Appendix A

NATURAL ENVIRONMENT REPORT

VMC
Schedule 'C' Class Environmental Assessment (EA) Studies for the Extensions of Interchange Way and Millway Avenue

Natural Environment Report

JUNE 2025

DOWNTOWN
vaughan
METROPOLITAN CENTRE

REVISION HISTORY

Revision 01			
30% Design Submission			
Prepared By	Technical Review By	Reviewed By	Approved By
Riley Jauniaux	Michael Godard	Michael Godard	Christine Vazz
Date	Date	Date	Date
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Revision 02			
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Prepared By	Technical Review By	Reviewed By	Approved By
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Date	Date	Date	Date
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Date

[1] Approval of this document is an administrative function indicating readiness for release and does not impart legal liability on to the Approver for any technical content contained herein. Technical accuracy and fit-for-purpose of this content is obtained through the review process. The Approver shall ensure the applicable review process has occurred prior to signing the document.

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1 Introduction

1.1 Project Overview

WSP Canada Inc. (WSP) has been retained by the City of Vaughan to complete a Schedule 'C' Municipal Class Environmental Assessment (EA) for the extensions of Interchange Way from Commerce Street to Creditstone Road, and Millway Avenue from Highway 7 to Interchange Way. WSP is also assisting the City in updating the Transportation Master Plan (TMP) to confirm transportation needs, supportive policies, and a phasing strategy to 2041 with a focus on street connectivity, accessibility, and support for multi-modal mobility (i.e., walking, cycling, transit, ride share). This report will focus on the natural environment report for the design for the MCEA roadway extensions.

The Vaughn Metropolitan Centre (VMC) is proposing infrastructure upgrades in line with the Transportation Master Plan (TMP) Update and Extension of Millway Avenue and Interchange Way in Vaughan, Ontario (the “Site Boundary”, see Figure 1A). It should also be noted that the project is within the City of Vaughan and within the administrative jurisdiction of the Toronto and Region Conservation Authority (TRCA).

The purpose of this Natural Environment – Existing Conditions and Impact Assessment Report (NER) is to document the existing natural environment conditions in the Study Area and provide a succinct description of potential impacts and prescribe avoidance and mitigation measures as needed and was completed following the TRCA Environmental Impact Statement Guidelines (2014) and the Environmental Management Guideline in support of the Vaughan Official Plan (2013).

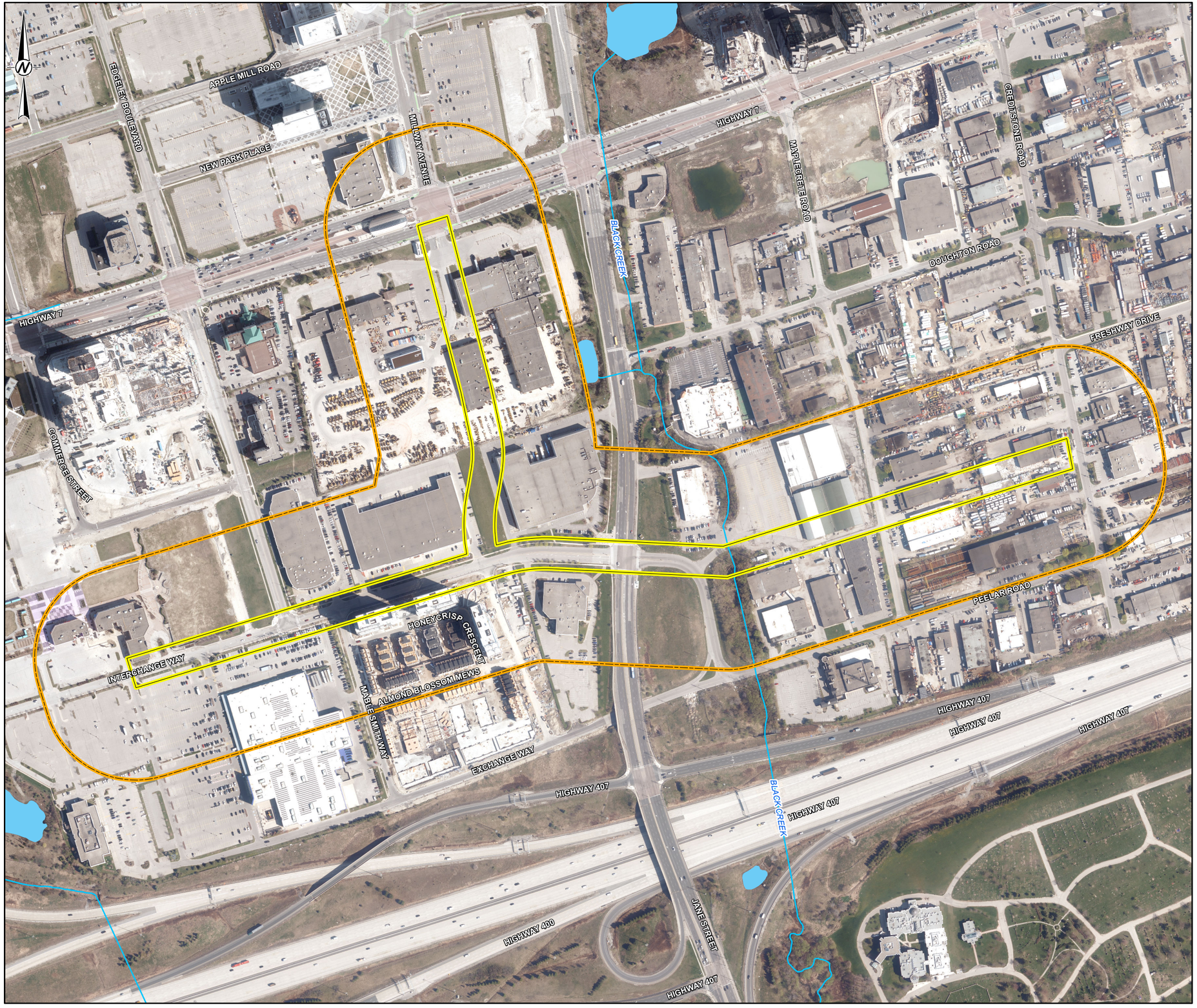
1.2 Study Area

The Millway Avenue Extension will extend Millway Avenue from Interchange Way to Highway 7. The Interchange Way Extension will follow the existing road alignment of Interchange Way between Commerce Way and Jane Street where the extension will then

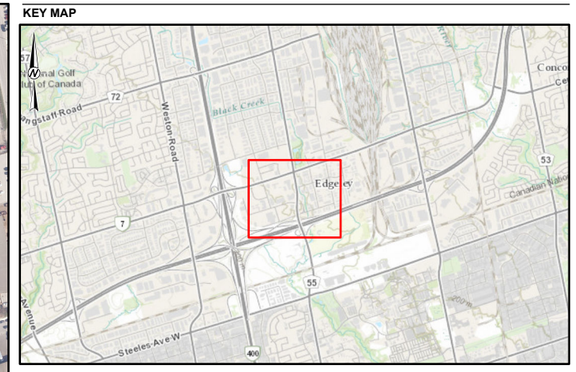
run east of Jane Street to Creditstone Road. The Site Boundary encompasses both road extensions as shown in Figure 1A.

For the purposes of this report, the Study Area is identified as a 120 m buffer around the Site Boundary, as described above. Figure 1A shows the location of the Site Boundary and Study Area whereas Figure 1B identifies the Toronto Region Conservation Authority (TRCA) regulation limit and shows the Natural Heritage System (NHS) features identified through the secondary source review process.

The study area is sparsely vegetated and runs through a largely industrial area. Trees are present along boulevards and in a small, forested area east of Jane Street. The project site runs through a TRCA Regulated Area as shown in Figure 1B.



KEY MAP



SCALE: 1:100,000

LEGEND

- WATERCOURSE
- SITE BOUNDARY
- STUDY AREA
- WATER BODY

0 50 100 200

1:5,000 METRES

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

1. CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE - ONTARIO
2. BASE MAP: © THE REGIONAL MUNICIPALITY OF YORK, YORK UNIVERSITY, CITY OF BRAMPTON, CITY OF TORONTO, YORK REGION, PROVINCE OF ONTARIO, ONTARIO MNR, ESRI CANADA, ESRI, HERE, GARMIN, INCREMENT P, USGS, METI/NASA, NGA, EPA, USDA, AAFC, NRCAN, MAXAR
3. COORDINATE SYSTEM: NAD 1983 CSRS UTM ZONE 17N

CLIENT
CITY OF VAUGHAN

PROJECT
VAUGHAN METROPOLITAN CENTRE (VMC) SCHEDULE 'C' CLASS ENVIRONMENTAL ASSESSMENT (EA) STUDIES FOR THE EXTENSIONS OF INTERCHANGE WAY AND MILLWAY AVENUE
VAUGHAN, ONTARIO, CANADA

TITLE
PROJECT FOOTPRINT AND STUDY AREA

CONSULTANT

wsp

YYYY-MM-DD	2024-05-16
DESIGNED	SO
PREPARED	LS
REVIEWED	SS/JT
APPROVED	----

PROJECT NO.	CONTROL	REV.	FIGURE
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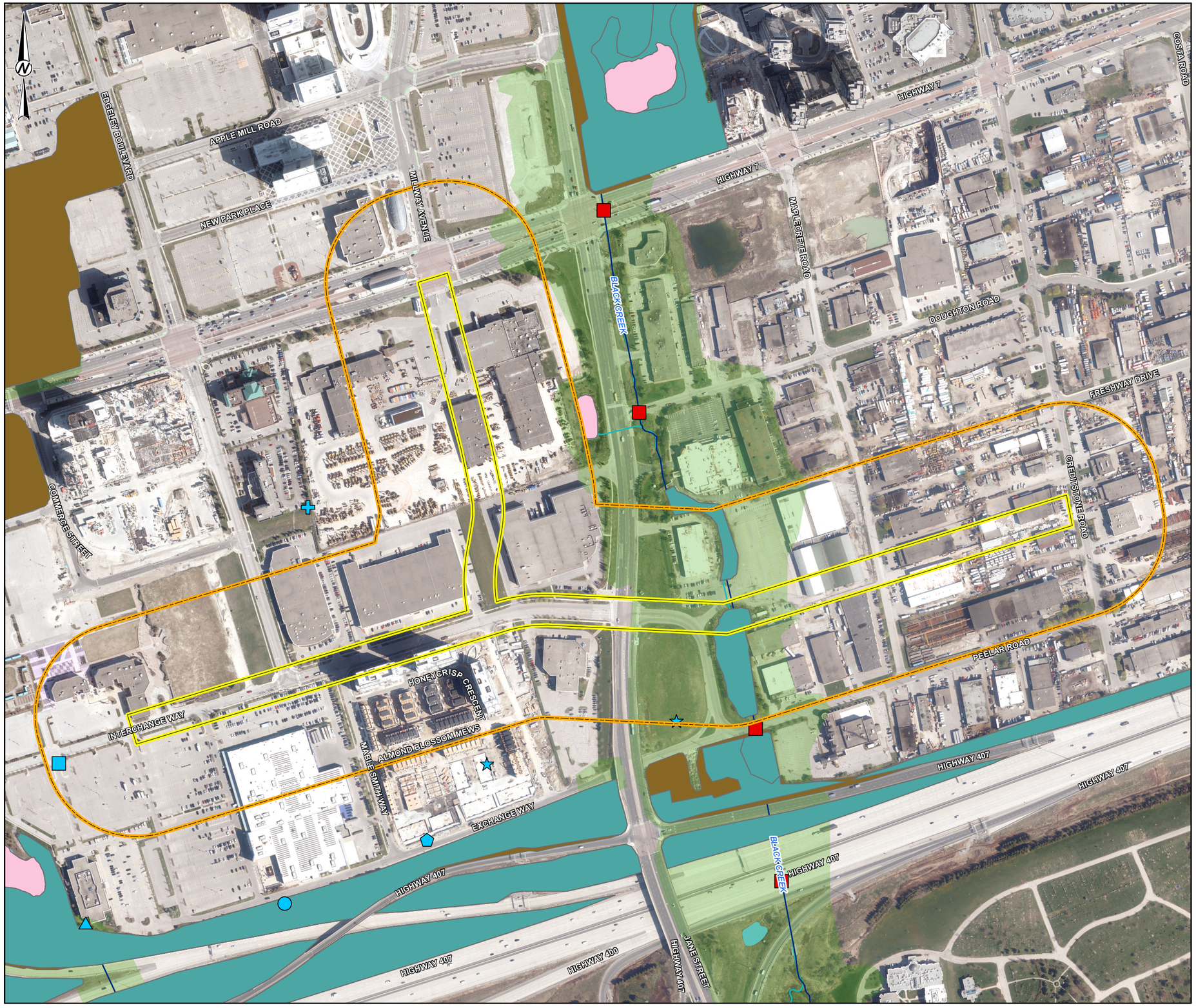
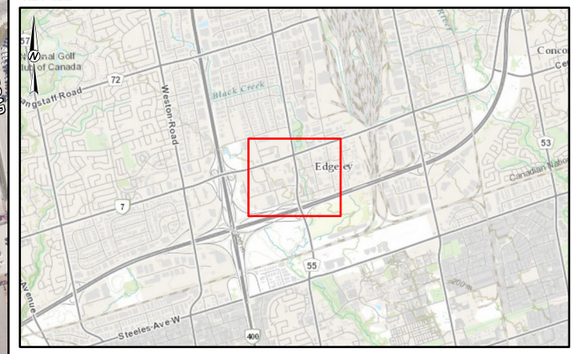


KEY MAP



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LEGEND

- EASTEN COMMA
- EASTERN KINGBIRD
- LONG-EARED OWL
- MEADOW VOLE
- SAVANNAH SPARROW
- STRIPED SKUNK
- THERMAL WATERCOURSE
- WATERCOURSE
- SITE BOUNDARY
- STUDY AREA
- WATER BODY
- IN STREAM BARRIERS
- TARGET SYSTEM
- NATURAL COVER
- LANDSCAPE ANALYSIS 2017
- TRCA REGULATED AREA

0 50 100 200

1:5,000 METRES

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

1. CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE - ONTARIO
2. BASE MAP: © THE REGIONAL MUNICIPALITY OF YORK, YORK UNIVERSITY, CITY OF BRAMPTON, CITY OF TORONTO, YORK REGION, PROVINCE OF ONTARIO, ONTARIO MNR, ESRI CANADA, ESRI, HERE, GARMIN, INCREMENT P, USGS, METI/NASA, NGA, EPA, USDA, AAFC, NRCAN, MAXAR
3. COORDINATE SYSTEM: NAD 1983 CSRS UTM ZONE 17N

CLIENT

CITY OF VAUGHAN

PROJECT

VAUGHAN METROPOLITAN CENTRE (VMC) SCHEDULE 'C' CLASS ENVIRONMENTAL ASSESSMENT (EA) STUDIES FOR THE EXTENSIONS OF INTERCHANGE WAY AND MILLWAY AVENUE VAUGHAN, ONTARIO, CANADA

TITLE

STUDY AREA AND TRCA REGULATED AREAS

CONSULTANT

wsp

YYYY-MM-DD	2024-05-16
DESIGNED	SO
PREPARED	LS
REVIEWED	SS/JT
APPROVED	----

PROJECT NO.	CONTROL	REV.	FIGURE
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1.3 Report Framework

This report is to be read in conjunction with:

— Appendix A: Plant List
— Appendix B: Photographic Inventory
— Appendix C: Aquatic Field Sheets
— Appendix D: SAR Screening

2Environmental Policy Context

Documents reviewed to gain an understanding of the natural heritage features and policies that are relevant to the Site and Study Area consisted of the following:

- *Species at Risk Act* (Canada 2002)
- *Fisheries Act* (Canada 1985)
- *Migratory Birds Convention Act* (Canada 1994)
- *Endangered Species Act* (Ontario 2007)
- *Fish and Wildlife Conservation Act*
- Ontario Regulation 41/24: Toronto and Region Conservation Authority (TRCA): Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses (Ontario 2006)

An overview of the above noted legislation and policy documents is provided in Sections 2.1 to 2.5. For details surrounding the planning and policy framework guiding the infrastructure planning, land use planning, and strategic investment decisions to support Provincial, Regional and City objectives in growth and transportation. please refer to Section 2 within the Environmental Study Report (ESR).

2.1 Federal Legislative Requirements

2.1.1 Species at Risk Act, 2002 (as amended)

The Canadian Species at Risk Act (SARA; S.C. 2002, c. 29) was passed into law in 2002 and was last amended on December 8, 2023. The purpose of the SARA is to prevent wildlife species in Canada from disappearing, to provide for the recovery of wildlife species, and to manage species to prevent further risk to their status. SARA provides legal protection to Species at Risk (SAR) listed in Schedule 1 if they have a designation of Extirpated, Endangered, or Threatened with respect to harming the species (Section 32: Killing, Harming, etc. Listed Wildlife Species) or its residence (Section 33: Damage or Destruction of Residence). The SARA applies to federal lands (e.g., Canada's oceans and waterways, national parks, military training areas, national wildlife areas, some migratory bird sanctuaries, and First Nations reserve lands) and outside of federal lands to the following:

- Migratory birds (i.e., those species listed under Article I of the Migratory Birds Convention Act (MBCA), 1994) that also fall under Schedule 1 of SARA. This does not include the species' critical habitat; however, it does include residences of migratory birds which have residence descriptions (i.e., Barn Swallow); and
- Aquatic species that fall under Schedule 1 of SARA.

SAR with these federal designations require recovery strategies or conservation action plans that identify their critical habitat for mandatory prohibition from damage or destruction (SARA, Section 58: Destruction of Critical Habitat). Species listed as Special Concern in Schedule 1 are not legally protected under SARA but require a management plan. Species listed in Schedule 2 or 3 of SARA are not legally protected under SARA. Still, they require status assessment through the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) to determine conservation status and priority for recovery and action planning pursuant to SARA, Section 27: List of Wildlife Species at Risk. Notably, SARA prohibitions can be applied if provincial legislation or voluntary measures do not adequately protect federally listed species and their residence. Generally, compliance with provincial legislation in Ontario does satisfy the requirements under SARA.

2.1.2 Fisheries Act 1985 (as amended)

The purpose of the federal *Fisheries Act* (Canada 1985) is to maintain healthy, sustainable, and productive Canadian fisheries through the prevention of pollution and the protection of fish and their habitat. Under the *Fisheries Act* (Canada 1985), work in and near water must comply with the fish and fish habitat protection provisions of the *Fisheries Act* by incorporating measures to avoid (DFO 2019):

- causing the death of fish
- harmful alteration, disruption, or destruction (HADD) of fish habitat in your work, undertaking or activity

All projects where work is being proposed that cannot avoid impacts to fish or fish habitat or are at high risk of causing impacts require a Fisheries and Oceans Canada (DFO) project review (DFO 2019). If potential impacts can be avoided, project approval is not required (DFO 2020).

When reviewing a project, DFO will identify potential risks of the project to the conservation and protection of fish and fish habitat. If it is determined that the project is likely to result in death of fish or HADD of fish habitat, an Authorization is typically required under the *Fisheries Act*. Proponents of projects requiring a *Fisheries Act* authorization may be required to also submit a habitat offsetting plan, which provides details of how the death of fish and/or HADD of fish habitat will be offset, and outlines associated costs and monitoring commitments. Proponents also have a duty to notify DFO of any unforeseen activities during the project that cause harm to fish or fish habitat.

2.1.3 Migratory Birds Convention Act, 1994 (as amended)

The Migratory Birds Convention Act (MBCA; S.C. 1994, c. 22) was passed in 1917, and updated in 1994 and again on December 12, 2017. The MBCA prohibits harming and/or killing most species of birds and/or destroying or collecting their eggs or nests. Protected species are listed under Article I of the MBCA (the MBCA is enforced by Environment and Climate Change Canada [ECCC]). These species are native or naturally occurring in Canada and are species that are known to occur regularly in Canada. Most birds found in the Study

Area receive protection under the MBCA, and nearly all of the remaining species receive similar protection under the provincial Fish and Wildlife Conservation Act (FWCA; Section 2.3.2: Fish and Wildlife Conservation Act, 1997).

In 2022 the Migratory Birds Regulations (MBR) was updated and the nests of 18 species now receive year-round protection – regardless of whether they are occupied or not. When a proponent proposes to damage the nest of one of these 18 species, they are required to register the nest and undertake a minimum monitoring period (ranging from 12 – 36 months) to demonstrate the nest is not being used by any migratory birds, prior to being legally able to remove the nest. If the nest is observed being used, the timeline resets. In Ontario, Pileated Woodpecker and some herons are included in the 18 named species and are subject to the MBR updates. The "incidental take" of migratory birds and the disturbance, destruction, or taking of the nest of a migratory bird is prohibited. Bird species not regulated under the MBCA include Rock Dove, American Crow, Brown-headed Cowbird, Common Grackle, House Sparrow, Red-winged Blackbird, and European Starling. Some species are not protected under the MBCA but are listed under the ESA (e.g., Rusty Blackbird).

ECCC and the Canadian Wildlife Service have compiled nesting calendars that show the variation in nesting intensity by habitat type and nesting zone within broad geographical areas distributed across Canada (ECCC, 2021). While this does not mean nesting birds will not nest outside of these periods, the calendars can help greatly reduce the risk of encountering a nest.

2.2 Provincial Legistlative Requiements

2.2.1 *Endangered Species Act*, 2007 (as amended)

The *Endangered Species Act* (ESA) was passed into law in 2007, came into effect on June 30, 2008 and was last amended on February 22, 2024. In Ontario, SAR are determined by the Committee on the Status of Species at Risk in Ontario (COSSARO). If a species is listed under the ESA as Extirpated, Endangered, or Threatened, Section 9: Prohibition on Killing, etc. of the ESA prohibits killing, harming, harassing, capturing, taking, possessing, collecting, buying, selling, leasing, trading, or offering to buy, sell, lease or trade a member of the

species. Similarly, Section 10: Prohibition to Damage to Habitat, etc. of the ESA prohibits the damage or destruction of the habitat of all Endangered and Threatened species. Habitat is broadly characterized within the ESA as the area prescribed by regulation as the habitat of the species or an area on which the species depends directly or indirectly to carry on its life processes, including reproduction, rearing of young, hibernation, migration or feeding. Habitat is specifically defined for some species. Species listed as Special Concern are not afforded protection under Sections 9 and 10 of the ESA; however, the Provincial Planning Statement provides protection through Significant Wildlife Habitat (PPS, Chapter 4.1: Natural Heritage).

Destruction of SAR and their habitats constitutes a contravention of the ESA unless authorized by the Ministry of the Environment, Conservation and Parks (MECP). The MECP may authorize damage to habitat or individuals by way of registration or permit.

2.2.2 *Fish and Wildlife Conservation Act*, 1997

The *Fish and Wildlife Conservation Act* (FWCA) was passed into law in 1997 and was last amended on April 1, 2024. The FWCA applies to 'fish and wildlife' whereby fish are defined as having the same meaning as in the *Fisheries Act*, and wildlife are defined as "an animal that belongs to a species that is wild by nature and includes game wildlife and specially protected wildlife". 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 (*Fish and Wildlife Conservation Act*, 1997). The FWCA is managed by the Ministry of Natural Resources (MNR). Where wildlife will require collection or relocation at any point (i.e., through trapping/collection and relocation), permits and approvals under the FWCA may be required.

If a provision of the FWCA and a provision of the ESA conflict with respect to an animal, invertebrate, or fish, the provision that gives the most protection prevails.

2.3 Toronto and Region Conservation Authority

From a review of available online mapping (TRCA 2023), a portion of the Site and Study Area are located within TRCA's regulated limits as defined under O. Reg. 41/24: Regulation

of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses (Ontario 2024). Therefore, a permit from the TRCA may be required for development within the regulated limits. The re-alignment of Black Creek and new Interchange Way overpass are to be completed under a separate project (Black Creek Renewal Project).

Regulatory changes as of 2024 have substantially altered Conservation Authorities' jurisdiction over biological and ecological considerations. There is no provision for Conservation Authorities to comment on or include permit conditions related to ecology or biology.

3 Agency Consultation

Consultation with government agencies was undertaken as part of this study including TRCA, Ministry of Environment Conservation and Parks (MECP) and Ministry of Natural Resources (MNR).

The following sections provide a summary of the correspondence with Government Agencies.

3.1 Toronto Region Conservation Authority

A summary of the correspondence with the TRCA is documented in Table 1 below.

Table 1: Summary of correspondence with TRCA

Date	Method	Subject
08 September 2021	Email	WSP submitted a request for background information for the Study Area.
14 September 2021	Email	TRCA provided background information in the form of shapefiles.

Details of the shapefiles provided by TRCA can be found on Figure 1B.

3.2 Ministry of Environment Conservation and Parks

A summary of the correspondence with the MECP is documented in Table 2 below.

Table 2: Summary of correspondence with MECP

Date	Method	Subject
08 September 2021	Email	WSP submitted a request for background information including Species at Risk (SAR) for the Study Area.

No response to the email request was received from MECP.

3.3 Ministry of Natural Resources

A summary of the correspondence with the MNRF is documented in Table 3 below.

Table 3: Summary of correspondence with MNR

Date	Method	Subject
08 September 2021	Email	WSP submitted a request for background information for the Study Area.

No response to the email request was received from MNR.

4Methodology

A summary of the methods used to undertake desktop studies and field investigations to contribute to the assessment of the presence/no detection of wildlife and wildlife habitat, fish and fish habitat, SAR and SAR habitat, and Significant Wildlife Habitat (SWH) within the Study Area is provided in the subsections below.

4.1 Desktop Studies

Secondary sources, wildlife atlases, and databases were reviewed to establish existing terrestrial and aquatic information relevant to the Study Area. Targeted information included the locations of NHS features (e.g., Provincially Significant Wetlands (PSWs), ANSIs, Environmentally Significant Areas, and SWH), and records of SAR occurrences. Sources reviewed over the course of the Project included, but were not limited to:

- The Ontario Breeding Birds Atlas Database (OBBA) 10 x 10 km survey squares (BSC et al. 2006);
- eBird online database of bird distribution and abundance (eBird 2024);
- iNaturalist (iNaturalist 2024);
- The Atlas of the Mammals of Ontario (AMO) (Dobbyn 1994);
- The Ontario Reptile and Amphibian Atlas (ORAA) 10 x 10 km survey squares (Ontario Nature 2024);
- The Ontario Butterfly Atlas (OBA) 10 x 10 km survey squares (MacNaughton et al. 2022);
- Species at Risk in Ontario (SARO) List (MECP 2024);
- Vascular Plants at Risk (Leslie 2018);
- Federal aquatic SAR mapping (Fisheries and Oceans Canada 2024);
- Bat species profiles and range maps for the province of Ontario (BCI 2024);
- Natural Heritage Information Centre (NHIC) database 1 km x 1 km survey squares, maintained by the MNR (NHIC 2024);

- MNRF (2024) GeoHub Land Information Ontario (LIO) Aquatic Resource Area (ARA) Database; and,
- TRCA Regulated Mapping (2024).

The NHIC database uses a 1 km x 1 km system, while the OBBA, ORAA, and OBA, utilize a 10 km x 10 km system. Both systems generate a list of species that are documented within the specific square. It is important to note that the recorded presence of a specific species must be viewed in conjunction with existing habitat conditions (e.g., watercourses that are now dry or ephemeral cannot be expected to support the same fisheries community that they may have in the past). Likewise, the 10 km grid encompasses an area larger than the Study Area. Species of conservation concern, including SAR, have been considered in the SAR screening as habitat may not occur in the Study Area (i.e., the record comes from anywhere in the 10 km square). As such, records/element occurrences do not confirm or necessarily indicate species present within the Study Area.

For the purposes of this report, only common names for species have been provided; the full nomenclature of each reported species is provided in Appendix A.

4.2 Field Investigations

Field investigations were undertaken within the Study Area. All field investigations were completed by qualified biologists. A description of field survey methodologies is provided in the subsections below. Field investigations are summarized in the table below.

Table 4: Summary of Field Investigations

Field Investigation	Date	Temperature	Surveyor
Aquatic Habitat Assessment	28 October 2021	12°c	Jared Skeath
Ecological Land Classification; Botanical Inventory	28 October 2021	12°c	Carly Van Daele

Field Investigation	Date	Temperature	Surveyor
Wildlife and SAR	28 October 2021	12°c	Carly Van Daele
Tree Inventory	28 October and 04 November 2021	12°c	Carlene Perkin

4.2.1 Aquatic Surveys

Qualified WSP staff completed an aquatic habitat assessment on 28 October 2021 to document the existing conditions of the fish and fish habitat within the study area. The field investigations were conducted in accordance with "Section 4 – Field Investigations" of Ministry of Transportation Ontario's (MTO) Fish Guide. Photographs were taken for the assessed reach, with representative photographs provided in Appendix B, and additional photographs are kept on file at WSP.

The collection of fish habitat information during the field survey encompassed the following parameters:

— waterbody dimensions, general gradient and profile;
— bank / shoreline character (e.g., height and erosion);
— flow characteristics, including evidence of groundwater discharge;
— morphology and substrates;
— in-water cover opportunities (e.g., woody debris, undercut banks, boulders, vegetation);
— riparian vegetation;
— presence of physical barriers to fish movement;
— presence of potential critical or specialized habitat areas including potential spawning areas, good nursery cover, holding habitat (e.g., deeper refuge pools);
— disturbances and past habitat alterations (e.g., channelization, potential pollutant point sources); and,
— potential habitat enhancement opportunities.

All habitat data sheets, mapping and other field notes have been included in Appendix C.

4.2.2 Vegetation Communities and Plant Inventory

Qualified WSP staff conducted Ecological Land Classification (ELC) and plant inventories on 28 October 2021. The organizational framework contained within the ELC protocol (Lee et al. 1998) describes communities according to six nested levels: site region, system, community class, community series, ecosite, and vegetation type. These nested levels vary in spatial scale, with the ecoregion classifying communities at the largest spatial scale and vegetation type describing communities at the finest spatial scale (Lee et al. 1998). The First Approximation of ELC (Lee et al. 1998) was applied to determine ecosite type. Vegetation communities within the Study Area were classified to the level of vegetation type, where possible.

The occurrence of ELC communities was cross-referenced with provincially significant vegetation communities as identified in the Significant Wildlife Habitat Technical Guide (OMNR 2000) and Significant Wildlife Habitat Criteria Schedules (SWHCS) for Ecoregion 7E (OMNRF 2015), and the NHIC (2024). The information collected was also used to:

- Broadly characterize the ecosites within the Study Area;
- Aid in the identification of potentially suitable SAR habitat; and
- To identify the potential presence of rare and/or sensitive vegetation communities and/or species to the extent possible.

A botanical inventory was conducted in concert with vegetation community surveys to create an inventory of vascular plant species within the Study Area and to assess whether significant flora was present (Appendix A). The area search method was used to identify vascular plants in the Study Area. Those species that could not be identified to species were identified to genus.

4.2.3 Species at Risk Habitat Assessment

In Ontario, Species of Conservation Concern include SAR and rare and rapidly declining species. SAR are species whose individuals or populations are considered Extirpated (EXT), Endangered (END), Threatened (THR), or Special Concern (SC), as determined by the

provincial COSSARO and the federal Committee on the Status of Endangered Wildlife in Canada (COSEWIC). SAR in the Study Area are regulated by the Endangered Species Act (ESA). The potential for SAR and rare species to occur within the Study Area was determined based on a review of secondary source information and the completion of field investigations. Information collected was then used to evaluate SAR occurrence potential based on habitat preferences for each species. Provincially rare species are those with a provincial rank (sub-national rank) of S1, S2, or S3 and considered provincially vulnerable to imperiled. The NHIC tracks provincially rare species, and provincial rarity does not automatically provide a listing under the ESA. The potential for SAR and SAR habitat (i.e., candidate) to occur within the Study Area was determined based on a review of secondary source information relative to terrestrial and aquatic conditions and the vegetation communities identified during field investigations. While in the field, investigations included an assessment of habitat for SAR which have been reported in the vicinity of the Project and those that are known to the Region of York. Records/element occurrences (and absence thereof) do not confirm or necessarily indicate SAR presence or absence within the Study Area; it is the combination of secondary source information and field investigation data that allows for meaningful evaluation of the potential for SAR occurrences.

5Existing Conditions

5.1 Aquatic Environment

5.1.1 Background

The VMC and surrounding area are within the Humber River watershed, and Black Creek Subwatershed. The watershed encompasses 90,258 ha and is home to nearly one million people. It is the largest watershed in TRCA's jurisdiction with its waters, originating on the Niagara Escarpment and the Oak Ridges Moraine, flowing down the Humber River into Lake Ontario through a variety of landscapes, including kettle lakes and rich farmlands. The main branch of the river flows 126 km from its source on the Niagara Escarpment to Lake Ontario. There is higher quality habitat in the Main and East Humber subwatersheds in the northern part of the watershed but generally poorer quality habitat in the West Humber, Lower Humber, and Black Creek subwatersheds due to smaller amounts of natural cover and urban influences.

A review of available background information provided fish community data for Black Creek, identifying a total of eight species including Brook Stickleback, Common Carp, Common Shiner, Creek Chub, Golden Shiner, Hornyhead Chub, Pumpkinseed and White Sucker (MNRF 2024b). No SAR or their critical habitat was identified on DFO Aquatic SAR mapping (DFO 2024).

5.1.2 Aquatic Environment

Black Creek travels southward along the east side of Jane Street before curving slightly east around the Paradise Banquet Hall and flowing south through the right-of-way. A large, corrugated steel pipe (CSP) culvert located east of the Peelar Road and Jane Street intersection conveys the flow of the creek as it travels south towards Peelar Road (Photo 1). The CSP culvert has a diameter of 1.6 m and an approximate length of 43 m.

The existing aquatic habitat surveyed by WSP Ecologists are described below and their locations are identified in Figure 2. This section of the report includes a description of the fish habitat 120 m upstream and downstream of the right of way based on background data and field investigations conducted on October 28, 2021.

Upstream Reach

The upstream reach of Black Creek consisted of a wide, well-defined watercourse (Photo 2). The majority of the creek consisted of flats, with a few pools and runs (Table 5). The runs present were only due to woody debris that had fallen into the creek, channeling the flow and creating areas of faster flowing water (Photo 3). The substrate throughout the reach was mostly sandy, with small amounts of gravel, silt, and detritus present. Riparian trees provided 50% shading to the stream. A large amount of garbage is found throughout the creek, a 4 m wide pile has built up at the culvert (Photo 4). The water was moderately turbid and WSP ecologists observed two fish measuring < 5cm; however, they could not be identified to species. Iron staining was also present (Photo 5).

Table 5: Section Types and morphology of the upstream reach.

Subsection	Flat	Pool	Run
Area (%)	80	10	10
Mean Wetted Depth (m)	0.45	0.70	-
Mean Wetted Width (m)	3.10	-	-
Mean Bankfull Depth (m)	1.00	-	-
Mean Bankfull Width (m)	4.00	-	-
Substrate Composition (%)	70 Sand 20 Silt 5 Gravel 5 Detritus		

The left bank had a moderate slope and is separated from a commercial business parking lot by a small riparian zone measuring approximately 7 m wide. Gabion is present at the

crest of the bank at the culvert (Photo 6). Small runoff channels occur intermittingly acting as drainage for the above parking lot. Starting approximately 70 m upstream from the culvert, armour stones line the bank of the creek and continue to the extent of the reach. Vegetation in the riparian zone was limited to trees, grasses and shrubs were sparsely present.

The right bank had a steep slope and is separated from the Vaughan Iceplex parking lot by a 5 m wide riparian zone. Concrete barriers run the length of the site on the crest of slope. A 1.10 m diameter CSP culvert outlets into the stream approximately 90 m upstream of the culvert (Photo 7). The exact origination of this culvert is unknown; however, it is likely the Vaughan Iceplex. As the stream curves around the Paradise Banquet Hall, armour stone is present at the crest of the slope, supporting the above parking lot and barriers (Photo 8). Vegetation in the riparian zone was limited to trees, grasses and shrubs were sparsely present. A small undercut bank measuring 0.1 m was present near the banquet hall.

Downstream Reach

The downstream reach of Black Creek consisted of a wide, well-defined stream. The culvert flow outlets into a deep pool at the base of a gabion wall (Photo 9). This reach consisted of mostly flats and runs, with a few riffles (Table 6). The flow breaks around a series of islands within the first 50 m of the stream before flowing into a series of riffle and runs. A gabion-reinforced waterfall with a drop of 0.6 m is present approximately 80m downstream of the culvert, providing a barrier to fish movement (Photo 10). Woody debris is found throughout the reach, mostly before the waterfall (Photo 11). The substrate throughout the flats was mostly sandy, with small amounts of silt. The substrate through the runs and riffles was mostly cobble with smaller amounts of boulder, gravel, and sand. Riparian trees provided 70% shading to the stream. A sheen was intermittingly present above the waterfall, mostly in the low flow areas along the left bank (Photo 12). The water was turbid, and no fish were observed in the downstream reach.

Table 6: Section types and morphology of the downstream reach.

Subsection	Flat	Pool	Run
Area (%)	40	40	20
Mean Wetted Depth (m)	0.85	0.15	-
Mean Wetted Width (m)	6.00	2.60	-
Mean Bankfull Depth (m)	1.45	1.30	-
Mean Bankfull Width (m)	7.00	3.65	-
Substrate Composition (%)	70 Sand 30 Silt	70 Cobble 10 Boulder 10 Gravel 10 Sand	-

The left bank had a moderate slope and is separated from Peelar Road by a 20 m riparian zone and a 10 m wide strip of manicured lawn which lines Peelar Road for the extent of the reach. A 5 m tall gabion wall armours the culvert extends 20 m past the culvert along the left bank. The bank is naturalized after the gabion wall ends. Heavy vegetation grew in the riparian zone, consisting of trees, shrubs, and grasses.

The right bank had a steep slope and is separated from the Vaughan Iceplex parking lot and commercial businesses by a 5 m wide riparian zone. A 5 m tall gabion wall armours the culvert extends 20 m past the culvert along the right bank. A small natural area follows the gabion wall for approximately 20 m, where a small plastic pipe culvert flows out into the bank. Following this natural area is a 2 m high gabion wall that continues the extent of the reach on the right bank. Vegetation in the riparian zone is dense within the first 40 m of the reach, however it is reduced as the gabion wall does not allow for much growth. Riparian trees still create a canopy of the stream; however, shrubs and grasses are limited for most of the reach.

5.2 Terrestrial Environment

5.2.1 Background

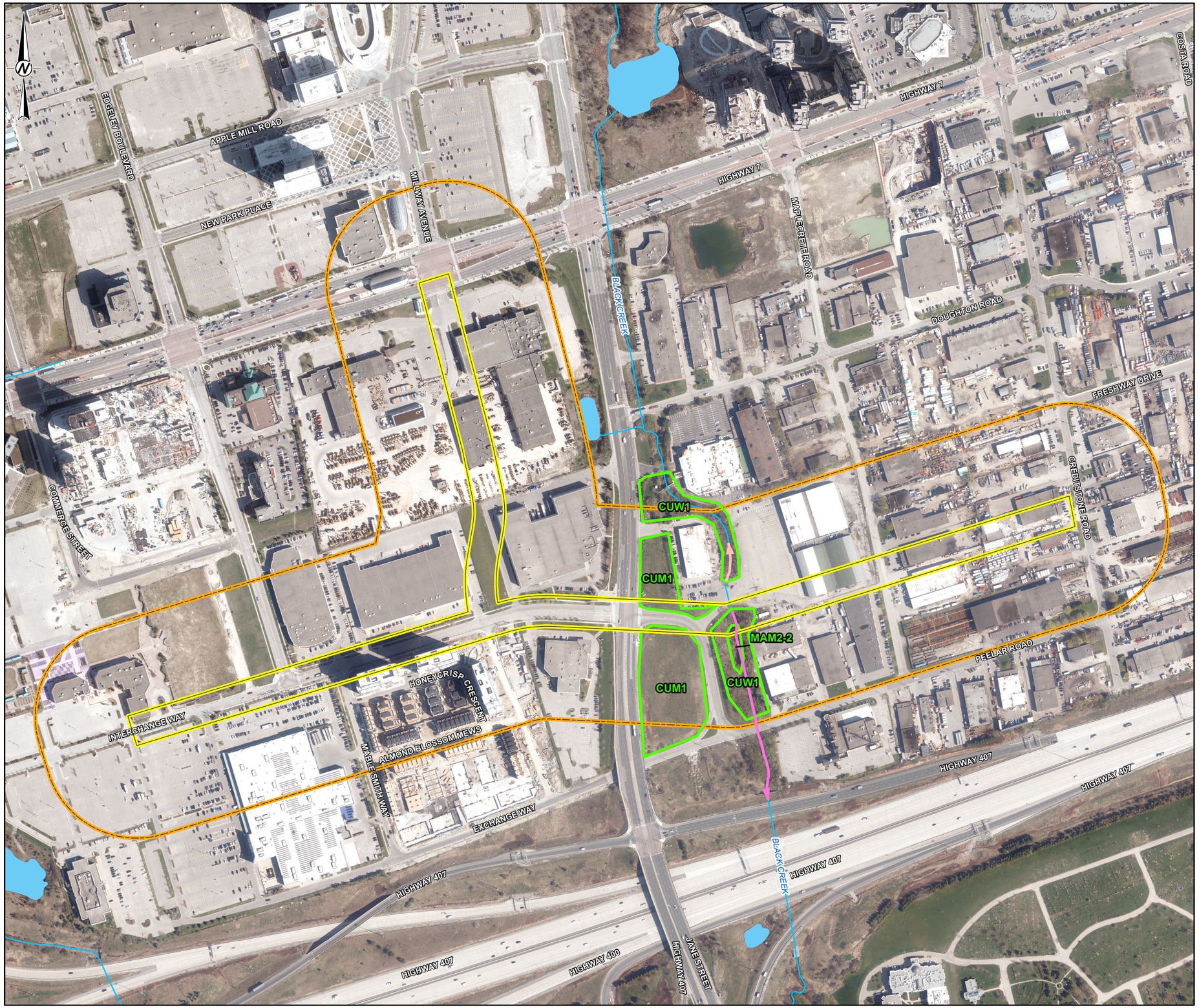
The Study Area is situated within Ecoregion 7E, the Lake Erie-Lake Ontario Ecoregion, which extends from Windsor and Sarnia east to the Niagara Peninsula and Toronto, with shoreline on Lakes Huron, Erie and Ontario. The vegetation in Ecoregion 7E is the most diverse in Canada. Remnants of Carolinian forests contain species such as the Tulip-tree, Black Gum, Sycamore, Kentucky Coffee-tree, Pawpaw, various Oaks and Hickories, and Common Hackberry, in addition to the more widespread Sugar Maple, American Beech, White Ash, Eastern Hemlock, and Eastern White Pine. This ecoregion also supports the largest remnants of tall-grass prairie in the province. Characteristic mammals such as White-tailed Deer, Northern Raccoon, Striped Skunk, and Virginia Opossum inhabit this ecoregion. Characteristics birds include Green Heron, Virginia Rail, Cooper's Hawk, Eastern Kingbird, Willow Flycatcher, Brown Thrasher, Yellow Warbler, Common Yellowthroat, Northern Cardinal, and Savannah Sparrow, with Wild Turkey having been re-introduced into this ecoregion. Herpetofauna is diverse, including provincially rare species (e.g., Spiny Softshell Turtle), as well as more frequent species such as Red-backed Salamander, American Toad, Eastern Gartersnake, and Midland Painted Turtle (Crins et al. 2009).

5.2.2 Vegetation Communities and Botanical Inventory

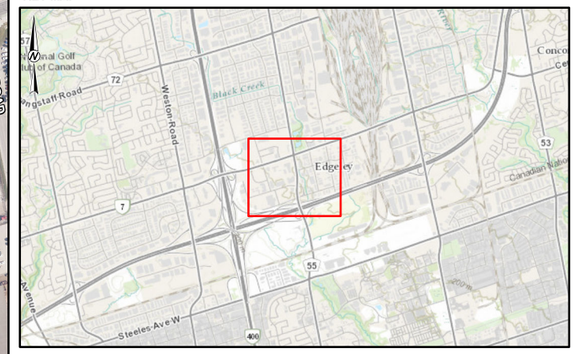
A total of 44 plants were documented (Appendix A) during the botanical inventory. Of these, 36 were identified to species while eight were identified to genus only. TRCA provides a local rank for each species which identifies none (0%) of the recorded species as Regional Species of Conservation Concern (L3), and two species (6%) as Urban Species of Conservation Concern (L4), Freeman's Maple and Pennsylvania Smartweed. Based on the Ontario Exotic Status as provided by NHIC, 20 (56%) of the plant species recorded in the Study Area are considered exotic in Ontario. The percentage of all plants inventoried by WSP was almost 44% native (16 species). This percentage is typical for plant communities along roads and in developed areas in Southern Ontario. A number of the introduced species recorded are also considered to be invasive. Species that are present which are considered particularly prolific include Garlic Mustard, Honeysuckles, Purple Loosestrife,

European Reed, and European Buckthorn. A complete floristic inventory of the Study Area is included in Appendix A.

The field work completed in 2021 identified most of the Study Area as composed of mostly highly disturbed, areas identifying three ELC polygons; Cultural Meadow (CUM1) (Photo 13), Cultural Woodland (CUW1) (Photo 14) which contains a Reed-canary Grass Mineral Meadow Marsh (MAM2-2) (Photo 15) within the Black Creek corridor, just east of Peelar Road (Figure 2). Dumping of garbage was recorded in the Cultural Woodland and Meadow Marsh communities.



KEY MAP



SCALE: 1:100,000

LEGEND

- WATERCOURSE
- 50 M UPSTREAM
- 250 M DOWNSTREAM
- SITE BOUNDARY
- STUDY AREA
- ECOLOGICAL LAND CLASSIFICATION
- WATER BODY

Name	Description
CUM1	Mineral Cultural Meadow Ecosite
CUW1	Mineral Cultural Woodland Ecosite
MAM2-2	Reed-canary Grass Mineral Meadow Marsh Type

0 50 100 200

1:5,000 METRES

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

1. CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE - ONTARIO
2. BASE MAP: © THE REGIONAL MUNICIPALITY OF YORK, YORK UNIVERSITY, CITY OF BRAMPTON, CITY OF TORONTO, YORK REGION, PROVINCE OF ONTARIO, ONTARIO MNR, ESRI CANADA, ESRI, HERE, GARMIN, INCREMENT P, USGS, METI/NASA, NGA, EPA, USDA, AAFC, NRCAN, MAXAR
3. COORDINATE SYSTEM: NAD 1983 CSRS UTM ZONE 17N

CLIENT
CITY OF VAUGHAN

PROJECT
VAUGHAN METROPOLITAN CENTRE (VMC) SCHEDULE 'C' CLASS ENVIRONMENTAL ASSESSMENT (EA) STUDIES FOR THE EXTENSIONS OF INTERCHANGE WAY AND MILLWAY AVENUE VAUGHAN, ONTARIO, CANADA

TITLE
ECOLOGICAL LAND CLASSIFICATION

CONSULTANT

wsp

YYYY-MM-DD	2024-05-16
DESIGNED	SO
PREPARED	LS
REVIEWED	SS/JT
APPROVED	----

PROJECT NO.	CONTROL	REV.	FIGURE
20M-01179-00	0001	A	2

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

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PATH: S:\Clients\City_of_Vaughan\Vaughan_Metropolitan_Centre(99)_PROJ\20M-01179-00\40_PROD\0002_Natural\Environment\Report\20M_01179_00-0002-EP-0000.aprx PRINTED ON: AT: 2:11:00 PM

Cultural Meadow (CUM1)

An approximately 1.2-hectare Cultural Meadow was identified northeast of the Jane Street and Exchange Avenue intersection, which continues north of Pellar Road to another approximately 0.50-hectare Cultural Meadow. Species in the Cultural Meadow include dominantly Smooth Brome, Knapweed Species, Fowl Bluegrass, Quackgrass.

Cultural Woodland (CUW1)

East and north of the Cultural Meadow is an approximatelty 0.79 hectares of Cultural Woodland within the Study Area which extends south to Peelar Road. Immediately north / east of Pellar Road, the Cultural Woodland contains MAM2-2. Separated by a parking lot to the north, the Cultural Woodland extends north in a narrow strip, and curves west towards Highway 55. Tree species in the Cultural Woodland include Hybrid White Willow and Manitoba Maple in the canopy layer, Manitoba Maple and Ash Species, and Grey Popular, in the sub-canopy, Honeysuckle Species was observed in the understory, Garlic Mustard was abundant in the ground layer, with frequent Smooth Brome, Avens Species, and Solidago Species observed in the ground layer.

Reed-canary Grass Mineral Meadow Marsh (MAM2-2)

Within the southern Cultural Woodland, is a small (approximately 0.1-hectare) Reed-canary Grass Mineral Meadow Marsh, bordering Black Creek. In the understory, Freeman's Maple was observed as rare in abundance. Reed Canarygrass was dominate in the ground layer, with frequent Narrow-leaved Cattail and Purple Loosestrife also recorded in the ground layer.

5.2.3 Incidental Wildlife

Species observed during the general wildlife survey included Raccoon (*Procyon lotor*), European Starling, White-throated Sparrow, Northern Cardinal, and Ring-billed Gull. A wasp nest was also observed during the general wildlife survey visit.

5.3 Species at Risk

A summary of provincially Endangered and Threatened SAR potentially within the vicinity of the Study Area, as documented from secondary source information, are provided in Table 7 below as well as within Appendix D. The probabilities provided in Table 7 are based on an assessment of each species' habitat preferences / needs in conjunction with background information and the results of the field investigations. The probabilities of occurrence are defined as 'High', 'Moderate', 'Low', and 'None' and are based on the following definitions:

- High: Those species recorded in the vicinity of the Study Area (typically within 10 km and recorded in the past 20 years, where the year of data is known) and whose preferred habitat is present. Species with 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: Those species in the vicinity of the Study Area but have limited suitable habitat within the Study Area. Species with moderate probabilities of occurrence may not occur within the Study Area frequently, but may intermittently use it for foraging, migration or movement to other parts of their home-range;
- Low: Those species recorded in the vicinity of the Study Area, but whose preferred habitat does not occur or is extremely limited within the Study Area. These species may intermittently move through the area but are unlikely to become permanent residents; and
- None: Those species whose preferred habitat is completely absent from the Study Area and may only migrate intermittently through the area if they occur at all.

Table 7: Species at Risk Potential Occurrence

Species Name, Status (ESA[1], SARA[2], S-Rank[3]), and Data Source[4]	Preferred Habitat	Potential For SAR Habitat/ Occurrence in the Study Area
Unisexual Ambystoma (Jefferson Salamander dependent population) (*Ambystoma* sp. DU 2), (END[1], END[2], S2[3]), Ontario Reptile and Amphibian Atlas[4]	In Ontario, the unisexual Jefferson salamander is found within deciduous or mixed forests containing, or adjacent to, suitable breeding ponds. Breeding ponds are normally ephemeral pools that dry in late summer. Terrestrial habitat is in moist woodlands, where the salamanders find shelter under fallen trees or rocks, as well as in mammal burrows. Adults forage during humid conditions at night on the forest floor within 1 km of the breeding pond. These salamanders also require terrestrial overwintering sites below the frost line (COSEWIC 2016).	Moderate - suitable habitat, including woodlands adjacent to breeding ponds, may exist on Site and within the Study Area within the Cultural Woodland, or Reed-canary Grass Mineral Meadow Marsh.
Acadian Flycatcher (*Empidonax virescens*), (END[1], END[2], S1B[3]), Ontario Breeding Bird Atlas[4]	In Ontario, Acadian flycatcher breeds in the understory of large, mature, closed-canopy forests, swamps and forested ravines. This bird prefers forests greater than 40 ha in size and exhibits edge sensitivity preferring the deep interior of the forest. Its nest is loosely woven and placed near the tip of branch in a small tree or shrub often, but not always, near water (Allen et al. 2002).	Low - no suitable mature, large forests are present on site or within the study area.
Bank Swallow (*Riparia riparia*), (THR[1], THR[2], S4B[3]), Ontario Breeding Bird Atlas[4]	In Ontario, bank swallow breeds in a variety of natural and anthropogenic habitats, including lake bluffs, stream and riverbanks, sand and gravel pits, and roadcuts. Nests are generally built in a vertical or near-vertical bank. Breeding sites are typically located near open foraging sites such as rivers, lakes, grasslands, agricultural fields, wetlands and riparian woods. Forested areas are generally avoided (Garrison 1999).	Moderate - suitable natural or anthropogenic habitat may exist on site or within the study area such as riverbanks and roadcuts.
Barn Swallow (*Hirundo rustica*), (SC[1], THR[2], S4B[3]), Ontario Breeding Bird Atlas[4]	In Ontario, barn swallow breeds in areas that contain a suitable nesting structure, open areas for foraging, and a body of water. This species nests in human made structures including barns, buildings, sheds, bridges, and culverts. Preferred foraging habitat includes grassy fields, pastures, agricultural cropland, lake and river shorelines, cleared rights-of-way, and wetlands (COSEWIC 2011). Mud nests are fastened to vertical walls or built on a ledge underneath an overhang. Suitable nests from previous years are reused (Brown and Brown 2019).	Moderate - suitable natural or anthropogenic habitat may exist on site or within the study area such as buildings, grassy fields, and river shorelines.
Bobolink (*Dolichonyx oryzivorus*), (THR[1], THR[2], S4B[3]), Ontario Breeding Bird Atlas[4]	In Ontario, bobolink breeds in grasslands or graminoid dominated hayfields with tall vegetation (Gabhauer 2007). Bobolink prefers grassland habitat with a forb component and a moderate litter layer. They have low tolerance for presence of woody vegetation and are sensitive to frequent mowing within the breeding season. They are most abundant in established, but regularly maintained, hayfields, but also breed in lightly grazed pastures,	Moderate - cultural meadows on site and within the study area may provide suitable breeding habitat.

Species Name, Status (ESA[1], SARA[2], S-Rank[3]), and Data Source[4]	Preferred Habitat	Potential For SAR Habitat/ Occurrence in the Study Area
	old or fallow fields, cultural meadows and newly planted hayfields. Their nest is woven from grasses and forbs. It is built on the ground, in dense vegetation, usually under the cover of one or more forbs (Renfrew et al. 2015).	
Chimney Swift (*Chaetura pelagica*), (THR[1], THR[2], S3B[3]), Ontario Breeding Bird Atlas[4]	In Ontario, chimney swift breeding habitat is varied and includes urban, suburban, rural and wooded sites. They are most commonly associated with towns and cities with large concentrations of chimneys. Preferred nesting sites are dark, sheltered spots with a vertical surface to which the bird can grip. Unused chimneys are the primary nesting and roosting structure, but other anthropogenic structures and large diameter cavity trees are also used (COSEWIC 2007).	Moderate - suitable buildings with chimneys or other vertical surfaces for the bird to grip may exist on site or within the study area.
Eastern Meadowlark (*Sturnella magna*), (THR[1], THR[2], S4B[3], S3N[3]), National Heritage Information Center (NHIC)[4], and Ontario Breeding Bird Atlas[4]	In Ontario, eastern meadowlark breeds in pastures, hayfields, meadows and old fields. Eastern meadowlark prefers moderately tall grasslands with abundant litter cover, high grass proportion, and a forb component (Hull 2019). They prefer well drained sites or slopes, and sites with different cover layers (Roseberry and Klimstra 1970).	Low - while there is a recorded occurrence within the NHIC 1km x 1 km square for this species, suitable tall grasslands are not present on site or within the study area.
Piping Plover (*Charadrius melodus*), (END[1], END[2], S1B[3]), iNaturalist[4]	In Ontario, breeding habitat for the piping plover consists of large, sparsely vegetated beaches of open sand, gravel or cobble, frequently adjacent to freshwater dune formations. The Great Lakes population typically breeds on beaches wider than 10 m with greater than 400 m of shoreline. Beaches separated from the tree line by freshwater dunes for at least 50 m are preferred. Nesting areas are often near to a seep, river or marsh. As of 2013, two subpopulations exist in Ontario. One population has bred in recent years on Lake Huron and Georgian Bay; the other population at Lake of the Woods. Historically, this species has bred at sites on Lake Erie and Lake Ontario (Kirk 2013).	Low - no suitable large, sparsely vegetated beaches are present on site or within the study area.
Red-headed Woodpecker (*Melanerpes erythrocephalus*), (END[1], END[2], S3[3]), Ontario Breeding Bird Atlas[4]	In Ontario, red-headed woodpecker breeds in open, deciduous woodlands or woodland edges and are often found in parks, cemeteries, golf courses, orchards and savannahs (Woodliffe 2007). They may also breed in forest clearings or open agricultural areas provided that large trees are available for nesting. They prefer forests with little or no understory vegetation. They are often associated with beech or oak forests, beaver ponds and swamp forests where snags are numerous. Nests are excavated in the trunks of large dead trees (Frei et al. 2017).	Moderate - suitable open woodland habitat may exist in the cultural woodland on site and within the study area.
Short-eared Owl (*Asio flammeus*), (THR[1], SC[2], S4?B[3], S2SN[3]), iNaturalist[4]	In Ontario, short-eared owl breeds in a variety of open habitats including grasslands, tundra, bogs, marshes, clear-cuts, burns, pastures and occasionally agricultural fields. The primary factor in determining breeding habitat is proximity to small mammal prey resources (COSEWIC 2008).	Low - no suitable open habitat such as grassland, tundra, bog, marsh, or agricultural fields are present on site or within the study area.

Species Name, Status (ESA[1], SARA[2], S-Rank[3]), and Data Source[4]	Preferred Habitat	Potential For SAR Habitat/ Occurrence in the Study Area
	Nests are built on the ground at a dry site and usually adjacent to a clump of tall vegetation used for cover and concealment (Gahbauer 2007).	
Wood Thrush (*Hylocichla mustelina*), (SC[1], THR[2], S4B[3]), Ontario Breeding Bird Atlas[4]	In Ontario, wood thrush breeds in moist, deciduous hardwood or mixed stands that are often previously disturbed, with a dense deciduous undergrowth and with tall trees for singing perches. This species selects nesting sites with the following characteristics: lower elevations with trees less than 16 m in height, a closed canopy cover (>70 %), a high variety of deciduous tree species, moderate subcanopy and shrub density, shade, fairly open forest floor, moist soil, and decaying leaf litter (COSEWIC 2012).	Moderate - suitable moist, previously disturbed habitat likely exists on site and within the study area in the Cultural Woodland.
Monarch (*Danaus plexippus*), (SC[1], END[2], S2N[3], S4B[3]), Ontario Butterfly Atlas[4], iNaturalist[4]	In Ontario, monarch is found throughout the northern and southern regions of the province. This butterfly is found wherever there is milkweed (Asclepias spp.) plants for its caterpillars and wildflowers that supply a nectar source for adults. It is often found on abandoned farmland, meadows, open wetlands, prairies and roadsides, but also in city gardens and parks. Important staging areas during migration occur along the north shores of the Great Lakes (COSEWIC 2010).	Low - while meadow habitat does exist on site, no milkweed plants were observed during the site visit.
Eastern Small-footed Myotis (*Myotis leibii*), (END[1], -[2], S2S3[3]), Bat Conservation International[4]	In Ontario, eastern small-footed myotis is not known to roost in trees, but there is very little known about its roosting habits. The species generally roosts on the ground under rocks, in rock crevices, talus slopes and rock piles, but it occasionally inhabits buildings. Entrances of caves or abandoned mines where humidity is low, and temperatures are cool and sometimes subfreezing may be used as hibernacula (Humphrey 2017).	Moderate - suitable roosting habitat may exist on site or within the study area such as within the ground under rocks, and rock piles.
Gray Fox (*Urocyon cinereoargenteus*), (THR[1], THR[2], S1[3]), Atlas of the Mammals of Ontario[4]	While the Ontario range of this species extends across much of southern and southeastern Ontario, the only known population in the province is on Pelee Island, with very rare sightings elsewhere in the province at points close to the border with the United States. This species inhabits deciduous forests and marshes and will den in a variety of features including rock outcroppings, hollow trees, burrows or brush piles, usually where dense brush provides cover and in close proximity to water. This species is considered a habitat generalist (COSEWIC 2015).	None - while this site may provide suitable habitat for this species, the site is outside of the current known population of this species.
Little Brown Myotis (*Myotis lucifugus*), (END[1], END[2], S3[3]), Atlas of the Mammals of Ontario[4], Bat Conservation International[4]	In Ontario, this species' range is extensive and covers much of the province. It will roost in both natural and man-made structures. Roosting colonies require a number of large dead trees, in specific stages of decay and that project above the canopy in relatively open areas. May form nursery colonies in the attics of buildings within 1 km of water. Caves or abandoned mines may be used as hibernacula, but high humidity and stable above freezing temperatures are required (ECCC 2018).	Moderate - suitable trees for roosting may exist on site and within the study area, as well as the site contains water. Potentially suitable foraging habitat for SAR bats is present within the Study Area, including cultural meadows, and cultural woodland vegetation.

Species Name, Status (ESA[1], SARA[2], S-Rank[3]), and Data Source[4]	Preferred Habitat	Potential For SAR Habitat/ Occurrence in the Study Area
Northern Myotis (*Myotis septentrionalis*), (END[1], END[2], S3[3]), Bat Conservation International[4]	In Ontario, this species' range is extensive and covers much of the province. It will usually roost in hollows, crevices, and under loose bark of mature trees. Roosts may be established in the main trunk or a large branch of either living or dead trees. Caves or abandoned mines may be used as hibernacula, but high humidity and stable above freezing temperatures are required (ECCC 2018).	Moderate - suitable trees for roosting may exist on site and within the study area. Potentially suitable foraging habitat for SAR bats is present within the Study Area, including cultural meadows, and cultural woodland vegetation.
Tricolored Bat (*Perimyotis subflavus*), (END[1], END[2], S3?[3]), Bat Conservation International[4]	In Ontario, tri-colored bat may roost in foliage, in clumps of old leaves, hanging moss or squirrel nests. They are occasionally found in buildings although there are no records of this in Canada. They typically feed over aquatic areas with an affinity to large-bodied water and will likely roost in close proximity to these. Hibernation sites are found deep within caves or mines in areas of relatively warm temperatures. These bats have strong roost fidelity to their winter hibernation sites and may choose the exact same spot in a cave or mine from year to year (ECCC 2018).	Moderate - suitable roosting habitat, such as clumps of leaves or squirrel nests, may exist on site and within the study area.
Blanding's Turtle (*Emydoidea blandingii*), (THR[1], END[2], S3[3]), Ontario Reptile and Amphibian Atlas[4]	In Ontario, Blanding's turtle will use a range of aquatic habitats, but favor those with shallow, standing or slow-moving water, rich nutrient levels, organic substrates and abundant aquatic vegetation. They will use rivers but prefer slow-moving currents and are likely only transients in this type of habitat. This species is known to travel great distances over land in the spring in order to reach nesting sites, which can include dry conifer or mixed forests, partially vegetated fields, and roadsides. Suitable nesting substrates include organic soils, sands, gravel and cobble. They hibernate underwater and infrequently under debris close to water bodies (COSEWIC 2016).	Low - aquatic habitat on site is limited, and highly disturbed, rendering it unsuitable
Black Ash (*Fraxinus nigra*), (END[1], -[2], S4[3]), National Heritage Information Center (NHIC)[4]	Found throughout Ontario in moist ecosystems; commonly found in northern swampy woodlands (MNRF 2018). This species typically grows on mucky or peaty soils and is considered a facultative wetland species (Reznicek et al. 2011).	Low - while there is a recorded occurrence within the NHIC 1km x 1 km square for this species, and suitable moist habitat may exist on site and within the study area, no Black Ash trees were observed during the site visit.
Butternut (*Juglans cinerea*), (END[1], END[2], S2?[3]), National Heritage Information Center[4], Vascular Plants at Risk in Ontario[4]	In Ontario, butternut is found along stream banks, on wooded valley slopes, and in deciduous and mixed forests. It is commonly associated with beech, maple, oak and hickory (Voss and Reznicek 2012). Butternut prefers moist, fertile, well-drained soils, but can also be found in rocky limestone soils. This species is shade intolerant (Farrar 1995).	Low - while there is a recorded occurrence within the NHIC 1km x 1 km square for this species, and suitable open habitat may exist on site and within the study area, no butternut trees were observed during the site visit.
Eastern Prairie Fringed Orchid (*Platanthera leucophaea*), (END[1], END[2], S2[3]), Vascular Plants at Risk in Ontario[4]	In Ontario, eastern prairie fringed-orchid grows in wet prairies, fens, bogs, wet meadows, and wet successional fields. It grows in full sun in neutral to mildly calcareous substrates, and occasionally grows along roadsides or lake margins (Eastern Prairie Fringed-orchid Recovery Team 2010). This	Low - suitable habitat along roadsides may exist on site and within the study area, however, the site is outside of the only two known locations for this species to occur.

Species Name, Status (ESA[1], SARA[2], S-Rank[3]), and Data Source[4]	Preferred Habitat	Potential For SAR Habitat/ Occurrence in the Study Area
	species is found only in southern Ontario, and only two locations are currently known on sand spits along the shore of Lake Erie.	
Eastern Prickly-pear Cactus (*Opuntia cespitosa*), (END[1], END[2], S1[3]), iNaturalist[4]	In Ontario, eastern prickly pear cactus occurs on dry substrates that are in the early stages of succession (COSEWIC 2010). Habitat includes rocks, shores, dunes, sandy fields, plains, open oak forests, and prairies. Occasionally it grows on disturbed ground along roadsides (Voss and Reznicek 2012). This species prefers full sunlight on well-drained sandy or rocky substrates (ODNR 1998).	Moderate - suitable disturbed ground along roadsides may provide suitable habitat on site and within the study area.
Purple Twayblade (*Liparis liliifolia*), (THR[1], THR[2], S2S3[3]), Vascular Plants at Risk in Ontario[4]	In Ontario, purple twayblade occurs in a wide variety of habitats such as open oak woodland and savannah, mixed deciduous forest, shrub thicket, shrub alvar, deciduous swamp, and conifer plantation. This species is commonly found in dry mesic conditions, but there have been reports from wetland habitats (COSEWIC 2010).	Moderate - suitable open habitat may exist within the cultural woodland on site and within the study area.

Notes:

1. Government of Ontario. 2007. Endangered Species Act (ESA). Available online: http://www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_07e06_e.htm

2. SARA rankings provided reflect Schedule 1 Status as of 14 July 2022

Government of Canada. 2015. Species at Risk (SARA) Public Registry. http://www.sararegistry.gc.ca/species/schedules_e.cfm?id=1.

3. S-Rank = S1 - Extremely rare throughout its range in the province; S2 - Rare throughout its range in the province; S3 - Uncommon or vulnerable species; S4 - Apparently Secure Species; S5 - Secure Species; SX - Extirpated; B - Breeding; N - Non-breeding; ? – Uncertainty

4. As listed in Section 3.1

5.4 Significant Wildlife Habitat

In addition to screening the site for potential SAR habitat, WSP ecologists completed a screening to review potential for SWH. The presence of potential candidate SWH within and adjacent to the site was determined based on the Significant Wildlife Habitat Criteria Schedule for Ecoregion 7E (MNRF, 2015). The following table lists SWH types applicable to Ecoregion 7E and those identified in bold are considered to have potential to occur within or adjacent to the site. Further discussion is provided related to those SWH types that have either been confirmed or determined to have potential.

Table 8: SWH Screening for the Study Area

SWH TYPE	WILDLIFE HABITAT
Seasonal Concentration Areas of Animals	• Waterfowl Stopover and Staging Areas (Terrestrial) • Waterfowl Stopover and Staging Areas (Aquatic) • Shorebird Migratory Stopover Area • Raptor Wintering Area • Bat Hibernacula • Bat Maternity Colonies • Turtle Wintering Areas • Reptile Hibernacula • Colonially - Nesting Bird Breeding Habitat (Bank and Cliff) • Colonially - Nesting Bird Breeding Habitat (Tree/Shrubs) • Colonially - Nesting Bird Breeding Habitat (Ground) • Migratory Butterfly Stopover Areas • Landbird Migratory Stopover Areas • Deer Winter Congregation Areas
Rare Vegetation Communities	• Cliffs and Talus Slopes • Sand Barren • Alvar • Old Growth Forest • Savannah • Tallgrass Prairie

SWH TYPE	WILDLIFE HABITAT
	• Other Rare Vegetation Communities
Specialized Habitat for Wildlife	• Waterfowl Nesting Area • Bald Eagle and Osprey Nesting, Foraging and Perching Habitat • Woodland Raptor Nesting Habitat • Turtle Nesting Areas • Seeps and Springs • Amphibian Breeding Habitat (Woodland) • Amphibian Breeding Habitat (Wetlands) • Woodland-area Sensitive Bird Breeding Habitat
Habitat for Species of Conservation Concern (Not including Endangered or Threatened Species)	• Marsh Breeding Bird Habitat • Open Country Bird Breeding Habitat • Shrub/Early Successional Bird Breeding Habitat • Terrestrial Crayfish • Special Concern and Rare Wildlife Species o See Appendix D
Animal Movement Corridors	• Amphibian Movement Corridors
Significant Wildlife Habitat Exceptions for Ecodistricts within EcoRegion 7E	• EcoDistricts • 7E-2 – Bat Migratory Stopover Area

6 Identification and Evaluation of Alternatives

Phase 3 of the Municipal Class EA process involves the assessment and evaluation of design alternatives. Having established the need for the project and selected a Preferred Alternative Solution this next phase involved the development and evaluation of design alternatives for the study area. Phase 3 for the Class EA studies involved the following activities:

- Development of Preliminary Design Alternatives;
- Consider feedback received at Public Information Centre #1 and refine Design Alternatives;
- Identification of evaluation criteria and weighting for evaluation of alternatives;
- Evaluation of Alternatives;
- Consider feedback received at Public Information Centre #2; and
- Selection of the Technically Preferred Alternative.

An evaluation framework was developed and is presented within the Environmental Study Reports (ESR). Details of the alternatives and the preferred alternatives can be found within the documents listed below.

- Vaughan Metropolitan Centre – Schedule 'C' Municipal Class EA for the Extension of Millway Avenue - Environmental Study Report
- Vaughan Metropolitan Centre – Schedule 'C' Municipal Class EA for the Extension of Interchange Way - Environmental Study Report

7Preferred Alternative / Proposed Works

The Preferred Alternatives include widening of Interchange Way from two to four lanes, extension of Interchange Way east of Jane Street to Credit Stone Road, and the construction of a new Millway Avenue extension from north of Interchange Way to south of Highway 7. Millway Avenue will be classified as a Special Collector Road, serving as a mobility hub with adjacent retail, commercial, transit, high-density residential, and public spaces. Interchange Way will be classified as a Major Collector Road, with multi-modal transportation prioritized through the accommodation of transit and pedestrian/cycling infrastructure.

The improvements will include the following features:

- Widening of the Interchange Way from two to four lanes with a center median barrier.
- New 2-meter-wide raised cycle tracks on both sides along Interchange Way and Millway Avenue.
- Decorative paving at intersections at both Interchange Way and Millway Avenue.
- Re-alignment of Black Creek and new Interchange Way overpass, completed under a separate project (Black Creek Renewal Project).
- Drainage and stormwater management improvements including potential Low Impact Development (LID) measures.
- Illumination improvements and relocation of impacted utilities.
- Potential for decorative paving at intersections and transit stops, to respect broader VMC character.

8 Potential Impacts of Proposed Works and Recommended Protection / Mitigation Measures

The following sections identify potential effects on the terrestrial and aquatic environments as result of proposed construction of the Project and recommended avoidance and mitigation measures based on the current understanding of the proposed Project works, the existing conditions within the Project Site and surrounding Study Area, as determined through background documents and desktop resources available at the time of the analysis. It should be noted that the effects assessment as presented herein was completed based on the 30% preliminary design that was available at the time of preparation of this NER and therefore, should there be any significant design changes from current design as the Project develops through the preliminary and detailed design phases, additional field work, effects assessments, mitigation measures and monitoring, and permitting requirements may be required with respect to the natural environment.

8.1 Aquatic Environment

Black Creek is being realigned as part of a separate project (Black Creek Renewal Project) and will be independent of these project works. As such, no direct impacts to Black Creek are discussed within this report.

8.2 General Vegetation, Wildlife and Wildlife Habitat Impacts

The Project Boundary consists of the areas where vegetation removal is anticipated to be required for the Project based on the 30% preliminary design. As a conservative approach, all vegetation overlapped by the project boundary was assumed to be permanently removed during construction.

Approximately 1.69 hectares of Cultural Meadow (CUM1) exists within the Study Area, with only 0.15 ha within the Project Boundary. The Cultural Meadow within the Project Boundary is directly north and south of Peelar Road.

Approximately 0.09 ha of Reed-canary Grass Mineral Meadow Marsh (MAM2-2), is within the Study Area, with approximately 0.01 ha of the northern edge of Reed-canary Grass Mineral Meadow Marsh is within the Project Boundary, and the remaining 0.08 ha is within the Study Area.

Excluding the Reed-canary Mineral Meadow Marsh that is contained within the Cultural Woodland (CUW1) approximately 0.79 ha of Cultural Woodland was identified within the Study Area, with approximately 0.11 ha of the CUW1 is within the Project Boundary and 0.41 ha within the Study Area south of the project boundary, and 0.27 ha within the Study Area north of the Project Boundary. The Project Boundary contains the north edge of the southern Cultural Woodland community, with the remainder of this patch of community within the Study Area. The northern Cultural Woodland contains some area of the Study Area, with the northern most tip being outside of the Study Area. Vegetation within the project boundary is anticipated to be removed to accommodate the project work.

Most of the area of the construction zone has been heavily disturbed, and contains weedy, introduced species such as Canada Thistle (*Cirsium arvense*) and Reed-canary Grass (*Phalaris arundinacea var. arundinacea*). The removal of small areas of vegetation on the edge of the Cultural Meadow, Cultural Woodland, and Reed-canary Grass Mineral Meadow Marsh communities is necessary within the construction area illustrated on Figure 2.

Additionally, there is the potential for harm, harassment and/or death of wildlife and/or SAR (including migratory birds, turtles, frogs, bats, and snakes) within the construction zone.

8.3 General Vegetation, Wildlife and Wildlife Habitat Mitigation

- The limits of vegetation clearing shall be clearly staked in the field and disturbance beyond the staked limits shall not be permitted.
- Any wildlife incidentally encountered during construction will not be knowingly harmed or harassed and will be allowed to move away on its own.
- In the event that an animal encountered during construction does not move from the construction zone and construction activities are such that continuing construction in the area would result in harm to the animal, all activities that could potentially harm the animal will cease immediately and the Contract Administrator and/or Environmental Inspector will be notified.

8.4 Regulated Features

A portion of the Site and Study Area consists of TRCA Regulated Area. Impacts to this Regulated Area surrounding Black Creek are to be mitigated through erosion and sediment control measures, as well as keeping vegetation clearing to a minimum.

8.5 Species at Risk Impacts

The proposed works have the potential to impact vegetation communities and associated SAR and SAR habitat through both direct and indirect impacts. Based on the SAR Screening, there is moderate potential suitable habitat within the Project Boundary and within the Study Area for 11 species designated threatened or endangered under the ESA:

- Jefferson Salamander dependent population (Ambystoma sp. DU 2; END – ESA and SARA). Suitable habitat, including woodlands adjacent to breeding ponds, may exist

within the project boundary and within the Study Area in the Cultural Woodland, or Reed-canary Grass Mineral Meadow Marsh.

- Bank Swallow (Riparia riparia; THR – ESA and SARA). Suitable natural or anthropogenic habitat may exist within project boundary or within the study area such as riverbanks and roadcuts.
- Bobolink (Dolichonyx oryzivorus; THR – ESA and SARA). Cultural Meadows within the project boundary and within the Study Area may provide suitable breeding habitat.
- Chimney Swift (Chaetura pelagica; THR – ESA and SARA). Suitable buildings with chimneys or other vertical surfaces for the bird to grip may exist witihin the project boundary or within the study area.
- Red-headed Woodpecker (Melanerpes erythrocephalus; END – ESA and SARA). Suitable open woodland habitat may exist in the cultural woodland within the project boundary and within the Study Area.
- Eastern Small-footed Myotis (Myotis leibii; END – ESA), and Tricolored Bat (Perimyotis subflavus; END – ESA and SARA). A rock pile was observed in the southern side of the Cultural Woodland, which could potentially provide habitat for Eastern Small-footed Myotis, and clumps of leaves or squirrel nests may provide suitable habitat for Tricolored Bat.
- Little Brown Myotis (Myotis lucifugus; END – ESA and SARA), and Northern Myotis (Myotis septentrionalis; END – ESA and SARA). Potentially suitable cavity trees for SAR bat roosting may exist within the Study Area. Potentially suitable foraging habitat for SAR bats is present within the Study Area, including Cultural Meadows, and Cultural Woodland vegetation.
- Eastern Prickly-pear Cactus (Opuntia cespitosa; END – ESA and SARA). Suitable disturbed ground along roadsides may provide suitable habitat within the project boundary and within the Study Area for this species.
- Purple Twayblade (Liparis liliifolia; THR – ESA and SARA). Suitable open habitat may exist within the Cultural Woodland within the project boundary and within the Study Area.

8.6 Species at Risk Mitigation

As noted, the project boundary and Study Area provides potential habitat for endangered and threated species protected under the ESA, including: four SAR bats, Bank Swallow, Bobolink, Chimney Swift, Eastern Prickly-pear Cactus, Jefferson Salamander dependent population, Purple Twayblade, and Red-headed Woodpecker. The following measures shall be implemented for the protection of SAR and SAR habitat.

- Tree removals are not to occur between April 1 - November 30 (active season for migratory bats) to ensure that no direct harm to SAR bat individuals occurs (including potential maternal and day-roosting bats). Refer to the Arborist report for tree protection information.
- If a tree identified as potential SAR bat roosting habitat cannot be removed between October 1 and March 31, the tree will be flagged and protected from harm. If protection of this tree is not possible, MECP will be consulted to determine if there are options for tree removal during the bat active season.
- An appropriate sediment and erosion control (ESC) plan shall be developed to manage the discharged water. Water shall be discharged into the swamp in such a way as to prevent erosion of soils, disturbance of vegetation and deposition of sediment.
- If the presence of SAR individuals is confirmed, permitting or registration under the ESA for removal of habitat may be required. Additional consultation with the Ontario Ministry of the Environment, Conservation and Parks (MECP) may be necessary to confirm permitting or registration requirements.

8.6.1 Migratory Birds Impacts

Nesting migratory birds and their nests, eggs and young are protected under the Migratory Bird Convention Act (MBCA 1994) and Regulations (2022) under that Act. No work is permitted to proceed that would result in the destruction of active nests (i.e., nests with eggs or young birds), or the wounding or killing of bird species protected under the MBCA.

As tree removal is required, there is the potential for harm to nesting birds, if present within the trees.

8.6.2 Migratory Birds Mitigation

To ensure compliance with the MBCA and Regulations, a due diligence approach is recommended, as follows:

- Awareness of the potential for nesting activity within the project limits during the Regional Nesting Period.
- Avoidance of activities that may disturb or harm nesting migratory birds.
  - Vegetation clearing (including grubbing and tree/shrub/grass removal) and any construction activities, in areas where migratory birds might nest should be scheduled to avoid the Regional Nesting Period (approximately March 31 to August 31). The Contractor will be made aware that occasionally bird species will precede or exceed the approximate breeding bird window.
  - If vegetation clearing must occur within the Regional Nesting Period, a nest search by a qualified biologist may be conducted in 'simple habitats', as defined by ECCC. If no nesting is observed, vegetation clearing shall occur within 48 hours of the nest search. Nest searches are due diligence measures that do not constitute or guarantee compliance with the MBCA. It remains the responsibility of the individual or company undertaking the activities to ensure compliance with the MBCA.
- Prevention and mitigation of potential impacts on migratory birds:
  - No active nests will be removed, or birds or nests disturbed in accordance with the MBCA.
  - The Contractor will be advised that all temporary brush and loose soil or aggregate piles that are expected to remain undisturbed for greater than 48 hours, should be tarped or otherwise inspected regularly to prevent nesting as they provide potentially suitable nesting sites for some species.
  - If a nesting migratory bird is identified within the construction site and the construction activities are such that continuing construction in that area might result in a contravention of the MBCA (i.e., potential harm or stress to nests, birds, eggs or young), all activities must cease, and the Contractor Administrator immediately notified.

8.7 Potential Indirect Impacts:

- Damage to the Reed-canary Grass Mineral Meadow Marsh
  - Erosion of soil and uprooting vegetation
  - Sediment deposition
  - Sediment releases downgradient/downstream from the work area.

Sediment and erosion control measures including the use of silt fencing is recommended to reduce indirect impacts related to construction,

9Summary and Conclusion

The City of Vaughan is preparing a MCEA for the extensions of Interchange Way from Commerce Street to Creditstone Road, and Millway Avenue from Highway 7 to Interchange Way. As part of these works, WSP is preparing two EAs for Phases 3 and 4 for Interchange Way and Millway Avenue. The Project Boundary is located within a heavily disturbed and anthropogenic area.

The results of this study as documented herein indicate that the proposed Project may result in permanent and temporary impacts to inhabiting wildlife and vegetation species. In addition, and based on the SAR Screening, there is potential suitable habitat within the Project Boundary and within the Study Area for 11 species designated threatened or endangered under the ESA, as well as Significant Wildlife Habitat for five Special Concern species.

The implementation of the avoidance and mitigation measures as presented above will limit any temporary impacts on the natural environment and ensure compliance with applicable environmental legislation.

To protect the natural environment during construction the following key mitigation features shall be implemented:

- Implement the ESC Plan, ensuring controls are in place to minimize sediment intrusion into Black Creek and surrounding vegetated areas;
- Minimize riparian vegetation removal; April 1 - November 30
- Tree removals are to occur between December 1st and March 31st (bat hibernation period) to ensure that no direct harm to SAR bat individuals occurs (including potential maternal and day-roosting bats).
- Undertake vegetation removal outside of the migratory bird nesting period (31 March to 31 August); and
- Contact MECP for any encounters or sightings of SAR.

Should the mitigation measures outlined be implemented, no negative impacts to SAR or SWH is anticipated to occur.

Regarding the slight proposed shift to the preferred alternative design for Interchange Way in alignment, as the field studies and evaluation of impacts included a 120 m buffer on the footprint, the shifts in alignment have been included within the impact assessment and mitigation strategies. No further investigations or reporting updates are required.

10 References

Allen MC, Napoli MM, Sheehan J, Master TL, Pyle P, Whitehead DR, Taylor T. 2002. Acadian Flycatcher (Empidonax virescens). The Birds of North America Online (A. Poole, Ed.), Version 2. Ithaca NY: Cornell Lab of Ornithology; [accessed 29 November 2019]. https://doi.org/10.2173/bna.acafly.02

BCI (Bat Conservation International). 2024. Species Profiles. [accessed April 2024]. http://www.batcon.org/about-bats/bat-profiles/?fwp_location=ontario

Brown MB, Brown CR. 2019. Barn Swallow (Hirundo rustica). In The Birds of North America Online (P. G. Rodewald, ed), version 2.0. Ithaca NY: Cornell Lab of Ornithology; [accessed 20 November 2019]. https://doi.org/10.2173/bna.barswa.02.

Cadman, M., D. Sutherland, G. Beck, D. Lepage and A. Couturier (eds). 2007. Atlas of the Breeding Birds of Ontario, 2001-2005. Bird Studies Canada, Environment Canada, Ontario Field Ornithologists, Ontario Ministry of Natural Resources and Ontario Nature, Toronto, xxii + 706 pp.

Canada, Government of (Canada). (1985). *Fisheries Act.* R.S.C. 1985, c. F-14.

Canada, Government of (Canada). (1994). *Migratory Birds Convention Act*. S.C. 1994, c. 22.

Canada, Government of (Canada). (2002). *Species at Risk Act*. S.C. 2002, c. 29.

City of Vaughan. (2013) DRAFT Environmental Management Guideline in support of the Vaughan Official Plan (VOP 2010).

COSEWIC (Committee on the Status of Endangered Wildlife in Canada). 2016. COSEWIC assessment and status report on the unisexual Ambystoma, Ambystoma laterale, Small-mouthed Salamander-dependent population, Jefferson Salamander-dependent population and the Blue-spotted Salamander-dependent population, in Canada. Ottawa ON: Committee on the Status of Endangered Wildlife in Canada; [accessed 22 November 2019].

https://wildlife-species.canada.ca/species-risk-registry/virtual_sara/files/cosewic/sr_Unisexual%20Ambystoma_2016_e.pdf. xxii + 61 p.

COSEWIC (Committee on the Status of Endangered Wildlife in Canada). 2011. COSEWIC assessment and status report on the Barn Swallow Hirundo rustica in Canada. Ottawa ON: Committee on the Status of Endangered Wildlife in Canada; [accessed 22 November 2019]. https://wildlife-species.canada.ca/species-risk-registry/virtual_sara/files/cosewic/sr_barn_swallow_0911_eng.pdf. ix + 37 p.

COSEWIC (Committee on the Status of Endangered Wildlife in Canada). 2007. COSEWIC assessment and status report on the Chimney Swift Chaetura pelagica in Canada. Ottawa ON: Committee on the Status of Endangered Wildlife in Canada; [accessed 22 November 2019]. https://wildlife-species.canada.ca/species-risk-registry/virtual_sara/files/cosewic/sr_chaetura_pelagica_e.pdf. vii + 49 p.

COSEWIC (Committee on the Status of Endangered Wildlife in Canada). 2008. COSEWIC assessment and update status report on the Short-eared Owl Asio flammeus in Canada. Ottawa ON: Committee on the Status of Endangered Wildlife in Canada; [accessed 02 December 2019]. https://wildlife-species.canada.ca/species-risk-registry/virtual_sara/files/cosewic/sr_shorteared_owl_0808_e.pdf. vi + 24 p.

COSEWIC (Committee on the Status of Endangered Wildlife in Canada). 2012. COSEWIC assessment and status report on the Wood Thrush Hylocichla mustelina in Canada. Ottawa ON: Committee on the Status of Endangered Wildlife in Canada; [accessed 02 December 2019]. https://wildlife-species.canada.ca/species-risk-registry/virtual_sara/files/cosewic/sr_Wood%20Thrush_2013_e.pdf. ix + 46 p.

COSEWIC (Committee on the Status of Endangered Wildlife in Canada). 2010. COSEWIC assessment and status report on the Monarch Danaus plexippus in Canada. Ottawa ON: Committee on the Status of Endangered Wildlife in Canada; [accessed 22 November 2019]. https://www.registrelep-sararegistry.gc.ca/virtual_sara/files/cosewic/sr_Monarch_0810_e1.pdf. vii + 43 p.

COSEWIC (Committee on the Status of Endangered Wildlife in Canada). 2015. COSEWIC assessment and update status report on the grey fox Urocyon cinereoargenteus in Canada.

Ottawa ON: Committee on the Status of Endangered Wildlife in Canada; [accessed 02 December 2019]. https://wildlife-species.canada.ca/species-risk-registry/virtual_sara/files/cosewic/sr_Gray%20Fox_2015_e.pdf. xii + 54 p.

COSEWIC (Committee on the Status of Endangered Wildlife in Canada). 2016. COSEWIC assessment and update status report on the Blanding's Turtle Emydoidea blandingii (Nova Scotia population and Great Lakes/St. Lawrence population) in Canada. Ottawa ON: Committee on the Status of Endangered Wildlife in Canada; [accessed 02 December 2019]. https://wildlife-species.canada.ca/species-risk-registry/virtual_sara/files/cosewic/sr_Blanding%E2%80%99s%20Turtle_2016_e.pdf. xix + 110 p.

COSEWIC (Committee on the Status of Endangered Wildlife in Canada). 2010. COSEWIC assessment and status report on the Eastern Prickly Pear Cactus Opuntia humifusa in Canada. Ottawa ON: Committee on the Status of Endangered Wildlife in Canada; [accessed 04 December 2019]. https://wildlife-species.canada.ca/species-risk-registry/virtual_sara/files/cosewic/sr_Eastern%20Prickly%20Pear%20Cactus_0810_e.pdf. x + 30 p.

COSEWIC (Committee on the Status of Endangered Wildlife in Canada). 2010. COSEWIC assessment and status report on the Purple Twayblade Liparis liliifolia in Canada. Ottawa ON: Committee on the Status of Endangered Wildlife in Canada; [accessed 16 December 2019]. https://wildlife-species.canada.ca/species-risk-registry/virtual_sara/files/cosewic/sr_purple_twayblade_0911_eng.pdf. xii + 25p.

DFO. 2024. Aquatic species at risk map. [accessed April 2024]. http://www.dfo-mpo.gc.ca/species-especes/sara-lep/map-carte/index-eng.html.

Dobbyn JS. 1994. Atlas of the Mammals of Ontario. Toronto ON: Federation of Ontario Naturalists. 120 p.

Eastern Prairie Fringed-orchid Recovery Team. 2010. Recovery strategy for the Eastern Prairie Fringed-orchid (Platanthera leucophaea) in Ontario. Ontario Recovery Strategy Series. Peterborough ON: Ontario Ministry of Natural Resources; [accessed 02 December

2019]. https://www.ontario.ca/page/eastern-prairie-fringed-orchid-recovery-strategy. vi + 30 p.

eBird. 2024. eBird: An online database of bird distribution and abundance. Ithaca NY: eBird; [accessed October 2022]. https://ebird.org/map/.

ECCC (Environment and Climate Change Canada). 2018. Recovery Strategy for the Little Brown Myotis (Myotis lucifugus), the Northern Myotis (Myotis septentrionalis), and the Tri-colored Bat (Perimyotis subflavus) in Canada. Species at Risk Act Recovery Strategy Series. Ottawa ON: Environment and Climate Change Canada; [accessed 02 December 2019]. https://wildlife-species.canada.ca/species-risk-registry/virtual_sara/files/plans/Rs-TroisChauveSourisThreeBats-v01-2019Nov-Eng.pdf. ix + 172 p.

ECCC (Environment and Climate Change Canada). 2018. Recovery Strategy for the Little Brown Myotis (Myotis lucifugus), the Northern Myotis (Myotis septentrionalis), and the Tri-colored Bat (Perimyotis subflavus) in Canada. Species at Risk Act Recovery Strategy Series. Ottawa ON: Environment and Climate Change Canada; [accessed 02 December 2019]. https://wildlife-species.canada.ca/species-risk-registry/virtual_sara/files/plans/Rs-TroisChauveSourisThreeBats-v01-2019Nov-Eng.pdf. ix + 172 p.

ECCC (Environment and Climate Change Canada). 2018. Recovery Strategy for the Little Brown Myotis (Myotis lucifugus), the Northern Myotis (Myotis septentrionalis), and the Tri-colored Bat (Perimyotis subflavus) in Canada. Species at Risk Act Recovery Strategy Series. Ottawa ON: Environment and Climate Change Canada; [accessed 02 December 2019]. https://wildlife-species.canada.ca/species-risk-registry/virtual_sara/files/plans/Rs-TroisChauveSourisThreeBats-v01-2019Nov-Eng.pdf. ix + 172 p.

Farrar JL. 1995. Trees in Canada. Markham, ON: Fitzhenry & Whiteside Limited and Ottawa, ON: Canadian Forest Service, Natural Resources Canada. 502 p.

Frei B, Smith KG, Withgott JH, Rodewald PG, Pyle P, Patten MA. 2017. Red-headed Woodpecker (Melanerpes erythrocephalus). In The Birds of North America (PG Rodewald, ed), version 2.1. Ithaca, NY: Cornell Lab of Ornithology; [accessed 02 December 2019]. https://doi.org/10.2173/bna.rehwoo.02.1.

Gabhauer MA. 2007. Bobolink, pp. 586-587 in Cadman MD, Sutherland DA, Beck GG, Lepage D, Couturier AT, eds. Atlas of the Breeding Birds of Ontario, 2001-2005. Toronto ON: Bird Studies Canada, Environment Canada, Ontario Field Ornithologists, Ontario Ministry of Natural Resources and Ontario Nature. xxii + 706 p.

Gahbauer MA. 2007. Short-eared Owl, pp. 302-303 in Cadman MD, Sutherland DA, Beck GG, Lepage D, Couturier AR, eds. Atlas of the Breeding Birds of Ontario, 2001-2005. Toronto ON: Bird Studies Canada, Environment Canada, Ontario Field Ornithologists, Ontario Ministry of Natural Resources and Ontario Nature. xxii + 706 p.

Garrison BA. 1999. Bank Swallow (Riparia riparia). The Birds of North America Online (AF Poole and FB Gill, eds). Ithaca NY: Cornell Lab of Ornithology; [accessed 20 November 2019]. https://doi.org/10.2173/bna.414.

Hull SD, Shaffer JA, Lawrence DI. 2019. The effects of management practices on grassland birds: Eastern Meadowlark (Sturnella magna). Jamestown ND: US Geological Survey; [accessed 02 December 2019]. https://pubs.usgs.gov/pp/1842/mm/pp1842MM.pdf.

Humphrey C. 2017. Recovery Strategy for the Eastern Small-footed Myotis (Myotis leibii) in Ontario. Ontario Recovery Strategy Series. Peterborough ON: Ontario Ministry of Natural Resources; [accessed 02 December 2019]. https://files.ontario.ca/mnrf_sar_rs_esfm_final_accessible.pdf vii + 76 p.

iNaturalist. 2024. Observations Map. [accessed April 2022]. https://www.inaturalist.org/observations/.

Jones C, Layberry R, Macnaughton A, Cavasin R, Edwards B. 2021. Ontario Butterfly Atlas. [accessed April 2024]. Toronto Entomologists' Association. http://www.ontarioinsects.org/atlas/index.htm.

Kirk DA. 2013. Recovery Strategy for the Piping Plover (Charadrius melodus) in Ontario. Peterborough ON: Ontario Ministry of Natural Resources; [accessed 02 December 2019]. https://www.ontario.ca/page/piping-plover-recovery-strategy. vi + 61 p.

Lee, H. T, W.D. Bakowsky, J. L. Riley, J. Bowles, M. Puddister, P. Uhlig, and S. McMurray, 1998. Ecological Land Classification for Southern Ontario: First Approximation and its Application. Ontario Ministry of Natural Resources, Southcentral Region, Science Development and Transfer Branch. Technical Manual ELC-005.

Leslie, J. (2018). Vascular Plants at Risk in Ontario. Savanta Inc.: http://cms.savanta.ca/Subject Property's/default/files/2018-08/SAR_Document_2018_05_25_1.pdf

Ministry of Natural Resources and Forestry (MNRF). 2024. Land Information Ontario (LIO). Aquatic Resource Area) Accessed April 2024. Available from: https://geohub.lio.gov.on.ca/

MNR (Ontario Ministry of Natural Resources). 2000. Significant Wildlife Habitat Technical Guide. Peterborough ON: Ontario Ministry of Natural Resources and Forestry Fish and Wildlife Branch, Wildlife Section. https://docs.ontario.ca/documents/3620/significant-wildlife-habitat-technical-guide.pdf. 151 pp.

MNRF (Ministry of Natural Resources and Forestry). 2019. Black Ash. [modified 16 October 2019; accessed 04 December 2019]. https://www.ontario.ca/page/black-ash.

MNRF (Ontario Ministry of Natural Resources and Forestry). 2015. Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E. Peterborough ON: Ontario Ministry of Natural Resources and Forestry Regional Operations Division, Southern Region Resource Section. https://docs.ontario.ca/documents/4775/schedule-7e-jan-2015-access-ver-final-s.pdf. 39 pp.

NHIC (Natural Heritage Information Centre). 2024. Make a Map: Natural Heritage Areas. Queen's Printer for Ontario; [accessed April 2024]. https://www.lioapplications.lrc.gov.on.ca/Natural_Heritage/index.html?viewer=Natural_Heritage.Natural_Heritage&locale=en-CA

ODNR (Ohio Department of Natural Resources). 1998. Opuntia humifusa (Raf.) Raf. (Prickley Pear). Division of Natural Areas and Preserves. [accessed 04 December 2019]. https://naturepreserves.ohiodnr.gov/portals/dnap/pdf/Rare_Plant_Abstracts/Opuntia%20humifusa.pdf. 2 p.

Ontario Nature. 2024. Ontario Reptile and Amphibian Atlas. [accessed April 2024]. https://www.ontarioinsects.org/herp/index.html?Sort=0&area2=squaresCounties&records=all&myZoom=5&Lat=46.58&Long=-85.81

Ontario, Government of (Ontario). (2024). *O. Reg. 41/24: Prohibited Activities, Exemptions and Permits*. Conservation Authorities Act, R.S.O. 1990, c. C.27. Retrieved from

Renfrew R, Strong AM, Perlut NG, Martin SG, Gavin TA. 2015. Bobolink (Dolichonyx oryzivorus). In The Birds of North America (PG Rodewald, ed.), version 2.0. Ithaca NY: Cornell Lab of Ornithology; [accessed 29 November 2019]. https://doi.org/10.2173/bna.176.

Reznicek AA, Voss EG, Walters BS. 2011. Fraxinus nigra. Ann Arbour MI: University of Michigan; [accessed 19 December 2018]. https://michiganflora.net/species.aspx?id=1733.

Roseberry JL, Klimstra WD. 1970. The nesting ecology and reproductive performance of the Eastern Meadowlark. The Wilson Bulletin 82(3): 243-267.

Toronto and Region Conservation Authority (TRCA). 2014. Environmental Impact Statement Guidelines

Toronto and Region Conservation Authority (TRCA). (2023). Regulated Area Search: https://trca.ca/planning-permits/regulated-area-search-v3/

Voss EG, Reznicek AA. 2012. Field Manual of Michigan Flora. Ann Arbour MI: University of Michigan Press. 990 p.

Voss EG, Reznicek AA. 2012. Field Manual of Michigan Flora. Ann Arbour MI: University of Michigan Press. 990 p.

Woodliffe PA. 2007. Red-headed Woodpecker, pp. 320-321 in Cadman MD, Sutherland DA, Beck GG, Lepage D, Couturier AR, eds. Atlas of the Breeding Birds of Ontario, 2001-2005. Toronto ON: Bird Studies Canada, Environment Canada, Ontario Field Ornithologists, Ontario Ministry of Natural Resources and Ontario Nature. xxii + 706 p.

Appendix A: Plant List

SCIENTIFIC NAME	COMMON NAME	CC [1]	CW[1]	WEEDINESS[1]	OWES WETLAND PLANT LIST[2]	G_RANK[3]	N_RANK	S_RANK[4]	COSEWIC[5]	SARA[6]	SARO[7]	NATIVE STATUS[9]	TRCA (2018)[8]	CUM1	CUW1	MAM2-2	Sorting Column
Acer x freemanii	Freeman's Maple	6	-5		X	GNA	NNA	SNA				N	L4		x	x	X
Acer negundo	Manitoba Maple	0	0		X	G5	N5	S5				N	L+?		x		X
Alliaria petiolata	Garlic Mustard		0	-3		GNR	NNA	SNA				I	L+		x		X
Ambrosia artemisiifolia	Common Ragweed	0	3			G5	N5	S5				N	L5		x		X
Arctium minus	Common Burdock		3	-2		GNR	NNA	SNA				I	L+	x			X
Bidens frondosa	Devil's Beggarticks	3	-3		X	G5	N5	S5				N	L5		x		X
Bromus inermis	Smooth Brome		5	-3		G5	NNA	SNA				I	L+	x	x		X
Centaurea sp.	Knapweed sp.													x			X
Chenopodium album	Common Lamb's-quarters		3	-1		G5	NNA	SNA				I	L+		x		X
Cirsium arvense	Canada Thistle		3	-1		G5	NNA	SNA				I	L+		x		X
Cornus sericea	Red-osier Dogwood	2	-3		X	G5	N5	S5				N	L5		x		X
Echium vulgare	Common Viper's Bugloss		5	-2		GNR	NNA	SNA				I	L+	x			X
Elymus repens	Quackgrass		3	-3		GNR	NNA	SNA				I	L+	x			X
Euthamia graminifolia	Grass-leaved Goldenrod	2	0			G5	N5	S5				P	L5		x		X
Fraxinus sp.	Ash sp.														x		X
Geum sp.	Avens sp.														x		X
Impatiens capensis	Spotted Jewelweed	4	-3		X	G5	N5	S5				N	L5			x	X
Ligustrum vulgare	European Privet		3	-2		GNR	NNA	SNA				I	L+		x		X
Linaria vulgaris	Butter-and-eggs		5	-1		GNR	NNA	SNA				I	L+		x		X
Lonicera sp.	Honeysuckle sp.														x		X
Lythrum salicaria	Purple Loosestrife		-5	-3	X	G5	NNA	SNA				I	L+			x	X
Pastinaca sativa	Wild Parsnip		5	-3		GNR	NNA	SNA				I	L+		x		X
Persicaria pensylvanica	Pennsylvania Smartweed	3	-3		X	G5	N5	S5				N	L4			x	X
Phalaris arundinacea var. arund	Reed Canarygrass	0	-3		X	G5TNR	NNR	S5				N	L+?	x	x	x	X
Phragmites australis ssp. austra	European Reed		-3		X	G5T5	NNA	SNA				I	L+		x		X
Poa palustris	Fowl Bluegrass	5	-3		X	G5	N5	S5				N	L5	x			X
Populus x canescens	Grey Poplar		0			GNA	NNA	SNA				I	L+		x		X
Prunus serotina	Black Cherry	3	3			G5	N5	S5				N	L5		x		X
Rhamnus cathartica	European Buckthorn		0	-3	X	GNR	NNA	SNA				I	L+		x		X
Ribes sp.	Gooseberry sp.														x		X
Rubus idaeus	Red Raspberry	2	3			G5	N5	S5				N			x		X
Salix x fragilis	Hybrid White Willow		0	-3	X	GNA	NNA	SNA				I	L+		x		X
Scirpus sp.	Bulrush sp.															x	X
Solanum dulcamara	Bittersweet Nightshade		0	-2	X	GNR	NNA	SNA				I	L+		x		X
Solidago sp.	Goldenrod sp.													x	x		X
Symphyotrichum ericoides	White Heath Aster	4	3			G5	N5	S5				N		x			X
Symphytum officinale	Common Comfrey		5	-1		GNR	NNA	SNA				I	L+		x		X
Symphyotrichum pilosum	Old Field Aster		3			G5	N5	S5				N		x			X
Taraxacum officinale	Common Dandelion		3	-2		G5	N5	SNA				I	L+	x			X
Tussilago farfara	Coltsfoot		3	-2	X	GNR	NNA	SNA				I	L+		x		X
Typha angustifolia	Narrow-leaved Cattail		-5		X	G5	N5	SNA				I	L+			x	X
Urtica dioica	Stinging Nettle	2	0			G5	N5	S5				N				x	X
Vicia sp.	Vetch sp.													x			X
Vitis riparia	Riverbank Grape	0	0			G5	N5	S5				N	L5		x	x	X

Appendix B: Photographic Inventory

Photo 1: Culvert conveying creek south

Photo 2: Wide, well-defined upstream reach of Black Creek

Photo 3: Woody debris creating runs

Photo 4: Garbage pile at culvert

Photo 5: Iron staining along bank

Photo 6: Gabion at crest of bank above culvert

Photo 7: CSP culvert upstream of culvert

Photo 8: Armour stone supporting slope

Photo 9: Culvert outlet into deep pool at base of gabion wall

Photo 10: Gabion waterfall creating barrier to fish movement

Photo 11: Woody debris present in creek

Photo 12: Sheen in low flow area along bank

Photo 13: Cultural Meadow (CUM1)

Photo 14: Cultural Woodland (CUW1)

Photo 15: Reed-canary Grass Mineral Meadow Marsh (MAM2-2)

Appendix C: Aquatic Field Sheets

20M-01179-00

Project Name / #: Vaughan Metropolitan Centre **Date:** Oct 28/21 **Time:** 12pm **Photos:** 4803-4819

Watercourse Name: Black Creek D15 **Location:** D15 **Length:** 120m **Observers:** J Skeath

Zone: 17T **Easting:** 628895 **Northing:** 4849572 **Water Temp:** ____ **Air Temp:** 12° **% Overhead Cover:** 70

Section Type and Morphology

Type: (check all that apply	Stream / River ☐	Channelized ☐	Permanent ☐	Intermittent ☐	Ephemeral ☐	Associated Wetland:

Total Section Length:	Current Velocity & Gradient:	Comments / Description

Sub-Section(s)	Run ☑	Pool ☐	Riffle ☑	Flats ☑	Culvert ☐	Other ☐
% Area	40		20	40		
Mean Depth Wetted (m)	0.15			0.83		
Mean Width Wetted (m)	2.60			6.00		
Mean Bankfull width (m)	3.65			7.00		
Mean Bankfull Depth (m)	1.30			1.45		
Substrate (%)	10Bo 70Co 10Sa 10Gr			80Sa 20Si		

Comments:

Banks / Stability

Bank Averages	Stability	Height (m)	Slope (gradual, steep, vertical)	Natural/Manmade/ Stabilized	Erosion?	Riparian Vegetation
Left Upstream Bank	stable	4m	moderate	natural	yes	trees/shrubs
Right Upstream Bank	stable	5m	steep	stabized	no	none

Habitat / Vegetation

Instream Cover	None	Sparse	Moderate	Dense	% Surface Area	Comments:
Undercut Banks	✓					
Overhanging Vegetation		5%				
Instream Vegetation	✓					
Woody / Organic Debris		10%				
Rocks/Boulders		10%				

Aquatic Veg Type (%):	Submergent:	Floating:	Emergent:	None
Predominant Species:	—	—	—	

Migratory Obstructions:	None	Seasonal:	Permanent: gabion waterfall 0.6m
Critical Habitat:	Spawning: —	Groundwater: —	Other: —

Enhancement Opportunities / Fish Observed / Comments

water murky, hard to see fish. fish present u/s of culvert

Aquatic Habitat Assessment

Page: 1 of 2

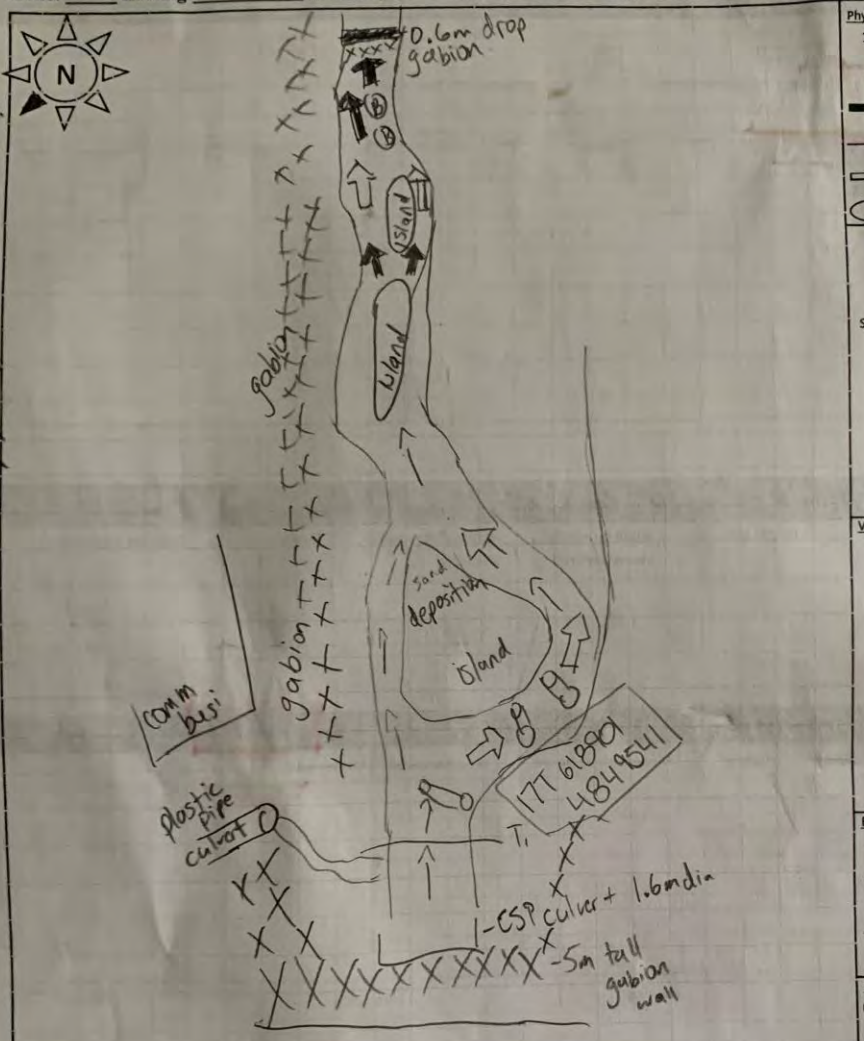
Project Name / #: _____ **Date:** _____ **Time:** _____ **Photos:** _____

Watercourse Name: Black Creek **Location:** DS **Length:** 90m **Observers:** J. Sheath

Zone: _____ **Easting:** _____ **Northing:** _____ **Water Temp:** _____ **Air Temp:** _____ **% Overhead Cover:** 70

T1
LW 6m
WD 33"
BW 7m
BD 57"
LB 5m
RB 5m
BOSo
20Si

T2
LW 8m
WD 6"
BW 12m
BD 1.3m
LB 4m
RB 5m
10Bo
OSa
70Co
10Gr



Physical Characteristics:
- 10d — Depth (cm)
- 6w — Width (m)
- — Riffle
- — Flat
- — Run/Glide
- — Pool

Substrate:
- — Island/Bar
- — Fine Substrate
- Sa, Si, M — Sand, Silt, Muck
- #### — Gravel Substrate
- — Cobble
- Sh — Shale
- (B) — Boulder
- **** — Debris

Vegetation:
- CT — Cattail
- RC — Reed Canary
- SV — Submergent Vegetation
- FV — Floating Vegetation
- EV — Emergent Vegetation
- Gr — Grasses
- (R) — Riparian Tree
- — Forested Area

Banks:
- /////// — Eroded Bank
- xxxxxxx — Riprap/other Stabilization
- — — — — Undercut Bank
- TH — Thatch

Barriers:
- — Instream Log/Tree
- ^^^^^^ — Dam/Weir/Obstruction
- — Barrier to fish movement
- S — Seasonal Barrier
- -X- - -X- — Fenceline
- — Culvert

Habitat Indicators:
- Fe — Iron Staining
- — Seep/Spring
- (W) — Watercress

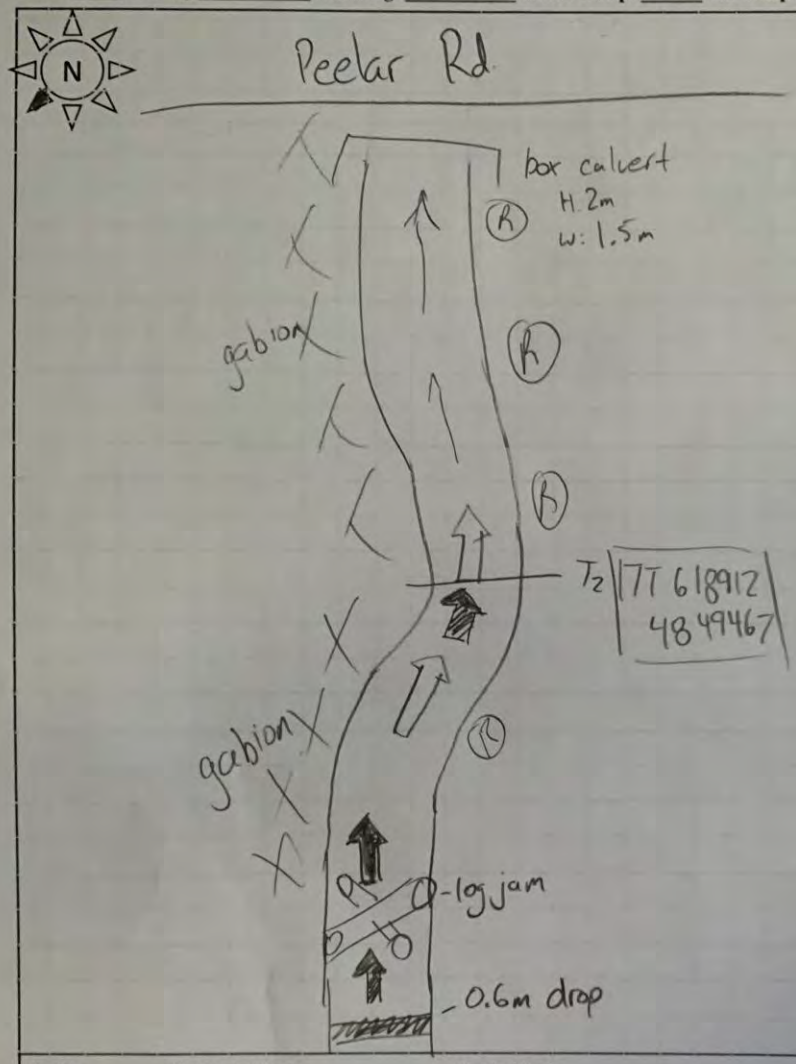
Profile: Horizontal Scale: Vertical Scale:

Aquatic Habitat Assessment Page: 2 of 2

Project Name / #: _____ **Date:** _____ **Time:** _____ **Photos:** _____

Watercourse Name: Black Creek **Location:** D/S **Length:** 50m **Observers:** J Skrenta

Zone: _____ **Easting:** _____ **Northing:** _____ **Water Temp:** _____ **Air Temp:** _____ **% Overhead Cover:** 50



Physical Characteristics:
- 10d — Depth (cm)
- 6w — Width (m)
- — Riffle
- — Flat
- — Run/Glide
- — Pool

Substrate:
- — Island/Bar
- — Fine Substrate
- Sa, Si, M — Sand, Silt, Muck
- #### — Gravel Substrate
- — Cobble
- Sh — Shale
- (B) — Boulder
- **** — Debris

Vegetation:
- CT — Cattail
- RC — Reed Canary
- SV — Submergent Vegetation
- FV — Floating Vegetation
- EV — Emergent Vegetation
- Gr — Grasses
- (R) — Riparian Tree
- — Forested Area

Banks:
- /////// — Eroded Bank
- xxxxxxx — Riprap/other Stabilization
- — — — — Undercut Bank
- TH — Thatch

Barriers:
- — Instream Log/Tree
- ^^^^^^ — Dam/Weir/Obstruction
- — Barrier to fish movement
- S — Seasonal Barrier
- -X- - -X- — Fenceline
- — Culvert

Habitat Indicators:
- Fe — Iron Staining
- — Seep/Spring
- (W) — Watercress

Profile: Horizontal Scale: Vertical Scale:

ZON-01179.00

Project Name / #: Vaughan Metropolitan Centre **Date:** Oct 28/21 **Time:** 10:00 **Photos:** 4789-480

Watercourse Name: Black Creek U/S **Location:** Vaughan **Length:** 120m **Observers:** J Skeath

Zone: 17 **Easting:** 618895 **Northing:** 4849572 **Water Temp:** _____ **Air Temp:** 12 **% Overhead Cover:** 50

Section Type and Morphology

Type: (check all that apply	Stream / River ☐	Channelized ☐	Permanent ☐	Intermittent ☐	Ephemeral ☐	Associated Wetland:
Total Section Length:		Current Velocity & Gradient:		Comments / Description		

Sub-Section(s)	Run ☑	Pool ☐	Riffle ☐	Flats ☑	Culvert ☐	Other ☐
% Area	10	10		80		
Mean Depth Wetted (m)		0.70		0.45		
Mean Width Wetted (m)				3.10		
Mean Bankfull width (m)				4.00		
Mean Bankfull Depth (m)				1.00		
Substrate (%)				70sa 20si 10gr		

Comments:

Banks / Stability

Bank Averages	Stability	Height (m)	Slope (gradual, steep, vertical)	Natural/Manmade/ Stabilized	Erosion?	Riparian Vegetation
Left Upstream Bank	good	3m	steep	natural/ stabilized	yes	trees, no shrubs/ grasses
Right Upstream Bank	good	3m	steep	natural/ stabilized	yes	"

Habitat / Vegetation

Instream Cover	None	Sparse	Moderate	Dense	% Surface Area	Comments:
Undercut Banks		✓			1%	
Overhanging Vegetation	✓					
Instream Vegetation	✓					
Woody / Organic Debris		✓			10%	
Rocks/Boulders	✓					

Aquatic Veg Type (%):	Submergent:	Floating:	Emergent:	None
Predominant Species:				

Migratory Obstructions:	None	Seasonal:	Permanent:
Critical Habitat:	Spawning:	Groundwater:	Other:

Enhancement Opportunities / Fish Observed / Comments

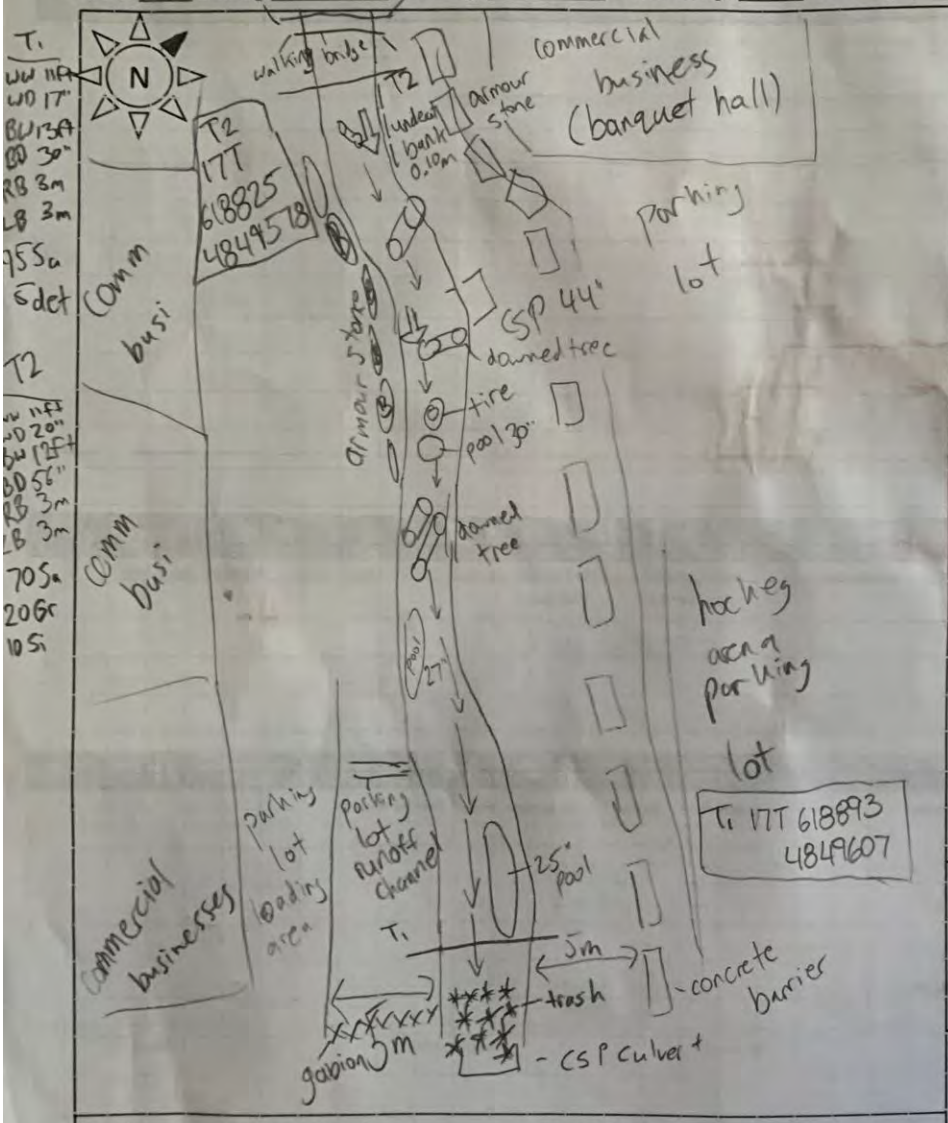
2 small fishes observed <5cm

Aquatic Habitat Assessment Page: 1 of 1

Project Name / #: _____ **Date:** _____ **Time:** _____ **Photos:** _____

Watercourse Name: Black Creek **Location:** U/S **Length:** 120 **Observers:** _____

Zone: _____ **Easting:** _____ **Northing:** _____ **Water Temp:** _____ **Air Temp:** _____ **% Overhead Cover:** _____



Profile: Horizontal Scale: Vertical Scale:

Physical Characteristics:
- 10d — Depth (cm)
- 6w — Width (m)
- — Riffle
- — Flat
- — Run/Glide
- — Pool

Substrate:
- — Island/Bar
- — Fine Substrate
- Sa, Si, M — Sand, Silt, Muck
- #### — Gravel Substrate
- — Cobble
- Sh — Shale
- (B) — Boulder
- **** — Debris

Vegetation:
- CT — Cattail
- RC — Reed Canary
- SV — Submergent Vegetation
- FV — Floating Vegetation
- EV — Emergent Vegetation
- Gr — Grasses
- (R) — Riparian Tree
- — Forested Area

Banks:
- /////// — Eroded Bank
- xxxxxxx — Riprap/other Stabilization
- — — — — Undercut Bank
- TH — Thatch

Barriers:
- — Instream Log/Tree
- ^^^^^^ — Dam/Weir/Obstruction
- — Barrier to fish movement
- S — Seasonal Barrier
- -X---X- — Fenceline
- — Culvert

Habitat Indicators:
- Fe — Iron Staining
- — Seep/Spring
- (W) — Watercress

Appendix D: SAR Screening

Taxon	Common Name	Scientific Name	S-rank	ESA Status	SARA Status	COSEWIC Status	COSSARO Status	Habitat Requirements	Probability to Occur in the Study Area
Amphibians	Unisexual Ambystoma (Jefferson Salamander dependent population)	*Ambystoma sp. DU 2*	S2	END	END	END	END	In Ontario, the unisexual Jefferson salamander is found within deciduous or mixed forests containing, or adjacent to, suitable breeding ponds. Breeding ponds are normally ephemeral pools that dry in late summer. Terrestrial habitat is in moist woodlands, where the salamanders find shelter under fallen trees or rocks, as well as in mammal burrows. Adults forage during humid conditions at night on the forest floor within 1 km of the breeding pond. These salamanders also require terrestrial overwintering sites below the frost line (COSEWIC 2016).	Moderate - suitable habitat, including woodlands adjacent to breeding ponds, may exist on Site and within the Study Area within the Cultural Woodland, or Reed-canary Grass Mineral Meadow Marsh.
Amphibians	Western Chorus Frog - Great Lakes - St. Lawrence - Canadian Shield population	*Pseudacris triseriata pop. 1*	S4		THR	THR		In Ontario, Western Chorus Frogs breed in temporary or shallow permenant wetlands including ponds, basins, marshes, swamps, and drainage ditches. They are known to forage in terrestrial habitats including pastures, clearings, meadows, and shrublands. Hibernation occurs in terrestrial lowlands with vegetation, soft substrate, dead leaves, woody debris, or burrows (Environment Canada 2014).	Moderate - suitable habitat may exist on site or within the study area within the cultural woodland, or reed-canary grass mineral meadow marsh.
Birds	Acadian Flycatcher	*Empidonax virescens*	S1B	END	END	END	END	In Ontario, Acadian flycatcher breeds in the understory of large, mature, closed-canopy forests, swamps and forested ravines. This bird prefers forests greater than 40 ha in size and exhibits edge sensitivity preferring the deep interior of the forest. Its nest is loosely woven and placed near the tip of branch in a small tree or shrub often, but not always, near water (Allen et al. 2002).	Low - no suitable mature, large forests are present on site or within the study area.
Birds	Bald Eagle	*Haliaeetus leucocephalus*	S4	NAR		NAR	NAR	In Ontario, bald eagle nests are typically found near the shorelines of lakes or large rivers, often on forested islands. The large, conspicuous nests are typically found in large super-canopy trees along water bodies (Buehler 2000).	Low - no suitable shorelines or super canopy trees are present on site or within the study area.

Taxon	Common Name	Scientific Name	S-rank	ESA Status	SARA Status	COSEWIC Status	COSSARO Status	Habitat Requirements	Probability to Occur in the Study Area
Birds	Bank Swallow	*Riparia riparia*	S4B	THR	THR	THR	THR	In Ontario, bank swallow breeds in a variety of natural and anthropogenic habitats, including lake bluffs, stream and riverbanks, sand and gravel pits, and roadcuts. Nests are generally built in a vertical or near-vertical bank. Breeding sites are typically located near open foraging sites such as rivers, lakes, grasslands, agricultural fields, wetlands and riparian woods. Forested areas are generally avoided (Garrison 1999).	Moderate - suitable natural or anthropogenic habitat may exist on site or within the study area such as riverbanks and roadcuts.
Birds	Barn Swallow	*Hirundo rustica*	S4B	SC	THR	SC	SC	In Ontario, barn swallow breeds in areas that contain a suitable nesting structure, open areas for foraging, and a body of water. This species nests in human made structures including barns, buildings, sheds, bridges, and culverts. Preferred foraging habitat includes grassy fields, pastures, agricultural cropland, lake and river shorelines, cleared rights-of-way, and wetlands (COSEWIC 2011). Mud nests are fastened to vertical walls or built on a ledge underneath an overhang. Suitable nests from previous years are reused (Brown and Brown 2019).	Moderate - suitable natural or anthropogenic habitat may exist on site or within the study area such as buildings, grassy fields, and river shorelines.
Birds	Bobolink	*Dolichonyx oryzivorus*	S4B	THR	THR	SC	THR	In Ontario, bobolink breeds in grasslands or graminoid dominated hayfields with tall vegetation (Gabhauer 2007). Bobolink prefers grassland habitat with a forb component and a moderate litter layer. They have low tolerance for presence of woody vegetation and are sensitive to frequent mowing within the breeding season. They are most abundant in established, but regularly maintained, hayfields, but also breed in lightly grazed pastures, old or fallow fields, cultural meadows and newly planted hayfields. Their nest is woven from grasses and forbs. It is built on the ground, in dense vegetation, usually under the cover of one or more forbs (Renfrew et al. 2015).	Moderate - cultural meadows on site and within the study area may provide suitable breeding habitat.

Taxon	Common Name	Scientific Name	S-rank	ESA Status	SARA Status	COSEWIC Status	COSSARO Status	Habitat Requirements	Probability to Occur in the Study Area
Birds	Chimney Swift	*Chaetura pelagica*	S3B	THR	THR	THR	THR	In Ontario, chimney swift breeding habitat is varied and includes urban, suburban, rural and wooded sites. They are most commonly associated with towns and cities with large concentrations of chimneys. Preferred nesting sites are dark, sheltered spots with a vertical surface to which the bird can grip. Unused chimneys are the primary nesting and roosting structure, but other anthropogenic structures and large diameter cavity trees are also used (COSEWIC 2007).	Moderate - suitable buildings with chimneys or other vertical surfaces for the bird to grip may exist on site or within the study area.
Birds	Common Nighthawk	*Chordeiles minor*	S4B	SC	SC	SC	SC	In Ontario, these aerial foragers require areas with large open habitat. This includes farmland, open woodlands, clearcuts, burns, rock outcrops, alvars, bogs, fens, prairies, gravel pits and gravel rooftops in cities (Sandilands 2007)	High - gravel rooftops may provide suitable habitat on site and within the study area. An occurrence of this species was recorded within the study area.
Birds	Eastern Meadowlark	*Sturnella magna*	S4B,S3N	THR	THR	THR	THR	In Ontario, eastern meadowlark breeds in pastures, hayfields, meadows and old fields. Eastern meadowlark prefers moderately tall grasslands with abundant litter cover, high grass proportion, and a forb component (Hull 2019). They prefer well drained sites or slopes, and sites with different cover layers (Roseberry and Klimstra 1970).	Low - while there is a recorded occurrence within the NHIC 1km x 1 km square for this species, suitable tall grasslands are not present on site or within the study area.

Taxon	Common Name	Scientific Name	S-rank	ESA Status	SARA Status	COSEWIC Status	COSSARO Status	Habitat Requirements	Probability to Occur in the Study Area
Birds	Eastern Wood-pewee	*Contopus virens*	S4B	SC	SC	SC	SC	In Ontario, eastern wood-pewee inhabits a wide variety of wooded upland and lowland habitats, including deciduous, coniferous, or mixed forests. It occurs most frequently in forests with some degree of openness. Intermediate-aged forests with a relatively sparse midstory are preferred. In younger forests with a relatively dense midstory, it tends to inhabit the edges. Also occurs in anthropogenic habitats providing an open forested aspect such as parks and suburban neighborhoods. Nest is constructed atop a horizontal branch, 1-2 m above the ground, in a wide variety of deciduous and coniferous trees (COSEWIC 2012).	High - suitable wooded habitat for this species may exist wihtin the Cultural Woodland on site/within the study area. There is a recorded occurrence of this species within the study area.
Birds	Grasshopper Sparrow	*Ammodramus savannarum*	S4B	SC	SC	SC	SC	In Ontario, grasshopper sparrow is found in medium to large grasslands with low herbaceous cover and few shrubs. It also uses a wide variety of agricultural fields, including cereal crops and pastures. Close-grazed pastures and limestone plains (e.g. Carden and Napanee Plains) support highest density of this bird in the province (COSEWIC 2013).	Low - no suitable grassland habitat exists on site or within the study area.
Birds	Great Black-backed Gull	*Larus marinus*	S1B,S4N					This species breeds in colonies mainly along coastal belts on small islands, rocky islets, barrier beaches and dunes. Prefers sites on rock outcrops (Good 1998).	Low - no suitable habitat is present on site or within the study area, such as dunes, small islands, or coastal belts.

Taxon	Common Name	Scientific Name	S-rank	ESA Status	SARA Status	COSEWIC Status	COSSARO Status	Habitat Requirements	Probability to Occur in the Study Area
Birds	Peregrine Falcon	*Falco peregrinus*	S4	SC	NAR	NAR	SC	In Ontario, peregrine falcon breeds in areas containing suitable nesting locations and sufficient prey resources. Such habitat includes both natural locations containing cliff faces (heights of 50 - 200 m preferred) and anthropogenic landscapes including urban centres containing tall buildings, open pit mines and quarries, and road cuts. Peregrine falcons nest on cliff ledges and crevices and building ledges. Nests consist of a simple scrape in the substrate (COSEWIC 2017).	High - suitable tall buildings may provide habitat on site and within the study area. There is a recorded occurrence of this species within the study area.
Birds	Piping Plover	*Charadrius melodus*	S1B	END	END	END	END	In Ontario, breeding habitat for the piping plover consists of large, sparsely vegetated beaches of open sand, gravel or cobble, frequently adjacent to freshwater dune formations. The Great Lakes population typically breeds on beaches wider than 10 m with greater than 400 m of shoreline. Beaches separated from the tree line by freshwater dunes for at least 50 m are preferred. Nesting areas are often near to a seep, river or marsh. As of 2013, two subpopulations exist in Ontario. One population has bred in recent years on Lake Huron and Georgian Bay; the other population at Lake of the Woods. Historically, this species has bred at sites on Lake Erie and Lake Ontario (Kirk 2013).	Low - no suitable large, sparsely vegetated beaches are present on site or within the study area.

Taxon	Common Name	Scientific Name	S-rank	ESA Status	SARA Status	COSEWIC Status	COSSARO Status	Habitat Requirements	Probability to Occur in the Study Area
Birds	Red-headed Woodpecker	*Melanerpes erythrocephalus*	S3	END	END	END	END	In Ontario, red-headed woodpecker breeds in open, deciduous woodlands or woodland edges and are often found in parks, cemeteries, golf courses, orchards and savannahs (Woodliffe 2007). They may also breed in forest clearings or open agricultural areas provided that large trees are available for nesting. They prefer forests with little or no understory vegetation. They are often associated with beech or oak forests, beaver ponds and swamp forests where snags are numerous. Nests are excavated in the trunks of large dead trees (Frei et al. 2017).	Moderate - suitable open woodland habitat may exist in the cultural woodland on site and within the study area.
Birds	Short-eared Owl	*Asio flammeus*	S4?B,S2S3N	THR	SC	THR	THR	In Ontario, short-eared owl breeds in a variety of open habitats including grasslands, tundra, bogs, marshes, clear-cuts, burns, pastures and occasionally agricultural fields. The primary factor in determining breeding habitat is proximity to small mammal prey resources (COSEWIC 2008). Nests are built on the ground at a dry site and usually adjacent to a clump of tall vegetation used for cover and concealment (Gahbauer 2007).	Low - no suitable open habitat such as grassland, tundra, bog, marsh, or agricultural fields are present on site or within the study area.
Birds	Wood Thrush	*Hylocichla mustelina*	S4B	SC	THR	THR	SC	In Ontario, wood thrush breeds in moist, deciduous hardwood or mixed stands that are often previously disturbed, with a dense deciduous undergrowth and with tall trees for singing perches. This species selects nesting sites with the following characteristics: lower elevations with trees less than 16 m in height, a closed canopy cover (>70 %), a high variety of deciduous tree species, moderate subcanopy and shrub density, shade, fairly open forest floor, moist soil, and decaying leaf litter (COSEWIC 2012).	Moderate - suitable moist, previously disturbed habitat likely exists on site and within the study area in the Cultural Woodland.

Taxon	Common Name	Scientific Name	S-rank	ESA Status	SARA Status	COSEWIC Status	COSSARO Status	Habitat Requirements	Probability to Occur in the Study Area
Fishes	American Brook Lamprey	*Lethenteron appendix*	S3					Habitat of adults includes gravel-sand riffles and runs of creeks and small to medium rivers with strong flow (Page and Burr 2011) and cool, clear water (Hoff 1988). Larvae burrow into sand and silt, often in pools or slow water near shore. Eggs are laid in nests in gravel/sand riffles and runs with strong flow. Juveniles are found in slow moving water buried in soft substrate of medium to large streams.	there is a recorded occurrence within the NHIC 1km x 1 km square for this species
Insects	Monarch	*Danaus plexippus*	S2N,S4B	SC	END	END	SC	In Ontario, monarch is found throughout the northern and southern regions of the province. This butterfly is found wherever there is milkweed (*Asclepias* spp.) plants for its caterpillars and wildflowers that supply a nectar source for adults. It is often found on abandoned farmland, meadows, open wetlands, prairies and roadsides, but also in city gardens and parks. Important staging areas during migration occur along the north shores of the Great Lakes (COSEWIC 2010).	Low - while meadow habitat does exist on ite, no milkweed plants were observed during the site visit.
Mammals	Eastern Small-footed Myotis	*Myotis leibii*	S2S3	END			END	In Ontario, eastern small-footed myotis is not known to roost in trees, but there is very little known about its roosting habits. The species generally roosts on the ground under rocks, in rock crevices, talus slopes and rock piles, but it occasionally inhabits buildings. Entrances of caves or abandoned mines where humidity is low, and temperatures are cool and sometimes subfreezing may be used as hibernacula (Humphrey 2017).	Moderate - suitable roosting habitat may exist on site or within the study area such as within the ground under rocks, and rock piles.

Taxon	Common Name	Scientific Name	S-rank	ESA Status	SARA Status	COSEWIC Status	COSSARO Status	Habitat Requirements	Probability to Occur in the Study Area
Mammals	Gray Fox	*Urocyon cinereoargenteus*	S1	THR	THR	THR	THR	While the Ontario range of this species extends across much of southern and southeastern Ontario, the only known population in the province is on Pelee Island, with very rare sightings elsewhere in the province at points close to the border with the United States. This species inhabits deciduous forests and marshes and will den in a variety of features including rock outcroppings, hollow trees, burrows or brush piles, usually where dense brush provides cover and in close proximity to water. This species is considered a habitat generalist (COSEWIC 2015).	None - while this site may provide suitable habitat for this species, the site is outside of the current known population of this species.
Mammals	Little Brown Myotis	*Myotis lucifugus*	S3	END	END	END	END	In Ontario, this species' range is extensive and covers much of the province. It will roost in both natural and man-made structures. Roosting colonies require a number of large dead trees, in specific stages of decay and that project above the canopy in relatively open areas. May form nursery colonies in the attics of buildings within 1 km of water. Caves or abandoned mines may be used as hibernacula, but high humidity and stable above freezing temperatures are required (ECCC 2018).	Moderate - suitable trees for roosting may exist on site and within the study area, as well as the site contains water. Potentially suitable foraging habitat for SAR bats is present within the Study Area, including cultural meadows, and cultural woodland vegetation.
Mammals	Northern Myotis	*Myotis septentrionalis*	S3	END	END	END	END	In Ontario, this species' range is extensive and covers much of the province. It will usually roost in hollows, crevices, and under loose bark of mature trees. Roosts may be established in the main trunk or a large branch of either living or dead trees. Caves or abandoned mines may be used as hibernacula, but high humidity and stable above freezing temperatures are required (ECCC 2018).	Moderate - suitable trees for roosting may exist on site and within the study area. Potentially suitable foraging habitat for SAR bats is present within the Study Area, including cultural meadows, and cultural woodland vegetation.

Taxon	Common Name	Scientific Name	S-rank	ESA Status	SARA Status	COSEWIC Status	COSSARO Status	Habitat Requirements	Probability to Occur in the Study Area
Mammals	Tricolored Bat	*Perimyotis subflavus*	S3?	END	END	END	END	In Ontario, tri-colored bat may roost in foliage, in clumps of old leaves, hanging moss or squirrel nests. They are occasionally found in buildings although there are no records of this in Canada. They typically feed over aquatic areas with an affinity to large-bodied water and will likely roost in close proximity to these. Hibernation sites are found deep within caves or mines in areas of relatively warm temperatures. These bats have strong roost fidelity to their winter hibernation sites and may choose the exact same spot in a cave or mine from year to year (ECCC 2018).	Moderate - suitable roosting habitat, such as clumps of leaves or squirrel nests, may exist on site and within the study area.
Mammals	Eastern Red Bat	*Lasiurus borealis*	S4			END		need to update once COSEWIC status report is available	Moderate - suitable roosting habitat may exist on site and wihin the study area for this species.
Mammals	Northern Hoary Bat	*Lasiurus cinereus*	S4			END		need to update once COSEWIC status report is available	Moderate - suitable roosting habitat may exist on site and wihin the study area for this species.
Molluscs	Eastern Pondmussel	*Ligumia nasuta*	S1	SC	SC	END	SC	In Ontario, the preferred habitat of eastern pondmussel is sheltered areas of lakes or slow streams in substrates of fine sand and mud at depths of 0.3 to 4.5 m (COSEWIC 2017). Two currently known populations: one in the delta area of Lake St. Clair and the second in Lyn Creek, a small tributary of the upper St. Lawrence River.	Low - aquatic habitat on site is limited, and highly disrtubed, rendering it unsuitable
Molluscs	Rainbow Mussel	*Cambarunio iris*	S1	SC	SC	SC	SC	In Ontario, rainbow mussel is found in shallow, well-oxygenated waters of small to medium-sized rivers and sometimes lakes. It is most abundant in waters less than 1 m deep. Preferred substrates are cobble, gravel, sand and occasionally mud (COSEWIC 2015).	Low - aquatic habitat on site is limited, and highly disrtubed, rendering it unsuitable

Taxon	Common Name	Scientific Name	S-rank	ESA Status	SARA Status	COSEWIC Status	COSSARO Status	Habitat Requirements	Probability to Occur in the Study Area
Reptiles	Blanding's Turtle	*Emydoidea blandingii*	S3	THR	END	END	THR	In Ontario, Blanding's turtle will use a range of aquatic habitats, but favor those with shallow, standing or slow-moving water, rich nutrient levels, organic substrates and abundant aquatic vegetation. They will use rivers but prefer slow-moving currents and are likely only transients in this type of habitat. This species is known to travel great distances over land in the spring in order to reach nesting sites, which can include dry conifer or mixed forests, partially vegetated fields, and roadsides. Suitable nesting substrates include organic soils, sands, gravel and cobble. They hibernate underwater and infrequently under debris close to water bodies (COSEWIC 2016).	Low - aquatic habitat on site is limited, and highly disrtubed, rendering it unsuitable
Reptiles	Midland Painted Turtle	*Chrysemys picta marginata*	S4		SC	SC		In Ontario, painted turtles use waterbodies, such as ponds, marshes, lakes and slow-moving creeks, with a soft bottom and abundant basking sites and aquatic vegetation. This species hibernates on the bottom of waterbodies (Ontario Nature 2018).	Low - aquatic habitat on site is limited, and highly disturbed, rendering it unsuitable
Reptiles	Eastern Milksnake	*Lampropeltis triangulum*	S4	NAR	SC	SC		In Ontario, milksnake uses a wide range of habitats including prairies, pastures, hayfields, wetlands and various forest types, and is well-known in rural areas where it frequents older buildings. Proximity to water and cover enhances habitat suitability. Hibernation takes place in mammal burrows, hollow logs, gravel or soil banks, and old foundations (COSEWIC 2014).	Moderate - suitable habitat including wetlands, and woodlands may provide suitable habitat on site and within the study area.

Taxon	Common Name	Scientific Name	S-rank	ESA Status	SARA Status	COSEWIC Status	COSSARO Status	Habitat Requirements	Probability to Occur in the Study Area
Reptiles	Northern Map Turtle	*Graptemys geographica*	S3	SC	SC	SC	SC	In Ontario, northern map turtle prefers large waterbodies with slow-moving currents, soft substrates, and abundant aquatic vegetation. Ideal stretches of shoreline contain suitable basking sites, such as rocks and logs. Along Lakes Erie and Ontario, this species occurs in marsh habitat and undeveloped shorelines. It is also found in small to large rivers with slow to moderate flow. Hibernation takes place in soft substrates under deep water (COSEWIC 2012).	Low - aquatic habitat on site is limited, and highly disrtubed, rendering it unsuitable
Reptiles	Snapping Turtle	*Chelydra serpentina*	S4	SC	SC	SC		In Ontario, snapping turtle uses a wide range of waterbodies, but shows preference for areas with shallow, slow-moving water, soft substrates and dense aquatic vegetation. Hibernation takes place in soft substrates under water. Nesting sites consist of sand or gravel banks along waterways or roadways (COSEWIC 2008).	Low - aquatic habitat on site is limited, and highly disrtubed, rendering it unsuitable
Vascular Plants	Black Ash	*Fraxinus nigra*	S4	END		THR	END	Found throughout Ontario in moist ecosystems; commonly found in northern swampy woodlands (MNRF 2018). This species typically grows on mucky or peaty soils and is considered a facultative wetland species (Reznicek et al. 2011).	Low - while there is a recorded occurrence within the NHIC 1km x 1 km square for this species, and suitable moist habitat may exist on site and within the study area, no Black Ash trees were observed during the site visit.
Vascular Plants	Butternut	*Juglans cinerea*	S2?	END	END	END	END	In Ontario, butternut is found along stream banks, on wooded valley slopes, and in deciduous and mixed forests. It is commonly associated with beech, maple, oak and hickory (Voss and Reznicek 2012). Butternut prefers moist, fertile, well-drained soils, but can also be found in rocky limestone soils. This species is shade intolerant (Farrar 1995).	Low - while there is a recorded occurrence within the NHIC 1km x 1 km square for this species, and suitable open habitat may exist on site and within the study area, no butternut trees were observed during the site visit.

Taxon	Common Name	Scientific Name	S-rank	ESA Status	SARA Status	COSEWIC Status	COSSARO Status	Habitat Requirements	Probability to Occur in the Study Area
Vascular Plants	Eastern Prairie Fringed Orchid	*Platanthera leucophaea*	S2	END	END	END		In Ontario, eastern prairie fringed-orchid grows in wet prairies, fens, bogs, wet meadows, and wet successional fields. It grows in full sun in neutral to mildly calcareous substrates, and occasionally grows along roadsides or lake margins (Eastern Prairie Fringed-orchid Recovery Team 2010). This species is found only in southern Ontario, and only two locations are currently known on sand spits along the shore of Lake Erie.	Low - suitable habitat along roadsides may exist on site and within the study area, however, the site is outside of the only two known locations for this species to occur.
Vascular Plants	Eastern Prickly-pear Cactus	*Opuntia cespitosa*	S1	END	END	END		In Ontario, eastern prickly pear cactus occurs on dry substrates that are in the early stages of succession (COSEWIC 2010). Habitat includes rocks, shores, dunes, sandy fields, plains, open oak forests, and prairies. Occasionally it grows on disturbed ground along roadsides (Voss and Reznicek 2012). This species prefers full sunlight on well-drained sandy or rocky substrates (ODNR 1998).	Moderate - suitable disturbed ground along roadsides may provide suitable habitat on site and within the study area.
Vascular Plants	Purple Twayblade	*Liparis liliifolia*	S2S3	THR	THR	THR		In Ontario, purple twayblade occurs in a wide variety of habitats such as open oak woodland and savannah, mixed deciduous forest, shrub thicket, shrub alvar, deciduous swamp, and conifer plantation. This species is commonly found in dry mesic conditions, but there have been reports from wetland habitats (COSEWIC 2010).	Moderate - suitable open habitat may exist within the cultural woodland on site and within the study area.