
APPENDIX 3

NATURAL ENVIRONMENTAL ASSESSMENT



Columbia Way Environmental Assessment (EA) Study

Natural Environment Assessment Report

Final

July 30, 2021

Prepared for:





Columbia Way Environmental Assessment (EA) Study

Natural Environment Assessment
Report – Final

Prepared for the Town of Caledon

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RVA 195072

July 30, 2021

**Columbia Way Environmental Assessment (EA) Study
Natural Environment Assessment Report**

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1.0 Introduction

The Town of Caledon (Town) has retained R.V. Anderson Associates Ltd. (RVA) to undertake a Municipal Class Environmental Assessment (EA) Study and Preliminary Design for road improvements to Columbia Way between Highway 50 and Caledon-King Townline. The primary scope of this EA is the urbanization of Columbia Way from Regional Road 50 to approximately 0.5 kilometers east of Mount Hope Road, with “rural setting improvements” from 0.5 kilometers east of Mount Hope Road to Caledon-King Townline.

In support of the Class EA, the existing natural environment conditions were established (Phase 1 of this assessment), and the proposed project impacts were evaluated, and mitigation measures determined (Phase 2 of this assessment). This report summarizes the results of the preliminary background review, includes the results of the field investigations, provides a screening of Species at Risk (SAR) potential within the Study Area, examines the potential impacts of the preferred design alternative on the natural environment, and documents the measures necessary to mitigate these impacts.

1.1 Study Area

The general Study Area is located within the Regional Municipality of Peel and includes the right-of-way (ROW) plus 120m on either side of Columbia Way between Highway 50 in the southwest and Caledon-King Townline in the northeast (**Figure 1.1**, also see **Appendix A – Map 1**). A detailed inventory (Scoped Study Area) of natural heritage features was limited to the ROW plus 150 m, depending on access.

Land use within in the Study Area is mainly suburban residential along the southern (urban) portion of Columbia Way, with active and fallowed agricultural lands along the northern portion which drain to an ephemeral tributary of Cold Creek. In the northeastern (rural) part of the Study Area, both sides of the roadway are a mixture of rural residential and existing natural and regenerating vegetation communities. These include old fields, plantations, and wetlands. Beyond the roadway and residential lands on both sides, a mixture of plantation and deciduous woodlands are present, Cold Creek, a tributary of the Humber River flows to the south under Columbia Way in this section of the Study Area.

1.1.1 Indigenous Land Acknowledgement

The Study Area is located within the traditional territory of the Huron-Wendat, Haudenosaunee and Anishinabek Nations and most recently, the Mississaugas of the Credit First Nation. This territory is included in Treaty 19, also known as the Ajetance Purchase.

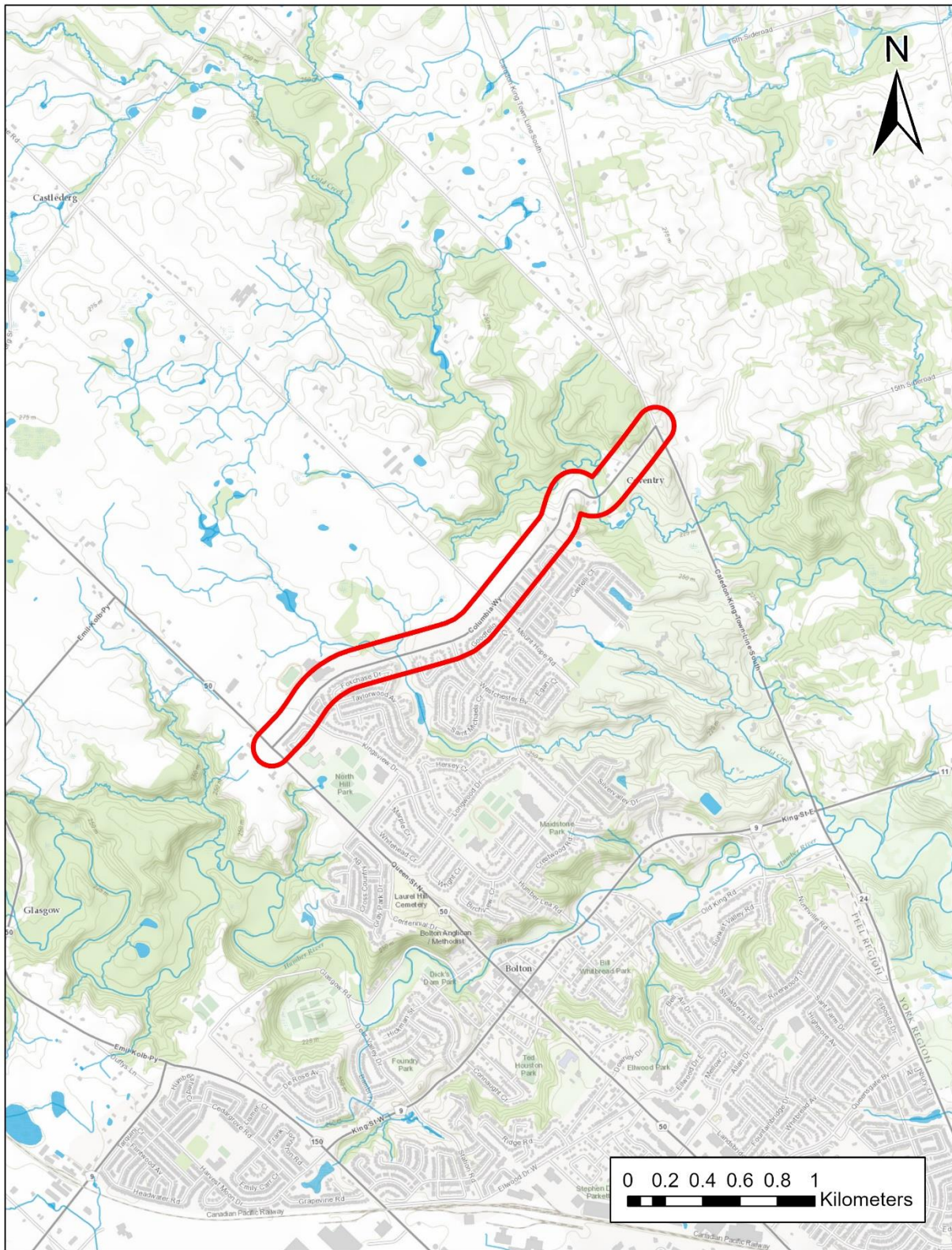


Figure 1.1 – Columbia Way Study Area

2.0 Governing Policy Context

The governing policy framework provides guidance on the protection of natural heritage features and the evaluation of their significance. Candidate features identified within the Study Area were evaluated against the applicable federal, provincial, and municipal planning policies.

2.1 Federal Legislation

2.1.1 Fisheries Act

The purpose of the *Fisheries Act* (Government of Canada, 1985) is to provide a framework for the proper management and control of fisheries and for the conservation and protection of fish and fish habitat, including the prevention of pollution. In June of 2019, Canada modernized the *Fisheries Act*; the new provisions and stronger protections aim to better support the sustainability of Canada's fish and fish habitat for future generations. In particular, Section 34.4 prohibits any work, undertaking or activity (other than fishing) that results in the death of fish; Section 35.1 prohibits the harmful alteration, disruption, or destruction of fish habitat (HADD); and Section 36 prohibits the deposit of deleterious substances.

The *Fisheries Act* requires that projects avoid causing death of fish or HADD of fish habitat unless authorized by Fisheries and Oceans Canada (DFO) or a designated representative. Proponents are responsible for planning and implementing works, undertakings or activities in a manner that avoids harmful impacts to fish and fish habitat. Should proponents believe that their work, undertaking or activity will result in harmful impacts to fish and fish habitat, a Request for Review (RFR) must be submitted, and the DFO will work with them to assess the risk and provide advice and guidance on how to comply with the *Fisheries Act*.

2.1.1 Migratory Birds Convention Act

The *Migratory Birds Convention Act* (MBCA) was passed in 1917 and updated in 1994 to implement the Migratory Birds Convention, a treaty signed with the United States in 1916 (Government of Canada, 1994a). The MBCA is enforced through the Migratory Birds Regulations and together they serve to protect most migratory birds, their nests, and eggs anywhere they are found in Canada (Government of Canada, 1994b).

2.1.2 Species at Risk Act

At a federal level, Species at Risk (SAR) designations for species occurring in Canada are initiated by the completion of a comprehensive Status Report by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). If approved by the federal Minister of the Environment, species are added to the federal List of Wildlife Species at Risk (Government of Canada, 2002).

Species that are included on Schedule 1 as Endangered or Threatened are afforded protection of critical habitat on federal lands under the *Species at Risk Act* (SARA). On private or provincially owned lands, only aquatic species listed as Endangered, Threatened or Extirpated and migratory birds are protected under SARA, unless ordered by the Governor in Council.

2.2 Provincial Legislation

2.2.1 Environmental Assessment Act

The *Environmental Assessment Act* was created to provide for the protection, conservation, and wise management of the environment in Ontario. The Act applies to:

- (a) enterprises or activities or proposals, plans or programs in respect of enterprises or activities by or on behalf of Her Majesty in right of Ontario or by a public body or public bodies or by a municipality or municipalities;
- (b) major commercial or business enterprises or activities or proposals, plans or programs in respect of major commercial or business enterprises or activities of a person or persons, other than a person referred to in clause (a), designated by the regulations;
- (c) an enterprise or activity or a proposal, plan, or program in respect of an enterprise or activity of a person or persons, other than a person or persons referred to in clause (a), if an agreement is entered into under Section 3.0.1 in respect of the enterprise, activity, proposal, plan, or program. R.S.O. 1990, c. E.18, s. 3; 2001, c. 9, Sched. G, s. 3 (3).

As the Columbia Way reconstruction is a municipal project, this act requires that a Class EA Study be completed. In support of this EA, a detailed natural environment field investigation program and impact assessment was conducted.

2.2.2 Provincial Policy Statement

The Provincial Policy Statement (PPS, Ministry of Municipal Affairs and Housing (MMAH), 2020) sets the policy direction for regulating development and land use planning in the province. Both provincial and local land-use planning decisions build on the PPS and its relevant policies. This report deals specifically with the policies contained in Part V, Section 2.1 (Natural Heritage) of the PPS which is directed at protection and management of natural heritage systems and features. A natural heritage system is defined by the Province of Ontario as:

“A system made up of natural heritage features and areas, and linkages intended to provide connectivity (at the regional or site level) and support natural processes which are necessary to maintain biological and geological diversity, natural functions, viable populations of indigenous species and ecosystems. These systems can include natural heritage features and areas, federal and provincial parks and conservation reserves, other natural heritage features, lands that have been restored or have the potential to be restored to a natural state, areas that support hydrologic functions and working landscapes that enable ecological functions to continue.” (MMAH, 2020).

Natural heritage features of significance are described in the Natural Heritage Resource Manual (MNR, 2010) and include:

- significant wetlands;
- significant coastal wetlands;
- other coastal wetlands in Ecoregions 5E, 6E and 7E;
- fish habitat;
- significant woodlands;
- significant valleylands in Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Marys River);
- habitat of endangered and threatened species;
- significant wildlife habitat; and
- significant areas of natural and scientific interest (ANSIs).

Development and site alteration is not permitted in:

- significant wetlands in Ecoregions 5E, 6E and 7E and significant coastal wetlands;
- significant wetlands in the Canadian Shield north of Ecoregions 5E, 6E and 7E, significant woodlands and significant valleylands in Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Marys River), significant wildlife habitat, significant ANSIs, and coastal wetlands in Ecoregions 5E, 6E and 7E that are not subject to policy 2.1.4(b), unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions; and
- fish habitat or habitat of endangered and threatened species except in accordance with provincial and federal requirements.

2.2.3 Endangered Species Act

At the provincial level, SAR and their habitats are protected under the *Endangered Species Act* (ESA, Government of Ontario, 2007) which is administered by the Ministry of Environment, Conservation and Parks (MECP). SAR designations for species in Ontario are initiated by the completion of a comprehensive Status Report by the Committee on the Status of Species at Risk in Ontario (COSSARO), and if approved by the provincial Minister of the Environment, Conservation and Parks, species are added to the ESA. Section 9(1) of the ESA, 2007 prohibits the killing, harming, harassment, capture, taking, possession, transport, collection, buying, selling, leasing, trading, or offering to buy, sell, lease or trade species listed as Extirpated, Endangered, or Threatened on the SAR in Ontario (SARO) List. Section 10(1) prohibits damaging or destroying habitat of Endangered or Threatened species on the SARO List and may apply to Extirpated species through special regulations. General habitat protection applies to all Endangered and Threatened species, with some species having 'categorized habitat', which protects areas within specific distances from known records. Additionally, some other species are afforded habitat protection through a habitat regulation (regulated habitat), as identified in Ontario Regulation 242/08. Species designated as Special Concern are not protected under the Act.

The ESA, 2007 does include provisions for permits under Section 17(2)(c) that would otherwise contravene the Act. Projects which propose impacts to SAR or their habitat would require a permit or other process (e.g., registration) to proceed without contravening the Act.

2.2.4 Conservation Authorities Act

Section 28(1) of the *Conservation Authorities Act* (Government of Ontario 1990a) empowers Conservation Authorities with the ability to make regulations governing development that can have an impact on watercourses and water bodies, including wetlands. The Study Area is located within the Toronto Region Conservation Authority (TRCA) watershed, and sections are regulated under the Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses, Ontario Regulation (O. Reg.) 166/06 (see **Appendix A – Map 2** for regulation areas).

Under O. Reg. 166/06, TRCA may grant permission to straighten, change, divert, or interfere with the existing channel of a river, creek, stream, or watercourse, or to change or interfere with a wetland under conditions outlined in the regulation (Government of Ontario 1990b).

2.2.5 Greenbelt Act

The *Greenbelt Act* was introduced in 2005 to help shape the future of the Greater Golden Horseshoe region (GGH). The Greenbelt Plan (2017), together with the Oak Ridges Moraine Conservation Plan (ORMCP), identifies where urbanization should not occur in order to provide permanent protection to the agricultural land base and the ecological and hydrological features, areas and functions occurring on this landscape. The Greenbelt Plan includes lands within, and builds upon the ecological protections provided by, the ORMCP. The Greenbelt Plan, together with the ORMCP, builds on the Provincial Policy Statement (PPS) to establish a land use planning framework for the GGH that supports a clean and healthy environment. Sections of the Study Area fall within the jurisdiction of the Greenbelt Act (see **Appendix A – Map 2**).

2.2.6 Oak Ridges Moraine Conservation Act

The ORMCP (2017) is set out in O. Reg. 140/02 under the *Oak Ridges Moraine Conservation Act, 2001*. It is an ecologically based Plan that provides land use and resource management planning direction on how to protect the Moraine's ecological and hydrological features and functions. The ORMCP divides the Moraine into four land use designations: Natural Core Areas, Natural Linkage Areas, Countryside Areas, and Settlement Areas. The Plan identifies key natural heritage features (such as wetlands and woodlands) and key hydrologic features (such as kettle lakes and springs). Development near these key natural heritage features and key hydrologic features is only allowed if it will not adversely affect these features. Sections of the Study Area are within the Oak Ridges Moraine and are subject to the directives of the ORMCP (see **Appendix A – Map 2**).

2.2.7 Invasive Species Act

Invasive species are an emerging concern, both due to impacts to ecosystems as well as land use and infrastructure. In Ontario, the Invasive Species Act (ISA, 2015) sets out rules to prevent and control the spread of invasive species. The ISA recognizes two classes of invasive species; prohibited and restricted. In the case of restricted invasive species, it is illegal to import, deposit, release, breed/grow, buy, sell, lease or trade restricted invasive species. Prohibited species have the same restrictions, but it is also illegal to possess or transport these species.

2.3 Municipal Legislation

2.3.1 Town of Caledon Official Plan

The Town of Caledon 2018 Official Plan identifies Bolton as one of three Rural Service Centre settlement areas where future growth will be focused. Schedule C – Bolton Land Use Plan, shows the Study Area designations are predominantly Prime Agricultural and Environmental Policy Areas to the north, and Low and Medium Density Residential, and Environmental Policy Areas to the south. The Environmental Policy Areas that span across Columbia Way to the north and south, are associated with the Greenbelt Plan and ORMCP (noted above see **Appendix A – Map 2**).

3.0 Methodology

3.1 Review of Background Information and Potential Species at Risk Data

The preliminary background review included review of the following publicly available sources, including databases and published reports, for information related to geological and natural environment components within the Study Area:

- Ministry of Natural Resources and Forestry (MNRF) – Natural Heritage Information Centre (NHIC) Make A Map: Natural Heritage Areas;
- Land Information Ontario (LIO) Mapping – Aquatic Resource Areas (ARA);
- Ontario Breeding Bird Atlas (OBBA);
- Fisheries and Oceans Canada (DFO) Aquatic SAR Mapping;
- Ontario Nature – Ontario Reptile and Amphibian Atlas (ORAA);
- iNaturalist (screened to include Research Grade and Threatened species);
- Ministry of Agriculture, Food and Rural Affairs (MAFRA) – AgMaps;
- Credit River Watershed and Region of Peel NAI Report – Volume 1;
- Bond, I.J. and Telford, P.G. 1976. Paleozoic geology, Bolton, southern Ontario; Ontario Division of Mines, Map 2338, 1:50 000;
- Hoffman., D.W. and Richards, N.R. 1953. Soil Survey of Peel County. Experimental Farm Service, Canada Department of Agriculture and the Ontario Agricultural College;

- Toronto Region Conservation Authority (TRCA) Humber River Watershed Scenario Modelling and Analysis Report;
- Humber River Fisheries Management Plan, TRCA 2005;
- Ontario Institute of Pedology, 1990, Soils of Brant County, Ontario; and
- Ontario Freshwater Fishes Life History Database, Robert J. Eakins (1999-2020).

3.2 Agency Consultation and Background Review

An information request regarding natural heritage information was submitted to The Ministry of Natural Resources and Forest (MNR) Aurora District, Ministry of Environment and Parks (MECP) Halton-Peel District and the Toronto and Region Conservation Authority (TRCA). Agencies generously responded with the following information for the Study area, which was utilized in the creation of this report:

- Ecological Land Classification information;
- Floral and Faunal Lists (rare or otherwise notable species);
- Crossings Guideline for Valley and Stream Corridors (TRCA);
- Evaluation, Classification and Management of Headwater Drainage Features Guidelines (TRCA);
- Fish and Wildlife Crossing Guidelines (Credit Valley Conservation);
- Fish community data;
- Watercourse classification;
- In-water timing windows for construction; and
- MNR interpretation of fish and fish habitat sensitivity.

3.3 Field Investigations

Field investigations were conducted through the 2020 field season as shown in **Table 3.1**. In addition to targeted surveys, all incidental wildlife, habitat, and pertinent landscape data was recorded to support a thorough assessment of the Study Areas.

Table 3.1 – Field Investigations Schedule

Survey Type		Weather	Staff
Fish and Fish Habitat; Incidental Observations	July 31	Sunny, 27°C	Courtney Beneteau Paul Mikoda Courtney Row
Vegetation/ELC; Incidental Observations	August 27	Sunny, 29°C	Paul Mikoda
Tree Inventory	September 22	Sunny, 22°C	Paul Mikoda Courtney Row

The following sections provide detailed methodologies used to assess the flora and fauna during field investigations.

3.3.1 Ecological Land Classification and Vegetation Inventory

Ecological Land Classification (ELC) for the Study Area previously undertaken by TRCA was referenced during the field visit. A single-season floral inventory and ELC confirmation/update was completed for the Study Area. Field visits were timed to correspond with a summer inventory window to attempt to identify as many plant species as possible. ELC was reviewed and updated as per Lee *et al.* (1998).

3.3.2 Tree Inventory

An inventory of trees immediately adjacent to the roadway was conducted. Information recorded included tree species, dbh (diameter at breast height) and notes on tree health and condition.

3.3.3 Incidental Terrestrial Wildlife

During all site visits, terrestrial wildlife, including call and signs, were recorded. Birds recorded have been assumed to either be residents or early migrants.

3.3.4 Significant Wildlife Habitat

Significant Wildlife Habitat (SWH) was assessed based on the collection of targeted and incidental field data and comparisons to thresholds set out in the Significant Wildlife Habitat Criteria Schedule for Ecoregion 7E (OMNR, 2015).

3.3.5 Fish and Fish Habitat

The potential for fish habitat was investigated at the watercourse crossings and associated headwater drainage features in the Study Area. Fish habitat investigations involved:

- Habitat information/locations including stream morphology, bed substrate, bank characteristics, stream flow and depth;
- Obstructions/barriers to fish passage and major disturbances;
- “Critical” or important habitat areas including potential spawning areas, nursery cover, and feeding areas;
- Potential constraints, habitat compensation or enhancement opportunities; and
- In-situ measurement of water quality parameters (temperature, DO, pH, and conductivity).

In all watercourses with potential to provide fish habitat, fish community inventories were conducted using a Smith-Root backpack electroshocker (Model LR-24). Electrofishing was conducted by moving in a downstream-to-upstream sweep and ensuring adequate sampling of all habitat types present at the site. Sampling was conducted both upstream and downstream of the Columbia Way

Road crossing. Any fish collected were identified, counted, and live-released at the site of capture. Water quality conditions, and fisheries collection details were recorded.

Photographs were taken of the in-stream habitat and bank characteristics of the watercourses. This representative photographic record can be found in **Appendix B**.

3.4 Species at Risk Screening

Provincially protected SAR can be found throughout Ontario in both documented and undocumented populations. The field studies described above, in conjunction with incidental observations, are compared to the known habitat preferences and general locations of SAR noted in background review documents, as well as those with a tendency to be commonly encountered, regardless of documentation.

3.5 Significance Assessment

Significance of ecological features and functions was determined through analysis of the site-specific field data against provincial policies (ESA, PPS, Greenbelt Plan, and ORMCP) as well as within the broader context of the natural heritage and ecology of the larger Study Area.

4.0 Existing Conditions

An overview of the natural heritage features and regulated areas in the Study Area is presented in **Appendix A – Map 1**.

4.1 Physiography

The Study Area is underlain by Ordovician bedrock of the Georgian Bay formation, composed of shale, limestone, dolostone and siltstone (Bond and Telford 1976; OGS, 2011). Most of the area is part of the South Slope physiographic region with soils of the Halton till layer, which are mainly loams and silt-loams (Chapman and Putnam, 1984). At a local level, soils are generally clay-loams of the King series with a pocket of Monaghan series located in the center of the Study Area. The eastern most section of the Study Area is shown as being part of the Oak Ridges Moraine (NHIC; TRCA). There are areas of modern alluvium and ice contract stratified drift associated with Cold Creek (White, 1975; OGS 2011). Soils associated with Cold Creek and its tributaries are described as variable Bottomland soils Topographically, the landscape has smooth, gentle to moderate slopes with good to imperfect drainage (Hoffman and Richards, 1953).

4.2 Designated Natural Areas

No provincially or locally designated parks, conservation areas, reserves, or Areas of Natural or Scientific Interest (ANSI) were identified in the Study Area.

As shown in **Appendix A – Map 2**, the Study Area is located in the Greenbelt Plan Area, Natural Heritage System. The east end of the Study Area falls under the ORMCP Area, as a Natural Linkage Area.

North of Columbia Way, the Provincially Significant Wetland (PSW) – Castlederg Wetland Complex is located outside of the Study Area and provides surface drainage to the Cold Creek tributary.

In the eastern, rural section of the Study Area, lands surrounding Cold Creek are designated as a Core Area of the Region of Peel Greenlands System. No Core Greenlands are located within the western, urbanizing section of the Study Area, though the Castlederg Wetland Complex to the north also designated as Core Greenlands.

4.3 Vegetation and Vegetation Communities

The Study Area is located in a landscape which is transitioning from a formerly agricultural land use to an urban and residential one, interspersed with preserved natural areas associated with wetlands and watercourses.

The western section of the Study Area is a mixture of agriculture and residential lands. Land use south of Columbia Way is mainly residential, save for parkland surrounding the ephemeral tributary to Cold Creek. North of Columbia Way, lands are a mixture of active and fallowed agriculture, remnant/regenerating woodlands and a newly constructed high school. The fallowed agricultural lands and woodlands are broadly associated with the Castlederg Provincially Significant Wetland (PSW) Complex which provides water to the Cold Creek tributary (**Appendix A – Map 3**).

The eastern section of the Study Area is rural, with natural/successional areas intermixed with rural and estate residential developments. Coniferous plantations make up the bulk of unmaintained vegetation in the area, with smaller amounts of deciduous forest and old field/thicket, which speaks to historic vegetation clearing in the area.

Cold Creek, a tributary to the Humber River, is the defining natural heritage feature within this part of the Study Area. There are wetlands immediately north of Columbia Way associated with the Cold Creek floodplain. The TRCA owns most of the non-residential lands north of Columbia Way in this section of the Study Area, as well as lands south of Columbia Way along the Caledon-King Townline (see **Appendix A – Map 3b**).

A few additional vegetation communities not noted by TRCA, as well as minor refinements, have been assessed and are shown in **Appendix A – Map 3a, Map 3b**. All communities are common and secure in the province.

4.3.1 Tree Inventory

Trees immediately adjacent to Columbia Way were catalogued. Information collected included species, diameter at breast height (DBH) and notes on general condition. See **Appendix D** for details. Trees inventoried were generally limited to those specimens greater than 10cm DBH, however, municipal planted specimens were inventoried regardless of size. The most notable trees encountered during the inventory included Butternut) as well as some relatively large residential Black Locust (*Robinia pseudoacacia*) growing along the frontage of 9862 Columbia Way. These residential Black Locust specimens are in generally good condition but have signs of decline, with a few trees exhibiting rot in the main crotch. Care should be taken to ensure road works do not impact these trees. For both Butternut and Black Locust, all individuals of the species inventoried are to be considered for protection are shown in **Appendix A – Map 4b**.

4.3.2 Flora

Two rare floral species were noted in background documents, with the potential to occur within the Study Area. Both species can occur wherever suitable habitat exists (**Table 5.1**). A total of seven Butternut (Endangered) were confirmed in the vicinity of Cold Creek within the Study Area. Many individuals of Cup Plant (S3) were observed throughout the Study Area within and beyond the roadside. Notable invasive species observed within the Study Area included Common Reed (*Phragmites australis*), Common Buckthorn (*Rhamnus cathartica*), Pale Swallowwort (*Cynanchum rossicum*) and White Poplar (*Populus alba*). The details of the single-season plant inventory are found in **Appendix D – Table 1**.

4.4 Wildlife

4.4.1 Birds

The Study Area contains terrestrial and aquatic communities and habitats that have the potential to support a variety of bird life. Birds recorded during citizen science surveys (Ontario Breeding Bird Atlas, 2001-2005) are indicative of the variety of habitats present in the broader area, with species representing interior woodlands, urban habitats, and everything in between. At-risk species include those associated with anthropogenic habitats and features, as well as those which utilize larger expanses of wooded habitat (**Table 5.1**). Various birds were noted during site investigations (**Appendix D – Table 2**). Eastern Wood Pewee (*Contopus virens*, Special Concern) was noted calling in the Cultural Woodland habitat immediately northwest of Cold Creek. Surveys were completed outside of the breeding season, however, the habitat in which the bird was heard calling was typical of that used during the breeding season.

4.4.2 Reptiles and Amphibians

Most of the reptile and amphibian records for the Study Area include commonly encountered species that would be expected based on the habitat in the area. One provincially protected at-risk species was noted (Blanding's Turtle, *Emydoidea blandingii*), as were additional species that are considered Special Concern (**Table 5.1**). No Blanding's Turtle, nor any other turtles, were observed during site visits. Large, high quality wetland or aquatic habitat that would serve as a source for Blanding's Turtle was not noted within the Study Area, and due to general lack of habitat there is a low likelihood of encountering this species. Within the Study Area, Cold Creek could support Midland Painted (*Chrysemys picta marginata*) and Snapping Turtles (*Chelydra serpentina*). Two Gray Treefrogs (*Hyla versicolor*) were noted calling during site investigations, one from the wetland habitat immediately northeast of the Columbia Way bridge over Cold Creek, and another in the Cultural Meadow habitat associated with 9861 Columbia Way (**Appendix D – Table 2**). As this species has a relatively small home range, breeding habitat is likely nearby, potentially in anthropogenic ponds south of Columbia Way.

4.4.3 Mammals

No rare mammal species were noted as occurring in the Study Area during background review. Mammals expected to be observed are species commonly encountered in association with local anthropogenic and natural habitats. Gray Squirrel (*Sciurus carolinensis*) and Red Squirrel (*Tamiasciurus hudsonicus*) were observed during site visits in the rural section of the Study Area. A single road-killed Raccoon (*Procyon lotor*) and Striped Skunk (*Mephitis mephitis*) were observed in the urban section of the Study Area (**Appendix D – Table 2**).

4.4.4 Insects/Other Invertebrates

The habitat types within the Study Area are suitable to support many insect species, including rare butterfly and Odonate (dragonfly and damselfly) species (**Table 5.1**). As insects are not commonly surveyed for and can have short periods of detection (adult stage), it is possible that other species of provincial interest may utilize habitat within or adjacent to the Study Area. Site visits identified a number of notable invertebrate species (**Appendix D – Table 2**). Bluet species (*Enallagma* sp.) were observed near Cold Creek and also near St. Michaels School. No larger dragonflies were observed. Terrestrial crayfish burrows, likely *Creaserinus fodiens* (formerly *Fallicambarus*) were observed in the northern ditch along Columbia Way, west of Mount Hope Road. A bumblebee (*Bombus* sp.) was observed along the roadside near the tributary to Cold Creek, but it was confirmed through photographs as a species other than the Yellow-Banded Bumblebee (*Bombus terricola*, Special Concern). Two Monarch (*Danaus plexippus*) adults were identified in the rural section of the Study Area, one in the vicinity of Cold Creek the other associated with the Cultural Meadow west of 9735 Columbia Way.

4.5 Fish and Fish Habitat

4.5.1 Aquatic Habitat

Columbia Way is located in the Upper Humber River subwatershed of the Humber River watershed, which in total drains approximately 911 km². Within the Study Area there are two watercourses which flow from north to south across Columbia Way: 1) Cold Creek tributary, between Kingsview Drive and Westchester Boulevard, and 2) Cold Creek, west of Caledon-King Townline.

The Cold Creek tributary is a 2nd order stream which drains a PSW (Castlederg Wetland Complex) northeast of the Study Area. Within the Study Area, this tributary flows southeast through fallowed lands, is conveyed under Columbia Way by a corrugated steel culvert, and south through a retained natural corridor. The watercourse appears to be natural, with no evidence of straightening or hardening. At the time of investigation, there was a shallow, isolated pool of water at the culvert inlet, north of the road. There was no flow and the channel presented as a vegetated swale primarily extending parallel to the roadsides with no visible channel extending north to the wetlands. Inside the culvert, water was pooled toward the upstream (north) and did not extend the full length (i.e., no flow). There was a shallow, isolated pool at the culvert outlet, south of the road. Downstream of the culvert, the watercourse widened into a marsh floodplain, thick with cattails and grasses, bound by an asphalt walking path to the east and steep embankment to the west. East of the walking path was a similar embankment – both with trees on the slope and residential properties at the top. Through the marsh there were sections of small defined channel, with dry bare earth bottoms, and areas where no channel was evident. The aquatic habitat features observed in the tributary are summarized in **Table 4.1**. As there was no flow and no connectivity,

this tributary may provide seasonal fish habitat and likely provides contributing habitat to Cold Creek. Water quality parameters in the Cold Creek tributary were measured in a stagnant pool approximately 15 m downstream of the Columbia Way crossing, these are provided in **Table 4.2**.

The main channel of Cold Creek, a 4th order stream, flows under the Columbia Way bridge, through a mixture of unmaintained and maintained lands owned by both TRCA and local residential landowners. The watercourse appears to be natural and sinuous through the Study Area. Cold Creek confluences with the Upper Humber River southeast of the King Street East/Caledon-King Townline intersection. True to its name, Cold Creek provides coldwater, direct fish habitat (LIO-ARA), which was confirmed in the field. At the time of investigation, the creek was flowing, unobstructed through the Study Area. Downstream (south) of the Columbia Way bridge, the creek flows along residential properties on the west bank approximately 100 m from the road. These properties have mown the riparian grass buffer into lawn, right up to the creek. The remainder of the creek in the Study Area had forested riparian buffers and predominantly vegetated banks, under the bridge being the exception. The creek morphology transitioned from riffle to run to pool, with the majority of the area consisting of runs flowing at approximately 0.2 m/s. The creek showed evidence of groundwater discharge with abundant watercress in the stream and mineral staining on the streambed. Undercut banks were noted downstream of the bridge, suggesting bank instability, but also providing additional cover and habitat for fish – this was the only location where lampreys were observed and collected during electrofishing. Other in-stream cover was provided by overhanging and instream vascular plants and woody debris, cobble, and to a lesser extent, boulders. In addition to the watercress, arrowhead (*Sagittaria latifolia*) and Rice Cutgrass (*Leersia oryzoides*) were also noted, and much of the rocky substrate was covered with hair algae. The aquatic habitat features and water quality parameters in Cold Creek as observed during field investigations are presented in **Table 4.1** and **Table 4.2**, respectively.

Additional surface water features noted within the Study Area included roadside ditch swales which were dry at the time investigations and due to the ephemeral nature and elevations in relation to adjacent permanent waterbodies were determined not to provide fish habitat. A small corrugated black plastic pipe crossed under the road near the residence at 9731 Columbia Way. This pipe conveys ephemeral surface flows across the road to a private pond to the south. Like the adjacent ditches, the swale associated with this pipe were dry and did not appear to provide fish habitat.

Table 4.1 – Aquatic Habitat in Watercourses Crossing Columbia Way

Habitat Attribute	Cold Creek tributary	Cold Creek
Crossing Type	CSP culvert	Bridge
Flow Regime	Intermittent	Permanent
Thermal Regime	Coldwater	Coldwater

Habitat Attribute	Cold Creek tributary	Cold Creek
Flow Velocity (m/s)	Nil (stagnant)	0.2
Morphology (%)	Isolated pool (100%)	Run (80%), riffle (10%), pool (10%)
Mean Wetted Depth (m)	0.09 – 0.15	0.35 – 0.47
Mean Wetted Width (m)	0.80	3.30
Substrate	Silt, clay, sand, cobble	Cobble, clay, silt, sand, boulder
Bank Stability	Slightly unstable	Slightly unstable
Instream Cover (%)	Instream/overhanging vascular macrophytes (80/15%), cobble (5%)	Instream/overhanging vascular macrophytes (40/15%), instream/overhanging woody debris (10/10%), cobble (10%), undercut banks (10%), boulders (5%)
Riparian Vegetation	Cattails, grasses, few deciduous trees	Forb Mineral Meadow Marsh, Cattail Mineral Shallow Marsh, Alder Mineral Thicket
% Stream Shaded	40%	75%
Migratory Barriers	Low flow – lack of connectivity	None observed
Evidence of Groundwater	None observed	Watercress (abundant), iron staining
Adjacent Land Use	Marsh/floodplain, residential, fallowed agricultural	Forest (TRCA woodlands), residential

Note: Aquatic habitat characteristics observed on July 31, 2020

Table 4.2 – Water Quality in Watercourses Crossing Columbia Way

Parameter	Cold Creek tributary (downstream isolated pool)	Cold Creek
Temperature (°C)	16.2	16.1
pH	7.87	8.04
Conductivity (µS/cm)	1352	521.7
Dissolved Oxygen (mg/L)	2.49	9.38
Air Temperature (°C)	27.0	27.0

Note: Water quality parameters measured in-situ on July 31, 2020

4.5.2 Fish Community

The coldwater habitats provided by Cold Creek and its tributary host a diversity of fish species ranging from common and non-native, like carps, to sensitive and native lampreys and salmonids (LIO-ARA). As noted in the background information, the fish species recorded in Cold Creek are generally common and widespread in Ontario, with some exceptions noted. Fish records were available for both the 2nd and 4th order streams, however the species list was identical, so it is presented in **Appendix D** as the fish community in Cold Creek, however, these species may also be present in the tributary.

DFO mapping of the Study Area did not indicate any aquatic SAR, however, Northern Brook Lamprey (*Ichthyomyzon fossor*) was noted in the LIO-ARA fish records and is considered a “Special Concern” species both provincially and federally. A full list of fish species recorded in Cold Creek can be found in **Appendix D – Table 3**.

The fish community in Cold Creek was sampled via electrofishing for approximately 150 m upstream and downstream of the Columbia Way crossing. The backpack electrofisher settings used ranged from 100 - 120 V, 40 - 60 Hz for 1335 shocking seconds. Fish captured included the following species with the number caught indicated:

- 1 – American Brook Lamprey (*Lethenteron appendix*);
- 40 – Mottled Sculpin (*Cottus bairdii*);
- 4 – Blacknose Dace (*Rhinichthys atratulus*); and
- 3 – White Sucker (*Catostomus commersonii*).

In addition to those species captured and released, one *Salmonidae* was observed but not netted, it appeared to be most likely a Rainbow Trout (*Oncorhynchus mykiss*). Based on the species collected and those previously recorded (i.e., those found in the appended table), the fish community in Cold Creek is comprised of generally secure or apparently secure cool to cold water

bait, forage, and sportfish species. Rainbow Trout are spring-spawning species, and Brook Trout (*Salvelinus fontinalis*) are fall-spawning species.

No records of freshwater mussels were available in the background sources. However, under the Columbia Way bridge mussel shell fragments were observed, but due to the condition of the shells, species identification was not possible. No live specimens were observed, but please note that a targeted survey was not performed.

5.0 Species of Conservation Concern and Species at Risk

According to the sources reviewed, a variety of floral and faunal species of provincial interest have been recorded in the vicinity of the Study Area. The mosaic of habitat within and immediately adjacent to the Study Area, including wooded areas, preserved riparian areas, and associated watercourses have the potential to support some or all of these species. Additionally, the province has not been surveyed extensively and novel individuals and populations can be located during site-specific surveys. A full list of SAR identified in the background sources with potential to be found in the Study Area, discussion on their habitat preferences, and probability of occurrence as determined following field investigations in the Study Area, and the assessment is presented in Table 5.1.

Table 5.1 – Species of Conservation Concern and Species at Risk Assessment

Species Name and Status (Ontario Canada)	Species Records in the Study Area and Habitat Preference	Probability Assessment
Flora		
Cup Plant (<i>Silphium perfoliatum</i>) S2 N2*	This plant has been recorded by citizen scientists in the vicinity of the Study Area within the Cold Creek floodplain. Cup Plant grows in well-drained moist soils in bottomlands, floodplains, or other open habitats. Suitable conditions exist for this species within the Study Area.	High – Confirmed throughout Study Area in roadside habitats and beyond.
Butternut (<i>Juglans cinerea</i>) Endangered Endangered	NHIC and citizen science observations indicate this species is present in the vicinity of the Study Area. Butternut is found throughout southern Ontario in deciduous and mixed forests often found growing along floodplains, streambanks, terraces, and ravine slopes growing in neutral to calcareous soils, though it can occur in other habitats as well. This species is still somewhat commonly encountered and not	High – Confirmed in the vicinity of Cold Creek.

Species Name and Status (Ontario Canada)	Species Records in the Study Area and Habitat Preference	Probability Assessment
	all populations are documented. Suitable habitat is present within the Study Area.	
Fish		
Northern Brook Lamprey (<i>Ichthyomyzon fossor</i>) Special Concern Special Concern	Northern Brook Lamprey inhabits clear, coolwater streams. The larval stage requires soft substrates such as silt and sand for burrowing which are often found in the slow-moving portions of a stream. Adults are found in areas associated with spawning, including fast flowing riffles comprised of rock or gravel. Cold Creek provides suitable habitat for larval stage and adults.	High – American Brook Lamprey was captured in the creek; this species has similar habitat requirements and distribution to Northern Brook Lamprey. It is likely that the creek would support both species.
Birds		
Eastern Meadowlark (<i>Sturnella magna</i>) Threatened Threatened	Eastern Meadowlark was recorded in the vicinity of the Study Area as part of targeted citizen science surveys. The species breeds primarily in moderately tall grasslands, such as pastures and hayfields, but are also found in other open areas. Small trees, shrubs or fence posts are used as elevated song perches. Fallowed fields within the Study Area could provide nesting habitat for this species.	Moderate – Potential habitat for this species was confirmed during site visits, but no individuals were noted. Habitat is generally outside of the Study Area.
Caspian Tern (<i>Hydroprogne caspia</i>) S3B NAR	Citizen science observers noted this species in the vicinity of the Study Area. The Caspian Tern typically breeds in large, well-established colonies, mainly distributed around the Great Lakes. This species occasionally nest singly and is known to travel long distances from its nest during foraging activities. Suitable habitat for this species is not present within the Study Area.	Low – No habitat or individuals were observed during site visits.
Black-crowned Night-Heron (<i>Nycticorax nycticorax</i>) S3B -	Citizen science observers noted this species in the vicinity of the Study Area. Black-crowned Night-Herons nest in small to large colonies in shrubs, trees or on the ground and forage in nearby wetland habitats. There is limited nesting habitat for this species within the Study Area, though suitable foraging habitat is present.	Low – No individuals were observed, though potential nesting habitat is present along Cold Creek.
Bobolink (<i>Dolichonyx oryzivorus</i>) Threatened Threatened	Bobolink was recorded in the vicinity of the Study Area as part of targeted citizen science surveys. Historically found in tallgrass prairie and other open meadows,	Moderate – Potential habitat for this species was confirmed during site visits, but no individuals

Species Name and Status (Ontario Canada)	Species Records in the Study Area and Habitat Preference	Probability Assessment
	the species now breeds in hayfields. They build their nests on the ground in dense grasses. Fallowed fields within the Study Area could provide nesting habitat for this species.	were noted. Habitat is generally outside of the Study Area.
Wood Thrush (<i>Hylocichla mustelina</i>) Special Concern Threatened	Wood Thrush were recorded in the vicinity of the Study Area as part of targeted citizen science surveys. They live in moist, mature deciduous and mixed forests with well-developed undergrowth and tall trees for singing perches. They prefer larger forests but will also use smaller woodlots. This species is likely to utilize the larger wooded communities within the Study Area.	High – This species is expected to utilize habitats beyond the Study Area in the eastern section.
Cerulean Warbler (<i>Setophaga cerulea</i>) Threatened Endangered	The Cerulean Warbler is noted by NHIC within the Study Area, but this record is not corroborated with recent citizen science records. The Cerulean Warbler breeds in mature deciduous forests with an open understorey. This habitat is not present within the Study Area.	Low – No habitat or individuals were observed during site visits.
Barn Swallow (<i>Hirundo rustica</i>) Threatened Threatened	Recorded in the vicinity of the Study Area as part of targeted citizen science surveys. Barn Swallow are still relatively common and build their cup-shaped mud nests almost exclusively on human-made structures like open barns, under bridges, and in culverts. Suitable nesting habitat for this species likely exists within the Study Area.	Medium – No individuals were observed during site visits, but nesting habitat is present (bridge, buildings, etc.).
Bank Swallow (<i>Riparia riparia</i>) Threatened Threatened	Bank Swallow were recorded in the vicinity of the Study Area as part of targeted citizen science surveys. Nests are excavated in vertical faces of silt or sand, including gravel pits and material stockpiles. Suitable habitat may be present within the Study Area, likely associated watercourse banks.	Low – No habitat or individuals were observed during site visits.
Chimney Swift (<i>Chaetura pelagica</i>) Threatened Threatened	Recorded in the vicinity of the Study Area as part of targeted citizen science surveys. Chimney Swifts nested in caves and hollow trees prior to European settlement and are today most often associated with chimneys and other manmade structures. Suitable habitat may be present within the Study Area.	Low – No habitat or individuals were observed during site visits.

Species Name and Status (Ontario Canada)	Species Records in the Study Area and Habitat Preference	Probability Assessment
Common Nighthawk (<i>Chordeiles minor</i>) Special Concern Special Concern	Common Nighthawk was recorded in the vicinity of the Study Area as part of targeted citizen science surveys. They nest in open areas such as forest clearings, rock barrens and shorelines, but may also nest in fields, orchards, parks and gravel along road edges and railways. In urban situations, this species nests on flat rooftops. Suitable habitat is likely present within the Study Area.	Moderate – No individuals were observed during site visits, but nesting habitat is present (school flat roof, open fields, and edge habitats).
Eastern Wood-Pewee (<i>Contopus virens</i>) Special Concern Special Concern	Recorded in the general area as part of targeted citizen science surveys. Eastern Wood-Pewee prefers 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 and can often be found in parks or other modified habitats. Suitable habitat is likely present within the Study Area.	High – Habitat for this species is present throughout the eastern section of the Study Area beyond the roadway and an individual was heard north of Columbia Way near Cold Creek.
Short-Eared Owl (<i>Asio flammeus</i>) Special Concern Special Concern	This species was recorded in the vicinity of the Study Area during targeted citizen science surveys. The Short-Eared Owl nests and forages in open grasslands, marshes, and tundra habitats. There is some habitat for this species within and adjacent to the Study Area.	Low/Medium – Habitat for this species is present, mainly in the western section beyond the Study Area. No individuals were observed.
Canada Warbler (<i>Cardellina canadensis</i>) Special Concern Threatened	Canada Warbler was recorded in the vicinity of the Study Area during targeted citizen science surveys. It breeds in wet forests with a well-developed shrub layer. Suitable habitat for this species likely exists within and adjacent to the Study Area.	Low – Habitat for this species was limited within and beyond the Study Area. No individuals were noted.

Reptiles

Blanding's Turtle (<i>Emydoidea blandingii</i>) Threatened Threatened	Blanding's Turtles live in shallow water, typically associated with wetlands, ponds and lakes, often with abundant aquatic vegetation. These turtles also utilize terrestrial habitats for movement, foraging and nesting. The Study Area contains habitats that are suitable for this species.	Moderate/Low – Habitats for this species are present within and beyond the Study Area limits, but none were observed. It is expected that this species would be most likely found in more expansive wetlands north of the Study Area.
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Species Name and Status (Ontario Canada)	Species Records in the Study Area and Habitat Preference	Probability Assessment
Snapping Turtle (<i>Chelydra serpentina</i>) Special Concern Special Concern	Snapping Turtles have been recorded by local citizen science observers multiple times in the general area and are noted by the GRCA as present within the watershed. Snapping turtles can utilize any available permanent aquatic habitat, including lakes, rivers, and wetlands, also stormwater ponds and sewage lagoons. This species is expected to be found in all permanent water features within the Study Area.	High – Though none were observed, it is expected that Snapping Turtles are present in all permanent or semi-permanent water features within and adjacent to the Study Area.
Midland Painted Turtle (<i>Chrysemys picta marginata</i>) S5 Special Concern	Midland Painted Turtles have been recorded by local citizen science observers multiple times near the Study Area and are also noted in the watershed by GRCA. Typical habitat includes still to slow-moving water bodies with soft bottoms and aquatic vegetation. This species is expected to be found in local wetlands and suitable sections of the Grand River within the Study Area but may also utilize sewage lagoons.	High – Though none were observed, it is expected that Midland Painted Turtles are present in all permanent water features within and adjacent to the Study Area.

Insects

Unicorn Clubtail (<i>Arigomphus villosipes</i>) S3 N3*	Citizen science data reports this species is present in the local area. Unicorn Clubtail habitat includes ponds, pools and marshes with open bank habitat and muddy substrates. Suitable habitat for this species is potentially present within and adjacent to the Study Area.	Low/Medium – This species was not observed during site investigations. Cold Creek and associated wetland habitats could support this species.
Lilypad Clubtail (<i>Arigomphus furcifer</i>) S3 N3*	Citizen science data reports this species is present in the vicinity of the Study Area. Lilypad Clubtail habitat includes ponds, pools, and other slow-moving aquatic habitat with floating and emergent vegetation. Suitable habitat for this species is potentially present within and adjacent to the Study Area.	Low – This species was not observed during site investigations. Cold Creek and associated wetland habitats within the Study Area do not have abundant floating and emergent aquatic vegetation to support this species.
Potter Wasp group (<i>Parazumia symmorpha</i>) S3 N3*	Citizen science data reports this species is present in the vicinity of the Study Area. Very little is known about this wasp species, though it has been observed to nest in pre-existing shallow holes in wood or concrete.	Low/Medium – No individuals were observed during site visits, but nesting habitat is presumably present.

Species Name and Status (Ontario Canada)	Species Records in the Study Area and Habitat Preference	Probability Assessment
	Habitat for this species is like present within and beyond the Study Area.	
Harpoon Clubtail (<i>Phanogomphus descriptus</i>) S3 N4N5*	There are citizen science records of this species in the vicinity of the Study Area. Harpoon Clubtail inhabits clear, cold streams with intermittent sections of rocks and rapids. where the aquatic nymphs burrow into the substrate. Habitat for this species is potentially present within and beyond the Study Area.	Low – This species was not observed during site investigations. Cold Creek within the Study Area does rocks and rapids to support this species.
Spatterdock Darner (<i>Rhionaeschna mutata</i>) S2 N2*	There is a citizen science record of this species near the Study Area and additional records nearby. Spatterdock Darner inhabits pools, ponds, and small lakes, often fishless and typically with abundant aquatic vegetation. Potential habitat for this species is present outside of the Study Area on adjacent lands.	Low – No habitat or individuals were observed during site visits.
Amber-winged Spreadwing (<i>Lestes eurinus</i>) S3 N4N5*	This species has been observed by citizen scientists in the vicinity of the Study Area. It is found in and around still bodies of water. Habitat for this species is present outside of the Study Area.	Low – No habitat or individuals were observed during site visits.
Rapids Clubtail (<i>Phanogomphus quadricolor</i>) Endangered Endangered	Citizen scientists have recorded a number of observations of this species in the general vicinity, including one near the Study Area. The Rapids Clubtail inhabits clear, cool, medium-to-large rivers with wooded shorelines, gravel shallows, and muddy pools. Within the Study Area, Cold Creek could provide habitat for this species.	Medium – Cold Creek provides habitat that could be utilized by this species, but no individuals were observed.
Yellow-banded Bumble Bee (<i>Bombus terricola</i>) S3S5 N5*	There are citizen science records of this species in general area. This species utilizes a variety of habitat types is still somewhat common but has declined significantly from historical population levels. As it is a habitat generalist, suitable habitat is present within the Study Area for this species.	High – No individuals were observed.
Monarch (<i>Danaus plexippus</i>) Special Concern Special Concern	There are citizen science records of this species in general area. Monarchs require milkweed plants for larva to feed on, while adults forage on the nectar of available wildflowers. As roadsides and other edge habitat may support milkweed and	High – Two adults were observed within the Study Area during site investigations

Species Name and Status (Ontario Canada)	Species Records in the Study Area and Habitat Preference	Probability Assessment
	wildflower species, Monarchs are expected to be present within the Study Area.	

Source: NHIC – 2020-01-17; NatureServe

S/N* – range of uncertainty about the status of the species

S1/N1 – Critically Imperiled: At very high risk of extirpation in the jurisdiction due to very restricted range, very few populations or occurrences, very steep declines, severe threats, or other factors.

S2/N2 – Imperiled: At high risk of extirpation in the jurisdiction due to restricted range, few populations or occurrences, steep declines, severe threats, or other factors.

S3/N3 – Vulnerable: At moderate risk of extirpation in the jurisdiction due to a fairly restricted range, relatively few populations or occurrences, recent and widespread declines, threats, or other factors

S4/N4 – Apparently Secure: At a fairly low risk of extirpation in the jurisdiction due to an extensive range and/or many populations or occurrences, but with possible cause for some concern as a result of local recent declines, threats, or other factors.

S5/N5 – Secure: At very low or no risk of extirpation in the jurisdiction due to a very extensive range, abundant populations, or occurrences, with little to no concern from declines or threats.

6.0 Significance of Natural Heritage Features

The significance of ecological features and functions was determined through analysis of the site-specific field data against provincial policies (ESA, PPS) as well as within the broader context of the natural heritage and ecology of the region.

6.1 Provincial Features

6.1.1 Habitat of Endangered and Threatened Species

A total of seven Butternut (Endangered) were identified within the Study Area. Trees were located on the southern side of Columbia Way in the vicinity of Cold Creek, including two individuals within the floodplain immediately adjacent to the Coventry Bridge. These two individuals were older and heavily affected by canker, while the remaining five trees were young (under 10 m dbh) and located on tablelands east and west of the creek. No additional species protected under the ESA were observed during site visits.

6.1.2 Provincially Significant Wetlands

There are no provincially significant wetlands identified on NHIC mapping within the Study Area. Portions of the Castlederg Wetland Complex are located north of the Study Area. Local wetlands are discussed below (under **Section 6.2**).

6.1.3 Provincially Significant Woodlands

Woodlands exist in and adjacent to the Study Area in the eastern portion of the Study Area. Though the core of the woodland is outside of the scope of this study and evidence of anthropogenic impacts are evident (plantation, clearings), when considered as a whole, the feature meets many criteria for provincial significance, including:

- Size, as the entire feature is well over 50 ha in size;
- Interior habitat;
- Proximity to other habitats (fish habitat within Cold Creek);
- Linkages – part of a large, linked natural feature system;
- Water protection – Cold Creek, a tributary of the Humber River; and
- Economic and social value – valued and recreation area (pers. comm local resident).

6.1.4 Provincially Significant Valleylands

The valleyland that contains Cold Creek should also be considered for provincial significance. Based on attributes noted during site-specific surveys, the valleyland meets a number of criteria including:

- Provides both surface and groundwater functions;
- Has a reasonable degree of naturalness;
- Habitat value for coldwater fish species;
- Part of a large, linked natural heritage feature;
- Possess restoration potential; and
- Additional criteria that are likely present in the larger system but were outside of the Study Area.

6.1.5 Significant Wildlife Habitat

A Significant Wildlife Habitat (SWH) assessment was completed using the Ecoregion 7E Criterion (see **Appendix E** for assessment rationale tables). Candidate wildlife habitat was identified for the following categories: Raptor Wintering Area, Bat Maternity Colonies, Turtle Wintering Areas, Reptile Hibernaculum, Deer Winter Congregation Area, breeding habitat for Eastern Wood-Pewee (Special Concern). These candidate habitats and features are all within the rural section of the Study Area and most are outside of the right of way, save for turtle habitat (throughout Cold Creek) and a single animal burrow noted in the grassed road shoulder along 9784 Columbia Way which has the potential to provide reptile hibernacula habitat. Cold Creek was confirmed as Significant Wildlife Habitat supporting American Brook Lamprey (*Lethenteron appendix*) (S3).

6.1.6 Significant Areas of Natural and Scientific Interest

There are no ANSIs identified on NHIC mapping.

6.1.7 Fish Habitat

Within the Study Area, Cold Creek provides direct fish habitat, and the Cold Creek tributary provides seasonal, contributing, or indirect fish habitat by contributing to downstream habitats.

6.2 Local Features

Generally, locally designated features agree with provincially designated areas associated with the Greenbelt Plan, which generally applies to Cold Creek, the tributary of Cold Creek, and the natural/successional and low-lying areas that surround these features. TRCA specifically requested a review of potential spring breeding (ephemeral pool) habitats. Within the Study Area, the Cold Creek tributary north of Columbia Way has the potential to support spring breeding amphibians, as the culvert on the inlet side is perched, resulting in ponding water and some restriction to fish passage into this area. Based on the recording of two Gray Tree Frogs calling in the vicinity of Cold Creek during investigations and their relatively small home range, breeding habitat for this species is present in the general area, though no features were observed within the Study Area.

6.2.1 Sensitive Features

The watercourses and wetland habitats associated with them within the Study Area, specifically those associated with Cold Creek proper, are features which would be sensitive to disturbance and require consideration during the development of environmental mitigation and protective measures.

7.0 Preferred Design Alternative

The preferred design alternative for the urbanization of Columbia Way from Regional Road 50 to approximately 0.5 kilometers east of Mount Hope Road includes a new roundabout at Mount Hope Road, new curb and gutter north and south of the roadway which will drain to maintained and new roadside ditches (i.e., no storm sewers), a 3.0 m paved multi-use path south of the roadway terminating at Forest Gate Avenue, new illumination, and a new crosswalk across Columbia Way mid-way between Kingsview Drive and Westchester Boulevard. The “rural setting improvements” from 0.5 kilometers east of Mount Hope Road to Caledon-King Townline include improving sight lines by reducing roadside vegetation and operational improvements at the S-curve such as advanced/dynamic warning signs, double solid yellow centreline, solid white edge lines, chevron signs on the outside of the curves, and shoulder rumble strips. The north slope along the western part of the curve shows signs of downslope moment from the crest and this issue is proposed to be remedied via regrading at 2:1, which will require vegetation removal. This alternative does not require any alterations to the existing Cold Creek tributary culvert, nor does it require any grading below the high water mark (i.e., no in-water work at this location). It does, however, require rehabilitation to the Coventry Bridge structure over Cold Creek to address structural issues which will be further investigated in detailed design. The Coventry Bridge will also require minor deck

widening to be compliant with current design standards, however, this widening will be accomplished via cantilever deck extension on both sides of the bridge and will not require any changes to the existing abutments or footprint. Retaining wall extensions and repairs are also required to the Coventry Bridge. These activities are within proposed grading limits.

7.1 Project Activities

The preferred alternative includes several construction activities that have potential to impact the natural heritage features:

- Vegetation clearing;
- Grading;
- Excavation;
- Use of industrial equipment;
- Temporary placing of materials or structures in water (i.e., cofferdams, pending bridge rehabilitation and deck widening strategy); and
- Hardening of natural pervious surfaces (i.e., new asphalt/concrete).

8.0 Preliminary Assessment of Potential Impacts

The following sections assess the potential impacts of the proposed project activities noted in **Section 7.1** on the existing natural heritage features in the Study Area.

8.1 Terrestrial Vegetation

Potential direct impacts to terrestrial vegetation as a component of road works include complete removal through construction and grading activities, as well as vegetation clearing to support surveying and construction equipment access. Indirect impacts to woody vegetation along the periphery of construction areas may occur due to damage to roots, stems and branches through interaction with construction equipment. Excessive dust raised by construction activities may also negatively impact vegetation.

The proposed improvements within the urban section of Columbia Way will directly impact existing anthropogenic vegetation communities. These features include mowed areas, field edges and unmaintained/lightly maintained roadsides and ditches currently occupied by planted or pioneering native and non-native grass, forb, shrub, and tree species. The dominant vegetation type impacted is Cultural Meadow, which is locally common and most plants within this community are expected to re-establish along the margins of the new roadway. Certain species, including Common Buckthorn, Autumn Olive, Common Reed and White Poplar are recognized as problematic invasive species and their responsible removal will reduce the spread of these plants. Care should be taken not to spread these plants beyond their current limits during construction phases. Management of invasive *Phragmites* (Common Reed) within the ROW should be considered at detailed design.

Direct impacts to vegetation communities within the rural section of Columbia Way will be more extensive than those in the urban section, as there are a number of safety concerns that require modification to the roadside associated with the 'S-bend' west of Cold Creek. These include sight-line improvements throughout the curve via vegetation clearing as well as regrading and installation of ditches to alleviate slope stability and erosion issues. Additional vegetation impacts will be required to repair another historic area of erosion near the Caledon-King Townline. Vegetation is already being impacted in some of these areas due to existing slope failure/erosion and ongoing targeted sightline clearing. These are mainly regenerating woody communities, including Cultural Thickets, Hedgerows (Norway Spruce, *Picea abies*) and White Cedar (*Thuja occidentalis*) hedgerows and forests. In the immediate vicinity of Cold Creek, two wetland communities, a Meadow Marsh (MAM2-10) and a Cattail Mineral Shallow Marsh (MAS2-1A), as well as a Cultural Plantation (CUP3) community will be slightly impacted by proposed grading revisions to the northern road shoulder. The edges of Cultural Thickets and Coniferous Plantations that abut the road allowance east of Cold Creek may also be impacted by proposed grading changes. The remainder of impacts are proposed to occur within residential or occasionally maintained roadside communities. As in the urban section, Common Buckthorn is present within the area proposed to be graded, as is Pale Swallowwort. Management of the spread of these species during construction, as well as control/management of Pale Swallowwort, should be considered at detailed design.

8.2 Terrestrial Wildlife and Habitats; Significant Wildlife Habitat

Potential impacts to wildlife and their habitats during construction can occur through direct injury and habitat loss as well as indirect impacts such as avoidance of areas of active construction and resulting modification to established daily movement patterns.

Wildlife and habitats identified during site visits were typical of rural and urbanizing areas of southern Ontario. Only a single Candidate Significant Wildlife Habitat (SWH) was located wholly within the area proposed to be graded in the form of a mammal burrow, which has the potential to be utilized by hibernating snakes. This habitat use was not confirmed during site investigations. The main concern for this habitat is the potential entombment of wildlife, particularly during winter months. Terrestrial crayfish burrows, which are considered SWH when in appropriate habitat, were recorded in the ditch of the urban section of Columbia Way do not qualify for SWH in this situation as they are outside of a qualifying habitat. These features are also known to support hibernating snakes.

Most of Canada's birds are protected under the MBCA. Vegetation clearing has the potential to impact breeding birds through disturbance of nesting birds and destruction of nests, eggs and young.

Other habitats, including Candidate SWH for Eastern Wood Pewee, Raptor Wintering, Bat Maternity

Colonies and Deer Winter Congregation Areas, will be directly affected by slight reductions in existing edge habitats as a result of vegetation clearing and no reduction in overall ecological function is expected. Candidate Turtle Overwintering habitats have the potential to be impacted by proposed bridge rehabilitation. Bats utilizing maternity colony habitat have the potential to be directly impacted by vegetation clearing activities during their active season.

Construction activities have the potential to indirectly affect all other wildlife within the surrounding landscape through vibration along with light and noise pollution. This disturbance will be temporary, and it is anticipated that local wildlife is accustomed to human disturbances.

Dust created as a result of grading and vegetation clearing has the potential to negatively affect plants and be carried to adjacent watercourse receptors.

8.3 Fish and Fish Habitat

Potential impacts to fish and fish habitat can be identified as: a direct loss of habitat; direct injury to fish as a result of construction; or indirect changes to fish habitat that may occur in the long term and/or over a larger area. In general, road reconstruction, stormwater management (new ditching), grading and bridge rehabilitation are likely to cause impacts to the surrounding riparian vegetation, changes to the embankment slopes and surface drainage, localized impacts to the streambed and fish habitat in areas of direct disturbance, and potentially more widespread impacts as a result of sedimentation and thermal changes. Potential impacts to fish and fish habitat can be assessed further by taking into consideration the project activities noted in **Section 7.1**.

Vegetation clearing exposes soils and increases the likelihood of erosion and release of sediments into the nearby creek. Impacts of terrestrial vegetation clearing and general mitigation measures are also discussed elsewhere in this and the following section. Release of sediment into Cold Creek and tributaries could have significant detrimental impacts to water quality and fish habitats. Sediments that enter a watercourse can increase stream turbidity, abrade fish gill membranes (leading to physical stress), cover spawning areas and incubating juvenile fish, cover/smother mussel beds, decrease food production, and smother eggs in nests. Removing riparian vegetation can also decrease watercourse shading, thereby potentially affecting the water temperature of Cold Creek, and can limit the natural shedding of organic materials into the watercourse which may provide food, cover, and nutrients to the aquatic ecosystems.

Grading will be required following bank disturbance due to construction equipment access, to achieve the new slopes at the S-bend of the roadway and as a component of general road improvements. Grading operations, similar to excavation activities, disturb the ground and expose soils, increasing the likelihood of erosion and the potential release of sediments into nearby water features. These activities most likely also require the use of industrial equipment.

Industrial equipment accessing the watercourse and watercourse banks may release deleterious materials such as debris, oil, fuel, and grease into the Cold Creek system.

Pending the extent of the bridge rehabilitation, materials may be placed in the creek during construction to isolate the work areas (cofferdams). The concrete material that may be used to patch or rehabilitate the bridge can be toxic to aquatic organisms while in its raw state, until cured. The placement of materials in water can disturb and re-suspend the sediments, negatively affecting the aquatic organisms in the area.

The proposed deck widening will result in a small, permanent reduction of solar inputs to Cold Creek, which may also have minor impacts on growth of aquatic and riparian vegetation. As coldwater systems are more sensitive to increases in solar inputs from a thermal regime perspective, this change is expected to be negligible on the system as a whole.

8.4 Species at Risk and Species of Conservation Concern

One species protected under the Ontario ESA, Butternut (Endangered) was located during field investigations. The proposed road improvements will directly impact three individuals of this species and have the potential to impact an additional four individuals. Proposed vegetation clearing and grading to support sight-line improvements and slope stabilization will remove three trees within the right-of-way within the S-bend. Grading activities have the potential to impact the regulated habitat (25 m radius around the stem) of the remaining four Butternuts.

Three species of conservation concern (Eastern Wood Pewee, Monarch, and Cup Plant) were located during site investigations, while an additional three were not located (Northern Brook Lamprey, Midland Painted Turtle and Snapping Turtle) but are expected to be present in appropriate habitats. There is a low likelihood of impacts to individuals or important habitats of the remaining species of conservation concern and species at risk noted in **Table 5.1**.

The proposed road improvements along Columbia Way will have direct impacts on a small amount of edge habitat that likely supports Eastern Wood Pewee breeding.

Habitat for Monarch and Cup Plant is present in open habitats within and beyond the Study Area, including road shoulders and Cultural Meadow habitats. These habitats are common in the area and there were no locations that were noted as having large densities of individuals or, in the case of Monarchs, habitat (milkweed plants). The loss of the small amounts of habitat required to support the proposed improvements is not anticipated to affect the ability of these species to continue to utilize the remaining local habitat. Cup Plant forms a deep taproot from which it can re-sprout, and it is considered invasive in some US states. It is expected that some taproots impacted by grading will survive and this species will re-colonize the new road shoulder over time and as a result, impacts to this species will be temporary in nature.

The proposed road improvements to Columbia Way do not directly impact individuals or important habitats of Snapping Turtle, Midland Painted Turtle or Northern Brook Lamprey. Indirect and

temporary impacts to these species may occur through incidental encounters during construction or through impacts to aquatic habitats that may result during bridge rehabilitation works.

9.0 General Mitigation Measures

The following sections describe mitigation measures that have been identified to generally avoid or minimize the potential impacts to the natural environment associated with the road upgrades and bridge rehabilitation project. These measures should be considered and elaborated on, as required, in the next phase of this project.

9.1 Terrestrial Vegetation

Terrestrial vegetation within the Study Area will be impacted by the proposed road improvement activities through clearing and removals associated with road widening, shoulder, and slope grading, as well as to improve sightlines. Mitigations will therefore focus on the retention and reduction of impacts to adjacent remaining vegetation, invasive species control and revegetation.

- Vegetation clearing requirements in the vicinity of Cold Creek and the S-bend should be reviewed at detailed design with an emphasis on retaining mature trees where slopes are stable, and visibility is not impacted.
- Shoulder grading requirements within the regulated area of Cold Creek should be reviewed at detailed design and reduced impacts to vegetation should be considered, especially the wetland communities immediately north of Columbia Way.
- Revegetation of cleared areas should consider using non-invasive native plant species with high wildlife value (fruit-producing shrubs and trees, wildflowers, etc.) which will provide long-term ecological improvement to the local terrestrial system. Species and densities should be chosen so that at maturity, plants may reach typical size without interfering with each other or safe operation of the roadway, thus reducing maintenance.
- Areas of Common Reed and Pale Swallowwort within the grading boundaries should be identified prior to the implementation of construction and efforts should be made to not spread these species. The Clean Equipment Protocol for Industry should be provided to contractors at the implementation stage to assist with these efforts.
- Detailed mapping and control of Common Reed and Pale Swallowwort throughout the right-of-way as a component of implementation would also provide long-term benefit, as these species cause significant negative ecological impacts.
- The impacts of dust on the surrounding ecosystem can be mitigated by moistening dry soils with water as required during construction and adhering to erosion and sediment management measures as described below.

9.1 Terrestrial Wildlife and Habitats; Significant Wildlife Habitat

Construction activities, including vegetation removals and grading within the right-of-way will impact terrestrial wildlife habitats and have the potential to impact individuals. The following measures are recommended to reduce these impacts.

- To prevent incidental impacts to nesting birds and bat maternity colonies, woody vegetation clearing should be restricted to outside of the bat maternity and migratory bird nesting seasons, generally April 1 through October 31. If vegetation clearing must occur within this window, a qualified ecological professional should be retained to ensure no birds or bats are incidentally harmed by vegetation removals.
- Grading activities should be limited to the active season for wildlife, typically May 1 through September 30 to prevent entombment within burrows, tunnels, or other subterranean features.
- Limiting construction activities to daylight hours will reduce the impacts to behaviour changes (avoidance) of local wildlife in response to the project.

9.2 Fish and Fish Habitat

As the primary impacts to the fish and fish habitat for this project are associated with riparian vegetation removal and proposed work in and around Cold Creek to facilitate rehabilitation and deck widening of the Coventry Bridge, the following measures are recommended:

- Vegetation clearing impacts to the Cold Creek slopes and banks should be mitigated by Erosion and Sediment Controls (ESCs – e.g., silt fence, fibre filtration tubes, etc.) in place during construction.
- Riparian vegetation removal should be kept to a minimum, as required for construction and access only. Vegetation scheduled for removal should have proper clearing techniques implemented to protect and retain the surrounding vegetation and root masses will be left in place for bank stabilization, where feasible.
- Restoration plan – all exposed soils should be immediately stabilized with a suitable seed and cover mix, and riparian areas should be replanted with native trees and shrubs to provide additional bank stability and stream shading where possible (i.e., where the vegetation does not interfere with sight lines for traffic safety).
- Enhanced swales have been included as part of the SWM design to slow the flow of stormwater, filter contaminants, and encourage infiltration by using flat-bottom ditches and appropriate vegetation.
- Any work in the immediate vicinity of Coventry Bridge (in-water or near-water) should adhere to the cold-water timing window to avoid potential impacts or disturbances to fish in early life stages. The general coldwater timing window restricts work in or near Cold Creek or its tributaries from October 1 to July 15.
 - Additional timing considerations:
 - Minimize duration of in-water work.
 - Conduct instream work “in the dry” or otherwise, during periods of low flow.

- Schedule work to avoid wet, windy, and rainy periods that may increase erosion and sedimentation and allow proper re-stabilization and re-vegetation as appropriate prior to winter.
- Maintain flow and fish passage to minimize risk for fish and other aquatic animals passing through the worksite.
- Design and implement erosion and sediment controls (ESC) to contain/isolate the construction zone, manage site drainage and prevent erosion of exposed soils and migration of sediment to adjacent watercourses/waterbodies during all phases of the project.
- All ESC measures should be inspected and maintained to ensure they are functioning as intended throughout the construction period and until such time that disturbed areas have stabilized.
- To prevent any deleterious substances from entering the watercourse, operate, store, and maintain all equipment, vehicles and associated materials at a minimum, 30 m away from any watercourse.
- Manage and treat dewatering effluent to prevent erosion and/or release of sediment laden or contaminated water to the waterbody.
 - Additional dewatering considerations:
 - Use of appropriately designed and sited temporary settling basin, filter bag, etc., such that sediment is filtered out prior to the water entering a waterbody.
 - Use of energy dissipation measures to prevent bank and bed erosion.
- Travel paths, stockpile areas and staging areas, within the vicinity of the crossing, should be pre-planned and followed.
- Before dewatering, all fish (and mussels) shall be salvaged from within any isolated areas and immediately be released as directed in the Licence to Collect Fish for Scientific Purposes obtained from MNRF.
- Accumulated sediment and excess material shall be removed from the isolated area before removing the worksite isolation methods.
- The streambed shall be stabilized and restored to the original watercourse shape, bottom gradient, and substrate to pre-construction conditions before removing worksite isolation measures.
- During the final removal of the site isolation methods, the original watercourse shape, bottom gradient, and substrate at these locations shall be restored to pre-construction condition.
- The waterbody banks shall be stabilized, restored to their original shape, adequately protected from erosion and re-vegetated with native species.
- If rock is used to stabilize the banks of Cold Creek surrounding the bridge, it shall be clean, free of fine materials, and of sufficient size to resist displacement during peak flood events. The rock shall be placed at the original bank grade to ensure there is no infilling of the creek.

In order to comply with the fish and fish habitat protection provisions of the *Fisheries Act*, measures must be incorporated to avoid causing the death of fish, and/or the harmful alteration, disruption, or destruction (HADD) of fish habitat. In the event that a project cannot completely implement the

measures to protect fish and fish habitat, DFO has created a series of standards and codes of practice that may be applicable. For the Columbia Way project, in particular the works at the Coventry Bridge over Cold Creek, the following Interim Codes of Practice should be investigated as the rehabilitation works are confirmed:

- End-of-pipe fish protection screens for small water intakes in freshwater
- Temporary cofferdams and diversion channels
- Temporary stream crossings

Mitigation measures should be updated and refined during the detailed design phase of the project.

9.3 Species at Risk and Species of Conservation Concern

The various potential SAR and Species of Conservation Concern noted in **Section 8.4** will be generally protected through the proper application of the general mitigation measures noted in the sections above. The following discussion explains any SAR specific measures and recommendations:

- All Butternut trees should be assessed by a professional arborist that is also a certified Butternut Heath Assessor (BHA) to determine appropriate measures to mitigate these impacts through discussion with MECP. Based on initial review, it is expected that the proposed activities can be accomplished through the registering the impacts to these trees, rather than completing an overall benefit permit. This is based on the three trees proposed to be destroyed being saplings, and the remaining trees either being in poor condition, or, due to their topographic location, their root zones being mostly or entirely out of the area proposed to be graded.
- Vegetation clearing timing windows (no clearing between April 1 through October 31) will serve to protect Eastern Wood Pewee, and no long-term impacts are anticipated.
- Vegetation clearing schedules recommended above would also be effective at mitigating against incidental impacts to Monarch eggs, larva, and pupa. The restoration plan/seed mix should consider inclusion of milkweed species.
- Limiting the areas of in-water habitat access for potential bridge rehabilitation, as well as mitigation measures to protect aquatic habitats and water quality (primarily ESCs), will serve to protect the at-risk Lamprey species and other sensitive fish and mussels. Restoring the riparian vegetation immediately surrounding the creek will stabilize the banks, protecting water quality, and will provide stream shading and other organic inputs that serve as cover and food.
- Education of construction staff regarding the potential of encountering wildlife, including turtles, and appropriate actions (i.e., allow the animal to leave on its own, contact a wildlife professional, etc.) is an effective mitigation against unintended impacts to turtles and other wildlife.

In addition to the mitigation measures and operational constraints noted in this section, specific measures and commitments may be specified by the permitting agencies and described in the

potential issued permits and approvals. Potential permits and approvals are identified in **Section 10.0**.

10.0 Potential Permits and Approvals

In general, the reconstruction of Columbia Way (and the associated stormwater upgrades, vegetation clearing, and bridge rehabilitation) has potential to impact the natural environment that cannot be fully mitigated by the measures and operational constraints described. Such impacts may require agency permitting and/or approvals, and include alterations within TRCA regulated habitat, impacts to SAR, and impacts to fish and fish habitat. The following list of potential approvals and permits should be considered and confirmed with the appropriate agencies during the next phase of design:

TRCA – O. Reg. 166/06 (Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses) establishes regulated areas where development could be subject to flooding, erosion, or dynamic beaches, or where interference with wetlands and alterations to shorelines and watercourses might have an adverse effect on those environmental features. TRCA regulated lands can be found in **Appendix A – Map 2**. Under this regulation, any proposed development, interference, or alteration within these areas requires a permit from TRCA.

MECP – As noted earlier, Butternuts in the vicinity of Columbia Way require assessment by a certified Butternut Health Assessor (BHA). This assessment will determine whether impacts to trees can be registered or if an overall benefit permit will be required under the ESA. As the trees to be impacted are young or in poor condition, it is expected that registration of the proposed impacts will be possible. Registration of impacts will require planting and tending of replacement trees. It is suggested that replacement trees could be planted within the nearby TRCA lands. To reduce registration requirements, consideration should be given to the assessment of the growing conditions of trees west of Cold Creek by a professional arborist. Their topographical position (high on tablelands immediately beside a steep ditch bank) may preclude their consideration for registration, as grading may not impact their root systems.

DFO – The DFO Projects Near Water website contains a list of criteria used to determine if a project requires submission for specific review. Typically, for any work below the high-water mark (often the 2-year storm level), including temporary disturbances not covered by the interim codes of practice noted in **Section 9.3**, a Request for Review application should be submitted to DFO to review the project for compliance with the *Fisheries Act*. Northern Brook Lamprey is listed as a Special Concern species, and therefore permitting under the SARA is not required for potential impacts to this species.

Additional permits that may be required include fish and wildlife collection/relocation/salvage permits issued by the MNRF (Licence to Collect Fish for Scientific Purposes and Wildlife Scientific Collectors Permit).

11.0 Conclusions

This Natural Environment Assessment documents the existing conditions within the Columbia Way right-of-way Study Area, supported by field studies carried out in 2020. These studies included aquatic habitat and fish community assessment, Ecological Land Classification a Tree Inventory, and a single season plant inventory, as well as wildlife habitat assessment and incidental wildlife observations, with a focus on species and features noted in background data and agency correspondence.

The improvements in the preferred alternative (Alternative #3) will impact natural environment components within the Study Area, however, the overall function of the larger system is not expected to be significantly impacted by the proposed project. Vegetation loss associated with road widening, slope stabilization and sightline improvements is the most notable impact. Most vegetation to be lost is in the form of Cultural Meadow/roadside and is the most common vegetation type within the Study Area. In the western (rural) section of the Study Area, woody and wetland vegetation communities are proposed to be impacted to manage safety and stability issues with the S-curve segment of the roadway. Most of this area is composed of young, cultural communities, some areas of which are already impacted by failing slopes and ad-hock clearing for visibility improvements. At detailed design, consideration for retaining the mature cedar forest in this area and reducing the small impacts to wetland communities associated with Cold Creek should be considered. Butternut trees (Endangered) in this vicinity require assessment by a BHA so they can be registration and subsequently removed to support the proposal. Grading limit revisions to protect mature, residential trees, such as the Black Locusts identified in the rural road section, should be considered at detailed design.

Field work confirmed Cold Creek as a coldwater feature supporting sensitive fish species. Proper mitigation and timing windows to protect these fish and their habitat should be implemented during bridge rehabilitation. If shade-providing vegetation is removed during the course of construction/grading, a riparian planting plan that restores or enhances shading of Cold Creek to reduce thermal impacts is recommended. The tributary to Cold Creek in the eastern (urban) section of the Study Area was found to provide contributing fish habitat during the field surveys. At this location, the perched culvert at the upstream end of the crossing under Columbia Way should be corrected when the culvert reaches the end of its lifespan (not a component of this project). Appropriate ESCs, riparian vegetation restoration, as well as contractor education and appropriate timing of activities should serve to further reduce impacts to the Natural Heritage System.

No other impacts are anticipated as a result of the proposed project. Butternut was the only SAR directly identified within the Study Area; however, this should be re-examined at the detailed design stage in consultation with MECP as species ranges and classifications change over time.

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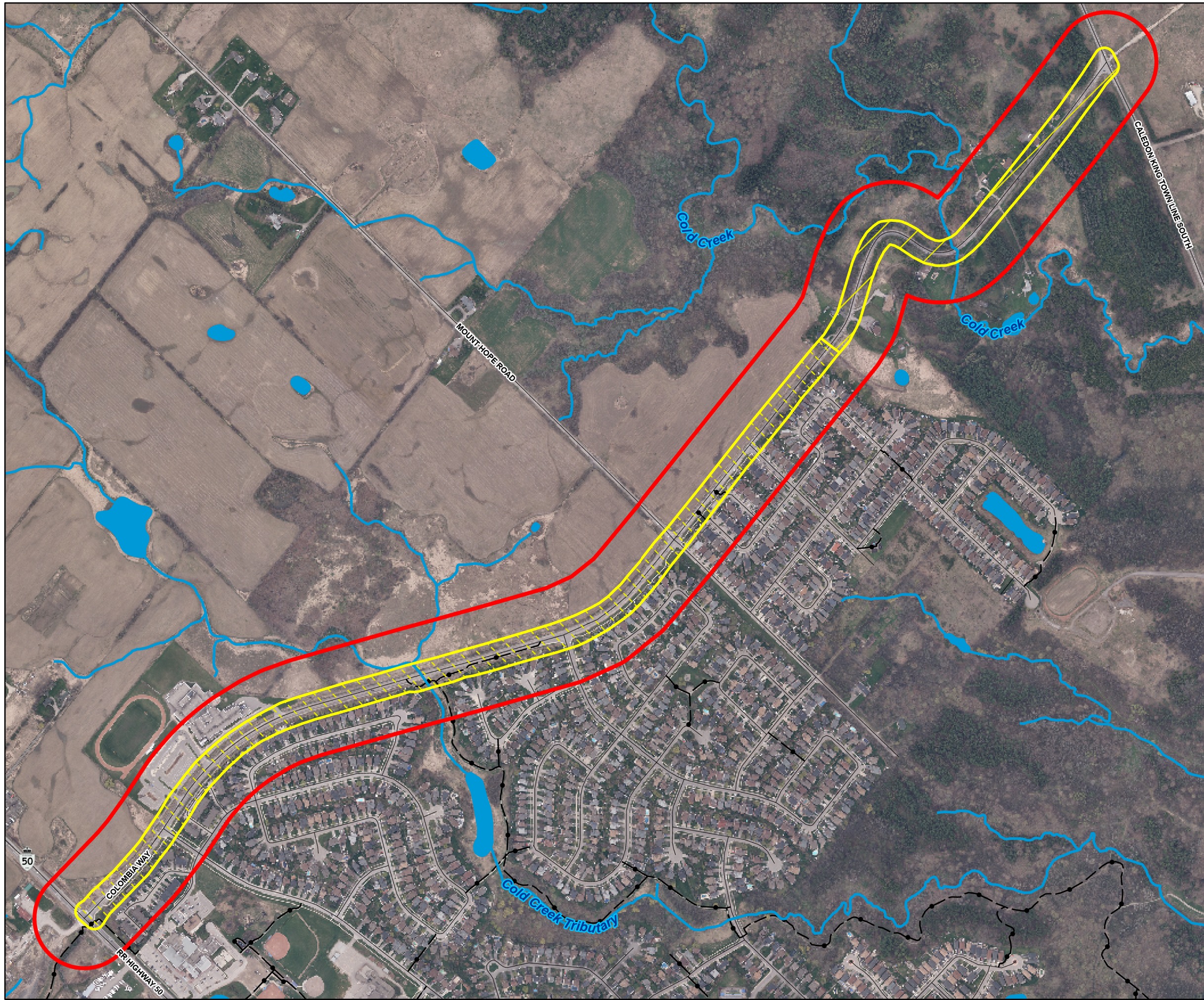
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Appendix A

Maps



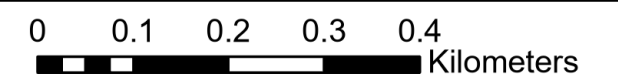
TOWN OF CALEDON

COLUMBIA WAY EA STUDY NATURAL ENVIRONMENTAL ASSESSMENT

Map 1 - Study Area Overview

Legend

- Road
- Trail
- Watercourse
- Waterbody
- Study Area
- ▨ Rural Section
- Urban Section
- ▭ Study Area and Adjacent Lands



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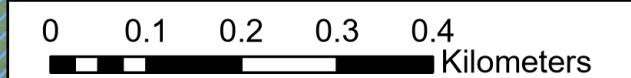
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COLUMBIA WAY EA STUDY NATURAL ENVIRONMENTAL ASSESSMENT

Map 2 - Overview of Natural Heritage Features & Conservation
Authority Regulated Areas

Legend

- Road
- Trail
- Watercourse
- Waterbody
- Study Area and Adjacent Lands
- Provincially Significant Wetland (Castleberg)
- Wetland
- Woodland
- TRCA Property
- Flood Plain
- Regulation Limit (O. Reg. 166/06)
- Greenbelt Designation (O. Reg. 59/05)
- Oak Ridges Moraine Designation (O. Reg. 140/02)

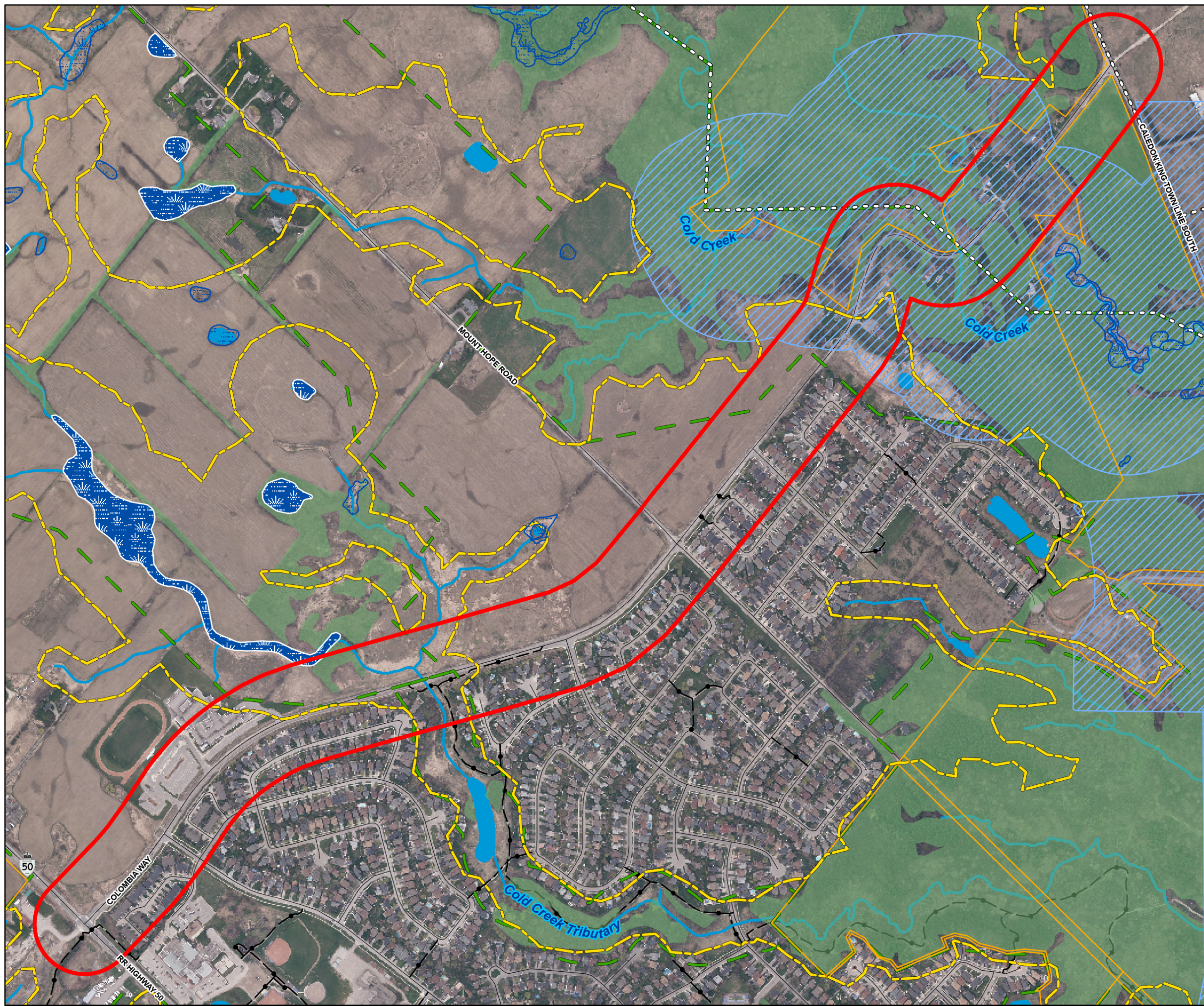


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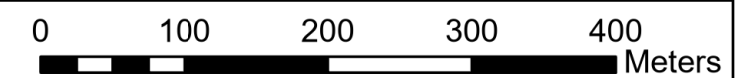
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COLUMBIA WAY EA STUDY NATURAL ENVIRONMENTAL ASSESSMENT

Map 3a - Vegetation Communities - Urban Section

Legend

- Road
 - Trail
 - Watercourse
 - Waterbody
 - Study Area and Adjacent Lands
- #### Vegetation Communities - Urban Section
- Agriculture
 - CUM1 - Forb Meadow
 - CUP2 - Conifer Mixed Plantation
 - CUT1 - Deciduous Thicket
 - FOD4 - Dry-Fresh Ironwood Deciduous Forest
 - FOD5-2 - Dry-Fresh Sugar Maple - Beech Deciduous Forest
 - MAM2-2 - Reed Canary Grass Mineral Meadow Marsh
 - MAS2 - Cattail Mineral Shallow Marsh
 - OAO - Open Aquatic



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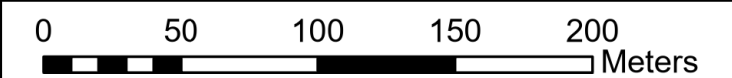
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COLUMBIA WAY EA STUDY NATURAL ENVIRONMENTAL ASSESSMENT

Map 3b - Vegetation Communities - Rural Section

Legend

- Road
 - Trail
 - Watercourse
 - Waterbody
 - Study Area and Adjacent Lands
- #### Vegetation Communities - Rural Section
- Agriculture
 - CBT1 - White Cedar Low Treed Clay Barren
 - CUH1-A - Treed Hedgerow
 - CUM1 - Forb Meadow
 - CUP1-8 - Red Oak Deciduous Plantation
 - CUP2 - Conifer Mixed Plantation
 - CUP3 - Mixed Coniferous Plantation
 - CUT1 - Deciduous Thicket
 - CUW1-b - Exotic Successional Woodland
 - FOC2-2 - Dry-Fresh White Cedar Coniferous Forest
 - FOD7 - Fresh-Moist Lowland Deciduous Forest
 - MAM2-10 - Forb Mineral Meadow Marsh
 - MAS2 - Cattail Mineral Shallow Marsh
 - OAO - Open Aquatic
 - OAO1 - Open Aquatic (unvegetated)
 - SWM1-1 - White Cedar - Hardwood Mineral Mixed Swamp



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TOWN OF CALEDON

COLUMBIA WAY EA STUDY NATURAL ENVIRONMENTAL ASSESSMENT

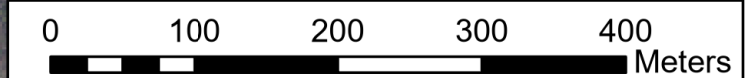
Map 4a - Tree Inventory - Urban Section

Legend

- Road
- Trail
- Watercourse
- Waterbody
- Study Area and Adjacent Lands

Tree Inventory - Scientific Name - Common Name

- Acer tataricum* - Amur Maple
- Pinus nigra* - Austrian Pine
- Populus balsamifera* - Balsam Poplar
- Picea pungens* - Blue Spruce
- Thuja occidentalis* - Eastern White Cedar
- Quercus robur* - English Oak
- Acer x freemanii* - Freeman Maple
- Syringa reticulata* - Ivory Silk Tree
- Acer negundo* - Manitoba Maple
- Acer spp.* - Maple
- Acer platanoides* - Norway Maple
- Picea abies* - Norway Spruce
- Quercus rubra* - Red Oak
- Pinus sylvestris* - Scots Pine
- Euonymus europaeus* - Spindle Tree
- Fraxinus americana* - White Ash
- Ulmus americana* - White Elm American
- Pinus strobus* - White Pine
- Populus alba* - White Poplar
- Picea glauca* - White Spruce



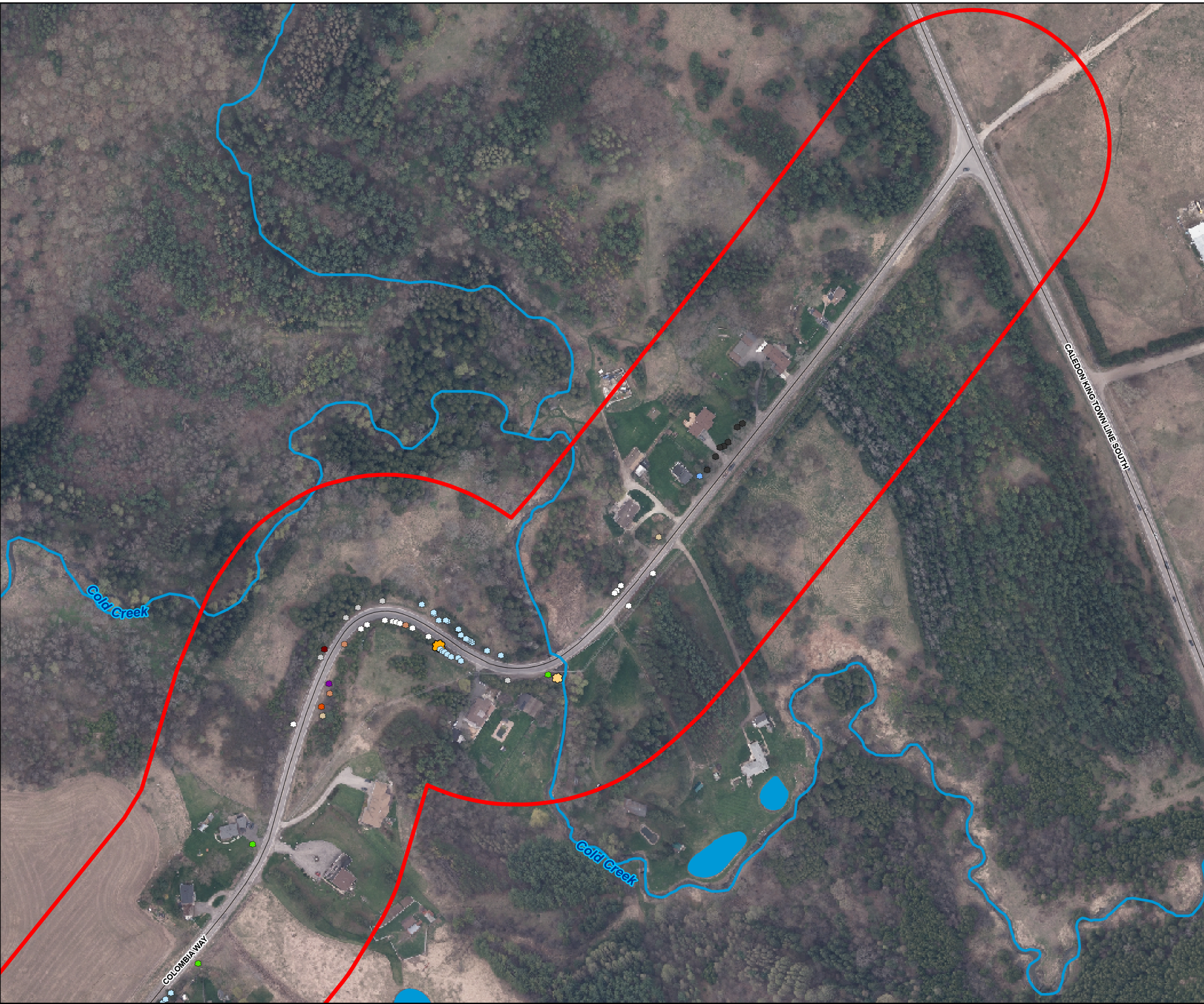
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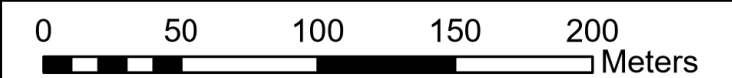
TOWN OF CALEDON

COLUMBIA WAY EA STUDY NATURAL ENVIRONMENTAL ASSESSMENT

Map 4b - Tree Inventory - Rural Section

Legend

- Road
 - Trail
 - Watercourse
 - Waterbody
 - Study Area and Adjacent Lands
- Tree Inventory - Rural Section*
- *Ulmus americana* - American Elm
 - *Malus sp.* - Apple
 - *Robinia pseudoacacia* - Black Locust
 - *Juglans cinerea* - Butternut
 - *Juglans cinerea* (3) - Butternut (3)
 - *Crataegus monogyna* - Common Hawthorn
 - *Thuja occidentalis* - Eastern White Cedar
 - *Thuja occidentalis* (Hedge) - Eastern White Cedar (Hedge)
 - *Acer negundo* - Manitoba Maple
 - *Picea abies* - Norway Spruce
 - *Pinus sylvestris* - Scots Pine
 - *Pinus strobus* - White Pine
 - *Picea glauca* - White Spruce



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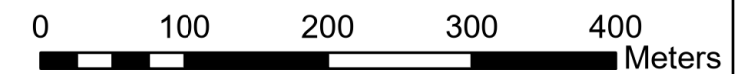
TOWN OF CALEDON

COLUMBIA WAY EA STUDY NATURAL ENVIRONMENTAL ASSESSMENT

Map 5a - Aquatic Habitat - Urban Section

Legend

-  Road
-  Trail
-  Watercourse
-  Watercourse - Coldwater, Permanent
-  Watercourse - Coldwater, Intermittent
-  Waterbody
-  Study Area and Adjacent Lands



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TOWN OF CALEDON

**COLUMBIA WAY EA STUDY
NATURAL ENVIRONMENTAL ASSESSMENT**

Map 5b - Aquatic Habitat - Rural Section

Legend

- Road
- Trail
- Watercourse
- Watercourse - Coldwater, Permanent
- - - Watercourse - Coldwater, Intermittent
- Waterbody
- Study Area and Adjacent Lands

Legend

- 🐟 Lamprey Observed
- 🐚 Mussel Shell Fragments Observed
- 🌀 Channel Braiding
- 🌉 Bridge Crossing



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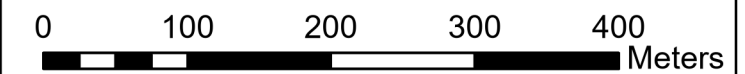
TOWN OF CALEDON

**COLUMBIA WAY EA STUDY
NATURAL ENVIRONMENTAL ASSESSMENT**

Map 6a - Road Design - Urban Section

Legend

-  Road Design
-  Road Regrade
-  Watercourse
-  Waterbody
-  Study Area and Adjacent Lands



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






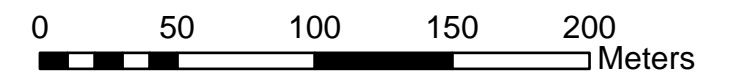
TOWN OF CALEDON

**COLUMBIA WAY EA STUDY
NATURAL ENVIRONMENTAL ASSESSMENT**

Map 6b - Road Design - Rural Section

Legend

-  Road Design
-  Road Regrade
-  Watercourse
-  Waterbody
-  Study Area and Adjacent Lands



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









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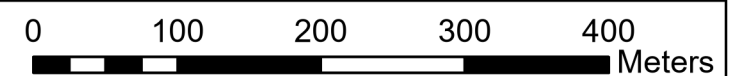
COLUMBIA WAY EA STUDY NATURAL ENVIRONMENTAL ASSESSMENT

Map 7a - Road Design, Grading, Aquatic, Tree Inventory,
and Vegetation Communities - Urban Section

Legend

-  Road Design
-  Road Regrade
-  Watercourse
-  Watercourse - Coldwater, Permanent
-  Watercourse - Coldwater, Intermittent
-  Waterbody
-  Study Area and Adjacent Lands
-  Tree (Common)

Vegetation Community	Existing (m ²)	Graded (m ²)	Remaining (m ²)
Agriculture	75,807.43	999.02	74,808.41
CUM1	87,720.71	10,161.67	77,559.04
CUP2	855.68	0.00	855.68
FOD4	973.15	0.00	973.15
FOD5-2	5,282.83	0.00	5,282.83
MAM2-2	6,453.79	20.31	6,433.48
MAS2	899.66	0.00	899.66



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











TOWN OF CALEDON

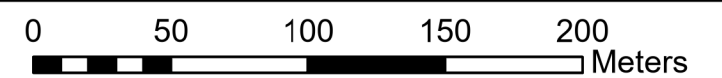
COLUMBIA WAY EA STUDY NATURAL ENVIRONMENTAL ASSESSMENT

Map 7b - Road Design, Grading, Aquatic, Tree Inventory, and Vegetation Communities - Rural Section

Legend

-  Road Design
-  Road Regrade
-  Watercourse
-  Watercourse - Coldwater, Permanent
-  Watercourse - Coldwater, Intermittent
-  Waterbody
-  Study Area and Adjacent Lands
-  Tree (SARA)
-  Tree (3) (SARA)
-  Tree (Common)

Vegetation Community	Existing (m ²)	Graded (m ²)	Remaining (m ²)
CBT1	247.79	0.00	247.79
CUH1-A	722.12	78.97	643.15
CUM1	23,601.75	591.30	23,010.45
CUP1-8	1,232.28	0.00	1,232.28
CUP2	316.62	0.00	316.62
CUP3	40,918.25	1,727.26	39,190.99
CUT1	23,668.59	4,118.16	19,550.43
CUW1	11,460.53	666.84	10,793.69
FOC2-2	1,929.89	708.90	1,220.99
FOD7	6,065.20	0.00	6,065.20
MAM2-10	1,179.30	11.14	1,168.16
MAS2	1,549.57	236.02	1,313.55
OAO	699.38	0.00	699.38
OAO1	1,190.77	0.00	1,190.77
SWM1-1	2,251.22	0.00	2,251.22



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Appendix B

Photographic Record



1 - August 27, 2020
Roadside and Cultural Meadow east of St. Michael Catholic Secondary School showing Cup Plant in roadside (left) and beyond (right).



2 - July 31, 2020
Trailhead associated with Cold Creek tributary, showing typical vegetation.



3 - August 27, 2020
Terrestrial crayfish burrow in roadside ditch between Westchester Boulevard and Mount Hope Road.



4 - August 27, 2020
Typical urban cross-section with unmaintained and maintained vegetation, facing south between Westchester Boulevard and Mount Hope Road.



5 - August 27, 2020
Typical unmaintained roadside vegetation, rural section.



6 - August 27, 2020
Typical maintained residential roadside, rural section.



7 - August 27, 2020
Wetland communities north of Columbia Way along Cold Creek.



8 - August 27, 2020
Vegetation along west side of S-bend proposed for removal to support slope stabilization via grading.



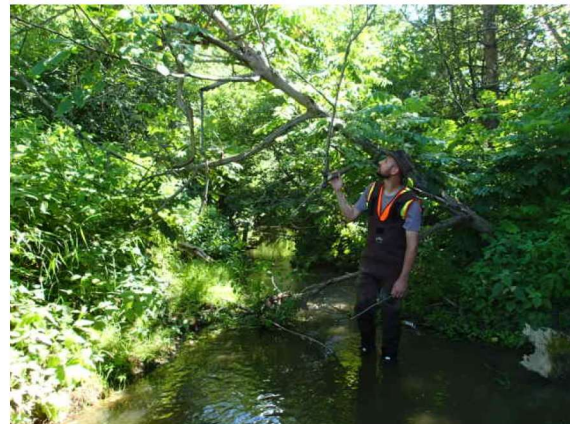
9 - August 27, 2020
Vegetation along east slope of S-bend proposed for removal to support improved sight lines.



10 - September 22, 2020
Residential Black Locust specimen trees, 9862 Columbia Way.



11 - August 27, 2020
Eroding bank near Caledon-King Townline Road.



12 - July 31, 2020
Butternut leaning over Cold Creek, south of Columbia Way.



13 - July 31, 2020
Cold Creek tributary downstream of Columbia Way.



14 - July 31, 2020
Cold Creek tributary upstream of Columbia Way.



15 - July 31, 2020
Upstream end of Cold Creek tributary culvert, note perched (elevated) above ground.



16 - July 31, 2020
Small surface drainage culvert outlet to private pond, south of Columbia Way.



17 - July 31, 2020
Cold Creek lamprey habitat; undercut bank far right.



18 - July 31, 2020
Electrofishing sampling Cold Creek downstream of Columbia Way.



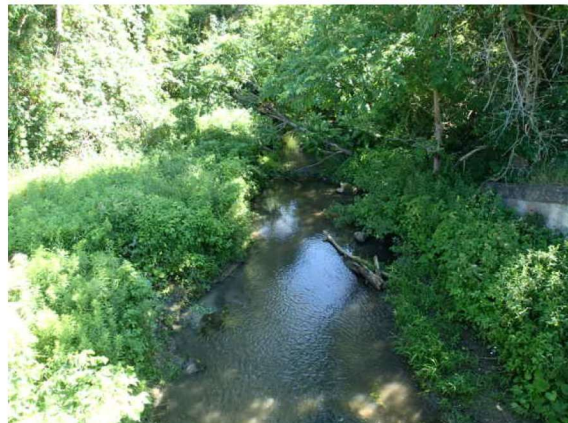
19 - July 31, 2020
American Brook Lamprey collected from Cold Creek.



20 - July 31, 2020
Mottled Sculpin collected from Cold Creek.



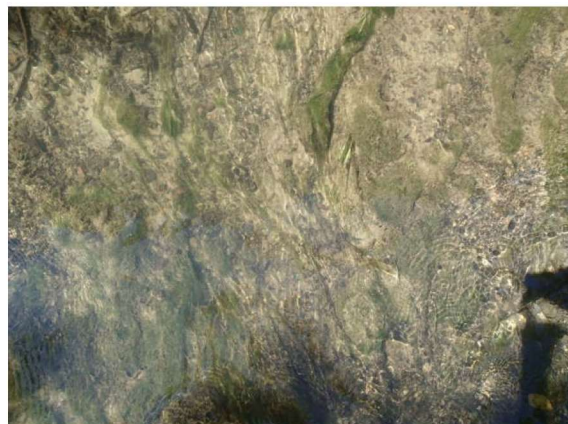
21 - July 31, 2020
Cold Creek upstream of Coventry Bridge.



22 - July 31, 2020
Cold Creek downstream of Coventry Bridge, note
Butternut visible overhanging stream.



23 - July 31, 2020
Coventry Bridge, looking upstream.



24 - July 31, 2020
Substrate near Coventry Bridge; typical.

Appendix C

Tree Inventory

Tree Inventory

Tree No.	Common Name	Scientific Name	DBH* (cm)	Rating**	Comments
1	White Spruce	<i>Picea glauca</i>	9	F-P	Poor install, blown over, raised root ball, interior death
2	Amur Maple	<i>Acer tataricum</i>	10	G	Multiple stems all under ten cm DBH
3	Austrian Pine	<i>Pinus nigra</i>	25	G-F	Some needle drop, lost leader
4	Austrian Pine	<i>Pinus nigra</i>	23	G-F	Multiple stems, wound on main branch
5	Austrian Pine	<i>Pinus nigra</i>	21	G	None
6	Amur Maple	<i>Acer tataricum</i>	14	G	None
7	Freeman Maple	<i>Acer x freemanii</i>	26	G	Included bark at joints, root flare slightly exposed
8	Freeman Maple	<i>Acer x freemanii</i>	25	G-F	Included bark at joints, root flare exposed
9	Amur Maple	<i>Acer tataricum</i>	10	F	Small wound (healed), damage to trunk (healed), lean
10	Austrian Pine	<i>Pinus nigra</i>	24	G-F	Codominant leaders
11	Austrian Pine	<i>Pinus nigra</i>	21	G	None
12	Austrian Pine	<i>Pinus nigra</i>	24	G-F	Wounding on trunk, lost leader in past, minor lean
13	Austrian Pine	<i>Pinus nigra</i>	27	G	Codominant leaders
14	Maple	<i>Acer spp.</i>	10	G-F	Damage to trunk (healed)
15	Red Oak	<i>Quercus rubra</i>	13	G-F	Uneven branching, poor shape
16	Ivory Silk Tree	<i>Syringa reticulata</i>	10	D	Dead
17	Ivory Silk Tree	<i>Syringa reticulata</i>	5	G-F	Die back from drought
18	Ivory Silk Tree	<i>Syringa reticulata</i>	6	F	Significant die back, trunk damage, lean
19	Red Oak	<i>Quercus rubra</i>	8	G-F	Lean, damage at root flare, poor structure, epicormic branching
20	English Oak	<i>Quercus robur</i>	20	G	Evidence of gypsy moth infestation, recovering
21	Red Oak	<i>Quercus rubra</i>	15	G-F	Some gypsy moth evidence, epicormic branching, smaller dead branch
22	Red Oak	<i>Quercus rubra</i>	16	F	Epicormic branching, dead branches, healed trunk wounds, unhealed wound

Tree No.	Common Name	Scientific Name	DBH* (cm)	Rating**	Comments
23	Ivory Silk Tree	<i>Syringa reticulata</i>	9	F	Epicormic shoots at root flare, growing into fence, leaning, dead branches
24	Ivory Silk Tree	<i>Syringa reticulata</i>	6	G	Minor lean
25	Blue Spruce	<i>Picea pungens</i>	17	G	Growing into fence, lean, minor needle loss
26	Blue Spruce	<i>Picea pungens</i>	13	G	Crooked trunk, growing into fence
27	Blue Spruce	<i>Picea pungens</i>	15	G	Mower damage, growing into fence
28	Norway Maple	<i>Acer platanoides</i>	15	G	Healed trunk damage, good shape, minor inclusion at lower branch fork
29	Norway Maple	<i>Acer platanoides</i>	18	F	Major wound on trunk, insect damage, growing well
30	Norway Maple	<i>Acer platanoides</i>	19	G	None
31	Norway Maple	<i>Acer platanoides</i>	16	G	Healed trunk wound
32	Norway Maple	<i>Acer platanoides</i>	28	G	None
33	Austrian Pine	<i>Pinus nigra</i>	22	G	None
34	Austrian Pine	<i>Pinus nigra</i>	22	G	None
35	Austrian Pine	<i>Pinus nigra</i>	27	G	None
36	Austrian Pine	<i>Pinus nigra</i>	19	G-F	Some die back, Dothistroma needle blight
37	Norway Maple	<i>Acer platanoides</i>	23	G	None
38	Norway Maple	<i>Acer platanoides</i>	22	G	Old trunk wound (healed)
39	Norway Maple	<i>Acer platanoides</i>	20	G	None
40	Norway Maple Crimson King	<i>Acer platanoides</i>	12	G-F	Seeping trunk wound in middle of trunk, wounds at root flare, exposed roots
41	Norway Maple Crimson King	<i>Acer platanoides</i>	13	G-F	Growing into fence
42	White Spruce	<i>Picea glauca</i>	22	G	None
43	Spindle Tree	<i>Euonymus europaeus</i>	6		None
44	Spindle Tree	<i>Euonymus europaeus</i>	3		None
45	Blue Spruce	<i>Picea pungens</i>	22	G	None
46	Norway Maple	<i>Acer platanoides</i>	15	G	Gypsy moth eggs throughout, mower damage at root flare

Tree No.	Common Name	Scientific Name	DBH* (cm)	Rating**	Comments
47	Norway Maple	<i>Acer platanoides</i>	16	G	Gypsy moth eggs throughout, mower damage at root flare
48	White Elm American	<i>Ulmus americana</i>	39	G	None
49	Balsam Poplar	<i>Populus balsamifera</i>	24	G-F	Lean, branch die back, beginning decline
50	Balsam Poplar	<i>Populus balsamifera</i>	27	G	None
51	Norway Spruce	<i>Picea abies</i>	24	G-F	Lost leader, crowded by poplar
52	Balsam Poplar	<i>Populus balsamifera</i>	34	G-F	Seeping wounds from branch trimming, some dieback
53	Red Oak	<i>Quercus rubra</i>	32	G	None
54	Red Oak	<i>Quercus rubra</i>	24	G-F	Crowding from spruce, lean, minor die back
55	Blue Spruce	<i>Picea pungens</i>	28	G-F	Crowded
56	Norway Spruce	<i>Picea abies</i>	29	G	None
57	Norway Spruce	<i>Picea abies</i>	25	G	None
58	White Spruce	<i>Picea glauca</i>	21	F	Lost leader, crowded, some branch dieback
59	Balsam Poplar	<i>Populus balsamifera</i>	37	F	Multi-stemmed, lost leader, some dieback
60	Balsam Poplar	<i>Populus balsamifera</i>	40	G	None
61	Red Oak	<i>Quercus rubra</i>	25	G-F	Slightly mishappen, some branch dieback
62	Balsam Poplar	<i>Populus balsamifera</i>	31	G	Leaning
63	Balsam Poplar	<i>Populus balsamifera</i>	34	G-F	Some branch dieback
64	White Poplar	<i>Populus alba</i>	20	G	Some branch dieback
65	Norway Spruce	<i>Picea abies</i>	34	F-P	Lost leader, moderate dieback, crowded
66	Norway Spruce	<i>Picea abies</i>	28	F-P	Moderate dieback, crowded
67	Norway Spruce	<i>Picea abies</i>	27	G	Crowded
68	Norway Spruce	<i>Picea abies</i>	33	G	Crowded
69	Norway Spruce	<i>Picea abies</i>	38	G	None
70	Norway Spruce	<i>Picea abies</i>	27	G	Crowded
71	Norway Spruce	<i>Picea abies</i>	31	F	Dieback

Tree No.	Common Name	Scientific Name	DBH* (cm)	Rating**	Comments
72	Norway Spruce	<i>Picea abies</i>	34	G	Two stems
73	Norway Spruce	<i>Picea abies</i>	23	D	Dead
74	Manitoba Maple	<i>Acer negundo</i>	24	P	Three stems, major lean, fungus in heartwood, epicormic shoots (lots)
75	Norway Spruce	<i>Picea abies</i>	30	G	Crowding
76	Norway Spruce	<i>Picea abies</i>	28	G-F	Lost leader, crowding
77	Norway Spruce	<i>Picea abies</i>	29	G-F	Codominant leader, loss of main leader
78	Norway Spruce	<i>Picea abies</i>	51	G	Excellent specimen
79	Manitoba Maple	<i>Acer negundo</i>	39	G	Codominant leaders
80	White Pine	<i>Pinus strobus</i>	39	G-F	Codominant leaders
81	Apple	<i>Malus sp.</i>	30	F	One dead stem, dieback
82	Scotch Pine	<i>Pinus sylvestris</i>	22	G	Minor branch dieback
83	Common Hawthorn	<i>Crataegus monogyna</i>	22	P	Multiple stems, major dieback
84	Scotch Pine	<i>Pinus sylvestris</i>	23	G	None
85	Eastern White Cedar	<i>Thuja occidentalis</i>	30, 27	G	Single tree with two stems, lower branch die back, trimming
86	Eastern White Cedar	<i>Thuja occidentalis</i>	21	G	Multiple stems, lower branch die back
87	Eastern White Cedar	<i>Thuja occidentalis</i>	21	G	None
88	Eastern White Cedar	<i>Thuja occidentalis</i>	26	G	Lower branch trimming
89	Eastern White Cedar	<i>Thuja occidentalis</i>	20	G	Crowded
90	Eastern White Cedar	<i>Thuja occidentalis</i>	20	G	Crowded
91	Scotch Pine	<i>Pinus sylvestris</i>	27	G	Crowded, slight curve at top of trunk
92	Eastern White Cedar	<i>Thuja occidentalis</i>	21	G	Crowded, hedge-type environment/growth
93	Eastern White Cedar	<i>Thuja occidentalis</i>	20	G	Lower branch trimming, dieback
94	Butternuts 3	<i>Juglans cinerea</i>	6, 2, >1	G	Small canker on largest specimen
95	Norway Spruce	<i>Picea abies</i>	28	P	Hedge area, little live material, reduced vigour
96	Norway Spruce	<i>Picea abies</i>	33	G-F	Lower branch dieback
97	Norway Spruce	<i>Picea abies</i>	26	G-F	Lower branch dieback
98	Norway Spruce	<i>Picea abies</i>	26	F-G	Lower branch dieback

Tree No.	Common Name	Scientific Name	DBH* (cm)	Rating**	Comments
99	Norway Spruce	<i>Picea abies</i>	35	P	Poor growth, narrow, not a lot of live material on it
100	Norway Spruce	<i>Picea abies</i>	26	G-F	Lower branch dieback
101	Norway Spruce	<i>Picea abies</i>	29	F	Leaning, lower branch dieback
102	Eastern White Cedar Hedge	<i>Thuja occidentalis</i>	0	F-G	Lower branch dieback, browning leaves
103	Manitoba Maple	<i>Acer negundo</i>	47	F	Dieback, old wound (hollow)
104	Butternut	<i>Juglans cinerea</i>	17	P	Heavily cankered, vigorous upper growth. Another specimen nearby, similar condition
105	Norway Spruce	<i>Picea abies</i>	46	G	Codominant leaders but in excellent condition
106	Norway Spruce	<i>Picea abies</i>	32	G	None
107	Norway Spruce	<i>Picea abies</i>	34	P	Mostly dead, broken top
108	Norway Spruce	<i>Picea abies</i>	28	P	Bark loss, dead top, no leader
109	Norway Spruce	<i>Picea abies</i>	33	G-F	Lower branch dieback
110	Norway Spruce	<i>Picea abies</i>	34	G-F	None
111	Norway Spruce	<i>Picea abies</i>	30	G-F	None
112	Norway Spruce	<i>Picea abies</i>	32	G	None
113	Norway Spruce	<i>Picea abies</i>	51	G	None
114	Norway Spruce	<i>Picea abies</i>	23	G-F	Dead leader
115	Norway Spruce	<i>Picea abies</i>	38	G	None
116	Norway Spruce	<i>Picea abies</i>	39	G	Lower branch dieback
117	Norway Spruce	<i>Picea abies</i>	28	F-G	Crowded, most growth at top.
118	Norway Spruce	<i>Picea abies</i>	41	P	Top dead
119	Norway Spruce	<i>Picea abies</i>	44	F	Crowded, most growth at top.
120	Norway Spruce	<i>Picea abies</i>	24	G-F	Crowded
121	Norway Spruce	<i>Picea abies</i>	29	G-F	Crowded
122	Norway Spruce	<i>Picea abies</i>	57	G	None
123	Norway Spruce	<i>Picea abies</i>	53	G	None
124					Multiple stems originating along steep slope generally outside of grading limits. Leaf browning noted.
-	Eastern White Cedar Hedge	<i>Thuja occidentalis</i>	<10	G	

Tree No.	Common Name	Scientific Name	DBH* (cm)	Rating**	Comments
128	American Elm	<i>Ulmus americana</i>	25	G-F	Branch dieback, crowding
129	Eastern White Cedar	<i>Thuja occidentalis</i>	22	G	Two stems
130	Manitoba Maple	<i>Acer negundo</i>	56		Leaning, has been pruned
131	Norway Maple	<i>Acer platanoides</i>	15	F	Crowded, growing through fence
132	Freeman Maple	<i>Acer x freemanii</i>	21	F	Many epicormic shoots from base; impacting form.
133	Freeman Maple	<i>Acer x freemanii</i>	17	G	Major trunk wound, reduced vigour
134	White Spruce	<i>Picea glauca</i>	12	G	None
135	White Spruce	<i>Picea glauca</i>	12	G	None
136	White Spruce	<i>Picea glauca</i>	11	G	None
137	White Spruce	<i>Picea glauca</i>	15	G	None
138	White Spruce	<i>Picea glauca</i>	1	G	None
139	White Spruce	<i>Picea glauca</i>	1	G	None
140	White Ash	<i>Fraxinus americana</i>	16	P	Damaged by Emerald Ash Borer
141	White Spruce	<i>Picea glauca</i>	>10	F	Five stems under 10 cm dbh
142	White Pine	<i>Pinus strobus</i>	15	F	Sparse
143	White Spruce	<i>Picea glauca</i>	8	P	Growth on top only
144	White Pine	<i>Pinus strobus</i>	16	G-F	Co-dominant leader, tag #960
145	White Spruce	<i>Picea glauca</i>	9	G-F	Crooked leader, good growth
146	White Spruce	<i>Picea glauca</i>	10	G-F	Crooked leader, good growth
147	Scotch Pine	<i>Pinus sylvestris</i>	20	G	None
148	Scotch Pine	<i>Pinus sylvestris</i>	23	F	Multiple stems, good growth, dead leader
149	Norway Spruce	<i>Picea abies</i>	26	G	None
150	Norway Spruce	<i>Picea abies</i>	29	G	None
151	Red Oak	<i>Quercus rubra</i>	6	F	Dead top, gypsy moth
152	Red Oak	<i>Quercus rubra</i>	7	F	Dead top, gypsy moth
153	Red Oak	<i>Quercus rubra</i>	6	F	Curve in stem, dead branches
154	Freeman Maple	<i>Acer x freemanii</i>	14	G	Old wounds (healed), slightly included bark at unions
155	Freeman Maple	<i>Acer x freemanii</i>	11	G	None

Tree No.	Common Name	Scientific Name	DBH* (cm)	Rating**	Comments
156	Freeman Maple	<i>Acer x freemanii</i>	15	G-F	Showing signs of disease, old trunk wounds
157	Freeman Maple	<i>Acer x freemanii</i>	11	G-F	Reduced vigour, dead branches
158	Freeman Maple	<i>Acer x freemanii</i>	12	G-F	Reduced vigour, dead branches
159	Freeman Maple	<i>Acer x freemanii</i>	9	F	Branch death, shows signs of disease, weeping canker, healed wound
160	Freeman Maple	<i>Acer x freemanii</i>	14	G	None
161	Red Oak	<i>Quercus rubra</i>	>10	F	Four stems under 10 cm DBH, poor structure
162	Freeman Maple	<i>Acer x freemanii</i>	15	G	None
163	Freeman Maple	<i>Acer x freemanii</i>	15	G	None
164	Freeman Maple	<i>Acer x freemanii</i>	13	G-F	Weeping canker
165	Freeman Maple	<i>Acer x freemanii</i>	12	F	Fairly significant trunk wound, dead branches, epi shoot from base
166	Freeman Maple	<i>Acer x freemanii</i>	11	G	Some dead branches
167	Freeman Maple	<i>Acer x freemanii</i>	13	F	Small weeping canker, trunk wound (healed), codominant leader
168	Black Locust	<i>Robinia pseudoacacia</i>	86	F	Four stems, significant structural defects in trunk, measured below split, otherwise healthy, large
169	Black Locust	<i>Robinia pseudoacacia</i>	47	G	Two stems, some dead branches
170	Black Locust	<i>Robinia pseudoacacia</i>	110	G-F	Some dead branches, some fungus, large tree
171	Black Locust	<i>Robinia pseudoacacia</i>	73	G	Some dead branches, large tree
172	Black Locust	<i>Robinia pseudoacacia</i>	117	G	Formerly two-stemmed, other stem removed
173	Black Locust	<i>Robinia pseudoacacia</i>	98	G-F	Two stems, branching to multiple stems higher up, some fungus and rot noted, large tree
174	Black Locust	<i>Robinia pseudoacacia</i>	52	G	Multiple stems, some dead branches
175	White Spruce	<i>Picea glauca</i>	42	F	Some die back at bottom, crowded
176	White Pine	<i>Pinus strobus</i>	35	G	None
177	Eastern White Cedar	<i>Thuja occidentalis</i>	31	G-F	Yellowing leaves, two stems, some dieback, pruned in past

Tree No.	Common Name	Scientific Name	DBH* (cm)	Rating**	Comments
178	Eastern White Cedar	<i>Thuja occidentalis</i>	32	G-F	Yellowing leaves
179	Eastern White Cedar	<i>Thuja occidentalis</i>	30	G-F	Two stems, yellowing leaves
180	Eastern White Cedar	<i>Thuja occidentalis</i>	24	F	Two stems, yellowing leaves, topped for hydro wire
181	Eastern White Cedar	<i>Thuja occidentalis</i>	20	F	None
182	White Spruce	<i>Picea glauca</i>	3, 4, 6	F	Multi-stemmed tree

* Diameter at Breast Height

** Rating

G – Good – dead branches less than 10%; signs of good compartmentalization on wounds, no structural defects

F – Fair – 10-30% dead branches, size or occurrence of wounds present some concerns, minor structure defects

P – Poor – more than 30% dead branches, weak compartmentalization, early leaf drop, presence of insects of disease, major structure defects.

Note that ability of trees to overcome various defects/injuries and continue to provide aesthetic and ecological services was taken into account as a component of the rating.

Appendix D

Species Lists

Table 1 – Floral Inventory

Common Name	Scientific Name	Provincial Status (S Rank)*	COSSARO Ranking	Ecodistrict 74E Rank
Manitoba Maple	<i>Acer negundo</i>	G5		IC
Norway Maple	<i>Acer platanoides</i>	GNR		IC
Red Maple	<i>Acer rubrum</i>	G5		C
Sugar Maple	<i>Acer saccharum</i>	G5		C
Amur Maple	<i>Acer tataricum ssp. ginnala</i>	G--TNR		IR
Common Yarrow	<i>Achillea millefolium</i>	G5		IX
White Baneberry	<i>Actaea pachypoda</i>	G5		C
White Snakeroot	<i>Ageratina altissima</i>	G5		C
Garlic Mustard	<i>Alliaria petiolata</i>	GNR		IC
Common Ragweed	<i>Ambrosia artemisiifolia</i>	G5		C
Tall Anemone	<i>Anemone virginiana</i>	G5		C
Wild Sarsaparilla	<i>Aralia nudicaulis</i>	G5		C
Common Burdock	<i>Arctium minus</i>	GNR		IC
Common Goatsbeard	<i>Aruncus dioicus</i>	G5		
Common Milkweed	<i>Asclepias syriaca</i>	G5		C
Japanese Barberry	<i>Berberis thunbergii</i>	GNR		IC
Paper Birch	<i>Betula papyrifera</i>	G5		C
Devil's Beggarticks	<i>Bidens frondosa</i>	G5		C
Smooth Brome	<i>Bromus inermis</i>	G5		IC
Bluejoint Reedgrass	<i>Calamagrostis canadensis</i>	G5		U
Creeping Bellflower	<i>Campanula rapunculoides</i>	GNR		IX
Fox Sedge	<i>Carex vulpinoidea</i>	G5		C
Spotted Knapweed	<i>Centaurea stoebe</i>	GNR		IR
Common Lamb's-quarters	<i>Chenopodium album</i>	G5		IC
Wild Chicory	<i>Cichorium intybus</i>	GNR		IC
Broad-leaved Enchanter's Nightshade	<i>Circaea canadensis</i>	G5		C
Canada Thistle	<i>Cirsium arvense</i>	G5		IC
Bull Thistle	<i>Cirsium vulgare</i>	GNR		IC
Virginia Clematis	<i>Clematis virginiana</i>	G5		C
European Lily-of-the-valley	<i>Convallaria majalis</i>	G5		IC
Field Bindweed	<i>Convolvulus arvensis</i>	GNR		IC
Tatarian Dogwood	<i>Cornus alba</i>	GNR		
Alternate-leaved Dogwood	<i>Cornus alternifolia</i>	G5		C
Silky Dogwood	<i>Cornus obliqua</i>	G5		R

Common Name	Scientific Name	Provincial Status (S Rank)*	COSSARO Ranking	Ecodistrict 74E Rank
Grey Dogwood	<i>Cornus racemosa</i>	G5		C
Red-osier Dogwood	<i>Cornus sericea</i>	G5		C
English Hawthorn	<i>Crataegus monogyna</i>	G5		IC
Pale Swallowwort	<i>Cynanchum rossicum</i>	GNR		
Orchard Grass	<i>Dactylis glomerata</i>	GNR		IC
Wild Carrot	<i>Daucus carota</i>	GNR		IC
Smooth Crabgrass	<i>Digitaria ischaemum</i>	GNR		IC
Common Teasel	<i>Dipsacus fullonum</i>	GNR		IC
Large Barnyard Grass	<i>Echinochloa crus-galli</i>	GNR		IC
Wild Cucumber	<i>Echinocystis lobata</i>	G5		C
Common Viper's Bugloss	<i>Echium vulgare</i>	GNR		IC
Russian Olive	<i>Elaeagnus angustifolia</i>	GNR		IC
Autumn Olive	<i>Elaeagnus umbellata</i>	GNR		IU
Quackgrass	<i>Elymus repens</i>	GNR		IC
Purple-veined Willowherb	<i>Epilobium coloratum</i>	G5		C
Field Horsetail	<i>Equisetum arvense</i>	G5		C
Tufted Lovegrass	<i>Eragrostis pectinacea</i>	G5		
Annual Fleabane	<i>Erigeron annuus</i>	G5		C
European Euonymus	<i>Euonymus europaeus</i>	GNR		IR
Common Boneset	<i>Eupatorium perfoliatum</i>	G5		C
Grass-leaved Goldenrod	<i>Euthamia graminifolia</i>	G5		C
Purple Joe Pye Weed	<i>Eutrochium purpureum</i>	G5		R
Red Fescue	<i>Festuca rubra</i>	G5		
Wild Strawberry	<i>Fragaria virginiana</i>	G5		C
Glossy Buckthorn	<i>Frangula alnus</i>	GNR		IR
White Ash	<i>Fraxinus americana</i>	G5		C
Red Ash	<i>Fraxinus pennsylvanica</i>	G5		C
Large-leaved Avens	<i>Geum macrophyllum</i>	G5		
Virginia Stickseed	<i>Hackelia virginiana</i>	G5		U
Jerusalem Artichoke	<i>Helianthus tuberosus</i>	G5		IC
Orange Daylily	<i>Hemerocallis fulva</i>	GNA		IC
Dame's Rocket	<i>Hesperis matronalis</i>	G4G5		IC
Smooth Hawkweed	<i>Hieracium laevigatum</i>	G5?		
Virginia Waterleaf	<i>Hydrophyllum virginianum</i>	G5		C
Common St. John's-wort	<i>Hypericum perforatum</i>	GNR		IC
Spotted Jewelweed	<i>Impatiens capensis</i>	G5		C

Common Name	Scientific Name	Provincial Status (S Rank)*	COSSARO Ranking	Ecodistrict 74E Rank
Butternut	<i>Juglans cinerea</i>	G3	END	U
Black Walnut	<i>Juglans nigra</i>	G5		C
Path Rush	<i>Juncus tenuis</i>	G5		C
Eastern Red Cedar	<i>Juniperus virginiana</i>	G5		U
Prickly Lettuce	<i>Lactuca serriola</i>	GNR		IC
Everlasting Pea	<i>Lathyrus latifolius</i>	GNR		IR
Rice Cutgrass	<i>Leersia oryzoides</i>	G5		C
Oxeye Daisy	<i>Leucanthemum vulgare</i>	GNR		IC
Butter-and-eggs	<i>Linaria vulgaris</i>	GNR		IC
Great Blue Lobelia	<i>Lobelia siphilitica</i>	G5		R
Maack's Honeysuckle	<i>Lonicera maackii</i>	GNR		IU
Tatarian Honeysuckle	<i>Lonicera tatarica</i>	GNR		IC
Garden Bird's-foot Trefoil	<i>Lotus corniculatus</i>	GNR		IC
Purple Loosestrife	<i>Lythrum salicaria</i>	G5		IC
Black Medick	<i>Medicago lupulina</i>	GNR		IC
Alfalfa	<i>Medicago sativa</i>	GNR		
White Sweet-clover	<i>Melilotus albus</i>	G5		IC
Canada Mint	<i>Mentha canadensis</i>	G5		C
(<i>Mentha aquatica</i> X <i>Mentha spicata</i>)	<i>Mentha x piperita</i>	GNA		hyb
Watercress	<i>Nasturtium officinale</i>	GNR		?
Catnip	<i>Nepeta cataria</i>	GNR		IC
Common Evening-primrose	<i>Oenothera biennis</i>	G5		U
Eastern Hop-hornbeam	<i>Ostrya virginiana</i>	G5		C
Common Panicgrass	<i>Panicum capillare</i>	G5		U
Virginia Creeper	<i>Parthenocissus quinquefolia</i>	G5		R
Pennsylvania Smartweed	<i>Persicaria pensylvanica</i>	G5		R
Reed Canarygrass	<i>Phalaris arundinacea</i>	G5		C
Common Timothy	<i>Phleum pratense</i>	GNR		IC
Common Reed	<i>Phragmites australis</i>	G5		
Eastern Ninebark	<i>Physocarpus opulifolius</i>	G5		R
Virginia False Dragonhead	<i>Physostegia virginiana</i>	G5		R
Norway Spruce	<i>Picea abies</i>	G5		IX
White Spruce	<i>Picea glauca</i>	G5		U
Blue Spruce	<i>Picea pungens</i>	G5		
Mouse-ear Hawkweed	<i>Pilosella officinarum</i>	GNR		IR
Austrian Pine	<i>Pinus nigra</i>	GNR		

Common Name	Scientific Name	Provincial Status (S Rank)*	COSSARO Ranking	Ecodistrict 74E Rank
Red Pine	<i>Pinus resinosa</i>	G5		R
Eastern White Pine	<i>Pinus strobus</i>	G5		C
Scots Pine	<i>Pinus sylvestris</i>	GNR		IC
Canada Bluegrass	<i>Poa compressa</i>	GNR		IC
Kentucky Bluegrass	<i>Poa pratensis</i>	G5		
White Poplar	<i>Populus alba</i>	G5		IU
Balsam Poplar	<i>Populus balsamifera</i>	G5		C
Eastern Cottonwood	<i>Populus deltoides</i>	G5		
Sulphur Cinquefoil	<i>Potentilla recta</i>	GNR		IC
Sweet Cherry	<i>Prunus avium</i>	GNR		IX
Pin Cherry	<i>Prunus pensylvanica</i>	G5		R
Sand Cherry	<i>Prunus pumila</i>	G5		
Black Cherry	<i>Prunus serotina</i>	G5		C
Chokecherry	<i>Prunus virginiana</i>	G5		C
White Oak	<i>Quercus alba</i>	G5		C
English Oak	<i>Quercus robur</i>	GNR		IR
Northern Red Oak	<i>Quercus rubra</i>	G5		C
European Buckthorn	<i>Rhamnus cathartica</i>	GNR		IC
Staghorn Sumac	<i>Rhus typhina</i>	G5		C
Swamp Gooseberry	<i>Ribes hirtellum</i>	G5		R
Black Locust	<i>Robinia pseudoacacia</i>	G5		IC
Marsh Yellowcress	<i>Rorippa palustris</i>	G5		U
Multiflora Rose	<i>Rosa multiflora</i>	GNR		IC
Red Raspberry	<i>Rubus idaeus</i>	G5		
Black Raspberry	<i>Rubus occidentalis</i>	G5		C
Curled Dock	<i>Rumex crispus</i>	GNR		IC
Broad-leaved Arrowhead	<i>Sagittaria latifolia</i>	G5		C
White Willow	<i>Salix alba</i>	G5		IC
Black Willow	<i>Salix nigra</i>	G5		U
Green Foxtail	<i>Setaria viridis</i>	GNR		IX
Bladder Campion	<i>Silene vulgaris</i>	GNR		IR
Cup Plant	<i>Silphium perfoliatum</i>	S2		IR
Bittersweet Nightshade	<i>Solanum dulcamara</i>	GNR		IC
Tall Goldenrod	<i>Solidago altissima</i>	G5		
Canada Goldenrod	<i>Solidago canadensis</i>	G5		
Zigzag Goldenrod	<i>Solidago flexicaulis</i>	G5		C

Common Name	Scientific Name	Provincial Status (S Rank)*	COSSARO Ranking	Ecodistrict 74E Rank
Giant Goldenrod	<i>Solidago gigantea</i>	G5		C
Grey-stemmed Goldenrod	<i>Solidago nemoralis</i>	G5		
Field Sow-thistle	<i>Sonchus arvensis</i>	GNR		IC
American Mountain-ash	<i>Sorbus americana</i>	G5		
White Heath Aster	<i>Symphyotrichum ericoides</i>	G5		
Panicled Aster	<i>Symphyotrichum lanceolatum</i>	G5		C
Interior Panicled Aster	<i>Symphyotrichum lanceolatum ssp. lanceolatum var. interior</i>	G5T5		C
New England Aster	<i>Symphyotrichum novae-angliae</i>	G5		C
Old Field Aster	<i>Symphyotrichum pilosum</i>	G5		
Purple-stemmed Aster	<i>Symphyotrichum puniceum</i>	G5		C
Arrow-leaved Aster	<i>Symphyotrichum urophyllum</i>	G4G5		R
Japanese Tree Lilac	<i>Syringa reticulata</i>	GNR		
Common Lilac	<i>Syringa vulgaris</i>	GNR		IC
Common Dandelion	<i>Taraxacum officinale</i>	G5		IC
Eastern White Cedar	<i>Thuja occidentalis</i>	G5		C
Basswood	<i>Tilia americana</i>	G5		C
Little-leaved Linden	<i>Tilia cordata</i>	GNR		IR
Poison Ivy	<i>Toxicodendron radicans</i>	G5		
Red Clover	<i>Trifolium pratense</i>	GNR		IC
Coltsfoot	<i>Tussilago farfara</i>	GNR		IC
Narrow-leaved Cattail	<i>Typha angustifolia</i>	G5		IC
Broad-leaved Cattail	<i>Typha latifolia</i>	G5		C
White Elm	<i>Ulmus americana</i>	G4		C
Blue Vervain	<i>Verbena hastata</i>	G5		C
White Vervain	<i>Verbena urticifolia</i>	G5		C
Wayfaring Viburnum	<i>Viburnum lantana</i>	GNR		IC
Nannyberry	<i>Viburnum lentago</i>	G5		C
Cranberry Viburnum	<i>Viburnum opulus</i>	G5		
Highbush Cranberry	<i>Viburnum opulus ssp. trilobum</i>	G5TNR		U
Tufted Vetch	<i>Vicia cracca</i>	GNR		IC
Lesser Periwinkle	<i>Vinca minor</i>	GNR		IC
Riverbank Grape	<i>Vitis riparia</i>	G5		C

Provincial Rank

S5 - secure
S4 – apparently secure
S3 - vulnerable
S2 - imperiled

S1 – critically imperiled

County Rank

I – introduced
C – common
U – uncommon
R – rare

H – historic
X – present
? – unconfirmed report
hyb - hybrid

Table 2 – Incidental Terrestrial Wildlife

Common Name	Scientific Name	Provincial Status (S Rank)*	SARO	Section	Notes
Birds					
American Crow	<i>Corvus brachyrhynchos</i>	S5		Rural - Cold Creek and adj. lands	
American Goldfinch	<i>Spinus tristis</i>	S5B		Rural - residential/plantation; Urban	
American Robin	<i>Turdus migratorius</i>	S5B		Rural - residential/plantation; Cold Creek and adj. lands	
Baltimore Oriole	<i>Icterus galbula</i>	S4B		Rural - Cold Creek and adj. lands	
Black-capped Chickadee	<i>Poecile atricapillus</i>	S5		Rural - residential/plantation	
Belted Kingfisher	<i>Megasceryle alcyon</i>	S4B		Rural - Cold Creek and adj. lands	
Blue Jay	<i>Cyanocitta cristata</i>	S5		Rural - residential/plantation	
Cedar Waxwing	<i>Bombycilla cedrorum</i>	S5B		Rural - Cold Creek and adj. lands	
Common Grackle	<i>Quiscalus quiscula</i>	S5B		Rural - residential/Plantation; Urban	
Eastern Kingbird	<i>Tyrannus tyrannus</i>	S4B		Urban	Pathway/Open Space
Eastern Wood Pewee	<i>Contopus virens</i>	S4B	SC	Rural - Cold Creek and adj. lands	
Grey Catbird	<i>Dumetella carolinensis</i>	S4B		Rural – residential/plantation; Cold Creek and adj. lands	
Morning Dove	<i>Zenaida macroura</i>	S5		Rural - residential/plantation	
Northern Cardinal	<i>Cardinalis cardinalis</i>	S5		Rural - residential/plantation	
Northern Flicker	<i>Colaptes auratus</i>	S4B		Rural - residential/plantation	
Red-eyed Vireo	<i>Vireo olivaceus</i>	S5B		Rural - Cold Creek and adj. lands	
Red-tailed Hawk	<i>Buteo jamaicensis</i>	S5		Rural - Cold Creek and adj. lands	Calling
Ruby-throated Hummingbird	<i>Archilochus colubris</i>	S5B		Rural - Cold Creek and adj. lands	
Scarlet Tanager	<i>Piranga olivacea</i>	S4B		Rural - Cold Creek and adj. lands	possibly migrant
Song Sparrow	<i>Melospiza melodia</i>	S5B		Urban	Pathway/Open Space
Turkey Vulture	<i>Cathartes aura</i>	S5B		Rural - Cold Creek and adj. lands	
Invertebrates					
Bluet sp	<i>Enallagma sp.</i>			Rural - Cold Creek and adj. lands; Urban	Associated with Cold Creek and ditch near St. Michaels school
Bumblebee	<i>Bombus sp.</i>			Urban	Pathway/Open Space; not <i>B. terricola</i>
Cabbage White	<i>Pieris rapae</i>	SNA		Rural - Cold Creek and adj. lands	
Digger Crayfish	<i>Creaserinus fodiens</i>	S3		Urban	Ditch between Mt. Hope Road and St. Michaels school
Monarch	<i>Danaus plexippus</i>	S2N,S4B	SC	Rural – residential/plantation; Cold Creek and adj. lands	

Common Name	Scientific Name	Provincial Status (S Rank)*	SARO	Section	Notes
Mammals					
Eastern Cottontail	<i>Sylvilagus floridanus</i>	S5		Urban	Pathway/Open Space
Eastern Grey Squirrel	<i>Sciurus carolinensis</i>	S5		Rural - Cold Creek and adj. lands	
Muskrat	<i>Ondatra zibethicus</i>	S5		Rural - Cold Creek and adj. lands; Urban	Scat in Cold Creek; 1 ind. observed dead in ephemeral watercourse
Raccoon	<i>Procyon lotor</i>	S5		Urban	Roadkill remains
Red Squirrel	<i>Tamiasciurus hudsonicus</i>	S5		Rural – residential/plantation; Cold Creek and adj. lands	
Striped Skunk	<i>Mephitis mephitis</i>	S5		Urban	Roadkill remains
Herptiles					
Gray Treefrog	<i>Hyla versicolor</i>	S5		Rural – residential/plantation; Cold Creek and adj. lands	Calling

Table 3 – Fish Community in Cold Creek

Common Name	Scientific Name	Provincial Status (S Rank)*	Thermal Regime**	Collected by RVA in 2020
American Brook Lamprey	<i>Lethenteron appendix</i>	S3	cold	🐟
Blacknose Dace	<i>Rhinichthys atratulus</i>	SNR	cool	🐟
Blacknose Shiner	<i>Notropis heterolepis</i>	S5	cool	-
Bluntnose Minnow	<i>Pimephales notatus</i>	S5	warm	-
Brassy Minnow	<i>Hybognathus hankinsoni</i>	S5	cool	-
Brook Stickleback	<i>Culaea inconstans</i>	S5	cool	-
Brook Trout	<i>Salvelinus fontinalis</i>	S5	cold	-
Brown Bullhead	<i>Ameriurus nebulosus</i>	S5	warm	-
Brown Trout	<i>Salmo trutta</i>	SNA	cold	-
Common Carp	<i>Cyprinus carpio</i>	SNA	warm	-
Common Shiner	<i>Luxilus cornutus</i>	S5	cool	-
Creek Chub	<i>Semotilus atromaculatus</i>	S5	cool	-
Fantail Darter	<i>Etheostoma flabellare</i>	S4	cool	-
Fathead Minnow	<i>Pimephales promelas</i>	S5	warm	-
Iowa Darter	<i>Etheostoma exile</i>	S5	cool	-
Johnny Darter	<i>Etheostoma nigrum</i>	S5	cool	-
Largemouth Bass	<i>Micropterus salmoides</i>	S5	warm	-
Longnose Dace	<i>Rhinichthys cataractae</i>	S5	cool	-
Mottled Sculpin	<i>Cottus bairdii</i>	S5	cool	🐟
Northern Brook Lamprey	<i>Ichthyomyzon fossor</i>	S3	cool	-
Northern Hog Sucker	<i>Hypentelium nigricans</i>	S4	warm	-
Northern Redbelly Dace	<i>Chrosomus eos</i>	S5	cool	-
Pumpkinseed	<i>Leopomis gibbosus</i>	S5	warm	-
Rainbow Darter	<i>Etheostoma caeruleum</i>	S4	cool	-
Rainbow Trout	<i>Oncorhynchus mykiss</i>	SNA	cold	-
River Chub	<i>Nocomis micropogon</i>	S4	cool	-
Rock Bass	<i>Ambloplites rupestris</i>	S5	cool	-
Sea Lamprey	<i>Petromyzon marinus</i>	SNA	cool	-
Slimy Scuplin	<i>Cottus cognatus</i>	S5	cold	-
Spottail Shiner	<i>Notropis hudsonius</i>	S5	cool	-

Common Name	Scientific Name	Provincial Status (S Rank)*	Thermal Regime**	Collected by RVA in 2020
Stonecat	<i>Noturus flavus</i>	S4	warm	-
Tessellated Darter	<i>Etheostoma olmstedii</i>	S4	cool	-
White Sucker	<i>Catostomus commersoni</i>	S5	cool	➔

Source: LIO – ARA (2020)

*S3 – Rare to Uncommon: may be susceptible to large-scale disturbances; S4 – Apparently Secure: uncommon but not rare, some cause for long-term concern due to declines or other factors; S5 – Secure: common, widespread and abundant in the province; SNA – Not Applicable: usually refers to non-native species; SNR – Unranked: conservation status not yet assessed

** Eakins 2020

Appendix E

Significant Wildlife Habitat Assessment

SWH Ecoregion 7E Criterion Schedule

Table 1.1 Seasonal Concentration Areas of Animals.

Wildlife Habitat	Wildlife Species	CANDIDATE SWH		CONFIRMED SWH	Candidate Habitat Present Within the Study Area	Confirmed Habitat Found Within the Study Area
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria		
<p>Waterfowl Stopover and Staging Areas (Terrestrial)</p> <p><u>Rationale:</u> Habitat important to migrating waterfowl.</p>	<p>American Black Duck Northern Pintail Gadwall Blue-winged Teal Green-winged Teal American Wigeon Northern Shoveler Tundra Swan</p>	<p>CUM1 CUT1 - Plus evidence of annual spring flooding from melt water or run-off within these Ecosites. - Fields with seasonal flooding and waste grains in the Long Point, Rondeau, Lk. St. Clair, Grand Bend and Pt. Pelee areas may be important to Tundra Swans.</p>	<p>Fields with sheet water during Spring (mid- March to May).</p> <ul style="list-style-type: none"> Fields flooding during spring melt and run-off provide important invertebrate foraging habitat for migrating waterfowl. Agricultural fields with waste grains are commonly used by waterfowl, these are not considered SWH unless they have spring sheet water available. <p><u>Information Sources</u></p> <ul style="list-style-type: none"> Anecdotal information from the landowner, adjacent landowners or local naturalist clubs may be good information in determining occurrence. Reports and other information available from Conservation Authorities (CAs). Sites documented through waterfowl planning processes (eg. EHJV implementation plan). Field Naturalist Clubs. Ducks Unlimited Canada. Natural Heritage Information Centre (NHIC) Waterfowl Concentration Area 	<p>Studies carried out and verified presence of an annual concentration of any listed species, evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"</p> <ul style="list-style-type: none"> Any mixed species aggregations of 100 or more individuals required. The area of the flooded field ecosite habitat plus a 100-300m radius buffer dependent on local site conditions and adjacent land use is the significant wildlife habitat. Annual use of habitat is documented from information sources or field studies (annual use can be based on studies or determined by past surveys with species numbers and dates). SWH MIST Index #7 provides development effects and mitigation measures. 	<p>No</p> <p>Habitats within and adjacent to the Study Area are unlikely to experience suitable flooding conditions.</p>	<p>No</p> <p>Candidate habitat was not identified.</p>
<p>Waterfowl Stopover and Staging Areas (Aquatic)</p> <p><u>Rationale:</u> Important for local and migrant waterfowl populations during the spring or fall migration or</p>	<p>Northern Shoveler American Wigeon Gadwall Green-winged Teal Blue-winged Teal Hooded Merganser Common Merganser Lesser Scaup Greater Scaup Long-tailed Duck Surf Scoter White-winged Scoter</p>	<p>MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 SWD1 SWD2 SWD3 SWD4 SWD5 SWD6</p>	<ul style="list-style-type: none"> Ponds, marshes, lakes, bays coastal inlets, and watercourses used during migration. Sewage treatment ponds and storm water ponds do not qualify as a SWH, however a reservoir managed as a large wetland or pond/lake does qualify. These habitats have an abundant food supply (mostly aquatic invertebrates and vegetation in shallow water) 	<p>Studies carried out and verified presence of"</p> <ul style="list-style-type: none"> Aggregations of 100 or more of listed species for 7 days, results in >700 waterfowl use days Areas with annual staging of ruddy ducks, canvasbacks, and redheads are SWH. The combined area of the ELC ecosites and a 100m radius area is the SWH. Wetland area and shorelines 	<p>No</p> <p>Wetlands within the Study Area are not large enough to support the required numbers of waterfowl.</p>	<p>No</p> <p>Candidate habitat was not identified.</p>

Wildlife Habitat	Wildlife Species	CANDIDATE SWH		CONFIRMED SWH	Candidate Habitat Present Within the Study Area	Confirmed Habitat Found Within the Study Area
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria		
	Black Scoter Ring-necked duck Common Goldeneye Bufflehead Redhead Ruddy Duck Red-breasted Merganser Brant Canvasback Ruddy Duck		<u>Information Sources</u> <ul style="list-style-type: none"> Environment Canada. Naturalist clubs often are aware of staging/stopover areas. OMNRF Wetland Evaluations indicate presence of locally and regionally significant waterfowl staging. Sites documented through waterfowl planning processes (eg. EHJV implementation plan). Ducks Unlimited projects. Element occurrence. specification by Nature Serve: http://www.natureserve.org Natural Heritage Information Centre (NHIC) Waterfowl Concentration Area 	associated with sites identified within the SWHTG Appendix K are significant wildlife habitat. <ul style="list-style-type: none"> Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects” Annual use of habitat is documented from information sources or field studies (annual use can be based on studies or determined by past surveys with species numbers and dates). SWHMIST Index #7 provides development effects and mitigation measures. 		
Shorebird Migratory Stopover Area <u>Rationale:</u> High quality shorebird stopover habitat is extremely rare and typically has a long history of use.	Greater Yellowlegs Lesser Yellowlegs Marbled Godwit Hudsonian Godwit Black-bellied Plover American Golden-Plover Semipalmated Plover Solitary Sandpiper Spotted Sandpiper Semipalmated Sandpiper Pectoral Sandpiper White-rumped Sandpiper Baird’s Sandpiper Least Sandpiper Purple Sandpiper Stilt Sandpiper Short-billed Dowitcher Red-necked Phalarope Whimbrel Ruddy Turnstone Sanderling Dunlin	BBO1 BBO2 BBS1 BBS2 BBT1 BBT2 SDO1 SDS2 SDT1 MAM1 MAM2 MAM3 MAM4 MAM5	<ul style="list-style-type: none"> Shorelines of lakes, rivers and wetlands, including beach areas, bars and seasonally flooded, muddy and un-vegetated shoreline habitats. Great Lakes coastal shorelines, including groynes and other forms of armour rock lakeshores, are extremely important for migratory shorebirds in May to mid-June and early July to October. Sewage treatment ponds and storm water ponds do not qualify as a SWH. <u>Information Sources</u> <ul style="list-style-type: none"> Western hemisphere shorebird reserve network. Canadian Wildlife Service (CWS) Ontario Shorebird Survey. Bird Studies Canada. Ontario Nature. Local birders and naturalist clubs. 	Studies confirming: <ul style="list-style-type: none"> Presence of 3 or more of listed species and > 1000^l shorebird use days during spring or fall migration period. (shorebird use days are the accumulated number of shorebirds counted per day over the course of the fall or spring migration period) Whimbrel stop briefly (<24hrs) during spring migration, any site with >100^l Whimbrel used for 3 years or more is significant. The area of significant shorebird habitat includes the mapped ELC shoreline ecosites plus a 100m radius area. Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects” SWH MIST Index #8 provides development effects and mitigation measures. 	No Shoreline habitat is present within the Study Area along Cold Creek but not large enough to support the required waterfowl numbers.	No Candidate habitat was not identified.

Wildlife Habitat	Wildlife Species	CANDIDATE SWH		CONFIRMED SWH	Candidate Habitat Present Within the Study Area	Confirmed Habitat Found Within the Study Area
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria		
			<ul style="list-style-type: none"> NHIC Shorebird Migratory Concentration Area 			
Raptor Wintering Area Rationale: Sites used by multiple species, a high number of individuals and used annually are most significant.	Rough-legged Hawk Red-tailed Hawk Northern Harrier American Kestrel Snowy Owl Special Concern: Short-eared Owl Bald Eagle	Hawks/Owls Combination of ELC Community Series; need to have present one Community Series from each land class; Forest: FOD, FOM, FOC. Upland: CUM; CUT; CUS; CUW. Bald Eagle: Forest community Series: FOD, FOM, FOC, SWD, SWM or SWC on shoreline areas adjacent to large rivers or lakes with open water (hunting areas).	<ul style="list-style-type: none"> The habitat provides a combination of fields and woodlands that provide roosting, foraging and resting habitats for wintering raptors. Raptor wintering(hawk/owl) sites need to be > 20 ha with a combination of forest and upland. Least disturbed sites, idle/fallow or lightly grazed field/meadow (>15ha) with adjacent Woodlands. Field area of the habitat is to be wind swept with limited snow depth or accumulation. Eagle sites have open water and large trees and snags available for roosting. Information Sources: <ul style="list-style-type: none"> OMNR Ecologist or Biologist. Naturalist club. Natural Heritage Information Center (NHIC) Raptor Winter Concentration Area. Data from Bird Studies Canada, most notably for Short-eared Owls. Results of Christmas Bird Counts. Reports and other information available from Conservation Authorities. 	Studies confirm the use of these habitats by: <ul style="list-style-type: none"> One or more Short-eared Owls or; One of more Bald Eagles or; At least 10 individuals and two of listed hawk/owl species. To be significant a site must be used regularly (3 in 5 years) for a minimum of 20 days by the above number of birds. The habitat area for an Eagle winter site is the shoreline forest ecosites directly adjacent to the prime hunting area. Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects" SWH MIST Index #10 and #11 provides development effects and mitigation measures. 	Yes Candidate habitat is present within the Study Area.	No Candidate habitat has not been confirmed but should be assumed.
Bat Hibernacula Rationale: Bat hibernacula are rare habitats in all Ontario landscapes.	Big Brown Bat Tri-colored Bat	Bat Hibernacula may be found in these ecosites: CCR1 CCR2 CCA1 CCA2 (Note: buildings are not considered to be SWH)	<ul style="list-style-type: none"> Hibernacula may be found in caves, mine shafts, underground foundations and Karsts. Active mine sites should not be considered as SWH. The locations of bat hibernacula are relatively poorly known. Information Sources	<ul style="list-style-type: none"> All sites with confirmed hibernating bats are SWH. The area includes 200m radius around the entrance of the hibernaculum for most development types. and 1000m for wind farms. Studies are to be conducted during the peak swarming period (Aug. – Sept.). 	No Candidate habitat is not present within the Study Area.	No Candidate habitat was not identified.

Wildlife Habitat	Wildlife Species	CANDIDATE SWH		CONFIRMED SWH	Candidate Habitat Present Within the Study Area	Confirmed Habitat Found Within the Study Area
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria		
			<ul style="list-style-type: none"> • OMNR for possible locations and contact for local experts. • Natural Heritage Information Center (NHIC) Bat Hibernaculum. • Ministry of Northern Development and Mines for location of mine shafts. • Clubs that explore caves (eg. Sierra Club). • University Biology Departments with bat experts. 	<ul style="list-style-type: none"> • Surveys should be conducted following methods outlined in the “Bats and Bat Habitats: Guidelines for Wind Power Projects”. • SWH MIST Index #1 provides development effect and mitigation measures. 		
Bat Maternity Colonies Rationale: Known locations of forested bat maternity colonies is extremely rare in all Ontario landscapes.	Big Brown Bat Silver-haired Bat	Maternity colonies considered SWH are found in forested Ecosites. All ELC Ecosites in ELC Community Series: FOD FOM SWD SWM	<ul style="list-style-type: none"> • Maternity colonies can be found in tree cavities, vegetation and often in buildings (buildings are not considered to be SWH). • Maternity roosts are not found in caves and mines in Ontario • Maternity colonies located in Mature deciduous or mixed forest stands with >10/ha large diameter (>25cm dbh) wildlife trees. • Female Bats prefer wildlife tree (snags) in early stages of decay, class 1-3 or class 1 or 2. • Silver-haired Bats prefer older mixed or deciduous forest and form maternity colonies in tree cavities and small hollows. Older forest areas with at least 21 snags/ha are preferred. <u>Information Sources</u> <ul style="list-style-type: none"> • OMNR for possible locations and contact for local experts. • University Biology Departments with bat experts. 	<ul style="list-style-type: none"> • Maternity Colonies with confirmed use by; <ul style="list-style-type: none"> - >10 Big Brown Bats - >5 Adult Female Silver-haired Bats • The area of the habitat includes the entire woodland or the forest stand ELC Ecosite containing the maternity colonies. • Evaluation methods for maternity colonies should be conducted following methods outlined in the “Bats and Bat Habitats: Guidelines for Wind Power Projects”. • SWH MIST Index #12 provides development effects and mitigation measures. 	<p style="text-align: center;">No</p> Candidate habitat is present in the form of wooded habitats, but qualifying Ecosites are located beyond of the Study Area.	<p style="text-align: center;">No</p> Candidate habitat is not present within the Study Area however, bats, including SAR, may utilize appropriate habitat trees within the Study Area.
Turtle Wintering Areas Rationale: Generally sites are the only known sites in the area. Sites with the	Midland Painted Turtle Special Concern: Northern Map Turtle Snapping Turtle	Snapping and Midland Painted turtles; ELC Community Classes; SW, MA, OA and SA. ELC Community Series; FEO and BOO	<ul style="list-style-type: none"> • For most turtles, wintering areas are in the same general area as their core habitat. • Water has to be deep enough not to freeze and have soft mud substrates. • Over-wintering sites are permanent water bodies, large 	<ul style="list-style-type: none"> • Presence of 5 over-wintering Midland Painted Turtles is significant • One or more Northern Map Turtle or Snapping Turtle over-wintering within a wetland is significant¹. • The mapped ELC ecosite area 	<p style="text-align: center;">Yes</p> Candidate habitat is present within Cold Creek. Though no turtles were observed, they are expected to be	<p style="text-align: center;">No</p> Habitat has not been confirmed but should be assumed to be present within Cold Creek.

Wildlife Habitat	Wildlife Species	CANDIDATE SWH		CONFIRMED SWH	Candidate Habitat Present Within the Study Area	Confirmed Habitat Found Within the Study Area
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria		
highest number of individuals are most significant.		Northern Map; Open Water areas such as deeper rivers or streams and lakes with current can also be used as over-wintering	<p>wetlands, and bogs or fens with adequate Dissolved Oxygen.</p> <ul style="list-style-type: none"> Man-made ponds such as sewage lagoons or storm water ponds should not be considered SWH. EIS studies carried out by Conservation Authorities. Field Naturalists Clubs. OMNRF Ecologist or Biologist. Natural Heritage Information Centre (NHIC). 	<p>with the over wintering turtles is the SWH. If the hibernation site is within a stream or river, the deep-water pool where the turtles are over-wintering is the SWH.</p> <ul style="list-style-type: none"> Over wintering areas may be identified by searching for congregations (Basking Areas) of turtles on warm, sunny days during the fall (Sept. – Oct.) or spring (Mar. – May). Congregation of turtles is more common where wintering areas are limited and therefore significant. SWH MIST Index #28 provides development effects and mitigation measures for turtle wintering habitat. 	preset within the larger aquatic system.	
<p>Reptile Hibernaculum</p> <p>Rationale: Generally sites are the only known sites in the area. Sites with the highest number of individuals are most significant.</p>	<p>Snakes: Eastern Gartersnake Northern Watersnake Northern Red-bellied Snake Northern Brownsnake Smooth Green Snake Northern Ring-necked Snake Milksnake</p> <p>Special Concern: Eastern Ribbonsnake</p>	<p>For all snakes, habitat may be found in any ecosite other than very wet ones. Talus, Rock Barren, Crevice and Cave, and Alvar sites may be directly related to these habitats. Observations of congregations of snakes on sunny warm days in the spring or fall is a good indicator.</p>	<ul style="list-style-type: none"> For snakes, hibernation takes place in sites located below frost lines in burrows, rock crevices and other natural or naturalized locations. The existence of features that go below frost line; such as rock piles or slopes, old stone fences, and abandoned crumbling foundations assist in identifying candidate SWH. Areas of broken and fissured rock are particularly valuable since they provide access to subterranean sites below the frost line. Wetlands can also be important over-wintering habitat in conifer or shrub swamps and swales, poor fens, or depressions in bedrock terrain with sparse trees or shrubs with sphagnum moss or sedge hummock ground cover. <p>Information Sources</p>	<p>Studies confirming:</p> <ul style="list-style-type: none"> Presence of snake hibernacula used by a minimum of five individuals of a snake sp. <u>or</u>; individuals of two or more snake spp. Congregations of a minimum of five individuals of a snake sp. <u>or</u>; individuals of two or more snake spp. near potential hibernacula (eg. foundation or rocky slope) on sunny warm days in Spring (Apr/May) and Fall (Sept/Oct)¹. <u>Note:</u> If there are Special Concern Species present, then site is SWH. <u>Note:</u> Sites for hibernation possess specific habitat parameters (e.g. temperature, humidity, etc.) and consequently are used annually, often by many of the same individuals of a local population [i.e. strong hibernation site fidelity.]. Other 	<p>Yes</p> <p>Candidate habitat was identified in the form of a mammal burrow within the roadside near Cold Creek. No snakes were observed during any site visits.</p>	<p>No</p> <p>Candidate habitat was identified however no applicable wildlife species were observed.</p>

Wildlife Habitat	Wildlife Species	CANDIDATE SWH		CONFIRMED SWH	Candidate Habitat Present Within the Study Area	Confirmed Habitat Found Within the Study Area
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria		
			<ul style="list-style-type: none"> In spring, local residents or landowners may have observed the emergence of snakes on their property (e.g. old dug wells). Reports and other information available from Conservation Authorities. Field Naturalist Clubs. University herpetologists. Natural Heritage Information Center (NHIC). 	<p>critical life processes (e.g. mating) often take place in close proximity to hibernacula. The feature in which the hibernacula is located plus a 30 m buffer is the SWH.</p> <ul style="list-style-type: none"> SWH MIST Index #13 provides development effects and mitigation measures for snake hibernacula. 		
<p>Colonially - Nesting Bird Breeding Habitat (Bank and Cliff)</p> <p>Rationale: Historical use and number of nests in a colony make this habitat significant. An identified colony can be very important to local populations. All swallow population are declining in Ontario.</p>	Cliff Swallow Northern Rough-winged Swallow (this species is not colonial but can be found in Cliff Swallow colonies).	<p>Eroding banks, sandy hills, borrow pits, steep slopes, and sand piles, cliff faces, bridge abutments, silos, barns (Cliff Swallows).</p> <p>Habitat found in the following ecosites: CUM1 CUT1 CUS1 BLO1 BLS1 BLT1 CLO1 CLS1 CLT1</p>	<ul style="list-style-type: none"> Any site or areas with exposed soil banks, undisturbed or naturally eroding that is not a licensed/permitted aggregate area. Does not include man-made structures (bridges or buildings) or recently (2 years) disturbed soil areas, such as berms, embankments, soil or aggregate stockpiles. Does not include a licensed/permitted Mineral Aggregate Operation. 	<p>Studies confirming:</p> <ul style="list-style-type: none"> Presence of 1 or more nesting sites with 8 or more cliff swallow pairs and/or rough-winged swallow pairs during the breeding season. A colony identified as SWH will include a 50m radius habitat area from the peripheral nests. Field surveys to observe and count swallow nests are to be completed during the breeding season (May-June). Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects" SWH MIST Index #4 provides development effects and mitigation measures. 	Yes Candidate habitat in the form of the bridge over Cold Creek was identified.	No No individuals or nests of wildlife species were present in the Study Area.
<p>Colonially - Nesting Bird Breeding Habitat (Tree/Shrubs)</p> <p>Rationale: Large colonies are important to local bird population, typically sites are only known.</p>	Great Blue Heron Black-crowned Night-Heron Great Egret Green Heron	<p>SWM2 SWM3 SWM5 SWM6 SWD1 SWD2 SWD3 SWD4 SWD5 SWD6 SWD7 FET1</p>	<ul style="list-style-type: none"> Nests in live or dead standing trees in wetlands, lakes, islands, and peninsulas. Shrubs and occasionally emergent vegetation may also be used. Most nests in trees are 11 to 15 m from ground, near the top of the tree. <p><u>Information Sources</u></p> <ul style="list-style-type: none"> Ontario Breeding Bird Atlas, colonial nest records. Ontario Heronry Inventory 1991 available from Bird Studies Canada or NHIC 	<p>Studies confirming:</p> <ul style="list-style-type: none"> Presence of 2 or more active nests of Great Blue Heron or other listed species. The habitat extends from the edge of the colony and a minimum 300 m radius or extend of the Forest Ecosite containing the colony or any island <15.0ha with a colony is the SWH. Confirmation of active heronries are to be achieved through site visits conducted during the nesting season (April to August) or by evidence such as the 	No Candidate Ecosites were identified within the Study Area but habitat criteria was not met.	No No candidate habitat was identified within the Study Area.

Wildlife Habitat	Wildlife Species	CANDIDATE SWH		CONFIRMED SWH	Candidate Habitat Present Within the Study Area	Confirmed Habitat Found Within the Study Area
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria		
			(OMNRF). <ul style="list-style-type: none"> Natural Heritage Information Center (NHIC) Mixed Wader Nesting Colony. Aerial photographs can help identify large heronries. Reports and other information available from Conservation Authorities. MNRF District Offices. Local naturalist clubs. 	<ul style="list-style-type: none"> presence of fresh guano, dead young and/or eggshells. SWH MIST Index #5 provides development effects and mitigation measures. 		
Colonially - Nesting Bird Breeding Habitat (Ground) Rationale: Colonies are important to local bird population, typically sites are only known colony in area and are used annually.	Herring Gull Great Black-backed Gull Little Gull Ring-billed Gull Common Tern Caspian Tern Brewer's Blackbird	Any rocky island or peninsula (natural or artificial) within a lake or large river (two-lined on a 1:50,000 NTS map). Close proximity to watercourses in open fields or pastures with scattered trees or shrubs (Brewer's Blackbird). MAM1 – 6; MAS1 – 3; CUM CUT CUS	<ul style="list-style-type: none"> Nesting colonies of gulls and terns are on islands or peninsulas associated with open water or in marshy areas. Brewers Blackbird colonies are found loosely on the ground in or in low bushes in close proximity to streams and irrigation ditches within farmlands. <p><u>Information Sources</u></p> <ul style="list-style-type: none"> Brewers Blackbird colonies Ontario Breeding Bird Atlas, rare/colonial species records. Canadian Wildlife Service. Reports and other information available from Conservation Authorities. Natural Heritage Information Center (NHIC) Colonial Waterbird Nesting Area. MNRF District Offices. Field Naturalist Clubs. 	Studies confirming: <ul style="list-style-type: none"> Presence of > 25 active nests for Herring Gulls or Ring-billed Gulls, >5 active nests for Common Tern or >2 active nests for Caspian Tern. Presence of 5 or more pairs for Brewer's Blackbird. Any active nesting colony of one or more Little Gull, and Great Black-backed Gull is significant. The edge of the colony and a minimum 150m radius area of habitat, or the extent of the ELC ecosites containing the colony or any island <3.0ha with a colony is the SWH. Studies would be done during May/June when actively nesting. Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects" SWH MIST Index #6 provides development effects and mitigation measures. 	<p style="text-align: center;">No</p> Candidate habitat was not identified within the Study Area.	<p style="text-align: center;">No</p> No candidate habitat was identified within the Study Area.

Wildlife Habitat	Wildlife Species	CANDIDATE SWH		CONFIRMED SWH	Candidate Habitat Present Within the Study Area	Confirmed Habitat Found Within the Study Area
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria		
Migratory Butterfly Stopover Areas Rationale: Butterfly stopover areas are extremely rare habitats and are biologically important for butterfly species that migrate south for the winter.	Painted Lady Red Admiral <u>Special Concern</u> Monarch	Combination of ELC Community Series; need to have present one Community Series from each landclass Field: CUM CUT CUS Forest: FOC FOD FOM CUP Anecdotally, a candidate sight for butterfly stopover will have a history of butterflies being observed.	<ul style="list-style-type: none"> A butterfly stopover area will be a minimum of 10 ha in size with a combination of field and forest habitat present, and will be located within 5 km of Lake Erie and Ontario. The habitat should not be disturbed, fields/meadows with an abundance of preferred nectar plants and woodland edge providing shelter are requirements for this habitat. Stopover areas usually provide protection from the elements and are often spits of land or areas with the shortest distance to cross the Great Lakes. <u>Information Sources</u> <ul style="list-style-type: none"> MNR district Offices. Natural Heritage Information Center (NHIC). Agriculture Canada in Ottawa may have list of butterfly experts. Field Naturalist Clubs. Toronto Entomologists Association. Conservation Authorities 	Studies confirm: <ul style="list-style-type: none"> The presence of Monarch Use Days (MUD) during fall migration (Aug/Oct). MUD is based on the number of days a site is used by Monarchs, multiplied by the number of individuals using the site. Numbers of butterflies can range from 100-500/day significant variation can occur between years and multiple years of sampling should occur. Observational studies are to be completed and need to be done frequently during the migration period to estimate MUD. MUD of >5000 or >3000 with the presence of Painted Ladies or Red Admiral's is to be considered significant. SWH MIST Index #16 provides development effects and mitigation measures. 	No Candidate Ecosites are present within Study Area, however, it is > 5km from Lake Ontario or Erie.	No No candidate habitat was identified within the Study Area.

Wildlife Habitat	Wildlife Species	CANDIDATE SWH		CONFIRMED SWH	Candidate Habitat Present Within the Study Area	Confirmed Habitat Found Within the Study Area
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria		
<p>Landbird Migratory Stopover Areas</p> <p>Rationale: Sites with a high diversity of species as well as high numbers are most significant.</p>	<p>All migratory songbirds.</p> <p>Canadian Wildlife Service Ontario website: http://www.ec.gc.ca/natu/re/default.asp?lang=En&n=421B7A9D-1</p> <p>All migrant raptors species:</p> <p>Ontario Ministry of Natural Resources: Fish and Wildlife Conservation Act, 1997. Schedule 7: Specially Protected Birds.</p>	<p>All Ecosites associated with these ELC Community Series; FOC FOM FOD SWC SWM SWD</p>	<ul style="list-style-type: none"> Woodlots need to be >5 ha in size and within 5 km Lake Ontario and Erie. If woodlands are rare in an area of shoreline, woodland fragments 2-5ha can be considered for this habitat. If multiple woodlands are located along the shoreline those Woodlands <2km from Lake Erie and Lake Ontario are more significant. Sites have a variety of habitats; forest, grassland and wetland complexes. The largest sites are more significant. Woodlots and forest fragments are important habitats to migrating birds, these features located along the shore and located within 5km of Lake Erie and Lake Ontario are Candidate SWH. 	<p>Studies confirm:</p> <ul style="list-style-type: none"> Use of the woodlot by >200 birds/day and with >35 spp. with at least 10 bird spp. recorded on at least 5 different survey dates. This abundance and diversity of migrant bird species is considered above average and significant. Studies should be completed during spring (March to May) and fall (Aug to Oct) migration using standardized assessment techniques. Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects". SWH MIST Index #9 provides development effects and mitigation measures. 	<p>No</p> <p>Candidate Ecosites are present within the Study Area, however, it is > 5km from Lake Ontario or Erie.</p>	<p>No</p> <p>No candidate habitat was identified within the Study Area.</p>
<p>Deer Winter Congregation Areas</p> <p>Rationale: Deer movement during winter in the southern areas of Ecoregion 7E are not constrained by snow depth, however deer will annually congregate in large numbers in suitable woodlands to reduce or avoid the impacts of winter conditions.</p>	<p>White-tailed Deer</p>	<p>All Forested Ecosites with these ELC Community Series; FOC FOM FOD SWC SWM SWD Conifer plantations much smaller than 50 ha may also be used.</p>	<ul style="list-style-type: none"> Woodlots >100 ha in size or if large woodlots are rare in a planning area woodlots>50ha. Deer movement during winter in the southern areas Ecoregion 7E are not constrained by snow depth, however deer will annually congregate in large numbers in suitable woodlands. Large woodlots > 100ha and up to 1500 ha are known to be used annually by densities of deer that range from 0.1-1.5 deer/ha. Woodlots with high densities of deer due to artificial feeding are not significant. <p><u>Information Sources</u></p> <ul style="list-style-type: none"> MNRF District Offices. LIO/NRVIS. 	<p>Studies confirm:</p> <ul style="list-style-type: none"> Deer management is an MNRF responsibility, deer winter congregation areas considered significant will be mapped by MNRF. Use of the woodlot by white-tailed deer will be determined by MNRF, all woodlots exceeding the area criteria are significant, unless determined not to be significant by MNRF Studies should be completed during winter (Jan/Feb) when >20cm of snow is on the ground using aerial survey techniques, ground or road surveys, or a pellet count deer density survey. SWH MIST Index #2 provides development effects and mitigation measures. 	<p>Yes</p> <p>The treed areas surrounding Cold Creek, extending north and south of the Study Area are candidate habitat.</p>	<p>No</p> <p>Candidate habitat was not confirmed within the Study Area but should be assumed.</p>

SWH Ecoregion 7E Criterion Schedule

Table 1.2.1 Rare Vegetation Communities.

Rare Vegetation Community	CANDIDATE SWH			CONFIRMED SWH	Candidate Habitat within the Study Area	Confirmed Habitat within the Study Area
	ELC Ecosite Codes	Habitat Criteria and Information Sources	Detailed Information and Sources	Defining Criteria		
<p>Cliffs and Talus Slopes</p> <p>Rationale: Cliffs and Talus Slopes are extremely rare habitats in Ontario.</p>	<p>Any ELC Ecosite within Community Series:</p> <p>TAO CLO TAS CLS TAT CLT</p>	<p>A Cliff is vertical to near vertical bedrock >3m in height.</p> <p>A Talus Slope is rock rubble at the base of a cliff made up of coarse rocky debris.</p>	<p>Most cliff and talus slopes occur along the Niagara Escarpment.</p> <p><u>Information Sources</u></p> <ul style="list-style-type: none"> The Niagara Escarpment Commission has detailed information on location of these habitats. OMNRF Districts. Natural Heritage Information Centre (NHIC) has location information available on their website. Field Naturalist Clubs. Conservation Authorities. 	<ul style="list-style-type: none"> Confirm any ELC Vegetation Type for Cliffs or Talus Slopes. SWH MIST Index #21 provides development effects and mitigation measures. 	<p>No</p> <p>Candidate habitat is not present within the Study Area.</p>	<p>No</p> <p>Candidate habitat was not identified.</p>
<p>Sand Barren</p> <p>Rationale: Sand barrens are rare in Ontario and support rare species. Most Sand Barrens have been lost due to cottage development and forestry</p>	<p>ELC Ecosites: SBO1 SBS1 SBT1</p> <p>Vegetation cover varies from patchy and barren to continuous meadow (SBO1), thicket-like (SBS1), or more closed and treed (SBT1). Tree cover always ≤ 60%.</p>	<p>Sand Barrens typically are exposed sand, generally sparsely vegetated and caused by lack of moisture, periodic fires and erosion. Usually located within other types of natural habitat such as forest or savannah. Vegetation can vary from patchy and barren to tree covered but less than 60%.</p>	<p>A sand barren area >0.5ha in size.</p> <p><u>Information Sources</u></p> <ul style="list-style-type: none"> OMNRF Districts. Natural Heritage Information Center (NHIC) has location information available on their website. Field Naturalist Clubs. Conservation Authorities. 	<ul style="list-style-type: none"> Confirm any ELC Vegetation Type for Sand Barrens. Site must not be dominated by exotic or introduced species (<50% vegetative cover exotics). SWH MIST Index #20 provides development effects and mitigation measures. 	<p>No</p> <p>Candidate habitat is not present within the Study Area.</p>	<p>No</p> <p>Candidate habitat was not identified.</p>

Rare Vegetation Community	CANDIDATE SWH			CONFIRMED SWH	Candidate Habitat within the Study Area	Confirmed Habitat within the Study Area
	ELC Ecosite Codes	Habitat Criteria and Information Sources	Detailed Information and Sources	Defining Criteria		
<p>Alvar</p> <p>Rationale: Alvars are extremely rare habitats in Ecoregion 7E.</p>	<p>ALO1 ALS1 ALT1 FOC1 CUW2</p> <p>Five Alvar Indicator Species: 1)<i>Carex crawei</i> 2)<i>Panicum philadelphicum</i> 3)<i>Elocharis compressa</i> 4)<i>Scutellaria parvula</i> 5)<i>Trichostema brachiatum</i></p> <p>These indicator species are very specific to Alvars within Ecoregion 7E.</p>	<p>An alvar is typically a level, mostly unfractured calcareous bedrock feature with a mosaic of rock pavements and bedrock overlain by a thin veneer of soil. The hydrology of alvars is complex, with alternating periods of inundation and drought. Vegetation cover varies from sparse lichen-moss associations to grasslands and shrublands and comprising a number of characteristic or indicator plant. Undisturbed alvars can be phyto- and zoogeographically diverse, supporting many uncommon or are relict plant and animal species. Vegetation cover varies from patchy to barren with a less than 60% tree cover.</p>	<p>An Alvar site > 0.5 ha in size Alvar is particularly rare in Ecoregion 7E where the only known sites are found in the western islands of Lake Erie.</p> <p><u>Information Sources</u></p> <ul style="list-style-type: none"> Alvars of Ontario (2000), Federation of Ontario Naturalists. Ontario Nature – Conserving Great Lakes Alvars. Natural Heritage Information Center (NHIC) has location information available on their website OMNRF Staff. Field Naturalist Clubs. Conservation Authorities. 	<p>Field studies identify four of the five Alvar Indicator Species at a Candidate Alvar site is Significant.</p> <ul style="list-style-type: none"> Site must not be dominated by exotic or introduced species (<50% vegetative cover exotics). The alvar must be in excellent condition and fit in with surrounding landscape with few conflicting land uses. SWH MIST Index #17 provides development effects and mitigation measures. 	<p>No</p> <p>Candidate habitat is not present within the Study Area.</p>	<p>No</p> <p>Candidate habitat was not identified.</p>
<p>Old Growth Forest</p> <p>Rationale: Due to historic logging practices and land clearance for agriculture, old growth forest is rare in Ecoregion 7E.</p>	<p>Forest Community Series: FOD FOC FOM SWD SWC SWM</p>	<p>Old-growth forests are characterized by heavy mortality or turnover of over-storey trees resulting in mosaic of gaps that encourage development of multi-layered canopy and an abundance of snags and downed woody debris.</p>	<p>Woodland area is >0.5 ha.</p> <p><u>Information Sources</u></p> <ul style="list-style-type: none"> OMNRF Forest Resource Inventory mapping. OMNRF Districts. Field Naturalist Clubs. Conservation Authorities. Sustainable Forestry Licence (SFL) companies. will possibly know locations through field operations. Municipal forestry departments. 	<p>Field Studies will determine:</p> <ul style="list-style-type: none"> If dominant trees species of the ecosite are >140 years old, then area containing these trees is Significant Wildlife Habitat . The forested area containing the old growth characteristics will have experienced no recognizable forestry activities (cut steps will not be present). The area of forest ecosites combined or an eco-element within an ecosite that contain the old growth characteristics is the SWH. Determine ELC vegetation types For the forest area containing the old growth characteristics. SWH MIST Index #23 provides development effects and mitigation measures. 	<p>Yes</p> <p>Candidate habitat is present within the Study Area in the FOD and FOC communities</p>	<p>No</p> <p>Candidate habitat does not exhibit characteristics of old growth.</p>

Rare Vegetation Community	CANDIDATE SWH			CONFIRMED SWH	Candidate Habitat within the Study Area	Confirmed Habitat within the Study Area
	ELC Ecosite Codes	Habitat Criteria and Information Sources	Detailed Information and Sources	Defining Criteria		
<p>Savannah</p> <p>Rationale: Savannahs are extremely rare habitats in Ontario.</p>	TPS1 TPS2 TPW1 TPW2 CUS2	<p>A Savannah is a tallgrass prairie habitat that has tree cover between 25 – 60%.</p> <p>In ecoregion 7E, known Tallgrass Prairie and savannah remnants are scattered between Lake Huron and Lake Erie, near Lake St. Clair, north of and along the Lake Erie shoreline, in Brantford and in the Toronto area (north of Lake Ontario).</p>	<p>No minimum size to site. Site must be restored or a natural site. Remnant sites such as railway right of ways are not considered to be SWH.</p> <p><u>Information Sources</u></p> <ul style="list-style-type: none"> Natural Heritage Information Center (NHIC) has location data available on their website. OMNRF Districts. Field Naturalists Clubs. Conservation Authorities. 	<p>Field studies confirm one or more of the Savannah indicator species listed in Appendix N should be present. Note: Savannah plant spp. list from Ecoregion 7E should be used</p> <ul style="list-style-type: none"> Area of the ELC Ecosite is the SWH. Site must not be dominated by exotic or introduced species (<50% vegetative cover exotics). SWH MISTcxlx Index #18 provides development effects and mitigation measures. 	<p>No</p> <p>Candidate habitat is not present within the Study Area.</p>	<p>No</p> <p>Candidate habitat was not identified.</p>
<p>Tallgrass Prairie</p> <p>Rationale: Tallgrass Prairies are extremely rare habitats in Ontario.</p>	TPO1 TPO2	<p>A Tallgrass Prairie has ground cover dominated by prairie grasses. An open Tallgrass Prairie habitat has < 25% tree cover.</p> <p>In ecoregion 7E, known Tallgrass Prairie and savannah remnants are scattered between Lake Huron and Lake Erie, near Lake St. Clair, north of and along the Lake Erie shoreline, in Brantford and in the Toronto area (north of Lake Ontario).</p>	<p>No minimum size to site. Site must be restored or a natural site. Remnant sites such as railway right of ways are not considered to be SWH.</p> <p><u>Information Sources</u></p> <ul style="list-style-type: none"> OMNRF Districts. Natural Heritage Information Center (NHIC) has location data available on their website. Field Naturalists Clubs. Conservation Authorities. 	<p>Field studies confirm one or more of the Prairie indicator species listed in Appendix N should be present. Note: Prairie plant spp. list from Ecoregion 7E should be used.</p> <ul style="list-style-type: none"> Area of the ELC Ecosite is the SWH Site must not be dominated by exotic or introduced species (<50% vegetative cover exotics). SWH MIST Index #19 provides development effects and mitigation measures. 	<p>No</p> <p>Candidate habitat is not present within the Study Area.</p>	<p>No</p> <p>Candidate habitat was not identified.</p>

SWH Ecoregion 7E Criterion Schedule

Table 1.2.2 Specialized Habitats For Wildlife considered SWH.

Specialized Wildlife Habitat	Wildlife Species	CANDIDATE SWH			Candidate Habitat within the Study Area	Confirmed Habitat within the Study Area
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria		
<p>Waterfowl Nesting Area</p> <p>Rationale: Important to local waterfowl populations, sites with greatest number of species and highest number of individuals are significant.</p>	<p>American Black Duck Northern Pintail Northern Shoveler Gadwall Blue-winged Teal Green-winged Teal Wood Duck Hooded Merganser Mallard</p>	<p>All upland habitats located adjacent to these wetland ELC Ecosites are Candidate SWH:</p> <p>MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 SWT1 SWT2 SWD1 SWD2 SWD3 SWD4</p> <p>Note: includes adjacency to Provincially Significant Wetlands</p>	<p>A waterfowl nesting area extends 120 m ^{or less} from a wetland (> 0.5 ha) or a wetland (>0.5 ha) with small wetlands (<0.5ha) within 120m or a cluster of 3 or more small (<0.5 ha) wetlands within 120 m of each individual wetland where waterfowl nesting is known to occur.</p> <ul style="list-style-type: none"> Upland areas should be at least 120m wide so that predators such as racoons, skunks, and foxes have difficulty finding nests. Wood Ducks and Hooded Mergansers utilize large diameter trees (>40cm dbh) in woodlands for cavity nest sites. <p><u>Information Sources</u></p> <ul style="list-style-type: none"> Ducks Unlimited staff may know the locations of particularly productive nesting sites. OMNRF Wetland Evaluations for indication of significant waterfowl nesting habitat. Reports and other information available from Conservation Authorities. 	<p>Studies confirmed:</p> <ul style="list-style-type: none"> Presence of 3 or more nesting pairs for listed species excluding Mallards, or; Presence of 10 or more nesting pairs for listed species including Mallards. Any active nesting site of an American Black Duck is considered significant. Nesting studies should be completed during the spring breeding season (April - June). Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects". A field study confirming waterfowl nesting habitat will determine the boundary of the waterfowl nesting habitat for the SWH, this may be greater or less than 120 m from the wetland and will provide enough habitat for waterfowl to successfully nest. SWH MIST Index #25 provides development effects and mitigation measures. 	<p>Yes</p> <p>Candidate Ecosites are present within the Study Area but habitat criteria (size) was not met.</p>	<p>No</p> <p>Candidate habitat does not meet size criteria to support required number of wildlife species.</p>
<p>Bald Eagle and Osprey Nesting, Foraging and Perching Habitat</p> <p>Rationale: Nest sites are fairly uncommon in Ecoregion 7E and are used annually by these species. Many suitable nesting locations</p>	<p>Osprey Special Concern Bald Eagle</p>	<p>ELC Forest Community Series: FOD, FOM, FOC, SWD, SWM and SWC directly adjacent to riparian areas – rivers, lakes, ponds and wetlands,</p>	<p>Nests are associated with lakes, ponds, rivers or wetlands along forested shorelines, islands, or on structures over water.</p> <ul style="list-style-type: none"> Osprey nests are usually at the top a tree whereas Bald Eagle nests are typically in super canopy trees in a notch within the tree's canopy. Nests located on man-made 	<p>Studies confirm the use of these nests by:</p> <ul style="list-style-type: none"> One or more active Osprey or Bald Eagle nests in an area. Some species have more than one nest in a given area and priority is given to the primary nest with alternate nests included within the area of the SWH. 	<p>Yes</p> <p>Candidate habitat is present within the Study Area.</p>	<p>No</p> <p>Candidate habitat was not confirmed. No nests or individuals were observed.</p>

Specialized Wildlife Habitat	Wildlife Species	CANDIDATE SWH			Candidate Habitat within the Study Area	Confirmed Habitat within the Study Area
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria		
may be lost due to increasing shoreline development pressures and scarcity of habitat.			<p>objects are not to be included as SWH (e.g. telephone poles and constructed nesting platforms).</p> <p><u>Information Sources</u></p> <ul style="list-style-type: none"> Natural Heritage Information Center (NHIC) compiles all known nesting sites for Bald Eagles in Ontario. MNRF values information (LIO/NRVIS) will list known nesting locations, Note: data from NRVIS is provided as a point and does not represent all the habitat. Nature Counts, Ontario Nest Records Scheme data. OMNRF Districts. Check the Ontario Breeding Bird Atlas or Rare Breeding Birds in Ontario for species documented. Reports and other information available from Conservation Authorities. Field naturalist Clubs. 	<ul style="list-style-type: none"> For an Osprey, the active nest and a 300 m radius around the nest or the contiguous woodland stand is the SWH, maintaining undisturbed shorelines with large trees within this area is important. For a Bald Eagle the active nest and a 400-800 m radius around the nest is the SWH. Area of the habitat from 400-800m is dependent on site lines from the nest to the development and inclusion of perching and foraging habitat. To be significant a site must be used annually. When found inactive, the site must be known to be inactive for ≥ 3 years or suspected of not being used for >5 years before being considered not significant. Observational studies to determine nest site use, perching sites and foraging areas need to be done from mid March to mid August. Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects" SWH MIST Index #26 provides development effects and mitigation measures. 		

Specialized Wildlife Habitat	Wildlife Species	CANDIDATE SWH			Candidate Habitat within the Study Area	Confirmed Habitat within the Study Area
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria		
<p>Woodland Raptor Nesting Habitat</p> <p>Rationale: Nests sites for these species are rarely identified; these area sensitive habitats are often used annually by these species.</p>	<p>Northern Goshawk Cooper's Hawk Sharp-shinned Hawk Red-shouldered Hawk Barred Owl Broad-winged Hawk</p>	<p>May be found in all forested ELC Ecosites. May also be found in SWC, SWM, SWD and CUP3.</p>	<p>All natural or conifer plantation woodland/forest stands combined >30ha or with >4 ha of interior habitat. Interior habitat determined with a 200m buffer.</p> <ul style="list-style-type: none"> Stick nests found in a variety of intermediate-aged to mature conifer, deciduous or mixed forests within tops or crotches of trees. Species such as Coopers hawk nest along forest edges sometimes on peninsulas or small off-shore islands. In disturbed sites, nests may be used again, or a new nest will be in close proximity to old nest. <p><u>Information Sources</u></p> <ul style="list-style-type: none"> OMNRF Districts. Check the Ontario Breeding Bird Atlas or Rare Breeding Birds in Ontario for species documented. Check data from Bird Studies Canada. Reports and other information available from Conservation Authorities. 	<p>Studies confirm:</p> <ul style="list-style-type: none"> Presence of 1 or more active nests from species list is considered significant. Red-shouldered Hawk and Northern Goshawk – A 400m radius around the nest or 28 ha habitat area would be applied where optimal habitat is irregularly shaped around the nest). Barred Owl – A 200m radius around the nest is the SWH. Broad-winged Hawk and Coopers Hawk, – A 100m radius around the nest is the SWH. Sharp-Shinned Hawk – A 50m radius around the nest is the SWH. Conduct field investigations from mid-March to end of May. The use of call broadcasts can help in locating territorial (courting/nesting) raptors and facilitate the discovery of nests by narrowing down the search area. SWH MIST Index #27 provides development effects and mitigation measures. 	<p>No</p> <p>Candidate habitat is present within the eastern section of the Study Area.</p>	<p>No</p> <p>Candidate habitat was not confirmed within the Study Area.</p>

Specialized Wildlife Habitat	Wildlife Species	CANDIDATE SWH			Candidate Habitat within the Study Area	Confirmed Habitat within the Study Area
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria		
<p>Turtle Nesting Areas</p> <p>Rationale: These habitats are rare and when identified will often be the only breeding site for local populations of turtles.</p>	<p>Midland Painted Turtle</p> <p><u>Special Concern Species</u> Northern Map Turtle Snapping Turtle</p>	<p>Exposed mineral soil (sand or gravel) areas adjacent (<100m) cxlviii or within the following ELC Ecosites: MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 BOO1 FEO1</p>	<ul style="list-style-type: none"> • Best nesting habitat for turtles are close to water and away from roads and sites less prone to loss of eggs by predation from skunks, raccoons or other animals. • For an area to function as a turtle-nesting area, it must provide sand and gravel that turtles are able to dig in and are located in open, sunny areas. Nesting areas on the sides of municipal or provincial road embankments and shoulders are not SWH. • Sand and gravel beaches adjacent to undisturbed shallow weedy areas of marshes, lakes, and rivers are most frequently used. <p><u>Information Sources</u></p> <ul style="list-style-type: none"> • Use Ontario Soil Survey reports and maps to help find suitable substrate for nesting turtles (well-drained sands and fine gravels). • Check the Ontario Herpetofaunal Atlas records (or other similar atlases) for uncommon turtles; location information may help to find potential nesting habitat for them. • Natural Heritage Information Center (NHIC). • Field Naturalist Clubs. 	<p>Studies confirm:</p> <ul style="list-style-type: none"> • Presence of 5 or more nesting Midland Painted Turtles. • One or more Northern Map Turtle or Snapping Turtle nesting is a SWH. • The area or collection of sites within an area of exposed mineral soils where the turtles nest, plus a radius of 30-100m around the nesting area dependent on slope, riparian vegetation and adjacent land use is the SWH. • Travel routes from wetland to nesting area are to be considered within the SWH as a part of the 30-100m area of habitat. • Field investigations should be conducted in prime nesting season typically late spring to early summer. Observational studies observing the turtles nesting is a recommended method. • SWH MIST Index #28 provides development effects and mitigation measures for turtle nesting habitat. 	<p>No</p> <p>Candidate habitat is present within the Study Area near Cold Creek.</p>	<p>No</p> <p>Candidate habitat was not confirmed. Most turtle nests in Ontario are scavenged and egg shells persist for months in the environment. None were observed.</p>

Specialized Wildlife Habitat	Wildlife Species	CANDIDATE SWH			Candidate Habitat within the Study Area	Confirmed Habitat within the Study Area
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria		
<p>Seeps and Springs</p> <p>Rationale: Seeps/Springs are typical of headwater areas and are often at the source of coldwater streams.</p>	<p>Wild Turkey Ruffed Grouse Spruce Grouse White-tailed Deer Salamander spp.</p>	<p>Seeps/Springs are areas where ground water comes to the surface. Often they are found within headwater areas within forested habitats. Any forested Ecosite within the headwater areas of a stream could have seeps/springs.</p>	<p>Any forested area (with <25% meadow/field/pasture) within the headwaters of a stream or river system.</p> <ul style="list-style-type: none"> Seeps and springs are important feeding and drinking areas especially in the winter will typically support a variety of plant and animal species. <p><u>Information Sources</u></p> <ul style="list-style-type: none"> Topographical Map. Thermography. Hydrological surveys conducted by Conservation Authorities and MOE. Field Naturalists Clubs and landowners. Municipalities and Conservation Authorities may have drainage maps and headwater areas mapped. 	<p>Field Studies confirm:</p> <ul style="list-style-type: none"> Presence of a site with 2 or more seeps/springs should be considered SWH. The area of a ELC forest ecosite or ecoelement within ecosite containing the seeps/springs is the SWH. The protection of the recharge area considering the slope, vegetation, height of trees and groundwater condition need to be considered in delineation the habitat. SWH MIST Index #30 provides development effects and mitigation measures. 	<p>No</p> <p>Candidate habitat is not present within the Study Areas. Groundwater was noted associated with wetland habitats rather than forested ones.</p>	<p>No</p> <p>Candidate habitat was not identified.</p>

Specialized Wildlife Habitat	Wildlife Species	CANDIDATE SWH			Candidate Habitat within the Study Area	Confirmed Habitat within the Study Area
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria		
<p>Amphibian Breeding Habitat (Woodland).</p> <p>Rationale: These habitats are extremely important to amphibian biodiversity within a landscape and often represent the only breeding habitat for local amphibian populations.</p>	<p>Eastern Newt Blue-spotted Salamander Spotted Salamander Gray Treefrog Spring Peeper Western Chorus Frog Wood Frog</p>	<p>All Ecosites associated with these ELC Community Series; FOC FOM FOD SWC SWM SWD</p> <p>Breeding pools within the woodland or the shortest distance from forest habitat are more significant because they are more likely to be used due to reduced risk to migrating amphibians.</p>	<ul style="list-style-type: none"> Presence of a wetland, pond woodland pool (including vernal pools) >500m² within or adjacent (within 120m) to a woodland (no minimum size). Some small wetlands may not be mapped and may be important breeding pools for amphibians. Woodlands with permanent ponds or those containing water in most years until mid-July are more likely to be used as breeding habitat. <p><u>Information Sources</u></p> <ul style="list-style-type: none"> Ontario Herpetofaunal Summary Atlas (or other similar atlases) for records. Local landowners may also provide assistance as they may hear spring-time choruses of amphibians on their property. OMNRF Districts and wetland Evaluations. Field Naturalist Clubs Canadian Wildlife Service Amphibian Road Call Survey. Ontario Vernal Pool Association: http://www.ontariovernalpools.org 	<p>Studies confirm;</p> <ul style="list-style-type: none"> Presence of breeding population of 1 or more of the listed newt/salamander species or 2 or more of the listed frog species with at least 20 individuals (adults juveniles, larva or eggs masses) or 2 or more of the listed frog species with Call Level Codes of 3. A combination of observation study and call count survey will be required during the spring (March-June) when amphibians are concentrated around suitable breeding habitat within or near the woodland/wetlands. The habitat is the wetland area plus a 230m radius of area. If a wetland area is adjacent to a woodland, a travel corridor connecting the wetland to the woodland is to be included in the habitat. SWH MIST Index #14 provides development effects and mitigation measures. 	<p>No</p> <p>Candidate habitat is not present within the Study Area.</p>	<p>No</p> <p>Candidate habitat was not identified.</p>
<p>Amphibian Breeding Habitat (Wetlands)</p> <p>Rationale: Wetlands supporting breeding for these amphibian species are extremely important and fairly rare within Central Ontario landscapes.</p>	<p>Eastern Newt American Toad Spotted Salamander Four-toed Salamander Blue-spotted Salamander Gray Treefrog Western Chorus Frog Northern Leopard Frog Pickerel Frog Green Frog Mink Frog Bullfrog</p>	<p>ELC Community Classes SW, MA, FE, BO, OA and SA.</p> <p>Typically these wetland ecosites will be isolated (>120m) from woodland ecosites, however larger wetlands containing predominantly aquatic species (e.g. Bull Frog) may be adjacent to woodlands.</p>	<ul style="list-style-type: none"> Wetlands >500m² (about 25m diameter), supporting high species diversity are significant; some small or ephemeral habitats may not be identified on MNRF mapping and could be important amphibian breeding habitats. Presence of shrubs and logs increase significance of pond for some amphibian species because of available structure for calling, foraging, escape and concealment from predators. Bullfrogs require permanent water 	<p>Studies confirm:</p> <ul style="list-style-type: none"> Presence of breeding population of 1 or more of the listed newt/salamander species or 2 or more of the listed frog/toad species with at least 20 individuals (adults or eggs masses) or 2 or more of the listed frog/toad species with Call Level Codes of 3 or; Wetland with confirmed breeding Bullfrogs are significant. 	<p>Yes</p> <p>Candidate habitat is present immediately adjacent to the Study Area, associated with the Cold Creek tributary in the western section of the Study Area. Open water suitable for amphibian breeding was observed to be very limited within this habitat.</p>	<p>No</p> <p>Candidate habitat was not confirmed.</p>

Specialized Wildlife Habitat	Wildlife Species	CANDIDATE SWH			Candidate Habitat within the Study Area	Confirmed Habitat within the Study Area
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria		
			<p>bodies with abundant emergent vegetation.</p> <p><u>Information Sources</u></p> <ul style="list-style-type: none"> Ontario Herpetofaunal Summary Atlas (or other similar atlases). Canadian Wildlife Service Amphibian Road Surveys and Backyard Amphibian Call Count. OMNRF Districts and wetland evaluations. Reports and other information available from Conservation Authorities. 	<ul style="list-style-type: none"> The ELC ecosite wetland area and the shoreline are the SWH. A combination of observational study and call count surveys will be required during the spring (March-June) when amphibians are concentrated around suitable breeding habitat within or near the wetlands. If a SWH is determined for Amphibian Breeding Habitat (Wetlands) then Movement Corridors are to be considered as outlined in Table 1.4.1 of this Schedule. SWH MIST Index #15 provides development effects and mitigation measures. 		
<p>Woodland Area-Sensitive Bird Breeding Habitat</p> <p><u>Rationale:</u> Large, natural blocks of mature woodland habitat within the settled areas of Southern Ontario are important habitats for area sensitive interior forest song birds.</p>	<p>Yellow-bellied Sapsucker Red-breasted Nuthatch Veery Blue-headed Vireo Northern Parula Black-throated Green Warbler Blackburnian Warbler Black-throated Blue Warbler Ovenbird Scarlet Tanager Winter Wren Pileated Woodpecker</p> <p><u>Special Concern:</u> Cerulean Warbler Canada Warbler</p>	<p>All Ecosites associated with these ELC Community Series;</p> <p>FOC FOM FOD SWC SWM SWD</p>	<ul style="list-style-type: none"> Habitats where interior forest breeding birds are breeding, typically large mature (>60 yrs old) forest stands or woodlots >30 ha. Interior forest habitat is at least 200 m from forest edge habitat. <p><u>Information Sources</u></p> <ul style="list-style-type: none"> Local birder clubs. Canadian Wildlife Service (CWS) for the location of forest bird monitoring . Bird Studies Canada conducted a 3-year study of 287 woodlands to determine the effects of forest fragmentation on forest birds and to determine what forests were of greatest value to interior species. Reports and other information available from Conservation Authorities. 	<p>Studies confirm:</p> <ul style="list-style-type: none"> Presence of nesting or breeding pairs of 3 or more of the listed wildlife species. Note: any site with breeding Cerulean Warblers or Canada Warbler is to be considered SWH. Conduct field investigations in spring and early summer when birds are singing and defending their territories. Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects" SWH MIST Index #34 provides development effects and mitigation measures. 	<p>No</p> <p>Candidate habitat is present in the area, but generally outside of the Study Area.</p>	<p>No</p> <p>Candidate habitat was not confirmed within the Study Area.</p>

SWH Ecoregion 7E Criterion Schedule

Table 1.3. Habitats of Species of Conservation Concern considered SWH

Wildlife Habitat	Wildlife Species	CANDIDATE SWH			Candidate Habitat within the Study Area	Confirmed Habitat within the Study Area
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria		
<p>Marsh Breeding Bird Habitat</p> <p>Rationale: Wetlands for these bird species are typically productive and fairly rare in Southern Ontario landscapes.</p>	<p>American Bittern Virginia Rail Sora Common Moorhen American Coot Pied-billed Grebe Marsh Wren Sedge Wren Common Loon Green Heron Trumpeter Swan</p> <p>Special Concern: Black Tern Yellow Rail</p>	<p>MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 SAS1 SAM1 SAF1 FEO1 BOO1 For Green Heron: All SW, MA and CUM1 sites.</p>	<ul style="list-style-type: none"> Nesting occurs in wetlands. All wetland habitat is to be considered as long as there is shallow water with emergent aquatic vegetation present. For Green Heron, habitat is at the edge of water such as sluggish streams, ponds and marshes sheltered by shrubs and trees. Less frequently, it may be found in upland shrubs or forest a considerable distance from water. <p><u>Information Sources</u></p> <ul style="list-style-type: none"> OMNRF District and wetland evaluations. Field Naturalist clubs. Natural Heritage Information Centre (NHIC) Records. Reports and other information available from Conservation Authorities. Ontario Breeding Bird Atlas. 	<p>Studies confirm:</p> <ul style="list-style-type: none"> Presence of 5 or more nesting pairs of Sedge Wren or Marsh Wren or breeding by any combination of 4 or more of the listed species. Note: any wetland with breeding of 1 or more Black Terns, Trumpeter Swan, Green Heron or Yellow Rail is SWH. Area of the ELC ecosite is the SWH. Breeding surveys should be done in May/June when these species are actively nesting in wetland habitats. Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects". SWH MIST Index #35 Provides development effects and mitigation measures. 	<p>Yes</p> <p>Candidate Ecosites are present within the Study Area associated with the Cold Creek shoreline.</p>	<p>No</p> <p>Candidate habitat was not confirmed and is not expected to be present based on the very small amount of habitat present. No associated wildlife species were observed during site visits.</p>
<p>Open Country Bird Breeding Habitat</p> <p>Rationale: This wildlife habitat is declining throughout Ontario and North America. Species such as the Upland Sandpiper have declined significantly the past 40 years based on CWS (2004) trend records.</p>	<p>Upland Sandpiper Grasshopper Sparrow Vesper Sparrow Northern Harrier Savannah Sparrow</p> <p>Special Concern Short-eared Owl</p>	<p>CUM1 CUM2</p>	<ul style="list-style-type: none"> Large grassland areas (includes natural and cultural fields and meadows) >30 ha. Grasslands not Class 1 or Class 2 agricultural lands, and not being actively used for farming (i.e. no row cropping or intensive hay or livestock pasturing in the last 5 years). Grassland sites considered significant should have a history of longevity, either abandoned fields, mature hayfields and pasturelands that are at least 5 years or older. The Indicator bird species are 	<p>Field Studies confirm:</p> <ul style="list-style-type: none"> Presence of nesting or breeding of 2 or more of the listed species. A field with 1 or more breeding Short-eared Owls is to be considered SWH. The area of SWH is the contiguous ELC ecosite field areas. Conduct field investigations of the most likely areas in spring and early summer when birds are singing and defending their territories. 	<p>Yes</p> <p>Candidate Ecosites are present within and adjacent to the Study Area but do not meet size criteria thresholds.</p>	<p>No</p> <p>Candidate habitat was not confirmed.</p>

Wildlife Habitat	Wildlife Species	CANDIDATE SWH			Candidate Habitat within the Study Area	Confirmed Habitat within the Study Area
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria		
			<p>area sensitive requiring larger grassland areas than the common grassland species.</p> <p><u>Information Sources</u></p> <ul style="list-style-type: none"> Agricultural land classification maps, Ministry of Agriculture. Local bird clubs. Ontario Breeding Bird Atlas EIS Reports and other information available from Conservation Authorities. 	<ul style="list-style-type: none"> Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects". SWH MIST Index #32 provides development effects and mitigation measures. 		
<p>Shrub/Early Successional Bird Breeding Habitat</p> <p><u>Rationale</u> This wildlife habitat is declining throughout Ontario and North America. The Brown Thrasher has declined significantly over the past 40 years based on CWS.</p>	<p><u>Indicator Spp.</u> Brown Thrasher Clay-coloured Sparrow</p> <p><u>Common Spp.</u> Field Sparrow Black-billed Cuckoo Eastern Towhee Willow Flycatcher</p> <p>Special Concern: Yellow-breasted Golden-winged Warbler</p>	<p>CUT1 CUT2 CUS1 CUS2 CUW1 CUW2</p> <p>Patches of shrub ecosites can be complexed into a larger habitat for some bird species.</p>	<p>Large field areas succeeding to shrub and thicket habitats >10ha in size.</p> <ul style="list-style-type: none"> Shrub land or early successional fields, not class 1 or 2 agricultural lands, not being actively used for farming (i.e. no row-cropping, haying or live-stock pasturing in the last 5 years). Shrub thicket habitats (>10 ha) are most likely to support and sustain a diversity of these species. Shrub and thicket habitat sites considered significant should have a history of longevity, either abandoned fields or pasturelands. <p><u>Information Sources</u></p> <ul style="list-style-type: none"> Agricultural land classification maps, Ministry of Agriculture. Local bird clubs. Ontario Breeding Bird Atlas Reports and other information available from Conservation Authorities. 	<p>Field Studies confirm:</p> <ul style="list-style-type: none"> Presence of nesting or breeding of 1 of the indicator species and at least 2 of the common species. A habitat with breeding Yellow-breasted Chat or Golden-winged Warbler is to be considered as Significant Wildlife Habitat. The area of the SWH is the contiguous ELC ecosite field/thicket area. Conduct field investigations of the most likely areas in spring and early summer when birds are singing and defending their territories. Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects". SWH MIST Index #33 provides development effects and mitigation measures. 	<p>No</p> <p>Candidate Ecosites are present within and adjacent to the Study Area but do not meet size criteria thresholds.</p>	<p>No</p> <p>Candidate habitat was not identified.</p>

Wildlife Habitat	Wildlife Species	CANDIDATE SWH			Candidate Habitat within the Study Area	Confirmed Habitat within the Study Area	
		ELC Ecosite Codes		Habitat Criteria and Information Sources			Defining Criteria
Terrestrial Crayfish; Rationale: Terrestrial Crayfish are only found within SW Ontario in Canada and their habitats are very rare.	Chimney or Digger Crayfish; <i>(Falicambarus fodiens)</i> Devil Crawfish or Meadow Crayfish; <i>(Cambarus Diogenes)</i>	MAM1 MAM3 MAM5 MAS1 MAS3 SWT	MAM2 MAM4 MAM6 MAS2 SWD SWM	Wet meadow and edges of shallow marshes (no minimum size) should be surveyed for terrestrial crayfish. <ul style="list-style-type: none"> Constructs burrows in marshes, mudflats, meadows, the ground can't found far from water. Both species are a semi-terrestrial burrower which spends most of its life within burrows consisting of a network of tunnels. Usually the soil is not too moist so that the tunnel is well formed. <u>Information Sources</u> <ul style="list-style-type: none"> Information sources from "Conservation Status of Freshwater Crayfishes" by Dr. Premek Hamr for the WWF and CNF March 1998. 	Studies Confirm: <ul style="list-style-type: none"> Presence of 1 or more individuals of species listed or their chimneys (burrows) in suitable meadow marsh, swamp or moist terrestrial sites. Area of ELC ecosite or an Habitat ecoelement area of meadow marsh or swamp within the larger ecosite area is the SWH. Surveys should be done April to August in temporary or permanent water. Note the presence of burrows or chimneys are often the only indicator of presence, observance or collection of individuals is very difficult. SWH MIST Index #36 provides development effects and mitigation measures. 	Yes Candidate Ecosites are present within the Study Areas. Wildlife species were identified within the Study Area, but outside of the candidate Ecosites.	No Candidate habitat was not confirmed.

Wildlife Habitat	Wildlife Species	CANDIDATE SWH			Candidate Habitat within the Study Area	Confirmed Habitat within the Study Area
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria		
<p>Special Concern and Rare Wildlife Species</p> <p>Rationale: These species are quite rare or have experienced significant population declines in Ontario.</p>	<p>All Special Concern and Provincially Rare (S1-S3, SH) plant and animal species. Lists of these species are tracked by the Natural Heritage Information Centre (NHIC).</p>	<p>All plant and animal element occurrences (EO) within a 1 or 10km grid. Older element occurrences were recorded prior to GPS being available, therefore location information may lack accuracy.</p>	<ul style="list-style-type: none"> When an element occurrence is identified within a 1 or 10 km grid for a Special Concern or provincially Rare species; linking candidate habitat on the site needs to be completed to ELC Ecosites. <u>Information Sources</u> Natural Heritage Information Centre (NHIC) will have Special Concern and Provincially Rare (S1-S3, SH) species lists with element occurrences data. NHIC Website "Get Information" : http://nhic.mnr.gov.on.ca Ontario Breeding Bird Atlas Expert advice should be sought as many of the rare spp. have little information available about their requirements. 	<p>Studies Confirm:</p> <ul style="list-style-type: none"> Assessment/inventory of the site for the identified special concern or rare species needs to be completed during the time of year when the species is present or easily identifiable. The area of the habitat to the finest ELC scale that protects the habitat form and function is the SWH, this must be delineated through detailed field studies. The habitat needs be easily mapped and cover an important life stage component for a species e.g. specific nesting habitat or foraging habitat. SWH MIST Index #37 provides development effects and mitigation measures. 	<p>Yes</p> <p>Candidate habitat is present within the Study Areas as one Special Concern bird species (Eastern Wood Pewee) and one Special Concern insect species (Monarch) were recorded within the Study Area.</p>	<p>No</p> <p>Both species are expected to breed where suitable habitat (wooded areas/open habitats with milkweed plants) within the Study Area, but breeding was not confirmed.</p>

SWH Ecoregion 7E Criterion Schedule

Table 1.4.1 Animal Movement Corridors

Wildlife Habitat	Wildlife Species	CANDIDATE SWH			Candidate Habitat within the Study Area	Confirmed Habitat within the Study Area
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria		
<p>Amphibian Movement Corridors</p> <p>Rationale; Movement corridors for amphibians moving from their terrestrial habitat to breeding habitat can be extremely important for local populations.</p>	<p>Eastern Newt American Toad Spotted Salamander Four-toed Salamander Blue-spotted Salamander Gray Treefrog Western Chorus Frog Northern Leopard Frog Pickerel Frog Green Frog Mink Frog Bullfrog</p>	<p>Corridors may be found in all ecosites associated with water.</p> <ul style="list-style-type: none"> Corridors will be determined based on identifying the significant breeding habitat for these species in Table 1.1 	<p>Movement corridors between breeding habitat and summer habitat</p> <ul style="list-style-type: none"> Movement corridors must be determined when Amphibian breeding habitat is confirmed as SWH from Table 1.2.2 (Amphibian Breeding Habitat – Wetland) of this Schedule. <p><u>Information Sources</u></p> <ul style="list-style-type: none"> MNRF District Office. Natural Heritage Information Centre (NHIC). Reports and other information available from Conservation Authorities. Field Naturalist Clubs. 	<ul style="list-style-type: none"> Field Studies must be conducted at the time of year when species are expected to be migrating or entering breeding sites. Corridors should consist of native vegetation, with several layers of vegetation. Corridors unbroken by roads, waterways or bodies, and undeveloped areas are most significant. Corridors should have at least 15m of vegetation on both sides of waterway ^{cxlix} or be up to 200m wide ^{cxlix} of woodland habitat and with gaps <20m. Shorter corridors are more significant than longer corridors, however amphibians must be able to get to and from their summer and breeding habitat. SWH MIST Index #40 provides development effects and mitigation measures. 	<p>No</p> <p>Candidate habitat (Amphibian breeding habitat) was not confirmed within the Study Area.</p>	<p>No</p> <p>Candidate habitat was not confirmed.</p>

SWH Ecoregion 7E Criterion Schedule

Table 1.5.1 Significant Wildlife Habitat Exceptions for Ecodistricts within EcoRegion 7E

EcoDistrict	Wildlife Habitat and Species	CANDIDATE SWH			Candidate Habitat within the Study Area	Confirmed Habitat within the Study Area
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria		
7E-2	<p>Bat Migratory Stopover Area</p> <p>Rationale: Stopover areas for long distance migrant bats are important during fall migration.</p> <p>Hoary Bat Eastern Red Bat Silver-haired Bat</p>	No specific ELC types	<ul style="list-style-type: none"> Long distance migratory bats typically migrate during late summer and early fall from summer breeding habitats throughout Ontario to southern wintering areas. Their annual fall migration may concentrate these species of bats at stopover areas. This is the only known bat migratory stopover habitats based on current information. <p><u>Information Sources</u></p> <ul style="list-style-type: none"> OMNRF for possible locations and contact for local experts. Western University Biology Department. 	<ul style="list-style-type: none"> Long Point (42°35'N, 80°30'E, to 42°33'N, 80°03'E) has been identified as a significant stop-over habitat for fall migrating Silver-haired Bats, due to significant increases in abundance, activity and feeding that was documented during fall migration. The confirmation criteria and habitat areas for this SWH are still being determined. SWH MIST Index #38 provides development effects and mitigation measures. 	<p>No</p> <p>The Study Area is not within the region considered for SWH.</p>	<p>No</p> <p>Candidate habitat was not identified.</p>