental Protection Agency.

Bird Studies Canda. (2005). Ontario Breeding Bird Atlas (Atlas 2). Port Rowan, Ontario, Canada. Retrieved 2022, from https://www.birdsontario.org

Canadian Standards Association. (2019). Bird-friendly building design (CSA A460:19). Retrieved from https://www.scc.ca/en/standardsdb/standards/29805

City of Ottawa. (2013). Natural Landscape Linkage Analysis.

City of Ottawa. (2015, August). City of Ottawa Protocol for Wildlife Protection during Construction. Retrieved from http://ottwatch.ca/meetings/file/309612/_Document_1_Protocol_for_Wildlife_Protection_During_Construction_pdf

City of Ottawa. (2015, October). Environmental Impact Statement Guidelines. Retrieved from http://documents.ottawa.ca/sites/documents.ottawa.ca/files/documents/eis_guidelines2015_en.pdf

City of Ottawa. (2019). Significant Woodlands: Guidelines for Identification, Evaluation, and Impact Assessment.

City of Ottawa. (2019, May). Tree Protection Specification. Retrieved from https://documents.ottawa.ca/sites/documents/files/tree_protection_specification_en.pdf

City of Ottawa. (2019a). *Tree Conservation Report Guidelines.* Retrieved from City of Ottawa: https://ottawa.ca/en/residents/water-and-environment/trees-and-community-forests/tree-protection#tree-conservation-report-guidelines

City of Ottawa. (2020). Bird-friendly Design Guidelines. Retrieved from https://documents.ottawa.ca/sites/documents/files/birdsafe_designguidelines_en.pdf

City of Ottawa. (2020). Tree Protection (By-law No. 2020-340). Retrieved from https://ottawa.ca/en/living-ottawa/laws-licences-and-permits/laws/laws-z/tree-protection-law-no-2020-340

City of Ottawa. (2021). Official Plan. *Volume 1*. Retrieved from https://engage.ottawa.ca/the-new-official-plan

City of Ottawa. (2022). Retrieved from geoOttawa Webmap Portal. Retrieved from https://maps.ottawa.ca/geoottawa/

Coder, K. D. (2014). *Conserving Trees During Site Development.* The University of Georgia Warnell School of Forestry & Natural Resources.

Department of Fisheries and Oceans Canada. (1985). Fisheries Act, 1985. Justice Laws. Retrieved 2022, from https://laws-lois.justice.gc.ca/eng/acts/f-14/

Dobbyn, J. S. (1994). Atlas of the Mammals of Ontario. Federation of Ontario Naturalists.

Environment Canada. (2004). An invasive alien species strategy for Canada. Ottawa: Environment Canada.

Environment Canada. (2022). Species at Risk Public Registry: A to Z Species Index. Retrieved from https://species-registry.canada.ca/index-en.html

Government of Canada. (1994). *Migratory Birds Convention Act.* Retrieved 2022, from Justice Laws: http://laws.justice.gc.ca/eng/acts/M-7.01/

Government of Canda. (2002). *Species at Risk Act.* Retrieved 2022, from Justice Laws: https://laws.justice.gc.ca/eng/acts/S-15.3/

Government of Ontario. (2022, July). *Butternut*. Retrieved from Government of Ontario: https://www.ontario.ca/page/butternut-species-risk

iNaturalist. (n.d.). iNaturalist Observations. Retrieved 2022, from https://www.inaturalist.org/

Lee, H., Bakowsky, W., Riley , J., Puddister, M., Uhlig, P., & McMurray, S. (1988). Ecological Land Classification for Southern Ontario: First Approximation and its Application. North Bay, Ontario, Canada: Ontario Ministry of Natural Resources.

Ministry of Environment Conservation and Parks. (2007). Endangered Species Act, 2007. Queen's Printer for Ontario. Retrieved from https://www.ontario.ca/laws/statute/07e06

Ministry of Municipal Affairs and Housing. (2014). *Archived - Provincial Policy Statement, 2014.* Retrieved from Government of Ontario: https://www.ontario.ca/document/provincial-policy-statement-2014

Ministry of Natural Resources and Forestry. (2015). Invasive Species Act, 2015. Queen's Printer for Ontario.

Ministry of Northern Development and Mines. (n.d.). OGSEarth. Retrieved 2022, from https://www.mndm.gov.on.ca/en/mines-and-minerals/applications/ogsearth

MNRF. (1999). Cavity Trees are Refuges for Wildlife. Manotick, Ontario. Retrieved 2022, from http://www.lrconline.com/Extension_Notes_English/pdf/cvtytrs.pdf

MNRF. (2000). Significant Wildlife Habitat Guide. Retrieved 2022, from https://www.ontario.ca/document/guide-significant-wildlife-habitat

MNRF. (2010). *Natural Heritage Reference Manual for Natural Heritage Policies of the Povincial Policy Statement, (Second ed.).* Toronto: Queen's Printer for Ontario.

MNRF. (2011). *Bats and Bat Habitat: Guidelines for Wind Power Projects.* Retrieved 2022, from https://www.ontario.ca/page/bats-and-bat-habitats-guidelines-wind-power-projects

MNRF. (2015). *Bat Survey Methodology - hibernacula and maternity roosts.*

MNRF. (2015, January). *Significant wildlife habitat ecoregional criteria schedules.* Retrieved from Government of Ontario: https://www.ontario.ca/document/significant-wildlife-habitat-ecoregional-criteria-schedules-ecoregion-6e

MNRF. (2022). *Natural Heritage Information Centre*. Retrieved from https://www.ontario.ca/page/natural-heritage-information-centre

Ontario Invasive Species Council. (2016). *Clean Equipment Protocol for Industry.* Peterborough.

Ontario Nature. (2020). Ontario Reptile and Amphibian Atlas. Toronto Entomologists' Association. Retrieved 2022, from https://www.ontarioinsects.org/herp/

Rideau Valley Conversation Authority. (2022). *Regulation Mapping.* Retrieved from Rideau Valley Conversation Authority: https://www.rvca.ca/regulations-planning/map-a-property

Stanfield, L. (2017). *Ontario Stream Assessment Protocol Version 10.0.* 2017: Ontario Ministry of Natural Resources.

Toronto and Region Conservation Authority and Credit Valley Conservation. (2014). *Evaluation, Classification and Management of Headwater Drainage Features Guidelines.* Retrieved 2022

Toronto Entomologists' Association. (2022). Ontario Butterfly Atlas. Retrieved 2022, from https://www.ontarioinsects.org/atlas/

University of Michigan. (n.d.). Michigan Flora Online. University of Michigan Herbarium. Retrieved 2022, from https://michiganflora.net/

APPENDIX A

Curriculum Vitae

Alex Zeller M.SC
Natural Systems, Associate – Manager

Role on Project – Project Manager & Sr Ecologist

Alexander is a Project Manager and Senior Ecologist with 20 years of experience in terrestrial and aquatic ecology, open space planning, and natural heritage authorizations. With a broad experience in both Aquatic and Terrestrial ecology, Alex has led, managed, and supported many natural heritage studies within the City of Ottawa and across Canada. These studies have included; Environmental Impact Studies, Municipal and Federal Environmental Assessments, Species at Risk permitting, wetland evaluations, post – construction monitoring, Community Design Plans, and other natural heritage projects associated with land development, transportation and other sectors.

Education

Master of Science in Biology, Lakehead University, Thunder Bay, ON/CA, 2007

Honours Bachelor Environmental Science, Lakehead University, Thunder Bay, ON/CA, 2003

Experience

2021–Present
IBI Group Professional (Canada) Inc., Ottawa, ON/CA, Natural System, Associate – Manager

2018–2021
WSP, Ottawa, ON/CA, Senior Ecologist, Environment

2013–2018
Dillion Consulting Limited, Ottawa, ON/CA, Associate

2006–2013
Dillion Consulting Limited, Ottawa, ON/CA, Ecologist

Representative Experience

Land Development

Canada Lands Company – 470 Tremblay Road, Ottawa, ON (2019 – 2021) – Lead Ecologist responsible for the preparation of an Environmental Impact Statement and Tree Conservation Report for a brownfield re-development in Ottawa. This project involved both CLC and Public Services and Procurement Canada (PSPC) working together to develop a mixed used development while managing the ecological constraints and opportunities. Species at Risk and wetland constraints were the primary features managed during this study.

Claridge Homes – 3252 Navan Road, Ontario, Canada (2020) – Project Manager and Lead Ecologist. An Environmental Impact statement and an Environmental Impact Statement and Tree Conservation Report for a development in Ottawa. This study was completed in support of plan of subdivision for a residential development. Species at Risk, headwater drains, and wetlands were managed through this process

Canada Lands Company – 291 Carling Avenue, Ottawa, Ontario (2018) – Project Manager and Lead Ecologist. An Environmental Impact Statement and Tree Conservation Report for a development in downtown Ottawa. Urban trees, invasive species were addressed in this study.

Claridge Homes Group of Companies – 760 River Road, Ottawa, Ontario, Canada (2019) – Project Manager and Lead Ecologist. An Environmental Impact statement and an Environmental Impact Statement and Tree Conservation Reports for a development in south Ottawa. This study was completed in support of plan of subdivision for a residential development. Species at Risk habitat and a constraints associated with a watercourse were the key features managed through these studies

Urbandale Construction – Riverview Lane, Kemptville, Ontario, Canada (2018 – Present) – Project Manager and Lead Ecologist. Natural heritage approvals associated with a residential subdivision. Scope of work included SAR authorizations, Fisheries authorizations, wetland design and restoration plans; watercourse and fish habitat design and plans, and general agency consultation.

Minto Communities – Quinns Pointe, Ottawa, Ontario (2021) – Project Manager and Lead Ecologist. Responsible for natural heritage approvals associated with a residential subdivision. Scope of work included SAR surveys, vegetation survey, tree survey, significant wildlife habitat assessment, avoidance and mitigation recommendations, reporting, and general agency consultation.

Minto Communities – Avalon Isgar, Ottawa, ON (2018 – 2021) – Project Manager and Lead Ecologist. Responsible for natural heritage approvals associated with a residential subdivision.

Scope of work included SAR surveys, vegetation survey, tree survey, significant wildlife habitat assessment, avoidance and mitigation recommendations, reporting, and general agency consultation.

Minto Communities – 323 Jockvaile Road, Ottawa, Ontario, Canada (2018) – Project Manager and Lead Ecologist. An Environmental Impact statement and a tree conservation report for a proposed residential development in the south Orleans community. These reports were completed following the City of Ottawa guidelines.

Minto Communities – Barrhaven South Community Design Plan, Ottawa, Ontario, Canada (2015 – 2017) – Project Manager and Lead Biologist. 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.

Minto Communities – Clark Lands Development, Environmental Impact Statement, Ottawa, Ontario, Canada (2013 – 2017) – Project manager and lead biologist for an Environmental Impact Statement and Tree Conservation Study for a development. This study was completed in support of plan of subdivision for a residential development.

Minto Communities – Potter's Key Development, Environmental Impact Statement, Stittsville, Ontario, Canada (2013 – 2021) – Project Manager and Lead Biologist. An Environmental Impact Statement, Tree Conservation Report, Species at Risk Permitting, Fisheries approvals, and on – going environmental monitoring for a development. The study was completed as part of an application for residential development.

Minto Communities – Chapman Mills Environmental Impact Statement Addendum, Ottawa, Ontario, Canada (2011) – Project Manager. 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.

KNL Developments – SAR Permit Implementation and Monitoring, Ontario, Canada (2017 – Present) – Project Manager and Lead Biologist. 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.

Ironclad Developments – 800 Eagleson Road EIS and TCR, Ottawa, Ontario, Canada (2018) – Project Manager and Lead Ecologist. Responsible for completing an Environmental Impact Statement and Tree Conservation Study for a development in Ottawa West. The proposed project will consist of a six – story rental apartment building with approximately 150 units with access from Eagleson Road.

Riverside South Development Corporation – Phases 12, 13.2, 14, 15, 16, 17, and 18; Environmental Impact Statement, Ottawa, Ontario, Canada (2014 – Present) – Project Manager and Lead Biologist. A series of Environmental Impact Statements and Tree Conservation Reports for a several primarily residential developments. 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, Ontario, Canada (2015) – Project Manager and Lead Biologist. Natural heritage compliance requirements supporting a multi – phase residential/retirement complex located on McArthur Island within the Mississippi River. This project included 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.

Richcraft Group of Companies, Fernbank Lands Development Environmental Impact Statement, Stittsville, Ontario Canada (2013 – 2017) – Project Manager and Lead Biologist. Environmental Impact Statement, Tree conservation Report, and Species at Risk Permitting were completed as part of an application for residential development.

Walton Developments, Environmental Screening Study, Ottawa, Ontario, Canada (2012 – 2014) – Project Manager and Terrestrial Ecologist. Natural heritage screening study for a project aimed at identifying any natural heritage constraints that may affect the ability to develop several properties in southwest Ottawa. Responsibilities include project management, reporting, terrestrial field surveys, avian surveys and GIS mapping.

City of Ottawa, Scoped Environmental Impact Statement, City of Ottawa, Ontario, Canada (2011) – Project Manager. A scoped environmental impact statement 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.

Awards and Publications

Patriquin, D., Zeller, A. Truman, K., Hayes, R. and Gibbs, S. 2020. Managing and Enhancing Terrestrial Road Ecology. Ottawa, ON – Transportation Association of Canada.

Zeller.A., Patriquin, D. 2021. From Butterflies to Bears – Developing Standards for Road Ecology across Canada. Canadian Section of the Wildlife Society (CSTWS) Conference and AGM. March 2021

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.

Infrastructure

Public Services and Procurement Canada (PSPC) Energy Services Acquisition Program (ESAP), Ottawa, Ontario, Canada (2019 – 2021) – 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 km of district heating/cooling pipeline and associated plants.

Public Services and Procurement Canada (PSPC) Centre Block Rehabilitation Project, Ottawa, Ontario, Canada (2018 – 2021) – Lead Project Ecologist. Responsible for – all ecological studies, development and management mitigation and compensation measures, reporting requirements, and agency consultation required to facilitate the project on Parliament Hill in Ottawa.

City of Ottawa in Public – Private Partnership – Confederation Line Extension Light Rail Transit (2019 – 2021) – Lead Ecologist. Responsible for the implementing the established management recommendations and facilitating the outstanding permitting requirements to accommodate detail design phase of the project.

City of Ottawa – West Transitway Extension, Phase 11 – Stillwater Creek, Ottawa, Ontario, Canada (2018) – Project Manager and Lead Ecologist. 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.

Hydro One – Riverview to Overbrook – transmission line upgrade, Ottawa, Ontario Canada (2016) – Lead Ecologist. Class Environmental Assessment in support of a transmission line upgrade between Overbrook and Riverview facilities. Alexander was responsible for coordinating and undertaking field surveys, participating in public consultation, reporting writing, impact assessment, and developing mitigation and avoidance measures.

Enbridge Gas Distribution Inc., Innes Road Reinforcement Pipeline Project – Environmental Monitoring and Environmental Awareness Training, Ottawa, Ontario Canada (2014-2016) – Project Manager and Lead Biologist. Environmental monitoring and environmental awareness in support of the 2.8 km pipeline installation along Innes Road. 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 ongoing environmental monitoring during construction.

Enbridge Gas Distribution Inc., Innes Road Reinforcement Pipeline Project – Environmental Assessment, Ottawa, Ontario Canada (2014) – Lead Biologist. Class environmental assessment for the 2.8 km gas distribution pipeline installation. Alexander was responsible for coordinating and undertaking biophysical field surveys, reporting writing, impact assessment, and developing mitigation and avoidance measures.

Enbridge Gas Distribution Inc., Ottawa West Reinforcement Pipeline Environmental Assessment, Ottawa, Ontario, Canada (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. 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.

Enbridge Gas Distribution Inc., GTA Reinforcement Pipeline Environmental Assessment, Toronto, Ontario, Canada (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.

Town of Perth, Infrastructure Master Plan, Perth, Ontario, Canada (2009-2010) – Completed the ecological assessment and natural heritage inventory for an infrastructure master plan. 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.

Ministry of Transportation, Truck Inspection Station Assessment, Ontario, Canada (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.

Natural Resource Studies

Transportation Association of Canada (TAC) Synthesis of Practice for Management and Enhancement of Terrestrial Roadway Ecology, Ottawa, ON (2020 – 2021) – Project Manager. This project developed a synthesis of Beneficial Management Practices to manage terrestrial road ecology concerns across Canada, such as wildlife crossings and invasive species control, to emerging topics like roadside naturalization and ice road concerns. Drawing on literature and expert input from within Canada and around the world; the synthesis identified practices applicable to the diverse ecosystems, climates and rural to urban transportation systems across Canada.

City of Ottawa – West Transitway – Stillwater Creek Realignment Post – construction monitoring, Ottawa, Ontario, Canada (2018 – present) – Project Manager and Lead ecologist for the post – construction monitoring of the realigned Stillwater creek. Ecological monitoring includes water quality monitoring, Fish sampling, vegetation monitoring, and incidental wildlife observations.

City of Ottawa – Kizell Wetland Trail – SAR Authorizations, Ottawa, Ontario, Canada (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.

City of Ottawa – Goulbourn Wetland Re – delineation, Ottawa, Ontario, Canada (2015 – 2016) – Project Manager. The objective 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 landowners, and reviewing the approach and findings with the City and the Ontario Ministry of Natural resources.

City of Ottawa – Feedmill Creek Species at Risk Screening, Ottawa, Ontario, Canada (2017) – Project Manager and Lead Ecologist. A species at risk screening of Feedmill Creek in support of the proposed restoration efforts included specific surveys – bat habitat surveys, Blanding's turtle basking surveys, butternut Screening, and other incidental observations.

City of Ottawa – 2014 Species at Risk Screening, Ottawa, Ontario, Canada (2014) – Project Manager and Lead Biologist. A Species at Risk screening study for the Infrastructure Branch with the objective to identify the potential threat that 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.

City of Ottawa – Terry Fox Drive Environmental Construction Monitoring, Ottawa, Ontario, Canada (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.

City of Ottawa – Terry Fox Drive Environmental Assessment, Ottawa, Ontario, Canada (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.

National Capital Commission – Ecological Land Classification, Ontario, Canada (2015) – Project Manager and Lead Biologist. Project to map all 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 km^2. The mapping will be used to for various future ecological landscape management projects.

Defence Construction Canada (DCC) – Species at Risk Survey, CFB Shilo Range Training Area, Manitoba, Canada (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.

County of Frontenac – Natural Heritage Study, County of Frontenac, Ontario, Canada (2011 – 2012) – Lead Landscape Ecologist for the County of Frontenac's Natural Heritage Study forming the major piece of the county's Official Plan (OP) and to 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.

Parks Canada – Rideau Canal Landscape Strategy, Ontario, Canada (2012) – Lead Ecologist. 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, geospatial analysis, field survey, report writing and communicating with the client.

Municipality of Hastings Highlands – Birds Creek Secondary Plan, Banfcroft, Ontario, Canada (2011 – 2012) – Lead Ecologist. Working to produce/develop a secondary plan for the community of Birds Creek, north of Bancroft. The plan will 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.

Regional Municipality of Wood Buffalo – Regional Ecology Planning Framework, Regional Municipality of Wood Buffalo, Alberta, Canada (2008) – Lead Ecologist Working 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.

City of Yellowknife – Yellowknife Smart Growth Plan – Ecological Preservation Study, Yellowknife, Northwest Territories, Canada (2007 – 2010) – Project Ecologist 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.

Tsuu T'ina First Nation – Satellite Image Classification, Tsuu T'ina First Nation, Alberta, Canada (2007) – Spatial Analyst 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.

Tlicho Government – Tlicho Land Use Plan, Northwest Territories, Canada (2006 – 2009) – Lead Ecologist. 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 Tlicho Land Use Plan is on mitigating the cumulative effects of development on the natural and social environment while still promoting sustainable economic development.

Public Works Government Services – Mathews Lake Habitat Restoration, Northwest Territories, Canada (2008) – Assisted with the 2008 post – construction monitoring of the fish habitat enhancement in the Mathews Lake waterhead. 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.

Canadian Pacific Railway – Aquatic Habitat Assessment, Peterborough, Ontario, Canada (2007) – Field Biologist Assisting in aquatic habitat assessment for a water crossing along the railways. The objective of the study was to improve habitat for native brook trout and other resident fish by providing in – stream habitat near the crossing.

St. Mary's Cement – Westside Creek and Marsh Reconfiguration, Great Lakes Region, Canada (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.

Lindsay Jackson H.BSc.
Natural Systems, Sr. Ecologist

Role on Project: Natural Environment Specialist

Lindsay is a Senior Ecologist with 7 years professional experience in terrestrial and aquatic ecology, open space planning, natural heritage authorizations, and the implementation of low impact design. Lindsay's versatile skillset has allowed her to lead, and contribute to many natural heritage studies across Ontario, including Environmental Impact Studies, Municipal and Federal Environmental Assessments, Species at Risk permitting, wetland evaluations, construction monitoring, low impact development implementation, and other natural heritage projects associated with road infrastructure and land development.

With a background in road ecology, Lindsay has significant experience in the implementation of mitigation strategies that allow for human and wildlife interaction, creating smart road networks, while alleviating pressure on the natural environment within expanding urban areas. She is well versed in the environmental approvals process, having worked extensively with conservation authorities, as well as provincial and federal agencies.

Representative Experience

West Montrose Covered Bridge Municipal Environmental Assessment (EA) – Region of Waterloo, Woolwich (2021-2022) – Project Manager and Lead Project Ecologist
Responsible for the coordination of ecological studies, including species at risk screening, project reporting and environmental permitting requirements for the total rehabilitation of the West Montrose Covered Bridge.

Walker Homes Subdivision (Owen Sound) – Cobide Engineering Inc, Owen Sound (2021–2022) – Project Manager and Lead Project Ecologist
Led, coordinated and completed a Scoped Environmental Impact Study and tree inventory for the proposed single-home development in Owen Sound, including aquatic and terrestrial inventories, species at risk surveys, and completed all associated reporting, advising on low-impact development strategies.

JDSS Subdivision – Cobide Engineering Inc, Hanover (2021–2022) – Project Manager and Lead Project Ecologist
Led, coordinated and completed a Scoped Environmental Impact Study for a proposed residential development in Hanover, including aquatic and terrestrial inventories, species at risk surveys, and completed all associated reporting.

Gully Creek Bridge Construction –Ministry of Transportation Ontario, Bayfield (2021–2022) – Environmental Construction Monitor
Responsible for environmental monitoring, and associated reporting for the total reconstruction of the Gully Creek Bridge, ensuring the adherence to the Department of Fisheries and Oceans permit requirements associated with Red Side Dace habitat.

Shoemaker Creek Rehabilitation – Region of Waterloo (2021-2022) – Project Coordinator and Aquatic Ecologist

Education

B.Sc. Hons, Environmental and Resource Sciences, Trent University, Peterborough, ON, 2021

Fish and Wildlife Technology Advanced Diploma, Fleming College, Lindsay, ON, 2018

Fish and Wildlife Technician Diploma, Fleming College, Lindsay, ON, 2017

Public Relations, Algonquin College, Ottawa, ON, 2009-2010

Experience

2022–Present
IBI Group, Ottawa, ON, Senior Ecologist

2021-2022
EcoTec Environmental Consultants Inc, Acton, ON, Intermediate Ecologist

2018–2021
York Region, Newmarket, ON, Road Ecologist

2017
Morrison Hershfield, Ottawa, ON, Environmental Technician

2012 - 2013

Ottawa Humane Society, Ottawa, ON, Communications Coordinator

Memberships

Ontario Chapter of The Wildlife Society

Canadian Herpetology Society

Ontario Road Ecology Group

Language Proficiencies

English – Bilingual

French – Bilingual

Led and coordinated fish removal activities related to the total rehabilitation of Shoemaker Creek between Homer Watson Boulevard and Mill Street.

Grey Rat Snake (*Pantheropis spiloides*) Habitat Construction and Monitoring – Ministry of Transportation Ontario, Leeds and the Thousand Islands (2021-2022) –
Project Ecologist
Completed the monitoring and construction of nesting box sites, as well as the monitoring of constructed thermoregulation sites across Leeds and the Thousand Islands. The research study was completed to meet the requirements set out in an Endangered Species Act (ESA) Permit related to road improvements to Highway 15. The project included the construction of 15 thermoregulation and egg-laying structures and the associated maintenance, monitoring and project reporting.

Transportation Services, Capital Planning and Delivery – York Region (2018-2021) –
Road Ecologist
Responsible for the environmental review, and environmental monitoring of multiple large-scale transportation projects. Ensured the implementation of environmental protection measures, and when possible, the inclusion of low impact design to the York Region road network. Responsible for evaluating standard construction practices and collaborating with project teams to ensure that all environmental regulations were adhered to, as well as capitalizing on restoration opportunities in partnership with the Toronto and Region Conservation Authority and the Lake Simcoe and Region Conservation authority, and implementing environmentally friendly solutions within right-of-way projects.

Confederation Line Extension Ottawa Light Rail EA – City of Ottawa, Ottawa (2017) –
Project Ecologist
Completed the assessment of natural heritage features associated with the reconstruction of the Confederation Line Extension. This included completing a wetland evaluation, breeding bird surveys, tree inventory, bat monitoring studies and species at risk surveys.

Trillium Line Extension Ottawa Light Rail EA – City of Ottawa, Ottawa (2017) –
Project Ecologist
Completed the assessment of natural heritage features associated with the Trillium Line Extension. This included completing breeding bird surveys, marsh monitoring surveys, tree inventory, bat monitoring studies and species at risk surveys.

Rideau River Pedestrian Bridge Ottawa Light Rail EA – City of Ottawa, Ottawa (2017) –
Project Ecologist
Completed the assessment of natural heritage features associated with the reconstruction of the Rideau River Pedestrian Bridge. This included completing a wetland evaluation, breeding bird surveys, tree inventory, bat monitoring studies and species at risk surveys.

Highway 28 Shoulder Widening and Paving from Lakefield to Bancroft – Ministry of Transportation Ontario, Bancroft (2017) –
Project Ecologist
Completed a road ecology study along the Highway 28 corridor between Lakefield and Bancroft to identify and generate mapping for potential road mortality hotspots for herpetofauna. Project reporting included creating recommendations for appropriate mitigation associated with road widening activities intersecting significant wildlife habitat.

Highway 17/508 Interchange – Ministry of Transportation Ontario, Renfrew (2017) –
Project Ecologist
Completed the assessment of natural heritage features associated with the construction of the Highway 17/508 Interchange in Renfrew County. This included completing marsh monitoring, breeding bird surveys, crepuscular bird surveys, tree inventory, bat monitoring studies and species at risk surveys.

APPENDIX B

Photo Record

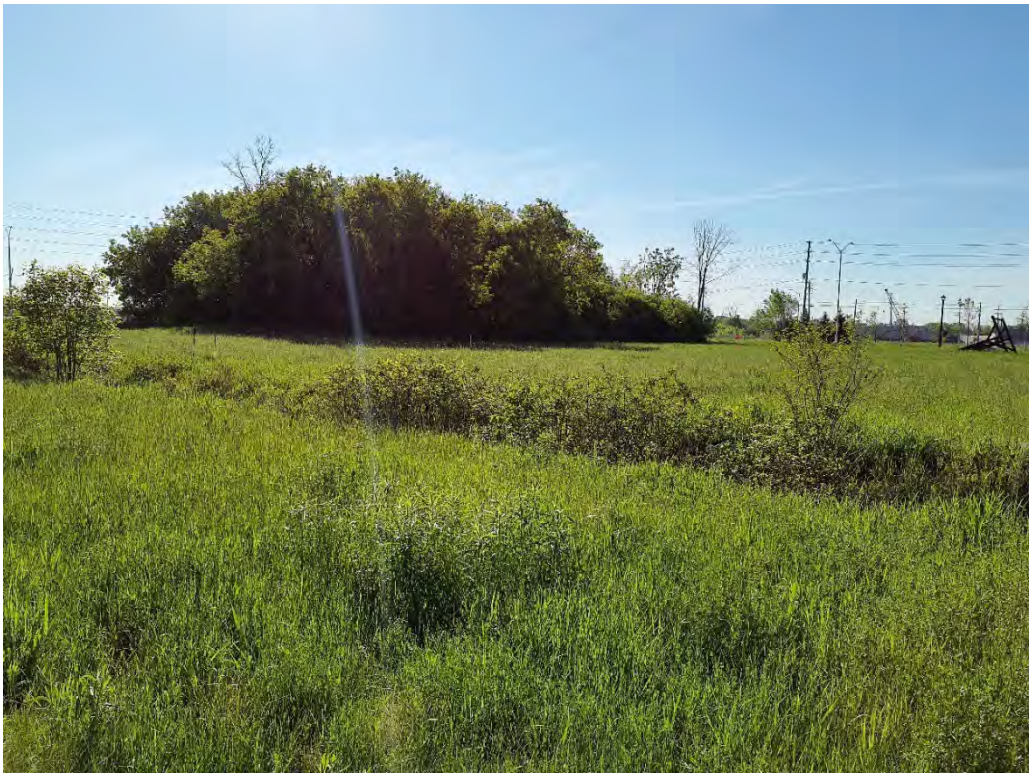
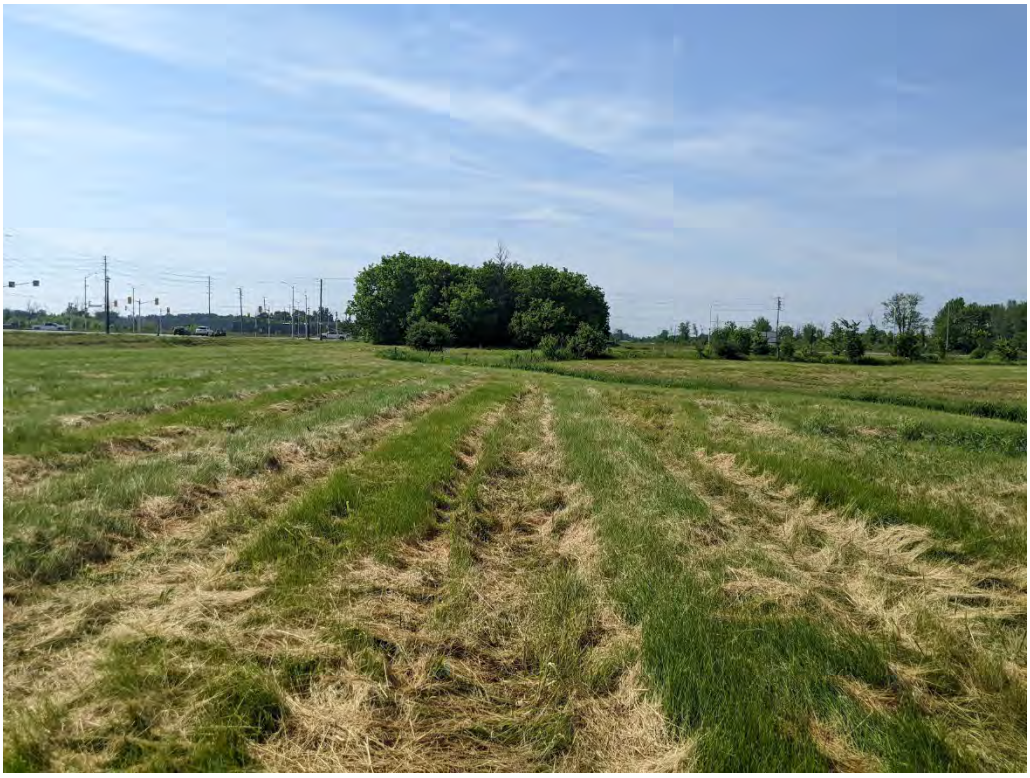
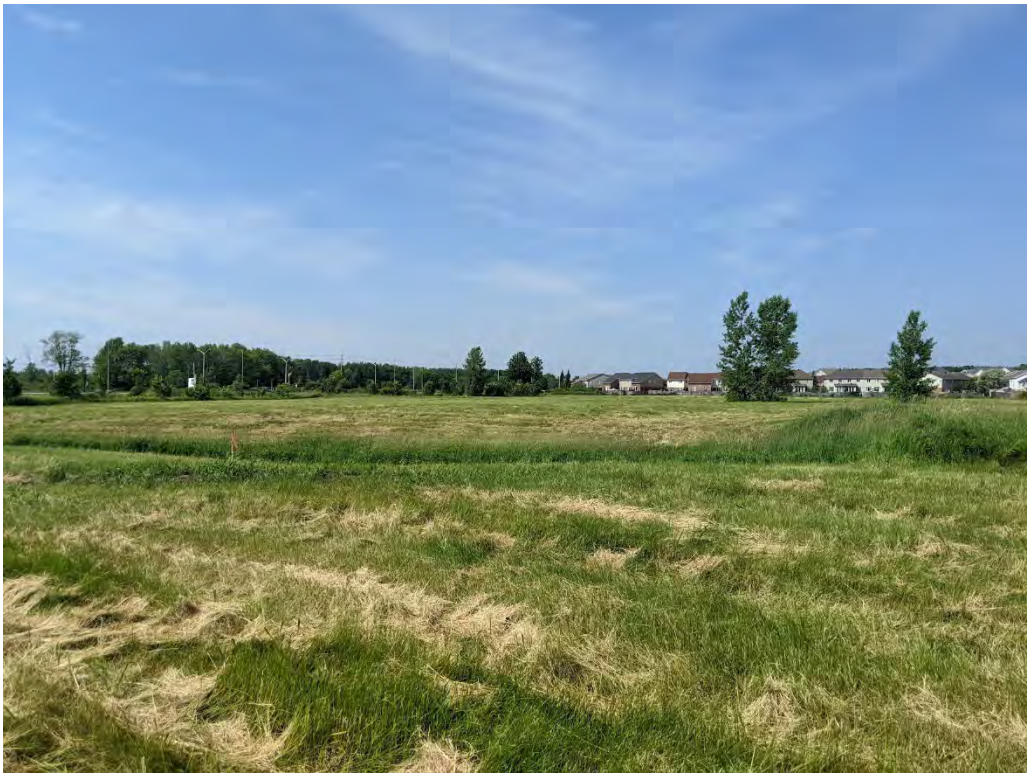
Photo 1: ***May 25, 2022*** Notes: Dry-Fresh Manitoba Maple Deciduous Forest Type at the southeast corner of the Study Area.	
Photo 2: ***May 25, 2022*** Notes: Dry-Fresh Mixed Meadow Ecosite with tree and shrub headgerows.	

Photo 3: ***June 22, 2022*** Notes: Dry-Fresh Manitoba Maple Deciduous Forest Type at the southeast corner of the Study Area.	
Photo 4: ***June 22, 2022*** Notes: Dry-Fresh Mixed Meadow Ecosite with tree and shrub headgerows.	

APPENDIX C

Vascular Plant Species List

COMMON NAME	SCIENTIFIC NAME	CONSERVATION STATUS			COEFFICIENT OF CONSERVATISM	COEFFICIENT OF WETNESS
		Federal (SARA, 2002)	Provincial (ESA, 2007)	S-Rank[1]		
American Elm	*Ulmus americana*	---	---	S5	3	-3
Amur Honeysuckle	*Lonicera maackii*	---	---	SNA	---	5
Bedstraw spp.	*Galium spp.*	---	---	---	---	---
Bur Oak	*Quercus macrocarpa*	---	---	S5	5	3
Canada Goldenrod	*Solidago canadensis*	---	---	S5	1	3
Choke Cherry	*Prunus virginiana*	---	---	S5	2	3
Common Buckthorn	*Rhamnus cathartica*	---	---	SNA	---	---
Common Dandelion	*Taraxacum officinale*	---	---	SNA	---	3
Common Milkweed	*Asclepias syriaca*	---	---	S5	0	5
Common Red Raspberry	*Rubus idaeus*	---	---	SNA		3
Common Vetch	*Vicia sativa*	---	---	SNA	---	3
Cranberry Viburnum	*Viburnum opulus*	---	---	S5	5	-3
Dewberry	*Rubus pubescens*	---	---	S5	4	-3
Eastern Hop-hornbeam	*Ostrya virginiana*	---	---	S5	4	3
Field Mustard	*Brassica rapa*	---	---	SNA	---	5
Grass spp.	*Grass spp.*	---	---	---	---	---
Green Ash	*Fraxinus pennsylvanica*	---	---	S4	3	-3
Hawthorn Spp.	*Crataegus Spp.*	---	---	---	---	---
Horsetail spp.	*Equisetum spp.*	---	---	---	---	---
Large-toothed Aspen	*Populus grandidentata*	---	---	S5	5	5
Manitoba Maple	*Acer negundo*	---	---	S5	0	0
Manitoba Maple	*Vitis riparia*	---	---	S5	0	0
New England Aster	*Symphyotrichum novae-angliae*	---	---	S5	2	-3
Poison Ivy	*Toxicodendron radicans*	---	---	S5	2	0
Prunus spp.	*Prunus spp.*	---	---	---	---	---

Red-osier Dogwood	*Cornus sericea*	---	---	S5	2	3
Sensitive Fern	*Onoclea sensibilis*	---	---	S5	4	-3
Silver Maple	*Acer saccharinum*	---	---	S5	5	-3
Trembling Aspen	*Populus tremuloides*	---	---	S5	2	0
Virginia Creeper	*Parthenocissus quinquefolia*	---	---	S4?	6	3
White Meadowsweet	*Spiraea alba*	---	---	S5	3	-3
Wild Strawberry	*Fragaria virginiana*	---	---	S5	2	3
Willow spp.	*Salix spp.*	---	---	---	---	---

[1]S-Rank (Provincial Status (NHIC))	S1:	Critically Imperiled – Critically imperiled in the 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 making it very vulnerable to extirpation from the province.
	S3:	Vulnerable – Vulnerable in the nation or sprovince due to a 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 longterm concern due to declines or other factors.
	S5:	Secure – Common, widespread, and abundant in the province.
	SU:	Unrankable – Currently unrankable due to lack of information or due to substantially conflicting information about status or trends.
	SNA:	Not Applicable – A conservation status rank is not applicable because the species is not a suitable target for conservation activities.
[2]Coefficient of Conservatism *Oldham, M. J., W. D. Bakowsky and D. A. Sutherland. 1995. Floristic Quality Assessment System for Southern Ontario. Natural Heritage Information Centre, Ministry of Natural Resources. Peterborough, Ontario.*	Coefficient of Conservatism. Rank of 0 to 10 based on plants degree of fidelity to a range of synecological parameters: (0-3) Taxa found in a variety of plant communities; (4-6) Taxa typically associated with a specific plant community but tolerate moderate disturbance; (7-8) Taxa associated with a plant community in an advanced successional stage that has undergone minor disturbance; (9-10) Taxa with a high fidelity to a narrow range of synecological parameters.	
[3]Coefficient of Wetness *Oldham, M. J., W. D. Bakowsky and D. A. Sutherland. 1995. Floristic Quality Assessment System for Southern Ontario. Natural Heritage Information Centre, Ministry of Natural Resources. Peterborough, Ontario.*	-5	Obligate Wetland - Occurs almost always in wetlands under natural conditions (99% probability)
	-4	Facultative Wetland - Usually occurs in wetlands, but occasionally found in non-wetlands (67-99%)
	-3	
	-2	
	-1	Facultative - Equally likely to occur in wetlands or non-wetlands (34-66%)
	0	
	1	
	2	Facultative Upland - Occasionally occurs in wetlands, but usually occurs in non-wetlands (1-33%)
	3	
	4	
	5	Upland - Occurs almost never in wetlands under natural conditions (<1%)

APPENDIX D

Breeding Bird Species List

COMMON NAME	SCIENTIFIC NAME	CONSERVATION STATUS		
		Federal (SARA, 2002)	Provincial (ESA, 2007)	S-Rank[1]
Alder flycatcher	*Empidonax alnorum*	---	---	S5
American goldfinch	*Carduelis tristis*	---	---	S5
American Robin	*Turdus migratorius*	---	---	S5
Bobolink	*Dolichonyx oryzivorus*	THR	THR	S4
Canada Goose	*Branta canadensis*	---	---	S5
Cedar Waxwing	*Bombycilla cedrorum*	---	---	S5
Chipping Sparrow	*Spizella passerina*	---	---	S5
Common Grackle	*Quiscalus quiscula*	---	---	S5
Common Yellowthroat	*Geothlypis trichas*	---	---	S5
European Starling	*Sturnus vulgaris*	---	---	SNA
Mourning Dove	*Zenaida macroura*	---	---	S5
Northern Cardinal	*Cardinalis cardinalis*	---	---	S5
Purple Finch	*Carpodacus purpureus*	---	---	S5
Red-eyed Vireo	*Vireo olivaceus*	---	---	S5
Red-winged blackbird	*Agelaius phoeniceus*	---	---	S5
Ring-billed gull	*Larus delawarensis*	---	---	S5
Savannah Sparrow	*Passerculus sandwichensis*	---	---	S5
Song Sparrow	*Melospiza melodia*	---	---	S5
Tree Swallow	*Tachycineta bicolor*	---	---	S5
Yellow Warbler	*Dendroica petechia*	---	---	S5

[1]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. SNA indicates species is not native to province.