BEACON ENVIRONMENTAL

GUIDING SOLUTIONS IN THE NATURAL ENVIRONMENT

Winston Churchill Blvd. Widening from Hwy 401 to Embleton Rd Region of Peel - Class EA Natural Environment Report

Prepared For:

Hatch Mott Macdonald

Prepared By:

Beacon Environmental Limited

Date: *Project:*

April 2023 **214069**

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1. Introduction

Beacon Environmental Limited (Beacon) was retained by Hatch Mott Macdonald (HMM) to provide an assessment of aquatic and terrestrial natural heritage features for the Class Environmental Assessment (EA) required in support of the widening of Winston Churchill Blvd. between Highway 401 and Embleton Road in the Region of Peel (**Figure 1**). Components of this study include characterization of the natural environment and the evaluation of the alternatives for the road widening based on information provided and policy review.

2. Methodology

2.1 Background Review

Background information was gathered and reviewed at the outset of the project. This involved consulting existing documentation for the subject lands, including:

- Ministry of Natural Resources and Forestry (MNRF) Aurora District Office information request;
- Ministry of Natural Resources' Natural Heritage Information Centre (NHIC) rare species database;
- Credit Valley Conservation Authority (CVC), data request, regulations and policies;
- Provincial Policy Statement (PPS; 2020);
- Peel Region Official Plan (2018);
- Halton Region Official Plan (2018);
- City of Brampton Official Plan (2020);
- City of Mississauga Official Plan (2019);
- Town of Halton Hills Official Plan (2017);
- Fisheries and Oceans Canada – Distribution of Fish and Mussel Species at Risk (2013);
- Aerial photography; and
- Topographic maps.

2.2 Field Investigations

Beacon ecologists undertook field investigations to complete an assessment of the terrestrial and aquatic natural heritage features within the study area that were visible from the road right of way. The field investigations focused on features within or adjacent to the preferred alternatives. The dates of field investigations are summarized in **Table 1**.

Table 1. Dates of Field Investigations

Survey Type	Dates of Surveys
Breeding Bird Surveys	May 30, 2015 June 14, 2015 June 27, 2015
Aquatic Habitat Assessment	September 19, 2016
Vegetation Communities and Flora	June 9, 2016

2.2.1 Vegetation communities and flora

A vegetation inventory of the study area was conducted on June 9, 2016. Vegetation communities in the study area were mapped and described according to the Ecological Land Classification (ELC) system for southern Ontario (Lee *et al.*, 1998), which involved delineating vegetation communities on an aerial photograph of the property, recording dominant vegetation types within these communities.

2.2.2 Breeding Bird Surveys

Targeted breeding bird surveys were completed during the spring of 2015 to determine if grassland Species at Risk birds were utilizing potentially suitable habitat identified within the study area.

This consisted of three surveys that were conducted:

- Between late May and the first week of July;
- Between dawn and approximately 10:30 am; and
- Under suitable weather conditions (low wind, no rain, no unusual temperatures).

The road allowance adjacent to the potentially suitable habitat was walked such that all singing birds within the grassland and hayfield communities adjacent to the road could be heard or observed and recorded. All birds heard and seen within these locations were recorded in the location observed on an aerial photograph of the site.

2.2.3 Watercourses and Aquatic Habitat

The aquatic habitat assessment was undertaken to determine the quality and function of fish habitat in the tributaries of Levi Creek and Mullet Creek that cross the road alignment and that may be impacted as a result of the proposed project. Visual inspection of the creek was undertaken and included the following parameters:

- Riparian cover type and extent;
- Channel width and depth profile;
- Substrate and morphology;
- Bank height; and
- Bank stability.

Site Map

Figure 1

Winston Churchill Blvd. Widening Class EA

UTM Zone 17 N, NAD 83

Project 214069
November, 2020

N
W E
S

0 500 1,000 2,000 Metres

1:60,000

BEACON ENVIRONMENTAL

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Fish community information for the site was provided by CVC. These data were recent and provided sufficient information such that a fish sampling program was not considered necessary.

3. Policy Context

The following section provides the provincial, regional and local policy context for this assessment. The study area traverses two regional municipalities (Halton and Peel Regions) and three local municipalities (Town of Halton Hills, City of Brampton and City of Mississauga).

3.1 Provincial Policy Statement (2020)

The PPS (MMAH 2020) provides policy direction to municipalities on matters of provincial interest as they relate to land use planning and development. The PPS provides for appropriate land use planning and development while protecting Ontario's natural heritage. Development governed by the *Planning Act* must be consistent with the policy statements issued under the PPS. These are outlined in Section 2.1 - Natural Heritage, Section 2.2 – Water, and Section 3.1 - Natural Hazards of the PPS.

3.2 Regional Municipality of Peel Official Plan (2021 Office Consolidation)

The 1996 Peel Region Official Plan (2021 Office Consolidation) contains policies aimed at protecting, maintaining, and restoring a Regional Greenlands System consisting of "Core Areas", "Natural Areas and Corridors (NACs)", and "Potential Natural Areas and Corridors (PNACs)". Key elements of the Region's Greenlands System include the following:

- Areas of Natural and Scientific Interest (ANSIs);
- Environmentally Sensitive or Significant Areas;
- Escarpment Natural Areas;
- Escarpment Protection Areas;
- Fish and wildlife habitat;
- Habitats of threatened and endangered species;
- Wetlands;
- Woodlands;
- Valley and stream corridors;
- Shorelines;
- Natural lakes;
- Batural corridors;
- Groundwater recharge and discharge areas;
- Open space portions of the Parkway Belt West Plan; and
- Other natural features and functional areas.

The above key elements are to be interpreted, identified and protected in accordance with the policies of the Peel Region Official Plan. While a new Official Plan was adopted by Regional Council in April 2022, the new OP has not been considered in this report.

3.3 Halton Region Official Plan (2022 Office Consolidation)

The Halton Region Official Plan, as amended by ROPA No. 38, identifies a Natural Heritage System (NHS) that consists of both the Greenbelt NHS and the Regional NHS. The NHS identified within the Official Plan utilizes a systems based approach to protecting and enhancing natural features and functions and is composed of the following components:

- Areas identified as part of the Regional NHS on Map 1 of the Region's Official Plan;
- The shoreline along Lake Ontario and Burlington Bay;
- Significant habitats of endangered and threatened species;
- Key Features, which include:
    - The significant habitat of endangered and threatened species;
    - Significant wetlands;
    - Significant coastal wetlands;
    - Significant woodlands;
    - Significant valleylands;
    - Significant wildlife habitat;
    - Significant areas of natural and scientific interest; and
    - Fish habitat;
- Enhancements to the Key Features including Centres for Biodiversity;
- Linkages;
- Buffers;
- Watercourses that are within a Conservation Authority Regulation Limit or that provide a linkage to a wetlands or a significant woodland; and
- Wetlands other than those that have been identified as being significant by the MNRF.

3.4 City of Brampton Official Plan (2020 Office Consolidation)

Section 4.6 of the City of Brampton Official Plan contains Natural Heritage and Environmental Management policies pertaining to the protection of the City's Natural Heritage System.

The NHS consists of 1) Valleylands and Watercourse Corridors, 2) Woodlands, 3) Wetlands, 4) Environmentally Sensitive Areas; 5) Fish and Wildlife Habitat; and 6) Greenbelt Plan Natural System.

3.5 City of Mississauga Official Plan (2022 Office Consolidation)

The City of Mississauga Official Plan identifies a NHS that includes:

- Significant Natural Areas;
- Natural Green Spaces;
- Special Management Areas;
- Residential Woodlands; and
- Linkages.

Significant Natural Areas include areas that meet one or more of the following criteria: provincially or regionally significant life science ANSIs, environmentally sensitive or significant areas, the habitat of threatened or endangered species, fish habitat, significant wildlife habitat, significant woodlands that meet the criteria provided in the Official Plan, significant wetlands, and significant valleylands.

3.6 Town of Halton Hills Official Plan (2020 Office Consolidation)

The Town of Halton Hills Official Plan established a Greenlands system in accordance with the requirements of the Halton Region Official Plan. The Official Plan states that "the intent of the Greenlands system is to maintain, as a permanent landform, an interconnected system of natural and open space areas that will preserve areas of significant ecological value while providing, where appropriate, some opportunities for recreation".

3.7 Credit Valley Conservation Policies and Regulations

The CVC (2010) regulates hazard lands including creeks, valleylands, shorelines, and wetlands under the *Conservation Authorities Act* - Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses (Ontario Regulation [O. Reg] 160/06).

CVC provides the following criteria with respect to Infrastructure Policies:

a) *CVC recognizes that certain types of interference or development (1) related to infrastructure by their nature must locate within hazardous land, watercourses, wetlands and natural features and areas contributing to the conservation of land and associated setbacks. Considering this, CVC may permit such works where all reasonable alternatives have been explored and determined not to be feasible through an environmental assessment, comprehensive environmental study or technical report supported by CVC, and subject to the following:*
    i. *The interference is acceptable and/or it has been demonstrated that, in the opinion of CVC, that the control of flooding, erosion, dynamic beaches, pollution or the conservation of land will not be affected. This includes, but is not limited to:*
        a. *all works must be constructed in such a manner as to prevent unacceptable increases in flood hazards, erosion hazards and associated effects on upstream and downstream properties. All reasonable efforts to eliminate or minimize impacts on flood hazards and erosion hazards must be implemented;*
        b. *the location and design of bridges and culverts must be consistent with CVC standards. Where feasible, bridge and culvert abutments or piers should be located outside of the meander belt allowance or the one hundred year erosion limit of any watercourse;*
        c. *the safe passage of flood flows should not be impeded. Where feasible, structural abutments or piers should be located outside of the flood hazard to minimize obstruction to water flows;*
        d. *the construction of pipe or service pipelines must maintain the predevelopment configuration of the floodplain and valleyland slopes, be*

below the scour depth of the watercourse and minimize disturbance to existing vegetation to the extent feasible;

e. *outfalls must be designed to provide adequate protection to watercourse embankments and maintain or enhance existing vegetation to the extent;*
f. *provincial, regional and municipal roads should be designed to be flood free based on the flood hazard limit, to the extent feasible;*
g. *ecological linkages and corridors should be incorporated into the design of all works. The design of infrastructure should maintain, and where possible, improve or restore ecological linkages where appropriate;*
h. *the area of construction disturbance is minimized to the extent feasible;*
i. *natural features, ecological functions and hydrologic functions contributing to the conservation of land are not affected. Where unavoidable, adverse impacts must be minimized to the extent feasible and mitigation measures implemented to the satisfaction of CVC;*
j. *the interference is acceptable for the natural features and ecological functions and hydrologic functions of the wetland or watercourse; and*
k. *infrastructure should be designed so it does not:*
    i. *decrease base flow characteristics;*
    ii. *adversely impact wetlands by changing the existing hydro-period and/or hydrological connections;*
    iii. *impair surface water and groundwater quality through the introduction of pollutants such as sediments of contaminants; and*
    iv. *Prevent access for maintenance, evacuation or during an emergency.*

3.8 *Species at Risk Act* (2002)

The federal *Species at Risk Act* (SARA; 2002) is intended to prevent federally endangered or threatened wildlife (including plants) from becoming extinct in the wild, and to help in the recovery of these species. This Act is also intended to help prevent species federally listed as Special Concern from becoming endangered or threatened. To ensure the protection of Species at Risk (SAR), SARA contains prohibitions that make it an offence to kill, harm, harass, capture, take, possess, collect, buy, sell or trade an individual of a species listed in Schedule 1 of SARA as endangered, threatened or extirpated.

SARA applies primarily to lands under federal jurisdiction and relies upon provincial legislation to protect SAR habitat. On private lands, SARA prohibitions apply only to aquatic species and migratory birds listed in the *Migratory Birds Convention Act* (1994).

3.9 Provincial *Endangered Species Act* (2007)

Species at risk in Ontario are those listed as provincially endangered, threatened or special concern at the provincial level, however the act regulates only the habitat of species that are endangered or threatened. Habitat for species of special concern is addressed under the significant wildlife habitat policies under the PPS discussed in **Section 2.3** below.

The *Endangered Species Act* (ESA, 2007) provides legal protection to endangered and threatened species confirmed on a site. For context, relevant excerpts from this Act are included below:

Subsection 9(1) of the Act states that:

> *No person shall,*
> *(a) kill, harm, harass, capture or take a living member of a species that is listed on the Species at Risk in Ontario List as an extirpated, endangered or threatened species;*
> *(b) possess, transport, collect, buy, sell, lease, trade or offer to buy, sell, lease or trade,*
> *(i) a living or dead member of a species that is listed on the Species at Risk in Ontario List as an extirpated, endangered or threatened species,*
> *(ii) any part of a living or dead member of a species referred to in subclause (i),*
> *(iii) anything derived from a living or dead member of a species referred to in subclause (i); or*
> *(c) sell, lease, trade or offer to sell, lease or trade anything that the person represents to be a thing described in subclause (b) (i), (ii) or (iii).*

Subsection 10(1)(a) of the Act states that:

> *No person shall damage or destroy the habitat of a species that is listed on the Species at Risk in Ontario list as an endangered or threatened species.*

Permits may be issued to alter the habitat of Threatened or Endangered species where certain legislated requirements are met.

3.10 Federal *Fisheries Act*

Fish and fish habitat are protected under the federal *Fisheries Act* (1985) which was last amended on August 28, 2019. The protection provisions of the *Fisheries Act* apply to all fish and fish habitat throughout Canada and the Act sets out authorities for the regulation of works, undertakings or activities that risk harming fish and fish habitat. Specifically, the protection provisions include two core prohibitions. One is against persons carrying on works, undertakings or activities that result in the "death of fish by means other than fishing" (subsection 34.4[1]), and the other is "harmful alteration, disruption or destruction of fish habitat" (subsection 35[1]; also referred to as "HADD"). The protection provisions are applied in conjunction with other applicable federal laws and regulations related to aquatic ecosystems, including the federal *Species at Risk Act*.

Fish habitat is defined in subsection 2(1) of the *Fisheries Act* to include all waters frequented by fish and any other areas upon which fish depend directly or indirectly to carry out their life processes. The types of areas that can directly or indirectly support life processes include, but are not limited to, spawning grounds and nursery, rearing, food supply and migration areas.

Under subsection 35(1) a person may carry on such works, undertakings or activities without contravening this prohibition, provided that they are carried on under the authority of one of the exceptions listed in subsection 35(2), and in accordance with the requirements of the appropriate exception. In most cases, this exception would be Ministerial authorizations granted to proponents in accordance with the *Authorizations Concerning Fish and Fish Habitat Protection Regulations* under the *Fisheries Act.*

Proponents are responsible for planning and implementing works, undertakings or activities in a manner that avoids harmful impacts, specifically the death of fish and HADD. Where proponents believe that their work, undertaking or activity will result in harmful impacts to fish and fish habitat, DFO will work with proponents to assess the risk of their proposed work, undertaking or activity resulting in the death of fish or HADD of fish habitat and provide advice and guidance on how to comply with the *Fisheries Act*.

4. Existing Conditions

4.1 Terrestrial Resources

Land use through the study area is primarily agricultural with several residences scattered along both sides of the existing road. Also, Maple Lodge Farms is a substantial presence within the project limits. The location of the various ecological communities present within the study area are provided in **Figures 2-1, 2-2, 2-3 and 2-4**.

4.1.1 Vegetation Communities

ELC Unit 1: Existing Road Right of Way

This area consists of the existing road and the right of way that is associated with it. This includes the paved roadway, the gravel road edges and the grassed ditches.

ELC Unit 2: Existing Residential/Commercial Development

These areas consist of the various residences and business that are located in and adjacent to the study area and the manicured lots that are associated with them.

ELC Unit 3: Agricultural Fields

These areas consist of the various agricultural fields that are located in and adjacent to the study area. They have been split into two categories, those that were planted in row crops at the time of the survey and those that were planted in hay or were pasture land for livestock. This distinction was made to assist with the SAR habitat assessment. This land use will vary from year to year based on the crop rotation for each field.

ELC Unit 4: Dry-Moist Old Field Meadow (CUM1-1)

This community consists of typical old field meadow species such Tall Goldenrod (*Solidago canadensis* var. *scabra*), Smooth Brome Grass (*Bromus inermis*), Tufted Vetch (*Vicia craca*), Creeping Thistle (*Cirsium arvense*), and asters (*Syphyotrichum* spp.).

Polygon	ELC Community
1	Road Allowance
2	Anthropogenic
3-A	Agricultural - Row Crop
3-B	Agricultural - Hay
4	Dry - Moist Old Field Meadow (CUM1-1)
5	Mineral Cultural Thicket (CUT1)
6	Fresh - Moist Lowland Deciduous Forest (FOD7)
7	Reed-canary Grass Mineral Meadow Marsh (MAM2-2)
8	Cattail Mineral Shallow Marsh (MAS2-1)
9	Open Aquatic (OAO)

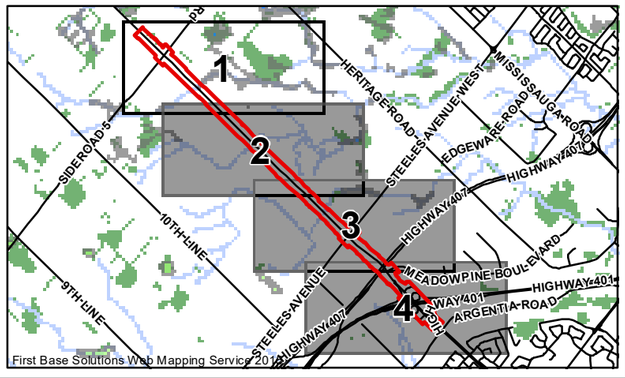
EMBLETON ROAD
WINSTON CHURCHILL BOULEVARD
SIDEROAD 5
Drainage Feature #6
Levi Creek North
Drainage Feature #5
Drainage Feature #4
Drainage Feature #3

Legend

Species at Risk (Beacon, 2015)
- Barn Swallow (Threatened)
- Bobolink (Threatened)
- Drainage Feature (Beacon, 2016)
- Study Area (Hatch, 2016)
- Fish Species Record (CVC, 2015)
- Watercourse (LIO, 2015)

Wetlands (LIO, 2015)
- Evaluated-Provincial
- Not evaluated per OWES

ELC Communities (Beacon, 2016)
- Anthropogenic (Road Allowance, Residence, Buisness)
- Agricultural (Row Crop)
- Agricultural (Hay, Pasture)
- Dry-Moist Old Field Meadow (CUM1-1)
- Mineral Cultural Thicket (CUT1)
- Fresh-Moist Lowland Deciduous Forest (FOD7)
- Mineral Meadow Marsh (MAM2)
- Mineral Shallow Marsh (MAS2)
- Open Aquatic (OAO)



Existing Conditions

Figure 2-1

Winston Churchill Blvd. Widening Class EA

UTM Zone 17 N, NAD 83

Project 214069
November, 2020

0 62.5 125 250 Metres

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Polygon	ELC Community
1	Road Allowance
2	Anthropogenic
3-A	Agricultural - Row Crop
3-B	Agricultural - Hay
4	Dry - Moist Old Field Meadow (CUM1-1)
5	Mineral Cultural Thicket (CUT1)
6	Fresh - Moist Lowland Deciduous Forest (FOD7)
7	Reed-canary Grass Mineral Meadow Marsh (MAM2-2)
8	Cattail Mineral Shallow Marsh (MAS2-1)
9	Open Aquatic (OAO)

Legend

Species at Risk (Beacon, 2015)

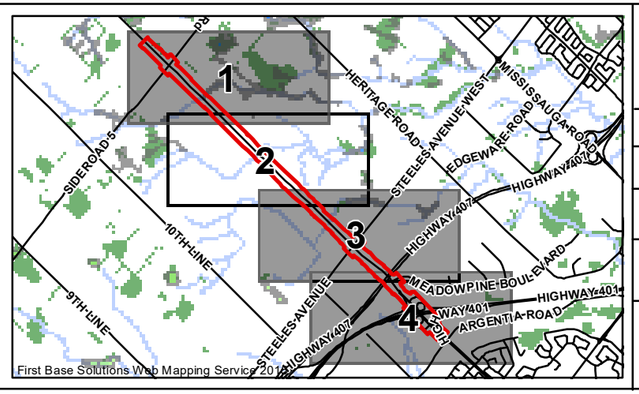
- Barn Swallow (Threatened)
- Bobolink (Threatened)
- Drainage Feature (Beacon, 2016)
- Study Area (Hatch, 2016)
- Fish Species Record (CVC, 2015)
- Watercourse (LIO, 2015)

Wetlands (LIO, 2015)

- Evaluated-Provincial
- Not evaluated per OWES

ELC Communities (Beacon, 2016)

- Anthropogenic (Road Allowance, Residence, Buisness)
- Agricultural (Row Crop)
- Agricultural (Hay, Pasture)
- Dry-Moist Old Field Meadow (CUM1-1)
- Mineral Cultural Thicket (CUT1)
- Fresh-Moist Lowland Deciduous Forest (FOD7)
- Mineral Meadow Marsh (MAM2)
- Mineral Shallow Marsh (MAS2)
- Open Aquatic (OAO)



Existing Conditions

Figure 2-2

Winston Churchill Blvd. Widening Class EA

UTM Zone 17 N, NAD 83

Project 214069
November, 2020

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Polygon	ELC Community
1	Road Allowance
2	Anthropogenic
3-A	Agricultural - Row Crop
3-B	Agricultural - Hay
4	Dry - Moist Old Field Meadow (CUM1-1)
5	Mineral Cultural Thicket (CUT1)
6	Fresh - Moist Lowland Deciduous Forest (FOD7)
7	Reed-canary Grass Mineral Meadow Marsh (MAM2-2)
8	Cattail Mineral Shallow Marsh (MAS2-1)
9	Open Aquatic (OAO)

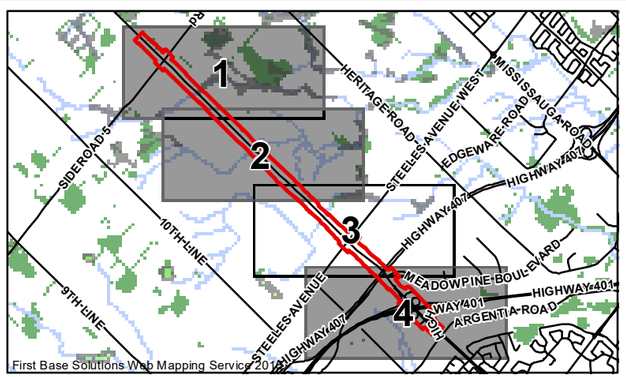
Mullet Creek
STEELES AVENUE WEST
STEELES AVENUE
WINSTON CHURCHILL BOULEVARD
MEADOWPINE BOULEVARD
HOWE COURT

Legend

Species at Risk (Beacon, 2015)
- Barn Swallow (Threatened)
- Bobolink (Threatened)
- Drainage Feature (Beacon, 2016)
- Study Area (Hatch, 2016)
- Fish Species Record (CVC, 2015)
- Watercourse (LIO, 2015)

Wetlands (LIO, 2015)
- Evaluated-Provincial
- Not evaluated per OWES

ELC Communities (Beacon, 2016)
- Anthropogenic (Road Allowance, Residence, Buisness)
- Agricultural (Row Crop)
- Agricultural (Hay, Pasture)
- Dry-Moist Old Field Meadow (CUM1-1)
- Mineral Cultural Thicket (CUT1)
- Fresh-Moist Lowland Deciduous Forest (FOD7)
- Mineral Meadow Marsh (MAM2)
- Mineral Shallow Marsh (MAS2)
- Open Aquatic (OAO)



Existing Conditions

Figure 2-3

Winston Churchill Blvd. Widening Class EA

UTM Zone 17 N, NAD 83

Project 214069
November, 2020

0 62.5 125 250 Metres

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Polygon	ELC Community
1	Road Allowance
2	Anthropogenic
3-A	Agricultural - Row Crop
3-B	Agricultural - Hay
4	Dry - Moist Old Field Meadow (CUM1-1)
5	Mineral Cultural Thicket (CUT1)
6	Fresh - Moist Lowland Deciduous Forest (FOD7)
7	Reed-canary Grass Mineral Meadow Marsh (MAM2-2)
8	Cattail Mineral Shallow Marsh (MAS2-1)
9	Open Aquatic (OAO)

Legend

Species at Risk (Beacon, 2015)

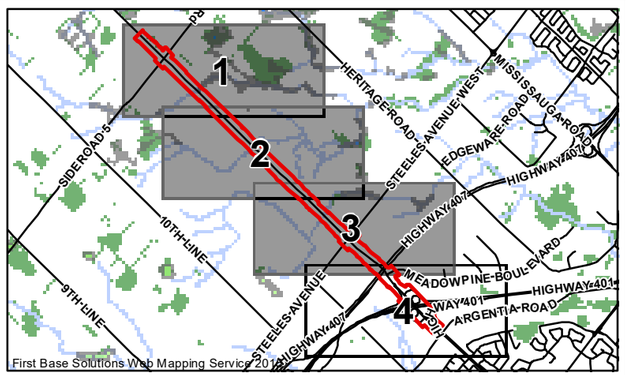
- Barn Swallow (Threatened)
- Bobolink (Threatened)
- Drainage Feature (Beacon, 2016)
- Study Area (Hatch, 2016)
- Fish Species Record (CVC, 2015)
- Watercourse (LIO, 2015)

Wetlands (LIO, 2015)

- Evaluated-Provincial
- Not evaluated per OWES

ELC Communities (Beacon, 2016)

- Anthropogenic (Road Allowance, Residence, Buisness)
- Agricultural (Row Crop)
- Agricultural (Hay, Pasture)
- Dry-Moist Old Field Meadow (CUM1-1)
- Mineral Cultural Thicket (CUT1)
- Fresh-Moist Lowland Deciduous Forest (FOD7)
- Mineral Meadow Marsh (MAM2)
- Mineral Shallow Marsh (MAS2)
- Open Aquatic (OAO)



Existing Conditions

Figure 2-4

Winston Churchill Blvd. Widening Class EA

UTM Zone 17 N, NAD 83

Project 214069
November, 2020

0 62.5 125 250 Metres

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ELC Unit 5: Cultural Thicket (CUT1)

This community is dominated by Common Buckthorn (*Rhamnus cathartica*) and apple (*Malus* sp.).

ELC Unit 6: Fresh-Moist Lowland Deciduous Forest (FOD7)

This community is situated on the east side of Winston Churchill Boulevard along Mullet Creek and is approximately 1.25 ha. It consists of White Elm (*Ulmus americana*), Manitoba Maple (*Acer negundo*), Trembling Aspen (*Populus tremuloides*), and Freeman's Maple (*Acer* x *freemanii*). The understory is comprised of Common Buckthorn and Tartarian Honeysuckle (*Lonicera tatarica*). Ground covers observable from the roadside include Tall Goldenrod and Day Lily (*Hemerocaulis fulva*).

The woodland has not been identified as a Significant Woodland in the Peel Region Official Plan or the City of Brampton Official Plan.

ELC Unit 7: Mineral Meadow Marsh (MAM2)

This community is a narrow band of meadow marsh located along Mullet Creek and Levi Creek North. The feature is dominated by Spearmint (*Mentha spicata*), in association with Soft-stem Bulrush (*Schoeoplectus tabernamontanii)*, spikerush (*Elyocharis erythropoda*), and Panicled Aster (*Symphyotrichum lanceolatum*).

ELC Unit 8: Mineral Shallow Marsh (MAS2)

This community, located at the north end of the study is dominated by Narrow-leaved Cattail (*Typha angustifolia*), Common Reed (*Phragmites australis*), Broad-leaved Cattail (*Typha latifolia*), and Reed Canary Grass (*Phalaris arundinacea*).

ELC Unit 9: Shallow Aquatic (SA) / Open Water Aquatic (OAO)

This dug pond feature is located at the north end of the study area.

4.2 Breeding Birds

Breeding bird surveys were conducted on the mornings of May 30, June 14 and June 27, 2015. Weather conditions for the surveys were ideal, with temperatures within 5°C of normal and no precipitation or excessive winds. Breeding birds were considered likely to be breeding if they were observed or heard in suitable habitat during the survey. Species that were foraging over the subject property but that were likely nesting elsewhere were also noted. The full results of the 2016 breeding bird surveys are presented in **Appendix B**.

A total of 34 species of birds were recorded within or adjacent the study area, 29 of which were considered to be breeding. The most numerous species included Barn Swallow (*Hirundo rustica*), Red-winged Blackbird (*Agelaius phoeniceus*), Savannah Sparrow (*Passerculus sandwichensis*), European

Starling (*Sturnus vulgaris*), and American Robin (*Turdus migratorius*). Species that were observed foraging within or flying over the study area included Red-tailed Hawk (*Buteo jamaicensis*), Great Blue Heron (*Ardea Herodias*), Northern Rough-winged Swallow (*Stelgidopteryx serripennis*), Chimney Swift (*Chaetura pelagica*), Canada Goose (*Branta canadensis*) and Ring-billed Gull (*Larus delawarensis*).

Bird species listed as Endangered, Threatened or Special Concern under the ESA that were observed within or adjacent the study area included Barn Swallow – Threatened, Bobolink (*Dolichonyx oryzivorus*) – Threatened and Chimney Swift – Threatened.

Barn Swallows often live in close association with humans, building their cup-shaped mud nests almost exclusively on human-made structures such as open barns, under bridges and in culverts. The species is attracted to open structures that include ledges where they can build their nests, which are often re-used from year to year. They prefer unpainted, rough-cut wood, since the mud does not adhere as well to smooth surfaces. All of the Barn Swallow observations within the study area consisted of birds foraging over the area or perching on hydro lines adjacent the road right of way. Buildings that the birds appeard to be nesting on during the breeding bird surveys that were visible from the road right of way are shown in the existing conditions figures.

Bobolinks are most commonly associated with hayfields where they often build their small nests on the ground in dense grasses. They can however occasionally be found other grassed areas including tallgrass prairies and cultural meadows. The nesting / foraging locations of Bobolink that were observed during the first two breeding bird surveys were in some of the hay fields along the highway corridor and are shown on the existing conditions figures.

Chimney Swift are most commonly associated with urban settlements where they nest and roost (rest or sleep) in chimneys and other anthropogenic structures. They also tend to stay close to water where the flying insects they eat, congregate. Four (4) Chimney Swift were observed foraging over open fields within / adjacent to the study area during the third survey. The location where the Chimney Swift were observed was not included on the existing conditions figures as foraging habitat for this species is not included as part of its general habitat description and is therefore not regulated under the ESA.

Bird species considered by the MNRF to be area sensitive that were recorded during the breeding bird surveys include Savannah Sparrow (*Passerculus sandwichensis*) and White-breasted Nuthatch (*Sitta carolinesis*).

Savannah Sparrow inhabit grassy meadows, cultivated fields, lightly grazed pastures, roadsides, sedge bogs and tundra. Savannah Sparrows were observed breeding / foraging in and along the edge of the agricultural fields within and adjacent the study area. Bobolink is also considered an area sensitive species by the MNRF.

White-breasted Nuthatch preferred habitat is mature deciduous woodland, but they can also be found in mixed deciduous, coniferous forest and occasionally in residential areas. One white-breasted Nuthatch was observed in a treed area adjacent the study area during the second survey.

While these species are considered area sensitive, they can also be associated with smaller patches of suitable habitat.

4.3 Amphibians

Amphibian surveys were not conducted as part of this assessment; however, there are wetlands within and beyond the study area which could potentially support habitat for frogs and toads. Features with a higher likelihood of supporting amphibian habitat include ELC unit 8 and 9 located at the north end of the property. The narrow bands of meadow marsh located along Levi Creek North and Mullet Creek (ELC Unit 7) are less likely to support breeding anurans.

4.4 Aquatic Resources

The study area is located within the Credit River watershed and within the Mullet Creek and Levi Creek subwatersheds. The tributary of Mullet Creek that flows through the study corridor originates approximately 2 km to the west of Winston Churchill Blvd and flows into the Credit River approximately 12 km south of the study area to the south of Highway 403. The CVC Management Plan (2002) classifies the thermal regime within Mullet Creek as warm/cool and indicates that it supports generalist fish species.

The two tributaries of Levi Creek that flow through the study corridor originate approximately 1.5 to 2 km west of Winston Churchill Blvd. Levi Creek ultimately flows into the Credit River approximately 5 km east of the study area to the north of Highway 401. Six headwater drainage features that flow through the study corridor also drain to Levi Creek. The CVC Management Plan (2002) classifies the thermal regime within upper Levi Creek as warm/cool due to the presence of several on-line ponds and extensive surrounding agricultural activity. MECP has identified Levi Creek as contributing habitat for Redside Dace (*Clinostomus elongatus*), a threatened species under the ESA, and therefore MECP will need to be contacted for any proposed works within Levi Creek.

4.4.1 Habitat Assessment

Mullet Creek

Mullet Creek originates approximately 2.7 km northwest of the culvert that conveys it across Winston Churchill Blvd. At the time of the survey, the channel upstream of the culvert was completely dry. The riparian vegetation for this portion of the channel consisted of manicured lawn on both sides of the channel. The channel itself was completely obscured with grasses and Cattail sp. (*Typha sp*.) which are a barrier to fish movement. No water was observed within the culvert which was lined with rip rap and is also a barrier to fish movement. Land use adjacent to the channel is residential and agricultural.

Downstream of the culvert, flowing water was observed which presumably originated from the storm sewer outfall located immediately northeast of the culvert. The stream morphology is entirely flat with only an isolated plunge pool located immediately downstream of the culvert outlet providing any diversity. This pool had a wetted width of about 1.1 m and a depth of approximately 0.18 m. Instream algae and overhanging grasses provided minimum shade. Pool substrate was a combination of silt, sand, gravel and some cobble material. A cluster of cobble isolates the pool from the remainder of the channel and acts as a seasonal barrier to fish passage. The channel then meanders naturally through a deciduous forest with a wetted width of about 0.23 m and a depth of about 0.10 m. Stream substrate through this reach includes gravel, silt and cobble. Adjacent land use is industrial and agricultural.

Levi Creek South

Levi Creek South originates about 1.8 km northwest of the culvert crossing. At the time of the investigation, the upstream reach of the channel was completely dry and entirely choked with vegetation including: cattail species, Wild Mint (*Mentha arvensis*) and Crown Vetch (*Coronilla varia*). This channel becomes highly disturbed immediately beyond the Right-of-Way (ROW) as it travels through an active pasture.

The downstream reach of the channel was obscured with instream cattails and minimal water that was approximately 0.04 m deep at the time of the survey. The channel was undefined with a riparian area that consisted of grasses and herbaceous vegetation with some low-lying shrubs. The culvert was lined with rip rap and no water was present. This system likely conveys flows that contribute to downstream fish habitat after the spring freshet and large rainfall events.

Levi Creek North

This watercourse is a vegetated swale situated between an agricultural field to the south and a meadow community to the north. The channel was completely dry in the downstream reach. West of Winston Churchill, the channel was completely obscured with grasses and herbaceous vegetation with minimal standing water of about 4 cm. Inside the culvert, the substrate was entirely rip rap with standing water. Due to its direct connection with the Levi Creek Wetland Complex, this system was identified as an intermittent system that may support fish habitat.

Drainage Features 1 & 2

During field investigations, these vegetated swales were completely dry and were composed mainly of grasses and cattails. Rip rap was present at the culvert outlets. The riparian area was comprised of manicured lawns east of Winston Churchill Blvd. Land use includes industrial and agricultural, east and west of Winston Churchill Blvd, respectively. The contribution to fish habitat of these features is likely limited to flow conveyance during periods of high flow.

Drainage Features 3 & 4

East of Winston Churchill Blvd., these dry features are agricultural swales which had recently been ploughed through and planted with soybeans. West of Winston Churchill Blvd., land use included farm pasture at Drainage Feature 3 and residential with manicured lawns at Drainage Feature 4. The only contribution to fish habitat is likely limited to flow conveyance during periods of high flow.

Drainage Feature 5

At the time of the survey this channel was undefined and dry. The culvert outlets into a drainage ditch that likely receives runoff from surrounding residential and agricultural areas. This drainage ditch connects to an agricultural swale which has been recently ploughed through and planted with corn. This system likely conveys flows to downstream fish habitat after the spring freshet and large rainfall events.

Drainage Feature 6

During field investigations this channel was dry and lined with grasses and goldenrod species (*Solidago sp*). Riprap was present at the base of the culvert outlet continuing past the ROW fence. Surrounding land use was agriculture. The swale is situated within a meadow community. An isolated pool covered in algae was located at the culvert outlet. The culvert was gated which acts as a barrier to fish passage. Upstream of Winston Churchill Blvd, no defined channel was present. Surrounding land use was also agricultural in this area. This system likely conveys flows after the spring freshet and large rainfall events and contributes indirectly to downstream fish habitat.

4.4.2 Fish Community

During the field investigations, no fish were observed in the tributaries; however, correspondence with MNRF indicated that Mullet Creek and Levi Creek North provide habitat for a warmwater fish community within the study area.

Credit Valley Conservation fish sampling results identified Brook Stickleback (*Culaea inconstans*) as the only fish species captured within the tributary of Mullet Creek and Levi Creek North. Brook Sticklebacks are habitat generalists and are tolerant of some disturbance.

4.5 Species at Risk

A total of 17 species have been recorded in the vicinity of the study area. These were identified following a review of a variety of publicly available background resources including the Natural Heritage Information Centre (NHIC) database, the Ontario Breeding Bird Atlas, the Ontario Reptile and Amphibian Atlas, the Toronto Entomologists' Association, Ontario Butterfly Atlas and the Atlas of the Mammals of Ontario (**Appendix A**). Based on the habitat specifications of these species, suitable habitat for six of these species, identified in **Table 2**, could be present within or adjacent to the study area.

Table 2. Species at risk identified within study area or for which suitable habitat may be present within the study area

Species	ESA Status	SARA Status	Suitable Habitat Present within the Study Area?
Butternut *Juglans cinerea*	END	END Schedule 1	**Yes** Suitable habitat may be present within the wooded portions of the study area.
Redside Dace *Clinostomus elongatus*	END	END Schedule 1	**Yes** Supporting habitat may be present with the tributary(ies) of Levi Creek that traverse the study area.
Barn Swallow *Hirundo rustica*	SC	No Status	**No** No suitable nesting habitat for this species is present within the study area.

Species	ESA Status	SARA Status	Suitable Habitat Present within the Study Area?
Bobolink *Dolichonyx oryzivorus*	THR	No Status	**Yes** Suitable habitat is present within the hay fields of the study area.
Chimney Swift *Chaetura pelagica*	THR	THR Schedule 1	**No** No suitable nesting habitat for this species is present within the study area.
Eastern Meadowlark *Sturnella magna*	THR	No Status	**Yes** Suitable habitat may be present within the hay fields of the study area.
Monarch *Danaus plexippus*	SC	No Status	**Yes** Suitable habitat may be present within the cultural meadow communities of the study area.
Snapping turtle *Chelydra serpentina*	SC	SC Schedule 1	**No** No suitable nesting habitat for this species is present within the study area..

Butternut

In Ontario, Butternut usually grows alone or in small groups in deciduous forests. It prefers moist, well-drained soil and is often present along streams. It can also be found on well-drained gravel sites and rarely, on dry rocky soil. This species does not thrive in the shade, and often grows in sunny openings and near forest edges. No Butternut were identified within or adjacent to the study area.

Redside Dace

Redside Dace frequent pools and slow-moving areas of small streams and headwaters with gravel substrate. They are generally present in areas with overhanging grasses and shrubs, and can leap up to 10 cm out of the water to catch insects. During spawning, they are present in shallow parts of streams, which are also popular spawning areas for other minnow species. Correspondence with the Aurora district MECP indicated that the tributaries of Levi Creek that traverse the study area are upstream of regulated Redside Dace habitat, and therefore may be considered contributing Redside Dace habitat.

Bobolink and Eastern Meadowlark

The MNRF general habitat description for Bobolink (MNRb, 2013b) categorizes habitat for this species as follows:

- Category 1 – Nest and the area within 10 m of the nest: The nest and the area surrounding it are the key feature in the reproduction process for this species. It is considered to be highly sensitive and has the lowest tolerance for alteration;
- Category 2 – The area between 10 m and 60 m of the nest or centre of approximated defended territory: This is the area used for courtship, mating, rearing young, feeding, resting and bathing. It is considered to have a moderate level of tolerance for alteration; and

- Category 3 – The area between 60 m and 300 m of the nest or centre of approximated defended territory: This is the area also used for feeding, rearing of young and resting as well as dispersal and concealment from predators. It is considered to have a high level of tolerance for alteration.

As indicated in Section 4.2, the Bobolink observed during the breeding bird surveys consisted of birds actively breeding within suitable habitat.

As Bobolink and Eastern Meadowlark frequently nest within hayfields MNRF has issued an exemption regulation under Section 4.1 of O. Reg. 242/08 which allows agricultural operations to continue where Bobolink and Eastern Meadowlark occur on the landscape. Generally compatible activites under this regulation include:

- Activities that maintain grasslands on the landscape including crop rotation, growing of hay and forage crops, grazing of livestock;
- Operation of agricultural machinery and equipment;
- Draining, irrigating or cultivating land; and
- Conversion of grassland habitat to other crop types including row crops and trees.

Generally incompatible activities include:

- Conversion of grassland habitat supporting Bobolink and Eastern Meadowlark into an area that does not support the species through non-agricultural operations; and
- Plough under or otherwise removing grassland habitat supporting Bobolink or Eastern Meadowlark as part of or to facilitate a land development undertaking or any other non-agricultural use.

The MNRF general habitat description states that activities in Bobolink habitat can occur provided the function of these areas is maintained and individuals of the species are not killed, harmed, or harassed. It also provides a list of generally compatible activities. Based on these criteria, the proposed widening of Winston Churchill Blvd. could negatively impact Bobolink or its habitat. However due to crop rotations, agricultural land use will change over time. Therefore, additional surveys prior to construction will be necessary to identify the presence of potentially suitable habitat for Bobolink and if so if it is being used by Bobolink. If habitat is present and the road widening would result in its removal, compensation would be required under the ESA.

Eastern Meadowlarks breed primarily in moderately tall grasslands, such as pastures and hayfields, but are also found in alfalfa fields, weedy borders of croplands, roadsides, orchards, airports, shrubby overgrown fields, or other open areas. Small trees, shrubs or fence posts are used as elevated song perches. No Eastern Meadowlark were observed within or adjacent to the study area.

Monarch Butterfly

Monarch caterpillars feed on milkweed plants which grow in meadows and open areas. Adult butterflies can be found in more diverse habitats where they feed on nectar from a variety of wildflowers. Some milkweed were identified within or adjacent to the study area; however, the roadside meadow within the study area would not represent significant habitat for this species.

4.6 Landscape Connectivity and Wildlife Linkages

The main creeks within the study are (Levi Creek North and Mullet Creek) provide potential landscape linkage functions including supporting wildlife movement through the existing agricultural matrix. However, the creeks corridors are generally very narrow and heavily influenced by adjacent farming; therefore, it is expected that these creeks would only support movement of small mammals and reptiles such as snakes.

As discussed above, Levi Creek North and Mullet Creek represent seasonal warm water fish habitat. However, several barriers to fish movement were identified through site specific investigations, notably dense vegetation and large cobbles/rip-rap within the channels.

Despite the lower level connectivity these corridors provide, as land use changes (i.e., rural to urban) occur within these areas, the maintenance of these corridors should remain.

5. Summary of Natural Heritage Features

Based on the findings of this investigation, the study area provides limited habitat for common species of flora and urban tolerant fauna. Key natural environment features that should be considered for the evaluation of the design alternatives include Levi Creek North (Tributary 1), Levi Creek South (Tributary 3) and Mullet Creek (Tributary 5). Bobolink, a Threatened species under the provincial ESA were observed breeding in agricultural fields that are planted in hay within or adjacent to the study area. Also, the branches of Levi Creek may be considered contributing Redside Dace habitat under the ESA.

No other significant natural features or functions at the provincial or regional level are associated with the lands within or adjacent to the study area.

6. Description of Alternatives

Four proposed alternatives have been identified for widening Winston Churchill Blvd between Highway 401 and Embleton Road. The alternatives are as follows:

- Do Nothing;
- Alternative #1 – East Side Widening (Figure 3-1);
- Alternative #2 – Centreline Widening (Figure 3-2); or
- Alternative #3 – West Side Widening (Figure 3-3).

Figures illustrating these alternatives have been prepared by HMM and are included in their report.

7. Impact Assessment

A summary of the evaluation of each alternative is presented in **Table 3**. The area of disturbance presented below may be subject to change once the detailed design for the selected alternative is completed.

Table 3. Evaluation of the Proposed Alternatives for the Widening of Winston Churchill Blvd. from Hwy 401 to Embleton Road

Criterion		Proposed Alternatives			
Natural Environment	**Measure of Potential Impact**	**Do Nothing**	**Alternative 1 East Side Widening**	**Alternative 2 Centreline Widening**	**Alternative 3 West Side Widening**
Surface Water	Aquatic Species and Habitat	No impact on aquatic species or habitat	Increase the width of the Mullet Creek culvert by approximately 20 m. Increase the width of the Levi Creek South tributary culvert by approximately 20 m. Increase the width of the Levi Creek North tributary culvert by 20 m. Potential removal of fish habitat through increased footprint of culvert. Potential impacts to aquatic species and habitat through sedimentation during construction.	Increase the width of the Mullet Creek culvert by approximately 20 m. Increase the width of the Levi Creek South tributary culvert by approximately 20 m. Increase the width of the Levi Creek North tributary culvert by 20 m. Potential removal of fish habitat through increased footprint of culvert. Potential impacts to aquatic species and habitat through sedimentation during construction.	Increase the width of the Mullet Creek culvert by approximately 20 m. Increase the width of the Levi Creek South tributary culvert by approximately 19 m. Increase the width of the Levi Creek North tributary culvert by 20 m. Potential removal of fish habitat through increased footprint of culvert. Potential impacts to aquatic species and habitat through sedimentation during construction.
	Headwater Drainage Feature	No impact on Headwater Drainage Features	Potential impacts to drainage feature through sedimentation during construction.	Potential impacts to drainage feature through sedimentation during construction.	Potential impacts to drainage feature through sedimentation during construction.
Vegetation	Wetlands	No impact on PSW	Removal of approximately 200 m^2 of wetland from the Levi's Creek PSW at the Levi's Creek north crossing. Potential impacts to PSW through sedimentation during construction. Removal of approximately 240 m^2 of unevaluated Mineral Meadow Marsh (MAM2) wetland that borders Mullet Creek west of Winston Churchill Blvd.	Removal of approximately 130 m^2 of wetland from the Levi's Creek PSW at the Levi's Creek north crossing. Potential impacts to PSW through sedimentation during construction. Removal of approximately 230 m^2 of unevaluated Mineral Meadow Marsh (MAM2) wetland that borders Mullet Creek west of Winston Churchill Blvd.	No removal of wetland from the Levi's Creek PSW Removal of approximately 239 m^2 of unevaluated Mineral Meadow Marsh (MAM2) wetland that borders Mullet Creek west of Winston Churchill Blvd. Potential impacts to PSW through sedimentation during construction.
	Terrestrial Vegetation	No impact on vegetation	Removal of approximately 1,160 m^2 of the Cultural Thicket (CUT1) and Cultural Meadow (CUM1) community east of Winston Churchill Blvd along Levi Creek South tributary. No removal of Lowland Deciduous Forest (FOD7) community. Potential impacts include fragmentation, spread of invasive species and edge effects.	Removal of approximately 700 m^2 of the Cultural Thicket (CUT1) and Cultural Meadow (CUM1) community east of Winston Churchill Blvd along Levi Creek South tributary. No removal of Lowland Deciduous Forest (FOD7) community. Potential impacts include fragmentation, spread of invasive species and edge effects.	No removal of Mineral Meadow Marsh (MAM2-2) that borders Mullet Creek west of Winston Churchill Blvd. No removal of Lowland Deciduous Forest (FOD7) community. Potential impacts include fragmentation, spread of invasive species and edge effects.
Wildlife	Loss of wildlife habitat	No impact on wildlife	Removal of wildlife habitat associated with meadow, thicket, and meadow vegetation.	Removal of wildlife habitat associated with meadow, thicket, and meadow vegetation.	Removal of wildlife habitat associated with meadow, thicket, and meadow vegetation.

Criterion		Proposed Alternatives			
Natural Environment	**Measure of Potential Impact**	**Do Nothing**	**Alternative 1 East Side Widening**	**Alternative 2 Centreline Widening**	**Alternative 3 West Side Widening**
			Increased light and noise pollution; increased potential for road mortality.	Increased light and noise pollution; increased potential for road mortality.	Increased light and noise pollution; increased potential for road mortality.
	Species at Risk	No impact on rare or SAR	Potential impacts to Redside Dace and its habitat through sedimentation during construction.	Potential impacts to Redside Dace and its habitat through sedimentation during construction.	Potential impacts to Redside Dace and its habitat through sedimentation during construction.

Based on the assessment outlined in **Table 3**, the various alternatives that have been proposed as part of the Environmental Assessment have been ranked based on their potential for impact the natural features identified within / adjacent to the study area.

Alternative 3 – West Side Widening was identified as the preferred alternative from an environmental perspective as it did not encroach into the Levi Creek PSW at the Levi Creek north crossing or into the Cultural Thicket (CUT1) or Cultural Meadow (CUM1-1) communities at the Levi Creek south crossing. It would result in the removal of a small area (approximately 239 m^2) of a Mineral Meadow Marsh (MAM2) community that borders Mullet Creek west of Winston Churchill Blvd.

Alternative 2 – Centerline Widening was identified as the second most preferred alternative from an environmental perspective. This alternative would result in the removal of approximately:

- 136 m^2 of wetland from the Levi's Creek PSW at the Levi's Creek north crossing;
- 697 m^2 of the Cultural Thicket (CUT1) and Cultural Meadow (CUM1) community east of Winston Churchill Blvd along Levi Creek South tributary; and
- 227 m^2 of Mineral Meadow Marsh (MAM2) that boarder Mullet Creek west of Winston Churchill Blvd.

Alternative 1 – East Side Widening was identified as the least preferred alternative from an environmental perspective. This alternative would result in the removal of approximately:

- Removal of approximately 216 m^2 of wetland from the Levi's Creek PSW at the Levi's Creek north crossing;
- 1,158 m^2 of the Cultural Thicket (CUT1) and Cultural Meadow (CUM1) community east of Winston Churchill Blvd along Levi Creek South tributary; and
- 240 m^2 of Mineral Meadow Marsh (MAM2) that boarders Mullet Creek west of Winston Churchill Blvd.

Overall the difference in environmental impacts between Alternative 2 – Centerline Widening and Alternative 1 East Side Widening were very similar with the Alternative 1 option encroaching a bit more into the natural or naturalized features adjacent the existing road alignment.

As indicated in previous sections, Bobolink were identified in hay fields within / adjacent to the study area. However due to crop rotations agricultural land use will change between the time this study was completed and when construction begins. Therefore, this species was not factored into this evaluation. Additional surveys prior to construction may be required to identify if potentially suitable habitat is present for Bobolink and if so if it is being used by Bobolink. If habitat is present and the road widening would result in the removal of this habitat, then approvals would be required under the ESA.

Aside from the differences identified here all three alternatives would have a similar impact on the natural environment within or adjacent the study area. The "Do Nothing" option results in no impacts to the existing natural environment; however, it does not provide a solution for resolving the need to widen Winston Churchill Blvd.

8. Mitigation for the Recommended Alternative

The following mitigation measures are recommended to avoid or minimize impacts on natural heritage and hydrological features based on the assessment of existing conditions, proposed design and construction considerations, and agency approval requirements. A number of the mitigation measures that have been identified will require further development and/or detailed site plans for agency review and approval as the project moves to the implementation phase.

8.1.1 Pre-construction/Design

- Where feasible and appropriate, watercourse crossings should be designed to facilitate passage for fish, reptiles, and amphibians and small mammals. An Openness Ratio for each culvert is suitable for turtles, amphibians, snakes . Refer to CVC's *Fish and Wildlife Crossing Guidelines* (2017) for culvert design considerations.
- Natural substrate should be installed with some cover, including branches, roots and debris to provide refuge. No rip rap or scour pools are proposed. To attenuate seasonal flow through the feature, medium sized stone shall be placed along with smaller materials to fill interstitial spacing. Additional measures including fencing placements and landscape design which facilitate passage should be included at detailed design.
- A sediment and erosion control plan should be prepared for the construction phase of the development and approved by CVC, prior to the start of construction works and to the standard of *Erosion and Sediment Control Guideline for Urban Construction (December 2006)*.
- To address impacts to trees in the project area, a tree inventory and preservation plan is recommended at the detailed design stage.
- Lighting along the road should be designed to limit intrusion into the adjacent natural areas using shielding devices.

8.1.2 During Construction

A number of mitigation measures are recommended in order to minimize erosion and prevent sediment-laden runoff from entering wetlands, watercourses, and treed areas adjacent to the work area.

- Disturbance within the watercourse channels and wetlands should be minimized as much as possible; Works should be undertaken during the summer low flow period.
- Prior to site preparation (clearing, grubbing, grading), the limit of the work area should be fenced with temporary erosion and sediment control (ESC) fencing.
- Stockpiled soils should be contained with sediment fencing.
- All ESC measures should be regularly inspected throughout the construction period. If measures are found to be ineffective, the Contractor should immediately make changes in order to control erosion and sediment runoff.
- Temporary ESC measures should be maintained and kept in place until all work has been completed and soils are sufficiently covered and stabilized. Exposed soils shall be stabilized as soon as possible through re-vegetation using CVC approved native seed mixes or other appropriate methods.

- A spill response plan should be prepared for works in or near the watercourses and wetlands and take necessary actions and notify appropriate personnel in the event of a spill (identification of local MECP office).
- Work area should be delineated by exclusion fencing for the protection of existing vegetation. Silt fence may double as tree/vegetation protection fencing.
- Equipment should not be operated in areas where the contract does not require.
- Construction material, excess material, construction debris, and empty containers should be stored outside the creek floodplain.
- Removal of vegetation must not interfere with breeding bird activity. The federal *Migratory Birds Convention Act* protects the nests, eggs and young of most bird species from harassment, harm, or destruction. The breeding bird season in southern Ontario is generally from mid-April to late-July; hence the clearing of vegetation should be outside of these dates. For any proposed clearing of vegetation between mid-April and late July, or where birds may be suspected of nesting outside of typical dates, an ecologist should undertake detailed nest searches immediately prior (within two days) to site alteration to ensure that no active nests are present.

9. Agency Review and Approvals

A permit will be required under CVC's O. Reg 160/06 Development; Interference with Wetlands and Alteration to Shorelines and Watercourses Regulations will likely be required for the works.

A project review by DFO will also be required for the works.

Levi Creek downstream of the study area is regulated Redside Dace habitat; therefore, the tributaries present within the study area may be considered contributing habitat, which is regulated by MECP under the ESA.

Bobolink were identified in hay fields within and adjacent to the study area; however, due to crop rotations, agricultural land use will change between the time this study was completed and when construction begins. In this regard, this species was not factored into this evaluation, but additional surveys prior to construction may be required to identify if potentially suitable habitat is present for and used by Bobolink.

If the habitat of any endangered or threatened species is to be affected as a result of the proposed activity, then communication with the MECP will be required to identify any requirements under the ESA.

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Appendix A

Breeding Bird Summary

Appendix A

Winston Churchill Blvd. Widening Class EA Breeding Bird Summary

Common Name	Scientific Name	Status				Surveys		
		National Species at Risk COSEWIC[a]	Species at Risk in Ontario Listing[b]	Provincial breeding season SRANK[c]	Area-sensitive (OMNR)[d]	May 30, 2015	June 14, 2015	June 27, 2015
Great Blue Heron	*Ardea herodias*			S4		1	1	1
Canada Goose	*Branta canadensis*			S5			12	
Red-tailed Hawk	*Buteo jamaicensis*			S5		1		
Ring-billed Gull	*Larus delawarensis*			S5			200	
Rock Pigeon	*Columba livia*			SNA				2
Mourning Dove	*Zenaida macroura*			S5			2	6
Chimney Swift	*Chaetura pelagica*	THR	THR	S4			4	
Eastern Wood-Pewee	*Contopus virens*	SC	SC	S4		1	1	
Eastern Phoebe	*Sayornis phoebe*			S5				2
Great Crested Flycatcher	*Myiarchus crinitus*			S4			1	
Eastern Kingbird	*Tyrannus tyrannus*			S4		3	1	4
Horned Lark	*Eremophila alpestris*			S5		3	2	
N. Rough-winged Swallow	*Stelgidopteryx serripennis*			S4		1	1	
Barn Swallow	*Hirundo rustica*	SC	SC	S4		3	38	28
American Crow	*Corvus brachyrhynchos*			S5			2	3
Black-capped Chickadee	*Poecile atricapillus*			S5		1	2	2
White-breasted Nuthatch	*Sitta carolinensis*			S5	A		1	
American Robin	*Turdus migratorius*			S5		4	8	8
Northern Mockingbird	*Mimus polyglottus*			S4		1	1	
Gray Catbird	*Dumetella carolinensis*			S4			1	1
Cedar Waxwing	*Bombycilla cedrorum*			S5				4
European Starling	*Sturnus vulgaris*			SE			3	16
Warbling Vireo	*Vireo gilvus*			S5		1		
Yellow Warbler	*Setophaga petechia*			S5		1	2	
Northern Cardinal	*Cardinalis cardinalis*			S5		2	1	5
Chipping Sparrow	*Spizella passerina*			S5		2	2	3
Savannah Sparrow	*Passerculus sandwichensis*			S4	A	9	14	17
Song Sparrow	*Melospiza melodia*			S5		7	11	13
Swamp Sparrow	*Melospiza georgiana*			S5		1		
Bobolink	*Dolichonyx oryzivorus*	THR	THR	S4	A	4	2	
Red-winged Blackbird	*Agelaius phoeniceus*			S4		11	19	18

Common Name	Scientific Name	Status				Surveys		
		National Species at Risk COSEWIC[a]	Species at Risk in Ontario Listing[b]	Provincial breeding season SRANK[c]	Area-sensitive (OMNR)[d]	May 30, 2015	June 14, 2015	June 27, 2015
Common Grackle	*Quiscalus quiscula*			S5		1	3	1
Brown-headed Cowbird	*Molothrus ater*			S4			5	4
American Goldfinch	*Spinus tristis*			S5			1	3
House Sparrow	*Passer domesticus*			SNA		1	1	4

a - COSEWIC = Committee on the Status of Endangered Wildlife in Canada
b - Species at Risk in Ontario List (as applies to ESA) as designated by COSSARO (Committee on the Status of Species at Risk in Ontario): END = Endangered, THR = Threatened, SC = Special Concern
c - SRANK (from Natural Heritage Information Centre) for breeding status if: S1 (Critically Imperiled), S2 (Imperiled),S3 (Vulnerable), S4 (Apparently Secure), S5 (Secure), SNA (Not applicable…'because the species is not a suitable target for conservation activities'; includes non-native species)
d - Ontario Ministry of Natural Resources (OMNR). 2000. Significant Wildlife Habitat Technical Guide (Appendix G). 151 p plus appendices.

Appendix B

SAR Habitat Screening

Appendix B. Winston Churchill Blvd. Widening Class EA
Species at Risk Habitat Screening

BEACON ENVIRONMENTAL

Taxonomy	Species	ESA Status	SARA Status	COSEWIC Status	Preferred Habitat[1, 2]	Known Species Range[1, 2]	Source Identifying Species Record	Habitat Present within the Study Area
Plants	Butternut *Juglans cinerea*	END	END Schedule 1	END	In Ontario, Butternut usually grows alone or in small groups in deciduous forests. It prefers moist, well-drained soil and is often found along streams. It is also found on well-drained gravel sites and rarely on dry rocky soil. This species does not do well in the shade, and often grows in sunny openings and near forest edges.	Butternut can be found throughout central and eastern North America. In Canada, Butternut occurs in Ontario, Quebec and New Brunswick. In Ontario, this species is found throughout the southwest, north to the Bruce Peninsula, and south of the Canadian Shield.	Aurora Distric MNRF January 20, 2014 NHIC Record - UTM Grid ID: 17NJ9531 - Last Recorded 2011	**Yes** Suitable habitat may be present within the wooded areas present within the study area.
Mammals	Little Brown Myotis (Bat) *Myotis lucifugus*	END	END Schedule 1	END	Bats are nocturnal. During the day they roost in trees and buildings. They often select attics, abandoned buildings and barns for summer colonies where they can raise their young. Bats can squeeze through very tiny spaces (as small as six millimetres across) and this is how they access many roosting areas. Little brown bats hibernate from October or November to March or April, most often in caves or abandoned mines that are humid and remain above freezing. This species can typically be associated with any community where suitable roosting (i.e. caviety trees, houses, abandoned buildings, barns, etc.) habitat is available.	The little brown bat is widespread in southern Ontario and found as far north as Moose Factory and Favourable Lake. Outside Ontario, this bat is found across Canada (except in Nunavut) and most of the United States.	Atlas of the Mammals of Ontario - (1970 - 1993)	**No** Suitable habitat likely not present within the study area.
Mammals	Northern Myotis *(Bat)* *Myotis septentrionalis*	END	END Schedule 1	END	Northern Myotis bats are associated with boreal forests, choosing to roost under loose bark and in the cavities of trees. These bats hibernate from October or November to March or April, most often in caves or abandoned mines.	The Northern Myotis is found throughout forested areas in southern Ontario, to the north shore of Lake Superior and occasionally as far north as Moosonee, and west to Lake Nipigon.	Atlas of the Mammals of Ontario (1900 - 1969)	**No** Suitable habitat likely not present within the study area.
Fish	Redside Dace *Clinostomus elongatus*	END	SC Schedule 3	END	The Redside Dace is found in pools and slow-moving areas of small streams and headwaters with a gravel bottom. They are generally found in areas with overhanging grasses and shrubs, and can leap up to 10 cm out of the water to catch insects. During spawning, they can be found in shallow parts of streams, which are also popular spawning areas for other minnow species.	In Canada, Redside Dace are found in a few tributaries of Lake Huron, in streams flowing into western Lake Ontario, the Holland River (which flows into Lake Simcoe), and Irvine Creek of the Grand River system (which flows into Lake Erie).	Aurora Distric MNRF January 20, 2014	**Yes** Supporting habitat may be present with the tributary(ies) of Levi Creek that cross through the study area.
Birds	Bank Swallow *Riparia riparia*	THR	No Status	THR	Bank Swallows nest in burrows in natural and human-made settings where there are vertical faces in silt and sand deposits. Many nests are on banks of rivers and lakes, but they are also found in active sand and gravel pits or former ones where the banks r	The Bank Swallow is found all across southern Ontario, with sparser populations scattered across northern Ontario. The largest populations are found along the Lake Erie and Lake Ontario shorelines, and the Saugeen River (which flows into Lake Huron).	Ontario Breeding Bird Atlas - Square 17NJ92 / 17NJ93	**No** Suitable habitat likely not present within the study area.
Birds	Barn Swallow *Hirundo rustica*	SC	No Status	SC	Barn Swallows often live in close association with humans, building their cup-shaped mud nests almost exclusively on human-made structures such as open barns, under bridges and in culverts. The species is attracted to open structures that include ledges where they can build their nests, which are often re-used from year to year. They prefer unpainted, rough-cut wood, since the mud does not adhere as well to smooth surfaces.	The Barn Swallow may be found throughout southern Ontario and can range as far north as Hudson Bay, wherever suitable locations for nests exist.	NHIC Record - UTM Grid ID: 17NJ9727 - Last Recorded 2011 Ontario Breeding Bird Atlas - Square 17NJ92 / 17NF93	**No** Suitable habitat likely not present within the study area.
Birds	Bobolink *Dolichonyx oryzivorus*	THR	No Status	THR	Historically, Bobolinks lived in North American tallgrass prairie and other open meadows. With the clearing of native prairies, Bobolinks moved to living in hayfields. Bobolinks often build their small nests on the ground in dense grasses. Both parents usually tend to their young, sometimes with a third Bobolink helping.	The Bobolink breeds across North America. In Ontario, it is widely distributed throughout most of the province south of the boreal forest, although it may be found in the north where suitable habitat exists.	Ontario Breeding Bird Atlas - Square 17NJ92 / 17NJ93	**Yes** Suitable habitat is present within the hay fields present within the study area.
Birds	Chimney Swift *Chaetura pelagica*	THR	THR Schedule 1	THR	Before European settlement Chimney Swifts mainly nested on cave walls and in hollow trees or tree cavities in old growth forests. Today, they are more likely to be found in and around urban settlements where they nest and roost (rest or sleep) in chimneys and other manmade structures. They also tend to stay close to water as this is where the flying insects they eat congregate.	The Chimney Swift breeds in eastern North America, possibly as far north as southern Newfoundland. In Ontario, it is most widely distributed in the Carolinian zone in the south and southwest of the province, but has been detected throughout most of the province south of the 49th parallel. It winters in northwestern South America.	Aurora Distric MNRF January 20, 2014 Ontario Breeding Bird Atlas - Square 17NJ92 / 17NJ93	**No** Suitable habitat likely not present within the study area.
Birds	Eastern Meadowlark *Sturnella magna*	THR	No Status	THR	Eastern Meadowlarks breed primarily in moderately tall grasslands, such as pastures and hayfields, but are also found in alfalfa fields, weedy borders of croplands, roadsides, orchards, airports, shrubby overgrown fields, or other open areas. Small trees, shrubs or fence posts are used as elevated song perches.	In Ontario, the Eastern Meadowlark is primarily found south of the Canadian Shield but it also inhabits the Lake Nipissing, Timiskaming and Lake of the Woods areas.	Ontario Breeding Bird Atlas - Square 17NJ92 / 17NJ93	**Yes** Suitable habitat may be present within the hay fields present within the study area.

Appendix B. Winston Churchill Blvd. Widening Class EA
Species at Risk Habitat Screening

Taxonomy	Species	ESA Status	SARA Status	COSEWIC Status	Preferred Habitat[1, 2]	Known Species Range[1, 2]	Source Identifying Species Record	Habitat Present within the Study Area
Birds	Eastern Whip-poor-will *Caprimulgus vociferus*	THR	THR Schedule 1	THR	The Eastern Whip-poor-will is usually found in areas with a mix of open and forested areas, such as savannahs, open woodlands or openings in more mature, deciduous, coniferous and mixed forests. It forages in these open areas and uses forested areas for roosting (resting and sleeping) and nesting. It lays its eggs directly on the forest floor, where its colouring means it will easily remain undetected by visual predators.	The Eastern Whip-poor-will's breeding range includes two widely separate areas. It breeds throughout much of eastern North America, reaching as far north as southern Canada and also from the southwest United States to Honduras. In Canada, the Whip-poor-will can be found from east-central Saskatchewan to central Nova Scotia and in Ontario they breed as far north as the shore of Lake Superior.	Ontario Breeding Bird Atlas - Square 17NJ93	**No** Suitable habitat likely not present within the study area.
Birds	Common Nighthawk *Chordeiles minor*	SC	THR Schedule 1	THR	Traditional Common Nighthawk habitat consists of open areas with little to no ground vegetation, such as logged or burned-over areas, forest clearings, rock barrens, peat bogs, lakeshores, and mine tailings. Although the species also nests in cultivated fields, orchards, urban parks, mine tailings and along gravel roads and railways, they tend to occupy natural sites.	The range of the Common Nighthawk spans most of North and Central America. In Canada, the species is found in all provinces and territories except Nunavut. In Ontario, the Common Nighthawk occurs throughout the province except for the coastal regions of James Bay and Hudson Bay.	Ontario Breeding Bird Atlas - Square 17NJ93	**No** Suitable habitat likely not present within the study area.
Birds	Hooded Warbler *Hooded Warbler*	SC	Threatened Schedule 1	Not at Risk	Nesting in mature hardwood forests, Hooded Warblers can be found in small clearings with low, shrubby vegetation. Hooded Warblers are considered area-sensitive, meaning they require large areas of forest.	In North America, the Hooded Warbler is found mainly in the eastern United States with its range extending into Canada only in southern Ontario. The Hooded Warbler was once considered a rare breeder in Ontario, but has recently increased in number and expanded its range. During the fall, it migrates south along the Caribbean to its wintering grounds in Central America.	Aurora Distric MNRF January 20, 2014 Ontario Breeding Bird Atlas - Square 17NJ93	**No** Suitable habitat likely not present within the study area.
Insects	Monarch *Danaus plexippus*	SC	No Status	SC	Throughout their life cycle, Monarchs use three different types of habitat. Only the caterpillars feed on milkweed plants and are confined to meadows and open areas where milkweed grows. Adult butterflies can be found in more diverse habitats where they feed on nectar from a variety of wildflowers.	The Monarch's range extends from Central America to southern Canada. In Canada, Monarchs are most abundant in southern Ontario and Quebec where milkweed plants and breeding habitat are widespread. During late summer and fall, Monarchs from Ontario migrate to central Mexico where they spend the winter months. During migration, groups of Monarchs numbering in the thousands can be seen along the north shores of Lake Ontario and Lake Erie.	Toronto Entomologists' Association Ontario Butterfly Atlas Online - Square 17NJ92 / 17NJ93 - Last Observed 2015	**Yes** Suitable habitat may be present within the cultural meadow communities present within the study area.
Birds	Red-headed Woodpecker *Melanerpes erythrocephalus*	SC	THR Schedule 1	THR	The Red-headed Woodpecker lives in open woodland and woodland edges, and is often found in parks, golf courses and cemeteries. These areas typically have many dead trees, which the bird uses for nesting and perching. This woodpecker regularly winters in the United States, moving to locations where it can find sufficient acorns and beechnuts to eat. A few of these birds will stay the winter in woodlands in southern Ontario if there are adequate supplies of nuts.	The Red-headed Woodpecker is found across southern Ontario, where it is widespread but rare. Outside Ontario, it lives in Alberta, Saskatchewan, Manitoba and Quebec, and is relatively common in the United States.	Ontario Breeding Bird Atlas - Square 17NJ92 / 17NJ93	**No** Suitable habitat likely not present within the study area.
Reptiles	Snapping turtle *Chelydra serpentina*	SC	SC Schedule 1	SC	Snapping Turtles spend most of their lives in water. They prefer shallow waters so they can hide under the soft mud and leaf litter, with only their noses exposed to the surface to breathe. During the nesting season, from early to mid summer, females travel overland in search of a suitable nesting site, usually gravelly or sandy areas along streams. Snapping Turtles often take advantage of man-made structures for nest sites, including roads (especially gravel shoulders), dams and aggregate pits.	The Snapping Turtle's range extends from Ecuador to Canada. In Canada this turtle can be found from Saskatchewan to Nova Scotia. It is primarily limited to the southern part of Ontario. The Snapping Turtle's range is contracting.	Aurora Distric MNRF January 20, 2014 Ontario Reptile and Amphibian Atlas - Square 17NJ92 / 17NJ93 - Last Recorded 2016	**Yes** Potentially suitable habitat may be present within watercourses that flow through the study area.
Birds	Wood Thrush *Hylocichla mustelina*	SC	No Status	THR	The Wood Thrush lives in mature deciduous and mixed (conifer-deciduous) forests. They seek moist stands of trees with well-developed undergrowth and tall trees for singing perches. These birds prefer large forests, but will also use smaller stands of trees. They build their nests in living saplings, trees or shrubs, usually in sugar maple or American beech.	The wood thrush is found all across southern Ontario. It is also found, but less common, along the north shore of Lake Huron, as far west as the southeastern tip of Lake Superior. There is a very small population near Lake of the Woods in northwestern Ontario, and there have been scattered sightings in the mixed forest of northern Ontario.	Ontario Breeding Bird Atlas - Square 17NJ92	**No** Suitable habitat likely not present within the study area.
Birds	Eastern Wood-Pewee *Contopus virens*	SC	No Status	SC	The Eastern Wood-pewee lives in the mid-canopy layer of forest clearings and edges of deciduous and mixed forests. It is most abundant in intermediate-age mature forest stands with little understory vegetation.	The eastern wood-pewee is found across most of southern and central Ontario, and in northern Ontario as far north as Red Lake, Lake Nipigon and Timmins.	Ontario Breeding Bird Atlas - Square 17NJ92 / 17NJ93	**No** Suitable habitat likely not present within the study area.

Appendix B. Winston Churchill Blvd. Widening Class EA
Species at Risk Habitat Screening

Taxonomy	Species	ESA Status	SARA Status	COSEWIC Status	Preferred Habitat[1, 2]	Known Species Range[1, 2]	Source Identifying Species Record	Habitat Present within the Study Area

Glossary

EXP	ESA - Extripated - a species that no longer exists in the wild in Ontario but still occurs elsewhere.
	SARA - Extripated - a wildlife species that no longer exists in the wild in Canada, but exists elsewhere in the wild.
END	ESA - Endangered - a species facing imminent extinction or extirpation in Ontario which is a candidate for regulation under Ontario's Endangered Species Act.
	SARA - Endangered - a wildlife species that is facing imminent extirpation or extinction.
THR	ESA - Threatened - a species that is at risk of becoming endangered in Ontario if limiting factors are not reversed.
	SARA - Threatened - a wildlife species that is likely to become endangered if nothing is done to reverse the factors leading to its extirpation or extinction.
SC	ESA - Special Concern (formerly Vulnerable) - a species with characteristics that make it sensitive to human activities or natural events.
	SARA - Special Concern - a wildlife species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats.
MNRF	Ontario Ministry of Natural Resources and Forestry
ESA	Endangered Species Act
SARA	Species at Risk Act (Federal)
Schedule 1	The official list of species that are classified as extirpated, endangered, threatened, and of special concern.
Schedule 2	Species listed in Schedule 2 are species that had been designated as endangered or threatened, and have yet to be re-assessed by COSEWIC using revised criteria. Once these species have been re-assessed, they may be considered for inclusion in Schedule 1.
Schedule 3	Species listed in Schedule 3 are species that had been designated as special concern, and have yet to be re-assessed by COSEWIC using revised criteria. Once these species have been re-assessed, they may be considered for inclusion in Schedule 1.
COSEWIC	Committee on the Stauts of Endangerd Wildlife in Canada - a committee of experts that assesses and designates which wild species are in some danger of disappearing from Canada.

References

1	- Species at Risk . Ontario Ministry of Natural Resources and Forestry. http://www.mnr.gov.on.ca/en/Business/Species/index.html. © Queens Printer For Ontario, 2013.
2	- Species at Risk Status Reports. Committed on the Status of Endangered Wildlife in Canada. Ottawa. http://www.sararegistry.gc.ca/search/advSearchResults_e.cfm?stype=doc&docID=18.

Appendix C

Aquatic Photo Log

Appendix C

Aquatic Photo Log

Photo 1. Mullet Creek – Looking West through the Culvert from Downstream **Instream Culvert Dry*

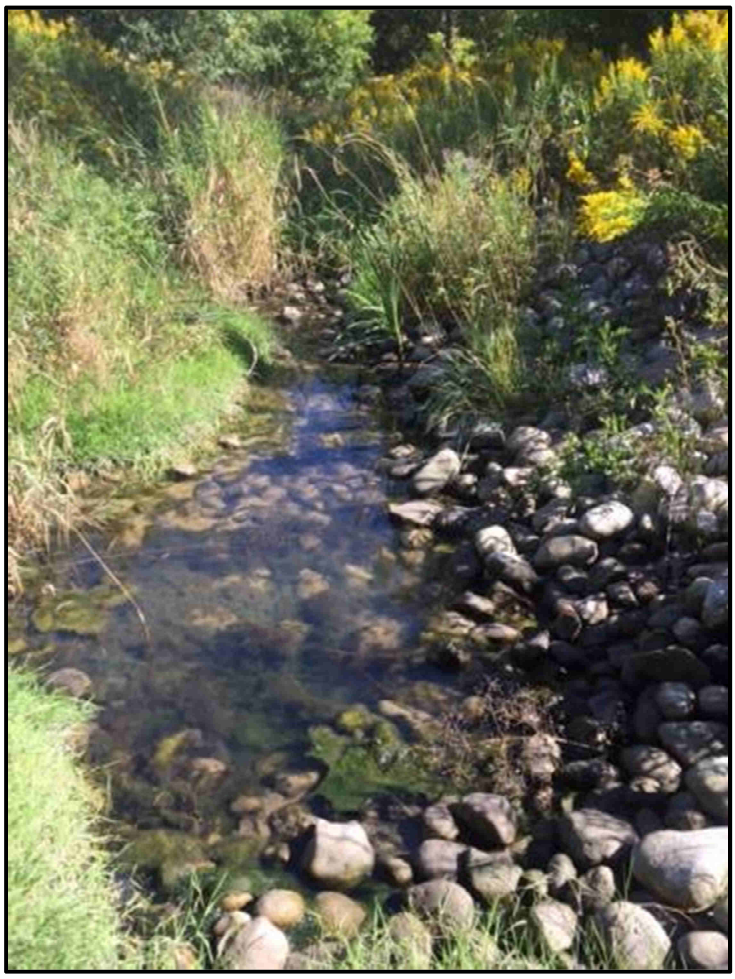

Photo 2. Mullet Creek – Looking East at Isolated Pool at the Culvert Outlet

Photo 3. Mullet Creek – Looking West at Upstream Reach *Completely Dry

Photo 4. Drainage Feature # 1 – East of Winston Churchill Blvd. – Dry Swale

Photo 5. Drainage Feature # 2 – East of Winston Churchill Blvd. – Dry Swale

Photo 6. Levi Creek South – Looking East (Downstream) Vegetated Swale with Standing Water

Photo 7. Levi Creek South – Looking West through Culvert *Dry

Photo 8. Levi Creek South- Looking West at Dry Upstream Reach

Photo 9. Drainage Feature #3 - Looking East at Dry Agricultural Swale

Photo 10. Drainage Feature #4 – Looking East at Dry Agricultural Swale

Photo 11. Drainage Feature #5 – Looking Southeast from Culvert at Drainage Ditch (Agricultural Swale Located Further South within Agricultural Field)

Photo 12. Levi Creek North – Looking East at Dry Agricultural Swale

Photo 13. Levi Creek North – Standing Water within Culvert Looking West

Photo 14. Levi Creek North – Looking Northwest at Upstream Reach with Minimal Standing Water Present

Photo 15. Drainage Feature #6 – Dry Vegetated Swale Looking East

Photo 16. Drainage Feature #6 – Standing Water at Culvert Outlet