Leitrim West Urban Expansion Area - S4

# Environmental Impact Statement

Prepared for Edge at Pathways Regional Inc.
1737 Woodward Drive, 2nd Floor, Ottawa ON K2C 0P9

Prepared by Arcadis Professional Services Canada
333 Preston Street, Suite 500, Ottawa, ON K1S 5N4

Project Number: 30260678
October, 2025

# Leitrim West Urban Expansion Area – S4
# Environmental Impact Study

**Riverside South Findlay Creek, City of Ottawa**

October 2025

**Prepared By:**
Arcadis Professional Services (Canada) Inc.
333 Preston Street, Suite 500
Ottawa, Ontario K1S 5N4
Canada
Phone: 613 225 1311

**Prepared For:**
Evan Garfinkel
Edge at Pathways Regional Inc.
1737 Woodward Drive, 2nd Floor
Ottawa ON K2C 0P9
Canada

**Our Ref:**
30260678

Brittany Semmler, BSc
Ecologist

Madolyn Mandrak Calim, MEnvSc
Ecologist

Casey Little, DipEM
Senior Ecologist

# Version Control (optional)

| Issue | Revision No. | Date Issued | Page No. | Description | Reviewed By |
|---|---|---|---|---|---|
| 1 | 1 | August 8, 2025 | | Draft EIS Report Issued to Client | EG |
| 1 | 2 | August 13, 2025 | | Address Client Comments | EG |
| 1 | 3 | August 14, 2025 | | Draft Issued for City/CA Comments | AM, ME, JH, JB |
| 1 | 4 | October 17, 2025 | | Final | |

# Contents

# Tables



# Figures

# Appendices

# Acronyms and Abbreviations

| | |
|---|---|
| Arcadis | Arcadis Professional Services (Canada) Inc.<br>(formerly, IBI Group Professional Services (Canada) Inc.) |
| City | The City of Ottawa |
| DBH | Diameter at breast height |
| DFO | The Department of Fisheries and Oceans Canada |
| ECCC | Environment and Climate Change Canada |
| ECR | *Existing Conditions Report* |
| ELC | Ecological Land Classification |
| ESA | *Endangered Species Act, 2007* |
| FWCA | *Fish and Wildlife Conservation Act, 1997* |
| Golder | Golder Associates Ltd. |
| HDF | Headwater Drainage Feature |
| ISA | International Society of Arboriculture |
| MBCA | *Migratory Birds Convention Act, 1994* |
| MBR | *Migratory Birds Regulations, 2022* |
| MNRF | Ministry of Natural Resources and Forestry |
| NHIC | Natural Heritage Information Centre |
| NHRM | *Natural Heritage Reference Manual* (MNR 2010) |
| NHS | Natural Heritage System |
| PPS | *Provincial Planning Statement, 2024* |
| SAR | Species at Risk |
| SARA | *Species at Risk Act, 2002* |
| SARO | Species at Risk in Ontario |
| Study Area | The Site and the area within 120 m of the Site |
| SWG | “Significant Woodlands Guidelines” (City of Ottawa 2022d) |
| SWH | Significant Wildlife Habitat |
| SWMP | Stormwater Management Pond |

# Executive Summary

The Edge at Pathways Regional Inc. is proposing to develop lands located at 4850 Bank Street (Concession 4, Part Lot 22), within the City of Ottawa, to support the future development of the Leitrim West Urban Expansion Area – S4 Lands (the Project). The Site is currently zoned as RU – Rural Countryside Zone, with the eastern majority of the Site identified on the City's Official Plan Schedule C17, classified as Category 1 lands identified for urban expansion through the Future Neighborhood Overlay. A *Zoning By-law Amendment* application is required to rezone the Subject Site to permit the future low-rise residential development, public park, and stormwater management facility.

This *Environmental Impact Study* (EIS) has been prepared to support land-use planning for the future development of the Leitrim West Urban Expansion Area - S4 Lands to make an informed decision as to whether the proposed Project will have a negative impact on any significant natural heritage features and/or ecological functions that are present within the Study Area. The EIS outlines the methodologies and associated results of the background screening and field data collection completed as part of this study. The following natural heritage features were identified within the Study Area:

- Six headwater drainage features were assessed within the Study Area, two of which are situated in the Urban Expansion Area Limits. The proposed management recommendation for these features is "No Management Required", meaning they can be removed, and all associated flows can be incorporated into the stormwater management design.
- The Leitrim Provincially Significant Wetland and Area of Natural and Scientific Interest limits occur approximately 50 m west of the western property line within the Study Area. It is anticipated that this feature will not be directly impacted by this Project as it is approximately 500 m from the western edge of the Urban Expansion Area Limits. Proposed stormwater management solutions have been designed to maintain hydration to the adjacent Leitrim Provincially Significant Wetland by directing on-site drainage through HDF S4-A / Conveyance Channel allowing this feature to continue to maintain and improve the surface water conveyance function of surface drainage from the S4 lands by providing more permanent flow to the Leitrim PSW.
- Only one wetland inclusion was identified within the eastern extent of the Urban Expansion Area Limits. This wetland feature was evaluated as not significant and should not warrant protection.
- Habitat for Species of Conservation Concern (i.e., Eastern Wood-pewee, Wood Thrush) was identified within the Study Area.
- Field surveys confirmed the presence of two Species at Risk plants (Butternut and Black Ash) that will require further assessment and potential authorization / permitting under the *Endangered Species Act, 2007*.

This EIS highlights the need for a balanced approach, ensuring that the environmental value of the area is maintained while allowing for sustainable development. Despite the presence of environmentally significant features, the report concludes that with proper planning, mitigation, and adherence to regulatory requirements, the development can proceed without causing long-term damage to the ecological functions of the Site. This summary outlines the key findings, recommendations, and timelines for actions that must be taken to minimize the environmental impacts of the project.

Due to the disturbed nature of the property, from an environmental perspective, the Subject Site is an excellent candidate for the proposed development.

# 1 Introduction

Arcadis Professional Services (Canada) Inc. (Arcadis; Formerly IBI Group) was retained by the Edge at Pathways Regional Inc. to complete this *Environmental Impact Study* (EIS) for the proposed Leitrim West Urban Expansion Area – S4 development (the "Project"), located at 4850 Bank Street (Concession 4, Part Lot 22), in the City of Ottawa (the "Site"). The Site is approximately 21.9 ha (54.2 acres) total and generally rectangular in shape. The property is situated west of Bank Street and south of the existing Pathways South at Findlay Creek Development, confined to the south by the future Earl Armstrong Road extension, adjacent to the south property line.

**Urban Expansion Area**

The Site is currently zoned as RU – Rural Countryside Zone, with the eastern majority of the Site mapped on Schedule C17 - Urban Expansion Areas (Category 1 – Future Neighbourhood Overlay), as designated in the City of Ottawa *Official Plan* (City OP; **Figure 1**).

The Urban Expansion Area (UEA) limits represent the developable area of the Site where Project activities are proposed. Approximately 13.6 ha (33.7 acres) of the Site occurs within the UEA limits and is proposed for development.

A *Zoning By-law Amendment* application is required to rezone the Subject Site to permit the future low-rise residential development, public park, and stormwater management facility.

## 1.1 Study Area

This report describes the natural heritage features within the Site (4850 Bank Street) and the area within 120 m of the Site (collectively referred to as the Study Area), to account for policy requirements and setback distances outlined in the *Provincial Planning Statement* (2024) and the accompanying *Natural Heritage Reference Manual* (MNR 2010). As necessary, consideration has been given to wildlife occurrences (including SAR) reported up to 10 km away, due to the nature of desktop resources (i.e., online databases and atlases) with data presented in a 10 km x 10 km grid.

## 1.2 Background and Purpose

The Edge at Pathways Regional Inc. has proposed the construction of low-rise residential dwellings with associated asphalt-paved local roads, driveways, a park, and stormwater management pond within the UEA lands at the eastern end of the Site.

In line with Edge at Pathways Regional Inc.'s commitment to sustainability, the purpose of this EIS is to collect and evaluate all the appropriate and necessary information to develop an understanding of the boundaries, attributes, connectivity, and functions of relevant environmental features within the Study Area (i.e., Subject Site + 120 m). This EIS provides a summary of the available information from review of background documents and site visits conducted by Arcadis Ecologists in 2024. Using this data, the functions and values of the natural heritage features within the UEA Limits, Site boundary, and adjacent lands, as well as an evaluation of their significance as per applicable guidelines (i.e., City OP, provincial and/or federal policies) will be documented. This report will conclude with general recommendations on avoidance and mitigation measures to protect natural heritage features from impacts. This report is also supporting the concurrent Draft Plan of Subdivision and Zoning By-law Amendment.

***Environmental Management Plan* (EMP; Golder 2016)**

At the request of the City, Golder Associates Ltd. (Golder) prepared the Golder (2016) EMP as background for a required EIS for the lands located immediately adjacent (north) of the Site, including the identification of significant natural heritage features that are to be subject to evaluation in the EIS (Golder 2016). The Golder (2016) EMP will be referenced throughout this EIS to characterize the current Site to the south of the existing Pathways South at Findlay Creek Development, where appropriate.

Furthermore, this EIS has been prepared to support land-use planning for the development of the Leitrim West Urban Expansion Area – S4 development to make an informed decision as to whether the proposed Project will have a negative impact on any significant natural heritage features and/or ecological functions that are present within the Study Area.

## 1.3 Property Information

**Table 1** below provides basic property information for the Site.

*Table 1: Site Property Information*

| | |
|---|---|
| **Owner(s):** | The Edge at Pathways Regional Inc. |
| **Lot and Concession:** | 4850 Bank Street (Concession 4, Part Lot 22),<br>City of Ottawa, Ontario |
| **Zoning:** | RU – Rural Countryside Zone |
| **Official Plan designation (Schedule C17 - Urban Expansion Area):** | Urban Expansion Area (Category 1 – Future Neighbourhood Overlay) |
| **Existing Land Uses:** | Rural |
| **Traditional Territory:** | Unceded Territory of the Anishnaabe Algonquin Nation |

## 1.4 Details of Proposed Amendment(s)

It is suggested to rezone the Subject Site from *Rural Countryside – RU* to *Residential Third Density, Subzone YY, Urban Exception 2989 – R3YY [2989], Residential Fourth Density, Subzone Z – R4Z, and Parks and Open Space – O1*. A Zoning By-law Amendment application is required to rezone the Subject Site as the existing zone does not permit a range of residential land uses. The suggested zoning provisions for the proposed development will be subject to further discussions with City of Ottawa staff (Novatech, 2025).

Most of the proposed residential development on the Subject Site is suggested to be rezoned to *Residential Third Density, Subzone YY, Urban Exception 2989 – R3YY [2989]* which permits a range of residential typologies including detached and townhouse dwellings. The purpose of the *Residential Third Density – R3* zone is to:

1. *Allow a mix of residential building forms ranging from detached to townhouse dwellings in areas designated as General Urban Area in the Official Plan;*
2. *Allow a number of other residential uses to provide additional housing choices within the third density residential areas;*
3. *Allow ancillary uses to the principal residential use to allow residents to work at home;*

4. *Regulate development in a manner that is compatible with existing land use patterns so that the mixed dwelling, residential character of a neighbourhood is maintained or enhanced; and*
5. *Permit different development standards, identified in the Z subzone, primarily for areas designated as Developing Communities, which promote efficient land use and compact form while showcasing newer design approaches.*

The multi-unit residential block that will be subject to a future *Site Plan Control* application is suggested to be rezoned to *Residential Fourth Density, Subzone 4 – R4Z* which permits a broader range of residential typologies including "missing middle housing". The purpose of the *Residential Fourth Density – R4* zone is to:

1. *Allow a wide mix of residential building forms ranging from detached to low rise apartment dwellings, in some cases limited to four units, and in no case more than four storeys, in areas designated as General Urban Area in the Official Plan;*
2. *Allow a number of other residential uses to provide additional housing choices within the fourth density residential areas;*
3. *Permit ancillary uses to the principal residential use to allow residents to work at home;*
4. *Regulate development in a manner that is compatible with existing land use patterns so that the mixed building form, residential character of a neighbourhood is maintained or enhanced: and*
5. *Permit different development standards, identified in the Z subzone, primarily for areas designated as Developing Communities, which promote efficient land use and compact form while showcasing newer design approaches.*

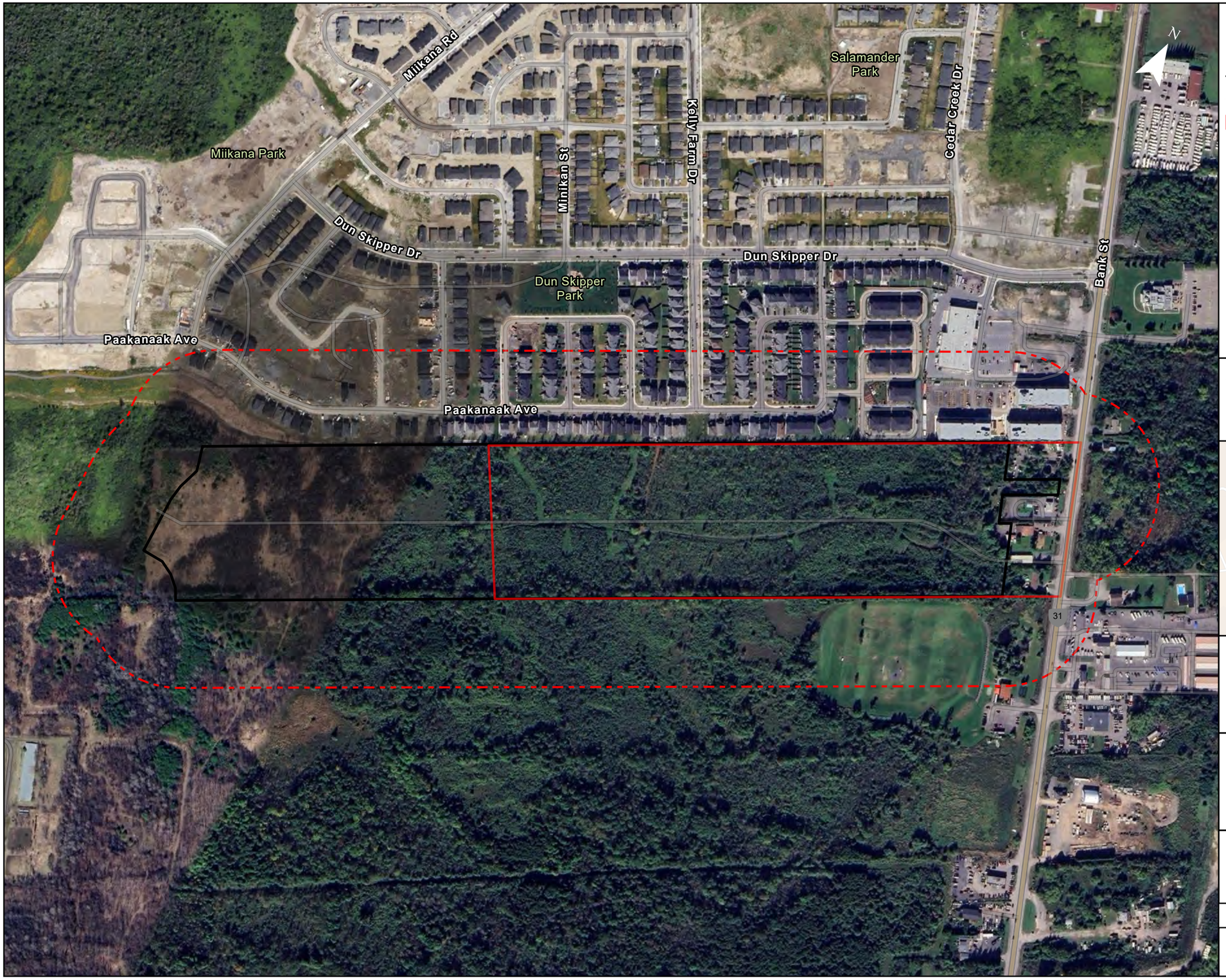
The future stormwater management facility and public park are suggested to be rezoned to *Parks and Open Space – O1*. The suggested *Parks and Open Space – O1* will reflect the current zoning in force and in effect for other stormwater management facilities as well as public parks in the City of Ottawa including those north of the Subject Site in the Pathways community. The purpose of the *Parks and Open Space – O1* zone is to:

1. *Permit parks, open space and related and compatible uses to locate in areas designated as General Urban Area, General Rural Area, Major Open Space, Mixed Use Centre, Village, Greenbelt Rural and Central Area as well as in Major Recreational Pathway areas and along River Corridors as identified in the Official Plan, and*
2. *Ensure that the range of permitted uses and applicable regulations is in keeping with the low scale, low intensity open space nature of these lands.*

## 1.5 First Nations Land Acknowledgement

Arcadis would like to acknowledge that the Subject Site located at 4850 Bank Street in the City of Ottawa, Ontario is located on the traditional lands / territories of the Anishinabewaki and Omàmìwininìwag (Algonquin) (NLD 2024).

We acknowledge that the First Nations are land stewards and caretakers of the land and waters within this territory in perpetuity.



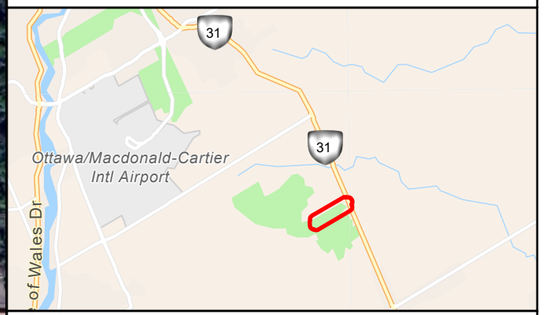

## Legend

- Site
- Study Area (120m)
- Urban Expansion Area Limits (CoO, 2025)

0 40 80 160 240 320

Meters

Scale: 1:5,000




Project:

**Leitrim West Future Neighborhood Urban Expansion Area - S4**

Title:

Site and Study Area

Prepared By:

ARCADIS Design & Consultancy for natural and built assets

Project: 145172

Date: 7/18/2025

**Figure: 1**

## 1.6 Environmental Impact 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. This approach also identifies the potential for impacts to natural heritage features, provides avoidance and mitigation measures to lessen or negate those impacts, and recommends compensation measures when appropriate.

Throughout this EIS, common names of species are used and binomial nomenclature (i.e., scientific names) are provided in the species lists in **Appendix E**. Both names of species (i.e., common and scientific) follow those used by the Ministry of Natural Resources (MNR) in the Natural Heritage Information Centre (NHIC 2025) Ontario Species Tables with the exception of scientific binomials of plant species which generally follow Newmaster et al. (2005) with updates taken from published volumes of the Flora of North America Editorial Committee (2000+ accessed 2015) and Michigan Flora Online (2015).

| | |
|---|---|
| **Relevant Policy and Legislative 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 / Background Review:** | This section provides 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. |
| **Field 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. |
| **Field Survey Results:** | This section provides the results from the field surveys. This also includes any incidental observations or notable observations made by the field ecologists. |
| **Summary of Natural Features:** | This section summarizes the natural heritage features confirmed present with respect to the relevant policies and legislation. |
| **Description of the Development Proposal:** | This section provides a summary of the Project, including the activities which may impact the natural environment. |
| **Development Constraints and Opportunities Analysis** | This section identifies areas or features that are ecologically sensitive, protected, or otherwise unsuitable for development, and portions of the site where low-impact development or restoration may be appropriate. |
| **Impact Assessment and Mitigation Measures:** | This section provides the assessment of the Project's potential impacts on the natural heritage system, including the natural heritage features and species confirmed present through this study.<br>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. |
| **Summary and Conclusions:** | This section provides a summary of the Study's findings, outlines Arcadis' general recommendations, and identifies any future permitting or agency authorizations that may be required before the Project may proceed. |

# 2 Policy and Legislative Framework

This EIS references the regulatory agencies and legislative authorities mandated to protect different elements of natural heritage features and functions within Canada, Ontario, and the City of Ottawa, as applicable. The scope of this report evaluates the natural heritage features and SAR governed by the policies outlined in **Table 2** below. The following subsections provide a high-level summary of the policies and legislation, noting their most recent date of amendment (at this time of preparation of this report). Each subsection also contains a short description of the policy's / legislation's applicability to this specific Project.

*Table 2: Relevant Environmental Policies and Legislation*

| Policy / Legislation | Governing Body, Guidelines, and Resources |
|---|---|
| **Federal Government of Canada** | |
| ***Migratory Birds Convention Act, 1994 (S.C. 1994, c. 22)*** **(MBCA)** | **Environment and Climate Change Canada (ECCC)**<br>- *Guidelines to Avoid Harm to Migratory Birds* (ECCC 2023a)<br>- *Migratory Birds Regulations, 2022*<br>- *Fact sheet: Nest Protection under the Migratory Birds Regulations, 2022* (ECCC 2023b)<br>- *Nesting Calendars* (ECCC 2023c) |
| ***Species at Risk Act, 2002 (S.C. 2002, c. 29)*** **(SARA)** | **Environment and Climate Change Canada (ECCC)**<br>- *Federal Species at Risk Public Registry*<br>- Distribution of aquatic Species at Risk mapping (DFO 2024)<br>- ECCC Open Data: Range Map Extents, and Critical Habitat for Aquatic SAR, Provincial SAR, and National SAR (ECCC 2022) |
| ***Fisheries Act, 1985 (R.S.C., 1985, c. F-14)*** | **Fisheries and Oceans Canada (DFO)**<br>- *Projects Near Water* online resources (DFO 2022)<br>- *The Fish and Fish Habitat Protection Program (FFHPP) Regulatory Review Process Map* (DFO 2020) |
| **Provincial Government of Ontario** | |
| ***Fish and Wildlife Conservation Act, 1997 (S.O. 1997, c. 41)*** **(FWCA)** | **Ministry of Natural Resources and Forestry (MNR)**<br>- Wildlife Schedules (*O. Reg. 669/98*) |
| ***Conservation Authorities Act, 1990 (R.S.O. 1990, c. C.27)*** | **South Nation Conservation (SNC)**<br>- *Prohibited Activities, Exemptions and Permits (O. Reg. 41/24)*<br>- South Nation Public GeoPortal (SNC 2024)<br>- *Mandatory Programs and Services (O. Reg. 686/21)* |
| ***Endangered Species Act, 2007 (S.O. 2007, c. 6)*** **(ESA)** | **Ministry of the Environment, Conservation and Parks (MECP)**<br>- *Species at Risk in Ontario List* (*O. Reg. 230.08*) |
| ***Planning Act, R.S.O. 1990, c. P.13*** | **Ministry of Municipal Affairs and Housing (MMAH)**<br>- *Provincial Planning Statement, 2024* (PPS) |
| | **MNR Natural Heritage Information Centre (NHIC) Database (MNR 2024):**<br>- Species at Risk occurrence records<br>- Identification of Species of Conservation Concern<br>- Mapping of Natural Heritage Features |

| Policy / Legislation | Governing Body, Guidelines, and Resources |
|---|---|
| **Local Municipalities** | |
| **City of Ottawa *Official Plan* (City OP)** | **City of Ottawa**<br>- Environmental Impact Study Guidelines (City of Ottawa 2023)<br>- Bird-Safe Design Guidelines (City of Ottawa 2022a)<br>- Official Plan 2022, adopted by By-law 2021-386 (City of Ottawa 2022b)<br>- Protocol for Wildlife Protection during Construction (City of Ottawa 2022c);<br>- Significant Woodlands: Guidelines for Identification, Evaluation, and Impact Assessment (SWG; City of Ottawa 2022d)<br>- Urban Expansion Areas (Official Plan Schedule C17)<br>- Natural Heritage System (South) (Official Plan Section C11B) |
| ***Tree Protection By-Law 2020-340*** | **City of Ottawa**<br>- *By-law 2020-340* (City of Ottawa 2021) |

# 2.1 Federal Policies and Legislation

### 2.1.1.1 *Migratory Birds Convention Act, 1994* (MBCA)

The federal MBCA was originally adopted in 1916, updated in June 1994 to strengthen the enforcement provisions and significantly increases the penalties. The MBCA was last amended in December 2017 and the associated *Migratory Birds Regulations* (MBR), were most recently updated in July 2022. Together the MBCA and the MBR protect migratory bird populations and individuals by regulating potentially harmful anthropogenic activities which may cause harm to the nests, eggs, and any part of a listed bird species.

Under the MBCA, protected species are listed under Article I. In general, birds not falling under federal jurisdiction within Canada include grouse, quail, pheasants, ptarmigan, hawks, owls, eagles, falcons, cormorants, pelicans, crows, jays, kingfishers, and some species of blackbirds. However, if the species identified is protected under Ontario's *Endangered Species Act, 2007* or Canada's *Species at Risk Act, 2002*, additional restrictions may apply.

The changes in the *MBR* altered the protection for nests of MBCA-listed birds. With the exception of 18 species listed under Schedule 1 of the MBR, which have year-round protection, instead of safeguarding *all* nests of MBCA-listed birds at *all* time, the new MBR protect *most* nests only when they are "active"; i.e., when they contain a live bird or a viable egg - generally during the breeding window (Late March – Late August with some regional variation, in the southern half of Ontario).

The changes to the MBR support conservation benefits, as the nests of most MBCA-listed birds only have conservation value when they are active. The changes also provide flexibility and predictability for stakeholders to manage their compliance requirements as they undertake activities on the landscape that may affect migratory birds and/or their nests.

Under specific conditions, a permit or authorization for activities that would otherwise not be allowable under MBCA or MBR can be obtained from ECCC.

### *MBCA - Applicability to the Project*

*Within Canada, the MBCA applies to activities conducted by the public and all levels of government. The killing or harming of an MBCA-listed bird or destruction / disturbance of a nest and eggs is unlawful regardless of intent. Therefore, if a protected species or their nest is encountered during Project activities, the Project must comply with the prohibitions of the MBCA. All impacts to natural habitat (e.g., ground cover, trees, or any structure with a nest) should follow appropriate timing windows and Best Management Practices specified by ECCC.*

*With respect to species listed under Schedule 1, targeted surveys and mitigation measures may be required to ensure nests are not impacted. Regardless of the time of year, nests of these species may only be removed with a permit from the ECCC.*

## 2.1.2 *Species at Risk Act, 2002* (SARA)

The federal SARA was adopted in 2002 and last amended in February 2023. The purposes of SARA are to prevent wildlife species from being extirpated or becoming extinct, to provide for the recovery of wildlife species that are Extirpated, Endangered, or Threatened because of human activity, and to manage species of Special Concern to prevent them from becoming Endangered or Threatened. Those species listed as Threatened, Endangered, or Extirpated under Schedule 1 are afforded both individual and habitat protection under SARA on federal lands. Additionally, outside of federal land, Section 58 of SARA affords protection to critical habitat of:

- Species of migratory birds protected by the MBCA that fall under Schedule 1 of SARA; and
- Aquatic species that fall under Schedule 1 of SARA.

A permit, or authorization, for activities that would otherwise not be allowable under SARA can be obtained from ECCC.

### *SARA – Applicability to the Project*

*The Study Area is not on federal land. As such, SARA only applies to the protection of federal SAR critical habitat, as per Section 58 of SARA.*

### 2.1.3 *Fisheries Act, 1985*

The federal *Fisheries Act* was established in 1985. On August 28, 2019, provisions of the new *Fisheries Act* came into force including new protections for fish and fish habitat in the form of standards, codes of practice, and guidelines for projects near water. The *Fisheries Act* provides protection to fish and fish habitat such that:

> *"No person shall carry on any work, undertaking or activity that results in the harmful alteration, disruption or destruction of fish habitat" (Section 35 (1)).*

Fish habitat is defined by the *Fisheries Act* as:

> *"Water frequented by fish and any other areas on which fish depend directly or indirectly to carry out their life processes, including spawning grounds and nursery, rearing, food supply and migration areas" (Section 2 (1)).*

The *Fisheries Act* requires that any work, undertaking, or activity avoid harmful alteration, disruption, or destruction of fish habitat unless authorized

#### *Fisheries Act - Applicability to the Project*

*The Fisheries Act governs all fish habitat (as defined above) within Canada. The Fisheries Act applies to the Site and Study Area where watercourses / drainage features provide fish habitat (as defined above).*

## 2.2 Provincial Policies and Legislation

### 2.2.1 *Fish and Wildlife Conservation Act, 1997* (FWCA)

The Ontario *Fish and Wildlife Conservation Act* (FWCA) was established in 1997 and most recently amended in June 2023. The FWCA is managed by the MNRF and applies to 'wildlife' which is defined as:

> *"An animal that belongs to a species that is wild by nature and includes game wildlife and specially protected wildlife" (Section 1 (1)).*

Those species considered "specially protected wildlife" include those specially protected amphibians, birds, invertebrates, mammals, and reptiles, as identified within Schedules 6 to 11 under the FWCA.

Under the FWCA, it is also illegal to destroy, take, or possess the nests, eggs, or young of most native bird species in Ontario without a permit. This includes stick nests constructed by birds such as hawks, owls, ospreys, eagles, and herons.

A permit, or authorization, for activities that would otherwise not be allowable under the FWCA can be obtained from MNR.

### *FWCA – Applicability to the Project*

*During the wildlife active period (typically spring through autumn), the probability of wildlife being found in the Site and not leaving on their own accord is low. In the case that wildlife relocation is required, consultation with MNR would be required to obtain the necessary permits and approvals under the FWCA.*

## 2.2.2 *Endangered Species Act, 2007* (ESA)

The Ontario ESA first came into effect on June 30, 2007, and was last amended in January 2022. Section 9 of the ESA protects members of species listed as Endangered, Threatened, or Extirpated on the Species at Risk in Ontario (SARO) List. Section 10 of the ESA prohibits the damage or destruction of the habitat of species listed as Endangered or Threatened. Species listed as Special Concern provincially are not afforded protection under the ESA.

In July 2019, amendments to the ESA came into effect through the *More Homes, More Choice Act*, and changes implemented in December 2021 enabled the payment of species conservation charges to the Species at Risk Conservation Fund and streamlined certain conditional exemptions for activities impacting prescribed SAR.

In June 2025, interim amendments to the ESA came into effect through the introduction and Royal Assent of Bill 5, known as the *Protect Ontario by Unleashing Our Economy Act, 2025*. These interim changes were implemented on June 5, 2025, while the proposed *Species Conservation Act, 2025* (SCA) is expected to be implemented sometime in early 2026 and will repeal the ESA. The Environmental Registry of Ontario identifies amendments to the ESA that have taken effect since the Royal Assent of Bill 5. It further identifies that once the enabling regulations are ready and the SCA is proclaimed into force, further changes will apply. The compliance and enforcement model in the SCA will be the same as in the amended ESA (including the mitigation and compliance orders).

At the time of preparation of this report, a permit, or authorization, for activities that would otherwise not be allowable under Sections 9 or 10 of the ESA can be obtained from MECP.

### *ESA - Applicability to the Project*

*Within Ontario, the ESA applies to activities conducted by the public and all levels of government. The killing or harming of a Threatened or Endangered SAR or destruction of its habitat (as defined by Bill 5) is unlawful, regardless of intent. As such, the ESA applies to the entire Study Area. Therefore, if a protected species or their critical habitat is encountered during Project activities, the Project must comply with the prohibitions of the ESA.*

***It is expected that the Endangered Species Act, 2007 (ESA) will be repealed by the Species Conservation Act, 2025 (SCA) prior to the commencement of Project activities. As such, review of the new legislation and requirements for registrations and approval shall be reviewed prior to impacts to protected species.***

### 2.2.3 *Planning Act, 1990*

The *Planning Act* was passed into law in 1990 and was recently amended in April 2022 by the *More Homes for Everyone Act*, with the most recent amendment in 2023. The *Planning Act* is provincial legislation that sets out the ground rules for land use planning in Ontario. It describes how land uses may be controlled and who may control them.

The *Planning Act* is the foundation for creating plans that guide development at both regional and municipal levels.

***Planning Act - Applicability to the Project***

*The Planning Act applies across the province to all projects outside of federal land. Project activities must be in compliance with and conducted under the appropriate permit(s) of, the Planning Act.*

#### 2.2.3.1 *Provincial Planning Statement, 2024* (PPS)

The *Provincial Planning Statement* (PPS) was issued under Section 3 of the *Planning Act* (1990). The current PPS came into effect on October 20, 2024. It replaces the *Provincial Policy Statement* that came into effect on May 1, 2020, and provides overall policy direction on matters of provincial interest related to land use planning and development in Ontario. Natural features are afforded protections under Section 4.1- Natural Heritage, of the PPS. Protections may include maintenance, restoration, and improved function of diversity, connectivity, ecological function, and biodiversity of natural heritage systems. These protections restrict development and site alteration in significant natural areas (e.g., woodlands, wetlands, wildlife habitat) unless it can be demonstrated that there will be no negative effects on the features and ecological functions of those natural areas.

Technical guidance for implementing the natural heritage policies of the PPS is found within the second edition of the *Natural Heritage Reference Manual for Natural Heritage Policies of the Provincial Policy Statement, 2005*. This manual recommends the approach and technical criteria for protecting natural heritage features and areas in Ontario.

The PPS identifies seven natural heritage features and provides planning policies for each. These features are:

- Significant wetlands (including coastal wetlands);
- Significant woodlands;
- Significant valleylands;
- Significant wildlife habitat (SWH);
- Significant areas of natural and scientific interest;
- Significant habitat of Endangered and Threatened species; and
- Fish habitat (detailed above).

Each of these features is afforded varying levels of protection subject to guidelines and/or regulations. Municipalities are the primary lead for implementing provincial policies, such as the PPS and other planning-related policies, through their official plans. Generally, special buffers and studies are prescribed based on the natural heritage features present and the land use proposed.

### *PPS – Applicability to the Project*

*The PPS, issued under Section 3 of the Planning Act by the Ministry of Municipal Affairs and Housing (MMAH), applies across the province to all projects outside of federal land.*

*The PPS 2024 continues to encourage municipalities to undertake watershed planning, especially in large, fast-growing areas, to manage water and wastewater services more effectively.*

## 2.2.4 *Conservation Authorities Act, 1990*

The *Conservation Authorities Act* was originally legislated in 1946 but has undergone many amendments since. Approved changes came into effect on April 1, 2024. These changes revoked the existing 36 conservation authority-specific regulations and the regulation governing their contents and replaced them with one new minister's regulation governing prohibited activities, exemptions, and permits under the *Conservation Authorities Act* (*Ontario Regulation 41/24, Prohibited Activities, Exemptions and Permits*). This minister's regulation applies to all conservation authorities resulting in a clear and streamlined permitting process that protects people and property from natural hazards across Ontario (Government of Ontario 2024).

Section 28 Part VI of the *Conservation Authorities Act* identifies the regulation of areas over which authorities have jurisdiction. These regulations include prohibited activities in watercourses, wetlands, etc. such as development in areas that could be unsafe due to natural processes associated with flooding or erosion, and interference with, or alterations to, watercourses, wetlands, or shorelines. In the Study Area,

The *Conservation Authorities Act* defines watercourses as:

> *"Watercourse (means a) defined channel, having a bed and banks or sides, in which a flow of water regularly or continuously occurs."*

The *Conservation Authorities Act* defines wetlands as:

> *"Wetland means land that, (a) is seasonally or permanently covered by shallow water or has a water table close to or at its surface, (b) directly contributes to the hydrological function of a watershed through connection with a surface watercourse, (c) has hydric soils, the formation of which have been caused by the presence of abundant water, and (d) has vegetation dominated by hydrophytic plants or water tolerant plants, the dominance of which have been favoured by the presence of abundant water."*

Furthermore, *O. Reg. 686/21 (Mandatory Programs and Services)* identifies the mandatory programs and services relating to the management of natural hazards (including flooding and erosion) that is to be provided by the Conservation Authority having jurisdiction (i.e., SNC), with the following objectives:

1. Developing an awareness of the areas that are important for the management of the natural hazards (e.g., wetlands);
2. Understanding the risks related to natural hazards, including how these risks may be affected by climate change;
3. Managing the risks related to natural hazards, including preventing or mitigating those risks; and
4. Promoting public awareness of the risks related to natural hazards.

### *Conservation Authorities Act - Applicability to the Project*

*The Study Area is under the jurisdiction of South Nation Conservation (SNC) under which the Conservation Authorities Act is applied through O. Reg. 41/24 (Prohibited Activities, Exemptions and Permits) and O. Reg. 686/21 (Mandatory Programs and Services).*

*Proposed Project activities within an SNC Regulated Area will require authorization from SNC. This includes any proposed activities within a watercourse or a Provincially Significant Wetland and the 30 m adjacent buffer area.*

*Additionally, SNC's review of the City's Official Plan Amendment determines permit requirements under O. Reg. 41/24, issued in accordance with SNC's Board-approved Regulation Policies.*

## 2.3 Municipal Policies and Legislation

### 2.3.1 City of Ottawa *Official Plan*

An Official Plan is a land use planning document that guides and shapes development by identifying where and under what circumstances specific types of land uses can be located. It is used to ensure that future planning development appropriately balances social, economic, and environmental interests of the community. As per the City of Ottawa *Official Plan*, 2022 (City OP), a natural heritage assessment is required to determine if significant natural features are present in or adjacent to the Site, followed by an assessment of the potential impacts to any identified natural environment feature from the proposed development.

The City's natural heritage features are listed in the City OP Subsection 4.8.1 Policy 3. Natural heritage features that are within a Natural Heritage System (NHS) are assessed by the City as having greater significance compared to features that are outside of the NHS. The NHS includes both Core Natural Areas and Natural Linkage Areas, both of which are found on Schedule C11.

It is important to note that, as per Subsection 5.6.4.1 Policy 2, the edge of the NHS boundary would need to be verified on-site, as the City OP only displays to a certain level of detail. Where identified, the boundaries of any significant natural heritage features are to be noted and the potential for the proposed development to cause negative impacts is assessed.

Additionally, as mentioned above, SNC's review of the Official Plan Amendment determines permit requirements under *O.Reg. 41/24*, issued in accordance with SNC's Board-approved Regulation Policies.

### *City of Ottawa Official Plan – Applicability to the Project*

*The City's OP requires assessment of multiple natural heritage features, some of which may be present within or adjacent to the Site and may be potentially impacted by this proposed development.*

*The Natural Heritage Features identified in the City's OP include the following:*

- ✓ *Significant wetlands*
- ✓ *Habitat for Endangered and Threatened Species (SAR)*
- ✓ *Significant woodlands*
- ✓ *Significant valleylands*
- ✓ *Significant wildlife habitat*
- ✓ *Areas of Natural and Scientific Interest*
- ✓ *Urban Natural Features*
- ✓ *Natural Environment Areas*
- ✓ *Natural linkage features and corridors*
- ✓ *Groundwater Features*
- ✓ *Surface water features, including Fish Habitat; and*
- ✓ *Landform Features*

## 2.3.2 *Tree Protection By-law No. 2020-340*

This City of Ottawa *Tree Protection By-law* is a by-law that is set out to respect the protection of municipal trees and municipal natural areas in the City of Ottawa and trees on private property in the urban area of the City of Ottawa. City approval is required to permit the injury or destruction of any tree protected under the by-law.

### *By-law No. 2020-340- Applicability to the Project*

*Under the Tree Protection By-law, the following protected trees cannot be injured or removed without a permit from the City:*

- *All City-owned trees throughout the urban and rural area.*
- *All trees 10 cm or more in diameter at breast height on private properties within the urban area that are subject to a Planning Act application for Site Plan, Plan of Subdivision, or Plan of Condominium.*
- *All trees 10 cm or more in diameter at breast height on private properties within the urban area that are over 1 hectare in size.*
- *All distinctive trees, which are trees 30 cm or more in diameter at breast height on private properties within the urban area that are 1 hectare or less in size.*

# 3 Background Review

A desktop review of the existing natural heritage features identified within the Study Area was completed during preparation of this EIS (as well as the previous ECR – Arcadis 2024) to inform the studies required. Natural heritage features identified to require consideration in the City OP (as designated in City OP Schedules) were the primary focus. Further information collected from external sources was used to help inform of the functions of these features and to identify those not depicted on the City OP Schedules (e.g., endangered, and threatened species habitat).

Information gathered from government websites / resources, site-specific reports produced by other professionals and consulting firms, and professional knowledge / interpretation has been incorporated, as appropriate. Furthermore, consideration has been given to wildlife occurrences (including SAR) reported up to 10 km away, due to the nature of desktop resources (i.e., online databases and atlases) with data presented in a 10 km x 10 km grid.

Overall, a variety of secondary sources were reviewed, the primary of which included the following:

**Reports pertaining to the Study Area and immediate surroundings:**

- *Environmental Management Plan* (EMP) for the Remer and Idone Lands (Golder 2016) – adjacent lands;
- *Planning Rationale and Public Consultation Strategy* (Novatech 2025);
- *Geotechnical Investigation* (Paterson Group 2025);
- *Pathways at Findlay Creek – Constructed Channel Monitoring (Year 5)* (Cambium 2024);
- *Hydrogeological Study Proposed Residential Development 4850 Bank Street Ottawa, Ontario* (Paterson Group 2025);
- *Leitrim Development Area – Area S4 Future Neighbourhood July 25, 2025, Field Notes and Observations* (SNC 2025a); and
- *Natural Heritage Existing Conditions Report* (ECR; Arcadis 2025a) – recently provided for this Project.
- *Tree Conservation Report* (Arcadis 2025b) – recently provided for this Project.
- *S4 Leitrim Urban Expansion Area Serviceability Report* (Arcadis 2025c) – recently provided for this Project.

**Ontario wildlife atlases and observation records:**

- Natural Heritage Information Centre (NHIC) Database (MNR 2024);
- Ontario Breeding Bird Atlas (BSC et al. 2006);
- Ontario Reptile and Amphibian Atlas (Ontario Nature 2019);
- Ontario Butterfly Atlas (TEA 2023);
- iNaturalist observation records (iNaturalist 2025);
- eBird HotSpot species lists (eBird 2025);
- Bat Conservation International Inc. Bat Profiles (BCI 2025); and
- Atlas of the Mammals of Ontario (Dobbyn 1994).

**Conservation Authority resources:**

- South Nation Conservation Public GeoPortal mapping (SNC 2025b).

**City of Ottawa Resources:**

- Environmental Impact Study Guidelines (City of Ottawa 2023)
- Bird-Safe Design Guidelines (City of Ottawa 2022a);
- City of Ottawa Official Plan (City of Ottawa 2022b);
- Protocol for Wildlife Protection during Construction (City of Ottawa 2022c);
- Significant Woodlands Guidelines (City of Ottawa 2022d); and
- *Tree Protection By-law No. 2020-340* (City of Ottawa 2021).

**Other provincial resources:**

- Species-specific resources (such as recovery strategies, etc.), as required; and
- Agency Consultation, as required.

This section outlines the relevant natural heritage background from the recent ECR (Arcadis 2024) that was based on field surveys conducted by Arcadis in 2024, as well as the previous EMP (Golder 2016) produced for the development of the lands immediately adjacent (north) of the Site.

## 3.1 Historic Land Use

A desktop review of recent and historic aerial imagery highlights the land uses within and adjacent to the Site (GeoOttawa 2024; **Figure 2**). From this review, the landscape around the Study Area has been predominantly agricultural fields separated by natural wooded hedgerows dating back to at least 1976. The Study Area for the proposed Leitrim West Urban Expansion Area – S4 development indicates that the property has experienced little change since at least 1976, likely due to it historically being located outside of the City's Urban Boundary (City of Ottawa 2022b; Google 2024).

A recent residential development Project by Edge at Pathways Regional Inc. (i.e., Pathways at Findlay Creek Development) started construction around early 2019 and is located directly north of the Site.

**1976**

**1999**

**2014** **2022**

*Figure 2: Aerial Imagery Showing Land Use Changes Over Time*

# 3.2 Landform, Geology, and Soils

The following Ontario Geological Survey (OGS) data has been obtained from Geology Ontario:

Portions of the Study Area are situated within a 17.9 ha Sand Plain Physiographic Landform, and a 3.6 ha Limestone Plains Physiographic Landform (OGS 2007).

The surficial geology of the Study Area is made up of “stone-poor, sandy silt to silty sand-textured till” on Paleozoic terrain (OGS 2010).

The underlying bedrock of the Study Area is part of the “dolostone, sandstone: Beekmantown Group (Unit 53)” dating back to the Lower Ordovician geologic period, approximately 485.4 to 470 million years ago (OGS 2011).

## 3.2.1 General Physical Setting

The Site is in the Mixedwood Plains Ecozone, which is underlain by limestone, sandstone and shale bedrock. A variety of landforms and surface deposits such as moraines and glaciofluvial deposits occur in this ecozone. Mixed and deciduous forests, alvars and tall-grass prairies comprise the main plant communities that grow here. Much of the wetland areas that historically occurred in this ecozone have been converted to urban, agricultural and industry land uses. This area is diverse in both plant and animal species and provides potential habitat for many Species at Risk (SAR) in the province (Golder 2016).

The Site is in Ecoregion 6E, where the majority of land use is cropland or pasture (57%) and 30% is forested. Dominant tree species include Sugar Maple, American Beech, White Ash, Red Maple, Eastern White Cedar and Green Ash (Golder 2016).

The Site is in the Ottawa Valley Clay Plains Physiographic Region (Chapman and Putnam 1984). This physiographic region is characterized by clay plains interrupted by ridges of rock or sand. The plains are present in a wide valley bottom, bounded by rocky Laurentian uplands. Although the topography is generally level, wetlands are somewhat scarce (Golder 2016).

# 3.3 Aquatic Environment and Fish Habitat

Within the context of this report, the 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 the aquatic features at a watershed and site-specific scale.

## 3.3.1 Surface Water

The Study Area is located within the South Nation Conservation (SNC) jurisdiction and associated watersheds (SNC 2024). Surface water features are displayed in **Figure 3**.

**Setbacks**

Setbacks and vegetated buffers are essential for the protection of surface water features and their ecological functions. Section 4.9.3 of the City OP provides policy direction to restrict / limit development and site alteration near surface water features by establishing minimum setbacks. Appendix 10 (Setbacks to Surface Water Features) of the City's EIS Guidelines (City of Ottawa 2023) indicates that, where Council-approved subwatershed studies or similar have not identified a setback, the minimum setback shall be the *greater* of the following:

- Conservation Authority hazard limit, which includes the regulatory flood line, geotechnical hazard limit and meander belt;
- Geotechnical hazard limit identified using the City's Slope Stability Guidelines for Development Applications;
- 30 metres from the top of bank, or the maximum point to which water can rise within the channel before spilling across the adjacent land (bank full flow); and
- 15 metres from the existing stable top of slope, where there is a defined valley slope / ravine.

Mapping by SNC and the City indicated the presence of surface water features within the Study Area (i.e., watercourses / drainage features), described below:

### 3.3.1.1 Conveyance Channel (Feature-1)

This watercourse ("Feature-1") occurs along the northwestern edge of the Site before transitioning into the upstream Scratch Ditch ("Feature-2"), bordering both the northern property boundary and the new development to the north. Historically, this feature may have functioned as a hedged agricultural ditch, present since at least 1976. Planned residential development associated with the ongoing Pathways South at Findlay Creek Development to the north resulted in the construction of this feature in 2019. This Conveyance Channel has since been accepted by the City of Ottawa following a five-year monitoring program as part of a previous, separate, development. This feature is mapped by the province as a Watercourse (GEO 2025).

***Environmental Management Plan* (Golder 2016)**

Feature-1 in this EIS represents the 'Conveyance Channel' constructed to the northwest of the Site based on the Golder (2016) EMP. This feature was constructed in a general southeast to northwest direction to convey clean surface water from this upstream catchment area toward the nearby wetland areas (i.e., Leitrim Core Wetland) while also providing compensatory habitat to replace water features removed during the Pathways at Findlay Creek Development to the north. This Conveyance Channel eventually orients in a south to north direction further downstream (northwest of the Casino Wetlands).

The EMP further recommended the following functionality of this constructed Conveyance Channel:

1. Maintain and improve the surface water conveyance function of surface drainage from rural lands off-site to the south by providing more permanent flow; and
2. Provide habitat for wildlife, including amphibians, which will be at least comparable to existing conditions.

***Constructed Channel Monitoring (Year 5)* (Cambium 2024)**

Cambium Inc. (Cambium) undertook the final year of annual natural environment monitoring of the constructed channel (i.e., Conveyance Channel) at the Pathways at Findlay Creek development located immediately north.

Throughout the monitoring period (2020-2022 and 2024), this channel was seen to be receiving inputs from the 'drainage swale' (i.e., Scratch Ditch collecting flows from lands to the south, including the Subject Site; see **Section 3.3.1.2** below). Additional inputs of surface and groundwater from the adjacent wetland areas was also observed, and the channel was seen conveying these flows northwards, eventually outletting at very low velocities into the Leitrim Core Wetland Buffer.

Overall, this monitoring confirmed that the Conveyance Channel has successfully established and is functioning as designed.

***July 25, 2025, Field Observations* (SNC 2025a)**

The following observations regarding the Conveyance Channel / Feature-1 were made by SNC on July 25, 2025:

- It is not apparent where HDF S4-B enters into the channel, the outlet is now obstructed with the rock weir and not functioning – needs maintenance / removal (see **Sections 8.1.1** and **8.1.3**).
- Conveyance Channel input from the Scratch Ditch was observed to be very dry.

These observations indicated that the Conveyance Channel making up the downstream portions of the Scratch Ditch was functioning as intended with respect to water conveyance, and the inputs from the south (including the Subject Site) appear to be part of the natural south-to-north flow of water in the Leitrim Wetland system that existed prior to the construction of the on-site linear Scratch Ditch and the off-site downstream portions of this feature (Cambium 2024).

### 3.3.1.2 Scratch Ditch (Feature-2)

The Scratch Ditch (also known as "Feature-2") is a historical drain identified through SNC background mapping occurring along the northern property line, located outside of the Urban Expansion Area limits. Historically, it functioned as an agricultural hedgerow drain dating back to at least 1976, prior to the land being left fallow sometime thereafter. In the late 2010s, development of the Pathways at Findlay Creek neighbourhood north of the Site resulted in modifications to this watercourse to facilitate the development. As of 2025, GeoOttawa classifies this reach as a Drainage Ditch.

***Environmental Management Plan* (Golder 2016)**

The Scratch Ditch (Feature-2) in this EIS is also referred to as "WC-B (HW-2)" in the Golder (2016) EMP. This feature represents the linear 'Scratch Ditch' constructed along the northern Site boundary to permanently convey runoff / sheet flow from the south and direct it to the Conveyance Channel designed to protect future developments from flooding (i.e., 100-year storm event).

***July 25, 2025, Field Observations* (SNC 2025a)**

SNC observed that the Scratch Ditch (Feature-2) was constructed entirely within the private lands to the north (i.e., within the backyards of houses on the south side of Paakanaak Avenue) which was an unintended deviation from the *Remer Site Serviceability Plan*. At the time of the Pathways development, the area now designated as the S4 UEA had no allowance for construction within the property lines, resulting in the dual swale design within the rear yards of the private properties (Arcadis 2025c).

Minimal vegetation and erosion activity was also evident in the area where the Scratch Ditch transitions into the downstream Conveyance Channel.

#### 3.3.1.3 Feature-3

The third watercourse ("Feature-3") is located past the eastern edge of the Site and has historically functioned as a hedged agricultural drainage ditch and roadside ditch as early as 1976, before the surrounding land was left fallow in subsequent years. Flow from this feature has historically traveled under Bank Street before continuing northeast. In the late 1990s, construction of a driving range to the south required modifications to the feature to accommodate the development. This watercourse remains more than 25 metres from the Site boundaries.

***Environmental Management Plan* (Golder 2016)**

This feature is not discussed in the Golder (2016) EMP as it occurs outside the Pathways at Findlay Creek Development Study Area to the north.

### 3.3.2 Groundwater

***Geotechnical Investigation* (Paterson Group 2025)**

The groundwater conditions of the Site have been provided by Paterson Group, as reported in the PG6912-1 *Geotechnical Investigation Proposed Residential Development 4850 Bank Street Ottawa, Ontario,* prepared on December 20, 2023, and Rev 03 dated October 9, 2025 (Paterson Group 2025). The report's purpose was to analyze the subsoil and groundwater conditions and to provide geotechnical recommendations related to the proposed residential development at the Subject Site, including stormwater management facilities.

Overall, from a geotechnical perspective, Paterson Group (2025) determined that the Subject Site and associated subsurface conditions were considered suitable for the proposed development and the topographic plans for the site indicate that there are no significant slopes present.

See **Section 4.1.2** and **Section 5.2.2** below for more details on methodology and results, respectively.

***Environmental Management Plan* (Golder 2016)**

***Recharge of Leitrim Core Wetland***

The Leitrim Core Wetland is a groundwater discharge zone for recharge that infiltrates the sand and gravel ridge deposits present to the west / southwest of the Site (directly southwest of the Leitrim Core Wetland). The wetlands in this area exist as a direct result of the pinching out of the water-bearing sand and gravel outwash deposits; as the groundwater discharging from the sand and gravel towards the northeast encounters the lower permeability fine grained silty soils and glacial till, it is forced to surface in the area to the northeast of the ridge (i.e., Leitrim Core Wetland).

Additionally, the rise in elevation of the glacial till and bedrock surfaces in a general west to east direction (i.e., heading eastward from Albion Road towards Bank Street) provides a natural hydrogeological control and contributes to the near-surface water table conditions in the Leitrim Core Wetland.

***Recharge of Casino Wetland***

Similar to above, groundwater flow from the Pathways at Findlay Creek development lands to the north does not recharge the Casino Wetland, which is recharged by discharging groundwater and overland drainage originating south (upgradient) of these lands.

***Hydrogeology***

As mentioned, recharge of both the Leitrim Core Wetland and the Casino Wetland originates from the sand and gravel ridge present west / southwest of the Site.

Golder (2016) identified that development activities that have the potential to alter wetland recharge and water levels in this area may include:

- Alterations to Site drainage;
- Temporary trench dewatering during installation of Site services; and
- Permanent lowering of groundwater levels on Site if groundwater is allowed to drain through the service trenching along the permeable pipe bedding and backfill or associated with basement perimeter drains.

Groundwater lowering during installation of Site services would be temporary and is not expected to permanently alter the existing groundwater flow pattern. Groundwater recharge from the sand and gravel ridge is the main mechanism and reason for the presence of the Leitrim Core Wetland and Casino Wetland, as well as a contribution from surface drainage. Recharge to the ridge will be unaffected by temporary groundwater level lowering during installation of Site services (Golder 2016).

***Constructed Channel Monitoring (Year 5)* (Cambium 2024)**

Based on detailed studies conducted by Golder, the area between the northern fringe of the Casino Wetland and the constructed channel (i.e., off-site downstream portions of the linear Scratch Ditch / Feature-2) have experienced a permanent drawdown due to the construction of this channel associated with the Pathways at Findlay Creek development to the north. The maximum permanent water drawdown was identified as 0.1 to 0.5 m near the north limit of the Casino Wetland; however, any permanent drawdown was being mitigated by precipitation events and recharge from off-site locations to the south (including the Subject Site).

The Leitrim Core Wetland has experienced no permanent drawdown due to the past construction of this channel located just northwest of the Subject Site.

### 3.3.3 Floodplain and Regulated Limit

SNC is the governing body that regulates zones with potential for flooding, protects associated natural features, and restores and enhances ecosystems within portions of the South Nation watershed (location of the Site). SNC also maintains, monitors, and collects information related to water quality / quantity, fisheries resources, forestry, land use, and wetlands. It is also important to note that, under *O. Reg. 41/24 (Prohibited Activities, Exemptions, and Permits),* SNC regulates any alteration to a watercourse that meets the definition under the *Conservation Authorities Act*, including constructed features (refer to **Section 2.2.4** above).

The SNC Public GeoPortal mapping shows that the property rests within the SNC jurisdiction, specifically the North Castor River subwatershed (Golder 2016). The Leitrim PSW / ANSI is situated approximately 50 m west of the Site, and approximately 500 m from the western edge of the UAE limits.

No portion of the Leitrim PSW / ANSI or the SNC Regulated Area occurs within the Site boundaries, though the SNC Regulated Area (i.e., 30 m buffer) for the Leitrim PSW / ANSI is situated approximately 20 m from the northern property line in the northwest corner (**Figure 3**).

### 3.3.4 Fishes and Fish Habitat

As shown in **Figure 3**, the Conveyance Channel / Feature-1 is a recently constructed, permanent watercourse that flows northwest from the northwestern extent of the Study Area, while the upstream Scratch Ditch flows west / southwest along the northern property line (see **Section 3.3.1**). The Aquatic Resource Area Survey Point feature layer (GEO 2025) has no fish community data associated with either of these features within the Study Area but does have fish community data along these features further upstream and downstream.

Golder (2016) provided further evidence for the identification of the Conveyance Channel / Feature-1 as direct fish habitat through the observation of small-bodied fishes within this watercourse during a summer terrestrial site visit. However, eventual electrofishing (327 seconds) of this watercourse by Golder in October 2013 yielded no catch.

Despite the lack of fish-catch in the Conveyance Channel / Feature-1 by Golder (2016), small-bodied fishes were observed at several locations, and this feature was also identified to contribute surface flows to downstream fish habitat (including the Leitrim Core Wetland and Findlay Creek to the north). Therefore, the Scratch Ditch / Feature-2 represents indirect fish habitat as it conveys flows downstream to direct fish habitat.

Based on extensive work done by Golder further north of the Site, a table of known fish species comprising a warmwater fish community within the Leitrim Core Wetland and adjacent Findlay Creek has been derived (see **Table 3** below). Further downstream, east of Bank Street, Findlay Creek is known to exhibit coldwater conditions (Golder 2016).

*Table 3: Fish Species Previously Captured in Findlay Creek (Golder 2016)*

| Common Name | Scientific Name |
|---|---|
| Bluntnose Minnow | *Pimephales notatus* |
| Brook Stickleback | *Culea inconstans* |
| Brassy Minnow | *Hybognatus hankinsoni* |
| Central Mudminnow | *Umbra limi* |
| Common Shiner | *Luxilus cornutus* |
| Creek Chub | *Semotilus atromaculatus* |
| Fathead Minnow | *Pimephales promelas* |
| Finescale Dace | *Phoxinus neogaeus* |
| Longnose Dace | *Rhinichthys cataractae* |
| Northern Redbelly Dace | *Phoxinus eos* |
| Pearl Dace | *Margariscus margarita* |
| Pumpkinseed | *Lepomis gibbosus* |
| White Sucker | *Catostomus commersonii* |

Additional fish species associated with Findlay Creek were identified in the background review and through previous fieldwork by Golder (2016). See **Table 4** below.

*Table 4: Fish Species Previously Captured by Golder in Findlay Creek (Golder 2016)*

| Common Name | Scientific Name |
|---|---|
| Blacknose Shiner | *Notropis heterolepis* |
| Brown Trout | *Salmo trutta* |
| *Etheostoma* sp. | *Etheostoma sp.* |
| *Phoxinus* sp. | *Phoxinus sp.* |

Overall, the fish community detailed above is made up of common species to southern Ontario (S-Rank of S5). Based on the DFO Aquatic SAR and NHIC mapping resources, no aquatic SAR, Species of Conservation Concern, and/or their habitat have been reported within the Site or surrounding Study Area (DFO 2025; MNR 2024).

### 3.3.5 Stormwater Management

***Environmental Management Plan* (Golder 2016)**

The EMP provides the following criteria for stormwater management quantity and quality:

***Water Quantity***

The Golder (2016) EMP provides the following summary table of water quantity control targets (**Table 5**).

*Table 5:* Water Quantity Control Targets (Golder 2016)

| Storm Event | Water Quantity Control Target at Point C (cms) |
|---|---|
| 25 mm 4 hour Chicago | 3.42 |
| 2 year 24 hour SCS II (48 mm) | 7.61 |
| 5 year 24 hour SCS Type II (62.4 mm) | 11.17 |
| 100 year 24 hour SCS Type II (103.2 mm) | 23.46 |

***Water Quality***

With respect to total suspended solids (TSS), it was established that SWM facilities servicing the Leitrim Development Area will provide an Enhanced Level of Protection, which corresponds to 80% TSS removal as per the *Stormwater Management Planning and Design Manual* (Ontario Ministry of the Environment, March 2003). This is consistent with the request from the Conservation Partners that SWM facilities servicing this area be designed for 80% TSS removal.

These water quality control targets were originally established in the 1995 ESR and July 2005 Addendum and are still applicable at this time (Golder 2016).

# 3.4 Terrestrial Environment

The Site is mostly comprised of undeveloped, former agricultural lands that are generally divided by mature hedgerows. The ground surface of the property is relatively flat, sloping gently from north to south (approximately 107 m to 99 m elevation, respectively). The entire Site has been regenerating since the 1970's from agricultural lands into scrublands comprised of deciduous thickets and areas of open meadow.

Several specific natural heritage features require consideration for protection under the Ontario PPS. The protection of these features is generally administered by the City of Ottawa and the SNC consistent with relevant provincial and federal legislation. These features are:

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

The subsections below provide 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 3.**

## 3.4.1 Wetlands

A review of the SNC Public GeoPortal and provincial natural heritage mapping (NHIC) indicates that no wetland features are mapped within the Site or surrounding Study Area.

Majority of the Leitrim Provincially Significant Wetland (PSW) is situated approximately 50 m west of the Site boundary, and approximately 500 m from the western edge of the UAE Limits (**Figure 3**). Most of the mapped 30 m buffer occurs 20 m outside the property line within the Study Area.

It should be noted that, at this time of writing, provincial background mapping has yet to update the PSW limits since the construction of the Pathways at Findlay Creek development lands to the north. Refer to **Figure 9** for a more accurate representation of the current PSW limits in relation to the Subject Site.

### ***Environmental Management Plan* (Golder 2016)**

A study was prepared by Beacon Environmental (2007) to review the Casino Wetland for the purpose of identifying an appropriate site-specific "no-touch" buffer width for the previous Pathways at Findlay Creek development and provided recommendations with respect to appropriate buffer widths for this feature. For the south, west and east sides of the Casino Wetland, the report recommended a 50 m no-touch buffer, with an additional 70 m adjacent lands zone in which only sensitive development should be allowed (e.g., stormwater management, recreation; Figure 6.1, Golder 2016).

A second document was prepared by Beacon Environmental (2012) which reviewed scientific literature and current practices in Ontario relating to ecological buffering. For wetlands, the study identified the following key functions of buffers:

- Providing protection of water quality;
- Providing protection of water quantity;
- Screening direct human disturbances;
- Protecting a hazard mitigation zone; and
- Protection of core habitat.

The following table was also provided, identifying ranges for wetland buffer widths, and the corresponding risk of not achieving the desired buffer function for each identified range of widths (**Table 6**).

*Table 6: Ranges for Buffer Widths to Natural Environment Features based on the Current Science (Golder 2016)*

| | Wetlands | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | <5m | 5-10m | 11-20m | 21-30m | 31-40m | 41-50m | 51-60m | 61-70m | 71-80m | 81-90m | 91-100m | 101-110m | 111-120m | >120m |
| A. Water Quantity | Data indicate that this is not mitigated by site specific buffers | | | | | | | | | | | | | |
| B. Water Quality | | | | | | | | | | | | | | |
| C. Screening of Human Disturbance / Changes in Land Use | | | | | | | | | | | | | | |
| D. Hazard Mitigation Zone | Should be based on consideration of hazards, but may overlap with buffers | | | | | | | | | | | | | |
| E. Core Habitat Protection | | | | | | | | | | | | | | |

**Key:** Risk of Not Achieving the Desired Buffer Function

| | High | | Moderate | | Low |
|---|---|---|---|---|---|

Based on the information presented by Beacon (2007; 2012) above, the **Golder (2016) EMP recommended a no-touch buffer zone of 50 m adjoining the Casino Wetland, with an additional 50 m limited-use zone.**

### 3.4.2 Woodlands

Based on review of NHIC mapping, there is a small, wooded area (0.5 ha) in the northeastern portion of the Site that extends north onto the adjacent property at 4840 Bank Street, as well as a narrow hedgerow along the southern perimeter of the Site boundary.

The oldest available historic aerial imagery of the area (1976; GeoOttawa) was used to estimate the age and measure historic extent of these wooded areas.

### 3.4.3 Valleylands

The Site is flat and there are no Significant Valleylands present within the Study Area.

### 3.4.4 Area of Natural and Scientific Interest (ANSI)

No Areas of Natural and Scientific Interest (ANSIs) are present within the Site boundary; however, the extents of the Leitrim ANSI are approximately 50 m west of the Site boundary, and approximately 500 m from the western edge of the UAE Limits (**Figure 3**).

### 3.4.5 Significant Wildlife Habitat (SWH)

Four categories of SWH exist within the eastern Ontario ecoregion 6E (MNR 2015). These include:

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

The potential for the presence of habitats matching the description of these SWHs within the Study Area was reviewed using available background information and aerial imagery, and it was determined that there may be presence of “Habitat for Species of Conservation Concern”:

#### 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 to 5. S2 represents a species that is considered imperilled within Ontario. S3 represents a species considered as vulnerable within Ontario. The classification of Species of Conservation Concern does not include SAR listed as Endangered or Threatened under the ESA or SARA but does include SAR listed as Special Concern as they do not receive protection under the ESA.

A review of background data (e.g., Ontario wildlife atlases and online databases; **Appendix B**) suggests that Barn Swallow, Grasshopper Sparrow, Eastern Wood-pewee, Olive-sided Flycatcher, Wood Thrush, Monarch, and Snapping Turtle have been reported within the Study Area. Additionally, screening by Golder (2016) identified Eastern Milksnake and Eastern Ribbonsnake as having moderate to high potential for occurrence within the vicinity of the Study Area.

#### Eastern Whip-poor-will

Arcadis’ 2025 ECR for this Project identified a moderate to high probability of occurrence of Eastern Whip-poor-will on-site, included under **Section 3.4.6 Species at Risk and Species at Risk Habitat** in the report (Arcadis 2025a). Eastern Whip-poor-will was recently downlisted to Special Concern status as of January 27, 2025; therefore, this species is now evaluated appropriately as a Species of Conservation Concern in this EIS (see **Section 5.3.4.1**).

There are no SWH features included in the City OP schedules. Updated Arcadis field surveys will confirm and/or determine whether appropriate habitat for these species remain / occur within the Study Area.

### 3.4.6 Wildlife and Wildlife Habitat

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

- **Mammals:** Northern Raccoon, White-tailed Deer, Coyote, Eastern Gray Squirrel, Eastern Cottontail, among others.
- **Reptiles & Amphibians:** Eastern Gartersnake, American Toad, among others.
- **Birds:** American Crow, American Robin, Northern Cardinal, American Goldfinch, Black-capped Chickadee, Blue Jay, Song Sparrow, among others.

## 3.5 Species at Risk and Species at Risk Habitat

Throughout this report, all references to SAR pertain specifically to species listed as Threatened or Endangered under the provincial ESA. As the Study Area is located on non-federal land, species listed as Threatened or Endangered under the federal SARA are only considered in relation to the protection of critical habitat, as delineated by ECCC. Species listed as Special Concern are addressed in the context of their potential contribution to SWH.

In Ontario, SAR are protected under the federal SARA and the provincial ESA. As the Project site is located on non-federal lands, SARA only affords protection to the critical habitat of species of migratory birds protected by the MBCA that fall under Schedule 1 of SARA, and aquatic species that fall under Schedule 1 of SARA. The ESA affords protection to species listed as Endangered, Threatened, or Extirpated on the SARO List. Species listed as Special Concern provincially are not afforded protection under the ESA but may be protected under the PPS within SWH features and are discussed throughout this report under their respective SWH sections.

A desktop review was performed to search for potential SAR within or adjacent to the Study Area. A review of aerial imagery was used to identify general candidate habitat for these species based on the description of habitat provided species assessed to have a moderate to high potential for occurrence within our Study Area are discussed in the following sections. This desktop review identified 14 SAR occurring within proximity to the Study Area, listed in **Appendix C**.

### 3.5.1 Endangered and Threatened Species and Their Habitat

Under the ESA, all species listed as Threatened or Endangered in Ontario received immediate ‘general habitat protection’. This included places that are used as dens, nests, hibernacula, or other residences. For some species, agencies have defined general habitat descriptions that provide science-based criteria for the habitat to be protected for some SAR species.

Through the recent introduction and Royal Assent of the *Protect Ontario by Unleashing Our Economy Act* (Bill 5) on June 5, 2025, interim changes to the ESA have since taken effect, including the narrowing of the definition of what is considered “habitat” (i.e., protections now focused on immediate species presence rather than considering long-term recovery needs or broader ecosystem health). Refer to **Section 2.2.2** for more details.

The ESA is expected to be superseded by the new *Species Conservation Act, 2025* (SCA) prior to the commencement of Project activities.

Beyond the limits of the Study Area, described above, wildlife and SAR occurrences are considered up to 10 km from the proposed development due to the nature of desktop resources (i.e., online databases and atlases) with data presented in a 10 km x 10 km grid.

Eight (8) Endangered or Threatened species have been reported in the area and have a moderate to high potential for occurrence within the Study Area (**Table 7**). Refer to the SAR Screening table in **Appendix C**.

*Table 7: Species at Risk with Occurrence Records and Suitable Habitat within the Study Area*

| Common Name | Scientific Name | S-Rank | ESA Status | SARA Status |
|---|---|---|---|---|
| ***MAMMALS*** | | | | |
| Little Brown Myotis | *Myotis lucifugus* | S4 | END | END |
| Northern Myotis | *Myotis septentrionalis* | S3 | END | END |
| Eastern Red Bat | *Lasiurus borealis* | S4 | END | END |
| Hoary Bat | *Lasiurus cinereus* | S4 | END | END |
| Silver-haired Bat | *Lasionycteris noctivagans* | S4 | END | END |
| Tri-colored Bat | *Perimyotis subflavus* | S3? | END | END |
| ***TREES*** | | | | |
| Black Ash | *Fraxinus nigra* | S4 | END | No Status |
| Butternut | *Juglans cinerea* | S2? | END | END |

Notes:
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.
ESA = *Endangered Species Act, 2007* Status, SARA = *Species at Risk Act, 2002* Status, END: Endangered

### Bat Species at Risk

Three bat species (Eastern Red Bat, Hoary Bat, and Silver-haired Bat) were recently uplisted to Endangered status under the ESA on January 27, 2025. As such, these species have been added as SAR having moderate to high probability of occurrence on the Site since Arcadis' previous ECR for this Project (Arcadis 2025a).

Bat habitat searches conducted by Golder for purposes of the EMP found that large cavity trees or trees with large pieces of loose bark were absent from the majority of the Site to the north (i.e., Pathways development), but some larger trees to the west may provide suitable habitat for bats. Therefore, suitable bat habitat occurs within the Study Area (Golder 2016).

### Eastern Whip-poor-will

This species was recently downlisted to a Species of Conservation Concern with Special Concern status as of January 27, 2025. Refer to **Section 3.4.5** above for more details.

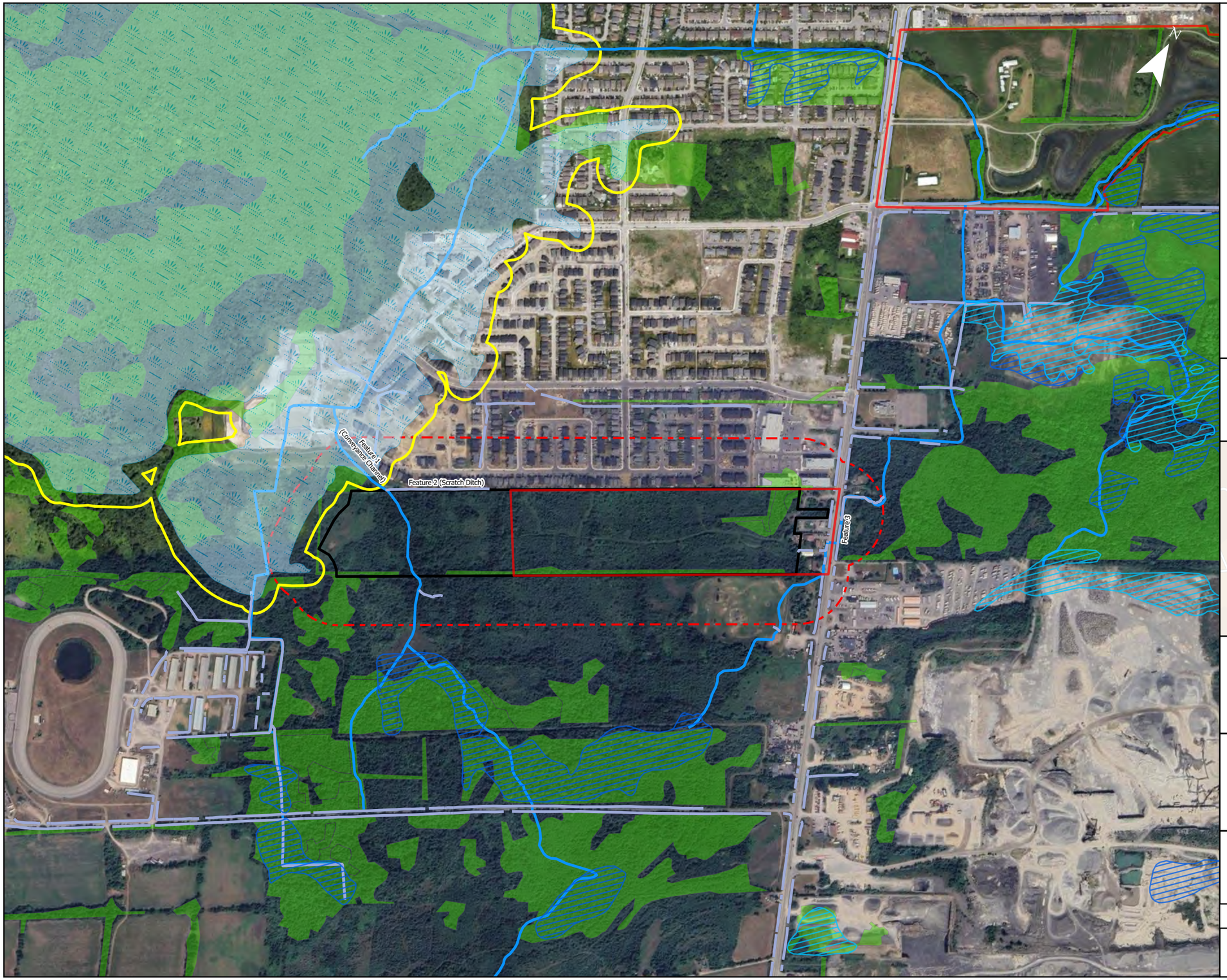
## 3.6 Summary of Natural Heritage Features as per the Provincial Policy Statement

Based on a review of background resources and aerial imagery, most of the Site is comprised of undeveloped, regenerating lands, with one small woodland in the eastern extents. Mapping by SNC and the City indicate the presence of two watercourses: one at the western extent of the Site which flows northwest from the southern extents of the Site, and another watercourse east of the Study Area that flows northeast from the wetlands south of the Site, travels along the eastern extents of the Site and crosses under Bank Street eastwards.

A summary of the known natural heritage features identified within the Site boundaries during the background review are summarized below in **Table 8** and are presented in **Figure 3**. Further background data is presented in **Appendix A** and **Appendix B.**

*Table 8: Known Natural Heritage Features within the Subject Site*

| Natural Heritage Feature | Present within Study Area | Comments | Further Assessment Required |
|---|---|---|---|
| **Provincially Significant Wetlands (PSWs)** | **Yes** | **Leitrim PSW approximately 50 m from the Site boundary.** | **Yes** Discussed in **Section 4.2.2** |
| **Significant Woodlands** | **Woodlands identified on Site** | **One small woodland identified during review of satellite imagery.** | **Yes** Discussed in **Section 4.5.1** |
| Significant Valleylands | None | No valleylands identified during review of satellite imagery. | No |
| **Areas of Natural and Scientific Interest (ANSIs)** | **Yes** | **Leitrim ANSI approximately 50 m from the Site boundary.** | **Yes** Discussed in **Section 4.5.2** |
| **Significant Wildlife Habitat** | **None identified in OP schedules** | **Potential for SWH / SAR needs to be determined following assessment of the suitable habitats on Site.** | **Yes** Discussed in **Section 4.5.3** |
| **Species at Risk Habitat** | **None identified in OP schedules. Arcadis (2025a) ECR:**<br>• **Butternut and Black Ash present within UEA limits**<br>• **Potential bat day-roosting habitat** | | **Yes** Discussed in **Section 4.3** |
| **Fish Habitat** | **Conveyance Channel / Feature 1 Scratch Ditch / Feature 2 Surface Water Feature 3** | **Reaches upstream and downstream of the Site contain known fish habitat.** | **Yes** Discussed in **Sections 4.1.3** |

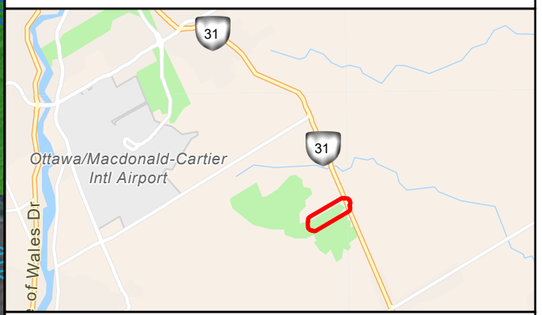



## Legend

- Site
- Urban Expansion Area Limits (CoO, 2025)
- Watercourse (GEO, 2025)
- Ditches (geoOttawa, 2025)
- Study Area (120m)
- Provincially Significant Wetland (GEO, 2025)
- Evaluated Wetland - Other (GEO, 2025)
- Unevaluated Wetland (GEO, 2025)
- SNC Regulation Limit (30 m)
- Woodlands (GEO, 2025)

0 75 150 300 450 600 Meters

Scale: 1:9,000




Project:

**Leitrim West Future Neighborhood Urban Expansion Area - S4**

Title:

# Natural Heritage Background Information

Prepared By:

ARCADIS Design & Consultancy for natural and built assets

Project: 30258325

Date: 10/17/2025

**Figure: 3**

# 4 Methodology

Based on the description of the existing natural environment outlined above, the natural heritage surveys outlined below have been completed by Arcadis Ecologists in 2024 to assess the impacts of the proposed development on the natural environment. These surveys follow industry standard protocols and are intended to establish baseline conditions. Surveys were undertaken within the Site and natural features within the larger Study Area were evaluated from a distance (when possible) or via air-photo interpretation.

The following studies have been completed to date:

**Aquatic Environment:**

- Headwater Drainage Feature (HDF) Assessment

**Terrestrial Environment:**

- Ecological Land Classification
- Wetland Verification / Delineation
- Amphibian Breeding Surveys
- Breeding Bird Surveys
  - Point counts
  - Eastern Whip-poor-will surveys
  - Raptor nest searches
  - Pileated Woodpecker habitat searches

**Species at Risk:**

- Identification of potential SAR and SAR habitat
- Butternut and Black Ash Inventory

**Incidental Wildlife:**

- Visual and auditory observations of wildlife during all field studies

**Natural Heritage Features Assessment:**

- Significant Woodlands Assessments
- Areas of Natural and Scientific Interest (ANSIs) Assessment
- Significant Wildlife Habitat Assessment

Where applicable a depiction of field survey locations is included at the end of this section in **Figure 4.**

# 4.1 Aquatic Environment

## 4.1.1 Surface Water Assessment

For purposes of this EIS, surface water associated with the aquatic environment within the Study Area is confined to the three Surface Water Features identified during the background data search (**Figure 3**) and any other features with defined channels observed on-site. In-situ assessments of each feature were conducted by Arcadis Ecologists in 2024.

**Headwater Drainage Feature Assessment**

HDF assessments were based on the Toronto and Region Conservation Authority and Credit Valley Conservation protocol, outlined in the *Evaluation, Classification and Management of Headwater Drainage Features Guidelines* ("*HDF Guidelines"*; TRCA and CVC 2014). Two site visits were conducted as part of this assessment to gather baseline data in spring freshet conditions, as well as a summer conditions assessment in 2024. These 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).

This assessment included a description of the channel morphology, channel width, wetted width, bankfull depth, water depth, substrate, and in-stream cover.

## 4.1.2 Groundwater Assessment

The field program for the Paterson Group (2025) *Geotechnical Investigation* was carried out on June 18 and 20, and July 7, 2025. At that time, a total of 10 boreholes were advanced to a maximum depth of 8.5 m below existing grade. The previous geotechnical investigation (carried out on December 11, 12 and 14, 2023) consisted of advancing a total of 15 boreholes to a maximum depth of 5.9 m below the existing ground surface.

Borehole locations were distributed in a manner to provide general coverage of the Subject Site and the proposed service connection along Bank Street, taking into consideration underground utilities and site features.

The boreholes were advanced using a track-mounted auger drill rig operated by a two-person crew. The drilling procedure consisted of augering and rock coring to the required depths at the selected borehole locations, and sampling and testing the soil and bedrock.

Groundwater monitoring wells were installed in six of the boreholes (BH 1-23, BH 2A-23, BH 6C-23, BH 10-23, BH 1-25, and BH 3-25) to permit long-term groundwater measurement subsequent to the field investigation.

For further details regarding the geotechnical investigation approach and methods, see Paterson Group (2025).

## 4.1.3 Fishes and Fish Habitat Assessment

Assessments for fishes and fish habitat were completed as part of the HDF evaluations conducted for all reaches and wetlands during on-site field investigations. Important habitat characteristics including flow, substrate size, substrate type, connectivity to adjacent habitats, and obstructions for fish passage / migration were measured, documented, and carried forward for evaluation.

# 4.2 Terrestrial Environment

## 4.2.1 Vegetation Communities / Ecological Land Classification (ELC)

Vegetation communities within the Study Area were characterized and mapped using the *Ecological Land Classification for Southern Ontario* (ELC) (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. Field studies were completed by systematically walking the Site. 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 existing vegetation community. In some instances, where an ecosite 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 MNR 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.

## 4.2.2 Wetland Verification / Delineation

Wetland communities were mapped using satellite imagery and verified during the ELC field visits. Wetland verification included a botanical inventory, and vegetation was characterized based on the *Ontario Wetland Evaluation System, Southern Manual* (OWES) (MNR 2022).

As per OWES, the outer boundaries of the wetlands within the Site were delineated and mapped using the “50% wetland vegetation rule” which estimates the relative abundance of wetland and upland species in each layer. Our OWES qualified professional walked the outer limits of the wetlands, using a hand-held GPS to create a boundary line. As per OWES, the minimum community size to be delineated is 0.5 ha and the minimum wetland size to be assessed is 2 ha unless special functions or ecological importance is identified. In this case, smaller wetland communities or wetlands may be delineated.

### Water Balance

A water balance analysis will be provided by Paterson Group (under separate cover) to evaluate the potential for this Project to cause impacts to adjacent wetlands (e.g., Leitrim PSW) due to on-site changes to stormwater and/or dewatering.

## 4.2.3 Botanical Inventory

A botanical / vegetation inventory was compiled by Arcadis Ecologists from the 2025 field investigations. Vegetation was inventoried in conjunction with ELC surveys, and a list of vascular plant species was compiled. This inventory was also used to screen for any SAR and/or provincially rare species not previously identified within the Study Area.

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

### 4.2.4 Amphibian Surveys

Amphibian breeding surveys were conducted and followed the *Marsh Monitoring Program - Participant's Handbook for Surveying Amphibians* (Bird Studies Canada 2008). Three survey visits were conducted between April and June 2024, with at least two weeks between each visit to target detection of all species that may be present at various times of the spring / summer. Surveys began at least one half-hour after sunset during evenings with a minimum night temperature greater than 5 ºC on the first survey, 10 ºC for the second survey, and 17 ºC for the last survey. Several survey locations were situated within the woodland and/or wetland features within the Study Area to target breeding individuals.

Each amphibian survey involved standing at a predetermined station for three minutes and listening for amphibian calls. The location of calling individuals was estimated to be within 50 m, 50 m to 100 m, or greater than 100 m away. When possible, the number of individuals was counted. Calling activity was then ranked using one of the three abundance code categories:

- **Code 1:** The number of individuals can be accurately counted.
- **Code 2:** Calls are distinguishable and some calls simultaneous, the number of individuals can be reliably estimated.
- **Code 3:** Full chorus; calls continuous and overlapping, the number of individuals cannot be estimated.

In areas where candidate amphibian habitat existed, vernal pools were visually examined for egg masses and amphibian larvae in conjunction with other field surveys.

### 4.2.5 Breeding Bird Surveys

#### 4.2.5.1 Point Counts

Diurnal breeding bird surveys were conducted by Arcadis Ecologists within the Study Area and followed point count methods outlined in the *Ontario Breeding Bird Atlas Guide for Participants* (Bird Studies Canada 2001) with a minor increase in the survey duration from 5 minutes, up to 6 minutes. Two surveys were completed during the bird breeding season in 2024.

Each survey consisted of visiting point-count locations for six minutes to establish quantitative estimates of bird abundance in different habitat types within the Study Area. To supplement the surveys, area searches of the habitats were completed by meandering throughout the Study Area on foot and using binoculars to observe species presence and breeding activity. Area searches involved noting all individual bird species and their corresponding breeding evidence.

#### 4.2.5.2 Raptor Nest Survey

The raptor nest survey consisted of searching for individuals or evidence of nesting (such as stick nests, food caches, whitewashing of branches and foliage, accumulation of feathers/fur, or prey remains on the ground or in shrubs as per the *Significant Wildlife Habitat Technical Guide* (SWHTG), *Appendix O*.

#### 4.2.5.3 Pileated Woodpecker Nest Surveys

Surveys for Pileated Woodpecker nests were completed within the Site. Transects spaced 15 m apart were walked in suitable habitat. Trees larger than 25 cm dbh were scanned with binoculars for cavities. Nests are those which are dome shaped 10-13 cm high and 7-10 cm wide (ECCC 2022). If more than one such hole is present in a decaying tree it will be considered a roosting cavity and is therefore not afforded protection under the MBR. If a candidate nest cavity was observed a photograph was taken along with notes on cavity size, tree species, and tree health.

#### 4.2.5.4 Eastern Whip-poor-will Surveys

Surveys for Eastern Whip-poor-will were completed in 2024 for purposes of Arcadis' (2025) ECR prior to this species being downlisted to Special Concern on the SARO List as of January 27, 2025. Refer to Arcadis' ECR (2025) for details on the survey protocol used to determine presence / absence of this species within the Study Area.

## 4.3 Species at Risk

Preliminary screening for SAR was conducted and a list of potential SAR was compiled for the Subject Site through review of various resources. The desktop review identified the potential for eight SAR (Little Brown Myotis, Eastern Red Bat, Hoary Bat, Silver-haired Bat, Northern Myotis, Tri-colored Bat, Butternut, Black Ash) to occur within the Study Area based on suitable habitat conditions (**Appendix C**).

Site visits recorded the location for all observed plant and animal species that are listed provincially as Threatened and Endangered (**Appendix C)**. Should any SAR or SAR habitat be identified within the Study Area during field surveys, appropriate measures will be proposed to reduce or eliminate the impact of the proposed development on the observed species or habitat. This may include further consultation with the Ministry of the Environment, Conservation and Parks (MECP) and/or additional species-specific surveys.

### 4.3.1 Butternut and Black Ash Inventory

Specific attention was paid to locating SAR plants within the Study Area, specifically Butternut and Black Ash. If these species were observed, they were photographed, and their coordinates recorded. Each individual tree was assigned a number and flagged (e.g., flagging tape).

For this survey, the inventory included all treed areas on site and the 50 m surrounding area. Where the 50 m extended to neighbouring lands, inventory was assessed from a distance / over the fence.

## 4.4 Incidental Wildlife

Any incidental observations of wildlife, as well as other wildlife evidence such as vocalizations, dens, tracks, and scat, were documented by means of observational notes and photographs. Such observations help validate conclusions regarding the ecological function and wildlife use of the Study Area.

Incidental sightings are documented in **Appendix E.**

## 4.5 Natural Heritage Features Assessment

The *Natural Heritage Reference Manual* (MNR 2010) is the technical document used to define and set out the criteria for the determination and designation of provincially significant natural heritage features, as summarized in **Table 8** above. Some of these significant natural heritage features have been designated by MNR (e.g., ANSIs), while others may be designated as regionally significant by the municipality having jurisdiction. For features that have not been identified as significant, site-specific findings are used for evaluation against criteria detailed by MNR.

Regionally significant features may provide important features to the local community and local environment but may not meet the threshold of significance at the provincial scale. These features are still important features to preserve on the landscape as they provide important benefits locally. If a feature is provincially significant then it will also be regionally significant, but not all regionally significant features will be provincially significant.

When projects are proposed, the identification of these features is essential to promote protection through the applicable guidelines, regulations, and policies. Referring to provincial and municipal resources, the following subsections evaluate the significance of the features present within the Study Area.

The natural heritage features identified as candidate features based on background review or confirmed present by others based on previous field investigations are brought forward for evaluation, as per the applicable municipal, provincial and/or federal guidelines for that feature. These methods are described in the sections below.

### 4.5.1 Significant Woodlands – Urban Criteria

This report makes use of the City of Ottawa's S*ignificant Woodlands: Guidelines for Identification, Evaluation, and Impact Assessment* (SWG; City of Ottawa 2022d) which notes that within the Urban Area, Ottawa defines all urban woodlands meeting minimum size and age thresholds (i.e., 0.8 ha and 60 years old, respectively) as significant under the *Natural Heritage Reference Manual* (NHRM) *Criterion 4 – Economic and Social Functional Values* (MNR 2010). This policy does not preclude the possibility that urban woodlands may also qualify as Significant under other NHRM criteria (City of Ottawa 2022d).

Section 4.3 of the guidelines notes that within Urban Expansion Areas, special policies exist for significant woodlands and other natural heritage features under City OP policies in Section 3.1 and 12.2. In these areas, development proponents are required to identify and to convey the natural heritage system and natural heritage features to the city at no cost. Significant woodlands, however, will be subject to further evaluation using these guidelines to determine if retention of the woodlot provides the greatest community benefit, or if modification or reduction of the woodlot is warranted prior to conveyance (City of Ottawa 2022d).

### 4.5.2 Areas of Natural and Scientific Interest

No ANSIs are present within the Site; however, the extents of the Leitrim ANSI are approximately 50 m west of the Site boundary, and approximately 500 m from the western edge of the UAE Limits (refer to **Figure 3**).

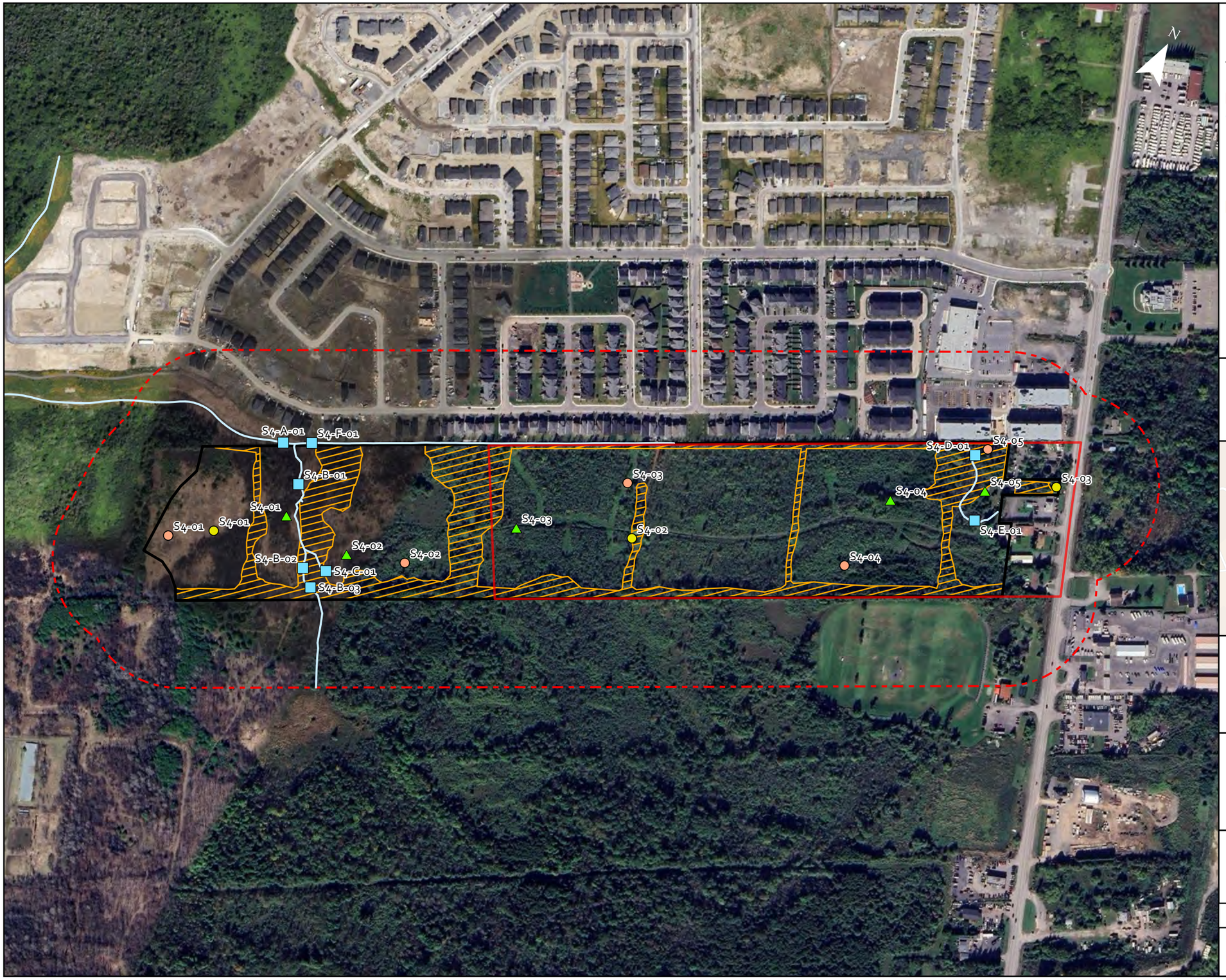
As this feature is not within the Site or Urban Expansion Area Limits where development is proposed, a full assessment was not completed as part of this EIS. However, due to the proximity of this feature to the Site, the Leitrim ANSI is being carried forward to evaluation.

### 4.5.3 Significant Wildlife Habitat

The PPS indicates that no development or site alteration is permitted within SWH unless it has been demonstrated that there will be no negative impacts on the natural feature or its ecological functions. Wildlife habitat is defined as:

> *"Areas where plants, animals and other organisms live and find adequate amounts of food, water, shelter, and space needed to sustain their populations. Specific wildlife habitat of concern may include areas where species concentrate at a vulnerable point in their annual or life cycle; and areas which are important to migratory or non-migratory species".*

The ELC communities were compared to the MNR's Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E (2015) and those that were deemed candidate SWH are discussed in **Section 6.4** below. The full SWH assessment is in **Appendix F**.



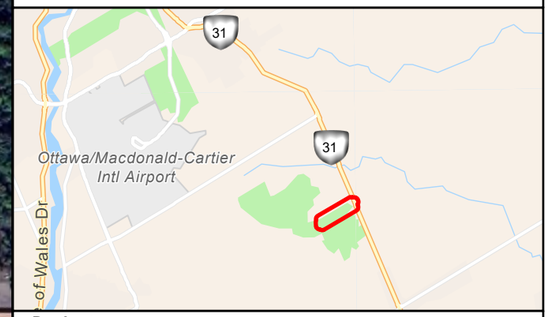

## Legend

- Site
- Study Area (120m)
- Urban Expansion Area Limits (CoO, 2025)
- Headwater Drainage Features
- Headwater Drainage Feature Survey Locations
- Crepuscular Breeding Bird Survey Stations
- Breeding Bird Survey Stations
- Breeding Amphibian Survey Stations
- SAR Plant, PIWO, and Stick Nest Survey Transect Areas (5m)

0 40 80 160 240 320

Meters

Scale: 1:5,000




Project:

**Leitrim West Future Neighborhood Urban Expansion Area - S4**

Title:

# Field Survey Locations

Prepared By:

ARCADIS Design & Consultancy for natural and built assets

Project: 145172

Date: 7/18/2025

**Figure: 4**

# 5 Field Investigation Results

The following field investigation results were documented from fieldwork conducted by Arcadis Ecologists for the Leitrim West Urban Expansion Area – S4 development between April and August 2024. Field investigations were conducted when weather conditions and timing were deemed suitable based on the survey protocols being implemented. The following sections outline the findings from the field surveys and characterize the existing conditions within the Study Area.

Refer to **Appendix G** for Site Photos.

## 5.1 Site Visit Dates and Purpose

A summary of the dates, times, ambient conditions, and purpose for the site visits are provided in **Table 9** below.

*Table 9: Summary of Survey Dates and Weather Conditions*

| Purpose Of Visit | Date (dd-mm-yyyy) | Time | Staff | Weather Conditions | Air Temp (°C) |
|---|---|---|---|---|---|
| Initial Site Visit, HDF1, MMP1 | 06-05-2024 | 2:24 PM – 10:15 PM | B.Semmler, C.Haines | Clear, Moderate Breeze | 20 |
| SAR, Client Visit | 16-05-2024 | 8:30 AM – 4:00 PM | B.Semmler, C.Little, A.Zeller | Sunny, Gentle Breeze | 23 |
| BBS1 | 31-05-2024 | 5:30 AM - 9:00 AM | B.Semmler, D.Shaw | Sunny, Light Breeze | 21 |
| BBS2 | 11-06-2024 | 5:30 AM - 8:30 AM | D.Shaw | Cloudy, light breeze | 9 |
| MMP2 | 25-06-2024 | 11:30 PM - 1:00 AM | B.Semmler, D.Shaw | Cloudy/Overcast, light breeze | 19 |
| HDF2, SAR Plants | 17-07-2024 | 8:00 AM - 12:00 PM | D.Shaw | Mostly to Partly Cloudy, Gentle Breeze | 16 |
| ELC, SAR Plants | 07-08-2024 | 10:30 AM - 5:00 PM | B.Semmler, D.Shaw | Mainly Sunny, Gentle Breeze | 22 |
| ELC, SAR Plants | 08-08-2024 | 8:00 AM - 3:30 PM | B.Semmler, D.Shaw | Mostly Cloudy, Light Air | 19 |

Notes:
BBS – Breeding Bird Survey
ELC – Ecological Land Classification
HDF – Headwater Drainage Feature; HDF#1 = spring assessment, HDF#2 = summer assessment
MMP – Marsh Monitoring Protocol (i.e., amphibian breeding / call surveys)

# 5.2 Aquatic Environment

## 5.2.1 Headwater Drainage Feature Assessment

Arcadis ecologists conducted field investigations of surface water features (Features 1 through 3; see **Section 3.3.1** above), which led to the identification of three additional features (one at the western extent and two at the eastern extent of the Site), as well as the ultimate exclusion of Feature-3 from assessment. Although Feature-3 exhibited characteristics of both a watercourse and an HDF, it was not influenced by on-site surface water hydrology, nor did it exert any influence on Site hydrology.

Through field investigations, a total of six drainage features were identified within the Study Area:

- Two drainage features are located within the Urban Expansion Area Limits,
- Two drainage features are located within the Site boundaries, and
- Two additional drainage features are located northwest of the Site, within the Study Area.

Water flow was observed in all features during the first spring freshet visit. Subsequent visits revealed varying flow conditions. Of these six features, reaches S4-B and S4-C resulted in a 'Protection' recommendation, reach S4-A (i.e., Conveyance Channel) and S4-F (i.e., Scratch Ditch) resulted in a 'Mitigation' recommendation, and S4-D and S4-E (within Urban Expansion Area Limits) resulted in a 'No Management Required' recommendation.

A summary of the management recommendations for each feature is provided below in **Table 11** and displayed in **Figure 5**. This detailed assessment highlights the management classification proposed by the HDF Guidelines (TRCA and CVC 2014) and the revised management recommendations carried forward in this study based on the specific landscape context of these features. Summary of data collected during the HDF assessments can be found in **Appendix D.**

The management recommendations proposed herein are intended to provide a framework to guide future development while maintaining the ecological and hydrological function that these features have in the natural heritage system. The following provides a summary of the intent for each of the proposed management recommendations, as described in the HDF Guidelines (TRCA and CVC 2014):

- **Protection:** Protect and/or enhance the existing feature and its riparian corridor in-situ.
- **Conservation:** Maintain, relocate, and/or enhance drainage feature and its riparian zone corridor.
- **Mitigation:** Replicate or enhance functions through enhanced conveyance measures. Flows should be conveyed to the appropriate downstream receiver.
- **Maintain Recharge:** Maintain overall water balance by through measures to infiltrate clean stormwater.
- **Maintain/Replicate Terrestrial Linkage:** Maintain or replicate the terrestrial corridor between features.
- **No Management Required:** Incorporate flow conveyance into standard stormwater solutions.

The following sections provide a brief description of the HDF features identified within the Study Area and the proposed management recommendations for each.

## Reach S4-A (Conveyance Channel)

This feature (Surface Water "Feature-1") is located outside the UEA Limits, within the northwestern extent of the Study Area (refer to **Figure 5**). Review of background resources for feature S4-A indicated that it was constructed around 2019 prior to urban development directly adjacent / north of the Site within the southwestern extent of the adjacent Pathways Subdivision. The Conveyance Channel was designed to maintain more consistent hydrologic conditions within the reach prior to discharge to the Leitrim PSW to the northwest. In-channel habitat features for amphibians, fishes, and invertebrates were either maintained or enhanced as outlined within Golder's Headwater Feature Management Recommendation (Golder 2016). The feature is now owned and managed by the city following a five-year monitoring program (Cambium 2024) as part of the previous development to the north.

Minimal water flow was observed within feature S4-A during Arcadis' spring and summer assessments, and the presence of a constructed rock weir (described below) was observed, located at the upstream end of the Conveyance Channel / intersection of S4-A, S4-B, and S4-F (Scratch Ditch). While this area does provide important riparian habitat (Ash Mineral Deciduous Swamp [SWDM2]), no fishes or breeding amphibians were observed during field investigations.

***Given these characteristics, the retention of this feature in-situ is not warranted; however, because this feature is an engineered drain and stormwater management feature which conveys stormwater from the adjacent development to the Leitrim PSW in the northwest. the proposed management recommendation for Reach S4-A is "Mitigation".***

### *ROCK WEIR*

A constructed Rock Weir at the upstream end of the Conveyance Channel was observed extending approximately 20 m along the intersection of S4-A, S4-B, and S4-F and consists of large limestone boulders (approximately 35 cm in length and width) on a steep slope that borders the Site and the adjacent Pathways Subdivision within the northwestern extent of the Study Area.

S4-A, May 6, 2024

S4-A, July 16, 2024

Rock Weir, Sept 26, 2025

Rock Weir, Sept 26, 2025

*Photos of Reach S4-A & Rock Weir*

## Reach S4-B

This feature (also referred to as “INT-3” in the Golder (2016) EMP) is located outside the UEA Limits, within the western extent of the Site (refer to **Figure 5**). S4-B facilitates flow from an unevaluated marsh (GEO 2025; **Figure 3**) located approximately 70 m south of the Study Area through the on-site Ash Mineral Deciduous Swamp (SWDM2) inclusion, where ultimately the flow drains into reach S4-A (after first needing to traverse the rock weir) and towards the Leitrim PSW to the northwest.

The presence of several Black Ash trees within the Ash Mineral Deciduous Swamp inclusion suggests that this reach provides habitat for this endangered species. Additionally, this reach contributes valuable terrestrial habitat, connecting both upstream and downstream areas and including an on-line wetland that serves as a movement corridor for low-mobility wildlife. There is low potential for upstream fish passage onto S4-B from downstream Feature S4-A due to the presence of the (described above), however ephemeral flooding during the high-water season may provide an opportunity for some fish species to migrate onto the Site. During the survey, minimal evidence of breeding amphibians was noted, with only one American Toad call recorded.

**Given these characteristics, the retention of this feature is essential, and the proposed management recommendation for Reach S4-B is "Protection”.**

S4-B, May 6, 2024

S4-B July 14, 2024

*Photos of Reach S4-B*

## Reach S4-C

This feature is located outside the UEA Limits, within the western extent of the Site (refer to **Figure 5**). This reach provides minimal surface flow toward the northwestern reaches (S4-A, S4-B), conveying water from the easternmost Mixed Willow Mineral Deciduous Thicket Swamp (SWTM3-6) inclusion to reach S4-B, then S4-A (Conveyance Channel) before draining into the Leitrim PSW.

At the intersection of reach S4-B and S4-C, a low-lying pond has formed, likely due to a natural depression and the continuous use of an ATV trail. Glossy Buckthorn thickets line the banks, creating riparian habitat. This reach also offers valuable terrestrial habitat by connecting the Mixed Willow Mineral Deciduous Thicket Swamp and the Ash Mineral Deciduous Swamp (SWDM2) inclusions. Additionally, S4-C serves as a movement corridor for breeding amphibians, with several recorded at the head of this reach.

**Given these characteristics, the retention of this feature is essential, and the proposed management recommendation for Reach S4-C is "Protection”.**

S4-C, May 6, 2024

S4-C, July 14, 2024

*Photos of Reach S4-C*

## Reaches S4-D and S4-E

Both Reach S4-D and S4-E are located within the eastern extent of the UEA Limits. These features are isolated and no longer connect to any upstream or downstream features (refer to **Figure 5**). Aerial imagery suggests that these reaches once received flow from the northern property prior to the construction of a residential complex.

S4-D currently exists as a disconnected reach that is situated along a clay basin with low permeability that allows for water accumulation and aids in sustaining the Poplar Mineral Deciduous Swamp (SWDM4-5) inclusion in this area. Although minimal amphibian breeding habitat was recorded along S4-D during targeted surveys (American Toad Call Code:1, Spring Peeper Call Code:1), the lack of connecting habitat indicates that this reach provides limited terrestrial habitat for low mobility species and does not contain habitat suitable for fishes.

Similarly disconnected, S4-E allows for water from S4-D to overflow further east on the property through Glossy Buckthorn thicket riparian habitat. This reach terminates at the eastern property line, thereby limiting its capacity for habitat mobility and fish passage. Water accumulates along this reach due to the presence of clay substrate.

**Given these characteristics, these isolated ditches (S4-D and S4-E) receive a management recommendation of "No Management Required".**

S4-D, May 6, 2024

S4-D, July 14, 2024

S4-E, May 6, 2024

S4-E, July 14, 2024

*Photos of Reach S4-D and S4-E*

**Reach S4-F (Scratch Ditch)**

This feature (previously identified as “Feature-2”) is located outside the UEA limits, along the northwestern boundary of the Site and adjacent to the northern development area (refer to **Figure 5**). Constructed as a “Scratch Ditch”, it was designed to accommodate runoff from the Subject Site area and backyards associated with the ongoing Pathways at Findlay Creek development. This feature was observed to have been constructed entirely within the private lands to the north (i.e., within the backyards of houses on the south side of Paakanaak Avenue) which was an unintended deviation from the *Remer Site Serviceability Plan*, as indicated by SNC in their *July 25, 2025, Field Observations* (SNC 2025a). At the time of the Pathways development, the area now designated as the S4 UEA had no allowance for construction within the property lines, resulting in the dual swale design within the rear yards of the private properties (Arcadis 2025c).

Additional on-site surface flow contributes to water accumulation in S4-F to the north, which then conveys flows to S4-A (first needing to traverse the rock weir) toward the Leitrim PSW. Erosion and minimal vegetation was observed in the area where S4-F joins S4-A, also documented by SNC during their July 25, 2025, field investigations (SNC 2025a). Flow from this reach was observed during all site visits; however, no fishes were observed within this reach at the time of survey.

**Given these characteristics, the proposed management recommendation for the Scratch Ditch (Reach S4-F) is "Mitigation”. The retention of this feature is recommended, otherwise the feature could be incorporated into the stormwater solution ensuring it maintains its existing hydrologic functions and is inline with SNC requirements for control of stormwater associated with this Project.**



S4-F, May 6, 2024



S4-F, July 14, 2024

*Photos of Reach S4-F*

### 5.2.2 Groundwater Assessment

Groundwater levels were measured by Paterson Group (2025) in the installed piezometers and groundwater monitoring wells following completion of the respective investigations at the Subject Site. The measured groundwater levels are shown below in **Table 10**.

*Table 10: Summary of Groundwater Level Readings (Paterson Group 2025)*

| Borehole Number | Ground Surface Elevation (m) | Measured Groundwater Level | | Date Recorded |
|---|---|---|---|---|
| | | Depth (m) | Elevation (m) | |
| BH 1-25* | 101.45 | 1.74 | 99.71 | July 3, 2025 |
| BH 2-25 | 103.07 | 2.18 | 100.89 | July 3, 2025 |
| BH 3-25* | 109.30 | 1.99 | 107.31 | July 3, 2025 |
| BH 1-23* | 102.56 | 1.30 | 101.26 | December 15, 2023 |
| BH 2A-23* | 102.25 | 0.80 | 101.45 | |
| BH 3-23 | 105.46 | 1.23 | 104.23 | |
| BH 4-23 | 106.70 | Dry | - | |
| BH 5-23 | 107.88 | 0.40 | 107.48 | |
| BH 6C-23* | 101.59 | 0.76 | 100.83 | |
| BH 7-23 | 109.28 | 0.66 | 108.62 | |
| BH 8A-23 | 107.22 | 0.27 | 106.95 | |
| BH 9-23 | 106.87 | 0.13 | 106.74 | |
| BH 10-23* | 103.35 | 0.39 | 102.96 | |

Note:
Ground surface elevation at each borehole location was surveyed by Paterson using a handheld GPS unit and was referenced to a geodetic datum.
* Borehole instrumented with groundwater monitoring well.

According to Paterson Group (2025), the long-term groundwater levels can be estimated based on the observed colour, moisture content, and consistency of the recovered soil samples. Based on these observations, the long-term groundwater level is expected to range between approximately **1 to 2 m** below the existing ground surface, though it should be noted that groundwater levels are subject to seasonal fluctuations and can vary.

A long-term, real-time groundwater monitoring program is currently on-going at the Subject Site to determine seasonal high groundwater levels. The results of this groundwater monitoring program will be provided in a future revision to the *Geotechnical Investigation* report.

Finally, Paterson Group (2025) indicated that in order for the foundation design data provided in their *Geotechnical Investigation* report to be applicable, it is a requirement that the following material testing be performed by the geotechnical consultant:

- Observation of all bearing surfaces prior to the placement of concrete.
- Sampling and testing of the concrete and fill materials.
- Periodic observation of the condition of unsupported excavation side slopes in excess of 3 m in height, if applicable.
- Observation of all subgrades prior to backfilling materials.
- Field density tests to determine the level of compaction achieved.
- Sampling and testing of the bituminous concrete including mix design reviews.

See the *Geotechnical Investigation* report provided by Paterson Group (2025) for additional details regarding groundwater assessment results (e.g., data tables).

### 5.2.3 Fishes and Fish Habitat

All HDFs were assessed for the presence of fishes and fish habitat; however, no fishes were observed during the survey period. Field investigations also revealed that the northeastern-most reaches (S4-D, S4-E) are not connected to any upstream or downstream features.

#### Rock Weir

Although the westernmost HDFs (S4-A, S4-B, S4-C and S4-F) do connect to higher quality fish habitat downstream within the Leitrim PSW and ANSI, rapid changes in grade at the Site property line (Rock Weir) presents a barrier for fish passage / migration into on-site features from downstream areas. This Rock Weir represents an approximate 5 to 6-foot drop in elevation over approximately 4 meters located at the intersection of S4-A (Conveyance Channel), S4-B, and S4-F (Scratch Ditch), and is composed of large limestone boulders, each measuring approximately 35 cm in both length and width.

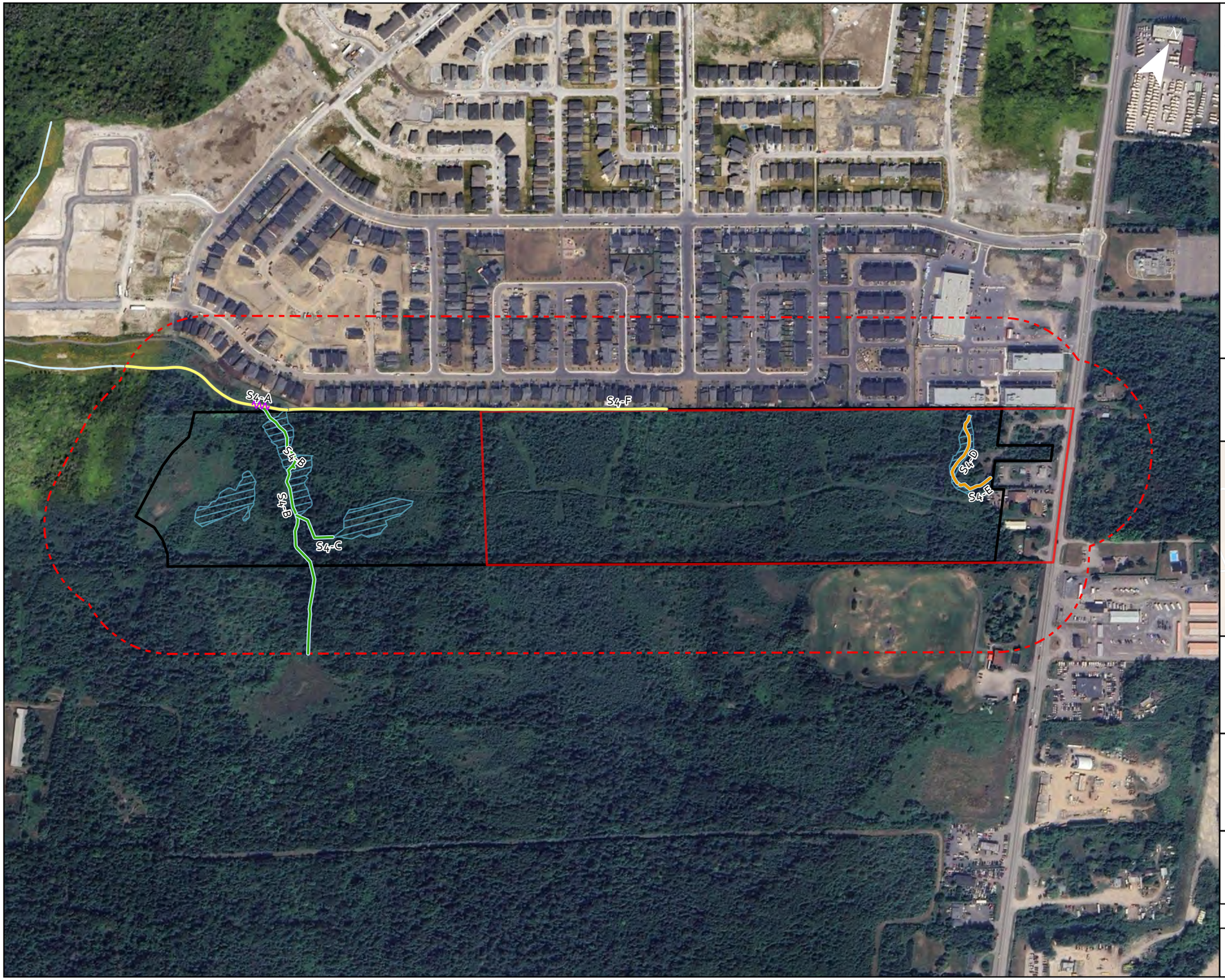
Due to the presence of the Rock Weir and associated impediment to fish migration from downstream confirmed direct fish habitat (i.e., Leitrim Core Wetland / PSW and Conveyance Channel; Golder 2016), all reaches upstream of the barrier (i.e., S4-B, S4-C, and S4-F / Scratch Ditch) provide indirect / contributing fish habitat as they convey flows downstream to areas containing fish communities.

As mentioned, HDFs S4-D and S4-E have been determined to not represent fish habitat as no fishes were observed, and they are no longer connected to any upstream or downstream features.

*Table 11: Headwater Drainage Feature Management Recommendations*

| Drainage Feature Segment | Step 1 Hydrology | Step 1 Modifiers | Step 2 Riparian Habitat | Step 3 Fish Habitat | Step 4 Terrestrial Habitat | Meets *Conservation Authorities Act* (*O.Reg.41/24*) Definition of Watercourse | CVC/ TRCA Management Classification | Study Area Management Recommendations |
|---|---|---|---|---|---|---|---|---|
| **S4-A** (Conveyance Channel) | **Important Function:** Minimal surface flow was observed in this reach during all HDF assessments. | This feature functions as an engineered drain and SWM feature. It is located adjacent to the active construction site, where construction activities in this area are ongoing. | **Important Function:** Riparian function is linked to an Ash Mineral Deciduous Swamp (SWDM2) located within a 30m distance from the reach. | **Contributing Function:** This feature provides minimal allochthonous transport to downstream habitats. No fish were observed within reach. | **Contributing Function:** This feature may provide some function as a movement corridor between the Ash Mineral Deciduous Swamp (SWDM2) and the Leitrim PSW and ANSI. No breeding amphibians were observed. | **Yes** | **Protection** | **Mitigation** This feature is an approved engineered drain and stormwater management feature which conveys stormwater from the adjacent development to the Leitrim PSW in the northwest. Fish passage at the head of this reach is impeded by a rock weir. Aerial Imagery suggests the reach was constructed around 2019. This feature provides minimal habitat for breeding amphibians and fish species. |
| **S4-B** | **Important Function:** This reach is associated with a wetland feature with minimal surface flow at all times of year. | An old ATV trail interrupts water flow and creates a low-lying permanent pond. | **Important Function:** Riparian function is located within an Ash Mineral Deciduous Swamp (SWDM2). | **Contributing Function:** This feature provides minimal allochthonous transport to downstream habitats. No fish were observed within reach. | **Valued Function:** Wetland habitat associated with this reach is connected to other wetland features upstream. Although there was minimal evidence of breeding amphibians within this reach (American Toad Call Count: 1), this feature likely acts as a movement corridor for low mobility wildlife. | **Yes** | **Protection** | **Protection** |
| **S4-C** | **Important Function:** Minimal surface flow was observed in this reach during all HDF assessments. | An old ATV trail interrupts water flow and creates a low-lying permanent pond. | **Important Function:** The adjacent riparian conditions are dominated by glossy buckthorn thicket communities. | **Contributing Function:** This feature provides minimal allochthonous transport to downstream habitats. No fish were observed within reach | **Limited Function:** Breeding amphibians were recorded in the Mixed Willow Mineral Deciduous Thicket Swamp (SWTM3-6) at the head of this reach. This reach additionally connects to the Ash Mineral Deciduous Swamp SWDM2). | **Yes** | **Protection** | **Protection** |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **S4-D** | **Not Applicable:**<br>This feature is isolated and not connected upstream or downstream. Minimal amounts of surface flow were present year-round. | Historical imagery indicates that this feature has been disconnected from upstream areas due to the recent construction of development to the north. Similarly, the downstream reach (S4-C) is disconnected and ends at the property line between the site and the automotive business at 4856 Bank Street.<br>It is also expected that this feature would be normally dry in years with more typical summer rainfall amounts. | **Valued Function:**<br>Riparian conditions are dominated by Poplar Mineral Deciduous Swamp (SWDM4-5) and forest communities. | **Not Applicable:**<br>Since this feature is not connected, no fish were observed within reach. | **Important Function:**<br>This disconnected reach is situated along a clay basin with low permeability that allows for water accumulation to occur. Minimal amphibian breeding activity (Spring Peeper and American Toad Call Code: 1) was observed within this reach. | **No** | **No Management Required** | **No Management Required**<br>This feature is no longer connected to upstream or downstream watercourses and does not convey flow. As such, it does not actually meet the definition of a headwater feature. |
| **S4-E** | **Not Applicable:**<br>This feature is isolated and not connected upstream or downstream. Minimal surface flow was observed during spring surveys, while standing water was observed during the summer months. | Several, disused, ATV trails intersect this feature. In addition, several abandoned vehicles were also observed throughout this area.<br>It is expected that this feature would be dry in years with more typical summer rainfall amounts and only conveying flow following heavy rainfall amounts. | **Valued Function:**<br>Glossy Buckthorn Deciduous Thickets associated with the rural property at line this reach. | **Not Applicable:**<br>Since this feature is not connected, no fish were observed within reach. | **Limited Function:**<br>This disconnected reach is situated along a clay basin with low permeability that allows for water accumulation to occur. No breeding amphibians were observed within this reach. No movement corridors are present. | **No** | **No Management Required** | **No Management Required**<br>This feature is no longer connected to upstream or downstream watercourses and does not convey flow. As such, it does not actually meet the definition of a headwater feature. |
| **S4-F**<br>(Scratch Ditch) | **Important Function:**<br>Minimal surface flow was observed in this reach during all HDF assessments. | This feature functions as a scratch drain, engineered to transport surface water flow from the existing development north of the Site towards the Leitrim PSW. | **Valued Function:**<br>Glossy Buckthorn Deciduous Thickets associated with the Site border the southern extent of this reach, while residential development borders the northern extent. | **Contributing Function:**<br>This feature provides minimal allochthonous transport to downstream habitats. No fish were observed within reach. | **Limited Function:**<br>This scratch ditch has no upstream features and does not provide corridor movement for breeding amphibians or fish. | **Yes** | **Mitigation** | **Mitigation**<br>This feature is an approved engineered scratch drain which conveys stormwater from the adjacent development to the Leitrim PSW in the northwest. Areal Imagery suggests the reach was constructed around 2019. This feature provides minimal habitat for breeding amphibians and fish species. |




## Legend

- Site
- Study Area (120m)
- Urban Expansion Area Limits (CoO, 2025)
- Wetland Inclusion (<0.5 ha)
- Drainage Feature (Unassessed)
- Rock Weir

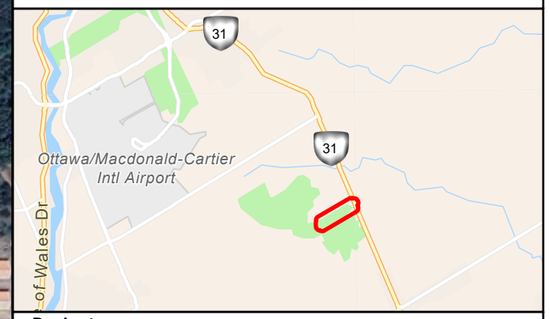
Headwater Drainage Feature Management Recommendations

- Protection
- Mitigation
- No Management Required

0 40 80 160 240 320

Meters

Scale: 1:5,000




Project:

**Leitrim West Future Neighborhood Urban Expansion Area - S4**

Title:

Headwater Drainage Feature Management Assessment

Prepared By:

ARCADIS Design & Consultancy for natural and built assets

Project: 30258325

Date: 10/9/2025

**Figure: 5**

# 5.3 Terrestrial Environment

The subsections below provide the results of surveys related to the terrestrial environment of the Study Area.

## 5.3.1 Ecological Land Classification (ELC)

The ELC survey identified a total of four upland vegetation communities, and two wetland vegetation communities (minimum size 0.5 ha, as per ELC protocol, unless a significant smaller community is identified).

The upland natural environment includes:

- **Mixed Meadow** (dominated by herbaceous species with no more than 25% cover provided by either shrub or tree species)
- **Thicket** (communities with >25% shrub cover and <25% tree cover)
- **Coniferous Forest** (communities with >60% canopy cover composed of >75% coniferous trees)
- **Deciduous Forest** (communities with >60% canopy cover composed of >75% deciduous trees)

The wetland natural environment includes:

- **Deciduous Swamps** (communities with >25% canopy cover > 5m in height and >75% deciduous species)
- **Thicket Swamps** (communities with >25% hydrophytic shrub cover)

The surrounding Study Area is mostly Low Density Residential (CVR_1) to the northwest and Buckthorn Deciduous Shrub Thicket (THDM2-6) and Business Sector (CVC_1) to the east / southeast.

All meadow communities surveyed within the Site are impacted by land use activities occurring within the past 30 years. The native vegetation communities present are considered common within Ontario.

Overall, the ELC survey divided the Study Area into a total of 11 ELC ecosites, plus an additional 7 ecosites associated with constructed lands (i.e., transportation and/or residential development).

The communities documented during ELC surveys, the dominant vegetation cover, as well as reference photos for each vegetation communities on the Site are summarized below in **Table 12** and displayed in **Figure 6**.

*Table 12: Summary of Ecological Land Classification for the Study Area*

| ELC Type | Total Area (ha) in Study Area | Total Area (ha) in UEA | Community Description | Photo Record |
|---|---|---|---|---|
| **UPLAND – Mixed Meadow (MEM)** | | | | |
| **MEMM3** Dry-Fresh Mixed Meadow | 1.4 | 0 | This community exists in the western extents of the Site. A naturalized meadow inclusive of drought tolerant broadleaf and graminoid species such as various Goldenrods, Common Vetch, Clover, Sulphur Cinq-foil, Wild Carrot, Hawkweed, Hoary false-alyssum, Common Yarrow, Common Viper's Bugloss, Common Mullein, Black-eyed Susan, and various graminoids dominate this area. | Looking northwest across the meadow. Photo taken 06.05.2024.  |

| ELC Type | Total Area (ha) in Study Area | Total Area (ha) in UEA | Community Description | Photo Record |
|---|---|---|---|---|
| **MEMM4**<br>Fresh-Moist Mixed Meadow | 2 | 0.5 | Much of this fresh-moist mixed meadow can be found in the western extent of the Site where it occupies open areas within the Buckthorn Thicket. Additionally, there is a smaller area close to the eastern edge of the Site. This meadow community features broadleaf graminoid species that have preference for moister soil regimes. This includes Reed Canary Grass, Goldenrod, Asters, Common Dandelion, and Canada Anemone.<br>*Note: Four Butternut were located on the edge of this community in the western extent of the Site.* | Looking west across meadow in western extant. Photo taken 07.08.2024.<br>  |

| ELC Type | Total Area (ha) in Study Area | Total Area (ha) in UEA | Community Description | Photo Record |
|---|---|---|---|---|
| **UPLAND – Thicket (TH)** | | | | |
| **THCM2-1**<br>Fresh-Moist White Cedar Coniferous Thicket | 2.5 | 0.7 | There are two ecosites in the eastern extent of the Site, with two more ecosites to the south and west of the Site in the Study Area. These areas feature many young Eastern White Cedar that are scattered and patchy in places but continuous in others. The canopy itself is less than 25% coverage, 10-15m tall, and primarily comprised of Eastern White Cedar. The sub-canopy, 20% coverage and 7-10m tall, had a similar composition to the canopy. Much of the understory is dominated by buckthorn species, with more than 50% coverage (.5-2m tall), with Red-osier Dogwood, Willow spp., Riverbank Grape, and Green Ash. In places where the cedar is dense, the ground cover is sparse, and in places where the buckthorn is dense, the ground cover was greater on average there was 40% coverage. Ground layer vegetation included Purple Loosestrife, Goldenrod, graminoids, and Riverbank Grape. | Thicket in southeastern extant of Site. Photo taken 07.08.2024.<br>  |

| ELC Type | Total Area (ha) in Study Area | Total Area (ha) in UEA | Community Description | Photo Record |
|---|---|---|---|---|
| **THDM2-6**<br>Buckthorn Deciduous Shrub Thicket | 22.2 | 8.6 | This community occupies most of the Site and is dominated by Glossy Buckthorn. Canopy coverage is 20% and 15-20m tall, and comprised of scattered Green Ash, White Ash, and White Elm. The sub-canopy had similar species (20% cover, 5-8m tall). The understory (80% coverage, 5-2m tall) was comprised mainly of Glossy Buckthorn with willow and Ash species. This densely covered area had a mix of graminoid, and broadleaf species found in other areas of the Site, such as Goldenrod and Purple Loosestrife, for ground vegetation (30% coverage). This community can also be found south and east of the Site. | Thicket in middle of Site on either side of CL. Photo taken 06.05.2024.<br>  |

| ELC Type | Total Area (ha) in Study Area | Total Area (ha) in UEA | Community Description | Photo Record |
|---|---|---|---|---|
| **UPLAND – Coniferous Forest (FOC)** | | | | |
| **FOCM4-1**<br>Fresh - Moist White Cedar Coniferous Forest | 2.5 | 0.4 | This community borders the southwest corner of the site and additionally includes a small section to the northeast. The canopy (10-15m tall, 85% coverage) and is dominated by Eastern White Cedar, with small occurrences of White Birch and White Elm. The Subcanopy (5-10m tall, 75% coverage) and understory (0.5-5m tall, 50% coverage) is dominated by Eastern White Cedar, Green Ash, White Ash, and Buckthorn. Ground layer (25% coverage) had Wood Fern, Purple Loosestrife, and small Ash and Buckthorn species scattered throughout. Four Butternuts were located within this community with one outside of the Site, and one outside of the UEA.<br>*Note: Four Butternuts are located within this ecosite.* | View from inside Forest. Photo taken 07.08.2024.<br>  |

| ELC Type | Total Area (ha) in Study Area | Total Area (ha) in UEA | Community Description | Photo Record |
|---|---|---|---|---|
| **FOCM5**<br>Naturalized Coniferous Hedgerow | 1.42 | 0.8 | This area borders the southeastern extent of the Site. Part of the hedgerow contains an old agricultural access road that runs between the Site and the Target Golf Centre (driving range). The canopy (12-15m tall, 80% coverage) was largely composed of Eastern White Cedar, with some White Birch and White Elm. The subcanopy (5-8m tall, 85% coverage) including the above species but also included White Pine, Green Ash and White Ash, and Buckthorn. The understory (25% cover, 0.5-2m tall) included younger Red Pine and Riverbank Grape with the above noted species. Ground vegetation (35% cover) had Wood Fern species along with Goldenrod and Purple Loosestrife, but also young Buckthorn and Ash species.<br>*Note: Nine Butternut (part of canopy and subcanopy) were located within this ecosite along with eleven Black Ash (subcanopy and understory).* | View from inside hedgerow. Photo taken 07.08.2024.<br>  |
| **UPLAND – Deciduous Forest (FOD)** | | | | |
| **FODM11**<br>Naturalized Deciduous Hedgerow | 2.3 | 0.8 | The hedgerow community covers most of the southern border of the Site and intersects the property in three areas. Two of those areas connect with the coniferous hedge-row community. This ecosite largely contains American Basswood in the canopy (10-25m tall, 80% coverage), with White Ash, American Elm, and Manitoba Maple. These noted species accompanied Green Ash, and Common Buckthorn in the subcanopy (5-8m tall, 70% coverage) and the understory (0.5-3m tall, 45% coverage), which also included Red-osier Dogwood. Ground vegetation included Virginia Creeper, Wild Carrot, Purple Loosestrife, Thin-leaved Goldenrod, Early Goldenrod, Joe-Pye Weed, Common Yarrow, and Red Raspberry. Note: Seven Butternut were located within this community as well as a bat cavity. | Photo from inside the hedgerow. Photo taken 08.08.2024.<br>  |

| ELC Type | Total Area (ha) in Study Area | Total Area (ha) in UEA | Community Description | Photo Record |
|---|---|---|---|---|
| **WETLAND – Deciduous Swamp (SWD)** | | | | |
| **SWDM2 (Inclusion)**<br>Ash Mineral Deciduous Swamp | 0.35 | 0 | This wetland community inclusion, located in the western extent of the Site, had concentrations of Black Ash and Butternut, with a headwater drainage feature coursing through. The canopy (10-20m tall, 75% coverage) was mainly composed of Green Ash and Red Maple, with some Butternut and Black Ash. The subcanopy (5-10m tall, 60% coverage) contained the above species along with Crack Willow and Bebb's Willow. Much of the Black Ash in this location could be found in the understory (0.5m-5m tall, 40% coverage) along with the noted willow species, buckthorn, and Riverbank Grape. Ground vegetation (70% coverage) consisted of Joe-Pye Weed, Purple Loosestrife, Water Plantain, Common Boneset, Sensitive Fern, Virginia Creeper, and nettle.<br>*Note: Six Butternut observed along with areas of high concentrations of Black Ash with many small stems (<8cm dbh).* | Within swamp in western extant. Photo taken 08.08.2024.<br>  |

| ELC Type | Total Area (ha) in Study Area | Total Area (ha) in UEA | Community Description | Photo Record |
|---|---|---|---|---|
| **SWDM4-5 (Inclusion)**<br>Poplar Mineral Deciduous Swamp | 0.12 | 0.1 | This inclusion wetland community, located in the northeast corner of the Site, contained a headwater drainage feature. The canopy (10-15m tall, 35% coverage) primarily surrounded the community and was composed of Trembling Aspen, Green Ash, and White Elm. The subcanopy (5-10m tall, 30% coverage) contained the above species including Willow species and Buckthorn, which was also true for the understory (0.5-4m tall, 25% coverage). Ground vegetation (70% coverage) contained Reed Canary Grass, Tussock Sedge, Joe-Pye Weed, Purple Loosestrife, Marsh Horsetail, and some Narrow-leaved Cattail.<br>*Note: one Black Ash was observed in this community.* | Within swamp in eastern extant. Photo taken 31.05.2024.<br>  |
| **WETLAND – Thicket Swamp (SWT)** | | | | |
| **SWT**<br>Thicket Swamp | 1.6 | 0 | This community is within the Leitrim Wetland within the Study Area and not within the Site. | *No Photo Available* |

| ELC Type | Total Area (ha) in Study Area | Total Area (ha) in UEA | Community Description | Photo Record |
|---|---|---|---|---|
| **SWTM3-6**<br>Mixed Willow Mineral Deciduous Thicket Swamp | 0.54 | 0 | This community exists in two locations in the western extent of the Site. The canopy (10-12m tall, 35% coverage) contained Green Ash and White Elm but was largely composed of Willow species. The subcanopy (5-8m tall, 40% coverage) was primarily Bebb's Willow, Crack Willow, and Slender Willow, which was also true for the understory (0.5m-3m tall, 75% coverage). Ground vegetation (60% coverage) was composed of Joe-Pye Weed, Water Plantain, Sensitive Fern, Common Boneset, Purple Loosestrife, Riverbank Grape, and Virgina Creeper.<br>Note: one Black Ash was located within the eastern area of this community. | Within swamp in eastern extant. Photo taken 07.08.2024.<br>  |

| ELC Type | Total Area (ha) in Study Area | Total Area (ha) in UEA | Community Description | Photo Record |
|---|---|---|---|---|
| **CULTURAL – Constructed (CV)** | | | | |
| **CL**<br>Cleared Lands | 1.26 | 1.3 | This area runs through the middle of the Site, appears to have been cleared for prior survey work. | Cleared lands in centre of Site. Photo taken 06.05.2024.<br>  |
| **CV**<br>Constructed Lands | 0.76 | 0 | These areas within the Study Area are comprised of active construction lands and construction access roads, including a drain to the northeast of Site. | *No Photo Available* |
| **CVC_1**<br>Commercial and Institutional | 5.38 | 0.7 | There are few business areas off Bank Street including Target Golf Centre (a driving range) to the southeast, Bridgeport Motor Dealers along the eastern boundary, and Home Hardware to the northeast. | *No Photo Available* |
| **CVI_1**<br>Transportation and Utilities | 1.56 | 0.2 | These areas consist of major roads, right of ways, and hydro corridors. | *No Photo Available* |
| **CVR_1**<br>Low Density Residential | 11.72 | 0 | These areas consist of single-family homes north of the Site. | *No Photo Available* |
| **CVR_4**<br>Rural Property | 1.61 | 1.1 | These areas consist of rural homes along Bank Street. | *No Photo Available* |


## Legend

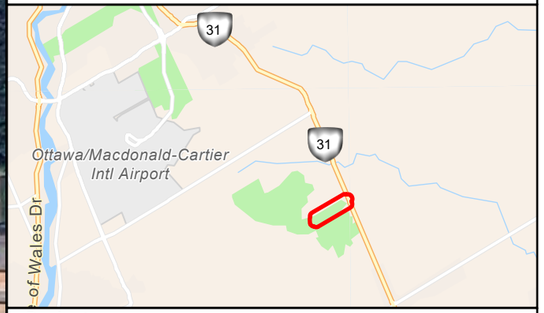
- Site
- Urban Expansion Area Limits (CoO, 2025)
- Study Area (120m)

### Ecological Land Classification

- 1 - Fresh - Moist White Cedar Coniferous Forest (FOCM4-1)
- 2 - Naturalized Coniferous Hedge-row (FOCM5)
- 3 - Naturalized Deciduous Hedge-row (FODM11)
- 4 - Dry - Fresh Mixed Meadow (MEMM3)
- 5 - Fresh - Moist Mixed Meadow (MEMM4)
- 6 - Ash Mineral Deciduous Swamp (SWDM2)
- 7 - Poplar Mineral Deciduous Swamp (SWDM4-5)
- 8 - Thicket Swamp (SWT)
- 9 - Mixed Willow Mineral Deciduous Thicket Swamp (SWTM3-6)
- 10 - Fresh - Moist White Cedar Coniferous Thicket (THCM2-1)
- 11 - Buckthorn Deciduous Shrub Thicket (THDM2-6)
- 12 - Cleared Land (CL)
- 13 - Constructed (CV)
- 14 - Drain (Constructed) (CV)
- 15 - Business Sector (CVC_1)
- 16 - Transportation (CVI_1)
- 17 - Low Density Residential (CVR_1)
- 18 - Rural Property (CVR_4)

0 40 80 160 240 320 Meters

Scale: 1:4,886




Project:

**Leitrim West Future Neighborhood Urban Expansion Area - S4**

Title:

# Ecological Land Classification

Prepared By:

ARCADIS Design & Consultancy for natural and built assets

Project: 30258325

Date: 10/17/2025

**Figure: 6**

## 5.3.2 Botanical Inventory

The botanical inventory identified 99 vegetation species within the Site (**Appendix E**). Majority of the vascular plants inventoried are considered common throughout Ontario and are native species.

### Floristic Quality Assessment

A Floristic Quality Assessment was conducted to determine the site's level of ecological integrity based on plant species composition. A coefficient of conservatism value is assigned to each species, ranging from 0 to 10, with 10 having a lower tolerance to disturbance and restricted to undisturbed habitats.

Seven vascular plants had coefficient of conservatism values ranging from 7-10 (high to highest sensitivity), including Twinleaf, Marsh Horsetail, Northern Maidenhair Fern, Spring Avens, Black Ash, and White Wood Aster; however, the average coefficient of conservatism value was three, indicating that majority of the vascular plants within the Study Area have a moderate tolerance to disturbance and, if given the opportunity, could recover in adjacent suitable habitat.

Two SAR plants were encountered during field surveys: Black Ash and Butternut. Refer to **Section 5.4** for further details on these observations.

### *Constructed Channel Monitoring (Year 5)* (Cambium 2024)

Monitoring of the constructed Conveyance Channel (i.e., off-site downstream portions of the Scratch Ditch to the northwest) resulted in observations of an increase in density, cover, and diversity of native species in 2024 compared to previous years (i.e., since 2020), with native species being dominant overall.

Native herbaceous plants are expected to continue to colonize over time, and Willows continue to become increasingly dominant in the wet meadow areas. Portions of these areas may become thicket swamp in future years with the emergence of woody species, which may also aid in reducing the colonization of invasive species such as Glossy Buckthorn (abundant in the adjacent Leitrim Wetland; Cambium 2024).

## 5.3.3 Amphibian Call Surveys

Two marsh monitoring surveys were completed in 2024 to determine amphibian breeding presence within the Site. Survey stations were in forest features with lowland depressions, as well as adjacent to shallow aquatic features that occurred within or in proximity to the 120 m Study Area.

Five stations were monitored for calling frogs. Three species were confirmed within the Site during the surveys: Spring Peeper, American Toad, and Green Frog. All species observed are common to the Ottawa area. A summary of the amphibian species identified within 100 m of the survey stations are presented in **Table 13** below.

*Table 13: Amphibian Survey Results*

| Common Name | Scientific Name | Number of Observations | Station Number | Meets SWH Criteria |
|---|---|---|---|---|
| Spring Peeper | *Pseudacris crucifer* | 1 (Call Code 3)<br>1 (Call Code 1) | S4-02<br>S4-05 | No |
| American Toad | *Anaxyrus americanus* | 1 (Call Code 1)<br>1 (Call Code 2)<br>1 (Call Code 1) | S4-01<br>S4-02<br>S4-03 | No |
| Green Frog | *Rana clamitans* | 1 (Call Code 1)<br>1 (Call Code 1) | S4-02<br>S4-05 | No |

Vernal pools were observed during the first round of surveys completed in the spring within the wetland inclusions on Site.

***Though breeding amphibians were observed during surveys, they do not meet the quantity or species diversity requirements to support Candidate Amphibian Breeding Habitat (Woodland) SWH.***

***Constructed Channel Monitoring (Year 5) (Cambium 2024)***

Monitoring of the constructed channel (i.e., Conveyance Channel) resulted in observations of increased amphibian breeding activity in 2024 compared with 2020, indicating the presence of high-quality amphibian breeding habitat and establishment of a thriving amphibian community associated with the wetland system just north of the northwest corner of the property.

The following species were observed during amphibian breeding surveys conducted over the monitoring period (Cambium 2024; **Table 14**).

*Table 14: Summary of Amphibian Breeding Results (All Years) for the Pathways at Findlay Creek Constructed Channel*

| Year | April | May | June |
|---|---|---|---|
| 2020 | None | American Toad (Code 1) | Green Frog (Code 1) |
| 2021 | Spring Peeper (Code 3)<br>Wood Frog (Code 1)<br>Northern Leopard Frog (Code 1)<br>American Toad (Code 2) | Green Frog (Code 1)<br>Spring Peeper (Code 2) | Green Frog (Code 1) |
| 2022 | Spring Peeper (Code 3)<br>Wood Frog (Code 1)<br>Northern Leopard Frog (Code 1)<br>American Toad (Code 2) | Spring Peeper (Code 3)<br>American Toad (Code 2) | Green Frog (Code 2) |
| 2024 | Spring Peeper (Code 3)<br>Northern Leopard Frog (Code 2)<br>American Toad (Code 1) | Spring Peeper (Code 3)<br>American Toad (Code 2) | Green Frog (Code 2) |

### 5.3.4 Breeding Bird Surveys

A total of 28 bird species were recorded during the breeding bird surveys (refer to survey methodology in **Section 4.2.5**). Evidence of breeding birds occurred as the following:

- Singing males being present within suitable nesting habitat [**Possible Breeders**];
- Pairs of a species and territorial behaviour observed in suitable nesting habitat [**Probable Breeders**]; and/or
- Active / used nests and fledged young observed in suitable nesting habitat [**Confirmed Breeders**].

Majority of the birds recorded are common within the City of Ottawa and generally have secure populations within Ontario. No Endangered or Threatened species were observed during field surveys. A record of the bird species observed within the Study Area, including their conservation status, can be found in **Appendix E.**

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.***

#### 5.3.4.1 Eastern Whip-poor-will

This species was surveyed for purposes of Arcadis' (2025) ECR prior to this species being downlisted from the SARO List as of January 27, 2025.

No Eastern Whip-poor-will or other crepuscular bird species were observed during the 2024 field surveys.

#### 5.3.4.2 Raptor Nest Surveys

No raptor nests were observed during the 2024 field surveys. Additionally, there were no signs of individuals or evidence of active nesting (e.g., food caches, whitewashing of branches and foliage, accumulation of feathers / fur, or prey remains on the ground or in shrubs) observed during the 2024 field surveys.

#### 5.3.4.3 Pileated Woodpecker Nest Surveys

There were no observations of suitable nesting habitat for Pileated Woodpecker observed within the Site boundaries, and no individuals were observed during the two breeding bird surveys, or incidentally during any other survey completed in 2024.

## 5.4 Species at Risk and Species at Risk Habitat

#### 5.4.1.1 SAR Bats

Little Brown Myotis, Eastern Red Bat, Hoary Bat, Silver-haired Bat, Northern Myotis, Tri-colored Bat, are all listed as Endangered species provincially signifying that they are at risk of becoming extinct or extirpated in Ontario. There are three types of habitats required by bats: hibernation, maternity sites, and day-roost sites. The latter is not considered significant habitat.

These six bat species prefer to hibernate in caves or mines, and rarely hibernate in buildings (COSEWIC, 2013). No caves or mines were present within the Study Area, as such, it is assumed that no suitable overwintering habitat will be impacted.

SAR bats can use tall, large cavity trees that are in the early to mid-stages of decay as maternity roosts, as well as loose/raised tree bark. These bat species occur in higher densities in mature deciduous and/or mixed forests due to increased opportunities for large snags. As there are no mature forests on Site, it is unlikely that suitable maternity roost habitat is present. However, there is suitable day-roost habitat on Site in the few, larger trees present along the edges of the Study Area (Arcadis 2025a; **Figure 7**).

***As such, it has been determined that there is suitable habitat for bats within the Study Area. For this reason, these species are being carried forward to evaluation.***

#### 5.4.1.2 Butternut

Butternut surveys were completed in 2024 within the Study Area, and 38 individuals were observed within these boundaries, 20 of which are in the Urban Expansion Area Limits (**Figure 7**). All Butternut trees observed varied in size and health condition and were generally located along the mature hedgerows present throughout the Study Area (Arcadis 2025a).

***It has been determined that there are known Butternut trees present within the Study Area. For this reason, this species is being carried forward to evaluation.***

#### 5.4.1.3 Black Ash

Black Ash was searched for in tandem with Butternut searches. The riparian areas, poorly drained upland areas, and hedgerow communities within the Study Area provide suitable conditions for Black Ash. A total of 34 individuals were observed within the Site boundaries. Additionally, four areas totaling 0.06 hectares were identified as Black Ash concentration areas featuring multiple saplings (**Figure 7**).

There were 15 individuals observed within the Urban Expansion Area limits, including nine Black Ash trees with a diameter at breast height (dbh) greater than 8 cm (Arcadis 2025a).

Trees observed on-site varied in quality from healthy to poor and dead. It should be noted that several larger Green Ash and White Ash trees were observed on Site, some of which were in poor condition and/or dead because of emerald ash borer (Arcadis 2025a).

***It has been determined that Black Ash trees, including suitable habitat, are present within the Study Area. For this reason, this species is being carried forward to evaluation.***

## 5.5 Incidental Wildlife

Incidental wildlife species and general wildlife observations were documented during field surveys and included: Eastern Chipmunk, Eastern Grey Squirrel, Red Squirrel, Northern Leopard Frog, Wood Frog, White-tailed Deer, American Woodcock, Chestnut-sided Warbler, Eastern Wood-pewee, Wood Thrush, and Eastern Tiger Swallowtail Butterfly.

Most species observed are common in Ontario and the City of Ottawa and appeared as residents of the Study Area, except for the Eastern Wood-pewee and Wood Thrush, both of which are listed as Special Concern by the province and were not observed breeding within the Site boundaries.

Refer to **Appendix E** for a list of all species observations within the Site.

# 6 Evaluation of Significance of Existing Natural Heritage Features

In conjunction with findings of the background review, field survey data was evaluated for significance with respect to the provincially designated significant natural heritage features, and the potential for negative impacts, which may occur as a result of the Project. The provincially designated significant natural heritage features listed under the *Provincial Planning Statement, 2024,* identified as candidate features based on background review or confirmed present based on field investigations are brought forward for evaluation, as per the applicable municipal, provincial and/or federal guidelines for that feature. The features identified within the Study Area are as follows:

- Significant Wetlands (in this Ecoregion 7E);
- Significant Woodlands;
- Areas of Natural and Scientific Interest (ANSIs).;
- Significant Wildlife Habitat (SWH);
- Habitat of Endangered and Threatened Species; and
- Fish Habitat

## 6.1 Wetlands

NHIC mapping indicated that there are no wetlands within the Study Area; however, during the ELC assessments completed on-site, it was observed that there are four small wetland inclusions present (i.e., SWDM2, SWDM4-5, SWT, and SWTM3-6). All four of these ecosites are <0.5 ha in size and have been described to the community level in **Table 12** above.

Majority of the Leitrim PSW is situated approximately 50 m west of the Site, and the PSW boundary is approximately 500 m from the western edge of the UAE limits (refer to **Figure 3**). As this feature is outside of the UEA boundary where development is proposed, it was not assessed under this Project.

***It has been determined through field surveys that there are four <0.5 ha wetland inclusions within the Site, despite mapping resources suggesting otherwise. Additionally, the Leitrim PSW is situated approximately 50 m west of the Site boundary, and the associated SNC Regulated Area is situated approximately 20 m west of the Site. As such, wetlands are being brought forward to evaluation.***

## 6.2 Significant Woodlands

The one woodland in the eastern extent of the Site was evaluated for significance using both desktop (e.g., geoOttawa) and field components, in relation to the guidelines for 'peri-urban woodlots', as outlined in the City's SWG (2022) document.

Peri-urban woodlands are described in the City's SWG as being woodlands located within areas that have been identified for urban expansion demonstrated in the City's OP Schedule C17 – Urban Expansion Areas. Woodlands within the peri-urban boundary are considered significant if they are a minimum of 60 years old and 0.8 ha or larger in area. Within larger woodlands, only portions that can be identified as older than 60 years old through aerial imagery interpretation count towards this 0.8 ha size threshold.

Based on review of historic imagery, a portion of the woodland on Site is >60 years old, however does not meet the size requirement (>0.8 ha) as it was only 0.5 ha dating back to 1974.

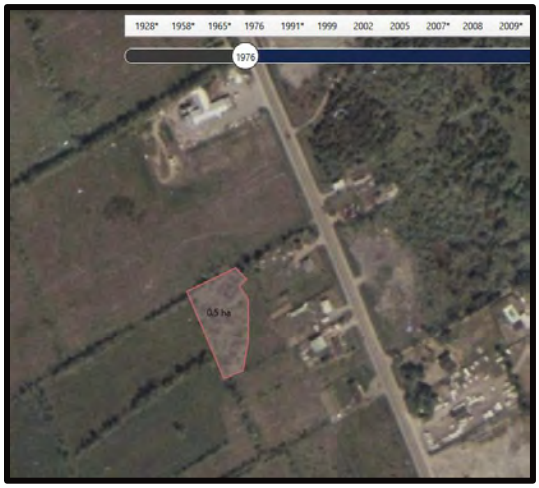



*Photo of Aerial Image of Woodland in 1976 (0.5 ha)*

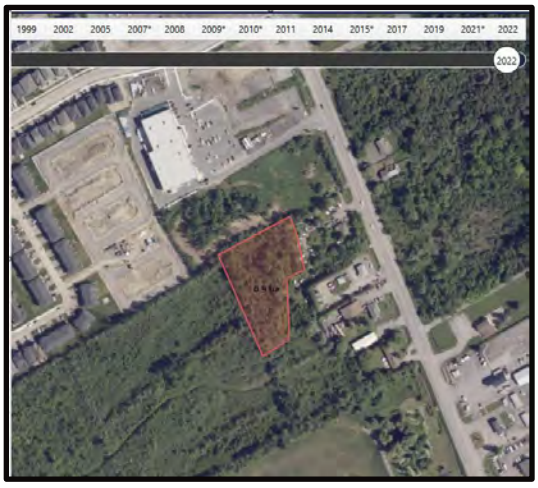



*Photo of Aerial Image of Woodland in 2022 (0.9 ha)*

Based on the evaluation of peri-urban criteria, this ***Woodland is not considered significant*****,** as the entire 0.9 ha of the present-day woodland is not older than 60 years, and the portion that is >60 years does not meet the size requirement (i.e., 0.8 ha) for significance. ***Significant Woodlands are not being brought forward to evaluation.***

## 6.3 Significant Areas of Natural and Scientific Interest

No ANSIs are present within the Site; however, the extents of the Leitrim PSW / ANSI are approximately 50 m west of the Site boundary, and approximately 500 m from the western edge of the UAE limits (refer to **Figure 3)**.

As this feature is not within the Site or UEA limits where development is proposed, a full assessment was not completed as part of this EIS. However, due to the proximity of this feature to the Site, ***the Leitrim ANSI is being carried forward to evaluation.***

## 6.4 Significant Wildlife Habitat

The ELC communities within the Study Area were compared to the *Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E* (MNR 2015) and those that were deemed candidate SWH are discussed below.

The full SWH assessment can be found in **Appendix F.**

**Habitat for Species of Conservation Concern**

Eastern Wood-pewee and Wood Thrush were observed incidentally within the Study Area. As such, Special Concern species are confirmed within the Study Area.

***Based on the results of the field surveys completed in 2024, Significant Wildlife Habitat is present within the Study Area because of the observations of Special Concern bird species and is being brought forward to evaluation.***

## 6.5 Habitat of Endangered and Threatened Species

Two SAR were confirmed present within the Site; Butternut and Black Ash, and suitable habitat is present for SAR Bats within the Study Area. Refer to **Section 5.4** for a full description of results from the 2024 targeted surveys in search of SAR.

## 6.6 Fish Habitat

Direct fish habitat occurs just north of the northwestern property line, represented by the Conveyance Channel (S4-A). HDFs S4-B and S4-C do not contain direct fish habitat due to the Rock Weir that presents a topographical barrier at the Site boundary (i.e., intersection of S4-A / Conveyance Channel, S4-B, and S4-F / Scratch Ditch) that impedes fish migration (**Figure 5**). These upstream reaches represent indirect fish habitat as they contribute flows downstream to direct fish habitat (i.e., Conveyance Channel, Leitrim PSW).

Importantly, no fish habitat occurs within the Urban Expansion Area limits of the Site where development is proposed as the surface water / drainage features in this area (i.e., S4-D and S4-E within northeastern corner of Site) was not observed to contain fishes and are not connected to any upstream / downstream features.

## 6.7 Summary of Natural Heritage Features

Following the background review and site investigations, the following have been confirmed *absent* from the Site:

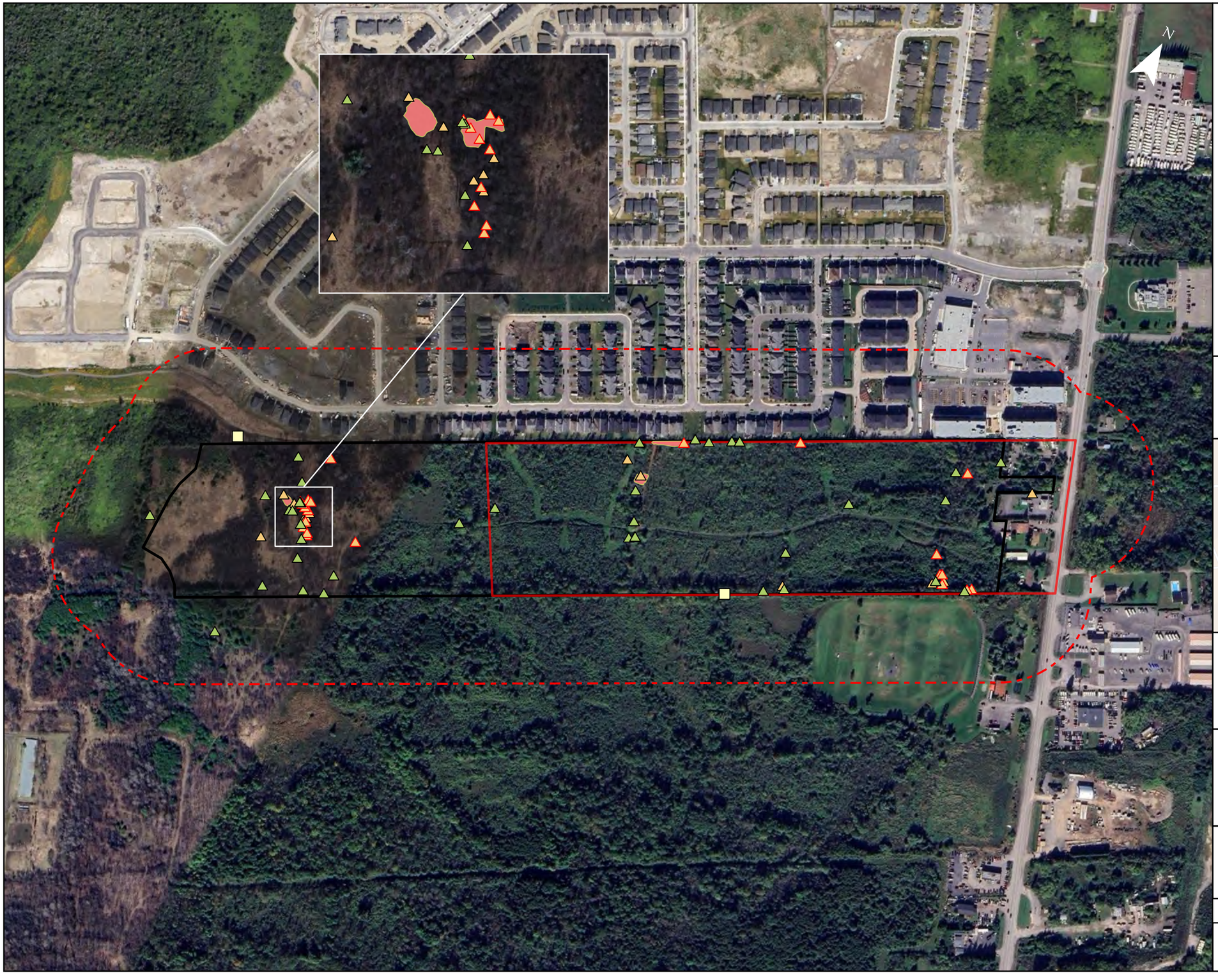
- Significant Woodlands; and
- Significant Valleylands.

Furthermore, the vegetation communities and landscape within the Site have been *confirmed* to provide the following:

- Provincially Significant Wetlands;
- Areas of Natural and Scientific Interest;
- Significant Wildlife Habitat;
- Endangered or threatened species and their habitat; and
- Fish Habitat.

Although the majority of the Leitrim PSW / ANSI is situated approximately 50 m west of the Site boundary (approximately 500 m from the western edge of the UAE Limits; **Figure 3**), its presence within 120 m of the Study Area requires this feature to be brought forward to evaluation.

**Figure 7** below displays the notable results of the field surveys, and **Table 15** provides a summary of the work completed for this study and the existing conditions for the proposed Leitrim West Urban Expansion - S4 Area.




## Legend

- Site
- Study Area (120m)
- Urban Expansion Area Limits (CoO, 2025)

### SAR Species

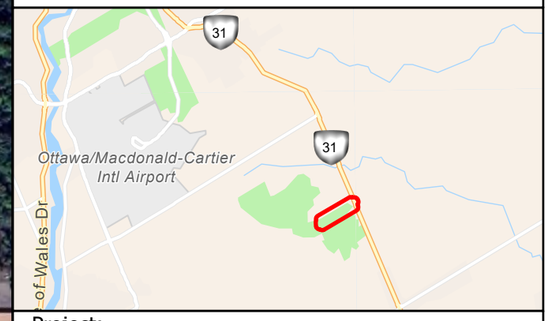
- Black Ash (<8cm DBH)
- Black Ash (>8cm DBH)
- Butternut
- Black Ash Concentration Area (<8cm DBH)

### Other Observations

- Candidate Bat Cavity Tree

0 40 80 160 240 320 Meters

Scale: 1:5,000




Project:

**Leitrim West Future Neighborhood Urban Expansion Area - S4**

Title:

Field Survey Results

Prepared By:

ARCADIS Design & Consultancy for natural and built assets

Project: 145172

Date: 7/18/2025

**Figure: 7**

*Table 15: Evaluation of Significance and Summary of Presence of Natural Heritage Features as per the Provincial Planning Statement*

| Designated Natural Heritage Feature | Criteria for Significance | Field Surveys Completed | Existing Conditions | Feature Confirmed Present within Study Area? | Regulatory Agency |
|---|---|---|---|---|---|
| **Significant Wetlands** | Wetlands are evaluated through the *Ontario Wetland Evaluation System* (OWES) (MNR 2022). | • ELC<br>• Wetland Delineation | **Provincially Significant Wetland (PSW) – Leitrim Wetland**<br>• The Leitrim PSW comes within 50 m of the western extent of the property, with the SNC Regulated Area extending approximately 20 m away from the Subject Site.<br>• Results of the 2024 wetland verification surveys confirmed four wetland inclusions within the Site boundaries. | **Yes** | • SNC |
| **Significant Woodlands** | Woodlands were assessed using the City's *Significant Woodlands Guidelines* (SWG) for Peri-urban woodlands (City of Ottawa 2022). | • ELC | **Coniferous Forest / Deciduous Swamp**<br>• A portion of the woodland on Site is >60 years old, however does not meet the size requirement (>0.8 ha) as it was only 0.5 ha dating back to 1974. | **No** | • City of Ottawa |
| **Significant Valleylands** | Valleylands are evaluated through the *Natural Heritage Reference Manual* (MNR 2010). | – | No significant valleylands occur within the Study Area. | **No** | – |
| **Significant Areas of Natural and Scientific Interest** | As identified by MNR's NHIC (MNR 2025) and available on Geospatial Ontario (GEO; formerly, Land Information Ontario) mapping. | – | **Areas of Natural and Scientific Interest (ANSIs) – Leitrim ANSI**<br>• The Leitrim ANSI comes within 50 m of the western extent of the property, with the SNC Regulated Area situated approximately 20 away from the Subject Site. | **Yes** | • City of Ottawa<br>• MNR |
| **Significant Wildlife Habitat** | In accordance with the *Ecoregion 6E Criterion Schedule* (MNR 2015) for the four categories of SWH. | • Amphibian Breeding Surveys<br>• Breeding Bird Surveys<br>• Incidental Wildlife Observations<br>• Significant Wildlife Habitat Assessment | **Habitat for Species of Conservation Concern (Not including Endangered or Threatened Species)**<br>• Two Species of Conservation Concern observed on Site (i.e., Eastern Wood-Pewee, and Wood Thrush) | **Yes** | • City of Ottawa |

| Designated Natural Heritage Feature | Criteria for Significance | Field Surveys Completed | Existing Conditions | Feature Confirmed Present within Study Area? | Regulatory Agency |
|---|---|---|---|---|---|
| **Habitat of Endangered and Threatened Species** | Habitat, as approved by MNR or DFO (in the case of fish SAR habitat), that is necessary for the maintenance, survival, and/or recovery of naturally occurring or reintroduced populations of Endangered or Threatened species, and where those areas of occurrence are occupied or habitually occupied by the species during all or any part(s) of its life cycle (MNR 2010) and DFO SAR Mapping. | • Breeding Bird Surveys<br>• SAR Plant Searches<br>• Incidental Wildlife Observations | **Butternut**<br>• 38 Butternut were observed within Study Area; 20 of which are in the Urban Expansion Area limits.<br>**Black Ash**<br>• 34 Black Ash were observed within Study Area; 15 are within the Urban Expansion Area limits.<br>**Bats**<br>• SAR habitat is represented by candidate bat SAR roosting trees. | **Yes** | • MECP |
| **Fish Habitat** | As defined by the *Fisheries Act* (see **Section 3.3.4**. | • HDF Assessments | **Conveyance Channel (S4-A / Feature-1)**<br>• Confirmed direct fish habitat within Study Area due to suitable habitat and observations of fishes (Golder 2016).<br>• Suitable fish habitat present downstream (Leitrim PSW, Findlay Creek), but the rock weir at upstream end impedes access to suitable habitat further upstream (e.g., S4-B, S4-C, S4-F / Scratch Ditch).<br>**HDF S4-B and S4-C**<br>• Upstream of S4-A and Rock Weir.<br>• No fishes were observed during surveys.<br>• Suitable habitat is present upstream and downstream of the Study Area.<br>• This feature provides indirect fish habitat (contributing flows downstream to direct fish habitat, i.e., S4-A, Leitrim PSW).<br>**Scratch Ditch (S4-F / Feature-2)**<br>• Upstream of S4-A and Rock Weir.<br>• No fishes were observed during surveys.<br>• Suitable habitat present downstream of the Study Area (Leitrim PSW, Findlay Creek).<br>• This feature provides indirect fish habitat (contributing flows downstream to direct fish habitat, i.e., Leitrim PSW). | **Yes** | • DFO |

# 7 Description of Development Proposal

Edge at Pathways Regional Inc is proposing the low-rise residential development of the Leitrim West Urban Expansion Area – S4 lands located at 4850 Bank Street (Concession 4, Part Lot 22) within the City of Ottawa, Ontario, Canada. The residential subdivision will consist of three hundred and four (304) dwelling units including seventy-seven (77) detached lots, thirty (30) street townhouse blocks, and one (1) multi-unit residential development block as shown on the draft Concept Plan provided by Novatech (dated October 15, 2025; **Figure 8**).

## 7.1 Construction Activities

The Subject Site is currently proposed to be developed mainly for purposes of a new residential subdivision, including asphalt-paved local roads, driveways, a park, and stormwater management pond (SWMP) within the Urban Expansion Area (UEA) lands at the eastern end of the Site.

Based on the most recent draft Concept Plan provided by Novatech (dated October 15, 2025; **Figure 8**), development of this property may include the following major Project components:

- Surveying and staking out the development.
- Clearing of vegetation / trees, excavation, and grading to accommodate construction.
- Installation of stormwater drainage network and related infrastructure (i.e., SWMP).
- Excavation to accommodate underground utilities including water, sewer, gas, and hydro.
- Construction of a new, low-rise residential subdivision (approximately 13.6 ha within UEA), including single houses, 2-storey townhouses, and multi-residential block; and
- Landscaping and fencing.

***Environmental Management Plan* (Golder 2016)**

The Golder (2016) EMP proposes the following site level, or source control, best management practices (BMPs):

- On individual lots:
  - Flat lot grading.
  - Split lot drainage.
  - Pre-installation of roof leader splash pads.
- Across the development:
  - Vegetative planting.
  - Installation of low permeability clay barriers in the servicing trenches to assist in maintaining the existing groundwater levels.

Additionally, the EMP proposes the following conveyance control BMPs:

- Flat vegetated swales.
- Pervious rear yard drainage.
- Catch basin sumps.

## 7.2 Water Distribution, Wastewater Collection, and Stormwater Management

### Water Distribution

The proximity of existing water distribution infrastructure provides an efficient servicing method for the Subject Lands with minimal impact on surrounding properties. Corridors have been included in the Concept Plan (**Figure 8**) to ensure connectivity with existing development lands.

Arcadis' Serviceability Report (2025) identifies the ideal locations for future watermain connections to existing city infrastructure. The Subject Site is proposed to be serviced through a connection to Bank Street to the east and Kelly Farm Drive to the north. These locations are both feasible and pose the least impact on surrounding developments. With respect to the existing infrastructure at the proposed connection locations, there is sufficient capacity in the current water distribution system to withstand demands from the proposed development once the City's SUC pressure zone upgrades are completed.

### Wastewater Collection

Existing municipal wastewater collection sewers have been constructed in adjacent development lands. Arcadis has demonstrated sufficient residual capacity in the existing system to support the UEA. Corridors have been included in the concept plan to ensure connectivity with existing development lands.

Arcadis' Serviceability Report (2025) identifies wastewater connections to Paakanaak Avenue and Labrador Crescent through an extension along Bank Street. These locations are both feasible and have minimal impact on the natural environment and surrounding developments.

### Stormwater Management

As part of the existing Pathways development to the north, a constructed channel (i.e., Conveyance Channel / downstream portions of the Scratch Ditch) and associated drainage swale (i.e., Scratch Ditch) were designed to collect and convey surface runoff from undeveloped areas south of the Pathways development limits (i.e., the Subject Site), directing it to the Leitrim Wetland Buffer. The existing drainage swale / Scratch Ditch (S4-F) was constructed parallel to the conventional rear-yard drainage swale within the rear yards of properties bordering the Subject Site to the north. A portion of the Scratch Ditch outlets to the constructed Conveyance Channel at the confluence with HDF S4-B.

The recommended stormwater management solution implements two outlets that similarly correspond with existing conditions. The western outlet will require a newly constructed linear dry pond facility to provide quality and quantity control and a dedicated Oil and Grit Separator to meet an enhanced level of quality control. It will outlet to the existing Conveyance Channel, adjacent to the Pathways Phase 3 community, and into the Leitrim Wetland Area. The eastern outlet will require an on-site dry pond facility to control major storm events, and a minor system extension along Bank Street to Dun Skipper, utilizing existing allocated capacity in the system. The existing Findlay Creek Stormwater Management Facility provides quality control for the eastern outlet, while the dry pond will be designed for quantity control.

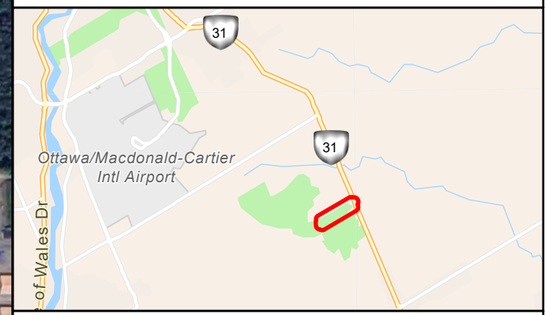
Refer to Arcadis' Serviceability Report (2025) for detailed information on the documentation of existing municipal infrastructure and an analysis of alternative servicing options for the Leitrim West Urban Expansion Area – S4 Lands.

## Legend

- Site
- Study Area (120m)
- Urban Expansion Area Limits (CoO, 2025)
- Concept Plan (Oct, 2025)
- West SWMP (Oct, 2025)
- Leitrim PSW and ANSI (GEO / photo interpretation 2025)
- SNC Regulation Limit (30 m)

0 40 80 160 240 320 Meters

Scale: 1:4,886




Project:

**Leitrim West Future Neighborhood Urban Expansion Area - S4**

Title:

# Concept Plan

Prepared By:

ARCADIS Design & Consultancy for natural and built assets

Project: 30258325

Date: 10/17/2025

**Figure: 8**

# 8 Impact Assessment and Mitigation

The following sections describe the anticipated environmental impacts associated with the proposed development and the mitigation measures that should be implemented.

This impact assessment and associated mitigation measures consider both temporary (i.e., construction-related) impacts and permanent impacts associated with the occupation of the development.

## 8.1 Aquatic Environment

Due to proximity of aquatic features to the Site, Project activities associated with the construction of the proposed low-rise residential development have the potential to impact these features if appropriate measures are not taken to avoid and mitigate against impacts.

The management recommendations for the Conveyance Channel (i.e., S4-A) from the Golder (2016) EMP is as follows:

1) Maintain and improve the surface water conveyance function of surface drainage from rural lands off-Site to the south by providing more permanent flow, and

2) Provide habitat for wildlife, including amphibians, which will be at least comparable to existing conditions.

The Conveyance Channel was designed to maintain the hydrologic function of the Leitrim PSW by conveying flows from the south (including S4-B) around the Pathways Subdivision, and to provide amphibian habitat. These functions need to be preserved as part the master planning process. As such, the following recommendations are proposed to protect the surface water features within the Subject Site.

### 8.1.1 Watercourses / Drainage Features

As drainage features are identified to occur within the UEA limits of the Site, these features are expected to be removed / substantially impacted to accommodate the proposed residential development. According to the most recent draft Site Plan, a 0.5 ha SWMP is proposed to be constructed at the northeastern end of where these features currently rest. Impacts associated with Project activities are expected to include:

— The permanent loss of drainage features (HDFs S4-D and S4-E) and associated aquatic habitat.

— Changes to drainage on the property; and

— Habitat loss, displacement, and/or injury / death for wildlife that were residing in the features or relying on them for life processes.

It is anticipated that with the implementation of the following mitigation measures no direct impacts to the drainage features identified within the western portion of the Site (i.e., HDFs S4-B and S4-C) will occur.

**Proposed Mitigation Measures – Planning and Design Stage**

✓ Any in-water works in surface water features on-Site should be undertaken outside of the in-water works timing restriction period for warmwater fish habitats (i.e., April 15 to June 30; Golder 2016).
✓ A Fish and Wildlife Salvage should be conducted for these features within 48 hours of Project activities.

- ✓ Grading and drainage shall be designed to ensure proper management of drainage off the site during construction activities.
- ✓ Consistent with the EMP (Golder 2016), a 15 m setback was recommended for the Conveyance Channel (S4-A) which should also be applied to S4-B, and S4-C.
- ✓ Stormwater management solutions should meet the criteria outlined in the Golder (2016) EMP with respect to water quality and quantity flowing into the Leitrim PSW.
- ✓ A permit will be required from SNC for the removal of HDFs S4-D and S4-E, as well as alteration to the Conveyance Channel / S4-A to accommodate the proposed stormwater solutions in the western extents of the Site.

**Proposed Mitigation Measures – Construction Implementation**

- ✓ Orange snow fencing or other suitable fencing should be used to delineate the construction limits from the drainage features.
    - o This will prevent encroachment of construction activities into the features. 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.
- ✓ A site-specific erosion and sediment control plan should be implemented to prevent on-site erosion and sedimentation / siltation outside of work areas.
- ✓ The Rock Weir barrier observed at the intersection of S4-A (Conveyance Channel), S4-B, and S4-F (Scratch Ditch) should be removed to improve drainage and conveyance of flows downstream and should be incorporated into the stormwater management design (i.e., associated with western SWM outlet).

**With the successful implementation of the mitigation measures outlined above, the two drainage features (i.e., S4-D and S4-E) within the northeastern corner of the Site are expected to be infilled / removed with minimal impacts to surrounding natural features.**

### 8.1.2 Groundwater and Hydrologic / Hydrogeologic

It is anticipated that the stormwater management system to the west will be designed to maintain hydration to the adjacent natural features (i.e., Leitrim PSW) thereby mitigating any potential impacts resulting from the water balance deficit. A stormwater management pond (SWMP) is proposed in the northeastern corner associated with stormwater management to the east of the Site (Paterson Group 2025).

No adverse effects from short-term or long-term dewatering are expected for surrounding structures or neighbouring properties. The short-term dewatering during the excavation program will be managed by the excavation contractor (Paterson Group 2025).

For more details on the potential constraints that groundwater may have on the Study Area and how these impacts can best be mitigated, please see the updated *Geotechnical and Hydrogeological Investigation* provided by Paterson Group (2025).

**Proposed Mitigation Measures – Planning and Design Stage**

- ✓ The Golder (2016) EMP provided for the development of the lands immediately north identified that excavations for basement construction and installation of some Site services could encounter problematic groundwater inflows as they extend below the groundwater level. From a geotechnical perspective, Golder (2016)

recommended to limit the depth of excavation for basement construction to no more than approximately 1 m below the existing ground surface.

- ✓ Golder (2016) recommended that grading should ideally avoid or limit the amount of bedrock excavation. If blasting is required, it should be planned to limit the peak particle velocities at adjacent structures or services such that blast induced damage will be avoided.
- ✓ It is recommended that Low Impact Design alternatives include elements that would contribute to or enhance the natural heritage system.
- ✓ Under the current regulations enacted by MECP, any dewatering in excess of 50,000 L/day requires a registration on the Environmental Activity and Sector Registry (EASR), so long as that dewatering is related to construction. In the event that an EASR is required to facilitate dewatering of the proposed development, a minimum of three to four weeks should be allotted for completion of the EASR registration and the *Water Taking and Discharge Plan*, to be prepared by a Qualified Person as stipulated under *O.Reg. 63/16*. Should a Permit to Take Water be required, a minimum of five to six months should be allotted for completion of the permit, due to the minimum review period imposed by the MECP (Paterson Group 2025).
- ✓ Precautions must be taken if winter construction is considered for this project as the subsoil conditions at this site consist of frost-susceptible materials. In the event of construction during below-zero temperatures, the base of the excavations should be insulated from sub-zero temperatures immediately upon exposure and until such time as heat is adequately supplied to the building and the footings are protected with sufficient soil cover to prevent freezing at founding level (Paterson Group 2025).
    - o Trench excavations and pavement construction are also difficult activities to complete during freezing conditions without introducing frost into the subgrade or in the excavation walls and bottoms. Precautions should be taken if such activities are to be carried out during freezing conditions (Paterson Group 2025).
- ✓ Based on the boreholes completed within the vicinity of the proposed SWMP within the northeastern corner of the property, it is anticipated that the proposed structure will be founded within the glacial till. Given the glacial till anticipated on the bottom and lower sides of the SWMP, a liner is recommended. The pond liner may consist of one of the following:
    - o A 500 mm thick layer of workable, brown silty clay which is compacted with several passes of a sheepsfoot roller, and placed directly over the glacial till, or a
    - o 150 mm thick layer of 19 mm clear crushed stone placed over the glacial till subgrade, followed by a scrim-reinforced geosynthetic clay liner (such as the Bentofix Thermal Lock SRNWL Series Geosynthetic Clay Liner, or approved equivalent) which is capped with a 300 mm thick layer of OPSS Granular A material (Paterson Group 2025).

**Proposed Mitigation Measures – Post-Construction**

- ✓ All excess soils must be handled as per *O. Reg. 406/19: On-Site and Excess Soil Management* (Paterson Group 2025).

### 8.1.3 Fishes and Fish Habitat

No direct fish habitat was identified to occur within the UEA limits where development is proposed; therefore, no impacts to fish habitat are anticipated within the UEA limits. Indirect fish habitat occurs within the western portion of the Site, particularly associated with HDFs S4-B and S4-C as they contribute flows to direct fish habitat present downstream. HDF S4-A (i.e., Conveyance Channel) contains direct fish habitat due to the confirmed presence of

fishes; however, a Rock Weir at the Site boundary (i.e., intersection of S4-A, S4-B, and S4-F) impedes upstream fish migration.

Impacts associated with Project activities are expected to include:

— Sedimentation or siltation into downstream fish habitat (e.g., Leitrim PSW / ANSI) from the Site.

— Permanent alteration to, or destruction of, fish habitat (e.g., Conveyance Channel).

**Proposed Mitigation Measures – Planning and Design Stage**

✓ DFO Request for Review submission to determine if the Project will result in serious harm to fishes or fish habitat.
✓ A Fish and Wildlife Salvage should be conducted for these features within 48 hours of Project activities.

**Proposed Mitigation Measures – Construction Implementation**

✓ Orange snow fencing or other suitable fencing should be used to delineate the construction limits (e.g., Urban Expansion Area) from adjacent lands / areas (e.g., property outside Urban Expansion Area)
    o This will prevent encroachment of construction activities into the non-developable / more naturalized areas. 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.
✓ A site-specific erosion and sediment control plan should be implemented to prevent on-site erosion and sedimentation / siltation outside of work areas, particularly toward downstream fish habitat present to the west (e.g., Leitrim PSW / ANSI).
✓ Any in-water works in the surface water features on-Site (i.e., S4-A / Conveyance Channel) should be undertaken outside of the in-water works timing restriction period for warmwater fish habitats (April 15 to June 30).
✓ The Rock Weir barrier observed at the intersection of S4-A (Conveyance Channel) and S4-B should be removed to aid contributing flows to the Leitrim PSW, and to allow / increase the migration of fishes into upstream reaches. This should be incorporated into the stormwater management design.

**With the successful implementation of the mitigation measures outlined above, minimal impacts to fishes and fish habitat are anticipated.**

# 8.2 Terrestrial Environment

To accommodate construction, the removal of vegetation communities consisting of buckthorn / deciduous shrub thicket, meadow, and coniferous hedgerows and thickets are anticipated, with minor removal of deciduous swamp habitat.

## 8.2.1 Wetlands

Four small wetland inclusions (i.e., <0.5 ha) were delineated during the ELC assessments within the Study Area, only one of which is located within the UEA Limits (i.e., Poplar Mineral Deciduous Swamp - SWDM4-5). It is anticipated that the three wetland inclusions within the western Site limits will not be impacted by this Project as they are outside of the UEA Limits.

### Poplar Mineral Deciduous Swamp (Inclusion)

The Poplar Mineral Deciduous Swamp inclusion will likely be cleared and graded to accommodate the proposed development of the Site. The removal of this feature may reduce its ability to retain and release surface water at a controlled rate. The natural heritage constraints associated with the removal of the wetland inclusion from the UEA Limits has been evaluated based on the presence of native vegetation vs. invasive / non-native vegetation, as well as the value of habitat provided by the community. The following paragraph details the ecological constraints associated with this small wetland inclusion:

This 0.12 ha Poplar Mineral Deciduous Swamp (SWDM4-5) inclusion is situated within a low-lying depression and accumulates standing water during the spring melt. Water likely accumulates within this feature due to the presence of clay substrate. Field studies resulted in minimal activity from breeding amphibians (American toad Call Code:1, Spring Peeper Call Code:1), suggesting that this community provides little ecological value. The understory of this feature is relatively sparce but does contain dense patches of invasive glossy buckthorn which emphasises the non-significance of this feature. In general, this area should not pose a constraint to the proposed development of the UEA Limits as it is impacted by invasive species (i.e., glossy buckthorn) and provides little natural heritage value other than to retain surface water during spring melt.

### Leitrim Provincially Significant Wetland (PSW)

The Leitrim PSW occurs approximately 50 m from the western property boundary, with SNC Regulated Area approximately 20 m away from the western property line. It is anticipated that this feature will not be directly impacted by this Project as it is approximately 500 m from the western edge of the UAE Limits. However, as recommended in the Golder EMP (2016), proposed stormwater solutions have been designed to outlet into S4-A / Conveyance Channel. These stormwater management solutions have been designed to maintain hydration to the adjacent PSW, in-turn, the Conveyance Channel will continue to maintain and improve the surface water conveyance function of surface drainage from the S4 lands by providing more permanent flows to the wetland.

To accommodate the construction of the proposed development, the Subject Site will be cleared as necessary, and the property will be graded. The impacts associated with this clearing and grading will include:

— The permanent loss of the small 0.12 ha Poplar Mineral Deciduous Swamp (SWDM4-5) wetland Inclusion.

— Changes in natural drainage patterns; and

— Potential for on-site erosion and deposition of sediment into adjacent watercourses and wetlands.

### Proposed Mitigation Measures – Planning and Design Stage

- ✓ Stormwater management solutions should meet the criteria outlined in the Golder (2016) EMP with respect to water quality and quantity flowing into the Leitrim PSW.
- ✓ Based on previous studies by Beacon (2007; 2012) and the EMP (Golder 2016), a 50 m no-touch buffer adjoining the Casino Wetland is to be maintained, with an additional 50 m limited-use zone. The limited-use zone will be occupied by the naturalized constructed Conveyance Channel, as well as a naturalized pedestrian trail, effectively increasing the wetland buffer to 100 m following construction. No other activities will be proposed in this limited-use zone.
    - o The pedestrian trail is to be located between the Conveyance Channel and the development area. A 15 m setback is to be maintained between the top of channel bank and the trail or the top of channel bank and the area of development (Golder 2016).

- A 15 m setback was also recommended between the rear lot lines and the eastern bank of the Conveyance Channel (Golder 2016).

✓ Consistent with the EMP (Golder 2016), a 15 m setback was recommended for the Conveyance Channel (S4-A) which should also be applied to S4-B, and S4-C, and associated Ash Mineral Deciduous Swamp (SWDM2).

**Proposed Mitigation Measures – Construction Implementation**

✓ Impacts to natural vegetation should be minimized to the extent possible, particularly within the Leitrim PSW buffer (i.e., 50 m no-touch and 50 m limited-use).

✓ Orange snow fencing or other suitable fencing should be used to delineate the construction limits from the Leitrim PSW area, as well as other wetland inclusion features within the Site boundaries.

- This will prevent encroachment of construction activities into the PSW to the west. 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.

✓ A site-specific erosion and sediment control plan should be implemented to prevent on-site erosion and sedimentation / siltation outside of work areas.

**Proposed Mitigation Measures – Post-Construction**

✓ The Golder (2016) EMP recommends that a groundwater monitoring program be devised for portions of wetland (e.g., Casino Wetland) adjacent to the Site that have the potential to be affected by temporary groundwater pumping from service trenches that extend into the upper bedrock zone.

**With the successful implementation of the mitigation measures outlined above, impacts to wetlands are expected to be limited to the removal of the small (0.12 ha) unevaluated wetland inclusion. It is anticipated that the proposed stormwater solutions will maintain and/or improve the surface water conveyance function of surface drainage from the S4 lands by providing more permanent flow to the adjacent Leitrim PSW via the Scratch Ditch and Conveyance Channel.**

### 8.2.2 Woodlands

Consistent with the observations in Golder's EMP (2016), the on-Site portions of woodlands do not represent any unique or significant features that are not well-represented elsewhere in the surrounding region. Therefore, it is also Arcadis' opinion that removal of the on-Site portions of woodlands will not affect the form or over-all function of the larger off-Site portions of the woodlands in the area.

To accommodate the construction of the proposed development, the Subject Site will be cleared as necessary, and the property will be graded. The impacts associated with this clearing will include:

— The permanent loss of or disturbance to vegetation / trees.

— Permanent loss of approximately 2.1 ha of the Forest communities.

— Increased heat retention due to replacement of vegetated areas with infrastructure; and

— Potential for accidental damage or loss of trees.

Based on the information it is unlikely that a significant opportunity for tree retention exists on-Site. As such, the following recommendations are proposed which largely focus on tree plantings as part of a future Landscape Plan to be implemented post-development.

**Proposed Mitigation Measures – Planning and Design Stage**

- ✓ Landscaping plans shall incorporate native vegetation and plantings in accordance with the City's *Urban Forest Management Plan* to increase the abundance of native vegetation species on the site and to offset any loss of species from vegetation removals.
- ✓ Replanting of trees on site to offset the loss of trees due to the development (or compensation plantings off site, if appropriate) should be considered at the Detail Design phase.

**Proposed Mitigation Measures – Construction Implementation**

- ✓ To protect the critical root zone of the outer trees of the new forest edge, no grading or other Site disturbances should occur within a distance of ten times the tree diameters or approximately three to four metres (Golder 2016).
- ✓ Orange snow fencing or other suitable fencing should be used to delineate the construction limits (e.g., Urban Expansion Area) from adjacent lands / areas (e.g., property outside Urban Expansion Area).
    - o This will prevent encroachment of construction activities into non-developable / more naturalized areas. 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.

**Proposed Mitigation Measures – Post-Construction**

- ✓ Native trees should be incorporated into the landscape plantings.

**With the successful implementation of the mitigation measures outlined above, an approximate 2.1 ha decrease in woodlands on-site is anticipated due to the proposed development.**

### 8.2.3 Vegetation Communities

To accommodate the construction of the proposed development, the Subject Site will be further cleared as necessary, and the property will be graded.

The approximate area of vegetation communities proposed for removal are shown below in **Table 16.**

*Table 16: Vegetation Communities Impacted*

| ELC Type | Total Area Proposed for Removal (ha) |
|---|---|
| **FOCM4-1 –** Fresh-Moist White Cedar Coniferous Forest | **0.4** |
| **FOCM5 –** Naturalized Coniferous Hedge-row | **0.8** |
| **FOCM11 –** Naturalized Deciduous Hedge-row | **0.8** |
| **MEMM4 –** Fresh-Moist Mixed Meadow | **0.5** |
| **SWDM4-5 –** Poplar Mineral Deciduous Swamp | **0.1** |
| **THCM2-1 –** Fresh-Moist White Cedar Coniferous Thicket | **0.7** |
| **THDM2-6 –** Buckthorn Deciduous Shrub Thicket | **8.6** |
| **CL** – Cleared Land | **1.3** |

The impacts associated with this clearing are expected to include the following:

— The permanent loss of or disturbance to vegetation / trees.

— Increased heat retention due to replacement of vegetated areas with infrastructure.

— Potential for spread of invasive species.

— Potential for accidental damage or loss of trees.

— Changes in natural drainage.

— Decreased biodiversity and decreased abundance of species; and

— Potential for on-site erosion and deposition of sediment into adjacent vegetation communities.

**Proposed Mitigation Measures – Planning and Design Stage**

- ✓ Landscaping plans shall incorporate native vegetation and plantings to increase the abundance of native vegetation species on the site and to offset any loss of species from vegetation removals.
- ✓ Replanting of trees on site to offset the loss of trees due to the development (or compensation plantings off site, if appropriate) should be considered at the Detail Design phase.

**Proposed Mitigation Measures – Construction Implementation**

- ✓ Orange snow fencing or other suitable fencing should be used to delineate the construction limits from adjacent areas.
    - o This will prevent encroachment of construction activities into adjacent natural areas. 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.
- ✓ A site-specific erosion and sediment control plan should be implemented to prevent on-site erosion and sedimentation / siltation outside of work areas.
- ✓ Invasive species to be removed shall be done so using species-appropriate methods (following best management practices outlined on the Ontario Invasive Plant Council [OIPC 2024] website) to prevent further contamination.
- ✓ Machinery will arrive on site in a clean condition and will be free of fluid leaks, invasive species, and noxious weeds.
- ✓ The Golder (2016) EMP provides the following general mitigation measures for trees or areas of vegetation identified for retention:
    - o Determine an appropriate buffer for protection;
    - o Erect a fence at the critical root zone (CRZ) of trees;
    - o Do not place any material or equipment within the CRZ of the tree;
    - o Do not attach any signs, notices or posters to any tree;
    - o Do not raise or lower the existing grade within the CRZ without approval;
    - o Tunnel or bore when digging within the CRZ of a tree; and,
    - o Do not damage the root system, trunk or branches of any tree.

**Proposed Mitigation Measures – Post-Construction**

- ✓ All waste construction material shall be removed from the Subject Site and impacted areas shall be reinstated in accordance with the proposed landscape plans upon Project completion.

**With the successful implementation of the mitigation measures outlined above, a decrease in native terrestrial vegetation is anticipated due to the proposed development.**

### 8.2.4 Significant Wildlife Habitat

Impacts associated with the proposed development have the potential to impact Species of Conservation Concern, if present on-site. The following potential impacts to SWH may include:

- The permanent loss / damage of or disturbance to vegetation / trees and associated loss of nesting and foraging habitat.
- Erosion or sedimentation / siltation into adjacent lands.
- Potential physical harm to wildlife (e.g., bird) nests and/or dens during clearing and construction activities.
- 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 and vibrations associated with construction activities, particularly during breeding periods.
- Conflict between wildlife and humans following development, including mortality from vehicles, particularly as the proposed development is urban in nature; and
- The increased potential for fatal bird collisions associated with building windows following construction.

**Proposed Mitigation Measures – Planning and Design Stage**

- ✓ Building and community design should consider the City of Ottawa's *Bird-Safe Design Guidelines* where practical (City of Ottawa, 2022a).

**Proposed Mitigation Measures – Construction Implementation**

- ✓ Orange snow fencing or other suitable fencing should be used to delineate the construction limits from adjacent naturalized areas.
    - This will prevent encroachment of construction activities into adjacent areas / habitats. 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.
- ✓ A site-specific erosion and sediment control plan should be implemented to prevent on-site erosion and sedimentation / siltation outside of work areas.
- ✓ 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, a nest search should be conducted by a qualified person 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 until the nest is no longer active, in accordance with the federal MBCA.
- ✓ Mitigation measures outlined in the *Protocol for Wildlife Protection during Construction* (City of Ottawa 2022c) should be considered prior to construction of the proposed development.

**Proposed Mitigation Measures – Post-Construction**

- ✓ Native plants should be used in landscaping in order to provide hostplants and foraging for Species of Conservation Concern birds.

**With the successful implementation of the mitigation measures outlined above, impacts to Significant Wildlife Habitat (i.e., Species of Conservation Concern) are not anticipated.**

### 8.2.5 Wildlife and Wildlife Habitat

The loss of wildlife and/or wildlife habitat (such as nesting or foraging habitat) is expected to be limited to wildlife common to the area. However, the following direct and indirect impacts on wildlife (including breeding birds, amphibians, bats, and other mammals) are a possible result of the proposed development:

- The permanent loss of nesting and foraging habitat will likely result from any vegetation clearing within the property;
- Potential physical harm to wildlife (e.g., bird) nests and/or dens during clearing and construction activities;
- 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 and vibrations associated with construction activities, particularly during breeding periods;
- Conflict between wildlife and humans following development, including mortality from vehicles, particularly as the proposed development is a residential subdivision; and
- The increased potential for fatal bird collisions associated with building / house windows following construction.

**Proposed Mitigation Measures – Planning and Design Stage**

- ✓ Building and community design should consider the City of Ottawa's *Bird-Safe Design Guidelines* where practical (City of Ottawa, 2022a).
- ✓ Vegetation planting should consider bird breeding, wildlife shelter, and foraging habitat within the Subject Site.
- ✓ Where possible, retain large mature trees (including cavity trees) to maintain available roosting habitat. At the Detail Design stage, consideration should also be given to the retention of standing dead wildlife trees if they have been assessed as safe.
- ✓ Tree planting and landscape design trees should consider bat roosting opportunities upon reaching maturity, specifically surrounding aquatic features (Oak, Maple, Hickory, etc.).
- ✓ At the Detail Design stage, consideration for the installation of bat boxes (i.e., constructed roosting habitat), is recommended to offset habitat loss. Boxes should be in association with parkland or within the edges of stormwater management facility blocks, meeting the design criteria provided by *Bat Conservation International* (BCI 2025).
- ✓ Natural habitats should be maintained to the extent possible, and naturalized habitats should be included whenever appropriate and permissible (Golder 2016).

**Proposed Mitigation Measures – Construction Implementation**

- ✓ Impacts to natural vegetation should be minimized to the extent possible, particularly within the Casino Wetland buffer (i.e., 50 m no-touch and 50 m limited-use; Golder 2016).
- ✓ Clearing of trees / snags that have potential to provide bat roosting habitat should be avoided during the active bat season, i.e., April through October, inclusive.
- ✓ Clearing of vegetation should be avoided during the breeding bird season, i.e., between April 15 and August 15.
    - o Should any clearing be required during the breeding bird season, a nest search should be conducted by a qualified person 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 until the nest is no longer active, in accordance with the federal MBCA.
- ✓ Idling of construction machinery should be limited to reduce disturbance to resident wildlife.
- ✓ Should wildlife enter the work area, activities in that area shall cease and the wildlife shall be allowed to vacate the site under its own power.
- ✓ A qualified wildlife rehabilitation centre should be contacted if any wildlife is injured or found injured during construction. Injured wildlife should be transported to a qualified facility for care with a small donation of money to help pay for their care.

**Proposed Mitigation Measures – Post-Construction**

- ✓ The proposed 50 m no-touch buffer and additional 50 m limited-use buffer recommended for the Casino Wetland in the EMP will also serve as a linkage between the Casino Wetland and Leitrim Core Wetland. Golder (2016) indicated that this linkage feature can be expanded and/or enhanced through the design of future developments in the surrounding landscape (e.g., current S4 development).

**With the successful implementation of the recommended mitigation, a site-wide decrease of wildlife habitat is expected due to the proposed development.**

### 8.2.6 Species at Risk

According to background resources and Arcadis' field investigations, eight SAR (provincially Endangered or Threatened) have been reported in the area of the Subject Site and have a moderate to high potential of occurrence: Black Ash, Butternut, Eastern Red Bat, Hoary Bat, Little Brown Myotis, Northern Myotis, Tri-coloured Bat, and Silver-haired Bat. Black Ash and Butternut have been confirmed present on-site.

**Butternut and Black Ash**

The potential to impact SAR plants is associated with activities that affect the ability of the plant to continue to grow and replicate in an area. For this project, that would be limited to areas that are associated with the clearing of vegetation and/or excavation of soil, in the laydown areas and access roads. Indirect impacts can result from items such as changes to drainage, compression of soil, accumulation of dust on the leaves, or inadvertently affecting the individuals roots or above ground structures in the area where vegetation is to be retained.

General searches of the Study Area were completed to determine SAR plant presence; 20 Butternut and 15 Black Ash were identified within the Urban Expansion Area Limits. In the province, all sizes of healthy Butternut are protected and require assessment. The protection for Black Ash is limited to individuals within a defined geographic area which are both in good health and over 8 cm in diameter at breast height. The individual and the surrounded 30m habitat is protected.

### SAR Bats

The mature trees located within the hedgerows likely provide suitable day roosting bat habitat. It's generally understood that within the Ottawa area, this roosting habitat is not a limiting factor contributing to the decline of SAR bats.

The following is a list of potential impacts to SAR from the proposed development activities:

— Removal / destruction to Black Ash and Butternut individuals that are confirmed present on the property and proposed for removal;

— Accidental harm or injury to SAR Bats if present on-site during construction activities;

— Permanent removal of suitable SAR Bat foraging habitat, if present on site, due to construction activities;

— An opportunity for the encroachment and spread of non-native species.

The following mitigation measures have been proposed for Black Ash and Butternut:

### Proposed Mitigation Measures – Planning and Design Stage

✓ Species-specific surveys in search of Black Ash will need to be conducted prior to vegetation clearing, and proper health assessments as per provincial guidelines will be required.

✓ The shelf-life of Butternut surveys is 2 years; as such, species-specific surveys will need to be completed prior to construction to identify all Butternut trees within 50 m of the Site.

✓ A butternut health assessment following the province's *Butternut Assessment Guidelines: Assessment of Butternut Tree Health for the Purposes of the Endangered Species Act, 2007*, (MECP, 2021) will be required prior to development.

✓ Consultation with MECP will be required to inform results of SAR Plant surveys and to determine compensation requirements, if necessary.

### Proposed Mitigation Measures – Construction Implementation

✓ Do not place any material or equipment within tree protection fencing.

✓ Do not attach any signs, notices, or posters to a SAR.

✓ Project activities should avoid damage to the root system, trunk / stem, and branches / leaves of any SAR to be preserved.

✓ Exhaust fumes from all heavy machinery, vehicles, generators, and other equipment shall not be directed towards any SAR for prolonged periods of time.

### Proposed Mitigation Measures – Post-Construction

✓ Post-construction tree maintenance methods should be used to repair any damage caused to SAR plants / trees by construction activities. These may include but are 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 SAR plants / 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.

The following mitigation measures have been proposed for SAR Bats:

**Proposed Mitigation Measures – Planning and Design Stage**

- ✓ Tree planting and landscape design should include tree species that will provide suitable roosting habitat upon reaching maturity specifically surrounding aquatic features (Oak, Maple, Hickory, etc.).
- ✓ Where possible, retain large mature trees (including cavity trees) to maintain available roosting habitat, specifically within parkland dedication and/or along the southern hedgerow.
- ✓ At the Detail Design stage, consideration for the installation of bat boxes (i.e., constructed roosting habitat), is recommended to offset habitat loss. Boxes should be in association with parkland or within the edges of stormwater management facility blocks, meeting the design criteria provided by *Bat Conservation International* (BCI 2025).

**Proposed Mitigation Measures – Construction Implementation**

- ✓ Tree removal should be avoided during the general active period for bats (i.e., March 15 to November 30, inclusive).
    - o If this is not possible, conduct exit survey prior to cutting them down. If the exit survey identifies bats, contact MECP or biologist for additional guidance.

**With the successful implementation of the mitigation measures outlined above, it is anticipated that there will be a site-wide decrease in nesting and foraging habitat for SAR, including the removal of multiple Black Ash and Butternut trees.**

## 8.3 Indirect Impacts

Indirect impacts from the proposed development may include an increase in air and light pollution into areas immediately adjacent to the development. A decrease in forest habitat and increase in forest edge area which may allow more light and wind penetration into the forest. There may also be an increase of invasive species spread into the property from development / construction and future residential community.

## 8.4 Cumulative Impacts

The proposed development is within the City of 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, business, and core natural areas, with most of the impacts to the larger natural heritage system occurring prior to at least 2019 (Google 2025). The Subject Site itself had previously been used for agricultural land-use.

Based on field assessments and available information, the removal of the natural heritage features within the Site will have a negligible negative impact on the existing 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;

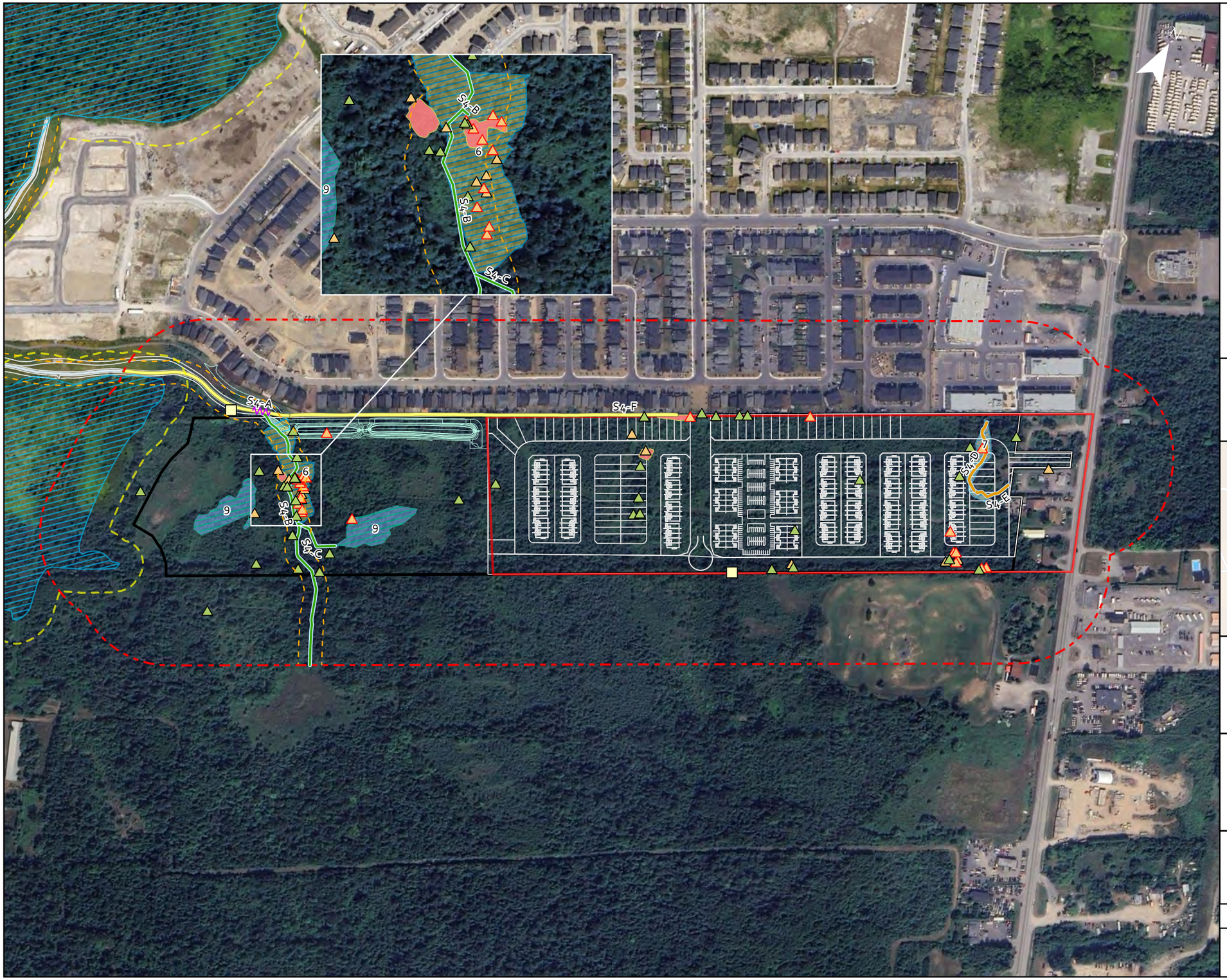
— Loss of urban tree canopy cover; and

— Increase in impervious surfaces increasing runoff potential.

## Proposed Mitigation Measures – Planning and Design Stage

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

- ✓ Landscaping plans should intend to compensate for the removal of trees and vegetation;
- ✓ Landscaping plans should include tree plantings to replace canopy cover in accordance with City Official Plan policies and associated guidelines; and
- ✓ Project design should promote the use of permeable landscaping materials and rain capture systems like rain gardens and permeable pavers.




## Legend

- Site
- Study Area (120m)
- Urban Expansion Area Limits (CoO, 2025)
- Concept Plan, Novatech (October, 2025)
- West SWMP (Oct, 2025)
- Rock Weir

**Existing Wetlands**

- 6 - Ash Mineral Deciduous Swamp (SWDM2)
- 7 - Poplar Mineral Deciduous Swamp (SWDM4-5)
- 9 - Mixed Willow Mineral Deciduous Thicket Swamp (SWTM3-6)
- Leitrim PSW and ANSI (GEO / photo interpretation 2025)
- SNC Regulation Limit (30 m)

**Headwater Drainage Feature Management Recommendations**

- Protection
- Mitigation
- No Management Required
- HDF Protection Buffer (15m)

**SAR Species**

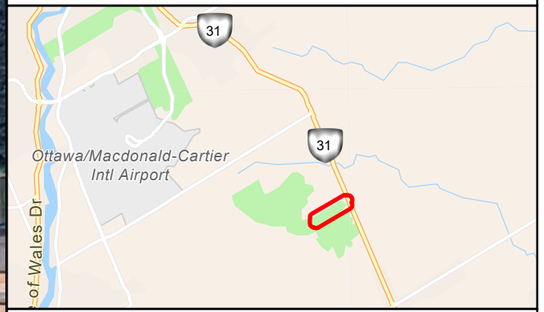
- Black Ash (<8cm DBH)
- Black Ash (>8cm DBH)
- Butternut
- Black Ash Concentration Area (<8cm DBH)

**Other Observations**

- Candidate Bat Cavity Tree

0 40 80 160 240 320 Meters

Scale: 1:4,886




Project:

**Leitrim West Future Neighborhood Urban Expansion Area - S4**

Title:

Natural Heritage Opportunities and Constraints

Prepared By:

ARCADIS Design & Consultancy for natural and built assets

Project: 30258325

Date: 10/17/2025

**Figure: 9**

# 9 Summary and Conclusion

Arcadis was retained by the Client, Edge at Pathways Regional Inc. ,to complete this updated *Environmental Impact Study* (EIS) to provide an analysis of the potential impacts to the natural heritage features that may result from the proposed development of the Leitrim West Urban Expansion - S4 Area, located at 4850 Bank Street (Concession 4, Part Lot 22), in the City of Ottawa, Ontario.

The lands north of the Study Area are currently fully developed residential lands (i.e., Pathways South at Findlay Creek Development), with the Leitrim Provincially Significant Wetland and Area of Natural and Scientific Interest situated west of the Subject Site, within the surrounding Study Area. Project activities for the proposed residential development would require the clearing and grading of the eastern portion of the Site located within the Urban Expansion Area limits, resulting in the removal of vegetation corresponding with a general loss of natural wildlife habitat.

Two HDFs (i.e., S4-D and S4-E) are located within the eastern extents of the Urban Expansion Area Limits. These features do not represent fish habitat as they are isolated and no longer connect to any upstream or downstream features. These isolated ditches receive a management recommendation of “No Management Required” and should pose no impacts to development of the Site. Consistent with the EMP (Golder 2016), a 15 m setback is recommended for the Conveyance Channel (HDF S4-A) which should also be applied to S4-B, and S4-C, and associated Ash Mineral Deciduous Swamp (SWDM2).

Based on the most recent draft Concept Plan provided by Novatech (dated October 15, 2025; **Figure 8**), a total of five unique vegetation communities are expected to be impacted: Mixed Meadow, Deciduous and Coniferous Thickets, Coniferous Forest, Deciduous Swamp, and Hedgerow communities.

The Leitrim Provincially Significant Wetland and Area of Natural and Scientific Interest is situated approximately 50 m west of the Site boundary, with SNC Regulated Area coming within approximately 20 m of the Site. It is anticipated that this feature will not be directly impacted by this Project as it is located approximately 500 m from the western edge of the Urban Expansion Area limits. Proposed stormwater management solutions have been designed to maintain hydration to the adjacent PSW by directing on-site drainage through HDF S4-A / Conveyance Channel allowing this feature to continue to maintain and improve the surface water conveyance function of surface drainage from the S4 lands by providing more permanent flow to the Leitrim PSW.

There will also be a permanent loss of a small 0.12 ha Poplar Mineral Deciduous Swamp (SWDM4-5) wetland inclusion in the eastern extent of the Urban Expansion Area. The removal of this wetland inclusion should not pose a constraint to the proposed development of the Urban Expansion Area Limits as it is impacted by invasive species (i.e., Glossy Buckthorn) and provides little natural heritage value.

Two Species at Risk were observed within the Urban Expansion Area Limits: Black Ash and Butternut (provincially endangered tree species), as well as the potential occurrence of Species at Risk bat habitat trees (e.g., snags). Health Assessments are to be completed prior to construction and consultation with MECP will be required to inform results of the health assessments and to determine compensation requirements, if necessary.

This EIS provides an evaluation of the anticipated environmental impacts associated with the construction and long-term occupation of the proposed residential development. Mitigation and compensation measures have been recommended (as required) to protect natural heritage features and offset impacts, respectively. The findings in this report are based on desktop screening results, site-specific background documents completed by others (i.e., *Environmental Management Plan* (EMP; Golder 2016)), and the eight Arcadis site visit conducted in 2024.

Overall, despite the development constraints outlined within this document, the Urban Expansion Area Limits has been identified as an excellent location for the proposed residential land development from a natural heritage and geotechnical perspective.

## 9.1 Policy Conformity and Next Steps

Project-specific details and next steps, to help ensure adherence to the applicable policies and legislation:

### *Migratory Birds Convention Act, 1994*

- *Any vegetation removal should occur between April 1 and August 15, to reduce the potential for incidental take of active bird nests.*

### *Fish and Wildlife Conservation Act, 1997*

- *In the case that wildlife is observed within the work area, all work in the area shall stop until the animal has left the area on its own. In the case that wildlife relocation is required, consultation with MNR would be required to obtain the necessary permits and approvals under the FWCA.*

### *Conservation Authorities Act, 1990*

- *A permit will be required from SNC for the removal of HDFs S4-D and S4-E, as well as alteration to the Conveyance Channel / S4-A to accommodate the proposed stormwater solutions in the western extents of the Site.*
- *In the case that impacts are anticipated to the adjacent Leitrim PSW/ANSI, permitting / approval under O. Reg. 41/24 (Prohibited Activities, Exemptions and Permits) will be required due to the presence of South Nation Conservation (SNC) regulated area along the western edge of the Study Area.*

### *Endangered Species Act, 2007*

***Butternut***

- *Species-specific surveys will need to be completed prior to construction to identify all Butternut within 50 m of the Site. A butternut health assessment (BHA) following the province's Butternut Assessment Guidelines: Assessment of Butternut Tree Health for the Purposes of the Endangered Species Act, 2007 (MECP, 2021) will be required prior to development.*
- *Consultation with MECP will be required to inform results of the BHA and to determine compensation requirements, if necessary.*

***Black Ash***

- *Species-specific surveys in search of Black Ash will need to be conducted prior to vegetation clearing, and proper health assessments as per provincial guidelines will be required.*
- *Consultation with MECP will be required to inform results of the health assessments and to determine compensation requirements, if necessary.*

***SAR Bats***

- *Tree removal should be avoided during the general active period for bats (i.e., March 15 to November 30, inclusive).*

### *Tree By-law 2020-340*

- *Tree removals and other prohibitions of By-law 2020-340 is required for the proposed development and will be addressed through the City's Site Plan Application process.*

## 9.2 Standard of Care and Limitations

In 2024, field investigations were carried out using investigation techniques and ecological methods consistent with those ordinarily exercised by Arcadis and other scientific practitioners, working under similar conditions and subject to the time, financial, and physical constraints applicable to these investigations. The field investigation results presented in this report are based on work undertaken by trained professionals and technical staff and the reasonable and professional interpretation using acceptable scientific practices current at the time the work was performed.

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

# 10 References

Arcadis Professional Services (Canada) Inc. (Arcadis). 2025a. Leitrim West Urban Expansion Area – S4, Natural Heritage Existing Conditions Report.

Arcadis Professional Services (Canada) Inc. (Arcadis). 2025b. Tree Conservation Report.

Arcadis Professional Services (Canada) Inc. (Arcadis). 2025c. S4 Leitrim Urban Expansion Area Serviceability Report.

Bat Conservation International Inc. (BCI). 2024. Bat Profiles. Retrieved from https://www.batcon.org/about-bats/bat-profiles/?fwp_location=ontario. Last accessed September 2024.

Bird Studies Canada (BSC), Environment Canada's Canadian Wildlife Service, Ontario Nature, Ontario Field Ornithologists and Ontario Ministry of Natural Resources. 2006. Ontario Breeding Bird Atlas (Atlas 2, 2001-2005). Retrieved from https://www.birdsontario.org/. Last accessed April 2023.

Bird Studies Canada (BSC). 2001. Ontario Breeding Bird Atlas: Guide for Participants. Guelph: University of Guelph. Retrieved from https://www.birdsontario.org/jsp/download/obba_guide_en.pdf. Last accessed April 2023.

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

Cambium. 2024. Pathways at Findlay Creek – Constructed Channel Monitoring (Year 5).

City of Ottawa. 2021. Tree Protection By-law 2020-340. Retrieved from https://ottawa.ca/en/living-ottawa/laws-licences-and-permits/laws/laws-z/tree-protection-law-no-2020-340#. Last accessed September 2024.

City of Ottawa. 2022a. Bird-Safe Guidelines. https://ottawa.ca/en/planning-development-and-construction/community-design/design-and-planning-guidelines/completed-guidelines/bird-safe-design-guidelines#section-dc9cb259-ab3c-434f-b974-6d7b140ab161. Last accessed September 2024.

City of Ottawa. 2022b. City of Ottawa Official Plan. Retrieved from https://ottawa.ca/en/planning-development-and-construction/official-plan-and-master-plans/official-plan. Last accessed September 2024.

City of Ottawa. 2022c. Protocol for Wildlife Protection during Construction. Retrieved from https://documents.ottawa.ca/sites/default/files/documents/construction_en.pdf. Last accessed September 2024.

City of Ottawa. 2022d. Significant Woodlands: Guidelines for Identification, Evaluation, and Impact Assessment. Retrieved from https://documents.ottawa.ca/sites/default/files/significant_woodlands_en.pdf. Last accessed October 2025.

City of Ottawa. 2023. Environmental Impact Study Guidelines. Retrieved from https://documents.ottawa.ca/sites/default/files/eis_guidelines_tor_en.pdf. Last accessed October 2025.

City of Ottawa. 2024. Urban Expansion in Future Neighbourhoods. Retrieved from https://engage.ottawa.ca/urban-expansion-in-future-neighbourhoods. Last accessed September 2024.

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

eBird. 2024. eBird: An online database of bird distribution and abundance. Retrieved from https://ebird.org/hotspots. Last accessed September 2024.

Environment and Climate Change Canada (ECCC). 2022. Open Data. Retrieved from https://open.canada.ca/en/open-data. Last accessed July 2024.

Environment and Climate Change Canada (ECCC). 2023a. Guidelines to Avoid Harm to Migratory Birds. Retrieved from https://www.canada.ca/en/environment-climate-change/services/avoiding-harm-migratory-birds/reduce-risk-migratory-birds.html. Last accessed July 2024.

Environment and Climate Change Canada (ECCC). 2023b. Fact sheet: Nest Protection under the *Migratory Birds Regulations, 2022*. Retrieved from https://www.canada.ca/en/environment-climate-change/services/avoiding-harm-migratory-birds/fact-sheet-nest-protection-under-mbr-2022.html. Last accessed July 2024.

Environment and Climate Change Canada (ECCC). 2023c. Nesting Calendars. Retrieved from https://www.canada.ca/en/environment-climate-change/services/avoiding-harm-migratory-birds/general-nesting-periods/nesting-periods.html#toc1. Last accessed July 2024.

Environment Canada (EC). 2013. How Much Habitat is Enough? Third Edition. Environment Canada, Toronto, Ontario

Fisheries and Oceans Canada (DFO). 2013. Ontario Restricted Activity Timing Windows for the Protection of Fish and Fish Habitat. Retrieved from: https://www.dfo-mpo.gc.ca/pnw-ppe/timing-periodes/on-eng.html. Last accessed July 2024.

Fisheries and Oceans Canada (DFO). 2020. FFHPP Regulatory Review Process Map. Retrieved from https://www.dfo-mpo.gc.ca/pnw-ppe/reviews-revues/docs/process-map-plan-processus-eng.pdf. Last accessed July 2024.

Fisheries and Oceans Canada (DFO). 2022a. Project Near Water. Retrieved from https://www.dfo-mpo.gc.ca/pnw-ppe/index-eng.html. Last accessed July 2024.

Fisheries and Oceans Canada (DFO). 2024. Aquatic Species at Risk Map. Retrieved from https://www.dfo-mpo.gc.ca/species-especes/sara-lep/map-carte/index-eng.html. Last accessed August 2024.

Geospatial Ontario (GEO; formerly, Land Information Ontario (LIO)). 2025. Aquatic Resource Area Polygon Segment. Retrieved from https://arcadis.maps.arcgis.com/home/item.html?id=0558f6ccea08410790a9182e568195c0. Last accessed July 2025.

Golder. 2016. Environmental Management Plan (EMP) for the Remer and Idone Lands.

Google. 2024. Aerial imagery centred around 45°13'55.47"N 75°44'42.28"W. Retrieved from Google Earth Pro software. Last accessed September 2024.

iNaturalist. 2024. iNaturalist Observations. Retrieved from https://www.inaturalist.org/. Last accessed September 2024.

Lee, H. 2008. Southern Ontario Ecological Land Classification Vegetation Type List.

Lee, H., Bakowsky, W., Riley, J., Puddister, M., Uhlig, P., & McMurray, S. 1998. Ecological Land Classification for Southern Ontario: First Approximation and its Application. North Bay, Ontario, Canada: Ontario Ministry of Natural Resources.

Ministry of Natural Resources (MNR). 2000. Significant Wildlife Habitat Technical Guide. Retrieved from https://www.ontario.ca/page/significant-wildlife-habitat-guide. Last accessed July 2024.

Ministry of Natural Resources (MNR). 2010. Natural Heritage Reference Manual for Natural Heritage Policies of the Provincial Policy Statement, 2005. Second Edition. Toronto: Queen's Printer for Ontario. 248 pp.

Ministry of Natural Resources (MNR). 2011. Bats and Bat Habitats: Guidelines for Wind Power Projects. Retrieved from https://www.ontario.ca/page/bats-and-bat-habitats-guidelines-wind-power-projects. Last accessed September 2024.

Ministry of Natural Resources and Forestry (MNRF). 2015. Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E. Ontario MNRF Regional Operations Division: Southern Region Resources Section. Retrieved from https://docs.ontario.ca/documents/4776/schedule-7e-jan-2015-access-vers-final-s.pdf. Last accessed August 2024.

Ministry of Natural Resources and Forestry (MNRF). 2022. Ontario Wetland Evaluation System (OWES). Retrieved from mnrf-pd-rpdpb-ontario-wetlands-evaluation-system-southern-manual-2022-en-2023-02-02.pdf. Last accessed September 2024.

Ministry of Natural Resources and Forestry (MNRF). 2023. Ontario Watershed Information Tool (OWIT). Retrieved from https://www.lioapplications.lrc.gov.on.ca/OWIT/index.html?viewer=OWIT.OWIT&locale=en-CA. Last accessed September 2024.

Ministry of Natural Resources and Forestry (MNRF). 2024. Natural Heritage Information Centre Database. Retrieved from https://www.ontario.ca/page/natural-heritage-information-centre. Last accessed September 2024.

Ministry of the Environment, Conservation and Parks (MECP). 2023a. Policy Guidance on Harm and Harass under the Endangered Species Act. Retrieved from https://www.ontario.ca/page/policy-guidance-harm-and-harass-under-endangered-species-act. Last accessed July 2024.

Novatech. 2025. 4850 Bank Street Planning Rationale and Public Consultation Strategy.

Ontario Geologic Survey (OGS). 2007. Physiography. Retrieved from https://www.hub.geologyontario.mines.gov.on.ca/. Last accessed September 2024.

Ontario Geologic Survey (OGS). 2010. Surficial Geology. Retrieved from https://www.hub.geologyontario.mines.gov.on.ca/. Last accessed September 2024.

Ontario Geologic Survey (OGS). 2011. 1:250 000 Scale Bedrock Geology of Ontario. Retrieved from https://www.hub.geologyontario.mines.gov.on.ca/. Last accessed September 2024.

Ontario Breeding Bird Atlas (OBBA). 2001. Guide for Participants. Atlas Management Board, Federation of Ontario Naturalists, Don Mills. Retrieved from https://www.birdsontario.org/jsp/download/obba_guide_en.pdf. Last accessed August 2024.

Ontario Invasive Plant Council (OIPC). 2024. Best Management Practices. Retrieved from https://www.ontarioinvasiveplants.ca/resources/best-management-practices/. Last accessed May 2024.

Ontario Nature. 2019. Ontario Reptile and Amphibian Atlas. Toronto Entomologists' Association. Retrieved from https://www.ontarioinsects.org/herp/. Last accessed September 2024.

Paterson Group. 2023. PG6912-1 Geotechnical Investigation Proposed Residential Development 4850 Bank Street Ottawa, Ontario.

Paterson Group. 2025. Hydrogeological Study Proposed Residential Development 4850 Bank Street Ottawa, Ontario.

South Nation Conservation (SNC). 2025a. Leitrim Development Area – Area S4 Future Neighbourhood July 25, 2025, Field Notes and Observations.

South Nation Conservation (SNC). 2025b. SNC Public GeoPortal. Retrieved from https://gis.snc.ca/geoportal/. Last accessed September 2024.

Stanfield, L. 2017. Ontario Stream Assessment Protocol (OSAP). Retrieved from https://trcaca.s3.ca-central-1.amazonaws.com/app/uploads/2019/06/05112225/osap-master-version-10-july1-accessibility-compliant_editfootnoteS1M4.pdf. Last accessed September 2024.

Toronto and Region Conservation Authority and Credit Valley Conservation (TRCA and CVC). 2014. Evaluation, Classification and Management of Headwater Drainage Features Guideline. TRCA Approval July 2013 (Finalized January 2014). Retrieved from https://trca.ca/conservation/aquatic-ecosystems/headwater-drainage-features/. Last Accessed March 2024.

Toronto Entomologists' Association (TEA). 2023. Ontario Butterfly Atlas. Retrieved from https://www.ontarioinsects.org/atlas/. Last accessed September 2024.

Urban Forest Associates Inc. 2002. Invasive Exotic Species Ranking for Southern Ontario.

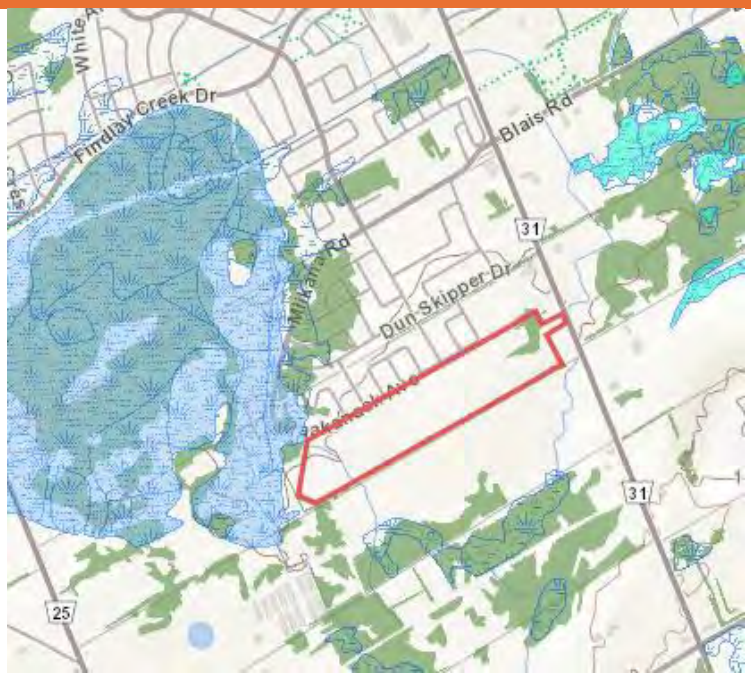
# Appendix A

## Aquatic Background Data

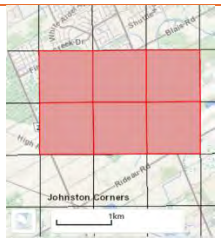
*Table A1: Summary of Aquatic Background Data Collection*

## Aquatic Resources Background Information

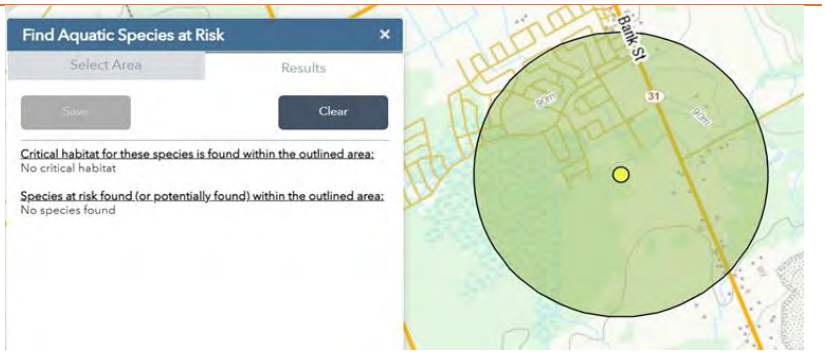
General NHIC map showing PSW west and north of the Site and non-PSW east of Bank St.



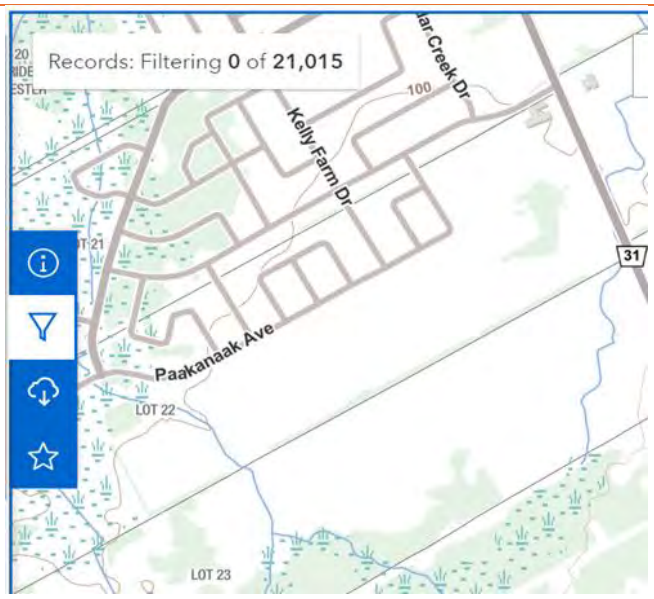

NHIC Species map does not indicate any aquatic species for the highlighted squares: 18VR5417, 18VR5416, 18VR5317, 18VR5316, 18VR5217, 18VR5216

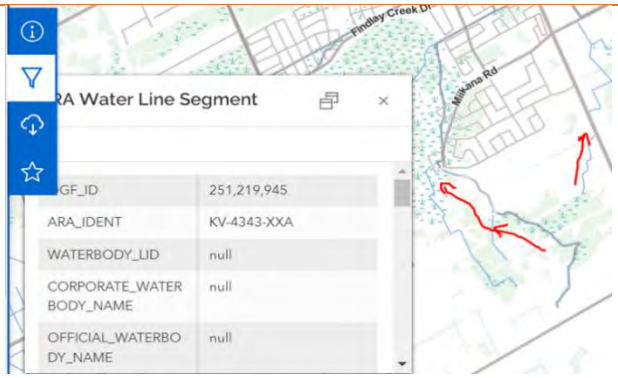
The DFO species at risk map does not indicate species or critical habitat present within the study area.




No fish activity is reported within the study area as indicated through Ontario GeoHub.



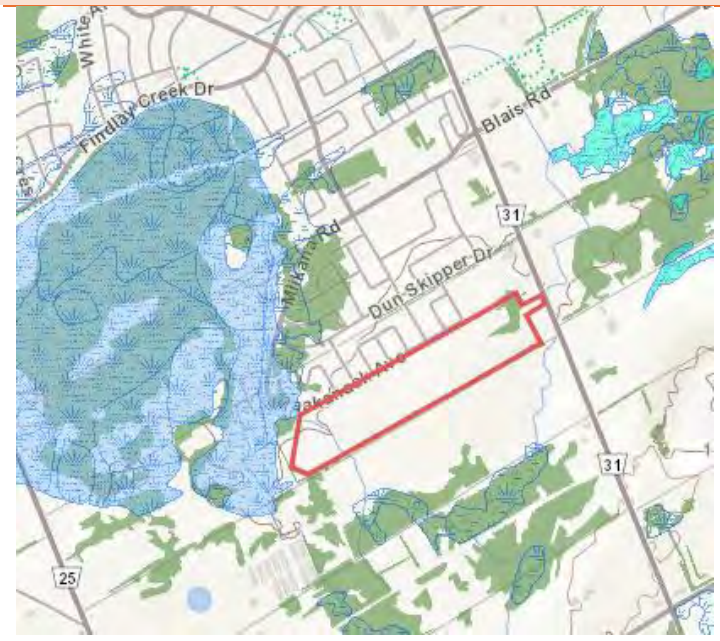
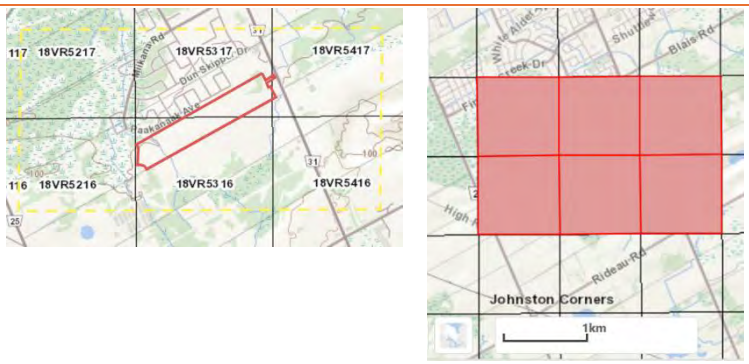

An unnamed tributary passes through the west end of the Site as indicated in Ontario GeoHub Aquatic Resources.



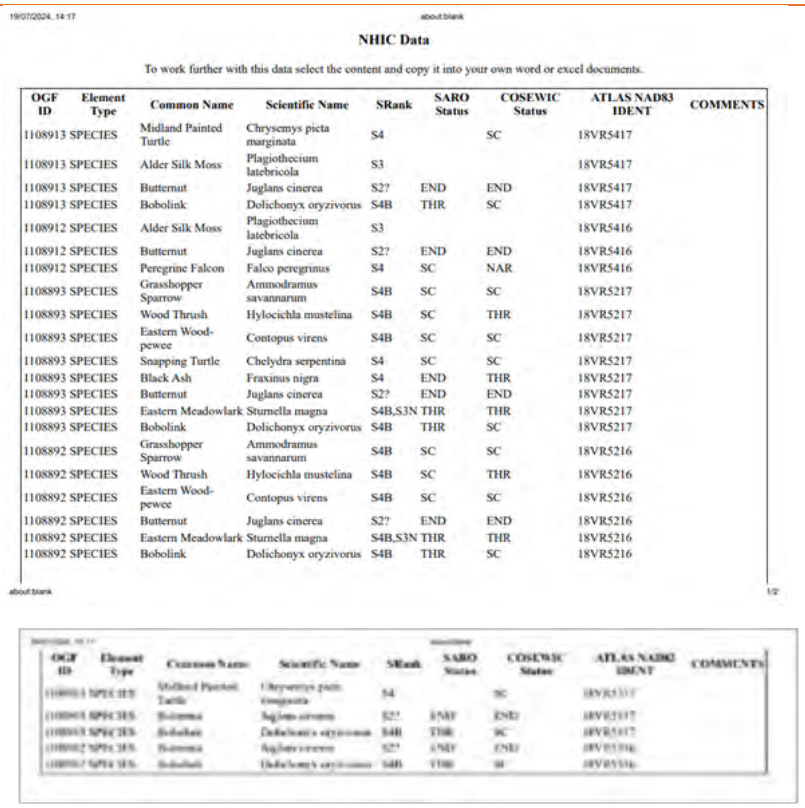
# Appendix B

## Terrestrial Background Data

*Table B1: Summary of Terrestrial Background Data Collection*

| Terrestrial Resources Background Information | |
|---|---|
| Comments | Resource Material |
| General NHIC map showing woodlands associated with the PSW as well as to the east and south of the Site. |  |
| NHIC Species map indicates SAR, including black ash, bobolink, butternut, eastern meadowlark, and wood thrush within the highlighted squares: 18VR4210, 18VR4209, 18VR4310, 18VR4309, 18VR4410, 18VR4409 |  |

NHIC data for the corresponding squares noted above.



19/07/2024, 14:17 about:blank

**NHIC Data**

To work further with this data select the content and copy it into your own word or excel documents.

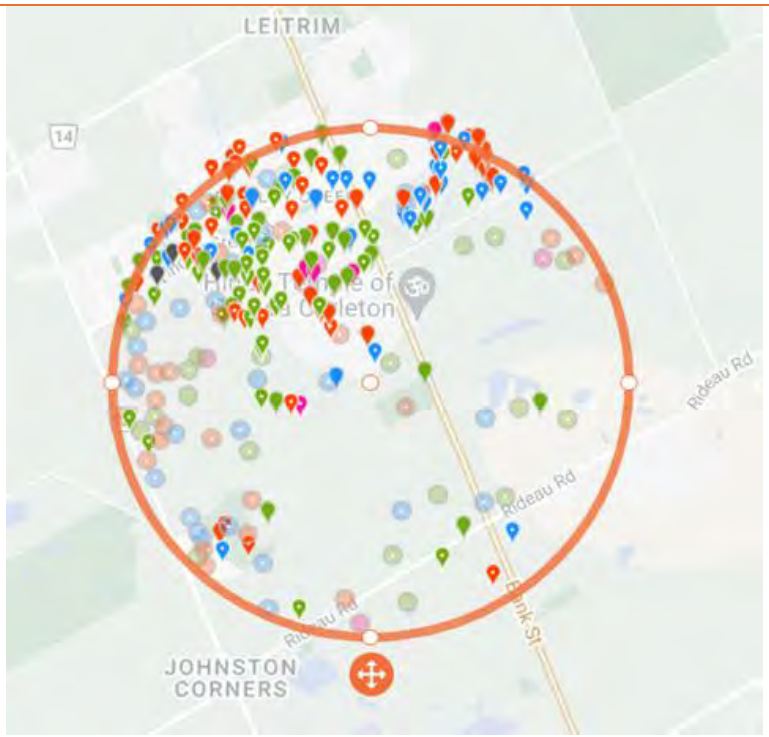
| OGF ID | Element Type | Common Name | Scientific Name | SRank | SARO Status | COSEWIC Status | ATLAS NAD83 IDENT | COMMENTS |
|---|---|---|---|---|---|---|---|---|
| 1108913 | SPECIES | Midland Painted Turtle | Chrysemys picta marginata | S4 | | SC | 18VR5417 | |
| 1108913 | SPECIES | Alder Silk Moss | Plagiothecium latebricola | S3 | | | 18VR5417 | |
| 1108913 | SPECIES | Butternut | Juglans cinerea | S2? | END | END | 18VR5417 | |
| 1108913 | SPECIES | Bobolink | Dolichonyx oryzivorus | S4B | THR | SC | 18VR5417 | |
| 1108912 | SPECIES | Alder Silk Moss | Plagiothecium latebricola | S3 | | | 18VR5416 | |
| 1108912 | SPECIES | Butternut | Juglans cinerea | S2? | END | END | 18VR5416 | |
| 1108912 | SPECIES | Peregrine Falcon | Falco peregrinus | S4 | SC | NAR | 18VR5416 | |
| 1108893 | SPECIES | Grasshopper Sparrow | Ammodramus savannarum | S4B | SC | SC | 18VR5217 | |
| 1108893 | SPECIES | Wood Thrush | Hylocichla mustelina | S4B | SC | THR | 18VR5217 | |
| 1108893 | SPECIES | Eastern Wood-pewee | Contopus virens | S4B | SC | SC | 18VR5217 | |
| 1108893 | SPECIES | Snapping Turtle | Chelydra serpentina | S4 | SC | SC | 18VR5217 | |
| 1108893 | SPECIES | Black Ash | Fraxinus nigra | S4 | END | THR | 18VR5217 | |
| 1108893 | SPECIES | Butternut | Juglans cinerea | S2? | END | END | 18VR5217 | |
| 1108893 | SPECIES | Eastern Meadowlark | Sturnella magna | S4B,S3N | THR | THR | 18VR5217 | |
| 1108893 | SPECIES | Bobolink | Dolichonyx oryzivorus | S4B | THR | SC | 18VR5217 | |
| 1108892 | SPECIES | Grasshopper Sparrow | Ammodramus savannarum | S4B | SC | SC | 18VR5216 | |
| 1108892 | SPECIES | Wood Thrush | Hylocichla mustelina | S4B | SC | THR | 18VR5216 | |
| 1108892 | SPECIES | Eastern Wood-pewee | Contopus virens | S4B | SC | SC | 18VR5216 | |
| 1108892 | SPECIES | Butternut | Juglans cinerea | S2? | END | END | 18VR5216 | |
| 1108892 | SPECIES | Eastern Meadowlark | Sturnella magna | S4B,S3N | THR | THR | 18VR5216 | |
| 1108892 | SPECIES | Bobolink | Dolichonyx oryzivorus | S4B | THR | SC | 18VR5216 | |

about:blank 1/2

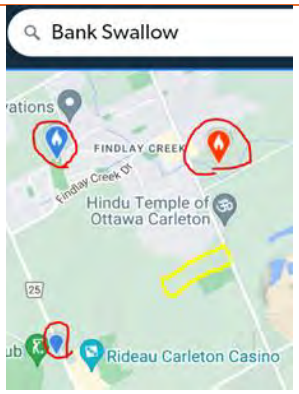


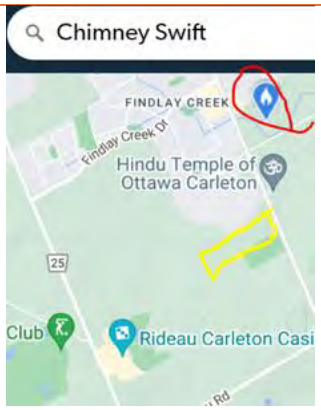
An iNaturalist search for research grade observations with an approximate 2km buffer from the center of the study area shows 1037 species have been observed and identified.

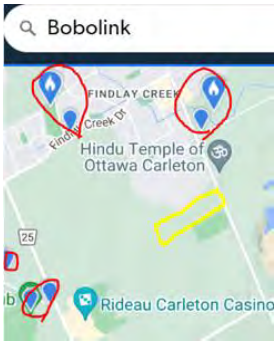
Notable SAR: bobolink, wood thrush, lesser yellowlegs, least bittern, eastern meadowlark, Blanding's turtle

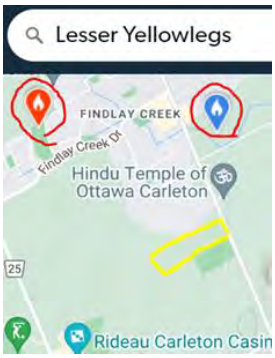


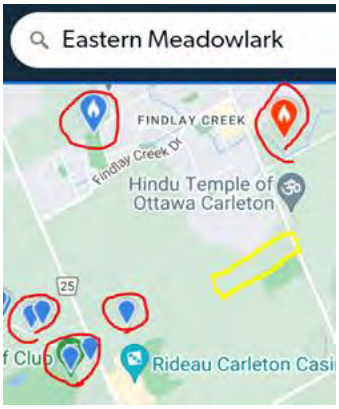
Exploring nearby eBird reports for SAR shows 6 notable species reported: bank swallow, bobolink, chimney swift, eastern meadowlark, lesser yellowlegs, and wood thrush.

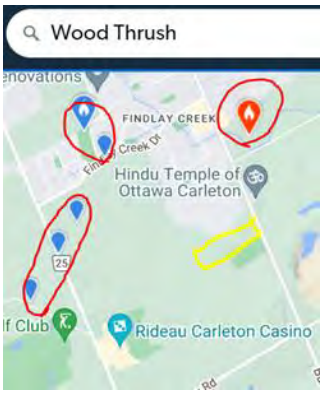


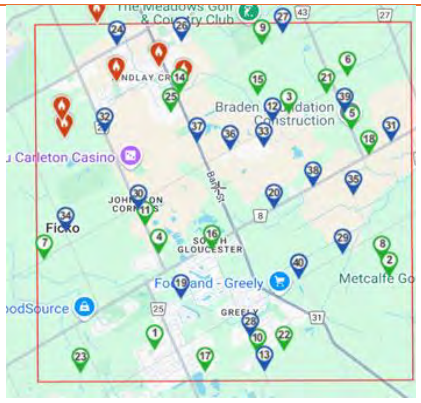



The study area falls within square 18VR51 of the OBBA and has 103 birds listed with breeding evidence

Notable SAR: Bank swallow, wood thrush, bobolink, eastern meadowlark, and wood thrush.

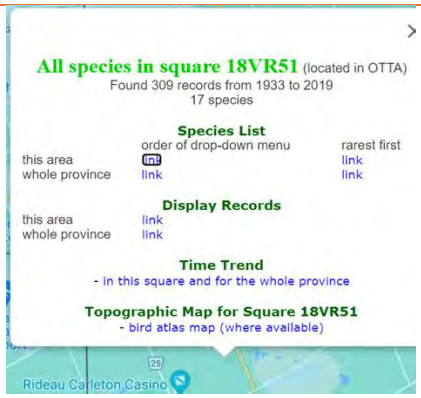



**Square Summary (18TVR51)** [change]

| | #species | | | | #hours | | #pc done | |
|---|---|---|---|---|---|---|---|---|
| | poss | prob | conf | total | total | peak | road | offrd |
| Curr. | 23 | 37 | 43 | 103 | 79.3 | 58.2 | 20 | 6 |
| Prev. | 21 | 17 | 66 | 104 | 66.3 | — | 28 | |

The ORAA showed property in square 18VR51.

Notable SAR: Blanding's turtle




Number of rows of data displayed below: 17.

| Species # | Common Name | # of Records | Earliest Yr | Latest Yr |
|---|---|---|---|---|
| 1 | Blanding's Turtle | 1 | 2018 | 2018 |
| 3 | Midland Painted Turtle | 8 | 1986 | 2018 |
| 6 | Snapping Turtle | 11 | 1997 | 2013 |
| 12 | Eastern Gartersnake | 11 | 1970 | 2018 |
| 20 | Northern Watersnake | 1 | 1970 | 1970 |
| 25 | American Bullfrog | 1 | 1965 | 1965 |
| 28 | Gray Treefrog | 40 | 1981 | 2018 |
| 29 | Green Frog | 51 | 1965 | 2016 |
| 31 | Northern Leopard Frog | 37 | 1982 | 2014 |
| 33 | Spring Peeper | 76 | 1964 | 2015 |
| 35 | Wood Frog | 21 | 1981 | 2015 |
| 36 | American Toad | 45 | 1961 | 2018 |
| 40 | Blue-spotted Salamander | 1 | 2017 | 2017 |
| 44 | Eastern Red-backed Salamander | 1 | 1933 | 1933 |
| 48 | Mudpuppy | 1 | 1982 | 1982 |
| 50 | Northern Two-lined Salamander | 2 | 1965 | 2002 |
| 53 | Spotted Salamander | 1 | 2004 | 2004 |

The OBA showed property in square 18VR51.

Monarch (sp of concern) observed in both squares.

# Appendix C

## Species at Risk Screening

# Legend

**For the following Species at Risk Screening Tables**

Orange highlighted species are protected and/or have protected critical habitat within the Study Area and the species is confirmed present or has a Moderate to High probability of occurrence in the Study Area (i.e., the species is Threated, Endangered under the ESA, and/or the Threatened or Endangered species' critical habitat is present – including ferally listed migratory birds and fish).

Grey highlighted SAR that are confirmed present or have a Moderate to High probability of occurrence in the Study Area but do not receive individual or habitat protection under the *Endangered Species Act, 2007*. These species may be protected in conjunction with significant wildlife habitat.

Only those SAR protected in the Study Area have been included in this table. Fish and molluscs have been excluded from this table as fish habitat is not present in the Study Area. No amphibian SAR occurrences have been reported in the vicinity of the Study Area.

Unhighlighted species are not expected to occur in the Study Area.

* Under consideration for status change

[1] Habitat description is sourced from the OMNR (2000) *Significant Wildlife Habitat Technical Guide* or from the *Species at Risk in Ontario* list provided in *O. Reg. 230/08*, unless otherwise cited.

[2] Conservation Status:

SC = Special Concern; THR = Threatened; END = Endangered*;* NAR = Not at Risk; Extirpated species have been excluded from the table.

Federal SARA = *Species at Risk Act, 2002* Schedule 1 unless otherwise noted. The protection and/or conservation measures afforded by SARA apply only to species listed under Schedule 1.

Federal COSEWIC = In the case that a species is not listed under Schedule 1 of SARA, but has a status recommended by the Committee on the Status of Endangered Wildlife in Canada, the uplisting of the species to Schedule 1 of SARA may be imminent.

Provincial ESA = *Endangered Species Act, 2007*.

Provincial (or Subnational) S-Rank: Subnational ranks are assigned and maintained by state or provincial NatureServe network programs.

S1 – Critically Imperiled; S2 – Imperiled; S3 - Vulnerable; S4 Apparently Secure; S5 - Secure; B - Breeding; N - Non-breeding; ? - Uncertainty,

[3] Sources:

AMO = Atlas of the Mammals of Ontario
iNat = iNaturalist observations
OBA = Ontario Butterfly Atlas
ECCC = Environment and Climate Change Canada Open Data
ORAA = Ontario Reptile and Amphibian Atlas
OBBA = Ontario Breeding Bird Atlas
NHIC = Natural Heritage Information Centre Database.
BCI = Bat Conservation International Inc. 2025. Bat Profiles.
Colville = 2020 Field Survey results as reported by Colville Consulting Inc.'s 2024 *Environmental Impact Statement0 Thompson Road, Town of Fort Erie*

Probability of Occurrence in the Study Area:

- **Confirmed**: Species and/or preferred habitat has been observed in the Study Area (i.e., confirmed by recent field investigations, consultation with MECP, or reliable secondary source).
- **High**: Species has been reported in the vicinity of the Study Area during field investigations by others or within 10 km atlas square. The species' preferred habitat is abundant within the Study Area. Species with a high probability of occurrence would be expected to breed within or frequently use the habitats available within the Study Area and would be known to have a high relative abundance within the region (i.e., compared to other regions in Ontario).
- **Moderate**: Species' preferred habitat is present but limited or uncommon in the Study Area and breeding in the area is rare. Species with Moderate probability of occurrence may intermittently use the area for foraging, migration, or movement to other parts of their home range and therefore may have been documented in secondary sources or field investigations.
- **Low**: Species has been recorded in the vicinity of the Study Area during field investigations by others or within 10 km atlas square. The species' preferred habitat does not occur or is extremely limited within the Study Area. These species may intermittently move through the Study Area but are unlikely to become permanent residents. Reports of this species may be historical records.
- **None**: Preferred habitat of the species is absent from the Study Area. Records of occurrence are expected to be historical or vagrant records (e.g., a species that is currently outside their wintering and breeding area) may exist.

*Table C1: Threatened or Endangered Species with records of occurrence within the S4 Study Area.*

| Common Name | Scientific Name | Habitat Description[1] | Conservation Status[2] | | | | Source of Occurrence Record[3] | Habitat within Study Area? | Rationale for Determination of Habitat Presence |
|---|---|---|---|---|---|---|---|---|---|
| | | | Federal SARA | Federal COSEWIC | Provincial ESA | Provincial S-Rank | | | |
| *Birds* | | | | | | | | | |
| Bank Swallow | *Riparia riparia* | This species nests within vertical banks, with a preference for sand-silt substrate. Nesting sites more likely near open upland habitats. (COSEWIC 2013). Provincially, the species protected habitat is the 50 m in front of a breeding colony's bank face and all suitable foraging habitat within 500 m (MECP, 2015). | THR | THR | THR | S4B | eBird | **No** | Insufficient vertical banks exist on the property, including the stream banks that cut through the west end of property. |
| Bobolink | *Dolichonyx oryzivorus* | Primarily in forage crops, and grassland habitat. It is sensitive to edge effects, size of habitat and areas with dense shrub vegetation or a litter layer deeper than a few centimeters (COSEWIC, 2010). Provincially, this species' protected habitat is the area extending 60 m from the nest as well as the 300 m of suitable habitat around the nest (MECP, 2013). | THR | THR | THR | S4B | NHIC, eBird, OBBA | **No** | No large tracts of grasslands, hayfields, meadows, or fallow fields are present within the Subject Site resulting in poor habitat potential for Bobolink. |
| Chimney Swift | *Chaetura pelagica* | Cities, towns, villages, rural, and wooded areas. This species rarely utilizes trees; they prefer trees greater than 50 cm in diameter and that are within 1 km of waterbodies (COSEWIC 2007). Provincially, this species' protected habitat consists of Category 1 habitat, which is a human-made nesting/roosting feature or natural nesting/roosting tree cavity, as well as the area within 90 m of the **natural** tree cavity (MECP, 2017). No Category 2 or 3 habitats are outlined for this species (MECP, 2017). | THR | THR | THR | S3B | eBird | **No** | Property does not contain wooded areas with large trees to serve as a nest sites, and there are no large waterbodies within 1 km. |

| Common Name | Scientific Name | Habitat Description[1] | Conservation Status[2] | | | | Source of Occurrence Record[3] | Habitat within Study Area? | Rationale for Determination of Habitat Presence |
|---|---|---|---|---|---|---|---|---|---|
| | | | Federal SARA | Federal COSEWIC | Provincial ESA | Provincial S-Rank | | | |
| Eastern Meadowlark | *Sturnella magna* | Open fields and pastures, meadows, prairies. Breeds in natural grasslands, meadows, weedy pastures, also in hayfields and sometimes in fields of other crops. Winters in many kinds of natural and cultivated fields. In the Midwest, it tends to prefer taller and lusher grass than Western Meadowlark, but in the Southwest, it lives in very arid desert grasslands. | THR | THR | THR | S4B, S3N | NHIC, eBird, OBBA | **No** | No large tracts of grasslands, hayfields, meadows, or fallow fields are present within the Subject Site resulting in poor habitat potential for Eastern Meadowlark. |
| Lesser Yellowlegs | *Tringa flavipes* | Marshes, mudflats, shores, ponds; in summer, open boreal woods. Occurs widely in migration, including coastal estuaries, salt and fresh marshes, edges of lakes and ponds, typically more common on freshwater habitats. Often in same places as Greater Yellowlegs but may be less frequent on tidal flats. Breeds in large clearings, such as burned areas, near ponds in northern forest. | - | THR | THR | S3S4B, S5M | EBird, iNaturalist | **No** | Breeds in northern boreal forests. May be on site during migration if large mudflats, puddles exist, but only temporarily. |
| *Herpetozoa* | | | | | | | | | |
| Blanding's Turtle | *Emydoidea blandingii* | Shallow water marshes, bogs, ponds or swamps, or coves in larger lakes with soft, muddy bottoms and aquatic vegetation; basks on logs, stumps, or banks; surrounding natural habitat is important in summer as they frequently move from aquatic habitat to terrestrial habitats. | THR | THR | THR | S3 | iNaturalist, ORAA | No | The study site does not contain sufficient marshes, bogs, ponds, or swamps for Blanding's to inhabit. |
| *Mammals* | | | | | | | | | |
| Little Brown Myotis | *Myotis lucifugus* | Females establish summer maternity colonies, often in buildings or large-diameter trees. Foraging occurs over water, along waterways, and forest edges. Overwinter in cold and humid hibernacula (caves/mines) (COSEWIC 2013). | END | END | END | S3 | AMO | **Yes** | Study Area contains deciduous woodlands that could provide cavities and loose bark suitable for roosting. |
| Northern Myotis | *Myotis septentrionalis* | Older (late successional or primary forests) with large interior habitat and snags that are in the mid-stage of decay. They prefer intact interior habitat and are sensitive to edge habitats | END | END | END | S3 | AMO | **Yes** | Study Area contains deciduous woodlands that could provide |

| Common Name | Scientific Name | Habitat Description[1] | Conservation Status[2] | | | | Source of Occurrence Record[3] | Habitat within Study Area? | Rationale for Determination of Habitat Presence |
|---|---|---|---|---|---|---|---|---|---|
| | | | Federal SARA | Federal COSEWIC | Provincial ESA | Provincial S-Rank | | | |
| | | (Menzel et al., 2002; Broders et al., 2006; SWH 6E Ecoregion Criterion Schedule). Critical habitat has not yet been defined by the province. | | | | | | | cavities and loose bark suitable for roosting. |
| Eastern Red Bat | *Lasiurus borealis* | Roosts among the foliage of both deciduous and coniferous trees, of any age class, and occasionally shrubs. Maternity roosts tend to be large in diameter and tall, reaching or exceeding the height of the surrounding canopy. Forage in both forested and non-forested habitats, in both open and semi-cluttered habitats, both above and below forest canopies, and in both early and later stage forests. They overwinter in the southern United States. | Not listed | END | END | S4 | AMO | **Yes** | Study Area contains deciduous and coniferous trees that could provide cavities and loose bark suitable for roosting. |
| Hoary Bat | *Lasiurus cinereus* | Roosts among the foliage of both deciduous and coniferous trees, of any age class, and occasionally shrubs. Maternity roosts tend to be large in diameter and tall, reaching or exceeding the height of the surrounding canopy. Forage in the open, including wetlands, grasslands and open fields with patchily distributed trees. They overwinter in the southern United States. | Not listed | END | END | S4 | AMO | **Yes** | Study Area contains deciduous and coniferous trees that could provide cavities and loose bark suitable for roosting. |
| Silver-haired Bat | *Lasionycteris noctivagans* | Roosting by Silver-haired Bats occurs primarily under bark and in the cavities of large, decaying, coniferous and deciduous trees. They may occasionally roost in or on buildings, especially during migration when natural roosting sites may be scarce. Forage in young and old forests, as well as forest openings (canopy gaps), but are concentrated along forest edges. Overwinter in the United States, southeastern British Columbia, and sometimes the Great Lakes region in mines, rock crevices, trees, and snags. | Not listed | END | END | S4 | AMO | **Yes** | Study Area contains deciduous and coniferous trees that could provide cavities and loose bark suitable for roosting. |
| Tricolored Bat | *Perimyotis subflavus* | Females establish summer maternity colonies, often in buildings or large-diameter trees. Foraging occurs over water, | END | END | END | S3? | AMO | **Yes** | Study Area contains deciduous woodlands that could provide |

| Common Name | Scientific Name | Habitat Description[1] | Conservation Status[2] | | | | Source of Occurrence Record[3] | Habitat within Study Area? | Rationale for Determination of Habitat Presence |
|---|---|---|---|---|---|---|---|---|---|
| | | | Federal SARA | Federal COSEWIC | Provincial ESA | Provincial S-Rank | | | |
| | | along waterways, and forest edges. Overwinter in cold and humid hibernacula (caves/mines) (COSEWIC, 2013). Critical habitat has not yet been defined by the province. | | | | | | | cavities and loose bark suitable for roosting. |
| *Plants* | | | | | | | | | |
| Butternut | *Juglans cineara* | Found in a variety of habitat types but grows best on well-drained fertile soils in shallow valleys and on gradual slopes (COSEWIC, 2017). Provincially, butternuts are assessed and categorized based on the amount of canker. These categories are 1-3 with Category 1 trees as those that are heavily infected to the point that they are not expected to survive. | END | END | END | S2 | NHIC | **Yes** | Sunny openings near forest edges with moist soils are present within the Study Area. |
| Black Ash | *Fraxinus nigra* | Predominantly a wetland species of swamps, floodplains, and fens. It has an intermediate light requirement and a tendency toward greater abundance in more alkaline sites. Most sites in which it is dominant are flood prone, where its high tolerance of seasonal flooding appears to offer a competitive advantage. Black Ash also occurs widely in moist upland forests, but generally at lower densities than in wet areas. | THR | THR | END | S4 | - | **Yes** | Wetland habitat and drainage features may provide suitable habitat for Black Ash within the Subject Site. |

Notes

Orange highlighted species are protected and/or have protected critical habitat within the Study Area (i.e., the species is Threatened, Endangered under the ESA, and/or the Threatened or Endangered species' critical habitat is present – including ferally listed migratory birds and fish)

[1] Habitat description is sourced from the OMNR (2000) *Significant Wildlife Habitat Technical Guide,* unless otherwise cited.

[2] Conservation Status:

SC = Special Concern; THR = Threatened; END = Endangered; NA = Not at Risk

Federal SARA = *Species at Risk Act, 2002* Schedule 1 unless otherwise noted. The protection and/or conservation measures afforded by SARA apply only to species listed under Schedule 1.

Federal COSEWIC = In the case that a species is not listed under Schedule 1 of SARA, but has a status recommended by the Committee on the Status of Endangered Wildlife in Canada, the uplisting of the species to Schedule 1 of SARA may be imminent.

Provincial ESA = *Endangered Species Act, 2007*.

Provincial (or Subnational) S-Rank: Subnational ranks are assigned and maintained by state or provincial NatureServe network programs.

S1 – Critically Imperiled; S2 – Imperiled; S3 - Vulnerable; S4 - Apparently Secure; S5 - Secure; B - Breeding; N - Non-breeding; ? - Uncertainty,

# Appendix D

## Headwater Drainage Feature Assessment Raw Data

*Table D1: Summary of Headwater Drainage Feature Data Collection*

| Date (yyyy-mm-dd) | Reach Name | Air Temp (ºC) | 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) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2024-05-06 | S4-A-01 | 21 | Freshet | Channelized or Constrained | Surface Flow Minimal | Moderate | 1.7 | 165 | 2.7 | Sand-silt | Meadow | Meadow | Meadow | Meadow | Wetland | Meadow | Wetland |
| 2024-05-06 | S4-B-01 | 22 | Freshet | Defined Natural Channel | Surface Flow Minimal | Moderate | 1.0 | 195 | 4.4 | Sand-silt | Wetland | Wetland | Wetland | Meadow | Wetland | Forest | Wetland |
| 2024-05-06 | S4-B-02 | 22 | Freshet | Defined Natural Channel | Surface Flow Minimal | Moderate | 2.1 | 175 | 3.9 | Sand | Forest | Forest | Forest | Scrubland | Scrubland | Scrubland | Scrubland |
| 2024-05-06 | S4-B-03 | 22 | Freshet | Defined Natural Channel | Surface Flow Minimal | Minimal | 1.5 | 180 | 2.1 | Stone-sand | Forest | Forest | Forest | Scrubland | Forest | Scrubland | Forest |
| 2024-05-06 | S4-C-01 | 22 | Freshet | Defined Natural Channel | Surface Flow Minimal | Minimal | 0.9 | 40 | 1.9 | Sand-silt | Scrubland | Scrubland | Scrubland | Scrubland | Scrubland | Scrubland | Forest |
| 2024-05-06 | S4-D-01 | 21 | Freshet | Wetland | Interstitial Flow | Minimal | 5.0 | 120 | 6.5 | Organics | Wetland | Forest | Forest | Forest | Forest | Forest | Forest |
| 2024-05-06 | S4-E-01 | 22 | Freshet | Defined Natural Channel | Interstitial Flow | Minimal | 0.4 | 40 | 1.7 | Silt | Scrubland | Scrubland | Scrubland | Scrubland | Scrubland | Scrubland | Scrubland |
| 2024-07-17 | S4-A-01 | 23 | Baseflow | Channelized or Constrained | Surface Flow Minimal | Moderate | 0.7 | 187 | 3.5 | Sand-silt | Meadow | Meadow | Meadow | Meadow | Wetland | Meadow | Wetland |
| 2024-07-17 | S4-B-01 | 24 | Baseflow | Defined Natural Channel | Interstitial Flow | None | 0.8 | 245 | 1.9 | Sand-silt | Wetland | Wetland | Wetland | Meadow | Wetland | Forest | Wetland |
| 2024-07-17 | S4-B-02 | 23 | Baseflow | Defined Natural Channel | Surface Flow Minimal | Minimal | 2.7 | 155 | 4.3 | Sand | Forest | Forest | Forest | Scrubland | Scrubland | Scrubland | Scrubland |
| 2024-07-17 | S4-B-03 | 23 | Baseflow | Defined Natural Channel | Surface Flow Minimal | Minimal | 1.2 | 145 | 3.9 | Stone-sand | Forest | Forest | Forest | Scrubland | Forest | Scrubland | Forest |
| 2024-07-17 | S4-C-01 | 23 | Baseflow | Defined Natural Channel | Surface Flow Minimal | Minimal | 0.8 | 57 | 3.2 | Sand-silt | Scrubland | Scrubland | Scrubland | Scrubland | Scrubland | Scrubland | Forest |
| 2024-07-17 | S4-D-01 | 21 | Baseflow | Wetland | Interstitial Flow | Minimal | 0.9 | 35 | 4.4 | Organics | Wetland | Forest | Forest | Forest | Forest | Forest | Forest |
| 2024-07-17 | S4-E-01 | 21 | Baseflow | Defined Natural Channel | Standing Water | None | 0.2 | 32 | 2.1 | Silt | Scrubland | Scrubland | Scrubland | Scrubland | Scrubland | Scrubland | Scrubland |

# Appendix E

## Species Lists

*Table E1: Breeding Bird List*

| | | CONSERVATION STATUS | | |
|---|---|---|---|---|
| **COMMON NAME** | **SCIENTIFIC NAME** | **FEDERAL (SARA, 2002)** | **PROVINCIAL (ESA, 2007)** | **S-RANK[1]** |
| Alder Flycatcher | *Empidonax alnorum* | - | - | S5B |
| American Crow | *Corvus brachyrhynchos* | - | - | S5 |
| American Goldfinch | *Spinus tristis* | - | - | S5 |
| American Redstart | *Setophaga ruticilla* | - | - | S5B |
| American Robin | *Turdus migratorius* | - | - | S5 |
| Black-and-white Warbler | *Mniotilta varia* | - | - | S5B |
| Black-capped Chickadee | *Poecile atricapillus* | - | - | S5 |
| Blue Jay | *Cyanocitta cristata* | - | - | S5 |
| Cedar Waxwing | *Bombycilla cedrorum* | - | - | S5 |
| Common Grackle | *Quiscalus quiscula* | - | - | S5 |
| Common Yellowthroat | *Geothlypis trichas* | - | - | S5B,S3N |
| Downy Woodpecker | *Dryobates pubescens* | - | - | S5 |
| Eastern Kingbird | *Tyrannus tyrannus* | - | - | S4B |
| Eastern Towhee | *Pipilo erythrophthalmus* | - | - | S4B,S3N |
| Gray Catbird | *Dumetella carolinensis* | - | - | S5B,S3N |
| Hairy Woodpecker | *Dryobates villosus* | - | - | S5 |
| House Wren | *Troglodytes aedon* | - | - | S5B |
| Northern Cardinal | *Cardinalis cardinalis* | - | - | S5 |
| Northern Flicker | *Colaptes auratus* | - | - | S5 |
| Rose-breasted Grosbeak | *Pheucticus ludovicianus* | - | - | S5B |
| Red-eyed Vireo | *Vireo olivaceus* | - | - | S5B |
| Red-winged Blackbird | *Agelaius phoeniceus* | - | - | S5 |
| Song Sparrow | *Melospiza melodia* | - | - | S5 |
| Swamp Sparrow | *Melospiza georgiana* | - | - | S5B,S4N |
| Veery | *Catharus fuscescens* | - | - | S5B |
| Willow Flycatcher | *Empidonax traillii* | - | - | S4B |
| White-throated Sparrow | *Zonotrichia albicollis* | - | - | S5 |

| | | | | |
|---|---|---|---|---|
| Yellow Warbler | *Setophaga petechia* | - | - | S5B |

1 - Conservation Status:

SC = Special Concern; THR = Threatened; END = Endangered; NA = Not at Risk

Federal SARA = *Species at Risk Act, 2002* Schedule 1 unless otherwise noted. The protection and/or conservation measures afforded by SARA apply only to species listed under Schedule 1.

Federal COSEWIC = In the case that a species is not listed under Schedule 1 of SARA, but has a status recommended by the Committee on the Status of Endangered Wildlife in Canada, the uplisting of the species to Schedule 1 of SARA may be imminent.

Provincial ESA = *Endangered Species Act, 2007*.

Provincial (or Subnational) S-Rank: Subnational ranks are assigned and maintained by state or provincial NatureServe network programs.

S1 – Critically Imperiled; S2 – Imperiled; S3 - Vulnerable; S4 - Apparently Secure; S5 - Secure; B - Breeding; N - Non-breeding; ? - Uncertainty

*Table E2: Incidental Bird List*

| | | Conservation Status[1] | | |
|---|---|---|---|---|
| **Common Name** | **Scientific Name** | **Federal (SARA, 2002)** | **Provincial (ESA, 2007)** | **S-Rank** |
| Alder Flycatcher | *Empidonax alnorum* | - | - | S5B |
| American Crow | *Corvus brachyrhynchos* | - | - | S5 |
| American Redstart | *Setophaga ruticilla* | - | - | S5B |
| American Robin | *Turdus migratorius* | - | - | S5 |
| American Woodcock | *Scolopax minor* | - | - | S4B |
| Black-and-white Warbler | *Mniotilta varia* | - | - | S5B |
| Black-capped Chickadee | *Poecile atricapillus* | - | - | S5 |
| Cedar Waxwing | *Bombycilla cedrorum* | - | - | S5 |
| Chestnut-sided Warbler | *Setophaga pensylvanica* | - | - | S5B |
| Common Yellowthroat | *Geothlypis trichas* | - | - | S5B,S3N |
| Eastern Towhee | *Pipilo erythrophthalmus* | - | - | S4B,S3N |
| **Eastern Wood-pewee** | ***Contopus virens*** | **SC** | **SC** | **S4B** |
| Gray Catbird | *Dumetella carolinensis* | - | - | S5B,S3N |
| Mourning Dove | *Zenaida macroura* | - | - | S5 |
| Red-eyed Vireo | *Vireo olivaceus* | - | - | S5B |
| Red-winged Blackbird | *Agelaius phoeniceus* | - | - | S5 |
| Rose-breasted Grosbeak | *Pheucticus ludovicianus* | - | - | S5B |
| Song Sparrow | *Melospiza melodia* | - | - | S5 |
| Veery | *Catharus fuscescens* | - | - | S5B |

| | | | | |
|---|---|---|---|---|
| White-throated Sparrow | *Zonotrichia albicollis* | - | - | S5 |
| **Wood Thrush** | ***Hylocichla mustelina*** | **THR** | **SC** | **S4B** |
| Yellow Warbler | *Setophaga petechia* | - | - | S5B |

1 - Conservation Status:

SC = Special Concern; THR = Threatened; END = Endangered; NA = Not at Risk

Federal SARA = *Species at Risk Act, 2002* Schedule 1 unless otherwise noted. The protection and/or conservation measures afforded by SARA apply only to species listed under Schedule 1.

Federal COSEWIC = In the case that a species is not listed under Schedule 1 of SARA, but has a status recommended by the Committee on the Status of Endangered Wildlife in Canada, the uplisting of the species to Schedule 1 of SARA may be imminent.

Provincial ESA = *Endangered Species Act, 2007*.

Provincial (or Subnational) S-Rank: Subnational ranks are assigned and maintained by state or provincial NatureServe network programs.

S1 – Critically Imperiled; S2 – Imperiled; S3 - Vulnerable; S4 - Apparently Secure; S5 - Secure; B - Breeding; N - Non-breeding; ? – Uncertainty

*Table E3: Other Incidental List*

| | | Conservation Status[1] | | |
|---|---|---|---|---|
| **Common Name** | **Scientific Name** | **Federal (SARA, 2002)** | **Provincial (ESA, 2007)** | **S-Rank** |
| Herpetofauna | | | | |
| Northern Leopard Frog | *Lithobates pipiens* | - | - | S5 |
| Wood Frog | *Lithobates sylvaticus* | - | - | S5 |
| Mammals | | | | |
| Eastern Chipmunk | *Tamias striatus* | - | - | S5 |
| Eastern Gray Squirrel | *Sciurus carolinensis* | - | - | S5 |
| Red Squirrel | *Tamiasciurus hudsonicus* | - | - | S5 |
| White-tailed Deer | *Odocoileus virginianus* | - | - | S5 |
| Insects | | | | |
| American Carrion Beetle | Necrophila americana | - | - | S4S5 |
| American Lady Butterfly | *Vanessa virginiensis* | - | - | S5 |
| Eastern Tent Caterpillar Moth | Malacosoma americana | - | - | S5 |
| Eastern Tiger Swallowtail | *Papilio glaucus* | - | - | S5 |
| Snowberry Clearwing Moth | *Hemaris diffinis* | - | - | S4S5 |
| White Admiral | *Limenitis arthemis arthemis* | - | - | S5 |

1 - Conservation Status:

SC = Special Concern; THR = Threatened; END = Endangered; NA = Not at Risk

Federal SARA = *Species at Risk Act, 2002* Schedule 1 unless otherwise noted. The protection and/or conservation measures afforded by SARA apply only to species listed under Schedule 1.

Federal COSEWIC = In the case that a species is not listed under Schedule 1 of SARA, but has a status recommended by the Committee on the Status of Endangered Wildlife in Canada, the uplisting of the species to Schedule 1 of SARA may be imminent.

Provincial ESA = *Endangered Species Act, 2007*.

Provincial (or Subnational) S-Rank: Subnational ranks are assigned and maintained by state or provincial NatureServe network programs.

S1 – Critically Imperiled; S2 – Imperiled; S3 - Vulnerable; S4 - Apparently Secure; S5 - Secure; B - Breeding; N - Non-breeding; ? – Uncertainty

*Table E4: Plant List*

| | | Conservation Status[1] | | | | |
|---|---|---|---|---|---|---|
| Common Name | Scientific Name | Federal (SARA, 2002) | Provincial (ESA, 2007) | S-Rank | Coefficient of Conservation | Coefficient of Wetness |
| Alternate-leaved Dogwood | *Cornus alternifolia* | 0 | 0 | S5 | 6 | 3 |
| Basswood | *Tilia americana* | 0 | 0 | S5 | 4 | 3 |
| Bebb's Willow | *Salix bebbiana* | 0 | 0 | S5 | 4 | -3 |
| Bittersweet Nightshade | *Solanum dulcamara* | 0 | 0 | SNA | 0 | 0 |
| Black Ash | *Fraxinus nigra* | 0 | END | S4 | 7 | -3 |
| Bladder Campion | *Silene vulgaris* | 0 | 0 | SNA | 0 | 5 |
| Blue Vervain | *Verbena hastata* | 0 | 0 | S5 | 4 | -3 |
| Bur Oak | *Quercus macrocarpa* | 0 | 0 | S5 | 5 | 3 |
| Butternut | *Juglans cinerea* | END | END | S2? | 6 | 3 |
| Canada Anemone | *Anemonastrum canadense* | 0 | 0 | S5 | 3 | -3 |
| Canada Goldenrod | *Solidago canadensis* | 0 | 0 | S5 | 1 | 3 |
| Coltsfoot | *Tussilago farfara* | 0 | 0 | SNA | 0 | 3 |
| Common Boneset | *Eupatorium perfoliatum* | 0 | 0 | S5 | 2 | -3 |
| Common Hemp-nettle | *Galeopsis tetrahit* | 0 | 0 | SNA | 0 | 3 |
| Common Mullein | *Verbascum thapsus* | 0 | 0 | SNA | 0 | 5 |
| Common Plantain | *Plantago major* | 0 | 0 | SNA | 0 | 3 |
| Common Ragweed | *Ambrosia artemisiifolia* | 0 | 0 | S5 | 0 | 3 |
| Common Self-heal | *Prunella vulgaris* | 0 | 0 | S5 | 0 | 0 |

| | | Conservation Status[1] | | | | |
|---|---|---|---|---|---|---|
| Common Name | Scientific Name | Federal (SARA, 2002) | Provincial (ESA, 2007) | S-Rank | Coefficient of Conservation | Coefficient of Wetness |
| Common Vetch | *Vicia sativa* | 0 | 0 | SNA | 0 | 3 |
| Common Water-parsnip | *Sium suave* | 0 | 0 | S5 | 4 | -5 |
| Common Yarrow | *Achillea millefolium* | 0 | 0 | SNA | 0 | 3 |
| Crack Willow | *Salix euxina* | 0 | 0 | SNA | 0 | 0 |
| Downy Serviceberry | *Amelanchier arborea* | 0 | 0 | S5 | 5 | 3 |
| Dwarf Raspberry | *Rubus pubescens* | 0 | 0 | S5 | 4 | -3 |
| Dwarf St. John's-wort | *Hypericum mutilum* | 0 | 0 | S4 | 6 | -3 |
| Eastern Prickly Gooseberry | *Ribes cynosbati* | 0 | 0 | S5 | 4 | 3 |
| Eastern White Cedar | *Thuja occidentalis* | 0 | 0 | S5 | 4 | -3 |
| Eastern White Pine | *Pinus strobus* | 0 | 0 | S5 | 4 | 3 |
| European Buckthorn | *Rhamnus cathartica* | 0 | 0 | SNA | 0 | 0 |
| European Lily-of-the-valley | *Convallaria majalis* | 0 | 0 | SNA | 0 | 5 |
| Field Mustard | *Brassica rapa* | 0 | 0 | SNA | 0 | 5 |
| Flat-top White Aster | *Doellingeria umbellata* | 0 | 0 | S5 | 6 | -3 |
| Foxtail Sedge | *Carex alopecoidea* | 0 | 0 | S4 | 6 | -3 |
| Freeman's Maple | *Acer x freemanii* | 0 | 0 | SNA | 6 | -5 |
| Garden Bird's-foot Trefoil | *Lotus corniculatus* | 0 | 0 | SNA | 0 | 3 |
| Garlic Mustard | *Alliaria petiolata* | 0 | 0 | SNA | 0 | 0 |
| Glossy Buckthorn | *Frangula alnus* | 0 | 0 | SNA | 0 | 0 |
| Green Ash | *Fraxinus pennsylvanica* | 0 | 0 | S4 | 3 | -3 |
| Grey Dogwood | *Cornus racemosa* | 0 | 0 | S5 | 2 | 0 |
| Hybrid Cattail | *Typha x glauca* | 0 | 0 | SNA | 0 | -5 |
| Jack-in-the-pulpit | *Arisaema triphyllum* | 0 | 0 | S5 | 5 | -3 |
| Japanese Sweet Coltsfoot | *Petasites japonicus* | 0 | 0 | SNA | 0 | -5 |
| Large False Solomon's Seal | *Maianthemum racemosum* | 0 | 0 | S5 | 4 | 3 |

| | | Conservation Status[1] | | | | |
|---|---|---|---|---|---|---|
| Common Name | Scientific Name | Federal (SARA, 2002) | Provincial (ESA, 2007) | S-Rank | Coefficient of Conservation | Coefficient of Wetness |
| Large-flowered Bellwort | *Uvularia grandiflora* | 0 | 0 | S5 | 6 | 5 |
| Large-leaved Aster | *Eurybia macrophylla* | 0 | 0 | S5 | 5 | 5 |
| Large-leaved Pondweed | *Potamogeton amplifolius* | 0 | 0 | S5 | 5 | -5 |
| Marsh Horsetail | *Equisetum palustre* | 0 | 0 | S5 | 10 | -3 |
| Meadow Willow | *Salix petiolaris* | 0 | 0 | S5 | 3 | -3 |
| Narrow-leaved Cattail | *Typha angustifolia* | 0 | 0 | SNA | 0 | -5 |
| Narrow-leaved Small Pondweed | *Potamogeton berchtoldii* | 0 | 0 | S5 | 4 | -5 |
| Northern Maidenhair Fern | *Adiantum pedatum* | 0 | 0 | S5 | 7 | 3 |
| Northern Water-hemlock | *Cicuta virosa* | 0 | 0 | S4? | 0 | -5 |
| Northern Water-plantain | *Alisma triviale* | 0 | 0 | S5 | 1 | -5 |
| Old-field Cinquefoil | *Potentilla simplex* | 0 | 0 | S5 | 3 | 3 |
| Ostrich Fern | *Matteuccia struthiopteris* | 0 | 0 | S5 | 5 | 0 |
| Oxeye Daisy | *Leucanthemum vulgare* | 0 | 0 | SNA | 0 | 5 |
| Paper Birch | *Betula papyrifera* | 0 | 0 | S5 | 2 | 3 |
| Philadelphia Fleabane | *Erigeron philadelphicus* | 0 | 0 | S5 | 1 | -3 |
| Poison Ivy | *Toxicodendron radicans* | 0 | 0 | S5 | 2 | 0 |
| Purple Loosestrife | *Lythrum salicaria* | 0 | 0 | SNA | 0 | -5 |
| Red Clover | *Trifolium pratense* | 0 | 0 | SNA | 0 | 3 |
| Red Maple | *Acer rubrum* | 0 | 0 | S5 | 4 | 0 |
| Red Raspberry | *Rubus idaeus* | 0 | 0 | S5 | 2 | 3 |
| Red-osier Dogwood | *Cornus sericea* | 0 | 0 | S5 | 2 | -3 |
| Reed Canarygrass | *Phalaris arundinacea* | 0 | 0 | S5 | 0 | -3 |
| Riverbank Grape | *Vitis riparia* | 0 | 0 | S5 | 0 | 0 |
| Sedge spp. | *Carex* | --- | --- | --- | --- | --- |
| Sensitive Fern | *Onoclea sensibilis* | 0 | 0 | S5 | 4 | -3 |
| Siberian Crabapple | *Malus baccata* | 0 | 0 | SNA | 0 | 5 |

| Common Name | Scientific Name | Conservation Status[1] | | | Coefficient of Conservation | Coefficient of Wetness |
|---|---|---|---|---|---|---|
| | | Federal (SARA, 2002) | Provincial (ESA, 2007) | S-Rank | | |
| Small Enchanter's Nightshade | *Circaea alpina* | 0 | 0 | S5 | 6 | -3 |
| Spinulose Wood Fern | *Dryopteris carthusiana* | 0 | 0 | S5 | 5 | -3 |
| Spotted Jewelweed | *Impatiens capensis* | 0 | 0 | S5 | 4 | -3 |
| Spotted Joe Pye Weed | *Eutrochium maculatum* | 0 | 0 | S5 | 3 | -5 |
| Spotted Knapweed | *Centaurea stoebe* | 0 | 0 | SNA | 0 | 5 |
| Spring Avens | *Geum vernum* | 0 | 0 | S4 | 7 | 3 |
| Square-stemmed Monkeyflower | *Mimulus ringens* | 0 | 0 | S5 | 6 | -5 |
| Staghorn Sumac | *Rhus typhina* | 0 | 0 | S5 | 1 | 3 |
| Sugar Maple | *Acer saccharum* | 0 | 0 | S5 | 4 | 3 |
| Sulphur Cinquefoil | *Potentilla recta* | 0 | 0 | SNA | 0 | 5 |
| Sweet Crabapple | *Malus coronaria* | 0 | 0 | S4 | 5 | 5 |
| Tall Goldenrod | *Solidago altissima* | 0 | 0 | S5 | 1 | 3 |
| Trembling Aspen | *Populus tremuloides* | 0 | 0 | S5 | 2 | 0 |
| Tussock Sedge | *Carex stricta* | 0 | 0 | S5 | 4 | -5 |
| Twinleaf | *Jeffersonia diphylla* | 0 | 0 | S4 | 10 | 3 |
| Virginia Clematis | *Clematis virginiana* | 0 | 0 | S5 | 3 | 0 |
| Virginia Creeper | *Parthenocissus quinquefolia* | 0 | 0 | S4? | 6 | 3 |
| White Ash | *Fraxinus americana* | 0 | 0 | S4 | 4 | 3 |
| White Clover | *Trifolium repens* | 0 | 0 | SNA | 0 | 3 |
| White Elm | *Ulmus americana* | 0 | 0 | S5 | 3 | -3 |
| White Meadowsweet | *Spiraea alba* | 0 | 0 | S5 | 3 | -3 |
| White Oak | *Quercus alba* | 0 | 0 | S5 | 6 | 3 |
| White Snakeroot | *Ageratina altissima* | 0 | 0 | S5 | 5 | 3 |
| White Spruce | *Picea glauca* | 0 | 0 | S5 | 6 | 3 |

| Common Name | Scientific Name | Conservation Status[1] | | | Coefficient of Conservation | Coefficient of Wetness |
|---|---|---|---|---|---|---|
| | | Federal (SARA, 2002) | Provincial (ESA, 2007) | S-Rank | | |
| White Trillium | *Trillium grandiflorum* | 0 | 0 | S5 | 5 | 3 |
| Wild Carrot | *Daucus carota* | 0 | 0 | SNA | 0 | 5 |
| Wild Cucumber | *Echinocystis lobata* | 0 | 0 | S5 | 3 | -3 |
| Wild Parsnip | *Pastinaca sativa* | 0 | 0 | SNA | 0 | 5 |
| Woodland Agrimony | *Agrimonia striata* | 0 | 0 | S4 | 3 | 3 |
| Woodland Strawberry | *Fragaria vesca* | 0 | 0 | S5 | 4 | 3 |
| Woolly Blue Violet | *Viola sororia* | 0 | 0 | S5 | 4 | 0 |

1 - Conservation Status:

SC = Special Concern; THR = Threatened; END = Endangered; NA = Not at Risk

Federal SARA = *Species at Risk Act, 2002* Schedule 1 unless otherwise noted. The protection and/or conservation measures afforded by SARA apply only to species listed under Schedule 1.

Federal COSEWIC = In the case that a species is not listed under Schedule 1 of SARA, but has a status recommended by the Committee on the Status of Endangered Wildlife in Canada, the uplisting of the species to Schedule 1 of SARA may be imminent.

Provincial ESA = *Endangered Species Act, 2007*.

Provincial (or Subnational) S-Rank: Subnational ranks are assigned and maintained by state or provincial NatureServe network programs.

S1 – Critically Imperiled; S2 – Imperiled; S3 - Vulnerable; S4 - Apparently Secure; S5 - Secure; B - Breeding; N - Non-breeding; ? – Uncertainty

# Appendix F

## Significant Wildlife Habitat Assessment

*Table F1: Candidate SWH Assessment (Ecoregion 6E) – S4 Leitrim Urban Expansion Area*

| Significant Wildlife Habitat | Candidate SWH | | Confirmed SWH | | Comments |
|---|---|---|---|---|---|
| | ELC Codes | Additional Criteria Summary | In Site | In Adjacent Lands | |
| **Seasonal Concentration Areas of Animals** | | | | | |
| **Waterfowl Stopover and Staging Areas (terrestrial)** | Certain cultural meadow or thicket<br>Plus, evidence of annual spring flooding | Fields flooded from mid-March to May | No spring flooding observed. No large flocks of waterfowl observed during surveys. | | Not discussed further |
| **Waterfowl Stopover and Staging Areas (aquatic)** | Specific aquatic habitat types (marsh, swamps) | Ponds, marshes, lakes, bays, coastal inlets, and watercourses used for migration. Stormwater and sewage management facilities are not included. | No suitable habitat features present. No large flocks of waterfowl observed during surveys. | | Not Present; Not discussed further |
| **Shorebird Migratory Stopover Area** | Beach/Bar<br>Sand Dunes<br>Meadow marsh | Shorelines used in May to mid-June and early July to October.<br>Stormwater and sewage management facilities are not included. | No shallow shorelines, beaches, bars, dunes, or meadow marshes. No shorebirds observed during surveys. | | Not Present; Not discussed further |
| **Raptor Wintering Area** | Requires combination of forest (deciduous, mixed, or coniferous) and upland (cultural meadow, cultural thickets, cultural savannahs, or cultural woodlands) | Combination of habitats must >20 ha and the field portion must be wind swept with little accumulation of snow. | The woodland stands on Site are unlikely to be large enough. No large trees suitable for eagles were noted. | | Not Present; Not discussed further |

| Significant Wildlife Habitat | Candidate SWH | | Confirmed SWH | | Comments |
|---|---|---|---|---|---|
| | ELC Codes | Additional Criteria Summary | In Site | In Adjacent Lands | |
| | | Where site is for eagles, open water and large trees and snags must be available. | | | |
| **Bat Hibernacula** | Crevices and caves | Active mines are not to be included.<br>Buildings are not included. | No crevices or caves present | | Not Present; Not discussed further |
| **Bat Maternity Colonies** | Deciduous, or mixed forests<br>Deciduous or mixed Swamps (>5m tall) | >10/ha large diameter (>25 cm diameter at breast height)<br>Snag trees in the decay classes 1-3 are preferred. | The woodland stands on Site are unlikely to be large enough.<br>Timing windows for SAR bats will protect for general bats. | | Not Present; Not discussed further |
| **Turtle Wintering Areas** | Swamps, marshes, open water, shallow water, open fen, or open bog | Water that is deep enough not to freeze solid with soft bottoms.<br>Must be permanent waterbody (or wetlands with adequate dissolved oxygen) | The water on Site is not deep enough to provide habitat for turtles in winter. | | Not present; Not discussed further |
| **Reptile Hibernaculum** | Any habitat except very wetlands<br>Talus, rock barren, cave and alvar | For snakes – needs to be below frost lines. | No rocky outcroppings present. No snakes encountered during the site investigations. | | Not Present; Not discussed further |
| **Colonially – Nesting Bird Breeding Habitat (Bank and Cliff Swallow)** | Exposed sandy slopes of banks or piles. | Does not include licensed aggregate areas. | No suitable habitat features present. No bank or cliff swallows observed during surveys. | | Not Present; Not discussed further |

| Significant Wildlife Habitat | Candidate SWH | | Confirmed SWH | | Comments |
|---|---|---|---|---|---|
| | ELC Codes | Additional Criteria Summary | In Site | In Adjacent Lands | |
| | Cliff faces or structures (bridges, silos etc.…) | Does not include man-made structures or recently (within 2 years) disturbed soil | | | |
| **Colonially – Nesting Bird Breeding Habitat (Trees/Shrubs)** | Swamps – deciduous or mixed (trees >5m)<br>Treed fen | Typically requires tall trees as nests are usually 11-15m from ground but shrubs and emergent vegetation could be used. | Breeding bird surveys were completed, and no colonial nesting species were observed. | | Not Present; Not discussed further |
| **Colonially – Nesting Bird Breeding Habitat (Ground)** | Any rocky island or peninsula on lake or large river.<br>For Brewer's Blackbird – near watercourses in open fields, pastures | | No rocky islands, or peninsulas were present.<br>Breeding bird surveys were completed, and no colonial nesting species were observed. | | Not Present; Not discussed further |
| **Migratory Butterfly Stopover Area**<br>**Landbird Migratory Stopover Area** | Not applicable to Ottawa Area – must be within 5 km of Lake Ontario | | | | |
| **Deer Yarding Areas** | Mixed or coniferous forests or swamps (>5m tall trees)<br>Can include plantations, cultural thickets, or dry-fresh poplar-white birch deciduous forest | These are mapped by OMNRF | None mapped by OMNRF for this area | | Not Present; Not discussed further |

| Significant Wildlife Habitat | Candidate SWH | | Confirmed SWH | | Comments |
|---|---|---|---|---|---|
| | ELC Codes | Additional Criteria Summary | In Site | In Adjacent Lands | |
| **Deer Winter Congregation Area** | All forest and wetland habitats and small conifer plantations | These are mapped by OMNRF<br>(typically, >100ha in size) | None mapped by OMNRF for this area | | Not Present; Not discussed further |
| **Rare Vegetation Communities or Specialized Habitat for Wildlife** | | | | | |
| **Cliffs and Talus Slopes** | Near vertical face that is >3m in height (cliff or talus) | Typically, in Niagara Escarpment | Cliffs and talus slope habitat were not present | | Not Present; Not discussed further |
| **Sand Barren** | Sand barrens various types but tree cover is always ≤ 60% | Must be >0.5ha | Sand barrens not present | | Not Present; Not discussed further |
| **Alvar** | Alvar, Coniferous forest, cultural meadow, cultural savannah, cultural thickets, and cultural woodlands | Must have at least 4 indicator species with substantial cover (must not have large amounts of exotic or introduced species)<br><br>Must be >0.5ha | Alvar habitat is typically flat and mostly unfractured calcareous bedrock. Not present | | Not Present; Not discussed further |
| **Old Growth Forest** | Any forest or treed (>5 m) swamp | Must be at least 30 ha with at least 10 ha of interior habitat (edge considered 100 m) | Woodland does not meet the requirements for old growth. | | Not Present; Not discussed further |

| Significant Wildlife Habitat | Candidate SWH | | Confirmed SWH | | Comments |
|---|---|---|---|---|---|
| | ELC Codes | Additional Criteria Summary | In Site | In Adjacent Lands | |
| | | Have specific characteristics (snags, mosaic of gaps, multi-layered canopy) | | | |
| **Savannah** | Tallgrass prairie savannah and cultural savannah | Must have indicator species | No savannah present | | Not Present; Not discussed further |
| **Tallgrass Prairie** | Tallgrass prairie (open prairie - <25% tree cover) | No minimum size | No tallgrass prairie was present. | | Not Present; Not discussed further |
| **Other Rare Vegetation Communities** | Provincially rare S1-S3 communities as described in Appendix M of the SWHTG | | None of the communities listed for the Ottawa-Carleton Area in Appendix M were present. | | Not Present; Not discussed further |
| **Specialized Habitat for Wildlife** | | | | | |
| **Waterfowl Nesting Area** | Shallow marsh, meadow marsh, thicket swamp or deciduous (treed >5 m tall) swamps | Wetland must be 0.5 ha or consist of up to 3 smaller wetlands within 120 m of each other if known nesting is occurring. | Between the dedicated breeding bird surveys and the incidental observations, the Site did not meet the minimum requirements of 3 or more nesting pairs of species (American Black Duck, Northern Pintail, Northern Shoveler, Gadwall, Blue-winged Teal, Green-winged Teal, Wood Duck, Hooded Merganser) or 10 or more pairs of Mallards. | | Not Present; Not discussed further |
| **Bald Eagle and Osprey Nesting, Foraging, and Perching Habitat** | Any forest or swamp (trees >5m) type of habitat that is immediately next to rivers, lakes, ponds, or wetlands | Nests on man-made structures are not included. | Some active in general area but none observed during survey, no nests present on or near site. | | Not Present; Not discussed further |

| Significant Wildlife Habitat | Candidate SWH | | Confirmed SWH | | Comments |
|---|---|---|---|---|---|
| | ELC Codes | Additional Criteria Summary | In Site | In Adjacent Lands | |
| **Woodland Raptor Nesting Habitat** | Any forest habitat or treed swamp (>5m tall) or coniferous plantation | Stand must be > 30 ha with >10 ha of interior habitat (edge is 200 m) | Minimum habitat requirements not present; no nesting raptors noted during surveys. | | Not Present; Not discussed further |
| **Turtle Nesting Areas** | Shallow marsh, shallow water, open bog | Close to water but away from roads.<br>It must provide sand and gravel that turtles can dig through and be in open sunny areas.<br>Areas on the sides of municipal or provincial roads are not included. | The only potential habitat noted were the ploughed agricultural fields however, these are actively cropped and not suitable for nesting turtles. | | Not Present; Not discussed further. |
| **Seeps and Springs** | Any forested community could have a seep/spring | Forest area with <25% meadow/pasture in the headwaters of a stream. | Candidate habitat not present | | Not Present; Not discussed further |
| **Amphibian Breeding Habitat (woodland)** | Any forest or treed swamp (>5m tall trees) | Wetland, pond, or vernal pool must be > 500 $m^2$<br>Those with water until mid-July (during most years) are better candidates | Woodland breeding habitat is present. However, the vernal pools do not meet size requirement and the amphibian breeding quantity or species diversity do not meet the requirements. | | Not discussed further |
| **Amphibian Breeding Habitat (wetlands)** | Swamps, marsh, fen, bog, open water, or shallow water | Unless it is a larger wetland, must be >120 m from woodlands. | Candidate habitat not present | | Not Present; Not discussed further |

| Significant Wildlife Habitat | Candidate SWH | | Confirmed SWH | | Comments |
|---|---|---|---|---|---|
| | ELC Codes | Additional Criteria Summary | In Site | In Adjacent Lands | |
| | | Must be > 500 $m^2$ | | | |
| **Woodland Area-Sensitive Bird Breeding Habitat** | Any forest or treed swamp (>5 m tall) | Interior habitat (200 m edge used) in mature (>60 years) large (>30 ha) stand | Candidate habitat not present. | | Not Present; Not discussed further |
| **Habitat for Species of Conservation Concern (not including Endangered or Threatened Species)** | | | | | |
| **Marsh Bird Breeding Habitat** | Meadow marsh, shallow water, fen, or open bog | | Does not meet the minimum requirements. | | Not Present; Not discussed further |
| **Open Country Bird Breeding Habitat** | Cultural meadows | Must be large grasslands (>30 ha)<br>Agricultural class 1 and 2 are not included<br>Agricultural lands planted in row crop or intensive hay, or pastures (within past 5 years) not included. | Candidate habitat not present. | | Not Present; Not discussed further |
| **Shrub/Early Successional Bird Breeding Habitat** | Cultural thickets or woodlands | Must be > 10 ha.<br>Agricultural class 1 and 2 are not included. | Candidate habitat and species present. However, the cultural thickets on Site to not meet the size requirements. | | Not discussed further |

| Significant Wildlife Habitat | Candidate SWH | | Confirmed SWH | | Comments |
|---|---|---|---|---|---|
| | ELC Codes | Additional Criteria Summary | In Site | In Adjacent Lands | |
| | | Agricultural lands planted in row crop or intensive hay, or pastures (within past 5 years) not included. | | | |
| **Terrestrial crayfish** | | Not present in Ottawa Area | | | |
| **Special Concern and Rare Wildlife Species** | All special concern or species ranked as S1-S3, SH (plants or animals) | Habitat depends on the species. | Eastern wood-pewee, and wood thrush were present on Site. | | **Discussed under SWH section.** |
| **Animal Movement Corridors** | | | | | |
| **Amphibian Movement Corridor** | Any habitat but amphibian breeding wetland habitat must be identified | | The criterion indicates that amphibian movement corridors are to have a minimum of 15 m of native vegetation on both sides of the waterway. This is not present at this location. | | Not Present; Not discussed further |
| **Deer Movement Corridor** | All forests but project must be in Stratum II Deer Wintering Area and Deer Wintering Habitat must be confirmed. | | Not applicable – no Deer Wintering Areas or Habitat identified by OMNRF for area. | | Not Present; Not discussed further |

# Appendix G

## Site Photos

*Photo 1: Black ash in western swamp inclusion (SWDM2)*


*Photo 2: Butternut in western swamp (SWDM2)*

*Photo 3: An American lady butterfly on the cleared swath in the middle of the Site*

*Photo 2: A male common yellowthroat warbler.*

*Photo 3: Rose-breasted grosbeak atop white elm in thicket (THDM2-6).*

*Photo 4: Yellow warbler in eastern white cedar in hedge-row (FOCM5)*

*Photo 5: White-tailed deer track in cleared lands (CL)*

*Photo 8: Eastern towhee singing from hedgerow (FODM11)*

*Photo 9: Mourning dove in thicket (THDM2-6)*

*Photo 10 Chestnut-sided warbler (FODM11)*

*Photo 11: An alder flycatcher in a poplar (SWDM4-5).*

*Photo 12: A veery singing in SWDM4-5.*

333 Preston Street, Suite 500
Ottawa, Ontario K1S 5N4
Canada
Phone: 613 225 1311
www.arcadis.com