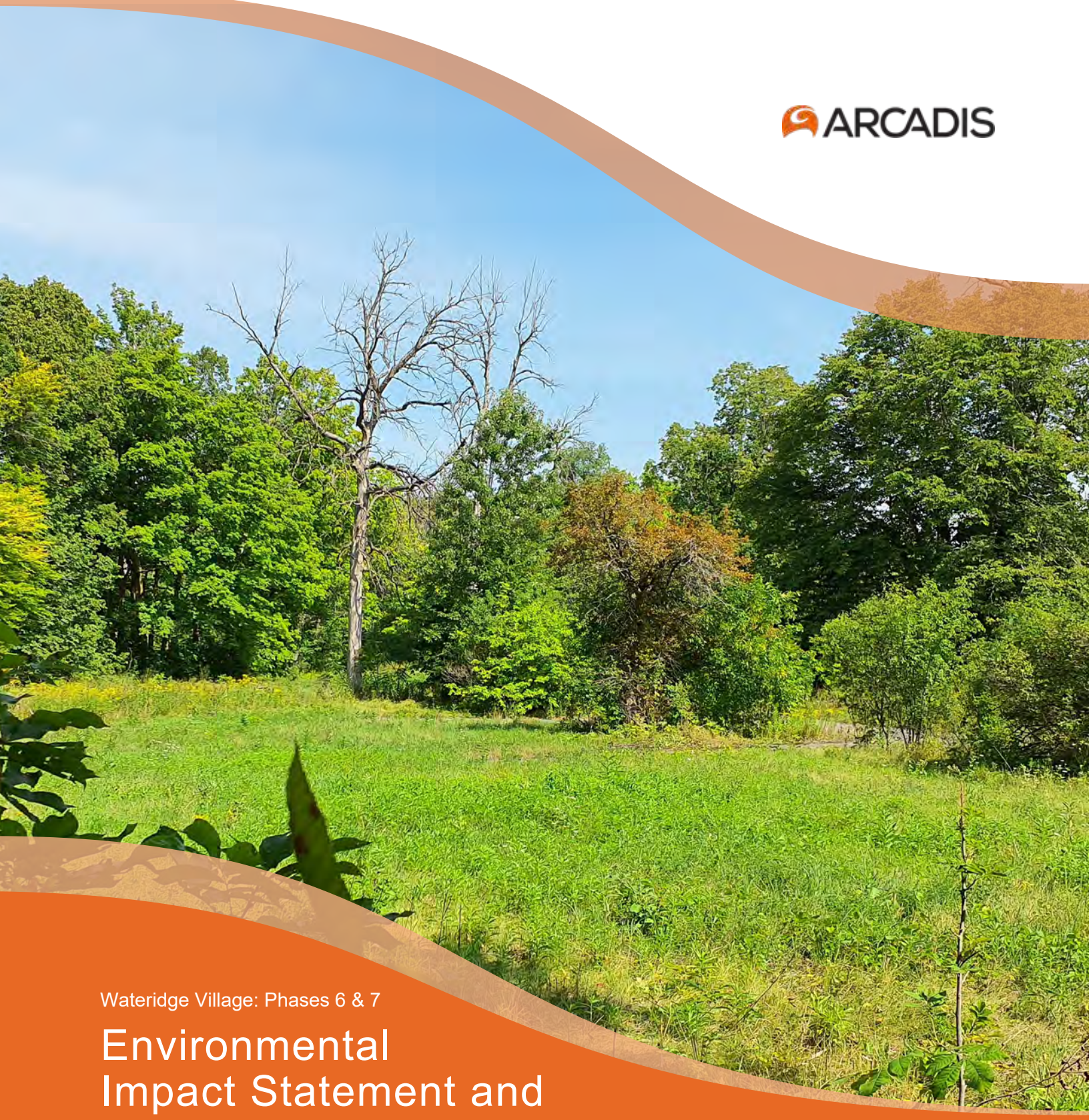

Wateridge Village: Phases 6 & 7

Environmental Impact Statement and Tree Conservation Report

Submitted to Canada Lands Company
Prepared for Philip Thibert, Director, Real Estate
Suite 1050 - 100 Queen Street, Ottawa, ON K1P 1A5

Prepared by Lindsay Jackson, Arcadis Professional Services (Canada) Inc.
500-333 Preston Street, Ottawa, ON K1S 5N4
lindsay.jackson@arccadis.com

Project Number: 139653
December 2024

Document Control Page

CLIENT:	Canada Lands Company.
PROJECT NAME:	Wateridge Village – Phases 6 & 7
REPORT TITLE:	Environmental Impact Statement and Tree Conservation Report
ARCADIS REFERENCE:	139653
VERSION:	Version 2 for Phases 6 & 7 only
ORIGINATOR:	Lindsay Jackson
REVIEWER:	Alex Zeller

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Executive Summary

Arcadis Professional Services (Canada) Inc. (Arcadis) has prepared an Environmental Impact Statement (EIS) and Tree Conservation Report (TCR) for the proposed Wateridge Village – Phases 6 & 7 development, located within parts of Lot 22, and 23, Concession 1 (Ottawa Front), in the Township of Gloucester, within the City of Ottawa. The purpose of this report is to describe the natural heritage features within the Study Area, evaluate the potential for environmental impacts associated with the proposed development, and recommend mitigation measures to offset those impacts.

Natural heritage field investigations for the Project were conducted in August 2022, and in March-September 2023.

The site surveys consisted of a preliminary site visit, Headwater Drainage Feature (HDF) assessment, Ecological Land Classification (ELC) and vegetation inventory, Breeding Bird Survey, Snake Visual Encounter Surveys, Bat Habitat Assessment, tree inventory and woodland evaluation, as well as Species at Risk (SAR) surveys and general wildlife habitat assessment.

Results from the field investigations are summarized below:

1) A protected Urban Natural Feature (UNF) associated with the Rockcliffe Escarpment occurs along the northern edge of the Study Area.
2) An HDF associated with stormwater infrastructure is located within the escarpment. Evaluation of this feature suggests that the HDF hydrates Eastern Creek, and eventually the Ottawa River.
3) Significant Woodlands are present within the Study Area and are associated with the Sugar Maple Basswood Deciduous community mapped during the ELC.
4) The Sugar Maple Basswood Deciduous communities within the property likely provide bat maternity colony Significant Wildlife Habitat (SWH).
5) One SAR and two Species of Conservation Concern were recorded by Arcadis during their field surveys; butternut, eastern wood-pewee, and wood thrush.
6) To offset the anticipated impacts resulting from vegetation and habitat removals, it is recommended to increase tree plantings and re-vegetation of suitable areas using appropriate native species.
7) Constructed and planted wildlife habitat features, such as pollinator gardens, bat boxes, have been recommended in various locations adjacent to the Urban Natural Feature (UNF), the Park and Open Spaces and Stormwater Management (SWM) blocks.
8) Additional mitigation measures have been recommended to limit the development impacts on terrestrial environments and wildlife.

Compensation measures have been proposed to minimize the anticipated negative impacts associated with this development, while also seeking to enhance the existing UNF and create opportunities for naturalized features within the proposed park, open space, and SWM areas. The additional negative impacts are associated with construction activities and can be mitigated accordingly.

Based on our proposed mitigation, developed in consultation with regulatory agencies, it is our professional opinion that the proposed development can proceed with the condition that the compensation and mitigation measures recommended herein be implemented.

1 Introduction

1.1 Purpose

Arcadis Professional Services (Canada) Inc. (Arcadis) was retained by Canada Lands Corporation (CLC) to complete an Environmental Impact Statement (EIS) and Tree Conservation Report (TCR) for the proposed Wateridge Village – Phases 6 & 7 development, located within the City of Ottawa (**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 outlined in the *Provincial Policy Statement (2020)* and the accompanying *Natural Heritage Reference Manual (MNRF, 2010)* (see **Figure 1**). In addition, various 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 an 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 Subject Property is identified within the City's Official Plan Schedule C11-C – Natural Heritage System (East) (City of Ottawa, 2021) as being located next to an Urban Natural Feature (UNF) that corresponds with an escarpment, which runs east to west along the property line. In addition to this major feature, the site contains several mature woodlands, and borders on property owned by the National Capital Commission (NCC). 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 need to complete the following surveys to meet municipal requirements, as well as to identify SAR and their habitat within the Study Area:

- → Breeding Bird Survey,
- → Bat Habitat Assessment,
- → Butternut Search and Health Assessment,
- → Headwater Drainage Feature Assessment, and
- → Tree Inventory and Health Assessment

The EIS and TCR have been prepared to; ensure the development do not contravene the federal *Species at Risk Act* (SARA, 2002), or the provincial *Endangered Species Act, 2007* (ESA, 2007), evaluate potential environmental impacts, support the retention of natural vegetation where possible, and develop mitigation plans addressing potential impacts and vegetation removals.

1.3 Property Information

Owner:	Canada Lands Company.
Address:	1076 Hemlock Private, Ottawa, Ontario
Lot and concession:	Part Lot 23 and Part Lot 22, Concession 1
Zoning:	DR – Development Reserves O1 – Parks and Open Space Zone R5 – Residential Fifth Density Zone
Official Plan designation:	Area B – Inner Urban Zone, Wateridge Village Secondary Plan
Existing Land Uses:	Regenerating Meadow/Forest/Cultural/Recreational

Location

The Study Area for the proposed project is located on the unceded traditional territory of the Anishinaabe, Mohawk, Haudenosaunee, and Algonquin peoples.

The Study Area is in the community of Gloucester and is located north of Tawadina Road. It is situated south of the Ottawa River and the Sir George Étienne Parkway, southeast of the Canada Aviation and Space Museum, and north of Old Montreal Road. Urban Natural Feature's (UNF) within the Study Area includes an escarpment feature at the northern edge of the Subject Property, as well as mature woodlands (**Figure 1**).

Subject Property

CLC plans to develop the Wateridge Village property in several phases. Phases 1A, 1B, 2 and 4, which cover about 60 ha, are currently under development. The current location now planned for development includes Phases 6 and 7 (**Figure 1**). These phases cover approximately 10.31 ha and includes 4 low to mid-rise residential blocks and 2 low to mid-rise mixed-use blocks. Phase 8 developments will be assessed and completed at a later date.

Land Use and Zoning

The City of Ottawa's *Official Plan, 2022* (OP), identifies that the Subject Property falls within the *Wateridge Village Secondary Plan*. Within the Secondary Plan, Phase 6 land use is designated as Low-Rise Neighbourhood, Parks and Urban Plazas, whereas Phase 7 is designated as Low-Rise to Mid-Rise Neighbourhood and Mixed-Use.

N

Polaris Ave

Sir George-Étienne Cartier Pky

Sir George-Étienne Cartier Pky

Rigel Pvt

Polaris Ave

Hercules Way

Burma Rd

Mynarski Pvt

Challenger Blvd

Phase 7

Canadian Forces Base Ottawa North

Cosmos Ave

Mynarski Pvt

Burma Rd

Arcturus Pvt

Phase 6

Cottage Row

Lake St

Via Venus Pvt

Tawadina Rd

Tawadina Rd

Polaris Ave

Michael Stoqua St

Moses Tennisco St

Wigwas St

Pimiwidon St

Wanaki Rd

Tarmak

Lt. Col. William Barker Vc Park

Hemlock Rd

Hemlock Rd

Hemlock Rd

Wàbà Pvt

Legend

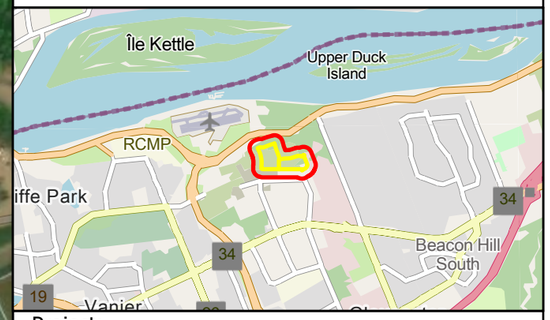
- Subject Property
- Study Area (120m)
- Existing Trail
- Eastern Creek
- Drainage Feature

Existing Woodlots

- Airbase Woods (Golder, 2014)
- Escarpment (Golder, 2014)
- NRC Woods North (Golder, 2014)

0 25 50 100 150 200 Meters

Scale: 1:3,500



Project:

Wateridge Village EIS: Phases 6 & 7

Title:

Study Area and Natural Heritage Features

Prepared By:

ARCADIS Design & Consultancy for natural and built assets

Project: 139653

Date: 12/19/2024

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 to the Project.
Natural Heritage Screening:	This section provides the detailed background information collected from a variety of publicly accessible resource databases to describe the natural heritage features and significant features that may occur within the Study Area.
Methodology:	This section provides a summary of the specific protocols and methods used to evaluate potential natural heritage features and species identified within the natural heritage screening.
Survey Results:	This section provides the results from the field surveys. This also includes any incidental observations or notable observations made by the field biologists.
Description of the Proposed Project:	This section provides a summary of the Project, including the construction activities and other activities which may have an impact on the natural environment.
Impact Assessment and Mitigation:	This section provides the assessment of potential environmental impacts associated with the Project on the natural heritage system, including the natural heritage features and species surveyed in this study. The mitigation measures proposed in this section are aimed at reducing or eliminating potential impacts to natural heritage features. Where mitigation may not be possible, compensation may be proposed. This section will also identify any future permitting or agency authorizations that may be required before the Project may proceed.
Summary and Conclusions:	This section provides a summary of the Study's findings, outlines any notable provisions, and provides Arcadis' general recommendation on whether this project should proceed as planned.

Tree Conservation Report

For the purposes of this integrated report, the Tree Conservation Report (TCR) requirements will be summarized throughout this report and detailed in **Appendix G**. 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. A comprehensive Tree Conservation Report, including proposed tree removals, is included within **Appendix G**.

2 Policy Framework

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

The scope of this report evaluates the natural heritage features and SAR governed by the policies outlined in the table below.

Table 1: Policies, Legislation and Background Source.

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: 08/2023)
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 at 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)
City of Ottawa	
City of Ottawa Official Plan (2022)	Official Plan
	Wateridge Village Secondary Plan
	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: Prohibited Activities, Exemptions and Permits (Ontario Regulation 41/24), under Conservation Authorities Act, (R.S.O. 1990, c. C.27)	• Floodplain mapping • Evaluation, Classification and Management of Headwater Drainage Features Guidelines • Wetland regulations within 30 m

It is important to note that for the purposes of this report, both the Federal *Species at Risk Act (2002)*, and the Provincial *Endangered Species Act, 2007* were considered due to the Federal land ownership of the Subject Property. However, to facilitate development approvals, it is anticipated that only provincial approvals will be sought.

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.

2.2 Canada Species at Risk Act, 2002

The Canadian Species at Risk Act (Government of Canada, 2003) prohibits the killing or harming of species identified as Threatened or Endangered under Schedule 1 of the Act. Sections 32 and 33 of SARA prohibits the damage or destruction of a species' residence, where the species has been classified as Endangered of Threatened in Schedule 1 of the Act.

Under SARA "residence" is defined as:

"*a dwelling-place, such as a den, nest or other similar area or place, that is occupied or habitually occupied by one or more individuals during all or part of their life cycles, including breeding, rearing, staging, wintering, feeding or hibernating."*

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

Section 58 of the Act prohibits the destruction of any part of the critical habitat of any species listed as Threatened or Endangered under Schedule 1 of the Act. This applies if the critical habitat is on federal lands, and anywhere the species is found if the species is an aquatic species or is a species of migratory bird protected by the *Migratory Bird Convention Act, 1994.*

Under SARA "critical habitat" is defined as:

"*the habitat that is necessary for the survival or recovery of a listed wildlife species and that is identified as the species' critical habitat in the recovery strategy or in an action plan for the species.*"

Critical 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, SARA also enables Environment and Climate Change Canada (ECCC) to issue permits or enter into agreements under Section 73 of SARA to authorize activities that would otherwise be prohibited by Sections 32 and 33 of the Act, provided the legal requirements of the Act are met.

If designated Endangered/Threatened species or their habitat are believed to be directly harmed on federally owned lands, a SARA permit or authorization may be required.

3 Description of the Natural Environment

The following sections provide a desktop screening of natural heritage records and background information available within the Study Area. This information provides the background information upon which the EIS and TCR will be based.

Golder and Associates (Golder) prepared an *EIS and TCR in Support of Draft Plan Approval of the Former CFB Rockcliffe Lands* in 2015. The 2015 Golder EIS report identifies the woodlands within the escarpment as *Site # 170 – NRC Woods North* (**Figure 1**) and is associated with the Urban Natural Features identified within the City of Ottawa's OP (Rockcliffe Escarpment). Findings from the Golder EIS report are being carried forward within the natural heritage assessment.

Throughout this EIS common names of species are used and binomial nomenclature (i.e., scientific names) are provided in the species lists in the **Appendices A to F.** Both names of species (i.e., common, and scientific) follow those used by MNRF (2022) in the Natural Heritage Information Centre (NHIC) Ontario Species Tables.

3.1 Historic Land Use

A review of recent and historic aerial imagery, as well as background documents highlight the land uses within and adjacent to the Subject Property (City of Ottawa, 2023) (**Figure 2**). This review reveals that the Study Area has been wooded for over 100 years, with aerial imagery from 1928 revealing that land within the Subject Property was predominantly forested. A small inclusion of agricultural land use was located at the eastern extent of the Study Area, and a group of residences was located at the western extent of the Study Area.

Aerial imagery from 1965 reveals that a development, known as the Canadian Forces Base Rockcliffe (CFB Rockcliffe) was well established, with what appear to be larger institutional buildings within the western portion of the Study Area. The eastern portion of the Study Area contained what appears to be residential development, with portions of the forest persisting throughout the Study Area.

The Rockcliffe Airport exists to the northwest of the Study Area, with residential developments apparent to the east, west and south of the Study Area in aerial imagery from 1965.

Aerial imagery suggests that the decommissioning of CFB Rockcliffe occurs sometime between 2007, and 2011, allowing for the re-naturalization of the Study Area to occur to present day.

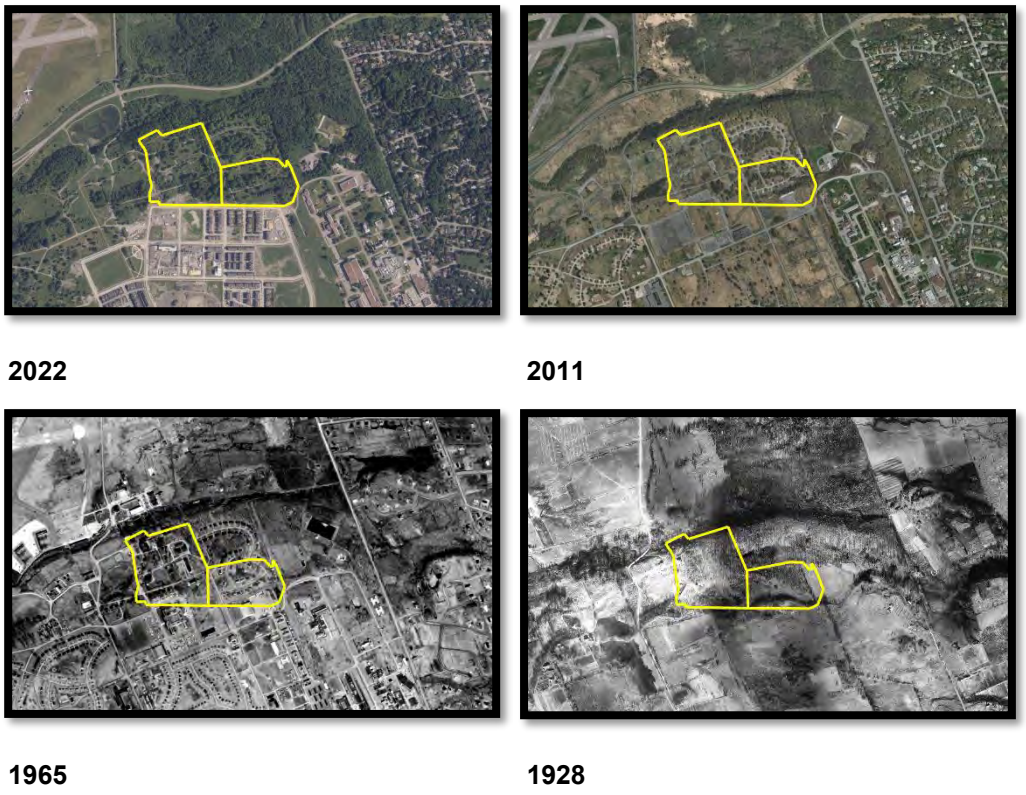


Figure 2: Land Use Change (geoOttawa, 2023)

3.2 Landform, Soils and Geology

The Study Area is situated within a unique Limestone Plains physiographic region, which is an inclusion of paleozoic bedrock within the greater Ottawa Valley Clay Plains (Ministry of Northern Development and Mines, 2023). The material within the Limestone Plains include silt, sand, and gravel which allows for some infiltration (Golder Associates, 2015), as the material is generally well drained.

The underlying bedrock of the Study Area is part of the Gull River Formation, consisting of limestone and dolostone (Natural Resources Canada, 2016). Bedrock escarpment (Rockcliffe Formation) is mapped along the northern extent of the Study Area composed of limestone, shale, dolostone and sandstone (Ministry of Northern Development and Mines, 2023).

3.3 Aquatic Environment

Within the context of this report, aquatic environment includes inland surface water and ground water, as well as the characteristics of the water and organisms / wildlife living within the water. The following subsections describe aquatic features at a watershed and site-specific scale.

3.3.1 Floodplain and Regulated Limit

On April 1, 2024, changes to sections of the *Conservation Authorities Act* and a new regulation under the Act, came into effect. The new regulation, *Ontario Regulation 41/24, Prohibited Activities, Exemptions and Permits*, replaces all previous Conservation Authority development regulations.

In the Study Area, the *Conservation Authorities Act* is applied through the Rideau Valley Conservation Authority (RVCA) Ontario Regulation 41/24. The RVCA also maintains, monitors, and collects information related to water quality/quantity, fisheries resources, forestry, land use, and wetlands.

There are no regulated limits within the Study Area. Drainage of the site flows north towards a roadside ditch along Aviation Parkway before crossing under the parkway via a culvert, discharging into Eastern Creek (**Figure 1**).

3.3.2 Fish and Fish Habitat

GeoOttawa, NHIC online mapping, and Fisheries and Oceans Canada online mapping indicate that there are no watercourses or wetlands within the Study Area, therefore no fish habitat is present within the Study Area.

Overland and ground water flows likely contribute to Eastern Creek. A review of studies completed within Eastern Creek indicate that no fish were observed within the watercourse, however the watercourse is likely a contributing feature to the Ottawa River, which provides fish habitat.

3.3.3 Headwater Drainage Features (HDF)

Mapping by the RVCA and geoOttawa indicate that there is no headwater drainage features within the Study Area.

A drainage feature exists just north of the Study Area within the Rockcliffe Escarpment, along Sir-George Étienne Cartier Parkway, which drains under the parkway through a culvert and discharges into Eastern Creek.

3.4 Terrestrial Environment

Several specific natural heritage features require consideration for protection under the PPS (Ministry of Municipal Affairs and Housing, 2024). 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
- 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 geoOttawa mapping, and provincial natural heritage mapping (NHIC) indicates that there are no mapped wetlands within the Study Area.

3.4.2 Woodlands

As described in the TCR (**Appendix H**), a review of aerial imagery suggests that the Study Area is well forested. The bulk of the forested area is associated with the escarpment feature to the north, and the NRC Woods North. Smaller pockets of woodlands have been maintained and are dispersed throughout the Study Area.

Historical aerial imagery confirms that most of the tree canopy within the Study Area has persisted for over 100 years, with some deforestation occurring with the establishment of CFB Rockcliffe in the 1960's. Re-naturalization of the Study Area has since occurred and is associated with the gradual decommissioning of the CFB Rockcliffe between the early 1990's and 2010.

3.4.3 Valleylands

No Valleylands are present within or adjacent to the Study Area.

3.4.4 Areas of Natural and Scientific Interest (ANSI)

No Areas of Natural and Scientific Interest are present within or adjacent to the Study Area.

3.4.5 Significant Wildlife Habitat

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

- Seasonal Concentration Areas of Animals
- Rare Vegetation Communities or Specialized Habitat for Wildlife

- Habitat for Species of Conservation Concern (excluding Endangered or Threatened Species)
- Animal Movement Corridors

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

SEASONAL CONCENTRATION AREAS OF ANIMALS

Seasonal Concentration Areas are areas where a large abundance of a species gathers at one time of year, or where several species congregate (MNRF, 2015). Based on the criteria established for Candidate SWH, the following seasonal concentration area may be found within or adjacent to the Study Area:

- Bat Maternity Colonies: The presence of mature woodlands with large cavity trees may provide suitable conditions for maternity colonies of SAR and non-SAR bats.
- Reptile Hibernacula: The presence of rocky outcrops associated with the escarpment feature may provide suitable hibernacula for snake species. Background studies indicate that no concentrations of snakes were observed within the Study Area. There are no suitable winter hibernacula present for turtle species within the Study Area.

SPECIALIZED HABITAT FOR WILDLIFE

Specialized Habitats are areas that provide suitable habitat for the species' long-term survival and require contiguous areas that are not fragmented. Based on the criteria established for Candidate SWH, the following specialized habitat for wildlife may be found within the Study Area:

- Seeps and Springs: the presence of forested area associated with the escarpment, within the vicinity of Eastern Creek may provide seeps and springs.

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 and reptiles may occur within or adjacent to the Subject Property. Those species identified have potential to be associated with the forest and meadow community. **Table A1 in Appendix A** provides a list of Species of Conservation Concern with occurrence records within and/or adjacent to the Subject Property.

ANIMAL MOVEMENT CORRIDORS

Animal movement corridors are elongated, naturally vegetated parts of the landscape used by animals to move from one habitat to another, including but not limited to riparian zones, shorelines, wetland buffers, woodlands, fencerows, and windbreaks (MNR 2000). The Natural

Heritage Component of the Provincial Policy Statement states that natural connections between natural features should be maintained and improved where possible. However, as per the *Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E* (MNRF 2015), Animal Movement Corridors should only be identified as SWH where a Confirmed or Candidate SWH has been identified by MNRF or the planning authority based on documented evidence of a habitat identified within the MNRF's Criterion Schedules or the *Significant Wildlife Habitat Technical Guide* (MNR 2000).

No Animal Movement Corridor SWH has been identified by MNRF within the Study Area.

3.4.6 Species at Risk and Species at Risk Habitat

A background review of previously conducted studies within the area identified the potential for several SAR to occur within and adjacent to the Subject Property. A review of aerial imagery was used to identify general candidate habitat for SAR based on the description of habitat provided. **Table A2 of Appendix A** 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 within the Study Area:

- American Ginseng
- Butternut
- Little Brown Bat
- Northern Myotis
- Tri-colored Bat

3.4.7 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 commonly found in the city's 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**: Coyote, Raccoon, White-tailed deer, Eastern Gray Squirrel, Eastern Cottontail, among others.
- **Reptiles & Amphibians**: Eastern Garter Snake, Eastern Red-backed Salamander, Smooth Green Snake, among others.
- **Birds**: American Crow, American Redstart, Black-capped Chickadee, Downy Woodpecker, Northern Cardinal, Northern Flicker, Red-Tailed Hawk, Ruby-crowned Kinglet, among others.

3.4.8 Ecological Linkages and Urban Natural Features

A review of aerial photos suggests that the forest within the Study Area may provide a functional ecological linkage. According to Schedule C11-C - Natural Heritage System (East)in the City of Ottawa's Official Plan (2022), there are no Natural Heritage System Core Areas or Natural Heritage System Linkage Area s within or adjacent to the Study Area. However, the woodlands directly north of the Subject Property, within the Study Area are included in the Natural Heritage Features Overlay and is also labeled as an Urban Natural Feature (**Figure 1**). The mapping indicates that there is limited connectivity adjacent to these areas due to the establishment of residential and institutional development. The function of the Urban Natural Frea is likely limited to the general movement of wildlife throughout the escarpment and local woodlands (NRC

Woods North, and Airbase Woods). This ecological linkage is also limited due to the presence of Sir George Etienne Parkway directly north of the Study Area.

4 Survey Methodology

The requirements for field surveys have been dictated by the presence of key natural heritage features and specifications of the relevant policy and regulatory framework. This section identifies how the existing natural heritage features and functions of the Study Area were assessed during the 2022-2023 field investigations.

4.1 Scope of Work

Based on the description of the existing natural environment outlined in Section 3 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.

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.

AQUATIC ENVIRONMENT

- Headwater Drainage Feature Assessment

NATURAL HERITAGE FEATURES

- Ecological Land Classification (ELC), including:
  - Vegetation survey
- Identification of potential SWH, including:
  - Breeding Bird Surveys
  - Bat Maternity Habitat
  - Snake Visual Encounter Surveys
  - General habitat assessment for Species of Conservation Concern

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 Aquatic Environment

The Headwater Drainage Features (HDF) assessment followed the Toronto and Region Conservation Authority and Credit Valley Conservation protocol, '*Evaluation, Classification and Management of Headwater Drainage Features Guidelines*' (Toronto and Region Conservation Authority and Credit Valley Conservation, 2014). Field surveys were carried out following the rapid assessment method, which utilizes the Unconstrained Headwater Sampling (Section 4, Module 11) methodology in the Ontario Stream Assessment Protocol (Stanfield, 2017).

One single survey was completed upon the request of the National Capital Commission (NCC) to evaluate Eastern Creek, just north of the Study Area.

4.3 Terrestrial Environment

4.3.1 Ecological Land Classification

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 encompass the vast range of natural and cultural communities more fully 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).

4.3.2 Woodlands

The woodlands within the Study Area were assessed for significance following the updated City of Ottawa guidelines (*Significant Woodlands: Guidelines for Identification, Evaluation, and Impact Assessment*, 2022). In the urban expansion areas, significant woodlands are evaluated using criteria under the 'Established Urban Process'. 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 were 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.

As outlined in the City's *Significant Woodlands: Guidelines for Identification, Evaluation, and Impact Assessment*, new significant woodlands will not be identified in urban areas where the NHS was already identified through Secondary Plans. The *Wateridge Village Secondary Plan* identifies an NHS area associated with woodlands within the Study Area, therefore woodlands within these areas have been evaluated for significance.

4.3.3 Significant Wildlife Habitat

Breeding bird, snake encounter surveys, bat habitat surveys, and bat echolocation surveys were conducted to establish baseline wildlife habitat conditions within the Study Area.

BREEDING BIRD SURVEY

Diurnal breeding bird surveys were conducted within the Study Area following methods outlined in the *Ontario Breeding Bird Atlas Guide for Participants* (BSC, 2001). The protocol requires the observer to record all the birds seen and heard at a point count station during a 5-minute period. Three surveys were completed between dawn and approximately 5 hours after dawn, 10 days apart, between May 24 and July 10, in good weather. Stations were placed approximately 300 m apart, adjusted for habitat (e.g., using smaller radii in loud areas and densely forested areas) (see **Figure 3** for survey locations).

Each of the surveys consisted of visiting predetermined bird point count locations for five minutes. The surveys document visual and auditory observations of birds. Visual observations include bird behaviours indicative of nesting activity. Results establish estimates of bird species and abundance in different habitat types within the Study Area.

To supplement the surveys, area searches of the habitat were completed using binoculars to observe species presence and breeding activity during other on-site visits. Area searches involved noting all individual bird species and their corresponding breeding evidence while traversing the habitat on foot.

BAT HABITAT ASSESSMENT AND ACOUSTIC MONITORING

To assess for candidate bat maternity colony habitat, a snag/cavity tree count was conducted within the forested habitats and followed the methodology outlined in the *Bat Survey Methodology – Hibernacula and Maternity Roosts informal publication distributed by the MNRF* (MNRF, 2015).

The survey is intended to count snag/cavity trees to ascertain whether the habitat is candidate SWH for maternity colony habitat for several non-SAR bats as well as SAR bats, including Little Brown Myotis, Northern Myotis, and Tri-colored Bat, which are listed as Endangered, federally, and provincially.

A complete tree inventory was completed within the Subject Property and therefore a detailed snag density survey was also completed concurrently. This survey was conducted in forested areas, during the leaf-off period. Snag/cavity trees equal to or greater than (≥) 25 cm diameter at breast height (DBH) in each ecosite was mapped and tallied, and snag density was calculated by dividing the number of snags mapped, by the total area of the ecosite. If the snag density within a surveyed ecosite is calculated to be ≥10 snags per ha, then the area should be considered candidate SWH for bat maternity colony habitat.

To supplement the snag density surveys, an acoustic survey for bats was conducted using a Wildlife Acoustic's Echo Meter Touch 2 Pro ultrasonic module. The survey involved walking transects throughout the Study Area and recording bat calls with the acoustic monitor. The survey was conducted a half-hour after sunset when bats typically emerge from roosts to forage.

The results of the acoustic surveys were used to identify bat species present within the Survey Area.

REPTILE HIBERNACULA

To supplement findings from the 2015 report by Golder, Arcadis ecologists conducted 3 targeted visual encounter surveys throughout the 2023 field season to evaluate the potential for reptile hibernacula throughout the Study Area.

Visual Encounter Surveys (VES) were completed following the methodology in the *Survey Protocol for Ontario's Species at Risk Snakes* (MNRF, 2016). Surveys are completed under sunny conditions when air temperature is between 10 and 25˚C, or under overcast conditions when air temperature is between 15 and 30˚C. In the spring, surveys are to be undertaken between 9 am and 5 pm. In July and August when daytimes temperatures are above 25˚C, surveys should be carried out between 8 am and 12 pm or 5 pm and 8 pm. Meanerding transects of the entire Study Area were completed in search of snakes and / or sign of snake habitat.

HABITAT FOR SPECIES OF CONSERVATION CONCERN

In addition to the targeted wildlife and vegetation community surveys described above, general habitat observations were noted as it relates to the habitat requirements for Species of Conservation Concern identified in **Table A1 of Appendix A.**

INCIDENTAL OBSERVATIONS OF SIGNIFICANT WILDLIFE HABITAT

Incidental observation of other candidate SWH were also undertaken during all site visits. Specifically, the presence of features that are not easily identifiable via aerial photography. This included the presence of seeps/springs, turtle nesting areas, and stick nests.

4.4 Species at Risk and Species at Risk Habitat

Targeted SAR surveys for Butternut, and SAR bats were completed. The surveys also included general breeding bird surveys to record any potential SAR birds. The bird survey is described in section 4.3.3.

BUTTERNUT

Arcadis biologists conducted systematic searches for Butternut throughout the Study Area between July and August 2023.

The survey consisted of walking throughout the Study Area and identifying Butternut specimens. Once located, a qualified biologist performed a Butternut Health Assessment (BHA) and followed guidelines outlined in *Butternut Assessment Guidelines: Assessment of Butternut Tree Health for the Purposes of the Endangered Species Act, 2007* (MNRF, 2021).

SAR BATS

The presence or absence of SAR bat habitat was evaluated by using methods described in Section 4.3.3. Subsequently, one round of acoustic monitoring was performed to determine the likelihood of SAR bats roosting or using habitat within the Study Area.

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 recommended 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.

4.5 Trees

Following the City of Ottawa's *Tree Conservation Report Guidelines* (City of Ottawa, 2022), and the request of the City of Ottawa Forester, a complete tree inventory of the Subject Property (+5 m buffer) was undertaken between August 2022 and August 2023.

Distinctive trees were recorded using the criteria to identify distinctive trees within the urban boundary (trees measuring greater than 30 cm DBH). Results of the tree inventory is summarized in the *Wateridge Village: Phase 6, & 7 Tree Conservation Report*, located in **Appendix H.**

4.6 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, photographs, and UTM coordinates, as applicable. Such observations help validate our conclusions on the ecological function of the Study Area.

N

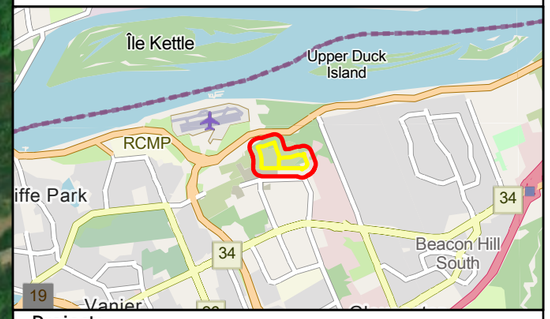
EC-1
WTR-4
WTR-3
WTR-2
WTR-1
BP-8
BP-5
BBS-5
BBS-6
BP-3
BP-2
BA-3
BBS-7
BA-4
BP-1
BBS-1

Legend

- Subject Property
- Study Area (120m)
- Butternut Buffer (50m)
- Breeding Bird Survey Point
- Bat Maternity Habitat Assessment Tree Plot
- Acoustic Bat Monitoring Station
- Headwater Drainage Feature Survey Location
- Headwater Drainage Feature
- Eastern Creek

0 35 70 140 210 280 Meters

Scale: 1:5,000



Project:

Wateridge Village EIS: Phases 6 & 7

Title:

Survey Locations

Prepared By:

ARCADIS Design & Consultancy for natural and built assets

Project: 139653

Date: 12/19/2024

Figure: 3

5 Survey 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, breeding bird, bat habitat, and reptile VES locations are illustrated in **Figure 3.** Other survey results are illustrated in **Figures 4, 5, and 6** depending on survey context.

5.1 Site Investigation Details

Fieldwork conducted for the EIS and TCR took place between July 2022, and September 2023, 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, bat habitat assessment, and reptile VES. Any incidental wildlife observations made during the surveys were also documented. The dates, times, surveyor names, and weather conditions for all surveys are listed in **Table 2 below.**

Table 2: Summary of field visits and conditions.

PURPOSE OF VISIT	DATE	TIME	STAFF	WEATHER CONDITIONS	AIR TEMP (C)
Headwater Drainage Feature Assessment	29/04/2022	9:00 AM - 12:30 PM	L.Jackson	Sunny, moderate breeze	13
VEC Survey #1	11/05/2022	8:30 PM - 00:00 AM	L.Jackson	Clear skies, calm winds	23
Headwater Drainage Feature Assessment	12/5/2022	8:30 AM – 2 PM	L. Jackson & B.Semmler	Clear skies, calm winds	30
Breeding Bird Point Count Survey #1/ELC	25/05/2022	8:00 AM - 10:00 AM	L. Jackson & B.Semmler	Partly Cloudy, Slight breeze.	15
VEC Survey #2, Bat Survey #1	26/05/2022	8:30 PM - 00:00 AM	L.Jackson & B.Semmler	Night, 100% Cover, Moderate, Breeze	22
VEC Survey #3, Bat Survey #2	14/06/2022	9:30 PM – 00:00 AM	L. Jackson & B.Semmler	Clear skies, calm winds	18
Breeding Bird Point Count Survey #2	22/06/2022	8:00 AM - 10:00 AM	L.Jackson	Partly cloudy, calm breeze	20
Breeding Bird Point Count Survey #3	28/06/2022	8:00 AM - 10:00 AM	L.Jackson	Cloudy/overcast , calm breeze	20
Tree Inventory/Butternut Assessment/ELC	30/09/22 & 5/10/22	8:00 AM -4:00 PM	L. Jackson & B.Semmler	Sunny, moderate breeze	14

5.2 Aquatic Environment

5.2.1 Floodplain and Regulated Limit

Eastern Creek and it's associated Regulated Limit is located to the north of the Study Area and the St. George Etienne Parkway.

5.2.2 Headwater Drainage Features

One field visit was completed to conduct a baseline assessment of the headwater drainage features within the Study Area. At the request of the National Capital Commission (NCC), the headwater drainage feature assessment also included an evaluation of Eastern Creek.

The topography of the site suggests that overland flows within the north-eastern portion of the Study Area likely drain towards the north of over the escarpment, while the western portion of the Study Area likely drains towards the northwest, and the southeastern portion of the Study Area drains towards the south.

No ephemeral drainage features were observed through throughout the Study Area during site visits; however, a single stormwater outlet was observed within the escarpment.

The features exist within the UNF and connects to a roadside drainage ditch that travels under the St. George Etienne Parkway, and discharges into Eastern Creek and drains north towards the Ottawa River.

Table A3 in Appendix B provides a summary of the HDF management recommendations based on a single site visit. **Figure 4** illustrates the HDF throughout the Study Area.

5.2.3 Fish and Fish Habitat

There is one drainage feature that flows from the Study Area towards Eastern Creek. The drainage feature is located within the escarpment feature where a perched corrugated steel pipe (CSP) culvert measuring approximately 1 m in diameter discharges what appears to be stormwater from the ridge. This drainage feature runs down the escarpment, into the roadside ditch, before flowing through a culvert under the St. George Etienne Parkway and discharging into Eastern Creek.

Eastern Creek is a water feature that meanders through a woodlot from the St. George Etienne Parkway towards the Ottawa River. The feature had minimal water at the time of assessment in April 2023, with little in-steam vegetation. Additionally, the feature appears to lack connectivity to the Ottawa River, rather the final section of the creek appears to permeate through/under the Ottawa River Pathway, which presents as a barrier to fish.

Although Eastern Creek could potentially provide fish habitat, no fish were observed within Eastern Creek during the Headwater Drainage Feature Assessment completed in 2023 by Arcadis. Similarly, the evaluation of Eastern Creek in 2015 by Golder noted no fish were observed during field investigations.

Legend

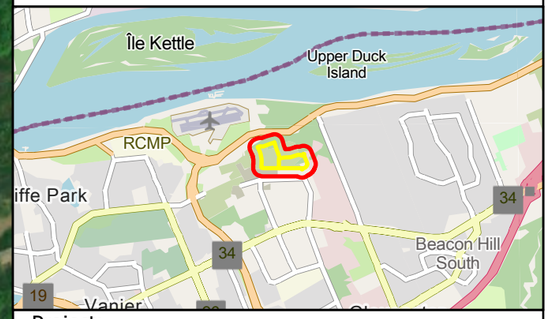
- Subject Property
- Study Area (120m)
- Existing Trail (NCC)
- Ottawa River
- Culvert
- Decommissioned Stormwater Culvert

HDF Classification

- HDF - Protection
- HDF - Conservation
- HDF - Mitigation

0 35 70 140 210 280 Meters

Scale: 1:5,000



Project:

Wateridge Village EIS: Phases 6 & 7

Title:

Headwater Drainage Features

Prepared By:

ARCADIS Design & Consultancy for natural and built assets

Project: 139653

Date: 12/19/2024

Figure: 4

5.3 Terrestrial Environment

5.3.1 Vegetation Community

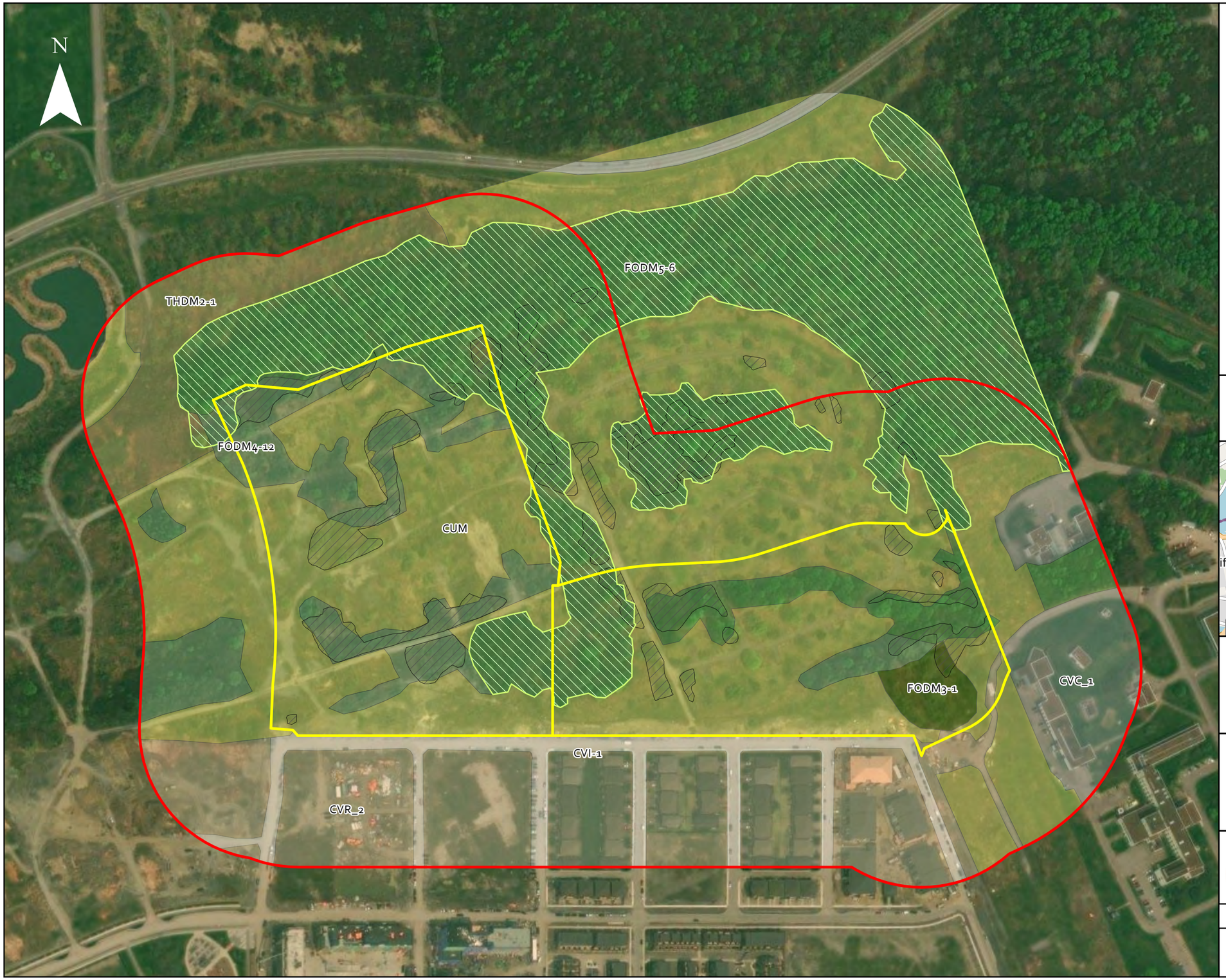
The ELC survey identified a total of five vegetation communities within the Study Area, in addition to four communities that are associated with transportation, and residential uses.

The prominent vegetation community within the Survey Area is a Dry-Fresh Sugar Maple Basswood Deciduous Forest. All vegetation communities surveyed within the Survey Area are considered common within Ontario. **Table 3** below outlines the communities documented during ELC surveys and summarizes the abundant vegetation cover. The location, type, and boundaries of vegetation communities are presented in **Figure 5**. Reference photos for the vegetation communities are included in **Appendix E**.

VEGETATION SURVEY

The vegetation survey identified 191 florae species within the Subject Property. Of these, 55% of the species identified were evaluated as being common within Ontario, having S-Ranks of S4 or S5; 43% of the species identified are considered as non-native or invasive in Ontario. One species, field thistle (*Cirsum discolour*), was observed on site and is considered as S-Rank S3 (i.e., rare to uncommon in Ontario). Butternut and hairy evening primrose (*Oenothera villosa*) were observed on site and are considered as S-Rank of S2 (i.e., rare in Ontario). Vascular plant species observed within the Study Area are listed in **Appendix C.**

Butternut, which is a provincial and federal SAR was identified throughout the Study Area, along the edges of the escarpment. This species has protections under both SARA and the ESA.



Legend

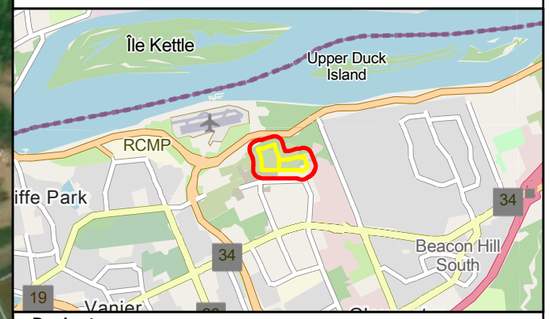
- Study Area (120m)
- Subject Property
- Significant Woodlands
- Invasive Species

Ecological Land Classification

- Cultural Meadow (CUM)
- Business Sector (CVC_1)
- Transportation (CVI-1)
- High Density Residential (CVR_2)
- Dry – Fresh Poplar Deciduous Forest (FODM3-1)
- Dry - Fresh Exotic Deciduous Forest (FODM4-12)
- Dry – Fresh Sugar Maple – Basswood Deciduous Forest (FODM5-6)
- Sumac Deciduous Shrub Thicket (THDM2-1)

0 25 50 100 150 200 Meters

Scale: 1:3,500



Project:

Wateridge Village EIS: Phases 6 & 7

Title:

Ecological Land Classification

Prepared By:

ARCADIS Design & Consultancy for natural and built assets

Project: 139653

Date: 12/19/2024

Figure: 5

Table 3: Ecological Land Classification Survey Results.

ELC TYPE	TOTAL AREA WITHIN STUDY AREA	COMMUNITY DESCRIPTION
DECIDUOUS FOREST		
FODM5-6 Dry-Fresh Sugar Maple – Basswood Deciduous Forest	15.4ha	This community extends along the escarpment at the north of the Study Area, with inclusions scattered throughout. The canopy and sub-canopy is composed of Sugar Maple, Basswood, American Elm, American Beech, and Bitternut Hickory. The understory is composed of Green Ash, American Beech, Round Leaved Dogwood, Nannyberry, Swamp Red-currant, Glossy Buckthorn and Common Buckthorn. Ground cover included White and Red Baneberry, Canada Anemone, Blue Cohosh, Bunchberry, Yellow Trout-lily, Northern Starflower, Starflower, False Solomon's Seal, Ghost Pipe, Northern Dewberry, Eastern Helleborine, Wild Sarsaparilla, and White Heath Aster.
FODM4-12 Dry-Fresh Exotic Deciduous Forest	3.6ha	These communities contain Siberian Elms that appear to have been intentionally planted in groupings and hedgerows. The community canopy often contains a few mature native species inclusive of Sugar Maple and Basswood, while the subcanopy and understory is dominated by Common Buckthorn thickets and Siberian Elm as well as Japanese Knotweed, and Black Locust. The groundcover species include young invasives such as Dog Strangling Vine, Garlic Mustard, Poison Ivy, White Heath Aster, Common Plantain, Virginia Creeper, European Lilly-of-the-valley.
FODM3-1 Dry-Fresh Poplar Deciduous Forest	0.5ha	This community is in the southeastern most corner of the Study Area where construction is ongoing adjacent to Tawadina Road. This area is mostly re-generating trees where the canopy and sub-canopy is composed of Cottonwood and Manitoba Maple. The understory contains small shrubs inclusive of invasives such as Common Buckthorn, Common Red Raspberry, Purple-flowering Raspberry, Staghorn Sumac, Riverbank Grape, and Gray Dogwood. Groundcover species observed includes Meadow Foxtail, Common Ragweed, Spreading Dogbane, Common Timothy, Kentucky Bluegrass, and Field Bindweed.
MEADOW		
MEMM4 Cultural Meadow	20.8ha	This community is a decommissioned Canadian Armed Forces Base. It is in a state of re-generation and is a highly impacted cultural meadow containing a wide variety of non-native, invasive, and cultivated species. Canopy trees within this community are likely old yard shade trees including Sugar Maple, Red Maple, Basswood, Norway Spruce, and Eastern White Pine. Ground cover plants include Goldenrod, Tall Goldenrod, Early Goldenrod, New-England Asters,

		Heart-leaved Asters, Panickled Asters, Common Vetch, Chamomile, Common Dandelion, Poison Ivy, Wild Strawberry, Purple Flowering Raspberry, Daylilies, and Common Burdock.
DECIDUOUS THICKET		
THDM2-1 Sumac Deciduous Shrub Thicket	2.2ha	This community surrounds half of the existing SWMP and features an understory of both native and non-native species. Groundcover species are inclusive of: Meadow Foxtail, Common Burdock, Smooth Brome, Canada Thistle, Field Horsetail, Smooth Aster, Canada Goldenrod, and Rough Bedstraw.
TRANSPORTATION AND UTILITIES		
CVI_1 Transportation	2.1ha	This area consists of roadway infrastructure for the existing residential community.
RESIDENTIAL		
CVR_2 High Density Residential	7.0ha	Recently constructed single homes, town homes, and condominiums exist within this community.
COMMERCIAL AND INSTITUTIONAL		
CVC_1 Business Sector	2.2ha	Buildings situated within this community are managed and operated by the Canadian National Research Council.

5.3.2 Woodlands Assessment

The Dry-Fresh Sugar Maple Basswood Deciduous Forest within the Study Area meets the prerequisite woodland designation as set out in the Forestry Act, R.S.O 1990, c.F.26.

In reviewing historic aerial imagery on geoOttawa, dating back to 1928 (95 years, current to 2023), the Study Area was dominated by forest (including the Urban Natural Feature), as well as agricultural land use. The imagery suggests that this forest community exceeds 60 years in age, and therefore exceeds the minimum age requirement to be considered significant.

The aerial imagery from 1928 suggests that the Sugar Maple Basswood Deciduous Forest covered an area of approximately 113 hectares, meeting the minimum size requirements to be considered significant.

The earliest available imagery (1928) suggests that these woodlands were well established and have persisted within the Study Area for more than 60 years and were greater than 0.8 ha. Additionally, the City's Natural Heritage Mapping designates the escarpment which is dominated by the Dry-Fresh Sugar Maple Basswood Deciduous Forest as an Urban Natural Feature**.**

The Dry-Fresh Sugar Maple Basswood Deciduous Forest within the Study Area is considered significant.

The Dry-Fresh Exotic Deciduous Forest in combination with the Dry-Fresh Poplar Deciduous Forest within the Study Area meets the prerequisite woodland designation as set out in the Forestry Act, R.S.O 1990, c.F.26.

In reviewing historic aerial imagery on geoOttawa dating back to 1928 (95 years, current to 2023), the Study Area was dominated by forest (including the Urban Natural Feature), as well as agricultural land use. In the aerial imagery from 1965 it is apparent that forest cover has been removed from the Study Area to facilitate development of infrastructure related to CFB

Rockcliffe, including what appears to be institutional use to the west (Phase 6), and residential use to the east (Phase 7).

Aerial imagery suggests that demolition of the infrastructure associated with institutional use in the western portion of the Study Area occurred between 1991 and 1999. Additionally, the demolition of the infrastructure associated with the residential use in the eastern portion of the Study Area occurred between 2008 and 2010.

The demolition of the existing infrastructure and subsequent re-naturalization of the site has allowed for early successional forests to establish throughout the Study Area. These areas include Dry-Fresh Exotic Deciduous Forest, and Dry-Fresh Poplar Deciduous Forest that date back to 1991 (32 years, current to 2023) and therefore do not meet the minimum age criteria to be considered significant.

The Dry-Fresh Exotic Deciduous Forest in combination with the Dry-Fresh Poplar Deciduous Forest are therefore not considered significant.

5.3.3 Significant Wildlife Habitat

Breeding bird surveys, snake visual encounter surveys, and bat habitat and bat echolocation surveys were conducted to establish baseline conditions within the Study Area.

BREEDING BIRD SURVEY

A total of 28 bird species were recorded during the surveys, and an additional 6 bird species were observed during other field surveys. 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.

No SAR birds were encountered during breeding bird surveys of within other field visits. However, eastern wood-pewee, and wood thrush were heard calling in the adjacent woods during the breeding survey completed on June 22, 2022. Most birds observed on-site are common in Ottawa and have generally secure populations within Ontario.

Pileated Woodpeckers, and signs of Pileated Woodpeckers were observed during field surveys, as well as other site visits. Although, evidence of foraging in dead or decaying trees was found throughout the woodlots within the Study Area, no nests were observed within the Study Area.

Based on surveys conducted by Arcadis, 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.

REPTILE HIBERNACULA

To supplement cover board surveys completed in 2014 by DST, Arcadis biologists completed five Visual Encounter Surveys (VES). Survey efforts were concentrated around the escarpment, in areas with notable rock outcrops, and in forest edges throughout the Study Area.

Rock outcrops throughout the Study Area were generally found to have northern slope exposure, meaning they are less suitable for hibernaculum as this is an important habitat characteristic for many species of snakes (MNRF, 2018).

No snakes were observed during targeted VES, or during any subsequent field surveys.

Based on surveys conducted by Arcadis, and DST, the Study Area likely contains some suitable foraging or basking habitat. **However, there were no observations of concentrations of snakes, or rock outcrops with southern exposure. Results of surveys conducted by**

Arcadis, DST, and Golder and Associates suggest that it is unlikely that reptile hibernacula occur within the Study Area.

BAT MATERNITY HABITAT

A comprehensive tree inventory of the Subject Property was undertaken by Arcadis biologists. The tree inventory collected the following data: species, DBH, overall health condition, presence of cavities, and presence of peeling bark.

Ten (10) circular plots (12.6 m radius) were randomly selected within the Deciduous Forest (FOD) communities in the Subject Property. The total of snag/cavity trees in each plot was then tallied to determine the snag/cavity tree density within the Subject Property.

It was determined that the FOD communities within the Subject Property had a snag/cavity tree density of 22 snags per hectare of trees equal of greater than 25 cm DBH. **Therefore, the FOD communities within the Study Area are a candidate for maternity colony roosts.**

The forested communities containing large cavity trees are concentrated within the escarpment feature, which is a protected Urban Natural Feature, as well as the woodlands that are mapped as Sugar Maple – Basswood Deciduous Forest.

Additionally, during acoustic monitoring conducted by Arcadis biologists in the summer of 2023, three bat species were recorded within the Study Area including Hoary Bat, Silver-haired Bat and Big-Brown Bat. Bat species recorded within the Study Area are known to thrive in urban settings.

Acoustic monitoring surveys conducted by DST in 2014, and Golder and Associated in 2015 identified six bat species including three SAR: Little Brown Bat, Northern Myotis, Tri-coloured Bat, as well as Hoary Bat, Silver-haired Bat and Big-Brown Bat. It is to be noted that areas surveyed by DST and Golder and Associates included lands to the west of the Study Area that were not surveyed by Arcadis.

Based on the results of the bat habitat assessment, combined with data gathered from the acoustic monitoring surveys completed by Arcadis, DST and Golder and Associates, the forested communities within the Study Area provides suitable bat maternity roost SWH.

Incidental Observations of Significant Wildlife Habitat

There were no incidental observations of SWH during field surveys, or site visits.

5.4 Species at Risk and Species at Risk Habitat

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

5.4.1 Butternut

A search for Butternut trees was completed throughout the Subject Property. A total of 17 Butternut trees were identified and assessed following the provincial guidelines (MECP 2021). Of the 17 trees identified within the Study Area, 15 are Category 1, one (1) is Category 2, and one (1) is Category 3 (see **Figure 6** for locations).

A detailed summary of Butternut tree health conditions can be found in **Appendix F**.

5.4.2 SAR Bats

No SAR bat species were recorded within the Study Area during acoustic monitoring undertaken by Arcadis in the summer of 2023.

Acoustic monitoring surveys conducted by DST in 2014, and Golder and Associated in 2015 identified six bat species including three SAR: Little Brown Bat, Northern Myotis, Tri-coloured Bat, as well as Hoary Bat, Silver-haired Bat and Big-Brown Bat. It is to be noted that areas surveyed DST and Golder and Associates included lands to the west of the Study Area that were not surveyed by Arcadis.

No SAR bat species were identified during acoustic monitoring surveys by Arcadis. Candidate roosting and maternity habitat for SAR bats was observed in the mature forests found in the Study Area.

N

801
803
804
805
809
816
817
818
819
820
900

Legend

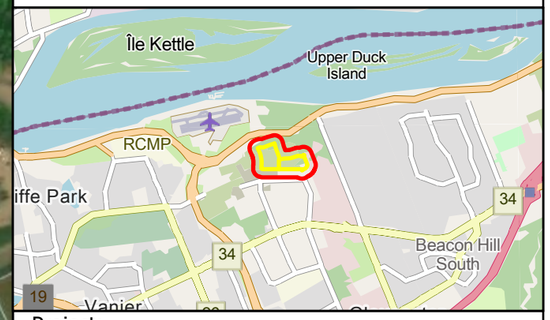
- Study Area (120m)
- Subject Property
- Butternut Buffer (50m)

Butternut Health Assessment

- Category - 1
- Category - 2
- Category - 3
- Butternut Root Harm Prevention Zone (50m)

0 25 50 100 150 200 Meters

Scale: 1:3,500



Project:

Wateridge Village EIS: Phases 6 & 7

Title:

Butternut Locations

Prepared By:

ARCADIS Design & Consultancy for natural and built assets

Project: 139653

Date: 12/19/2024

Figure: 6

5.5 Trees

The following section provides a summary of the findings of a tree inventory completed within the Subject Property. The findings of the tree inventory are detailed in the **TCR in Appendix H**.

A complete inventory of tree species, general health and conditions, and abundance within the property was completed between August 2022 and August of 2023. In total, 44 species were observed within the Subject Property and within the 5 m tree buffer surrounding the Subject Property. Tree species observed are listed below (tree species marked with an asterisk (*) are non-native or invasive):

- American Basswood
- American Beech
- American Elm
- Apple spp.
- Balsam Fir
- Balsam Poplar
- Bitternut Hickory
- Butternut
- Black Locust *
- Carolina Poplar
- Colorado Blue Spruce*
- Common Buckthorn*
- Crab Apple Spp.*
- Crack Willow*
- Eastern Cottonwood*
- Eastern White Cedar
- Eastern White Pine
- Emerald Cedar*
- Freeman's Maple
- Green Ash
- Ironwood
- Large-tooth Aspen
- Lilac Spp.*
- Little Leaf Linden *
- Manitoba Maple
- Mountain Ash
- Norway Maple*
- Norway Spruce*
- Paper Birch
- Red Elm
- Red Maple
- Red Pine
- Scots Pine
- Siberian Elm*
- Sugar Maple
- Silver Maple
- Staghorn Sumac
- Trembling Aspen
- Upland Willow
- Upright Juniper
- White Ash
- White Birch
- White Spruce
- Yellow Birch

Within the Sugar Maple – Basswood Deciduous Forest, mature Sugar Maples (40%) were the most dominant species, followed by American Basswood (23%) with lesser occurrences of Ash Spp. (4%), Ironwood (4%), and Bitternut Hickory (3%). Trees within this community were in 'Very Good' health and nearing a mature age as indicated by the overall DBH of trees (>30 cm DBH). Pockets of Common Buckthorn, Poison Ivy, Japanese Knotweed, and Dog Strangling Vine were noted within the community. Beech Bark Disease and Emerald Ash Borer damage was observed within American Beech and Ash trees respectively.

The Deciduous Exotic Forest consists of Siberian Elm (41%) and Basswood (9%) with lesser occurrences of Green Ash (8%), Manitoba Maple (7%) and Sugar Maple (6%). Trees within this community were in 'Poor' health. Field investigations concluded that there was a presence of Emerald Ash Borer, Beech Bark Disease, and Slime Flux Disease within American Beech, Ash trees, and Siberian Elms, respectively. Trees affected by Slime Flux Disease are predominantly located adjacent to walking paths.

Within the Poplar Deciduous Forest, Eastern Cottonwood (86%) dominated the landscape, followed by Manitoba Maple (3%), White Ash (3%), American Elm (3%), and Bitternut Hickory (3%). Trees within this community were in 'Good' health and generally mid-aged with the average DBH being 26 cm. Small thickets of invasive plant species such as Common Buckthorn and Dog Strangling Vine were noted within the community.

A complete Tree Conservation Report has been prepared and is included in Appendix H.

5.6 Ecological Linkages

The function of the Study Area as an ecological linkage is limited to the general movement of common Ottawa wildlife through the local landscape. The escarpment feature to the north of the Study Area is identified as an Urban Natural Feature in *Schedule C-11-C - Natural Heritage System (East)*, however it is not identified as a Natural Heritage System Linkage Area.

The Study Area provides general terrestrial linkage between the escarpment and the North Woods to the west, allowing for greater connectivity for wildlife with low mobility. Due to the presence of the Sir George Etienne Parkway, there is low connectivity to the Air Base Woods to the north of the Study Area.

The Study Area provides a localised movement corridor for wildlife with low mobility within the Study Area, however it does not provide high value ecological linkage to adjacent habitats.

5.7 Incidental Wildlife

In addition to incidental bird observations, the following incidental wildlife observations were made during site visits: red squirrel, gray squirrel, eastern cottontail, skunk, white-tailed deer, hawkmoth larvae, firefly larvae, cicada, eastern red-backed salamander, American toad, gray tree frog, and northern leopard frog.

6 Proposed Development

A conceptual site plan has been developed for CLC's Wateridge Village Phases 6, and 7. It is understood that this conceptual site plan is based on the approved Community Design Plan, but that the layout of the subdivision is subject to change. The Phase 6, and 7 conceptual site plan proposes the development of mixed-density (high and medium) residential units and includes open park space with associated trail systems (**Figure 7**). The total development footprint is approximately 24.6 ha. Impacts to natural heritage features, and possibility for retention and restoration are outlined in **Section 7** of the report.

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.
- Site grading and earth works, including blasting.
- Paving parking areas and access roads.
- Landscaping and fencing.
- On-going usage and maintenance.

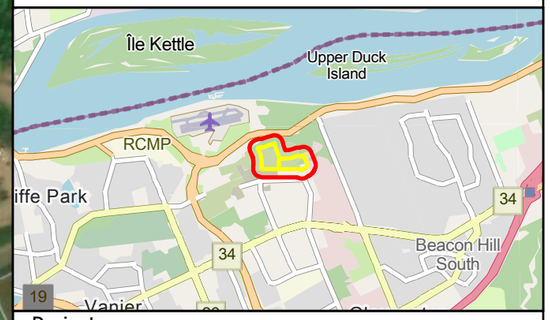
N

Legend

- Subject Property
- Study Area (120m)
- Preliminary Site Concept Plan
- Drypond
- Walking Trails
- Accessible Asphalt Pathway
- Approx. Limit of Fill Needed For Accessible Pathway Grading

0 25 50 100 150 200 Meters

Scale: 1:3,500



Project:

Wateridge Village EIS: Phases 6 & 7

Title:

Draft Plan of Subdivision

Prepared By:

ARCADIS Design & Consultancy for natural and built assets

Project: 139653

Date: 12/19/2024

Figure: 7

7 Impact Assessment and Mitigation

This section describes the proposed impacts to the Study Area based on the conceptual site plans described in **Section 6**. These impacts have been assessed, and mitigation measures that must be incorporated throughout the planning, design, construction, and post-construction phases of the project have been recommended to minimize impacts on natural heritage features where possible. **Figure 8** demonstrates the anticipated impacts on natural heritage features within the proposed development.

7.1 Aquatic Environment

A single headwater drainage feature was located within the Study Area; however, it appears to be associated with stormwater infrastructure. It is understood that flows from Phase 6 and 7 of Wateridge Village will be redirected to the stormwater management pond in the eastern extents of the Study Area, eventually discharging to Eastern Creek.

It is understood that pre-development flows are to be maintained to downstream reaches, including Eastern Creek.

The following impacts to aquatic habitat from the proposed development and associated construction activities expected:

- Replacement of existing stormwater management infrastructure and associated clean up of reach WTR-1.
- Reduction of, or alteration to natural drainage patterns, specifically as potential inputs to the Rockcliffe Escarpment feature.

Proposed Mitigation Measures – Planning and Design Stage

- ✓ As per consultation with the NCC, a FLUDTA will be required for any works associated with stormwater infrastructure on NCC lands.
- ✓ As per consultation with the NCC, a Fisheries Act 'Request for Review' will likely be required to address the fisheries impacts associated with any works conducted in or on headwater drainage features discharging into Eastern Creek.
- ✓ Stormwater retention, site grading, as well as quantity and quality control measures should be designed to appropriately direct pre-treated stormwater and surface flows to maintain the function of Eastern Creek.
- ✓ Include a Vegetation Management component to the designed stormwater management facilities to contribute to the maintenance of infiltration rates, erosion protection, evapotranspiration rates and filtration of stormwater.
- ✓ An Erosion and Sediment Control Site Plan should be developed by the contractor for implementation during construction to prevent impacts from all associated activities to adjacent water features.
- ✓ Incorporate Low Impact Design (LID) practices, such as bioretention bump-outs and permeable sidewalks designed to achieve the infiltration, erosion, and water quality design targets.

Proposed Mitigation Measures – Construction Implementation

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

- ✓ Heavy-duty silt fencing (OPSD 219.130) and/or other equivalent erosion and sediment control measures shall be installed around the Project footprint, adjacent to the footprint of the drainage feature, and associated wetland habitats to clearly demarcate the development area and prevent erosion and sedimentation into water features. Erosion and sediment control (ESC) measures shall be monitored weekly to ensure they are functioning properly and if issues are identified should be dealt with 48-hours of notice.
- ✓ Refuelling of all equipment shall be conducted 30 m or more from any water feature. Storage of fuel and refueling shall be conducted within an approved area.
- ✓ Stockpiling of excavated material should not occur outside the delineated work area. If stockpiling is to occur outside of this area, double-row silt fencing and straw bales shall be used to contain any spoil piles to prevent sedimentation into adjacent areas.
- ✓ Drip pans shall be used under stationary equipment using fuel products such as generators, and similar equipment to ensure no deleterious substances enter water features.
- ✓ Heavy equipment shall not enter active watercourses or wetlands at any time.
- ✓ A spill response plan shall be developed by the contractor and implemented as required.

Proposed Mitigation Measures – After Construction

- ✓ All ESC measures shall remain in place until vegetation is re-established, as directed by the environmental monitor.

With the successful implementation of the mitigation measures outlined above, impacts from the proposed development on the aquatic environment is expected to be permanent, but limited in the context of the greater watershed. These impacts are unlikely to impact water quantity being directed to the Eastern Creek.

7.2 Terrestrial Environment

7.2.1 Vegetation Communities

To accommodate the construction of the proposed residential development, it is anticipated that the permanent removal of terrestrial vegetation communities will be required. The impacts associated with the clearing will include:

- The permanent loss to native vegetation is approximately 14.4 ha of meadow and deciduous forests (subject to change upon detailed design). This disturbance is directly associated with the clearing required to accommodate the Project.
- Accidental damage or loss of trees and other vegetation features because of site alteration or construction activities.
- Permanent loss of habitat for wildlife dependent of terrestrial communities.
- Changes in natural drainage, evo transpiration and infiltration processes.
- Decreased biodiversity, reduced number of species, or abundance of species.
- Erosion and sedimentation into adjacent vegetation communities; and
- Permanent loss of native vegetation due to increased potential for non-native and invasive species after development.

Proposed Mitigation Measures – Planning and Design Stage

- ✓ Landscaping planting plans should consider naturalized features with native vegetation seeding and plantings where feasible. For example, a naturalized pollinator gardens should be designed and planted within open park spaces to provide native vegetation within the proposed development, as well as an opportunity for infiltration of stormwater.
- ✓ Where development encroaches into the Urban Natural Feature, or retained forest habitat, a forest edge management and restoration plan shall be developed to replace removed native trees and shrubs along the forest edge.
- ✓ Landscape plans should consider invasive species management, specifically to address abundant species such as Buckthorn. This should be consistent with federal standards under the federal Invasive alien species strategy (Environment Canada, 2004)
- ✓ Where residential development abuts the Urban Natural Feature, permanent fencing should be installed to prevent encroachment into the natural areas.

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 of the existing Natural Heritage Feature. 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 measures shall be installed where necessary prevent sedimentation outside of work areas, specifically within the Urban Natural Feature.
- ✓ 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 clean condition and will be free of fluid leaks, invasive species, and noxious weeds as issued through the Clean Equipment Protocol for Industry.
- ✓ Construction machinery should remain within the limit of development and stored in an area that is isolated from the Natural Heritage Feature to ensure that no deleterious substances enter the adjacent watercourses or wetlands.
- ✓ 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

- ✓ The creation and distribution of an ‘environmental awareness handbook’ should be considered to educate homeowners about the Urban Natural Feature adjacent to the proposed development. This handbook should provide information on invasive plant species as well as include suggestions for non-invasive, or native alternatives based on the Ontario Invasive Plant Council’s “Grow Me Instead” Guides.
- ✓ Naturalized features such as pollinator gardens, and native tree and shrub plantings should be monitored post-construction.

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

With the successful implementation of the mitigation measures outlined above, a moderate decrease in vegetation communities is anticipated due to the removal of vegetation within the Study Area.

7.2.2 Woodlands

It is expected that at least 3.5 ha of woodlands will be cleared to accommodate site remediation, development of the proposed mixed-use residential communitiy.

The woodlands throughout the Study Area have several large, mature, and healthy trees, as well as widespread evidence of Emerald Ash Borer, Beech Bark Disease, and Slime Flux Disease within the Ash trees, American Beech, and Siberian Elms, respectively. Additionally, there is a large presence of Common Buckthorn, and other invasive species, and all Butternut trees observed were impacted by Butternut canker.

Woodland removal in this area will negatively impact the abundance and diversity of native woodland vegetation, decrease canopy cover and permeable surfaces, and reduce available terrestrial habitat for wildlife. Vegetation removal will also limit the amount of interior forest habitat available for local wildlife.

The anticipated impacts to woodlands include:

- The permanent loss of significant woodlands within the proposed development area;
- 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

- ✓ A landscape plan favouring native trees and shrubs to offset the loss of woodlands within the Study Area. This plan can be incorporated into the landscape design for the site during the detailed design stage of the project.
    - Re-planting and vegetating the edge of forest with native vegetation with appropriate native species would improve the biodiversity and ecological functions of these areas.
    - The development of a planting plan should be done in coordination with the City of Ottawa to identify targets for planting and appropriate species as per the Tree Protection (By-law No. 2020-340) *Schedule B – Tree Compensation Requirements*.
- ✓ Grading plans should match new grades to the existing grades of the Urban Natural Feature and retained woodlands up to the Critical Root Zone (CRZ) of the edge trees were possible.
- ✓ Where residential development abuts the Urban Natural Feature, permanent fencing should be installed to prevent encroachment into the natural areas.

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 7.2.1.

It is anticipated that the clearing of woodlands 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 vegetation.

7.2.3 Significant Wildlife Habitat

BREEDING BIRDS

It is expected that the removal and disturbance to forest, and meadow within the proposed development area will result in a loss of potential nesting and foraging habitat for birds.

The Study Area provides suitable nesting habitat for Pileated Woodpeckers. Though Pileated Woodpeckers were observed foraging throughout the Study Area, no nests were observed during field surveys.

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.
- — 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).
- ✓ Where possible, retain suitable trees 30 cm DBH or greater within the proposed development, including deadwood stands to provide nesting and foraging opportunities for birds.
- ✓ 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 31st. Should any clearing be required during the breeding bird season, nest searches shall be conducted by a qualified person and 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, 1994* (MBCA) (Government of Canada, 1994).
- ✓ Trees shall be inspected for Pileated Woodpecker nests prior to removals by a qualified professional.
- ✓ 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.
- ✓ 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 permanent site-wide loss of breeding and foraging habitat for birds common to Eastern Ontario is expected.

BAT MATERNITY COLONY SWH

Based on the Draft Site Plan, it is anticipated that bat habitat will be negatively impacted throughout the Study Area, including maternity roosting habitat, and foraging habitat.

The following impacts on bat maternity roost habitat are possible:

- — Permanent loss of candidate roost habitat within forested habitat from vegetation removals.
- — Permanent loss of candidate foraging area within meadow habitat from vegetation removals and construction activities.
- — Permanent loss of woodland habitat; and,
- — Accidental displacement, injury, or death of bats which may be using woodlands as temporary roosting habitat during roosting period.

Proposed Mitigation Measures – Planning and Design

- ✓ Installation of artificial roosting structures such as large bat boxes following best management practices based on guidance provided by Bat Conservation International should be considered in open areas adjacent to the UNF. Locations of bat box installation shall be determined by a qualified professional. A total of 8 bat boxes is recommended as follows:
  - 4 in Phase 6
  - 4 in Phase 7
- ✓ Planting of native deciduous trees where possible should be considered during the landscape design. Native deciduous trees provide suitable roosting habitat upon reaching maturity.

- ✓ Where possible, retain large mature cavity trees to maintain available roosting habitat.

Proposed Mitigation Measures – Construction Implementation

- ✓ Clearing of vegetation should be avoided during the general active and maternity roosting periods for bats (April 1st to October 15th).

With the successful implementation of the mitigation measures outlined above, it is anticipated that the proposed development will result in a limited temporary negative impact to bats and bat habitat due to the loss of roosting habitat, as well as foraging habitat within the Study Area.

HABITAT FOR SPECIES OF CONSERVATION CONCERN

Habitat for two (2) Species of Conservation Concern (SCC) were observed (Eastern Wood-peewee and Wood Thrush). The following impacts to Species of Conservation Concern are expected:

- — Disturbance or removal of suitable marginal breeding and feeding habitat, as well as accidental harm or injury during construction activities.

Proposed Mitigation Measures – Planning and Design Stage

- ✓ Management measures for invasive species should be considered in the landscape plans to help manage the proliferation of invasive species within the Study Area, specifically addressing Dog-strangling Vine, should be implemented to limit risk of harmful plants to SCC birds; and
- ✓ Environmental awareness information package should be delivered to construction staff to make them aware of potential presence of SCC, and protocols if SCC are found incidentally during work activities.

Proposed Mitigation Measures – Construction Implementation

- ✓ Clearing of vegetation should be avoided between April 15th and August 31st, to avoid potential physical harm to Species of Conservation Concern birds during active seasons.
- ✓ Light-duty silt fencing (OPSD 219.110) or other equivalent shall be installed to ensure that wildlife do not enter the construction area.
- ✓ Other mitigation measures outlined in the *Protocol for Wildlife Protection during Construction* (City of Ottawa, 2022) should be considered prior to construction of the proposed development.
- ✓ Construction areas should be pre-stressed during clearing to allow Species of Conservation Concern to safely leave the area; and

Proposed Mitigation Measures – Post-Construction

- ✓ Pesticide use should be limited, or avoided, when possible, in landscape maintenance to reduce risk of exposure to Species of Conservation Concern.
- ✓ The creation and distribution of an 'environmental awareness handbook' should be considered to educate homeowners about the sensitive wildlife within and adjacent to the proposed development.

With the successful implementation of the mitigation measures outlined above, it is anticipated that the proposed development will result in a limited negative impact to

Species of Conservation Concern habitat due to the loss of breeding and foraging habitat within the Study Area.

7.3 Species at Risk

The following sub-sections describe the anticipated impacts that this development project may have on Species at Risk and associated habitat.

BUTTERNUT

17 Butternut trees (listed as Endangered both federally and provincially) were observed within the Study Area. Butternut locations have been mapped and are included on **Figure 6** and health assessment have been summarized within a table in **Appendix F.**

Butternut is protected under the ESA. Section 9 of the ESA includes prohibitions against activities, such as killing or harming a living Butternut specimen. Section 10 of the ESA includes prohibitions against damage or destruction of Butternut habitat. However, Ontario Regulation (O. Reg.) 830/21 of the ESA includes exemptions that would otherwise be prohibited by the Act and provides conditional exemptions from prohibitions for certain activities that may affect Butternut.

For most activities that involve killing or harming a species, a proponent's eligibility for exemptions is dependent on the Category of a tree, which has been assigned by a Butternut Health Assessor. For example, Category 1 (non-retainable) trees are exempted from clause 9 (1) (a) of the ESA, and trees under this category can be killed, harmed, or taken without authorization if all the exemption provisions have been met (Part 5 of O. Reg. 830/21). For Category 2 (retainable) trees, if greater than 15 trees are proposed for removal, an ESA authorization will be required and exemption provisions under the O. Reg do not apply. Exemption provisions also do not apply for the removal of greater than five (5) Category 3 (retainable and archivable) trees and proponents must seek an ESA authorization.

The butternut health assessment revealed that 15 butternut are Category 1, one (1) is Category 2, and one (1) is Category 3. One Category 2 tree (Tree 816 in Appendix F) will be impacted based on the Draft Plan of Subdivision.

Proposed Mitigation Measures – Planning and Design Stage

- ✓ The submission of Butternut Health Assessment report is required, and registration of activities harming Butternut must be undertaken if any impacts are to occur within 50 m of a Butternut tree.
- ✓ Retention of Butternut trees within the Project footprint, plus a 50 m buffer, until activities have been registered.

Proposed Mitigation Measures – Construction Implementation

- ✓ Construction awareness training package should be provided to contractors working on-site. The package will provide general information and mitigation for Butternut and other natural heritage features that may be encountered directly or indirectly on site and standard procedures if encountered.
- ✓ Butternut clearing should occur when construction activities (i.e., grading, excavation) are imminent to reduce the potential for new seedlings to regenerate.

An ESA registration will be required prior to the removal and/or harm of any Butternut trees on this property. Site alteration within the 50m buffer around each tree must be avoided until approval to remove these trees is granted by MECP.

SAR BATS

It is expected that the proposed development will have a minor negative, but not limiting, impact to SAR bats within the Study Area due to loss of candidate habitat. The clearing will likely result in the loss of 1.3 ha of candidate roosting habitat and disturb candidate foraging habitat over the course of construction. However, the majority of candidate bat habitat is located within the Rockcliffe Escarpment (UNF) and the associated woodlands, and removals are not predicted to significantly limit available roosting habitat in these areas. Additional impacts to bats may include:

- Permanent, but minor, loss of candidate roost trees within forest habitat from vegetation removals.
- Permanent, but minor, loss of naturalized foraging area within meadow habitat from vegetation removals and construction activities.
- Potential for accidental displacement, injury, or death of bats that may be using woodlands as temporary roosting habitat during roosting period.

Mitigation During Construction

- ✓ Clearing of woodland habitat should be avoided during the general active and maternity roosting periods for bats (April 1st to October 15th).
- ✓ Construction areas should be pre-stressed during clearing to allow SAR bats to safely leave the area.
- ✓ Installation of bat boxes as per the recommendations in Section 7.2.3.
- ✓ Compensation for habitat loss as per the recommendations for tree compensation in Section 7.2.2.
- ✓ Environmental awareness training and materials should be provided to construction staff by a qualified biologist to make construction staff aware of safety protocols should SAR be encountered directly during construction activities.

With the successful implementation of the recommended mitigation, it is expected that the proposed development will have no direct impacts to SAR Bats and any impacts to SAR Bat habitat will be non-limiting.

7.4 Trees

The following section provides an overview of the mitigation and recommendations which are detailed in the **TCR, located in Appendix H** of this report.

It is understood that the site development will require grading and will therefore require tree clearing, including all distinctive trees throughout the Study Area. The tree removals will result in a permanent decrease in tree biodiversity, as well as a loss of young, mid-aged, and mature trees. As described in Section 5.5, the tree community within the limit of development consists mainly of non-native species, measuring on average 28 cm DBH.

To offset the loss of trees within the Subject Property, it is recommended to incorporate tree plantings throughout the development, including within parks, and the un-developed block adjacent to the UNF (**Figure 7**). The retention of mature trees is also recommended, where possible. 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 development of a landscaping/planting plan should be done in coordination with the City of Ottawa to identify targets for planting and appropriate species as per the *Tree Protection (By-law No. 2020-340) Schedule B – Tree Compensation Requirements*.
- ✓ Invasive species, such as Buckthorn, Dog Strangling Wine, Garlic Mustard, and Japanese Knotweed should be prioritized for removal and replacement with suitable native species.
- ✓ 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 phases.
- ✓ Tree protection fencing should be installed around all trees that will be retained (i.e., property boundary). Additional tree protection fencing requirements include:
    - Fencing should be installed following industry standard practices.
    - 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.
    - Layouts for tree protection fencing should be reviewed by a qualified professional.
    - Local adjustment of the protection fence should occur to slightly alter grading to mitigate adverse harm to specific trees along the forest edges.
    - Groups of trees can be fenced together if the fencing still meets the recommended placement described above.
- ✓ 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 15th to August 31st) to limit disturbance to nesting birds and their nests or young and comply with the MBCA, 1994.
    - If trees are to be removed during the breeding bird season, it should be preceded by a nest survey by a qualified avian biologist. Surveys should be undertaken a maximum of 48 hours prior to the commencement of removals. If nests are found during a survey, or during construction, an appropriate buffer must be applied, and the nest must not be disturbed until the young have fledged.

- ✓ All Green and White 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.
- ✓ 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 mid-aged non-native trees, as well as mature native trees.

Further mitigation and recommendations are included in the TCR in Appendix H.

7.5 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.
- — 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, 2022).
- ✓ 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 (i.e., 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.

7.6 Cumulative Impacts

The proposed development is located within an urban area in 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, and industrial uses, with urban intensification occurring throughout the local community over the last 20 years. The Subject Property was formerly a part of CFB Rockcliffe, which has been since decommissioned, and the Subject Property has been re-naturalizing since the mid 1990's.

Based on field assessments and available information, the removal of the natural heritage features within the Subject Property will have a moderate 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.
- Loss of woodland habitat features.
- 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 low-impact development practices, including permeable landscaping materials and rain capture systems like rain gardens and permeable pavers.

N

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WTR-2

WTR-1

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Legend

- Subject Property
- Study Area (120m)
- Butternut Buffer (50m)
- Preliminary Site Concept Plan
- Drypond
- Walking Trails
- Accessible Asphalt Pathway
- Approx. Limit of Fill Needed For Accessible Pathway Grading
- Candidate Bat Maternity Colony Habitat
- Significant Woodlands
- Anticipated Vegetation Removal
- Invasive Species

Butternut Health Assessment

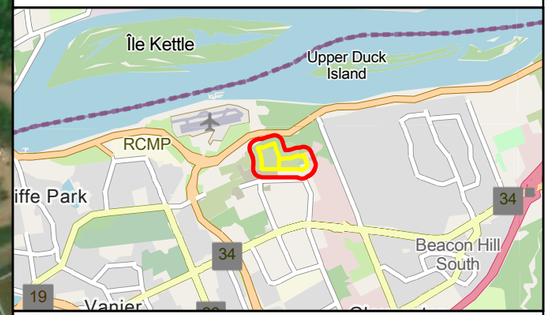
- Category - 1
- Category - 2
- Category - 3
- Butternut Root Harm Prevention Zone (50m)

HDF Classification

- HDF - Protection
- HDF - Conservation
- HDF - Mitigation

0 25 50 100 150 200 Meters

Scale: 1:3,500



Project:

Wateridge Village EIS: Phases 6 & 7

Title:

Opportunities and Constraints

Prepared By:

ARCADIS Design & Consultancy for natural and built assets

Project: 139653

Date: 12/19/2024

Figure: 8

8 Summary and Conclusions

This report provides an evaluation of the anticipated impacts associated with the construction and long-term occupation of Wateridge Village Phases 6, and 7 (**Figure 1**). The environmental impacts and mitigation are based off field investigations completed in 2022 and 2023, an EIS and TCR *in Support of Draft Plan Approval of the Former CFB Rockcliffe Lands* prepared by Golder and Associates in 2015, and a review of available desktop and background information.

Notable observations during Arcadis's field investigations include the presence of a single **Headwater Drainage Feature** (HDF) within the northern edge of the Study Area within the Rockcliffe Escarpment, contributing to Eastern Creek. It is understood that pre-development flows are to be maintained to downstream reaches, including Eastern Creek.

The SAR study confirmed the presence of one SAR (Butternut) and habitat for two (2) Species of Conservation Concern (Eastern Wood Peewee and Wood Thrush). The **Butternuts** were located within the Sugar Maple-Basswood Deciduous Forest community. The butternut health assessment revealed that 15 are Category 1, one (1) is Category 2, and one (1) is Category 3. **Eastern Wood-Peewee** and **Wood Thrush** were observed within the woodlots associated with the escarpment and protected UNF during breeding bird surveys and are likely using the woodlots for nesting and foraging. **Pileated Woodpeckers** were observed foraging throughout the Study Area; however, no nests were observed within the Study Area during field surveys.

Significant Woodlands are present within the Study Area based on size and age criteria within the City of Ottawa's *Significant Woodland Guidelines* (2022). The woodlands within the Study Area show signs of disturbance due to the presence of invasive Buckthorn, Japanese Knotweed, Garlic Mustard, and Dog-strangling Vine. Furthermore. There is widespread evidence of Emerald Ash Borer, Butternut Canker, Beech Bark Disease impacting Ash trees, Butternut, and American Beech trees respectively. It is anticipated that majority of the identified Significant Woodlands throughout the Study Area will be retained.

Forty-four (44) species of **trees** were recorded in the Study Area. Trees that are predicted to be impacted are generally mid-aged (average DBH 28 cm), non-native species. The most abundant species are primarily Sugar Maple, Basswood, and Siberian Elm. The Majority of Ash trees were in declining health with evidence of tree pests (Emerald Ash Borer) throughout the Study Area. **Distinctive Trees** were located throughout the Study Area and are mapped within the *Wateridge Village: Phase 6 & 7 Tree Conservation Report* in **Appendix H**.

The field evaluation suggests that natural features provide connectivity to adjacent natural features, however the linkage does not have any significant function, likely serving as general movement corridors for urban wildlife, specifically low-mobility wildlife such as amphibians.

Based on this evaluation, there are opportunities for habit enhancement, particularly adjacent to the UNF, within park blocks, and within the retained significant woodlot. This includes the following:

- Tree planting along the forest edge of the UNF, and retained woodlot stands. Additional tree planting will increase diversity and canopy cover, reduce invasive species abundance, and provide habitat for urban wildlife.
- Prioritizing the retention of mature trees (DBH 30 cm or greater) where possible along the edge of the UNF, parks and the retained Phase 8 woodlot.
- Installation of bat boxes to compensate for loss of candidate roost and maternity colony habitat and support urban bat populations.

- Creation of pollinator habitat through the implementation of low-impact development practices such as vegetated swales where possible, to enhance habitat for wild bees and other pollinators species as well as provide opportunity for infiltration.

The mitigation and compensation measures described in this report have been developed to avoid or limit negative environmental impacts associated with the proposed development. This study was completed by Lindsay Jackson, HBSc., and reviewed by Alex Zeller, MSc. with technical and field assistance provided by; Brittany Semmler. HBSc. The results and findings of this study have been reported without bias or prejudice. The conclusions of this study are based on our own professional opinion, substantiated by the findings of this study, and have not been influenced in any way.

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APPENDIX A

Species of Conservation Concern and Species at Risk Table

Table A1 Species of Conservation Concern with potential to occur 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								
Common Nighthawk	*Chordeiles minor*	Require large open habitat within farmlands, open woodlands, clearcuts, regenerating burn lands, alvars, or prairies.	SC	SC	S4B	OBBA	**No**	No suitable open habitat found within the Study Area. Open areas are dominated by cultural meadows and are highly vegetated.
Eastern Wood-Pewee	*Contopus virens*	Open, deciduous, mixed, or coniferous forest; predominated by oak with little understory; forest clearings, edges; farm woodlots, parks.	SC	SC	S5	OBBA	**Yes**	Open deciduous forest within the Study Area, however, this habitat is outside the limit of development therefore no impacts are anticipated.
Wood Thrush	*Hylocichla mustelina*	Carolinian and Great Lakes-St. Lawrence forest zones; undisturbed moist mature deciduous or mixed forest with deciduous sapling growth; near pond or swamp; hardwood forest edges; must have some trees higher than 12 m.	THR	SC	S4B	OBBA	**Yes**	Mature deciduous forest is located within the Study Area. However, due to fragmentation it is unlikely that there is enough interior habitat within the Study Area to provide habitat.
HERPETOZOA								
Eastern Ribbonsnake	*Thamnophis sauritius*	Usually found in habitats close to water such as ponds, marshes, bogs, or swamps surrounded by dense vegetation. Hibernating habitat includes underground burrows or rock crevices.	SC	SC	S4	ON	**No**	No aquatic habitat found within the Study Area.
Milksnake	*Lampropeltis triangulum*	Often found in farmlands, meadows, and hardwood forests stands with woody cover. Known for inhabiting structures in rural settings. Often found near aquatic habitat. Uses hollow logs, and old foundations for hibernating.	SC	SC	S4	ON	**No**	No old buildings, farmlands, or aquatic habitat found within the Study Area. Though hardwood forests are present within the Study Area, suitable hibernating habitat is sparse.
Snapping Turtle	*Chelydra serpentina*	Generally, inhabits slow-moving water waterbodies with abundant vegetation and soft substrate. Nests in gravel or sand along waters edge, or along roadways.	SC	SC	S5	NHIC	**No**	No suitable aquatic or nesting habitat present within the Study Area.
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.	SC	SC	S2	BA	**Yes**	Abandoned commercial lots may provide habitat for Monarch.

Table A2 1 Species at Risk with potential to occur within the Study Area.

COMMON NAME	SCIENTIFIC NAME	HABITAT DESCRIPTION	CONSERVATION STATUS			SOURCE	POTENTIAL FOR HABITAT WITHIN STUDY AREA	RATIONALE
			Federal (SARA, 2002)	Provincial (ESA, 2007)	S-Rank			
BIRDS								
Bobolink	*Dolichonyx oryzivorus*	Large, open expansive grasslands with dense ground cover; hayfields, meadows, or fallow fields; marshes; requires tracts of grassland >50 ha.	THR	THR	S3	OBBA	**No**	No grassland meadow habitat is present withing the Study Area.
Barn Swallow	*Hirundo rustica*	Breeds in areas with accessible structures for building nests such as barns, buildings, sheds, bridges, and culverts. Forages over open areas near water. Mud cup nests are built on ledges under overhangs, suitable nests are reused.	THR	SC	S5	OBBA	**No**	No structures for nesting present within the Study Area.
Bank Swallow	*Riparia riparia*	Breeds in vertical faces such as steep sand, clay, or gravel banks near water.	THR	THR	S5	OBBA	**No**	No steep sand, clay or gravel cliff faces within the Study Area. Escarpment is highly vegetated and too rocky for Bank Swallows to construct nests in.
Chimney Swift	*Chaetura pelagica*	In Ontario, breeding habitat is commonly associated with urban areas near buildings that can provide adequate shelter. Nests mostly in chimneys; highly gregarious; feeds over open water.	THS	THR	---	NHIC	**No**	No structures suitable for nesting such a as chimneys are located within the Study Area.
Eastern Meadowlark	*Sturnella magna*	Open, grassy meadows, farmland, pastures, hayfields, or grasslands with elevated singing perches; cultivated land and weedy areas with trees; old orchards with adjacent, open grassy areas >10 ha in size	THR	THR	S5	OBBA	**No**	No grassland meadow habitat is present withing the Study Area.
Eastern Whip-poor will	*Antrostomus vociferus*	In Ontario, the whip-poor-will breeds in semi-open forests with little ground cover. Breeding habitat is dependent on forest structure rather than species composition, and is found on rock and sand barrens, open conifer plantations and post-disturbance regenerating forest. Territory size ranges from 3 to 11 ha. No nest is constructed, eggs are laid directly on the leaf litter.	THR	THR	S4B	OBBA	**No**	Breeding habitat is absent from the Study Area. Forests within the Study Area are highly disturbed and well vegetated, with no semi-open inclusions or rock barrens. Located within a highly urbanized setting.
HERPETOZOA								
Western Chorus Frog	*Psudacris triesriata*	In Ontario, this amphibian species habitat typically consists of marshes or wooded wetlands, with dense shrub layers and grasses. They will breed in almost any fishless pond including roadside ditches, gravel pits and flooded swales in meadows. This species hibernates in terrestrial habitats under rocks, dead trees, or leaves, in loose soil or in animal burrows. During hibernation, this species is tolerant of flooding.	END	---	S3	ON	No	Study Area does not provide any areas of temporary or permanent open water required for breeding.
VASCULAR PLANTS								
Butternut	*Juglans cinerea*	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. Often grows in sunny openings and near forest edges.	END	END	S2	iNat	**Yes**	Moist, well-drained soils near streams may present candidate habitat for Butternut trees.

COMMON NAME	SCIENTIFIC NAME	HABITAT DESCRIPTION	CONSERVATION STATUS			SOURCE	POTENTIAL FOR HABITAT WITHIN STUDY AREA	RATIONALE
			Federal (SARA, 2002)	Provincial (ESA, 2007)	S-Rank			
American ginseng	*Panax quinquefolius*	American ginseng is found in moist, undisturbed, and relatively mature deciduous woods often dominated by sugar maple. It is commonly found on well-drained, south-facing slopes. American ginseng grows under closed canopies in neutral, loamy soils.				NHIC	**Yes**	Study Area contains mature Sugar Maple deciduous woodlots with loamy soils. However, the Study Area is in a highly urbanized area, and most of the forests have been impacted by development, or by invasive species such as Strangling Dog-vine, Garlic Mustard, Daylilies, and Common Buckthorn. Though potential habitat is present, it is unlikely that American Ginseng is present throughout the Study Area.
Mammals								
Little Brown	*Myotis lucifugus*	Uses caves, quarries, tunnels, hollow trees, or buildings for roosting; winters in humid caves; maternity sites in dark warm areas such as attics and barns; feeds primarily in wetlands, forest edges.	END	END	S3	AMO	**Yes**	Study Area contains deciduous forests with large diameter trees with cavities suited for roosting, and forest edges for feeding habitat.
Northern Myotis	*Myotis septentrionalis*	Hibernates during winter in mines or caves; during summer males roost alone and females form maternity colonies of up to 60 adults; roosts in houses, manmade structures but prefers hollow trees or under loose bark; hunts within forests, below canopy.	END	END	S3	AMO	**Yes**	Study Area contains deciduous forests with large diameter trees with cavities and loose bark, suited for roosting, and forests for feeding habitat.
Tri-colored Bat	*Perimyotis subflavus*	Open woods near water; roosts in trees, cliff crevices, buildings, or caves; hibernates in damp, draft-free, warm caves, mines, or rock crevices.	END	END	S3	AMO	**Yes**	Study Area contains open woods with rock crevices. Ottawa River is just outside of the Study Area and may provide foraging.

APPENDIX B

Headwater Drainage Feature Recommendations and Results Table

Table A3 Headwater Drainage Feature: Management recommendation results.

DRAINAGE FEATURE SEGMENT	STEP 1		STEP 2	STEP 3	STEP 4	HDFA Management Recommendation
	Hydrology	Modifiers	Riparian	Fish Habitat	Terrestrial Habitat	
WTR-1	**Contributing function:** Provide ephemeral flow during spring freshet and following rain events. Minimal substrate sorting is present throughout the reach because of being located within a steep slope. Channel is dominated by limestone bedrock of the escarpment.	*Feature appears to be associated with an old stormwater outlet over the escarpment.*	**Important function:** Riparian conditions are dominated by mature forest within an escarpment feature. The escarpment is considered an Urban Natural Feature by the City of Ottawa.	**Contributing function:** Open water upstream features are isolated and associated with stormwater infrastructure. This reach is located on the escarpment and is too steep to provide fish habitat.	**Contributing function:** Provides connectivity between a wetland downstream and the escarpment (two features protected by the planning process). Provides movement opportunities for wildlife.	**Conservation**
WTR-2	**Contributing function:** Provide ephemeral flow during spring freshet and following rain events. Minimal substrate sorting because of intermittent flow. Channel lacks definition and is dominated by terrestrial vegetation.	*Channel form changes substantially, braiding, and lacking structure. It appears that this portion of the drainage feature provides overland flow of stormwater from the escarpment toward the roadside ditch.*	**Valued function:** Riparian conditions are dominated by meadows, with forest and thicket present at the western portion of the reach.	**Contributing function:** Low connectivity to downstream habitat, multiple fish barriers present.	**Contributing function:** Provides connectivity between a wetland downstream and the escarpment (two features protected by the planning process). Provides movement opportunities for wildlife.	**Mitigation**
WTR-3	**Contributing function:** Provide ephemeral flow during spring freshet and following rain events. Minimal substrate sorting because of intermittent flow. Channel is a roadside ditch.	*Channel is a roadside ditch that collects water from the St. George Etienne Parkway. It also conveys water discharged from the upstream stormwater management facility towards Eastern Creek.*	**Limited function:** Riparian conditions are associated with roadside ditch, and limited vegetation.	**Contributing function:** Low connectivity to downstream habitat, multiple fish barriers present.	**Contributing function:** Provides connectivity between a wetland downstream and the escarpment (two features protected by the planning process). Provides movement opportunities for wildlife.	**Mitigation**
EC-1	**Valued Function:** Water is present throughout the year as either flowing water or standing surface water, likely due to groundwater discharge and contributions from wetland. Minimal flow observed throughout the channel. Limited channel sorting with dominating substrate being silt. No aquatic vegetation noted in stream.	*Channel meanders through the Airbase Woods from St George Etienne Parkway towards the Ottawa River.*	**Important function:** Riparian conditions are dominated by the Airbase Woods, which is a mature forest adjacent to the Ottawa River. It is considered an Urban Natural Feature by the City of Ottawa.	**Contributing function:** Low connectivity to downstream habitat, fish barriers present.	**Important function:** Channel runs adjacent to a wetland. Provides movement opportunities for amphibians, as well as an area suitable for feeding and hydration. Likely provides some amphibian breeding.	**Protection**

Table A4 Headwater Drainage Feature Assessment survey data.

DATE	REACH NAME	AIR TEMP (C)	DISCHARGE TYPE	UPSTREAM FEATURE TYPE	FLOW CONDITIONS	SEDIMENT DEPOSITION	FEATURE WIDTH (M)	FEATURE DEPTH (MM)	BANKFULL WIDTH (M)	SEDIMENT TYPE	FEATURE VEGETATION CATEGORY	VEGETATION LEFT BANK (0-1.5M)	VEGETATION RIGHT BANK (0-1.5M)	VEGETATION LEFT BANK (1.5-10M)	VEGETATION RIGHT BANK (1.5-10M)	VEGETATION LEFT BANK (10-30M)	VEGETATION RIGHT BANK (10-30M)
SURVEY 1																	
28/04/2023	WTR-1	16	Freshet	Channelized or constrained	Surface Flow Substantial	None	0.5	80	0.5	Organics	Forest	Forest	Forest	Forest	Forest	Forest	Forest
28/04/2023	WTR-2	16	Freshet	No defined feature	Standing Water	Minimal	4.3	130	4.3	Silt	Forest	Forest	Meadow	Forest	Meadow	Forest	None
28/04/2023	WTR-3	16	Freshet	Swale	Standing Water	Minimal	1	130	1	Organics	Meadow	Meadow	Meadow	Lawn	Meadow	None	Meadow
28/04/2023	WTR-4	16	Freshet	Defined Natural Channel	Surface Flow Minimal	Minimal	2.1	120	2.1	Silt	Forest	Forest	Forest	Forest	Forest	Forest	Forest
28/04/2023	WTR-5	16	Freshet	Defined Natural Channel	Surface Flow Substantial	Substantial	1	105	1	Silt	Forest	Forest	Forest	Forest	Forest	Forest	Forest

APPENDIX C

Vegetation List

COMMON NAME	SCIENTIFIC NAME	CONSERVATION STATUS			COEFFICIENT OF CONSERVATISM	COEFFICIENT OF WETNESS
		FEDERAL (SARA, 2002)	PROVINCIAL (ESA, 2007)	S-RANK[1]		
Absinthe Wormwood	*Artemisia absinthium*	-	-	SNA	-	5
Alternate-leaved Dogwood	*Cornus alternifolia*	-	-	S5	6	3
American Basswood	*Tilia americana*	-	-	S5	4	3
American Beech	*Fagus grandifolia*	-	-	S4	6	3
American Elm	*Ulmus americana*	-	-	S5	3	-3
American Mountain-ash	*Sorbus americana*	-	-	S5	8	0
American Speedwell	*Veronica americana*	-	-	S5	6	-5
Amur Honeysuckle	*Lonicera maackii*	-	-	SNA	-	5
Annual Fleabane	*Erigeron annuus*	-	-	S5	0	3
Ash spp.	*Fraxinus spp.*	-	-	S4	3	-
Balsam Fir	*Abies balsamea*	-	-	S5	5	-3
Balsam Poplar	*Populus balsamifera*	-	-	S5	4	-3
Bird's-eye Speedwell	*Veronica persica*	-	-	SNA	-	5
Bitternut Hickory	*Carya cordiformis*	-	-	S5	6	0
Bittersweet Nightshade	*Solanum dulcamara*	-	-	SNA	-	0
Black Cherry	*Prunus serotina*	-	-	S5	3	3
Black Locust	*Robinia pseudoacacia*	-	-	SNA	-	3
Black Medic	*Medicago lupulina*	-	-	SNA	-	3
Black Raspberry	*Rubus occidentalis*	-	-	S5	2	5
Black Walnut	*Juglans nigra*	-	-	S4?	5	3

COMMON NAME	SCIENTIFIC NAME	CONSERVATION STATUS			COEFFICIENT OF CONSERVATISM	COEFFICIENT OF WETNESS
		FEDERAL (SARA, 2002)	PROVINCIAL (ESA, 2007)	S-RANK[1]		
Black-eyed Susan	*Rudbeckia hirta*	-	-	S5	0	3
Bladder Campion	*Silene vulgaris*	-	-	SNA	-	5
Blue Cohosh	*Caulophyllum thalictroides*	-	-	S5	5	5
Blue Spruce	*Picea pungens*	-	-	SNA	-	3
Broad-leaved Enchanter's Nightshade	*Circaea canadensis*	-	-	S5	2	3
Bull Thistle	*Cirsium vulgare*	-	-	SNA	-	3
Bunchberry	*Cornus canadensis*	-	-	S5	7	0
Bur Oak	*Quercus macrocarpa*	-	-	S5	5	3
Butter-and-eggs	*Linaria vulgaris*	-	-	SNA	-	5
Butternut	*Juglans cinerea*	END	END	S2?	6	3
Canada Anemone	*Anemonastrum canadense*	-	-	S5	3	-3
Canada Fly Honeysuckle	*Lonicera canadensis*	-	-	S5	6	3
Canada Goldenrod	*Solidago canadensis*	-	-	S5	1	3
Canada Gooseberry	*Ribes oxyacanthoides*	-	-	S5	-	3
Canada Lettuce	*Lactuca canadensis*	-	-	S5	3	3
Canada Thistle	*Cirsium arvense*	-	-	SNA	-	3
Carolina Poplar	*Populus x canadensis*	-	-	SNA	-	-
Chicory	*Cichorium intybus*	-	-	SNA	-	5
Chinese Mustard	*Brassica juncea*	-	-	SNA	-	5
Colt's-foot	*Tussilago farfara*	-	-	SNA	-	3

COMMON NAME	SCIENTIFIC NAME	CONSERVATION STATUS			COEFFICIENT OF CONSERVATISM	COEFFICIENT OF WETNESS
		FEDERAL (SARA, 2002)	PROVINCIAL (ESA, 2007)	S-RANK[1]		
Common Buckthorn	*Rhamnus cathartica*	-	-	SNA	-	0
Common Burdock	*Arctium minus*	-	-	SNA	-	3
Common Crown-vetch	*Securigera varia*	-	-	SNA	-	5
Common Dandelion	*Taraxacum officinale*	-	-	SNA	-	3
Common Evening Primrose	*Oenothera biennis*	-	-	S5	0	3
Common Hackberry	*Celtis occidentalis*	-	-	S4	8	0
Common Juniper	*Juniperus communis*	-	-	S5	4	3
Common Lady Fern	*Athyrium filix-femina*	-	-	S5	4	0
Common Lilac	*Syringa vulgaris*	-	-	SNA	-	5
Common Milkweed	*Asclepias syriaca*	-	-	S5	0	5
Common Mullein	*Verbascum thapsus*	-	-	SNA	-	5
Common Plantain	*Plantago major*	-	-	SNA	-	3
Common Ragweed	*Ambrosia artemisiifolia*	-	-	S5	0	3
Common Ragwort	*Senecio vulgaris*	-	-	SNA	-	5
Common Red Raspberry	*Rubus idaeus*	-	-	S5	2	3
Common Reed	*Phragmites australis*	-	-	S4?	0	-3
Common St. John's-wort	*Hypericum perforatum*	-	-	SNA	-	5
Common Tansy	*Tanacetum vulgare*	-	-	SNA	-	5
Common Timothy	*Phleum pratense*	-	-	SNA	-	3

COMMON NAME	SCIENTIFIC NAME	CONSERVATION STATUS			COEFFICIENT OF CONSERVATISM	COEFFICIENT OF WETNESS
		FEDERAL (SARA, 2002)	PROVINCIAL (ESA, 2007)	S-RANK[1]		
Common Vetch	*Vicia sativa*	-	-	SNA	-	3
Common Viper's Bugloss	*Echium vulgare*	-	-	SNA	-	5
Common Yarrow	*Achillea millefolium*	-	-	SNA	-	3
Corn Mustard	*Sinapis arvensis*	-	-	SNA	-	5
Crack willow	*Salix euxina*	-	-	SNA	-	0
Creeping Buttercup	*Ranunculus repens*	-	-	SNA	-	0
Creeping Jennie	*Lysimachia nummularia*	-	-	SNA	-	-3
Creeping Thyme	*Thymus praecox*	-	-	SNA	-	5
Creeping Wildrye	*Elymus repens*	-	-	SNA	-	3
Creeping Wood-sorrel	*Oxalis corniculata*	-	-	SNA	-	3
Curly Dock	*Rumex crispus*	-	-	SNA	-	0
Devil's Beggarticks	*Bidens frondosa*	-	-	S5	3	-3
Early Goldenrod	*Solidago juncea*	-	-	S5	3	5
Eastern Cottonwood	*Populus deltoides*	-	-	S5	4	0
Eastern Helleborine	*Epipactis helleborine*	-	-	SNA	-	3
Eastern Hop-hornbeam	*Ostrya virginiana*	-	-	S5	4	3
Eastern White Cedar	*Thuja occidentalis*	-	-	S5	4	-3
Eastern White Pine	*Pinus strobus*	-	-	S5	4	3
Emerald Cedar	*Thuja occidentalis 'Smaragd'*	-	-	S5	4	-3

COMMON NAME	SCIENTIFIC NAME	CONSERVATION STATUS			COEFFICIENT OF CONSERVATISM	COEFFICIENT OF WETNESS
		FEDERAL (SARA, 2002)	PROVINCIAL (ESA, 2007)	S-RANK[1]		
European Lily-of-the-valley	*Convallaria majalis*	-	-	SNA	-	5
European Swallowwort	*Vincetoxicum rossicum*	-	-	SNA	-	5
Field Bindweed	*Convolvulus arvensis*	-	-	SNA	-	5
Field Horsetail	*Equisetum arvense*	-	-	S5	0	0
Field Mustard	*Brassica rapa*	-	-	SNA	-	5
Field Thistle	*Cirsium discolor*	-	-	S3	9	5
Flat Peavine	*Lathyrus sylvestris*	-	-	SNA	-	5
Freeman's Maple	*Acer x freemanii*	-	-	SNA	6	-5
Garden Bird's-foot Trefoil	*Lotus corniculatus*	-	-	SNA	-	3
Garlic Mustard	*Alliaria petiolata*	-	-	SNA	-	0
Ghost Pipe	*Monotropa uniflora*	-	-	S5	6	3
Giant Goldenrod	*Solidago gigantea*	-	-	S5	4	-3
Goutweed	*Aegopodium podagraria*	-	-	SNA	-	0
Gray Dogwood	*Cornus racemosa*	-	-	S5	2	0
Green Ash	*Fraxinus pennsylvanica*	-	-	S4	3	-3
Grey Alder	*Alnus incana*	-	-	S5	6	-3
Hairy Evening Primrose	*Oenothera villosa*	-	-	S2?	9	0
Hairy Galinsoga	*Galinsoga quadriradiata*	-	-	SNA	-	3
Heart-leaved Aster	*Symphyotrichum cordifolium*	-	-	S5	5	5
Hedge False Bindweed	*Calystegia sepium*	-	-	S5	2	0
Hooked Agrimony	*Agrimonia gryposepala*	-	-	S5	2	3

COMMON NAME	SCIENTIFIC NAME	CONSERVATION STATUS			COEFFICIENT OF CONSERVATISM	COEFFICIENT OF WETNESS
		FEDERAL (SARA, 2002)	PROVINCIAL (ESA, 2007)	S-RANK[1]		
Hop Sedge	*Carex lupulina*	-	-	S5	6	-5
Hosta	*Hosta spp.*	-	-	SNA	-	-
Japanese Knotweed	*Reynoutria japonica*	-	-	SNA	-	3
Jerusalem Artichoke	*Helianthus tuberosus*	-	-	SU	1	0
Kentucky Bluegrass	*Poa pratensis*	-	-	S5	0	3
Large False Solomon's Seal	*Maianthemum racemosum*	-	-	S5	4	3
Large-leaved Aster	*Eurybia macrophylla*	-	-	S5	5	5
Large-toothed Aspen	*Populus grandidentata*	-	-	S5	5	5
Lialac spp.	*Syringa spp.*	-	-	SNA	-	5
Little-leaf Linden	*Tilia cordata*	-	-	SNA	-	5
Manitoba Maple	*Acer negundo*	-	-	S5	0	0
Meadow Foxtail	*Alopecurus pratensis*	-	-	SNA	-	-3
Musk Cheeseweed	*Malva moschata*	-	-	SNA	-	5
New England Aster	*Symphyotrichum novae-angliae*	-	-	S5	2	-3
Northern Dewberry	*Rubus flagellaris*	-	-	S4	4	3
Northern Starflower	*Lysimachia borealis*	-	-	S5	6	0
Norway Maple	*Acer platanoides*	-	-	SNA	-	5
Norway Spruce	*Picea abies*	-	-	SNA	-	5
Orange Daylily	*Hemerocallis fulva*	-	-	SNA	-	5
Ostrich Fern	*Matteuccia struthiopteris*	-	-	S5	5	0

COMMON NAME	SCIENTIFIC NAME	CONSERVATION STATUS			COEFFICIENT OF CONSERVATISM	COEFFICIENT OF WETNESS
		FEDERAL (SARA, 2002)	PROVINCIAL (ESA, 2007)	S-RANK[1]		
Oxeye Daisy	*Leucanthemum vulgare*	-	-	SNA	-	5
Paper Birch	*Betula papyrifera*	-	-	S5	2	3
Periwinkle	*Vinca minor*	-	-	SNA	-	5
Pineappleweed	*Matricaria discoidea*	-	-	SNA	-	3
Poison Ivy	*Toxicodendron radicans*	-	-	S5	2	0
Poplar spp.	*Populus spp.*	-	-	-	-	-
Prairie Willow	*Salix humilis*	-	-	S5	7	3
Prickly Gooseberry	*Ribes cynosbati*	-	-	S5	4	3
Prickly Lettuce	*Lactuca serriola*	-	-	SNA	-	3
Purple-flowering Raspberry	*Rubus odoratus*	-	-	S5	3	5
Red Baneberry	*Actaea rubra*	-	-	S5	6	3
Red Clover	*Trifolium pratense*	-	-	SNA	-	3
Red Maple	*Acer rubrum*	-	-	S5	4	0
Red Pine	*Pinus resinosa*	-	-	S5	8	3
Red-osier Dogwood	*Cornus sericea*	-	-	S5	2	-3
Reed Canary Grass	*Phalaris arundinacea*	-	-	S5	0	-3
Riverbank Grape	*Vitis riparia*	-	-	S5	0	0
Rough Bedstraw	*Galium asprellum*	-	-	S5	6	-5
Round-leaved Dogwood	*Cornus rugosa*	-	-	S5	6	5
Royal Fern	*Osmunda regalis*	-	-	S5	7	-5
Rugosa Rose	*Rosa rugosa*	-	-	SNA	-	3
Scots Pine	*Pinus sylvestris*	-	-	SNA	-	3
Self-heal	*Prunella vulgaris*	-	-	S5	0	0

COMMON NAME	SCIENTIFIC NAME	CONSERVATION STATUS			COEFFICIENT OF CONSERVATISM	COEFFICIENT OF WETNESS
		FEDERAL (SARA, 2002)	PROVINCIAL (ESA, 2007)	S-RANK[1]		
Sensitive Fern	*Onoclea sensibilis*	-	-	S5	4	-3
Siberian Elm	*Ulmus pumila*	-	-	SNA	-	3
Siberian Peashrub	*Caragana arborescens*	-	-	SNA	-	5
Silver Maple	*Acer saccharinum*	-	-	S5	5	-3
Slippery Elm	*Ulmus rubra*	-	-	S5	6	0
Smooth Aster	*Symphyotrichum laeve*	-	-	S5	7	3
Smooth Brome	*Bromus inermis*	-	-	SNA	-	5
Sneezeweed Yarrow	*Achillea ptarmica*	-	-	SNA	-	0
Spotted Dead nettle	*Lamium maculatum*	-	-	SNA	-	5
Spotted Jewelweed	*Impatiens capensis*	-	-	S5	4	-3
Spotted Knapweed	*Centaurea stoebe*	-	-	SNA	-	5
Spotted St. John's-wort	*Hypericum punctatum*	-	-	S5	5	0
Spreading Dogbane	*Apocynum androsaemifolium*	-	-	S5	3	5
Spruce spp.	*Picea spp.*	-	-	-	-	-
Staghorn Sumac	*Rhus typhina*	-	-	S5	1	3
Star-flowered False Solomon's Seal	*Maianthemum stellatum*	-	-	S5	6	0
Sugar Maple	*Acer saccharum*	-	-	S5	4	3
Swamp Aster	*Symphyotrichum puniceum*	-	-	S5	6	-5
Sweet Crabapple	*Malus coronaria*	-	-	S4	5	5
Tall Buttercup	*Ranunculus acris*	-	-	SNA	-	0

COMMON NAME	SCIENTIFIC NAME	CONSERVATION STATUS			COEFFICIENT OF CONSERVATISM	COEFFICIENT OF WETNESS
		FEDERAL (SARA, 2002)	PROVINCIAL (ESA, 2007)	S-RANK[1]		
Tall Goldenrod	*Solidago altissima*	-	-	S5	1	3
Trembling Aspen	*Populus tremuloides*	-	-	S5	2	0
Upright Yellow Wood-sorrel	*Oxalis stricta*	-	-	S5	0	3
Virginia Creeper	*Parthenocissus quinquefolia*	-	-	S4?	6	3
Virginia Ground-cherry	*Physalis virginiana*	-	-	SU	8	5
White Ash	*Fraxinus americana*	-	-	S4	4	3
White Baneberry	*Actaea pachypoda*	-	-	S5	6	5
White Clover	*Trifolium repens*	-	-	SNA	-	3
White Heath Aster	*Symphyotrichum ericoides*	-	-	S5	4	3
White Spruce	*Picea glauca*	-	-	S5	6	3
White Trillium	*Trillium grandiflorum*	-	-	S5	5	3
White Vervain	*Verbena urticifolia*	-	-	S5	4	0
Whorled Loosestrife	*Lysimachia quadrifolia*	-	-	S4	8	3
Wild Black Currant	*Ribes americanum*	-	-	S5	4	-3
Wild Carrot	*Daucus carota*	-	-	SNA	-	5
Wild Leek	*Allium tricoccum*	-	-	S4	7	3
Wild Lily-of-the-valley	*Maianthemum canadense*	-	-	S5	5	3
Wild Parsnip	*Pastinaca sativa*	-	-	SNA	-	5
Wild Radish	*Raphanus raphanistrum*	-	-	SNA	-	5
Wild Sarsaparilla	*Aralia nudicaulis*	-	-	S5	4	3
Winged Euonymus	*Euonymus alatus*	-	-	SNA	-	5

COMMON NAME	SCIENTIFIC NAME	CONSERVATION STATUS			COEFFICIENT OF CONSERVATISM	COEFFICIENT OF WETNESS
		FEDERAL (SARA, 2002)	PROVINCIAL (ESA, 2007)	S-RANK[1]		
Woodland Agrimony	*Agrimonia striata*	-	-	S4	3	3
Woodland Strawberry	*Fragaria vesca*	-	-	S5	4	3
Woolly Blue Violet	*Viola sororia*	-	-	S5	4	0
Yellow Birch	*Betula alleghaniensis*	-	-	S5	6	0
Yellow Foxtail	*Setaria pumila*	-	-	SNA	-	0
Yellow Goat's-beard	*Tragopogon dubius*	-	-	SNA	-	5
Yellow Sweet-clover	*Melilotus officinalis*	-	-	SNA	-	3
Yellow Trout-lily	*Erythronium americanum*	-	-	S5	5	5

[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 province 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 long term 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	

	3	Facultative Upland - Occasionally occurs in wetlands, but usually occurs in non-wetlands (1-33%)
	4	
	5	Upland - Occurs almost never in wetlands under natural conditions (<1%)

APPENDIX D

Bird List

COMMON NAME	SCIENTIFIC NAME	CONSERVATION STATUS		
		FEDERAL (SARA, 2002)	PROVINCIAL (ESA, 2007)	S-RANK[1]
American Crow	*Corvus brachyrhynchos*	N/A	N/A	S5
American Goldfinch	*Carduelis tristis*	N/A	N/A	S5B
American Redstart	*Setophaga ruticilla*	N/A	N/A	S5
American Robin	*Turdus migratorius*	N/A	N/A	S5B
Black-capped Chickadee	*Parus atricapillus*	N/A	N/A	S5
Black-and-white Warbler	*Mniotilta varia*	N/A	N/A	S5B
Blue Jay	*Cyanocitta cristata*	N/A	N/A	S5
Cedar Waxwing	*Bombycilla cedrorum*	N/A	N/A	S5B
Chestnut-sided warbler	*Setophaga pensylvanica*	N/A	N/A	S5B
Common Grackle	*Quiscalus quiscula*	N/A	N/A	S5B
Common Raven	*Corvus corax*	N/A	N/A	S5
Common Yellowthroat	*Geothlypis trichas*	N/A	N/A	S5B
Downy woodpecker	*Picoides pubescens*	N/A	N/A	S5B
Eastern Wood-Pewee	*Contopus virens*	N/A	N/A	S5B
Field Sparrow	*Spizella ousilla*	N/A	N/A	S5B
European Starling	*Sturnus vulgaris*	N/A	N/A	SNA
Great Crested Flycatcher	*Myiarchus crinitus*	N/A	N/A	S4B
Hairy Woodpecker	Dryobates villosus	N/A	N/A	S5
House Wren	*Troglodytes aedon*	N/A	N/A	S5B
Indigo Bunting	*Passerina cyanea*	N/A	N/A	S4B
Mallard	*Anas platyrhynchos*	N/A	N/A	S5
Northern Cardinal	*Cardinalis cardinalis*	N/A	N/A	S5
Northern Flicker	*Colaptes auratus*	N/A	N/A	S4B
Ovenbird	Seiurus aurocapilla	N/A	N/A	S4B
Pileated Woodpecker	*Dryocopus pileatus*	N/A	N/A	S5
Red-eyed Vireo	*Vireo olivaceus*	N/A	N/A	S5B
Red-shouldered Hawk	*Buteo lineatus*	N/A	N/A	S4B
Red-winged Blackbird	*Agelaius phoeniceus*	N/A	N/A	S5B
Song Sparrow	*Melospiza melodia*	N/A	N/A	S5B
Turkey Vulture	*Cathartes aura*	N/A	N/A	S5B
White-breasted Nuthatch	*Sitta carolinensis*	N/A	N/A	S5

COMMON NAME	SCIENTIFIC NAME	CONSERVATION STATUS		
		FEDERAL (SARA, 2002)	PROVINCIAL (ESA, 2007)	S-RANK[1]
Wild Turkey	*Meleagris gallopavo*	N/A	N/A	S5
Yellow Warbler	*Dendroica petechia*	N/A	N/A	S5B
Yellow-bellied sapsucker	*Sphyrapicus varius*	N/A	N/A	S5B

[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.

APPENDIX E

Photo Record

Photo 1: ***Apr 18, 2023*** **Notes:** The perched stormwater culvert is the point of origin for the observed HDF (Reach WTR-1) within the Study Area. Photo facing south.	
Photo 2: ***April 28, 2023*** **Notes:** Headwater Drainage Feature reach WTR-4 within the Airbase Woods, picture taken facing upstream towards the culvert under the Sir-George-Étienne-Cartier Parkway.	
Photo 3: ***April 28, 2023*** **Notes:** Headwater Drainage Feature reach EC-1 within the Airbase Woods looking upstream.	

Photo 4: ***Apr 28, 2023*** **Notes: Re**ach WTR-2 discharges into Eastern Creek via the CSP culvert pictured on the left, under the Sir-George-Étienne-Cartier Parkway. The culvert on the right was noted to be decommissioned. Photo facing east.	
Photo 5: ***Apr 28, 2023*** **Notes:** Headwater Drainage Feature WTR-2 looking downstream along the Sir-George-Étienne-Cartier Parkway. Photo facing east.	
Photo 6: ***Apr 28, 2023*** **Notes:** The northern slope of the Rockcliffe Escarpment, photo facing east.	

Photo 7: ***Apr 28, 2023*** **Notes:** The Escarpment and Sumac Deciduous Shrub Thicket from the Sir-George-Étienne-Cartier Parkway, photo facing south.	
Photo 8: ***June 7, 2023*** **Notes:** Rocky outcrop found in remaining forested area in Phase 7.	
Photo 9: ***June 7, 2023*** **Notes:** A monoculture of Dog Strangling-Vine present within the Exotic Deciduous forest community.	

Photo 8: ***June 7, 2023*** **Notes:** Mature Sugar Maple trees provide candidate Maternity Roosting habitat for bats throughout the Dry – Fresh Sugar Maple – Basswood Deciduous Forest.	
Photo 9: ***Aug 9, 2023*** **Notes:** Freshly dropped Butternut seeds from BN-826.	

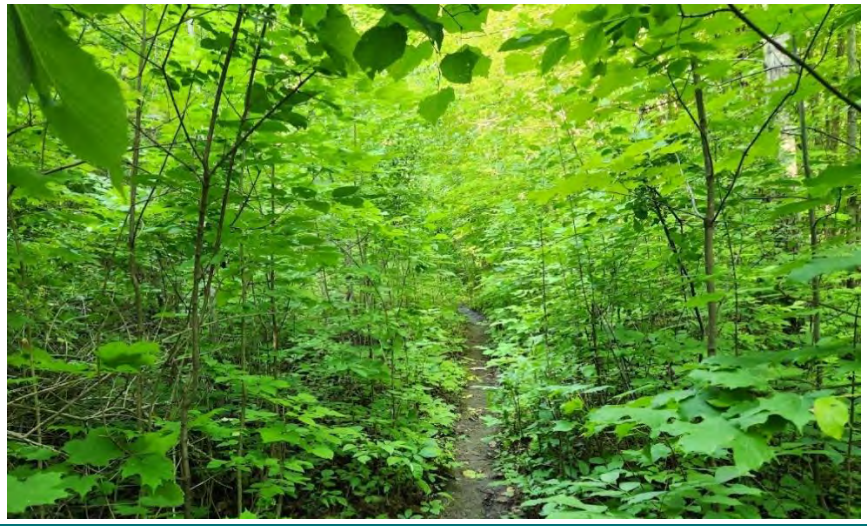
Photo 10: ***Aug 9, 2023*** **Notes**: An unmaintained walking trail extends along the Rockcliffe Escarpment at the northern extent of the Study Area in the Dry – Fresh Sugar Maple – Basswood Deciduous Forest community.	
Photo 11: ***Aug 15, 2023*** **Notes:** Young Sugar Maple trees in the understory of the Dry – Fresh Sugar Maple – Basswood Deciduous Forest community.	
Photo 12: ***Aug 15, 2023*** **Notes:** Eastern Red-backed Salamander (*Plethodon cinereus*) in a lead-back Phase found within the forested rocky outcrop in Phase 7.	

Photo 13: ***Aug 17, 2023*** **Notes:** Interior of the Central Retained Woodlot within Phase 8 - Dry – Fresh Sugar Maple – Basswood Deciduous Forest.	
Photo 14: ***Aug 21, 2023*** **Notes:** Non-native and invasive species such as Japanese Knotweed (pictured) present throughout the Exotic Deciduous Forest community.	
Photo 15: ***Aug 23, 2023*** **Notes:** Non-native and invasive species such as Common Buckthorn (pictured) present throughout the Exotic Deciduous Forest Community, and Sugar Maple-Basswood Forest community edges.	

Photo 16: ***Aug 24, 2023*** **Notes:** Cultural Meadow and Dry – Fresh Poplar Deciduous Forest communities.	
Photo 17: ***Aug 29, 2023*** **Notes:** Young Butternut tree found on the property.	

APPENDIX F

Detailed Summary of Butternut Tree Health Assessment

BHA TREE ID	COMMON NAME	SCIENTIFIC NAME	DBH (CM)	BHA RESULTS	GENERAL HEALTH CONDITION
801	Butternut	*Juglans cinerea*	1	Category 1	Poor
803	Butternut	*Juglans cinerea*	40	Category 3	Excellent
804	Butternut	*Juglans cinerea*	36	Category 1	Poor
805	Butternut	*Juglans cinerea*	29	Category 1	Poor
809	Butternut	*Juglans cinerea*	32	Category 1	Poor
810	Butternut	*Juglans cinerea*	41	Category 1	Poor
811	Butternut	*Juglans cinerea*	25	Category 1	Dead
813	Butternut	*Juglans cinerea*	34	Category 1	Poor
814	Butternut	*Juglans cinerea*	21	Category 1	Poor
816	Butternut	*Juglans cinerea*	6	Category 2	Good
817	Butternut	*Juglans cinerea*	14	Category 1	Dead
818	Butternut	*Juglans cinerea*	34	Category 1	Dead
819	Butternut	*Juglans cinerea*	6	Category 1	Poor
820	Butternut	*Juglans cinerea*	5	Category 1	Poor
821	Butternut	*Juglans cinerea*	27	Category 1	Poor
808	Butternut	*Juglans cinerea*	30	Category 1	Poor
802	Butternut	*Juglans cinerea*	34	Category 1	Dead

APPENDIX G

Wateridge Village: Phase 6, 7, 8 Tree Conservation Report