



Draft

Clark Boulevard Extension and Eastern Avenue Improvements – Municipal Class Environmental Assessment, Schedule C -

Environmental Impact Study Draft

Prepared for:

HDR Inc.
255 Adelaide Street West
Toronto, Ontario
M5H 1X9

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NATURAL RESOURCE SOLUTIONS INC.

Aquatic, Terrestrial and Wetland Biologists

**Clark Boulevard Extension and Eastern Avenue Improvements – Municipal Class
Environmental Assessment, Schedule C -**

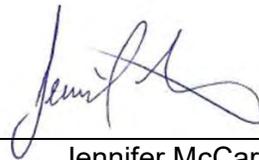
Environmental Impact Study Draft

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1.0 Introduction

Natural Resource Solutions Inc. (NRSI) was retained by HDR Inc. on behalf of the City of Brampton in April 2019 to complete the Natural Environment component of the required Schedule C Environmental Assessment (EA) for the road widening of Eastern Avenue and the road extension of adjacent Clark Boulevard, within the City of Brampton, Ontario.

The “Subject Lands” are shown on Map 1, which include the area identified as the preferred alternative. These lands lie generally along Eastern Avenue from west of Kennedy Road South to Clark Boulevard east of Rutherford Road South. For the purposes of this report, the “Study Area” refers to the Subject Lands as well as the adjacent lands within approximately 120m, as shown on Map 1. The Study Area is highly disturbed and dominated by industrial lots and facilities on both sides of Clark Boulevard and Eastern Avenue. Existing natural features are limited within the Study Area and a single watercourse is present in the eastern portion of the Study Area. This permanent watercourse is within the Spring Creek subwatershed of Etobicoke Creek. It receives overland flow from the surrounding area and flows east outside the Study Area towards Spring Creek, which is tributary to Etobicoke Creek (TRCA 2021a).

The City of Brampton (2020) Official Plan (OP; Schedule D) identifies the presence of a “watercourse and tributary” within the Study Area which falls within the Toronto and Region Conservation Authority (TRCA) regulated area and is subject to Ontario Regulation 166/06 (TRCA 2008a). The watercourse and Study Area are not classified by the Peel Region OP Schedule A and are not identified within the “Core Areas of the Greenlands System” (Region of Peel 2021). Additionally, the Study Area is not classified within the “Greenbelt Area”, “Natural Heritage System”, or within the “River Valley Connections Outside the Greenbelt” area (Region of Peel 2021).

A Natural Environment Assessment Report (NEAR) was completed and submitted in September 2019 in accordance with the requirements of the Municipal Class Environmental Assessment (MEA 2015).

This study has been developed in accordance with local municipal policies and TRCA Environmental Impact Statement Guidelines (TRCA 2014a). This report summarizes background information on natural heritage features, as well as results of original field surveys for the Study Area, as reported in the NEAR. The detailed characterization of existing natural features was used to inform an analysis of the significance and sensitivity of natural features

within the study area with consideration for applicable municipal and provincial policies and legislation. This information was then used to evaluate several alternatives for road improvements from a natural heritage perspective. This EIS is one component of the EA which informed the selection of the preferred alternative. Examples of other components which needed to be considered are technical feasibility, potential impacts to the local community, cost, and input from a variety of stakeholders. This report includes an assessment of environmental impacts associated with preferred alternative.

1.1 Proposed Undertaking

The City of Brampton is undertaking a road widening and road extension project to improve the network connectivity along the Clark Boulevard - Eastern Avenue corridor as well as within the broader network, improve traffic capacity, provide additional travel choices for pedestrians and cyclists, and improve safety and operational efficiency. The proposed undertaking includes road improvements along Eastern Avenue between Kennedy Road South and Hansen Road South, and an extension of Clark Boulevard from Hansen Road South to Rutherford Road South. This will create a new continuous road corridor between Kennedy Road South in the west to Rutherford Road South in the east.

1.2 Project Scoping

1.2.1 Background Information Review

A review of existing natural heritage information was completed to identify the presence of natural heritage features and species that are reported from or have potential to occur within the Study Area. Background information relevant to the Study Area was collected and reviewed from the following sources:

- Natural Heritage Information Centre (NHIC) Biodiversity Explorer (MNRF 2019a);
- Species at Risk in Ontario List (MNRF 2019c);
- Land Information Ontario (LIO) data base mapping;
- Region of Peel Official Plan (2018);
- City of Brampton Official Plan (2020);
- Etobicoke Creek Watershed Characterization Report (TRCA 2021);
- Greening our Watersheds – Revitalization Strategies for Etobicoke and Mimico Creeks Including the Etobicoke-Mimico Report Card (EMCWTF 2002);
- Fisheries and Oceans Canada (DFO) Species at Risk Mapping (DFO 2019);

- Government of Canada (2019);
- Atlas of the Mammals of Ontario (Dobbyn 1994);
- Ontario Reptile and Amphibian Atlas (Ontario Nature 2019);
- Ontario Breeding Bird Atlas (BSC et al. 2008);
- Odonata Background Review (MNR 2019b); and
- Ontario Butterfly Atlas (Jones et al. 2018).

1.2.2 Species at Risk and Species of Conservation Concern Screening

For the purposes of this report, Species at Risk (SAR) include species listed as ‘Threatened’ or ‘Endangered’ under the provincial *Endangered Species Act (ESA)*. In Ontario, provincial Species of Conservation Concern (SCC) include:

- Species designated under the *ESA* as ‘Special Concern’ within Ontario;
- Species that have been assigned a conservation status (S-Rank) of S1 to S3 or SH by the Natural Heritage Information Centre (NHIC);
- Species that have a high percentage of their global population in Ontario; and
- Species that are designated federally as Threatened or Endangered by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) but not provincially by the Committee on the Status of Species at Risk in Ontario (COSSARO). These species may be protected by the federal *Species at Risk Act (SARA)* if they are listed as Threatened or Endangered on Schedule 1 of the SARA.

Habitat for SCC is considered Significant Wildlife Habitat (SWH), which is afforded protection under the Provincial Policy Statement (MMAH 2020) and municipal natural heritage protection policies.

Based on NRSI’s examination of background sources and federally or provincially significant species with occurrence records in the vicinity of the Study Area (within 10km), an assessment of SAR and SCC suitable habitat presence was completed. Assessments of habitat suitability in the Study Area were made by cross-referencing each species’ known habitat preferences or requirements (e.g., MNR 2000) against habitats known to occur in the Study Area. This was completed to ensure that the potential presence of all significant species within the Study Area was adequately assessed to inform the Class EA.

Based on this screening exercise, no suitable habitat for SAR/SCC was identified within the Study Area. The full SAR/SCC screening assessment is provided in Appendix I.

1.2.3 Significant Wildlife Habitat Screening

A preliminary screening for the presence of SWH was also completed for the Study Area. The Significant Wildlife Habitat Technical Guide (SWHTG) is a guideline document that outlines the types of habitats that the NDMNRF considers significant in Ontario, as well as criteria to identify those habitats (MNR 2000, MNRF 2015). The SWHTG groups SWH into four broad categories: seasonal concentration areas, rare vegetation communities and specialized wildlife habitat, habitats of SCC, and animal movement corridors. This screening involved the comparison of NDMNRF criteria outlined for Ecoregion 7E, in which the Study Area is located, against habitats known to occur in the Study Area.

Based on this screening exercise, no suitable SWH was identified within the Study Area. The full SWH screening assessment is provided in Appendix I.

2.0 Relevant Policies, Legislation, and Planning Studies

Natural heritage features within the Study Area were assessed for significance by evaluating them against relevant policies, legislation, and planning studies. Table 1 provides an overview of policies and the analysis of natural features within the Study Area. These findings informed the field program and constraints analysis. The specific implications of these policies are provided to the study team here to help inform and guide a suitable development design while identifying areas to avoid and/or mitigate.

Table 1. Relevant Policies, Legislation, and Planning Studies

| Policy/Legislation | Description | Project Relevance |
|--|---|---|
| Provincial Policy Statement (PPS) (MMAH 2020) | <ul style="list-style-type: none"> • Issued under the authority of Section 3 of the Planning Act, the current PPS came into effect on May 1, 2020, replacing the PPS issued April 30, 2014 (MMAH 2014). • Section 2.1 of the PPS – Natural Heritage establishes clear direction on the adoption of an ecosystem approach and the protection of resources that have been identified as ‘significant’. • The Natural Heritage Reference Manual (MNR 2010) and the Significant Wildlife Habitat Technical Guide (SWHTG) (MNR 2000, MNRF 2015) were prepared by the MNRF to provide guidance on identifying natural features and in interpreting the Natural Heritage sections of the PPS. | <ul style="list-style-type: none"> • Background review and field observations confirmed the absence of significant natural features and Signification Wildlife Habitat (SWH) in the Study Area. |
| <i>Migratory Birds Convention Act (MBCA)</i> (Government of Canada 2019) | <ul style="list-style-type: none"> • The <i>MBCA</i> protects migratory game birds, insectivorous birds, and several other migratory non-game birds from persecution in the form of harassment and was assented in 1994. • The schedule of on-site work must consider <i>MBCA</i> timing windows, with the breeding bird season typically occurring between April 1 and August 31, however, this is a guideline, since the <i>MBCA</i> applies to nesting bird species at any time. • “Incidental take” is considered illegal, with the exception of a permit obtained by the Canadian Wildlife Service (CWS). | <ul style="list-style-type: none"> • The timing of construction activities, especially vegetation clearing and site grading, must have consideration for the <i>MBCA</i>. |
| <i>Fisheries Act</i> (Government of Canada 1985) | <ul style="list-style-type: none"> • Manages threats to all fish and fish habitats in Canada. • The Act prohibits harmful alteration, disruption or destruction of fish habitat (HADD). • DFO has developed an online, assessment tool, where proponents can determine whether their projects require DFO review based on the type of water body the work is occurring in and the nature of the proposed activity. | <ul style="list-style-type: none"> • The watercourse was not found to support any fish species during the fish community assessment completed in 2019, although the channel is likely to provide indirect fish habitat as it provides flow to fish habitat downstream. • An assessment screening will be required at detailed design to determine whether a request for review by DFO is required. Based on the proposed realignment of the |

| Policy/Legislation | Description | Project Relevance |
|--|---|---|
| | | tributary, it is expected that a review will be required at detailed design. |
| <i>Endangered Species Act (ESA)</i> (Government of Ontario 2007) | <ul style="list-style-type: none"> The <i>ESA</i> prohibits killing, harming, harassing, or capturing SAR and protects their habitats from damage and destruction. Ontario Regulation 242/08 under the <i>ESA</i> applies to all species on the SAR in Ontario List, as of July 1, 2022. | <ul style="list-style-type: none"> Based on the background review and SAR/SCC screening, several candidate SAR were reported within the vicinity of the Study Area. Candidate habitat for SAR bats was documented within the Study Area. The Ministry of Environment, Conservation and Parks (MECP) should be consulted to determine the best approach for avoiding contravening the <i>ESA</i> to SAR or candidate SAR habitats within the Study Area. |
| <i>Fish and Wildlife Conservation Act (FWCA)</i> (Government of Canada 2019) | <ul style="list-style-type: none"> The FWCA provides protection for certain bird species not protected under the <i>MBCA</i> (e.g., raptors), as well as furbearing mammals and their dens or habitual dwellings, aside from the Red Fox (<i>Vulpes vulpes</i>) and Striped Skunk (<i>Mephitis mephitis</i>). | <ul style="list-style-type: none"> The timing of construction activities, especially vegetation clearing and site grading, must have consideration for bird nesting and den sites of furbearing mammals. |
| Ontario Reg. 166/06: Toronto and Region Conservation Authority (TRCA): Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses (2013) | <ul style="list-style-type: none"> Regulation issued under <i>Conservation Authorities Act</i>, R.S.O. 1990. Through this regulation, the TRCA has the responsibility to regulate activities in natural and hazardous areas (i.e., areas in and near rivers, streams, floodplains, wetlands, and slopes). | <ul style="list-style-type: none"> A TRCA regulated tributary of Etobicoke Creek, in the Spring Creek Subwatershed, is present in the Study Area. |
| Region of Peel Official Plan (2021) | <ul style="list-style-type: none"> Peel Regional Council approved the OP in 1996. A September 2021 Office Consolidation and associated mapping was prepared to reflect recent decisions on several amendments. A new 2022 OP has been approved by Council and is currently awaiting Provincial approval. The Region of Peel OP requires evaluation of development impacts that occur within or adjacent to natural heritage features and areas as defined in the OP | <ul style="list-style-type: none"> Background review and field observations confirmed the absence of natural heritage feature designations and features within the Greenlands System. |

| Policy/Legislation | Description | Project Relevance |
|---------------------------------------|--|--|
| | as well as features identified as part of the Region of Peel Greenlands System (Schedule A). | |
| City of Brampton Official Plan (2020) | <ul style="list-style-type: none"> • The City of Brampton Official Plan (OP) was adopted by City Council in October 2006 and approved by the Ontario Municipal Board (OMB) in October 2008. The updated September 2020 Office Consolidation includes resolutions to several appeals to the 2006 OP as well as amendments made to reflect Council decisions. • The City of Brampton OP requires Natural Heritage and Environmental Management objectives to be met regarding proposed development within or adjacent to identified natural heritage features outlined in Section 4.6 and Schedule “D”- Natural Heritage Features and Areas. | <ul style="list-style-type: none"> • Background review and field observations confirmed the general absence of significant natural feature designations from the Study Area. • A single ‘watercourse and tributary’ is identified within the Study Area. |

3.0 Field Methods

Terrestrial and aquatic field surveys were undertaken within the Study Area to characterize natural features and identify those that are significant and sensitive and that have potential to be adversely affected by the proposed undertaking. A total of 6 site visits were completed in 2019 as described below.

During the field work program, all incidental observations of wildlife and vegetation species were documented on all field visits. This included direct observations of individuals, as well as signs of wildlife presence (i.e., tracks, scat, dens, nests, etc.).

3.1 Vegetation Community Mapping and Vascular Plant Survey

Vegetation communities within the Study Area were described and mapped using the Ecological Land Classification (ELC) system for southern Ontario (Lee et al. 1998) on June 21. A comprehensive inventory of vascular plants was completed to inform the ELC vegetation community classifications. ELC and vegetation inventory work was restricted to the watercourse and associated riparian areas due to the limited presence of natural features within the Study Area.

3.2 Tree Inventory

All trees $\geq 10\text{cm}$ diameter-at-breast-height (DBH) within a scoped area were inventoried and assessed for health condition by Certified Arborists on June 21, June 24, and July 9, 2019. The tree inventory was undertaken within the Subject Lands as identified on Map 1, as well as along the watercourse corridor to approximately 60m north of the Subject Lands (see Maps 1a and b in Appendix III). The following information was recorded for each tree:

- Species (common and scientific name),
- DBH (cm),
- Crown radius (m),
- Number of stems,
- General health (excellent, good, fair, poor, very poor),
- Potential for structural failure (improbable, possible, probable, imminent),
- General comments (i.e., disease, aesthetic quality, development constraints, sensitivity to development), and

- Presence of candidate bat maternity roost habitat using NDMNRF bat habitat assessment protocol (see below).

The location of each inventoried tree was georeferenced to sub-meter accuracy using a SXBlue II GNSS GPS unit by a biologist.

3.3 Breeding Bird Surveys

Two early morning breeding bird area search surveys were completed on June 5 and June 21, 2019 in accordance with the Ontario Breeding Bird Atlas (OBBA) protocol (BSC 2001). Surveys were completed between a half-hour before sunrise and 1000hrs and were timed to occur at least 10 days apart. Surveys were completed through a comprehensive area search of Study Area lands with a focus on the watercourse feature and its riparian area. Standard breeding evidence codes were recorded based on the OBBA protocol (BSC 2001).

3.4 Visual Reptile Survey

A visual encounter survey (VES) was completed on June 5 and June 21, 2019 to assess the habitat suitability within the Study Area for reptile species reported from the Study Area vicinity (Ontario Nature 2019; i.e., the vegetated riparian and watercourse features) and to also assess the presence of basking reptiles (snakes and turtles) within any suitable habitat.

3.5 Bat Habitat Assessment

Three SAR bat species, Little Brown Myotis (*Myotis lucifungus*), Northern Myotis (*Myotis septentrionalis*), and Tri-colored Bat (*Perimyotis subflavus*), reported from within 10km of the Study Area based on the background review data, were identified as having potentially suitable habitat within the Study Area (see the SAR/SCC screening in Appendix I). These species are all listed as Endangered both provincially and federally (MECP 2022c, Government of Canada 2022) and are afforded general habitat protection under the *ESA* (Government of Ontario 2007).

Little Brown Myotis and Northern Myotis are known to roost in tree cavities, hollows, or under loose bark, as well as within buildings (Environment Canada 2015, Humprey and Fotherby 2019). As part of the tree health assessments during the tree inventory on June 21, June 24, and July 9, 2019, NRSI's Certified Arborists, who are trained and experienced in the NDMNRF bat habitat assessment protocols (MNRF 2017), completed a bat habitat assessment within the Study Area. This involved visually scanning for and documenting all standing live or dead trees

≥10 cm Diameter-at-Breast Height (DBH) with cracks, crevices, hollows, cavities, and/or loose or naturally exfoliating bark that could provide suitable roosting habitat for bat SAR. Tree species, DBH, decay class according to Watt and Caceres (1999), and the number, height, and type (e.g., cavity, crevice, sloughing bark, etc.) of suitable roost sites was documented for each candidate roost tree.

The NDMNRF's protocol (MNRF 2017, MECP 2022a, MECP 2022b) for assessing the potential habitat suitability for SAR bats specifies that this survey should be conducted during the leaf-off season so that suitable features are not obscured by foliage. Since the tree inventory work was conducted in the summer, these visual assessments were done as best as conditions permitted during the leaf-on season.

Tri-colored Bat summer roosting habitats in Ontario are poorly understood. Elsewhere in their range this species has been documented to roost in deciduous or mixed forests in dead leaf clusters belonging to broken branches, those formed by natural causes, and those created as nests by Eastern Gray Squirrel (*Sciurus carolinensis*) (Humphrey and Fotherby 2019). They have also been observed to use dense clusters of live foliage, arboreal lichens or epiphytes, and anthropogenic structures (Humphrey and Fotherby 2019). Treed vegetation communities that contain Oak spp. (*Quercus* spp.) and/or Maple spp. (*Acer* spp.), are considered candidate roosting habitat for Tri-colored Bat in Ontario due to their potential to provide suitable foliage roost sites (MNRF 2017, MECP 2022a, MECP 2022b). Therefore, all Oak and Maple trees ≥10cm DBH throughout the Study Area were documented as potential suitable roosting habitat for Tri-colored Bat.

3.6 Aquatic Habitat Assessment and Fish Community Characterization

NRSI aquatic biologists completed surveys on June 25, 2019 to characterize the aquatic habitats and fish community within the watercourse (EMS-001) (Map 2).

The fish community assessments were undertaken by a two-person crew using a Smith-Root LR-20B Electrofishing Backpack within the entire stretch of watercourse located within the Study Area (300m²). Within the watercourse, electrofishing followed a multiple pass screening level assessment based on the Ontario Stream Assessment Protocol (Stanfield 2017). This method is designed to provide a qualitative assessment of fish species abundance and provide a general characterization of the fish community in the sampling reach.

The observed electrofishing conditions, settings, and total sampling time are summarized in Table 2 for the sampling site. This sampling was completed under license issued to NRSI on May 29, 2019 by the NDMNRF Aurora District Office (No. 1093252).

Table 2. Electrofishing Conditions, Settings, and Shocking Time

| Conditions | Station EMS-001 |
|-------------------------------|------------------------|
| Date | June 25, 2019 |
| Sampling start time | 0930hrs |
| Sampling end time | 1500hrs |
| Air temperature (°C) | 24 |
| Water temperature (°C) | 18 |
| Time water temp. taken | 0900hrs |
| Electrofisher Type | Smith-Root LR-20B |
| Number of Netters | 1 |
| Voltage (V) | 100 |
| Pulsating Frequency (Hz) | 60 |
| Shocking time (sec.) – Pass 1 | 3246 |
| Shocking time (sec.) – Pass 2 | 2567 |
| Shocking time (sec.) – Pass 3 | 2741 |

3.7 Field Methods Summary

Details about all field surveys completed are provided in Table 3, below.

Table 3. Field Survey Summary

| Survey Type | Protocol | Date (2019) | Start and End Time (24 hrs) | Temp. (°C) | Wind Speed (Beaufort Scale) | Cloud Cover (%) | Precipitation | Observers |
|--------------------------------|--|--|-----------------------------|------------|-----------------------------|-----------------|---------------|-----------------------------------|
| Vascular Plants | | | | | | | | |
| Ecological Land Classification | Lee et. al (2008) | June 21 | 0800-1200 | 18 | 3-4 | 70 | None | A. Dean |
| Vascular Plant Inventory | Systematic search by ELC polygon | June 21 | 0800-1200 | 18 | 3-4 | 70 | None | A. Dean |
| Tree Inventory | City of Brampton Tableland Tree Assessment Guidelines (June 2018) & City of Brampton Tree Preservation By-law 317-2012 | June 21 | 0800-1600 | 22 | 2 | 20 | None | J. Lance H. Manoharan |
| | | June 24 | 0800-1600 | 23 | 2 | 80 | None | J. Lance K. Ellis O. Foster |
| | | July 9 | 0800-1600 | 25 | 3 | 70 | None | J. Lance M. Zago |
| Birds | | | | | | | | |
| Breeding Bird Surveys | OBBA (2001) – Area Search | June 5 | 0655-0740 | 16 | 1 | 90 | None | N. Miller |
| | | June 21 | 0800-1000 | 18 | 3-4 | 70 | None | A. Dean |
| Reptiles | | | | | | | | |
| Reptile Area Searches | Systematic search within suitable habitat | June 5 | 0655-0740 | 16 | 1 | 90 | None | N. Miller |
| | | June 21 | 0800-1200 | 18 | 3-4 | 70 | None | A. Dean |
| Mammals | | | | | | | | |
| Bat Habitat Assessment | MNRF (2017) | Completed simultaneously with the tree inventory | | | | | | |
| Aquatic Habitat | | | | | | | | |

| Survey Type | Protocol | Date (2019) | Start and End Time (24 hrs) | Temp. (°C) | Wind Speed (Beaufort Scale) | Cloud Cover (%) | Precipitation | Observers |
|--|--|--------------------|------------------------------------|-------------------|------------------------------------|------------------------|----------------------|----------------------|
| Aquatic Habitat Characterization and Fish Survey | MNRF License to Collect Fish for Scientific Purposes (No. 1093252) | June 25 | 0900-1500 | 24-30 | 2 | 30 | None | N. Allen S. Catry |

4.0 Existing Conditions

4.1 Soils, Terrain and Drainage

The Study Area is located within the South Slope physiographic region, which slopes gradually toward Lake Ontario. The South Slope is underlain by glacial till and is dominated by clay, clay loam, and loam soils. The combination of topography and soils within this physiographic region results in relatively high runoff and low infiltration capacity. According to the Quaternary Geology of Toronto and Surrounding Area, the dominant soil within the Study Area is defined as clayey silt till within a young till formation (Sharpe 1980). Coarse fill and dense clay within the Study Area was confirmed by fieldwork completed by NRSI.

The Study Area contains a watercourse that flows east into Etobicoke Creek, which empties into Lake Ontario. The majority of the Study Area is highly developed and existing natural features are limited to the watercourse and its riparian zone.

4.2 Vegetation

The majority of the surrounding land is comprised by industrial properties with associated parking lots and roadways. Vegetation communities are described in Table 4 below, and are shown on Map 2.

Table 4. Vegetation Communities Identified within the Study Area

| ELC Ecosite Type | ELC Description | Environmental Characteristics |
|------------------|--------------------------------------|--|
| FOD7 | Fresh-Moist Lowland Deciduous Forest | <p>This lowland deciduous forest community is associated with the riparian area along the watercourse. Within the canopy, it is dominated by Manitoba Maple (<i>Acer negundo</i>), Green Ash (<i>Fraxinus pensylvanica</i>), and Crack Willow* (<i>Salix fragilis</i>). The sub-canopy is dominated by Common Buckthorn* (<i>Rhamnus cathartica</i>), Little-leaf Linden (<i>Tilia cordata</i>), and Manitoba Maple. Understorey vegetation is comprised of Common Buckthorn, Tartarian Honeysuckle* (<i>Lonicera tatarica</i>), and Choke Cherry (<i>Prunus virginiana</i>). The groundcover layer is dominated by Garlic Mustard* (<i>Alliaria petiolate</i>), Tall Goldenrod (<i>Solidago altissima</i>), Spiked Sedge (<i>Carex spicata</i>), and Dame's Rocket* (<i>Hesperis matronalis</i>).</p> <p>Soil sampling within this assessment unit resulted in a soil moisture regime of 6, which is representative of wetland but does not function as such due to channelization and the surrounding impermeable surfaces. Anthropogenic litter, debris and dense fill provide little ecological integrity within the riparian edge of the FOD7 community.</p> <p>*Highly invasive, non-native species.</p> |

| ELC Ecosite Type | ELC Description | Environmental Characteristics |
|------------------|-----------------|--|
| CV | Constructed | This constructed site contains marginal open space and lacks any significant natural features. Few natural features are present beyond planted roadside trees and the area is indicative of highly anthropogenic disturbances. |

4.2.1 Vascular Plants

A total of 81 species of vascular plants were inventoried within the Study Area. A complete list of vascular plant species is provided in Appendix II. Of the species observed, 42% were non-native (MNR 2019a). The majority of inventoried species are urban-tolerant and reflective of disturbed conditions (species with lower Coefficient of Conservatism (CC) values; Oldham et al. 1995). Additionally, all observed native species have low to moderate sensitivity and, in total, 14 of the species observed are considered to be highly invasive.

No provincially or federally significant plants species are reported from the Study Area vicinity (within 1 km; Varga 2000; TRCA 2008a; 2008b). A single regionally significant vascular plant species was observed within the Study Area. Larger Straw Sedge (*Carex normalis*) was observed along the northern bank of the watercourse, within the western portion of FOD7 community (Map 3). Larger Straw Sedge prefers moist fields, thickets and open forests and is listed in the TRCA watershed as L3, of Regional Concern. Further discussion regarding the significance and sensitivity of this species is provided in Section 5.6.

4.2.2 Tree Inventory

In total, 274 trees ≥ 10 cm DBH were inventoried from within the riparian zone of the identified watercourse, and along nearby streets, that may be impacted by the proposed road widening and extension. No significant tree species were observed. A high proportion of inventoried trees are non-native species that specialize in colonizing disturbed areas, reflecting past disturbances to this riparian zone and the limited availability of surface soil in the vicinity for tree recruitment. Nearly all of the Ash (*Fraxinus* sp.) trees inventoried displayed evidence of infestation by the non-native pest, Emerald Ash Borer (EAB; *Agilus planipennis*). A detailed assessment of trees within the Study Area, an analysis of tree retention and removals based on the preferred alignment and recommendation for suitable mitigation and compensation are provided in the Tree Preservation Plan (TPP) report (Appendix III).

4.3 Wildlife

4.3.1 Birds

In total, 106 bird species have been reported from the vicinity of the Study Area (BSC et al. 2008). Thirteen (13) of these species were documented within the Study Area during field surveys, of which 8 species displayed evidence of possible, probable or confirmed breeding within the Study Area based on OBBA breeding evidence codes (BSC 2001). A complete list of bird observations is provided in Appendix II.

A total of 9 SAR/SCC birds are reported for the Study Area based on the background review data (MNR 2019). Additionally, 36 bird species of regional concern are reported from background review data (BSC et al. 2008; TRCA 2008b). NRSI field surveys did not document any SAR/SCC or bird species of regional concern from the Study Area. All observed species documented by NRSI are considered to have secure or generally secure populations in the TRCA (2008a; 2008b) watersheds and are generally understood to be highly tolerant of disturbance (BSC et al. 2008).

4.3.2 Herpetofauna

In total, 9 reptile and amphibian species have been reported from the vicinity of the Study Area based on background data (Ontario Nature 2019). NRSI did not document any herpetofauna species during field investigations in the Study Area. A complete list of all herpetofauna species reported from the Study Area is provided in Appendix II.

4.3.3 Mammals

In total, 27 mammal species have been documented from within 10km of the Study Area, based on the Mammal Atlas of Ontario (Dobbyn 1994). Two mammal species were observed incidentally during field investigations in the Study Area by NRSI biologists: Eastern Cottontail (*Sylvilagus floridanus*) and Eastern Gray Squirrel (*Sciurus carolinensis*). A complete list of all mammal species reported from the Study Area is provided in Appendix II.

Three SAR bat species, Little Brown Myotis, Northern Myotis, and Tri-colored Bat, reported from within 10km of the Study Area based on the background review data, were identified as having potentially suitable habitat within the Study Area (see the SAR/SCC screening in Appendix I).

During the bat habitat assessment completed within the Study Area, 71 candidate bat roost trees for Little Brown Myotis and Northern Myotis and 108 candidate foliage bat roost trees for Tri-colored Bat (Maples and Oaks) were documented (Map 3).

It should be noted that the candidate bat roost trees for Little Brown Myotis and Northern Myotis are all Ash trees that are dead or declining due to infestation by the non-native pest EAB. Many of these trees were not found to be suitable bat habitat at the time of the survey, however, given the time that has elapsed since the bat habitat assessment was completed, many of these trees could now have loose or sloughing bark which would be suitable for providing bat roosting habitat. On the other hand, many of these trees may also no longer provide suitable bat habitat if the loose or sloughing bark that was documented in 2019 has fallen off or the trees have fallen. It should also be reiterated that the tree inventory was completed while trees were fully leafed-out and such habitat features may have been obscured to the Arborist.

In addition, given that potentially-suitable leaf clusters on Maples and Oaks for Tri-colored Bat will change from year to year, all Maples and Oaks were included in the summary of candidate foliage bat roost trees for Tri-colored Bat.

4.3.4 Insects

In total, 15 Odonata species and 23 butterfly species have been reported from the vicinity of the Study Area, based on the Odonata Atlas and NHIC database review (MNR 2019c), and the Ontario Butterfly Atlas (MacNaughton et al. 2019). No odonata or butterfly species were observed during field visits conducted by NRSI biologists. A complete list of insect species reported from the Study Area is provided in Appendix II.

4.4 Aquatic Features

4.4.1 Aquatic Habitat

Within the vicinity of the EMS-001, the watercourse is characterized by a relatively shallow channel flowing through a heavily disturbed industrial area within the vicinity of Clark Boulevard and Eastern Avenue.

No aquatic vegetation was observed within the vicinity of EMS-001. The watercourse is lined with cement block, and east of Rutherford Road is perched. Extensive debris is present throughout, with glass and barbed wire found throughout.

During the field assessment (June 25, 2019), the water temperatures was 18°C, with an air temperature of 30°C at 0900hrs. The pH was 7.94, with a conductivity of 0.32ms/cm, and 0.15ppt of Total Dissolved Solids (TDS). No fish or other aquatic organisms were observed during the field survey.

Several barriers to fish passage are located downstream of the Study Area, suggesting poor connectivity for fish species. A perched culvert is present on the east side of Rutherford Road South. In addition, a raised armourstone weir is located approximately 65m downstream of Rutherford Road South (GEO Morphix 2021).

4.4.2 Fish Community

No SAR fish species are reported from the Study Area (DFO 2019). NRSI biologists did not observe any fish species during the fish community assessment completed within the Study Area in 2019. Direct fish habitat is absent from the Study Area due to poor connectivity, low quality aquatic conditions, and absence of a fish community. The channel is, however, likely to provide indirect fish habitat as it provides flow to fish habitat downstream.

5.0 Significance and Sensitivity of Natural Features

Analysis of the significance of existing natural features was used to identify those features and habitats that are sensitive to disturbance based on the rarity or sensitivity of the feature or the functions/processes that contribute toward their significance. This assessment also considered the policies, legislation, and regulations that apply to the Study Area natural features which must be considered in the evaluation of the proposed development. The following is a discussion of the results of this analysis with regards to background information and the limited presence of natural features within the Study Area.

5.1 Wetlands

No wetlands are present within the Study Area.

5.2 Watercourse and Floodplain

The watercourse, which is a tributary to the Spring Creek, and its associated floodplain are regulated under the TRCA's *Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Regulation* (Ontario Regulation 166/06). Development and site alteration within TRCA-regulated lands is prohibited unless permitted by the TRCA under the policies of the regulation. The TRCA has developed a policy guideline document, *The Living City Policies for Planning and Development in the Watersheds of the Toronto and Region Conservation Authority* (TRCA 2014b), which describes the policies that are used to administer O. Reg. 166/06. Section 8.9 of the Living City Policies addresses infrastructure developments that are required to occur in TRCA regulated areas, including for the purposes of replacing or expanding existing road and culvert infrastructure. Under this policy, development and site alteration associated with infrastructure may be permitted to occur in regulated areas provided that various conditions are met, which include but are not limited to the following as it relates to the proposed undertaking:

- Risks associated with flood and erosion hazards are avoided or acceptably mitigated;
- Intrusions into natural areas are avoided or otherwise minimized, with restoration and enhancement measures implemented where feasible;
- The infrastructure is designed to maintain existing watercourse baseflow, floodplain configuration, and valley or stream corridor topography;

- Surface and groundwater quality are not impaired by sediments or contaminants; and,
- Environmental monitoring and contingency plans are developed according to TRCA standards in case of emergencies during construction and operation.

5.3 Habitat of Endangered and Threatened Species

No SAR were documented by NRSI within the Study Area. Refer to the SAR/SCC screening table provided in Appendix I for an analysis of all significant species assessed within the Study Area.

5.3.1 Candidate Habitat – Species at Risk Bats

Although the Study Area is located within an extensively industrial and developed area, potentially suitable roosting habitat for SAR bats was identified in 71 candidate bat roost trees for Little Brown Myotis and Northern Myotis and 108 candidate foliage bat roost trees for Tri-colored Bat (Maples and Oaks; Map 3). In addition to these candidate roost trees, suitable foraging habitat for Little Brown Myotis and Tri-colored Bat may also be present along the watercourse and along the edges of the Fresh-Moist Lowland Deciduous Forest (FOD7) community. Suitable habitats for these species are considered ‘candidate’, since no leaf-off bat cavity surveys or targeted bat exit surveys were completed.

These 3 species are listed as Endangered both provincially and federally (MECP 2022c, Government of Canada 2022) and are afforded general habitat protection under the *ESA* (Government of Ontario 2007). The MECP should be consulted as soon as possible regarding the candidate SAR bat roost trees that are within the proposed development area. The MECP will likely require that the trees are removed outside the bat active season (outside of April 1 to September 30) and may request that updated leaf-off and leaf-on bat habitat assessments be completed, and/or that acoustic bat surveys be completed to understand the extent and quality of candidate habitat proposed to be removed and to determine what (if any) bat species are using the candidate habitat during the peak maternity roosting period. Any correspondence with the MECP regarding the removal of candidate SAR bat roosting trees should be shared with the other reviewing agencies.

5.4 Significant Wildlife Habitat

No SWH was confirmed for the Study Area. Refer to the SWH screening tables provided in Appendix I for an analysis of all significant species assessed within the Study Area.

5.5 Fish Habitat

Aquatic habitat within the Study Area includes a small watercourse (Map 3) within the Spring Creek Subwatershed of Etobicoke Creek (TRCA 2021a). The fish community assessment conducted by NRSI biologists resulted in no fish observations. NRSI biologists noted poor aquatic habitat due to the channelized characteristics of the watercourse feature. The channel does not provide direct fish habitat, although it does provide indirect fish habitat through the flow provided to downstream habitats. The *Fisheries Act* protects fish and fish habitat (as identified within the Act to include both direct and indirect habitat) up to the high-water mark. The tributary is regulated by the TRCA according to Ontario Regulation 166/06 (Government of Ontario 2006). The TRCA can prohibit or regulate the straightening, changing, diverting or interfering with the existing channel and its shorelines in any way. Development, interference or alterations within the regulation limit may be permitted if, in the opinion of the TRCA, the development will not affect the control of flooding, erosion, dynamic beaches, pollution, or the conservation of land.

As indirect fish habitat, the tributary falls under the protections of the federal *Fisheries Act*. Under the Act, actions that would cause the harmful alteration, disruption or destruction of fish habitat (HADD) are prohibited. Any activities that may cause HADD must first be assessed through the self-assessment process and if there is potential that the preferred alternative will cause HADD, then the project will need to be submitted to DFO for a site-specific review to determine if a *Fisheries Act* Authorization or Letter of Advice is required.

5.6 Regionally Significant Species

A single occurrence of one regionally significant vegetation species was reported within the Study Area during NRSI field investigations. The plant species of regional concern, Larger Straw Sedge, was located within the wooded riparian area associated with the Fresh-Moist Lowland Deciduous Forest (FOD7) community (Map 3).

5.7 Buffers

Buffers are mitigation measures required around natural heritage features such as woodlands, wetlands, significant wildlife habitats, and watercourses to provide protection to such features and their associated functions from potential impacts as a result of development and/or site alteration. Properly functioning buffers protect natural features against sedimentation, erosion, provide attenuation of precipitation and run-off, protect against human disturbances, serve as habitat transition zones, and contribute to the protection of the natural feature through, for example, maintaining microclimate conditions and limiting the spread of invasive species to within the sensitive natural feature.

According to *The Living City Policies for Planning and Development in the Watersheds of the Toronto and Region Conservation Authority* (TRCA 2014b), which describes the policies that are used to administer O. Reg. 166/06, the TRCA typically requires a 10m buffer from the greater of the long-term stable top of slope/bank, stable toe of slope, Regulatory flood plain, meander belt, and any contiguous natural features or areas. An average buffer width of 14.0m from the top of the bank is provided, with a minimum buffer width of 9.3m in the small area just north of the proposed Clark Boulevard extension and a maximum buffer width of 35.6m at the southeast corner of Clark Boulevard and Rutherford Road South. Although in the small area just north of Clark Boulevard is proposed to have a buffer width slightly less than 10m, the majority of the realigned watercourse has a buffer width much greater than 10m, which is sufficient to protect the form and function of the watercourse.

6.0 Alternative Designs

6.1 Evaluation of Alternatives

Consistent with the Class EA process, a number of alternatives were considered as part of the EA to accommodate the required road and service upgrades. The process included an extensive evaluation of impacts on the natural and social environment, which considered natural heritage features, as well as traffic patterns and potential impacts to residents and businesses in the community. The process also considered the technical feasibility and cost of the different alternatives put forward.

The City undertook considerable efforts to identify alternative designs and innovative approaches to meet the needs and objectives of the project, to adhere to the recommendations of the Transportation Analysis Report (HDR 2021b) and the City's Active Transportation Master Plan (2019), as well as to avoid impacts to significant natural heritage features, where possible (HDR 2021a). Several alternative designs, with different combinations of active transportation facilities, road widening options, and road alignments for the Clark Boulevard Extension, were developed and presented to the public for input. In addition, different placements of elements within the 30m road right-of-way (ROW) for Eastern Avenue and Clark Boulevard were reviewed to assess placement options for street trees, active transportation facilities, vehicle lanes, light and hydro poles, and curbs and gutters (HDR 2021a). The alternative designs for Active Transportation, Road Widening, and Alignment of Clark Boulevard Extension, carried forward for an in-depth evaluation using criteria related to technical and engineering, natural environment, planning objectives, social and cultural environment, and economic environment, are provided in Table 5.

For Active Transportation, the preferred alternative is to have sidewalks on both sides of the road, with a multi-direction cycle track on the north side (Alternative 4; Table 5). This alternative was selected as it provides the greatest separation between pedestrians and cyclists, provides cyclists with bi-directional travel options, limits additional conflict points for cyclists at driveways, with the cycling track crossing driveways along the north boulevard only, and accommodates the planning objectives, including the Active Transportation Master Plan (2019) and proposed future Greenway.

For the Road Widening, the preferred alternative is to have the widening be centered on the road's centreline (Alternative 2; Table 5). This minimizes impacts to businesses on both sides

of the road, minimizes property requirements, and has lower capital and construction costs. From a natural heritage perspective, the three alternatives for road widening are equivalent as they will all be within the existing 30m ROW.

For the alignment of the Clark Boulevard extension, the TRCA indicated that they would not be supportive of new road construction parallel to the existing watercourse channel, and that a perpendicular watercourse crossing was preferred. Therefore, a direct road alignment between Hansen Road and Rutherford Road, rather than the alignment along the north side of the watercourse, was preferred (Alternative 2; Table 5). In order to achieve a perpendicular crossing, the existing watercourse is proposed to be realigned and restored and a new crossing structure will allow the watercourse to flow under the new road extension.

Table 5. Alternative Designs and Preferred Alternatives for Active Transportation, Road Widening and Alignment of Clark Boulevard Extension

| Alternatives | Active Transportation | Road Widening | Alignment of Clark Boulevard Extension |
|------------------------------|--|--|---|
| 1 | Boulevard one-directional cycle tracks and sidewalks on both sides | Widening on the north side of Eastern Avenue | Direct road alignment between Hansen Road and Rutherford Road, curved at watercourse crossing |
| 2 | Multi-use paths on both sides | Widening on both sides of Eastern Avenue | Direct road alignment between Hansen Road and Rutherford Road, curved east of watercourse crossing |
| 3 | Sidewalk on south side and multi-use path on north side | Widening on the south side of Eastern Avenue | Jogged Intersection at Hansen Road, alignment north of watercourse (no crossing) and connect to Rutherford Road |
| 4 | Sidewalks on both sides, multi-direction cycle track on the north side | N/A | N/A |
| Preferred Alternative | 4 | 2 | 2¹ |

¹The TRCA indicated that they would not be supportive of new road construction parallel to the existing watercourse channel, and that a perpendicular creek crossing was preferred.

6.2 Preferred Alternative

The preferred alternative for the for the Eastern Avenue and Clark Boulevard corridor improvements within the existing 30m ROW include widening and urbanization of the existing roadway from 2 to 4 lanes, with curb-lanes being 3.75m wide and inside lanes being 3.5m wide (HDR 2021a). Certain sections of the road will have 4m centre turning lanes and intersections will have 3.5m wide right and left turn lanes. A 3.0m wide multi-use trail will be located on the north side of Clark Boulevard while a 1.5m sidewalk will be located on the south side. The design concept also includes intersection improvements at Kennedy Road, Hansen Road, Rutherford Road, and at the rail crossing east of Kennedy Road (HDR 2021a). Crosswalks or crossrides will be installed at intersections (HDR 2021a).

Clark Boulevard is proposed to be extended between Hansen Road and Rutherford Road. A 245m section of the watercourse will be re-aligned and restored to achieve a perpendicular road crossing. A new 8.535 x 2.44 m Conspan arch culvert crossing is proposed to be installed over the watercourse.

The proposed design will include upgrades to the existing subsurface road drainage system, consisting of storm sewer systems, catchbasins along the curb lines to convey stormwater runoff to the various outfall locations along the corridor, and bioretention systems (HDR 2022).

The preferred draft plan and cross section, prepared by HDR (dated March 31, 2022), are provided in Appendix IV.

7.0 Impact Analysis of the Preferred Alternative

7.1 Approach to Impact Analysis

Potential impacts arising from the preferred alternative for the Eastern Avenue and Clark Boulevard corridor improvements were determined by comparing the details of the proposed undertaking with the characteristics of the existing natural heritage features and their functions. Where the development proposal overlaps with the natural features or their buffers, impacts may arise. The following types of impacts are discussed:

- Direct Impacts – associated with the disruption or displacement of natural features, caused by the actual “footprint” of the undertaking,
- Indirect Impacts – associated with changes in site conditions such as drainage and water quantity and quality,
- Induced impacts – associated with impacts after the development is completed, such as increased pressures on natural areas, and
- Cumulative impacts associated with the changes to the environment resulting from the proposed undertaking in combination with incremental impacts caused by other past, present, and future activities in the Study Area.

7.2 Direct Impacts and Mitigations

Direct impacts are expected to be minimal given that the majority of the proposed undertaking will be within the existing road ROW but may include tree and vegetation removal and associated potential impacts to bird nests. The watercourse will be realigned to accommodate a new road crossing, and therefore fish habitats downstream may be impacted.

7.2.1 Vegetation and Tree Removals

The majority of the roadside lands to be directly impacted by proposed road works are anthropogenically disturbed and highly developed. Direct impacts resulting from the proposed undertaking on vegetation and trees will include:

- The removal of approximately 0.38ha of the Fresh-Moist Lowland Deciduous Forest (FOD7) community within the proposed extension of the Clark Boulevard ROW and re-aligned watercourse. Ecological habitat enhancements have been proposed to restore this degraded forest community as part of the undertaking (see Section 8.0).

- The removal of 237 inventoried trees, 100 of which require compensation according to the City's Tableland Tree Assessment Guidelines (City of Brampton 2018), primarily along the watercourse and, to a lesser extent, in areas of impact along nearby roadways (Eastern Avenue, Clark Boulevard, Rutherford Road, Kennedy Road) which are recommended for removal to accommodate the proposed undertaking. These removals may be required where trees are directly in conflict with a proposed layout, or where trees are near enough to sustain significant injuries to roots or other parts from construction activities (see the TPP in Appendix III for additional details). A detailed analysis of retention opportunities will take place at the detailed design stage.
- The removal of 154 candidate bat roost trees for SAR bats and potential direct impacts to bats potentially roosting in these trees.
- Potential direct impacts on breeding birds through damage and destruction of nests, eggs and young, or avoidance of the area by breeding adults.

No federally or provincially significant species will require removal as a result of the planned road improvements. Larger Straw Sedge, which is listed in the TRCA watershed as L3, of Regional Concern, is outside the preferred alternative area and will not be impacted.

Mitigation Measures:

- The limit of development should be clearly delineated in the field prior to construction beginning.
- To compensate for the removal of 0.38ha of Fresh-Moist Lowland Deciduous Forest (FOD7), approximately 0.81ha of forest habitat, which is over twice that being removed, is proposed to be restored or created. This will include 0.72ha of forest habitat to be restored on either side of the re-aligned watercourse and 0.09ha of upland forest habitat to be created on the lands southwest of the intersection of Clark Boulevard and Rutherford Road South. In addition, another 0.09ha of native herbaceous species will be planted directly adjacent to the watercourse. Suitable regionally-native species should be selected for planting and these should be maintained appropriately (see Section 8.0 for more details).
- Recommendations have been provided in the TPP to protect trees, mitigate construction impacts to retained trees, and to inspect tree protection fencing and

respond to instances of mortality or damage to retained trees. See the TPP in Appendix III for additional details of the tree protection and mitigation requirements, including tree compensation.

- It is recommended that suitable regionally-native species of street trees be planted along the ROW and that appropriate soil volumes and tree spacing be provided so that the street trees can thrive. See the TPP in Appendix III for additional details.
- The MECP should be consulted as soon as possible regarding the 154 candidate SAR bat roosting trees that are within the proposed development area and the proposed approach to mitigating impacts (i.e., implementing timing windows for tree removals and habitat compensation). The MECP may require that the trees are removed outside the bat active season (outside of April 1 to September 30) to avoid direct impacts to individual bats and thereby avoiding contravening Section 9(1) of the *ESA* (Government of Ontario 2007), or the MECP may request that updated leaf-off and leaf-on bat habitat assessments be completed, and/or that acoustic bat surveys are completed to determine what (if any) bat species are using the trees during the peak maternity roosting period.
- To compensate for the removal of 154 candidate bat roost trees, 655 native trees, over 4x the number of roost trees to be removed, are proposed to be planted within the Ecological Enhancement Areas.
- Prior to construction work starting, examination of work area by qualified biologist and relocation of any wildlife.
- Vegetation clearing is recommended to occur outside the breeding bird period (April 1 to August 31) to limit disturbances to nesting activities of birds within the Fresh-Moist Lowland Deciduous Forest (FOD7) community and isolated trees, and to avoid destruction of active nests. The destruction of migratory birds and their nests is prohibited under the federal *Migratory Birds Convention Act*, 1994 (CWS 2013).
- If vegetation clearing cannot be avoided during the core bird nesting season, a qualified avian biologist must be retained to carry out a nest search ahead of clearing activities within “simple” (i.e., non-forested) habitats. Vegetation clearing can only proceed if there are no active nests.

7.2.2 Impacts to Fish and Aquatic Habitat

The proposed Clark Boulevard extension design involves a new crossing via a culvert, and a realignment of a 245m section of the watercourse. In advance of identifying the preferred alternative, a geomorphological study was completed by GEO Morphix (2021). The geomorphological study assessed the erosion hazards associated with the watercourse, crossing requirements, and evaluated the need for erosion protection and channel realignment in the vicinity of the Clark Boulevard extension.

A Drainage and Stormwater Management Report was prepared by HDR (July 2022) which included a Hydraulic Assessment of the watercourse. The hydraulic assessment within the report incorporated a Channel Alignment Options Memo that was prepared by Matrix Solutions Inc. in 2020 as part of the Queen's Boulevard Planning District Flood Mitigation Study to assess the flooding impact of various options for the channel realignment. Additional details regarding the memo are provided in the Drainage and Stormwater Management Report (HDR 2022). Within the report, a preliminary hydraulic assessment was conducted of the proposed 36.1m length by 8.535 x 2.44m Conspan arch culvert, and also included a comparison to existing conditions without the downstream Rutherford Road improvements, to ensure that the works would not generate negative upstream water surface elevation impacts. Based on the preliminary assessment, the hydraulic analysis results for the Clark Boulevard Extension Crossing indicates that the culvert meets the MTO freeboard criteria, and there is no regional overtopping under the Regional storm. The report also indicates that the results of the assessment show that the proposed crossing and channel realignment works will have no impact on the upstream and downstream water surface levels (HDR 2022). The report also indicates that more detailed analysis and coordination with the City of Brampton and TRCA is required during detail design to minimize the potential for flooding within the study area.

An assessment was carried out to determine the presence of fish and fish habitat, and identify whether the proposed Clark Road extension design, realignment of the watercourse, installation of the culvert crossing, and stormwater management plan have the potential to impact aquatic habitat in the study area. This assessment determined that, un-mitigated, the proposed works have the potential to result in a HADD to fish habitat (which includes direct and indirect habitat). Based on the extent of the proposed work and the current condition of the watercourse, it is expected that a HADD of fish habitat can be avoided, however, due to the nature of the works including the realignment, it is recommended that a Request for Review be submitted to DFO

for approval at the Detailed Design stage, when full details on the watercourse realignment (fluvial works) and the watercourse crossing are known.

Mitigation Measures:

- In-water works should be completed between July 1 and March 31 to have the least impact on aquatic systems (note that vegetation clearing is recommended to happen between October 1 and March 31 in order to avoid impacts to migratory birds and SAR bats, as explained above).
- Duration of in-water works should be minimized and should be scheduled to avoid wet, windy and rainy periods that may increase erosion and sedimentation.
- Any temporary stockpiled soil, debris, etc., should be stockpiled at least 30m from the watercourse and be properly contained.
- Flow must be maintained within the watercourse (upstream and downstream) during construction works.
- All in-water works should be completed in isolation.
- Although no fish were observed, as a precaution, any hoses conveying water should be screened as per the DFO Interim Code of Practice.
- A fish salvage should be completed prior to in-water works occurring.
- Maintain riparian vegetation and an undisturbed vegetation buffer where possible.
- A robust Erosion and Sediment Control (ESC) Plan should be developed at the detailed design stage and implemented throughout construction.
- The watercourse should be monitored regularly during all phases of work.
- Develop an Emergency Spill Response Plan to be implemented in the event of a spill of a deleterious substance.

The DFO has developed Pathways of Effects (PoE) diagrams to describe the cause-effect relationships connecting project activities to potential stressors, and the stressor to the ultimate effect on fish and fish habitat. These PoE's identify appropriate mitigation measures, and determine if there would be residual effects. Based on the proposed realignment and culvert crossing, these works will involve various construction activities that have the potential to impact fish and fish habitat both in-water and on land. The PoE's will be utilized during the request for review application to determine if any residual effects will be likely, which will then determine if the works will require an Authorization or Letter of Advice from the DFO.

As there are potential barriers to fish within the watercourse, as well as very poor conditions within the existing channel, the realignment design should incorporate natural channel design to avoid new barriers and work to improve the longitudinal connectivity within the system, providing an improvement over current conditions.

7.3 Indirect Impacts and Mitigation

7.3.1 Sediment and Erosion

During construction, areas of bare soil will be exposed which have the potential to erode during rainfall events and impact adjacent natural features. In the event of a heavy rain, sediment-laden runoff can enter adjacent natural areas by way of overland flow. In order to protect on-site and off-site natural heritage features from potential impacts due to sediment, a sediment and erosion control plan must be developed and implemented prior to any construction activities on the site.

During the site grading work, suitable sedimentation controls will be required to help control and reduce the turbidity of run-off water which may flow towards the surface water features. As construction work progresses at the site, regular maintenance and additional sedimentation measures may be required to limit the effect of siltation of run-off water in localized areas.

For additional details on proposed sediment and erosion controls, refer to HDR's Drainage and Stormwater Management Report (2022).

Mitigation Measures:

- A robust ESC Plan should be developed at the detailed design stage and implemented throughout construction.
- Placement of ESC fencing is to be installed prior to any construction, grading or digging, in order to demarcate the development limit. ESC fencing is to be inspected for proper installation by a Certified Arborist, Landscape Architect, or otherwise qualified individual.
- Maintenance of machinery during construction should occur at a designated location away from the natural areas on-site, at least 30m from the watercourse.
- No storage of equipment, materials or fill is to occur within the natural areas.
- All ESC measures are to be inspected and monitored, and repairs are to be completed immediately, as required.

- All materials and equipment used for the purpose of site preparation and project completion should be operated and stored in a manner that prevents any materials from leaving the development site.
- Any areas of bare soil within the construction area are to be re-vegetated as soon as feasible to prevent erosion of soils and keep dust to a minimum.
- Following completion of construction and site stabilization, all ESC measures and accumulated sediment are to be removed.

7.3.2 Surface Flow and Groundwater Water Balance

Given that the Study Area is already developed and the relatively small amount of increased impervious surface that is expected relative to existing conditions, indirect impacts associated with alterations to surface flow and groundwater water balance are expected to be minimal or negligible. However, due to the location of the watercourse immediately adjacent to the proposed road works, there is potential for hydrological and water quality impacts to this feature and its downstream aquatic habitats.

As outlined in HDR's Drainage and Stormwater Management Report (2022), the proposed roadway profile will generally remain consistent with existing conditions along the existing Eastern Avenue and Clark Boulevard, and the overall drainage pattern will generally match the existing conditions. One area of exception to this is the area between approximately 100m west of Hansen Road South and 70m west of Rutherford Road South, which will be raised to accommodate the proposed road extension and watercourse re-alignment. This area will be sloped to the east (HDR 2022). For areas where the roadway is higher than the existing ground, a continuous slope will be provided which will direct runoff from external drainage areas to their existing outlets (HDR 2022). For areas where the roadway is lower than the existing ground, runoff will be captured into a proposed storm sewer system by ditch inlet catchbasins (HDR 2022).

Existing groundwater levels in the area of the proposed watercourse crossing range from 0.54 to 1.09 meters below ground surface (mbgs) on Eastern Avenue and from 1.52 to 2.93mbgs at the proposed Clark Boulevard extension. Soil infiltration rates and groundwater levels should be confirmed for all proposed Low Impact Development (LID) locations at the detailed design stage through in-situ infiltration rate measurements (HDR 2022).

For additional details on surface flow and groundwater balance, refer to HDR's Drainage and Stormwater Management Report (2022),

A detailed stormwater management plan will be prepared as part of the detailed design. Engineering designs for the proposed road improvements will strive to maintain existing drainage patterns, flow rates and volumes relative to existing conditions.

7.3.3 Changes to Water Quality

The greatest potential for water quality impacts associated with the proposed undertaking relate to contamination of the watercourse, which is proposed to be re-aligned as part of the proposed road improvements. Water quality mitigation measures should be designed with a focus to protect this aquatic feature and its downstream aquatic habitats.

Watercourses within the TRCA's area of jurisdiction are required to have an "Enhanced" level of protection for water quality. As such, stormwater management measures for the proposed undertaking will be engineered at the detailed design stage to provide an "Enhanced" water quality treatment, at a minimum, which means removal of 80% of the Total Suspended Solids (TSS; HDR 2022).

For water quality treatment, erosion control, and water balance, a series of bioretention cells is proposed for catchments within the Study Area that discharge directly to the watercourse (HDR 2022). These bioretention cells, located in the boulevards parallel to the storm sewers, will allow for stormwater filtration, as well as evapotranspiration from vegetation. In addition, Oil-Grit Separator (OGS) units are proposed for some drainage areas which discharge to existing municipal systems (HDR 2022). The location and performance characteristics of water quality control structures, as well as possible use of supplemental measures to control water quality and water temperatures, including other LID measures, will need to be confirmed at the detailed design stage.

The use of road salt during winter should be minimized, or alternatives to road salt should be used to avoid water contamination in the watercourse and downstream aquatic habitats.

For additional details on the proposed water quality controls, including details on the proposed design of the bioretention cells, refer to HDR's Drainage and Stormwater Management Report (2022).

Mitigation Measures:

Engineering designs for the proposed road improvements are anticipated to include any water quality mitigation measures that are deemed necessary. This assessment will be made based on the outcome of detailed design; however, mitigation measures should include:

- Ensuring all construction equipment and machinery (i.e., cranes, backhoes) arrives on site in clean condition and is checked and maintained free of fluid leaks.
- Machinery must be refueled, washed and serviced a minimum of 30m from the watercourse so as to prevent contamination by deleterious substances.
- Fuel and other construction related materials should also be located away from the watercourse (i.e., at least 30m away).
- A Spill Response Plan (SRP) must be developed prior to commencement of construction. This SRP should provide a detailed response system to deal with events such as the release of petroleum, oils and lubricants or other hazardous liquids and chemicals. A spill kit must also be kept on site at all times and on-site workers must be trained in the use of this kit and be fully aware of the SRP.
- ESC measures must be installed prior to any site works and maintained in excellent working order.

7.3.4 Indirect Impacts to Wildlife

Given that there will be a new road crossing through the watercourse and riparian area, potential indirect impacts to wildlife from the proposed undertaking may include:

- Increased noise and dust associated with construction, although these are anticipated to be temporary and therefore significant impacts to wildlife from construction activities are not expected.
- The potential for reduced wildlife movements along the watercourse, although following the watercourse re-alignment, the new Clark Boulevard extension crossing will promote wildlife movements along the watercourse, which is an improvement over current conditions.
- Unnatural lighting and traffic noise resulting from the proposed Clark Boulevard extension may affect wildlife behaviour and ability to forage, reproduce, etc.
- Increased potential for rubbish in the watercourse and associated riparian area due to the proposed road crossing.

Mitigation Measures:

- In order to suppress dust, areas of bare soil should be moistened with water during construction activities to ensure that the amount of dust within the Study Area is reduced. Topsoil stockpile locations should be in areas of lesser wind exposure and away from natural features and their buffers. Proper ESC measures should be employed. Areas of bare soil that will not be touched for several weeks should be seeded with Annual Rye (*Lolium multiflorum*) or equivalent to reduce erosion.
- The culvert crossing installed on the re-aligned watercourse channel should be designed to promote the movement of wildlife and should be designed following the guidelines provided in the Ontario Ministry of Transportation's Environmental Guide for Mitigating Road Impacts to Wildlife (MTO 2017).
- Lighting designs should consider directional lighting for areas that are within 30m of natural features to eliminate lightwash. Detailed lighting designs will be provided at the detailed design stage.
- Noise mitigation measures (e.g., baffles, sound barrier walls, or additional tree and shrub plantings) should be considered for installation along the section of road that crosses the re-aligned watercourse and its associated riparian areas.
- Rubbish bins should be placed along the sidewalk and multi-direction cycle track in the areas adjacent to the re-aligned watercourse and its associated riparian areas to encourage proper disposal.
- Chain-link fences should be installed on the outside of the naturalized channel, especially in the vicinity of the road crossing, to help prevent rubbish from blowing into the channel. This will also help prevent people from entering the natural area.

7.4 Induced Impacts

No induced impacts are anticipated from the redevelopment of the Study Area, given the highly developed nature of the surrounding landscape and that the existing natural areas are relatively unused and inaccessible to humans. The redevelopment of this area will provide an improvement over current conditions.

7.5 Cumulative Impacts

No cumulative impacts from the proposed development are anticipated given the highly developed nature of the surrounding landscape.

8.0 Ecological Habitat Enhancements

To compensate for the removal of approximately 0.38ha of the Fresh-Moist Lowland Deciduous Forest (FOD7) community for the proposed extension of the Clark Boulevard ROW and re-aligned watercourse, 0.9ha of land along the newly created riparian corridor and at the southwest corner of Clark Boulevard and Rutherford Road South is proposed to be restored or enhanced, as follows:

- Restoration of 0.72ha of Fresh - Moist Lowland Deciduous Forest (FOD7) in the upland areas on either side of the re-aligned watercourse. This forest will include a mix of 11 native deciduous trees species that are appropriate for the region and well-suited to the proposed topographic and soil conditions. A total of 580 individual trees are proposed to be planted throughout the 0.72ha area. It should be noted that only 204 compensation plantings are required, as per the compensation plan in the TPP (Appendix III). Regionally-suitable native shrubs and herbaceous plants will be planted and/or seeded in this area to create a sub-canopy and understory promote a diverse and healthy lowland native forest community. Refer to the planting plan for Area A on Map 4 for the location of the proposed forest restoration and details on the recommended species and planting densities/rates.
- Restoration of the 0.09ha of Forb Mineral Meadow Marsh (MAM2-10) in the sloped area directly adjacent to the re-aligned watercourse channel (Area B, Map 4). This area is expected to have fluctuating soil moisture levels as it lies within the floodplain adjacent to the watercourse. Therefore, a mix of lowland native sedges (*Carex* sp.) and herbaceous species such as Boneset (*Eupatorium perfoliatum*), Square-stemmed Monkeyflower (*Mimulus ringens*), and Blue Vervain (*Verbena hastata*), that are tolerant of fluctuating moisture levels will be planted as plugs. Additional moisture-loving and adaptable native species, including sedges, rushes (*Juncus* sp.), bulrushes (*Scirpus* sp.), grasses, and herbaceous species, will be seeded throughout the area.
- In addition to the restoration areas above, a 0.09ha Dry - Fresh Poplar Deciduous Forest (FOD3-1) is proposed to be created on the lands southwest of the intersection of Clark Boulevard and Rutherford Road South (Area C, Map 4). This deciduous forest community will include 75 trees belonging to 7 native species appropriate for the region and site and soil conditions. Regionally-suitable native shrubs and

herbaceous plants will be planted and/or seeded in this area to create a sub-canopy and understory and promote a diverse and healthy native forest community.

It is recommended that litter and refuse, which is found in abundance along the existing watercourse, be collected and removed.

Map 4 shows the proposed preliminary Ecological Habitat Enhancement areas, as well as the planting plans for each area. Additional details for the Ecological Habitat Enhancement areas, including more detailed maps of the species planting locations, staging, and planting specifications, will be provided at the detailed design stage.

Additional opportunities for native species plantings will also be considered for street tree plantings during detailed design.

The re-aligned watercourse is proposed to be rehabilitated/enhanced through a hybrid natural and engineered approach. This would consist of a natural cascade design with reinforced-bioengineered banks (GEO Morphix 2021). The re-aligned channel would also be designed to ensure there are no barriers to fish movement.

Considering the anthropogenically altered, channelized, and overall degraded nature of the existing watercourse and associated riparian forest, the proposed watercourse re-alignment provides a valuable opportunity to create additional natural habitat and to widen and enhance the structure and function of the watercourse riparian corridor. This will also serve to reduce runoff and sedimentation into the watercourse, provide additional flood mitigation (through enhanced water retention by vegetation), thermal protection and buffering for the watercourse, as well as to provide a habitat linkage for plants and animals.

9.0 Summary

NRSI was retained in April 2019 by HDR, on behalf of the City of Brampton, to complete the Natural Environment component of the required Class C EA for the road widening of Eastern Avenue, between Kennedy Road South and Hansen Road South, and an extension of Clark Boulevard from Hansen Road South to Rutherford Road South across an existing watercourse.

A Natural Environment Assessment Report (NEAR) was completed and submitted in September 2019 in accordance with the requirements of the Municipal Class Environmental Assessment (MEA 2015).

This EIS includes the natural heritage information background review, characterization of existing natural features, and analysis of the significance and sensitivity of natural features within the Study Area, as well as an assessment of the alternative designs for the proposed undertaking, with an impact analysis for the preferred alternative.

The majority of the Study Area contains highly disturbed industrial areas that contain a variety of impermeable surfaces, lacking natural features. A single watercourse, that is within the Spring Creek subwatershed of Etobicoke Creek, is present within the Study Area. The watercourse's adjacent riparian zone is the only natural feature identified within the proposed area of development. All the vegetation communities, wildlife and plant species observed within the Study Area are typical of urban communities. Despite being located within an extensively industrial and developed area, candidate habitat for 3 SAR bats was identified in the Fresh-Moist Lowland Deciduous Forest (FOD7) community. No fish were documented within the watercourse; however, the watercourse does provide indirect fish habitat through the flow provided to downstream habitats. One regionally significant vegetation species, Larger Straw Sedge, was reported within the forest community, but will not be impacted through the proposed development. No other significant species (SAR or SCC) or SWH were documented within the Study Area.

Alternative designs for Active Transportation, Road Widening, and Alignment of Clark Boulevard Extension, were evaluated using criteria related to technical and engineering, natural environment, planning objectives, social and cultural environment, and economic environment. For the alignment of the Clark Boulevard extension, the TRCA indicated that a perpendicular watercourse crossing was preferred. Otherwise, it was determined that the extent of impacts

from each alternative were similar from a natural heritage perspective, with the same types and extent of impacts anticipated.

The preferred alternative includes widening and urbanization of the existing roadway from 2 to 4 lanes, intersection improvements, a multi-use trail on the north side of Clark Boulevard and a sidewalk on the south side. Clark Boulevard is proposed to be extended between Hansen Road and Rutherford Road. A 245m section of the watercourse will be re-aligned and restored to achieve a perpendicular road crossing.

The road widening for the preferred alternative will occur largely within the existing road ROW. Therefore, direct impacts to natural features resulting from the preferred alternative design will be limited to the re-alignment of the watercourse and tree and vegetation removals in the Fresh-Moist Lowland Deciduous Forest (FOD7) community, and potential impacts to candidate SAR bat habitat.

This report provides recommendations to minimize the identified impacts and ensure that mitigation measures are installed and functioning properly. These include recommendations to mitigate direct and indirect impacts that may arise during the proposed undertaking. An area of 0.9ha of land along the newly created riparian corridor and at the southwest corner of Clark Boulevard and Rutherford Road South is proposed to be restored or enhanced to Fresh - Moist Lowland Deciduous Forest (FOD7; 0.72ha), Forb Mineral Meadow Marsh (MAM2-10; 0.09ha), and Dry - Fresh Poplar Deciduous Forest (FOD3-1; 0.09ha). This includes the planting of 655 trees belonging to 11 native species suitable to the region and local conditions.

Based on the preliminary design, and provided that these recommendations are implemented, negative impacts arising from this undertaking are not anticipated. Rather, natural heritage features and wildlife movement through the area may be improved through the proposed development. The impact assessment and recommendations for impact mitigation will be updated as necessary based on detailed design of the proposed undertaking.

10.0 References

- Bird Studies Canada (BSC). 2001. Ontario Breeding Bird Atlas: Guide for Participants. Published by Bird Studies Canada in Cooperation with the Federation of Ontario Naturalists, Ontario Field Ornithologists, Environment Canada and the Ontario Ministry of Natural Resources.
- Bird Studies Canada (BSC), Environment Canada's (EC) Canadian Wildlife Service (CWS), Ontario Nature (ON), Ontario Field Ornithologists (OFO) and Ontario Ministry of Natural Resources (MNR). 2008. Ontario Breeding Bird Atlas Database, 31 January 2008. <http://www.birdsontario.org/atlas/aboutdata.jsp?lang=en> (Accessed March 2019)
- City of Brampton. 2018. Tableland Tree Assessment Guidelines. Updated June 2018. Available online: https://www.brampton.ca/EN/Business/planning-development/guidelines-manuals/Documents/Tableland_Tree_Assessment_Guidelines.pdf
- City of Brampton. 2020. The City of Brampton Official Plan. Office Consolidation September 2020. https://www.brampton.ca/EN/City-Hall/Official-Plan/Documents/Sept2020_Consolidated_OP_2006.pdf
- Department of Fisheries and Oceans Canada (DFO). 2019. Aquatic Species at Risk Maps. <http://www.dfo-mpo.gc.ca/species-especes/fpp-ppp/index-eng.htm>. Last updated August 23, 2019.
- Dobbyn, J.S. 1994. Atlas of the Mammals of Ontario. Don Mills, Federation of Ontario Naturalists.
- Environment Canada. 2015. Proposed Recovery Strategy for Little Brown Myotis (*Myotis lucifugus*), Northern Myotis (*Myotis septentrionalis*), and Tri-colored Bat (*Perimyotis subflavus*) in Canada. Species at Risk Recovery Strategy Series. Environment Canada, Ottawa. ix + 110pp.
- Etobicoke and Mimico Creek Watersheds Task Force (EMCWTF). 2002. Greening our Watersheds – Revitalization Strategies for Etobicoke and Mimico Creeks Including the Etobicoke-Mimico Report Card. May 2002. <https://trcaca.s3.ca-central-1.amazonaws.com/app/uploads/2020/09/01183825/Etobicoke-Mimico-Creek-Watershed-Plan-2002.pdf>
- GEO Morphix Ltd. (GEO Morphix) 2021. Geomorphological Report, Tributary of Spring Creek. Municipal Class Environmental Study for Clark Boulevard Extension and Eastern Avenue Improvements from Rutherford Road to Kennedy Road. City of Brampton. Prepared for HDR Inc. December 17, 2021. Project No. PN19055.
- Government of Canada. 2019. Species at Risk Public Registry: Species Index. Last updated September 4, 2019. <https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry.html>

- Government of Canada. 2022. Species at Risk Public Registry: Species Search. COSEWIC Last Assessment Date: 2022-05-11. Available: <https://species-registry.canada.ca/index-en.html#/species?sortBy=commonNameSort&sortDirection=asc&pageSize=10>
- Government of Ontario. 2007. *Endangered Species Act, 2007*, S.O. 2007, c. 6. <https://www.ontario.ca/laws/statute/07e06>
- HDR. 2021a. Clark Boulevard/Eastern Avenue Improvements from Rutherford Road to Kennedy Road. Online Public Information Centre #2. City of Brampton. August 24, 2021.
- HDR. 2021b. Transportation Analysis Report. Clark Boulevard/ Eastern Avenue from Kennedy Road to Rutherford Road Class Environmental Assessment Study. Final. City of Brampton. April 21, 2021.
- HDR. 2022. Drainage and Stormwater Management Report. Environmental Assessment Study for Clark Boulevard Extension and Eastern Avenue Improvements. City of Brampton. July 12, 2022.
- Humphrey, Christy and Heather Fotherby. 2019. Recovery Strategy for the Little Brown Myotis (*Myotis lucifugus*), Northern Myotis (*Myotis septentrionalis*) and Tri-colored Bat (*Perimyotis subflavus*) in Ontario. Ontario Recovery Strategy Series. Prepared by the Ministry of the Environment, Conservation and Parks, Peterborough, Ontario. vii + 35 pp. + Appendix. Adoption of the Recovery Strategy for the Little Brown Myotis (*Myotis lucifugus*), the Northern Myotis (*Myotis septentrionalis*), and the Tri-colored Bat (*Perimyotis subflavus*) in Canada (Environment and Climate Change Canada 2018).
- Lee, H.T., W.D. Bakowsky, J. Riley, J. Bowles, M. Puddister, P. Uhlig and S. McMurray. 1998. Ecological Land Classification for Southern Ontario: First Approximation and its Application. Ontario Ministry of Natural Resources, Southcentral Science Section, Science Development and Transfer Branch. SCSS Field Guide FG-02.
- Municipal Engineers Association (MEA). 2015. Municipal Class Environmental Assessment (MCEA) Manual; October 2000, as amended in 2007, 2011 & 2015.
- Ministry of Municipal Affairs and Housing (MMAH). 2020. Provincial Policy Statement. Queen's Printer for Ontario. Effective May 1, 2020. <https://files.ontario.ca/mmah-provincial-policy-statement-2020-accessible-final-en-2020-02-14.pdf>
- Ministry of Transportation (MTO). 2017. Environmental Guide for Mitigating Road Impacts to Wildlife. March 2017. Updated final report submitted by Eco-Kare International to the Ministry of Transportation, St. Catharines, Ontario, 107 pages.
- Oldham, M.J., W.D. Bakowsky and D.A. Sutherland. 1995. Floristic quality assessment for southern Ontario. MNR, Natural Heritage Information Centre, Peterborough. 68 pp.
- Ontario Ministry of Environment, Conservation and Parks (MECP). 2022a. Bat Survey Standards Note 2022.

- Ontario Ministry of Environment, Conservation and Parks (MECP). 2022b. Maternity Roost Surveys (Forests/Woodlands).
- Ontario Ministry of Environment, Conservation and Parks (MECP). 2022c. Species at Risk in Ontario. Published: 2018-07-12. Updated: 2022-04-01. Available: <https://www.ontario.ca/page/species-risk-ontario>
- Ontario Ministry of Natural Resources (MNR). 2000. Significant Wildlife Habitat Technical Guide. October 2000.
- Ontario Ministry of Natural Resources and Forestry (MNRF). 2015. Significant Wildlife Habitat Ecoregion 7E Criterion Schedule: Addendum to Significant Wildlife Habitat Technical Guide. MNRF, January 2015.
- Ontario Ministry of Natural Resources and Forestry (MNRF). 2017. Survey Protocol for Species at Risk Bats Within Treed Habitats: Little Brown Myotis, Northern Myotis & Tri-colored Bat. April 2017.
- Ontario Ministry of Natural Resources and Forestry (MNRF). 2019a Natural Heritage Information Centre (NHIC): Biodiversity Explorer. <https://www.ontario.ca/page/natural-heritage-information-centre> (Accessed 2019).
- Ontario Ministry of Natural Resources and Forestry (MNRF). 2019b. Odonata Background Review. [Pers. Communication] Furrer, M., Biodiversity Information Biologist, Ministry of Natural Resources and Forestry Natural Heritage Information Centre. Personal Correspondence with Patrick Deacon on April 17, 2019 (email).
- Ontario Ministry of Natural Resources and Forestry (MNRF). 2019c. Species at Risk in Ontario (SARO) List. <https://www.ontario.ca/page/species-risk-ontario> (Accessed March 2019).
- Ontario Nature. 2019. Ontario Reptile and Amphibian Atlas. http://www.ontarioinsects.org/herpatlas/herp_online.html (Accessed March 2019).
- Region of Peel. 2021. Region of Peel Official Plan. Office Consolidation September 2021. <https://peelregion.ca/officialplan/download/pdf/office-consolidation-text-2021-sept.pdf>
- Sharpe, D. R. 1980: Quaternary Geology of Toronto and Surrounding Area; Ontario Geological Survey Preliminary Map P. 2204, Geological Series. Scale 1:100 000. Compiled 1980.
- Stanfield L. (editor). 2017. Ontario Stream Assessment Protocol. Version 10.0. Fisheries Policy Section. Ontario Ministry of Natural Resources. Peterborough, Ontario. 376 pages.
- Toronto and Region Conservation Authority (TRCA). 2008a. Toronto and Region Conservation Authority's Terrestrial Natural Heritage Program Vegetation Community and Species Ranking and Scoring Method. March 2008. 31pp
- Toronto and Region Conservation Authority (TRCA). 2008b. 2008 Fauna Ranks and Scores.

Toronto and Region Conservation Authority (TRCA). 2014a. TRCA Environmental Impact Statement Guidelines. October 2014. https://trca.ca/app/uploads/2016/02/EIS_Guideline_-_Jan232015bp.pdf

Toronto and Region Conservation Authority (TRCA). 2014b. The Living City Policies for Planning and Development in the Watersheds of the Toronto and Region Conservation Authority. November 28, 2014.

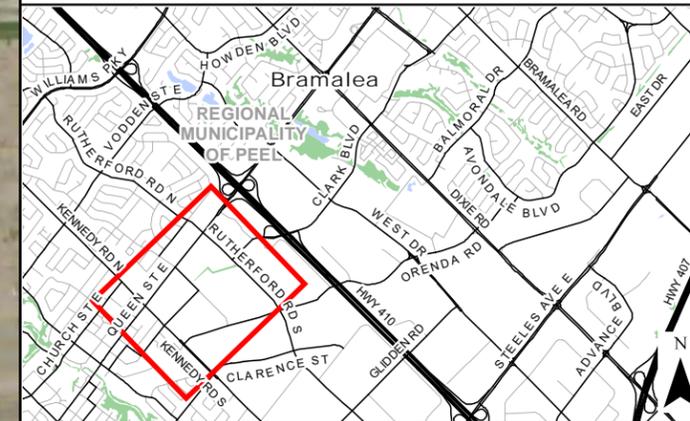
Toronto and Region Conservation Authority (TRCA). 2021a. Etobicoke Creek Subwatersheds. TRCA Information Technology and Records Management. January 26, 2021. https://trcaca.s3.ca-central-1.amazonaws.com/app/uploads/2021/06/29143809/Etobicoke-Creek-Watershed-MAP_jn29-21.jpg

Toronto and Region Conservation Authority (TRCA). 2021b. Etobicoke Creek Watershed Characterization Report. June 2021. https://trcaca.s3.ca-central-1.amazonaws.com/app/uploads/2021/06/29173309/AODA-Final-Watershed-Characterization-Report-ECWP-June-24_21.pdf

MAPS

Clark Boulevard and Eastern Avenue Environmental Assessment

Study Area



Legend

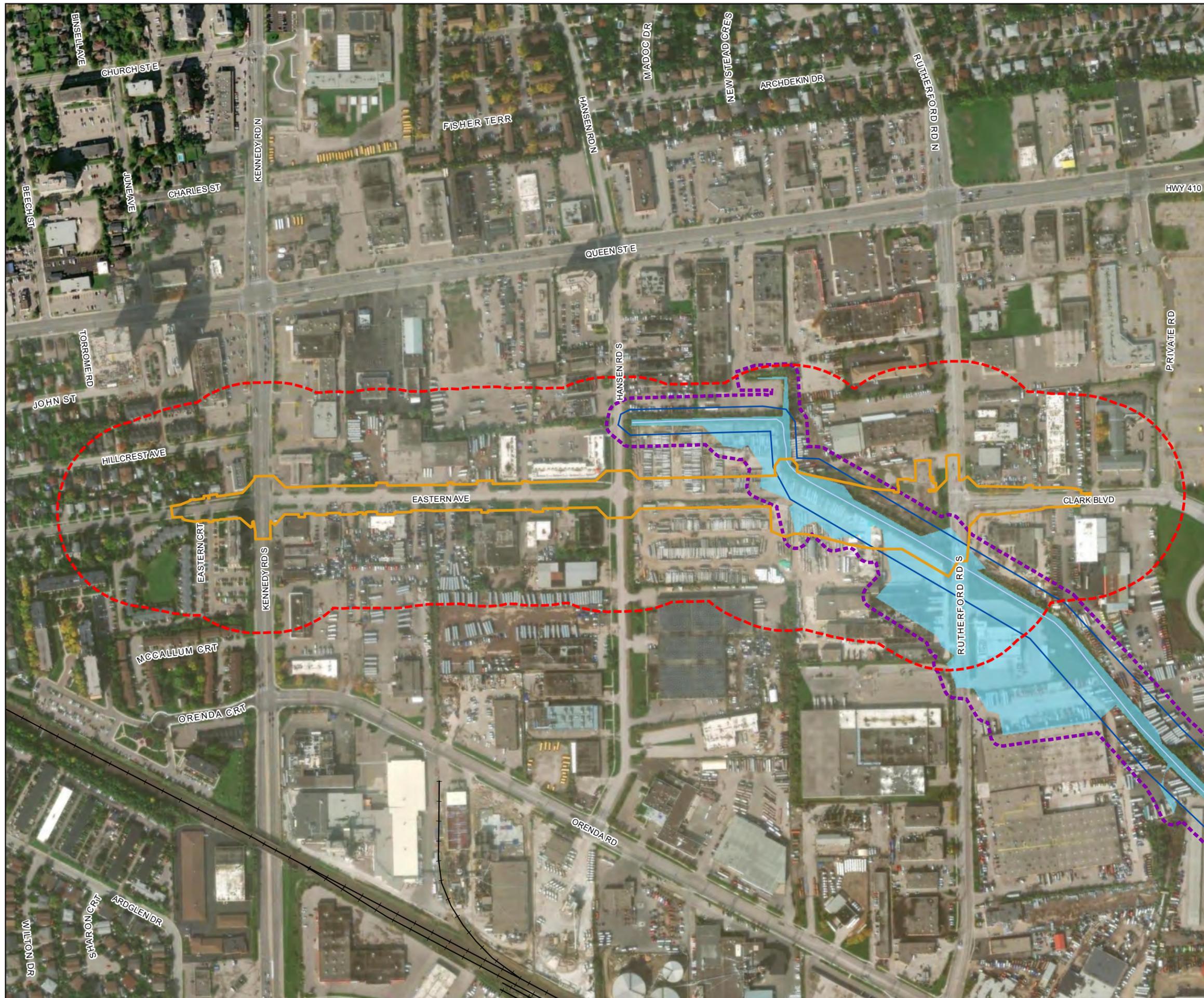
- Study Area (120m)
- Subject Lands
- Railway
- Permanent Watercourse
- Floodplain (TRCA)
- Regulation Limit (TRCA)
- Meander Belt (TRCA)



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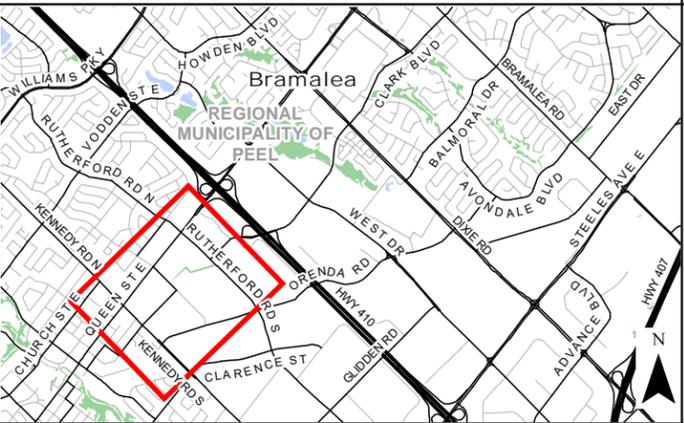
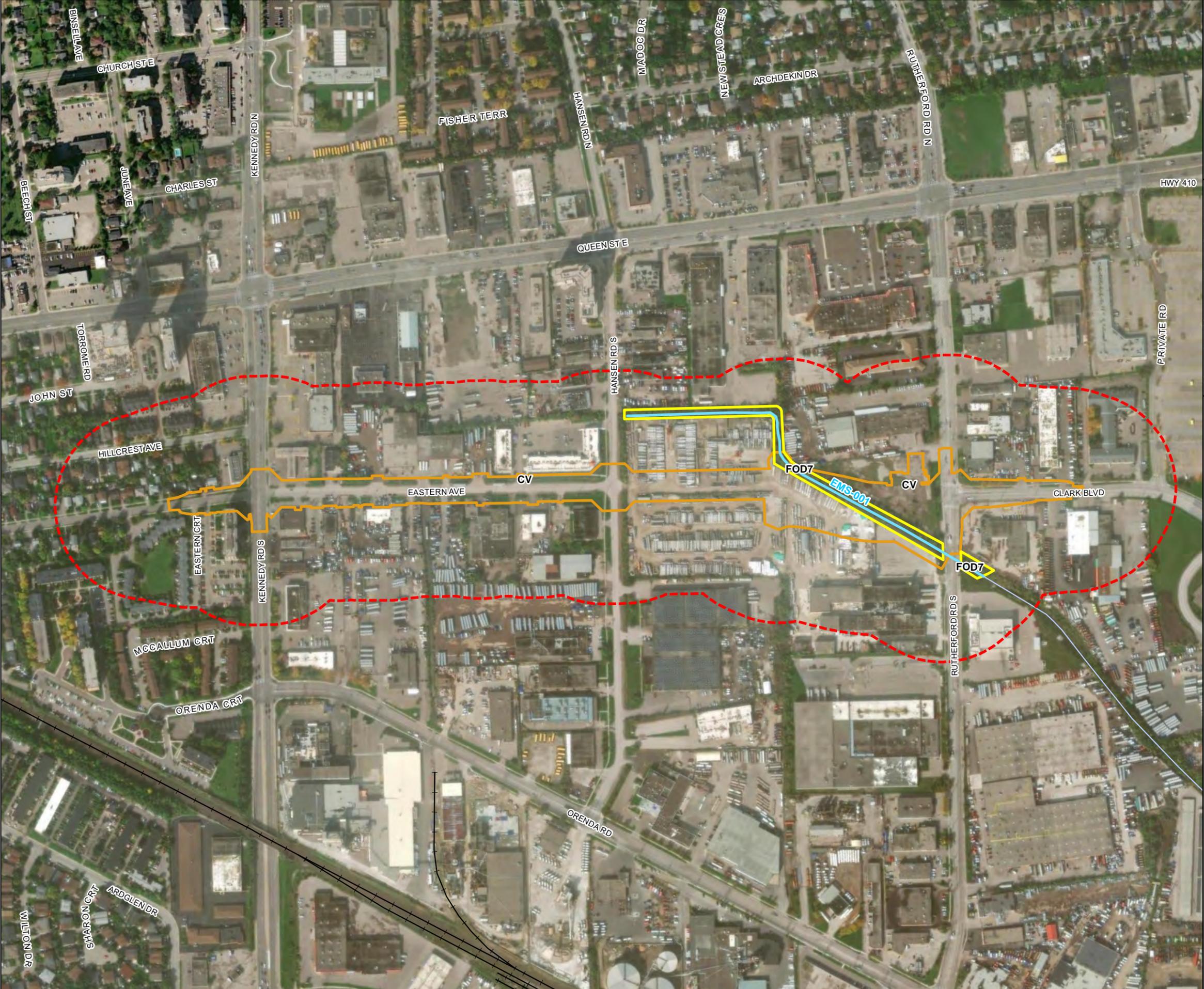
Project: 2258
Date: August 3, 2022

NAD83 - UTM Zone 17
Size: 11x17"
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Clark Boulevard and Eastern Avenue Environmental Assessment

Vegetation Communities and Monitoring Stations

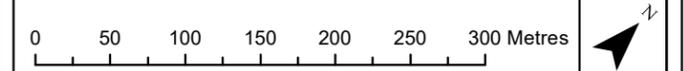


- Legend**
- Study Area (120m)
 - Subject Lands
 - Railway
 - Permanent Watercourse
 - Electro-fishing Monitoring Station (EMS-001)
 - Ecological Land Classification (ELC)
 - (CV) Constructed
 - (FOD7) Fresh - Moist Lowland Deciduous Forest Ecosite



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| Project: 2258 Date: August 3, 2022 | NAD83 - UTM Zone 17 Size: 11x17" 1:4,800 |
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Clark Boulevard and Eastern Avenue Environmental Assessment Significant Natural Features and Preferred Design



- Legend**
- Subject Lands
 - Preferred Alternative
 - Permanent Watercourse
 - Electro-fishing Monitoring Station (EMS-001)
 - Ecological Land Classification (ELC)
 - (CV) Constructed
 - (FOD7) Fresh - Moist Lowland Deciduous Forest Ecosite

*The tree inventory was completed in 2019, therefore the health of the Ash trees may have declined and/or they may no longer be standing.
 *The bat habitat assessment was not completed during the leaf-off period.

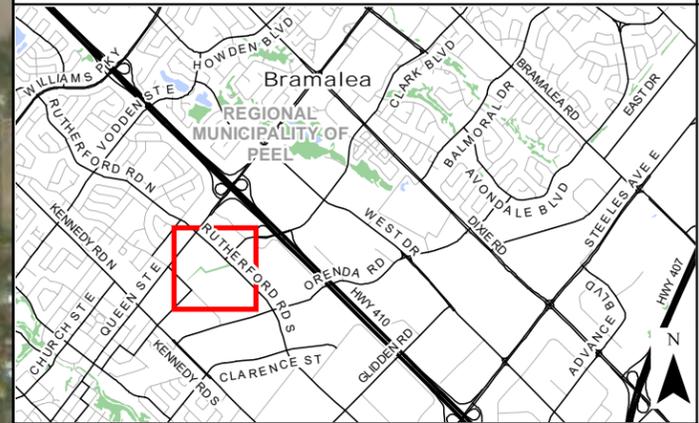
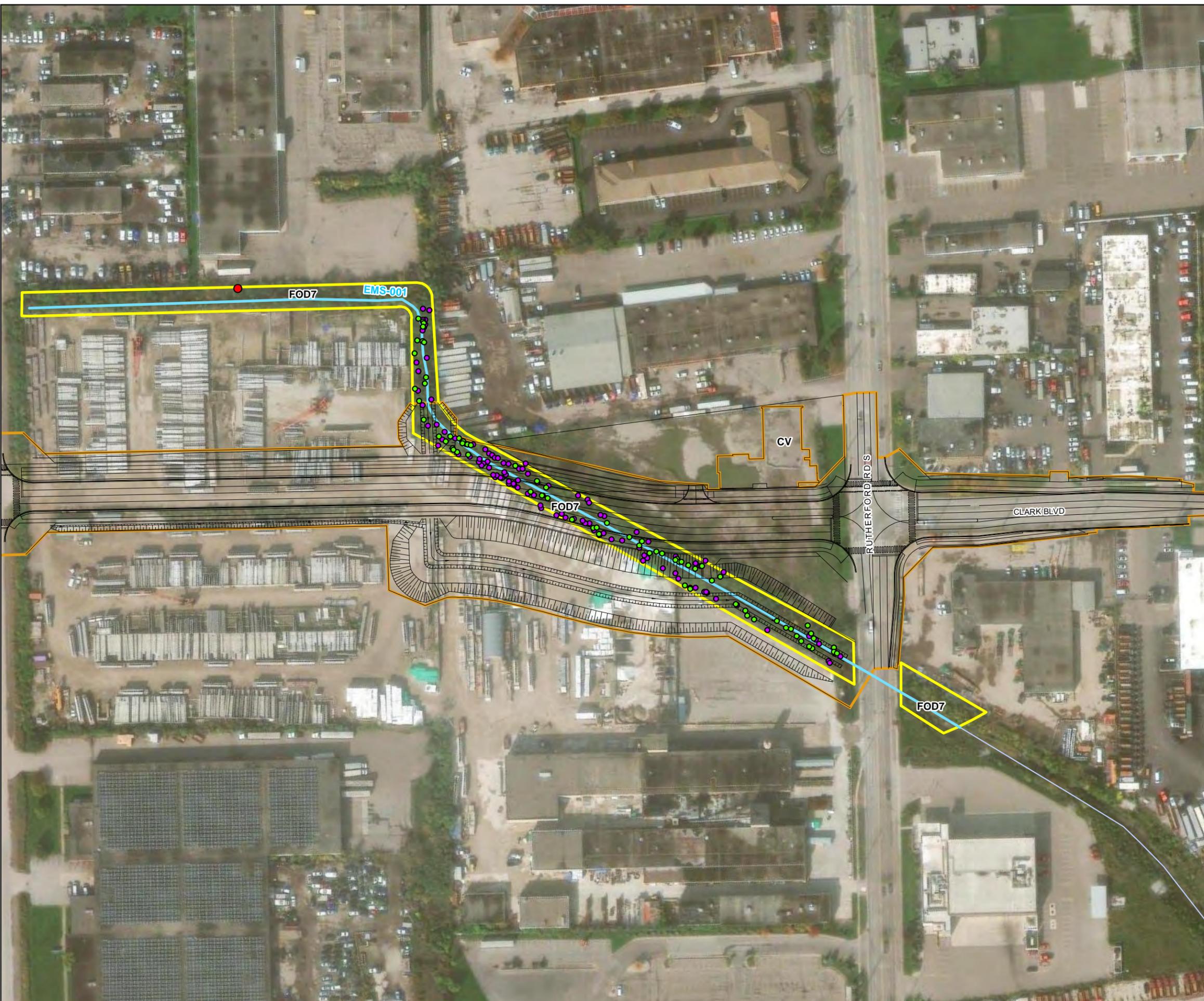


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| Project: 2258 Date: August 17, 2022 | NAD83 - UTM Zone 17 Size: 11x17" 1:1,850 |
| 0 20 40 60 80 100 Metres | |
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Clark Boulevard and Eastern Avenue Environmental Assessment

Significant Natural Features and Preferred Design



- Legend**
- Subject Lands
 - Preferred Alternative
 - Permanent Watercourse
 - Electro-fishing Monitoring Station (EMS-001)
 - Ecological Land Classification (ELC)
 - (CV) Constructed
 - (FOD7) Fresh - Moist Lowland Deciduous Forest Ecosite
 - Candidate SAR Bat Habitat Tree***
 - Little Brown Myotis, Northern Myotis
 - Tri-colored Bat
 - Species of Regional Concern**
 - Larger Straw Sedge (L3)

*The tree inventory was completed in 2019, therefore the health of the Ash trees may have declined and/or they may no longer be standing.
 *The bat habitat assessment was not completed during the leaf-off period.



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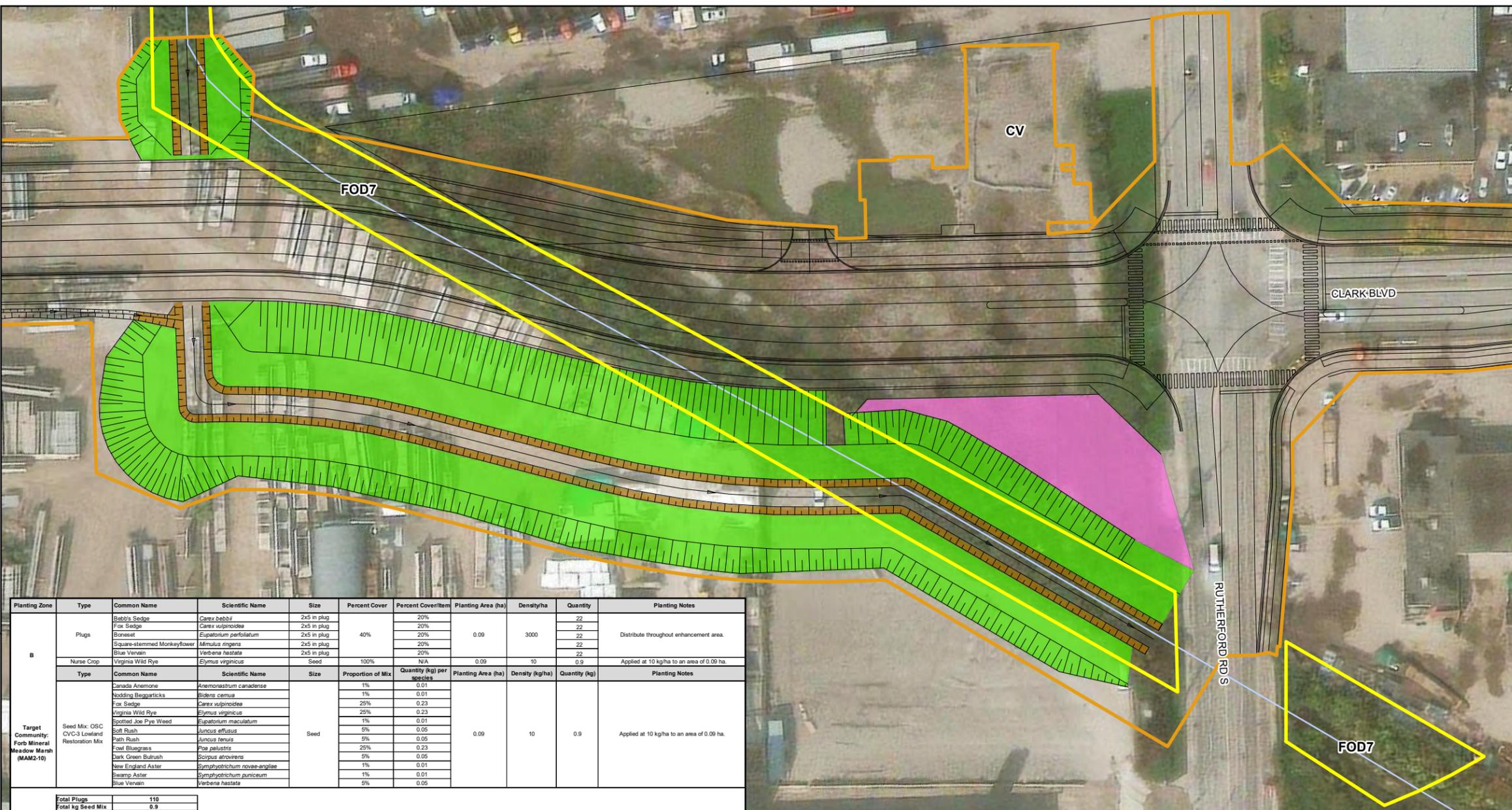
Clark Boulevard and Eastern Avenue Environmental Assessment

Ecological Habitat Enhancement Areas



Legend

- Subject Lands
 - Preferred Alternative
 - Permanent Watercourse
 - Ecological Land Classification (ELC)
 - (CV) Constructed
 - (FOD7) Fresh - Moist Lowland Deciduous Forest Ecosite
- Ecological Habitat Enhancement Areas**
- Planting Zone A (0.72ha)
 - Planting Zone B (0.09ha)
 - Planting Zone C (0.09ha)



| Planting Zone | Type | Common Name | Scientific Name | Size | Percent Cover | Percent Cover/item | Planting Area (ha) | Density/ha | Quantity | Planting Notes | |
|---|---|-----------------------------|------------------------|-------------|---------------|--------------------|--------------------|------------|--|--|--|
| B | Plugs | Bebb's Sedge | Carex bebbii | 2x5 in plug | 20% | 20% | 0.09 | 3000 | 22 | Distribute throughout enhancement area. | |
| | | Fox Sedge | Carex vulpinoidea | 2x5 in plug | 20% | 20% | | | 22 | | |
| | | Boneset | Eupatorium perfoliatum | 2x5 in plug | 20% | 20% | | | 22 | | |
| | | Square-stemmed Monkeyflower | Mimulus ringens | 2x5 in plug | 20% | 20% | | | 22 | | |
| | | Blue Vervain | Verbena hastata | 2x5 in plug | 20% | 20% | | | 22 | | |
| Nurse Crop | Virginia Wild Rye | Elymus virginicus | Seed | 100% | N/A | 0.09 | 10 | 0.9 | Applied at 10 kg/ha to an area of 0.09 ha. | | |
| Target Community: Forb Mineral Meadow Marsh (MAM2-10) | Seed Mix: OSC CVC-3 Lowland Restoration Mix | Canada Anemone | Anemone canadense | Seed | 5% | 0.05 | 0.09 | 10 | 0.9 | Applied at 10 kg/ha to an area of 0.09 ha. | |
| | | Path Rush | Juncus effusus | | | | | | | | |
| | | Soft Rush | Juncus tenuis | | | | | | | | |
| | | Path Rush | Juncus tenuis | | | | | | | | |
| | | Soft Rush | Juncus tenuis | | | | | | | | |
| | | Path Rush | Juncus tenuis | | | | | | | | |
| | | Soft Rush | Juncus tenuis | | | | | | | | |
| | | Path Rush | Juncus tenuis | | | | | | | | |
| | | Soft Rush | Juncus tenuis | | | | | | | | |
| | | Path Rush | Juncus tenuis | | | | | | | | |
| | | Soft Rush | Juncus tenuis | | | | | | | | |
| | | Path Rush | Juncus tenuis | | | | | | | | |
| | | Soft Rush | Juncus tenuis | | | | | | | | |
| | | Path Rush | Juncus tenuis | | | | | | | | |
| | | Soft Rush | Juncus tenuis | | | | | | | | |
| Total Plugs | | 110 | | | | | | | | | |
| Total kg Seed Mix | | 0.9 | | | | | | | | | |

Notes
 All plant materials will be true to species. No garden cultivars will be accepted.
 Seed mixes to be hand-broadcast or seeded with a Brillion seeder (or equivalent).
 Topsoil to be distributed within the enhancement area prior to planting. Nurse crop applied in 14 days or less.
 Planting to be installed outside of June 1 through September 30.

| Planting Zone | Type | Common Name | Scientific Name | Size | Percent Cover | Percent Cover/item | Planting Area (ha) | Density/ha | Quantity | Planting Notes | | | | | | | | | | |
|--------------------------|-----------------------------|--|--------------------------------|------------------------|-------------------|--------------------|--------------------|------------|----------|---|------|------|-----|--|--|--|--|--|--|--|
| C | Trees | Basswood | Tilia americana | 1 gallon pot | 25% | 25% | 0.09 | 1000 | 18 | Distribute throughout treed enhancement area. | | | | | | | | | | |
| | | Trembling Aspen | Populus tremuloides | 1 gallon pot | 20% | 20% | | | 15 | | | | | | | | | | | |
| | | Paper Birch | Betula papyrifera | 1 gallon pot | 15% | 15% | | | 11 | | | | | | | | | | | |
| | | Bur Oak | Quercus macrocarpa | 1 gallon pot | 10% | 10% | | | 8 | | | | | | | | | | | |
| | | White Oak | Quercus alba | 1 gallon pot | 5% | 5% | | | 4 | | | | | | | | | | | |
| | | Black Cherry | Prunus serotina | 1 gallon pot | 15% | 15% | | | 11 | | | | | | | | | | | |
| | | Sugar Maple | Acer saccharum | 1 gallon pot | 10% | 10% | | | 8 | | | | | | | | | | | |
| | | Grey Dogwood | Cornus racemosa | 1 gallon pot | 30% | 30% | | | 33 | | | | | | | | | | | |
| | | Chokecherry | Prunus virginiana | 1 gallon pot | 30% | 30% | | | 33 | | | | | | | | | | | |
| | | Slaghorn Sumac | Rhus typhina | 1 gallon pot | 20% | 20% | | | 22 | | | | | | | | | | | |
| | | American Black Currant | Ribes americanum | 1 gallon pot | 20% | 20% | | | 22 | | | | | | | | | | | |
| | | Nurse Crop | Virginia Wild Rye | Elymus virginicus | Seed | 100% | | | N/A | | 0.09 | 10 | 0.9 | Applied at 10 kg/ha to an area of 0.72 ha. | | | | | | |
| | | Target Community: Dry - Fresh Poplar Deciduous Forest (FOD3-1) | Seed Mix: OSC CVC 1 Upland Mix | Canada Anemone | Anemone canadense | Seed | | | 1% | | 0.01 | 0.09 | 10 | 0.9 | Applied at 10 kg/ha to an area of 0.09 ha. | | | | | |
| | | | | Common Milkweed | Asclepias syriaca | | | | | | | | | | | | | | | |
| | | | | Limestone Meadow Sedge | Carex granularis | | | | | | | | | | | | | | | |
| Riverbank Wildrye | Elymus riparius | | | | | | | | | | | | | | | | | | | |
| Grass-leaved Goldenrod | Euthamia graminifolia | | | | | | | | | | | | | | | | | | | |
| Wild Bergamot | Monarda fistulosa | | | | | | | | | | | | | | | | | | | |
| Common Evening Primrose | Oenothera biennis | | | | | | | | | | | | | | | | | | | |
| Black Eyed Susan | Rudbeckia hirta | | | | | | | | | | | | | | | | | | | |
| Canada Goldenrod | Solidago canadensis | | | | | | | | | | | | | | | | | | | |
| Early Goldenrod | Solidago juncea | | | | | | | | | | | | | | | | | | | |
| Gray Goldenrod | Solidago nemoralis | | | | | | | | | | | | | | | | | | | |
| New England Aster | Symphoricarum novae-angliae | | | | | | | | | | | | | | | | | | | |
| White Vervain | Verbena urticifolia | | | | | | | | | | | | | | | | | | | |
| Total Trees | | | | 75 | | | | | | | | | | | | | | | | |
| Total Shrubs | | | | 110 | | | | | | | | | | | | | | | | |
| Total kg Seed Mix | | 0.9 | | | | | | | | | | | | | | | | | | |

Notes
 All plant materials will be true to species. No garden cultivars will be accepted.
 Seed mixes to be hand-broadcast or seeded with a Brillion seeder (or equivalent).
 Topsoil to be distributed within the enhancement area prior to planting. Nurse crop applied in 14 days or less.
 Planting to be installed outside of June 1 through September 30.

| Planting Zone | Type | Common Name | Scientific Name | Size | Percent Cover | Percent Cover/item | Planting Area (ha) | Density/ha | Quantity | Planting Notes | | | | | | | | | | |
|---|--------------------------------|-------------------------|-----------------------------|--------------|---------------|--------------------|--------------------|------------|--|---|------------|--|--|--|--|--|--|--|--|--|
| A | Trees | Red Maple | Acer rubrum | 1 gallon pot | 15% | 15% | 0.72 | 1000 | 87 | Distribute throughout enhancement area, with Black Willow preferentially planted in the wettest areas, and Sugar Maple and White Oak planted in the driest areas. Place Black Walnuts together in clusters, well spaced from other species. | | | | | | | | | | |
| | | Black Walnut | Juglans nigra | 1 gallon pot | 5% | 5% | | | 29 | | | | | | | | | | | |
| | | Basswood | Tilia americana | 1 gallon pot | 15% | 15% | | | 87 | | | | | | | | | | | |
| | | Trembling Aspen | Populus tremuloides | 1 gallon pot | 10% | 10% | | | 58 | | | | | | | | | | | |
| | | Balsam Poplar | Populus balsamifera | 1 gallon pot | 5% | 5% | | | 29 | | | | | | | | | | | |
| | | Paper Birch | Betula papyrifera | 1 gallon pot | 10% | 10% | | | 58 | | | | | | | | | | | |
| | | Bur Oak | Quercus macrocarpa | 1 gallon pot | 5% | 5% | | | 29 | | | | | | | | | | | |
| | | White Oak | Quercus alba | 1 gallon pot | 5% | 5% | | | 29 | | | | | | | | | | | |
| | | Sugar Maple | Acer saccharum | 1 gallon pot | 10% | 10% | | | 58 | | | | | | | | | | | |
| | | Black Cherry | Prunus serotina | 1 gallon pot | 10% | 10% | | | 58 | | | | | | | | | | | |
| | | Black Willow | Salix nigra | 1 gallon pot | 10% | 10% | | | 58 | | | | | | | | | | | |
| | | Sandbar Willow | Salix interior | 1 gallon pot | 15% | 15% | | | 130 | | | | | | | | | | | |
| | | Bebb's Willow | Salix bebbiana | 1 gallon pot | 10% | 10% | | | 87 | | | | | | | | | | | |
| | | Heart-Leaved Willow | Salix eriocephala | 1 gallon pot | 10% | 10% | | | 87 | | | | | | | | | | | |
| | | Red Osier Dogwood | Cornus sericea | 1 gallon pot | 30% | 30% | | | 260 | | | | | | | | | | | |
| Grey Dogwood | Cornus racemosa | 1 gallon pot | 10% | 10% | 87 | | | | | | | | | | | | | | | |
| Chokecherry | Prunus virginiana | 1 gallon pot | 10% | 10% | 87 | | | | | | | | | | | | | | | |
| American Black Currant | Ribes americanum | 1 gallon pot | 15% | 15% | 130 | | | | | | | | | | | | | | | |
| Nurse Crop | Virginia Wild Rye | Elymus virginicus | Seed | 100% | N/A | 0.72 | 10 | 7.2 | Applied at 10 kg/ha to an area of 0.72 ha. | | | | | | | | | | | |
| Target Community: Fresh - Moist Lowland Deciduous Forest (FOD7) | Seed Mix: OSC CVC 1 Upland Mix | Canada Anemone | Anemone canadense | Seed | 1% | 0.07 | 0.72 | 10 | 7.2 | Applied at 10 kg/ha to an area of 0.72 ha. | | | | | | | | | | |
| | | Common Milkweed | Asclepias syriaca | | | | | | | | | | | | | | | | | |
| | | Limestone Meadow Sedge | Carex granularis | | | | | | | | | | | | | | | | | |
| | | Riverbank Wildrye | Elymus riparius | | | | | | | | | | | | | | | | | |
| | | Grass-leaved Goldenrod | Euthamia graminifolia | | | | | | | | | | | | | | | | | |
| | | Wild Bergamot | Monarda fistulosa | | | | | | | | | | | | | | | | | |
| | | Common Evening Primrose | Oenothera biennis | | | | | | | | | | | | | | | | | |
| | | Black Eyed Susan | Rudbeckia hirta | | | | | | | | | | | | | | | | | |
| | | Canada Goldenrod | Solidago canadensis | | | | | | | | | | | | | | | | | |
| | | Early Goldenrod | Solidago juncea | | | | | | | | | | | | | | | | | |
| | | Gray Goldenrod | Solidago nemoralis | | | | | | | | | | | | | | | | | |
| | | New England Aster | Symphoricarum novae-angliae | | | | | | | | | | | | | | | | | |
| | | White Vervain | Verbena urticifolia | | | | | | | | | | | | | | | | | |
| | | Total Trees | | | | | | | | | 80 | | | | | | | | | |
| | | Total Shrubs | | | | | | | | | 868 | | | | | | | | | |
| Total kg Seed Mix | | 7.2 | | | | | | | | | | | | | | | | | | |

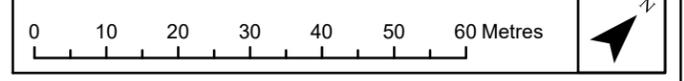
Notes
 All plant materials will be true to species. No garden cultivars will be accepted.
 Seed mixes to be hand-broadcast or seeded with a Brillion seeder (or equivalent).
 Topsoil to be distributed within the enhancement area prior to planting. Nurse crop applied in 14 days or less.
 Planting to be installed outside of June 1 through September 30.



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Project: 2258
 Date: September 8, 2022

NAD83 - UTM Zone 17
 Size: 11x17"
 1:1,000



Appendix I
SAR/SCC and SWH Screening Assessments

| Scientific Name | Common Name | SRANK ¹ | COSSARO ² | COSEWIC ³ | SARA Schedule ⁴ | Background Source | Habitat Preference ⁵ | Suitable Habitats within Study Area | Rationale |
|------------------------------|---------------------|--------------------|----------------------|----------------------|----------------------------|-------------------|---|-------------------------------------|---|
| Birds | | | | | | | | | |
| <i>Chaetura pelagica</i> | Chimney Swift | S4B, S4N | THR | T | Schedule 1 | BSC et al. 2008 | Commonly found in urban areas near buildings; nests in hollow trees, crevices of rock cliffs, chimneys; highly gregarious; feeds over open water. | No | Suitable habitat is not present within the Study Area. |
| <i>Chordeiles minor</i> | Common Nighthawk | S4B | SC | T | Schedule 1 | BSC et al. 2008 | Open ground; clearings in dense forests; ploughed fields; gravel beaches or barren areas with rocky soils; open woodlands; flat gravel roofs. | No | Study Area is highly disturbed and provides little relief from predation (eg., Ring-billed Gulls and mammalian predators). |
| <i>Contopus virens</i> | Eastern Wood-pewee | S4B | SC | SC | | BSC et al. 2008 | Predominantly found in deciduous forests, specifically along edge habitats and wet areas near bodies of water. | No | Suitable habitat is not present within the Study Area. |
| <i>Riparia riparia</i> | Bank Swallow | S4B | THR | T | | BSC et al. 2008 | Sand, clay or gravel river banks or steep riverbank cliffs; lakeshore bluffs of easily crumbled sand or gravel; gravel pits, road-cuts, grassland or cultivated fields that are close to water; nesting sites are limiting factor for species presence. | No | Suitable habitat is not present within the Study Area. |
| <i>Hirundo rustica</i> | Barn Swallow | S4B | THR | T | | BSC et al. 2008 | Farmlands or rural areas; cliffs, caves, rock niches; buildings or other man-made structures for nesting; open country near body of water. | No | Structures within the Study Area may provide nesting habitat for this species. However, breeding bird surveys did not document the species within the Study Area. |
| <i>Hylocichla mustelina</i> | Wood Thrush | S4B | SC | T | | BSC et al. 2008 | Carolinian and Great Lakes-St. Lawrence forest zones; undisturbed moist mature deciduous or mixed forest with deciduous sapling growth; near pond or swamp; hardwood forest edges; must have some trees higher than 12 m. | No | Suitable habitat is not present within the Study Area. |
| <i>Ammodramus savannarum</i> | Grasshopper Sparrow | S4B | SC | SC | | BSC et al. 2008 | Well-drained grassland or prairie with low cover of grasses, taller weeds on sandy soil; hayfields or weedy fallow fields; uplands with ground vegetation of various densities; perches for singing; requires tracts of grassland > 10 ha. | No | Suitable habitat is not present within the Study Area. |
| <i>Dolichonyx oryzivorus</i> | Bobolink | S4B | THR | T | No Schedule | BSC et al. 2008 | Large, open expansive grasslands with dense ground cover; hayfields, meadows or fallow fields; marshes; requires tracts of grassland >50 ha. | No | Suitable habitat is not present within the Study Area. |
| <i>Sturnella magna</i> | Eastern Meadowlark | S4B | THR | T | No Schedule | BSC et al. 2008 | Open, grassy meadows, farmland, pastures, hayfields or grasslands with elevated singing perches; cultivated land and weedy areas with trees; old orchards with adjacent, open grassy areas >10 ha in size. | No | Suitable habitat is not present within the Study Area. |

| Scientific Name | Common Name | SRANK ¹ | COSSARO ² | COSEWIC ³ | SARA Schedule ⁴ | Background Source | Habitat Preference ⁵ | Suitable Habitats within Study Area | Rationale |
|---------------------------------------|-----------------------------|--------------------|----------------------|----------------------|----------------------------|------------------------------------|--|-------------------------------------|---|
| Herpetofauna | | | | | | | | | |
| <i>Ambystoma jeffersonianum</i> | Jefferson Salamander | S2 | END | E | Schedule 1 | Ontario Nature 2019 | Damp shady deciduous forest, swamps, moist pasture, lakeshores; temporary woodland pools for breeding; hides under leaf litter, stones or in decomposing logs. | No | Suitable habitat is not present within the Study Area. |
| <i>Chelydra serpentina serpentina</i> | Common Snapping Turtle | S3 | SC | SC | Schedule 1 | Ontario Nature 2019 | Permanent or semi-permanent fresh water; marshes, swamps or bogs; rivers and streams with soft muddybanks or bottoms. The species often uses soft soil or clean dry sand on south-facing slopes for nest sites and may nest at some distance from water. | No | Suitable habitat is not present within the Study Area. |
| Mammals | | | | | | | | | |
| <i>Myotis leibii</i> | Eastern Small-footed Myotis | S2S3 | END | - | - | Dobbyn 1994, MNRF 2018d; MNRF 2019 | Overwintering habitat: Caves and mines that remain above 0 degrees Celsius. Maternal Roosts: primarily under loose rocks on exposed rock outcrops, crevices and cliffs, and occasionally in buildings, under bridges and highway overpasses and under tree bark. | No | Given that this species largely roosts under rocks, along cliffs and rock crevices in warm, sunny areas, there is no suitable roosting habitat within the Study Area. No potential hibernation sites are present. |
| <i>Myotis lucifungus</i> | Little Brown Myotis | S5 | END | E | Schedule 1 | Dobbyn 1994 | Uses caves, quarries, tunnels, hollow trees or buildings for roosting; winters in humid caves; maternity sites in dark warm areas such as attics and barns; feeds primarily in wetlands, forest edges. | Yes | Trees present within the Study Area may provide suitable roosting habitat. No potential hibernation sites are present. |
| <i>Myotis septentrionalis</i> | Northern Myotis | S3 | END | E | Schedule 1 | Dobbyn 1994, MNRF 2018d; MNRF 2019 | Northern Myotis roosts within tree crevices, hollows and under the bark of live and dead trees, particularly when trees are located within a forest gap. | Yes | Trees present within the Study Area may provide suitable roosting habitat. No potential hibernation sites are present. |
| <i>Perimyotis subflavus</i> | Tri-coloured Bat | S3? | END | E | Schedule 1 | Dobbyn 1994, MNRF 2018d; MNRF 2019 | Open woods near water; roosts in trees, cliff crevices, buildings or caves; hibernates in damp, draft-free, warm caves, mines or rock crevices. All Oak (<i>Quercus</i> spp.) and Maple (<i>Acer</i> spp.) trees ≥10 cm Diameter at Breast Height (DBH) have the potential to provide suitable roosting habitat in dead leaf clusters for Tri-colored Bat. | Yes | Maple and Oak trees present within the Study Area may provide suitable roosting habitat. No potential hibernation sites are present. |
| Insects | | | | | | | | | |
| <i>Danaus plexippus</i> | Monarch | S4 | SC | E | | Macnaughton et al. 2019 | Open areas with milkweed species (<i>Asclepias</i> spp.). | No | Concentrations of nectar plants, including Milkweed are absent from the Study Area. |

^{1,2}MNRF 2019c; ^{3,4}Government of Canada 2019; ⁵OMNR 2000

| Legend |
|--|
| SRANK |
| S2 Imperiled |
| S3 Vulnerable |
| S4 Apparently Secure |
| S5 Secure |
| COSSARO/COSEWIC |
| SC Special Concern |
| THR/T Threatened |
| END/E Endangered |
| SARA Schedule |
| Schedule 1 Officially Protected under SARA |

Significant Wildlife Habitat Assessment Tables

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 7E.

| | Wildlife Species ¹ | ELC Ecosite Codes ¹ | Candidate SWH Habitat Criteria and Information Sources ¹ | Confirmed SWH Defining Criteria ¹ | Study Area Assessment Details |
|---|---|--|--|--|---|
| Wildlife Habitat: Waterfowl Stopover and Staging Areas (Terrestrial) | | | | | |
| <u>Rationale:</u> Habitat important to migrating waterfowl | American Black Duck Northern Pintail Gadwall Blue-winged Teal Green-winged Teal American Wigeon Northern Shoveler Tundra Swan | CUM1 CUT1 - Plus evidence of annual spring flooding from melt water or run-off within these Ecosites. - Fields with seasonal flooding and waste grain in the Long Point, Rondeau, Lake. St. Clair, Grand Bend and Pt. Pelee areas may be important to Tundra Swans. | Fields with sheet water during Spring (mid March to May). • 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 ^{cxviii} <u>Information Sources</u> • 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 | 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" ^{ccxi} • Any mixed species aggregations of 100 ^l or more individuals required. • The area of the flooded field ecosite habitat plus a 100-300m radius buffer dependant on local site conditions and adjacent land use is the significant wildlife habitat ^{cxviii} . • 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 ^{cxlix} Index #7 provides development effects and mitigation measures. | Fields with spring sheet water are not present within the subject lands or surrounding study area. Not SWH. |
| Wildlife Habitat: Waterfowl Stopover and Staging Areas (Aquatic) | | | | | |
| <u>Rationale:</u> Important for local and migrant waterfowl populations during the spring or fall migration or both periods combined. Sites identified are usually only one of a few in the eco-district | Canada Goose Cackling Goose Snow Goose Green-winged Teal American Black Duck Northern Pintail Northern Shoveler American Wigeon Gadwall Blue-winged Teal Hooded Merganser Common Merganser Red-breasted Merganser Lesser Scaup Greater Scaup Common Goldeneye Bufflehead Long-tailed Duck Surf Scoter White-winged Scoter Black Scoter Canvasback Redhead Ruddy Duck Brant White-winged Scoter Black Scoter | MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 SWD1 SWD2 SWD3 SWD4 SWD5 SWD6 SWD7 | • 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). <u>Information Sources</u> • 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 | Studies carried out and verified presence of: • Aggregations of 100 ^l or more of listed species for 7 days ^l , results in >700 waterfowl use days. • Areas with annual staging of ruddy ducks, canvasbacks, and redheads are SWH ^{cxlix} • The combined area of the ELC ecosites and a 100m radius area is the SWH ^{cxviii} • Wetland area and shorelines associated with sites identified within the SWHTG ^{cxviii} Appendix K ^{cxlix} are significant wildlife habitat. • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects" ^{ccxi} • Annual Use of Habitat is Documented from Information Sources or Field Studies (Annual can be based on completed studies or determined from past surveys with species numbers and dates recorded). • SWHMIST ^{cxlix} Index #7 provides development effects and mitigation measures. | Ponds, marshes, lakes, bays, coastal inlets, and watercourses used during migration are not present in the study area. Not SWH. |

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 7E.

| | Wildlife Species ¹ | ELC Ecosite Codes ¹ | Candidate SWH Habitat Criteria and Information Sources ¹ | Confirmed SWH Defining Criteria ¹ | Study Area Assessment Details |
|--|---|--|---|---|---|
| Wildlife Habitat: Shorebird Migratory Stopover Area | | | | | |
| Rationale: 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 | 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> • Western hemisphere shorebird reserve network • Canadian Wildlife Service (CWS) Ontario Shorebird Survey • Bird Studies Canada • Ontario Nature • Local birders and naturalist clubs • Natural Heritage Information Center (NHIC) Shorebird Migratory Concentration Area | Studies confirming: • Presence of 3 or more of listed species and > 1000 ¹ 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 ¹ 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 ^{cxviii} • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects" ^{ccxd} • SWHMIST ^{cxlix} Index #8 provides development effects and mitigation measures. | Suitable habitat is not present in the study area. Not SWH. |
| Wildlife Habitat: 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 <u>Special Concern:</u> Short-eared Owl Bald Eagle | <u>Hawks/Owls:</u> 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 <u>Bald Eagle:</u> Forest Community Series: FOD, FOM, FOC, SWD, SWM, or SWC, on shoreline areas adjacent to large rivers or adjacent to lakes with open water (hunting area). | 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 > 20ha ^{cxvii, cxlix} with a combination of forest and upland ^{cxvi, cxvii, cxviii, xix, xx, xxi} . Least disturbed sites, idle/fallow or lightly grazed field/meadow (>15ha) with adjacent woodlands ^{cxlix} 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 ^{cxlix} <u>Information Sources</u> • OMNRF Districts • Natural clubs • Natural Heritage Information Centre (NHIC) Raptor Winter Concentration Area • Data from Bird Studies Canada • Reports and other information available from CAs • Results of Christmas Bird Counts | Studies confirm the use of these habitats by: • One or more Short-eared Owls, or, One of more Bald Eagles or; at least 10 individuals and two listed hawk/owl species • To be significant a site must be used regularly (3 in 5 years) ^{cxlix} for a minimum of 20 days by the above number of birds. ¹ • 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" ^{ccxd} • SWHMIST ^{cxlix} Index #10 and #11 provides development effects and mitigation measures. | Suitable habitat is not present in the study area. Not SWH. |

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 7E.

| | Wildlife Species ¹ | ELC Ecosite Codes ¹ | Candidate SWH Habitat Criteria and Information Sources ¹ | Confirmed SWH Defining Criteria ¹ | Study Area Assessment Details |
|---|--|--|---|---|---|
| Wildlife Habitat: Bat Hibernacula | | | | | |
| Rationale: Bat hibernacula, are rare habitats in all Ontario landscapes. | Big Brown Bat Eastern Pipistrelle/Tri-colored Bat | Bat Hibernacula may be found in these ecosites: CCR1 CCR2 CCA1 CCA2 (Note: buildings are not considered to be SWH) | Hibernacula may be found in caves, mine shafts, underground foundations and Karsts. Active mine sites should not be considered The locations of bat hibernacula are relatively poorly known. <u>Information Sources</u> • OMNRF for possible locations and contact for local experts • Natural Heritage Information Centre (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 | • All sites with confirmed hibernating bats are SWH ¹ . • The area includes 200m radius around the entrance of the hibernaculum ^{ccviii, ccvii, i} . for the development types and 1000m for wind farms ^{ccv} . • Studies are to be conducted during the peak swarming period (Aug. – Sept.). Surveys should be conducted following methods outlined in the ^{ccv} "Bats and Bat Habitats: Guidelines for Wind Power Projects" ^{ccv} • SWHMIST ^{cxlix} Index #1 provides development effects and mitigation measures. | Suitable habitat is not present in the study area. Not SWH. |
| Wildlife Habitat: Bat Maternity Colonies | | | | | |
| Rationale: Known locations of forested bat maternity colonies are 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 | Maternity colonies can be found in tree cavities, vegetation and often in building ^{xxxi, xxv, xxvi, xxvii, xxxi} (buildings are not considered to be SWH). • Maternity roosts are not found in caves and mines in Ontario ^{xxii} . • Maternity colonies located in Mature deciduous or mixed forest stands ^{ccix, ccx} with >10/ha large diameter (>25cm dbh) wildlife trees ^{ccvii} . • Female Bats prefer wildlife tree (snags) in early stages of decay, class 1-3 ^{ccxiv} or class 1 or 2 ^{ccxii} . • 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 ^{ccx} . <u>Information Sources</u> • OMNRF for possible locations and contact for local experts • University Biology Departments with bat experts | Maternity Colonies with confirmed use by: • >10 Big Brown Bats ¹ • >5 Adult Female Silver-haired Bats ¹ • The area of the habitat includes the entire woodland or the forest stand ELC Ecosite containing the maternity colonies ¹ . • Evaluation methods for maternity colonies should be conducted following methods outlined in the "Bats and Bat Habitats: Guidelines for Wind Power Projects" ^{ccv} . • SWHMIST ^{cxlix} Index #12 provides development effects and mitigation measures. | Big Brown Bat, Hoary Bat and Little Brown Myotis have been documented in the vicinity of the study area. Tree cover is limited to along the watercourse feature. Two potential tree cavities were documented by NRSI arborists but suitable habitat is marginal and limited in the study area due to high disturbance. Not SWH. |

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 7E.

| | Wildlife Species ¹ | Candidate SWH | | Confirmed SWH | Study Area |
|---|---|--|---|--|--|
| | | ELC Ecosite Codes ¹ | Habitat Criteria and Information Sources ¹ | Defining Criteria ¹ | Assessment Details |
| Wildlife Habitat: Turtle Wintering Area | | | | | |
| <p>Rationale: Generally sites are the only known sites in the area. Sites with the highest number of individuals are most significant.</p> | <p>Midland Painted Turtle</p> <p>Special Concern: Northern Map Turtle Snapping Turtle</p> | <p>Snapping and Midland Painted Turtles: ELC Community Classes: SW, MA, OA and SA ELC Community Series: FEO and BOO</p> <p>Northern Map Turtle: Open Water areas such as deeper rivers or streams and lakes with current can also be used as over-wintering habitat.</p> | <p>• 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.</p> <p>• Over-wintering sites are permanent water bodies, large wetlands, and bogs or fens with adequate Dissolved Oxygen^{cx, cxii, cxviii}.</p> <p>• Man-made ponds such as sewage lagoons or storm water ponds should not be considered SWH</p> <p><u>Information Sources</u></p> <ul style="list-style-type: none"> • EIS studies carried out by Conservation Authorities • Field naturalists clubs • OMNRF Ecologist or Biologist • Natural Heritage Information Centre (NHIC) | <p>• Presence of 5 over-wintering Midland Painted Turtles is significant^l.</p> <p>• One or more Northern Map Turtle or Snapping Turtle over-wintering within a wetland is significant^l.</p> <p>• The mapped ELC ecosite area 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> <p>• 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. – Apr)^{cxvii}. Congregation of turtles is more common where wintering areas are limited and therefore significant^{cx, cx, cxii, cxii}.</p> <p>• SWHMIST^{cxix} Index #28 provides development effects and mitigation measures for turtle wintering habitat.</p> | <p>Suitable habitat is not present in the study area.</p> <p>Not SWH.</p> |
| Wildlife Habitat: Reptile Hibernaculum | | | | | |
| <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</p> <p>Special Concern: Milksnake Eastern Ribbonsnake</p> | <p>For all snakes, habitat may be found in any ecosite in southern Ontario other than very wet ones. Talus, Rock Barren, Crevice and Cave, and Alvar sites may be directly related to these habitats.</p> <p>Observations of congregations of snakes on sunny warm days in the spring or fall is a good indicator. The existence of rock piles or slopes, stone fences, and crumbling foundations assist in identifying candidate SWH.</p> | <p>For snakes, hibernation takes place in sites located below frost lines in burrows, rock crevices and other natural locations. Areas of broken and fissured rock are particularly valuable since they provide access to subterranean sites below the frost line^{cxiv, i, ii, iii, cxii}.</p> <p>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> <p><u>Information Sources</u></p> <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 CAs • Local naturalists and experts, as well as university herpetologists may also know where to find some of these sites. • Natural Heritage Information Centre (NHIC) | <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., or, individuals of two or more snake spp. • Congregations of a minimum of five individuals of a snake sp., or, 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)^l. • Note: If there are Special Concern Species present, then site is SWH • Note: 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 critical life processes (e.g. mating) often take place in close proximity to hibernacula. The feature in which the hibernacula is located plus a 30m buffer is the SWH^l. • SWHMIST^{cxix} Index #13 provides development effects and mitigation measures for snake hibernacula. | <p>Suitable habitat is not present in the study area.</p> <p>Not SWH.</p> |

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 7E.

| | Wildlife Species ¹ | Candidate SWH | | Confirmed SWH | Study Area |
|--|---|--|--|---|--|
| | | ELC Ecosite Codes ¹ | Habitat Criteria and Information Sources ¹ | Defining Criteria ¹ | Assessment Details |
| Wildlife Habitat: Colonially - Nesting Bird Breeding Habitat (Bank and Cliff) | | | | | |
| 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. | Cliff Swallow Northern Rough-winged Swallow (this species is not colonial but can be found in Cliff Swallow colonies) | Eroding banks, sandy hills, borrow pits, steep slopes, and sand piles Cliff faces, bridge abutments, silos, barns Habitat found in the following ecosites: CUM1 CUT1 CUS1 BLO1 BLS1 BLT1 CLO1 CLS1 CLT1 | <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. <u>Information Sources</u> <ul style="list-style-type: none"> Reports and other information available from CAs Ontario Breeding Bird Atlas^{CCV}. Bird Studies Canada: Nature Counts http://www.birdscanada.org/birdmon/ Field Naturalist clubs | Studies confirming: <ul style="list-style-type: none"> Presence of 1 or more nesting sites with ^{g^{ccvix}} 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^{ccvii}. Field surveys to observe and count swallow nests are to be completed during the breeding season. Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"^{ccxi}. SWHMIST^{ccxix} Index #4 provides development effects and mitigation measures. | Cliff Swallow and Northern Rough-winged Swallow have both been identified in the vicinity of the subject lands. Suitable habitat not identified within the subject lands, but they could be located within the vicinity. Not SWH |
| Wildlife Habitat: Colonially - Nesting Bird Breeding Habitat (Tree/Shrubs) | | | | | |
| Rationale: Large colonies are important to local bird population, typically sites are only known colony in area and are used annually. | Great Blue Heron Black-crowned Night-Heron Great Egret Green Heron | SWM2 SWM3 SWM5 SWM6 SWD1 SWD2 SWD3 SWD4 SWD5 SWD6 SWD7 FET1 | <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. <u>Information Sources</u> <ul style="list-style-type: none"> Ontario Breeding Bird Atlas^{CCV}, colonial nest records. Ontario Heronry Inventory 1991 available from Bird Studies Canada or NHIC (OMNRF). Natural Heritage Information Centre (NHIC) Mixed Wader Nesting Colony Aerial photographs can help identify large heronries. Reports and other information available from CAs MNRF District Offices Field naturalist clubs | Studies confirming: <ul style="list-style-type: none"> Presence of 2 or more active nests of Great Blue Heron or other list species. The habitat extends from the the edge of the colony and a minimum 300m radius or extent of the Forest Ecosite containing the colony or any island <15.0ha with a colony is the SWH^{cc, ccvii}. Confirmation of active colonies must be achieved through site visits conducted during the nesting season (April to August) or by evidence such as the presence of fresh guano, dead young and/or eggshells SWHMIST^{ccxix} Index #5 provides development effects and mitigation measures. | Suitable habitat is not present in the study area. Not SWH. |

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 7E.

| Wildlife Species ¹ | | Candidate SWH | | Confirmed SWH | Study Area |
|--|--|---|---|--|--|
| | | ELC Ecosite Codes ¹ | Habitat Criteria and Information Sources ¹ | Defining Criteria ¹ | Assessment Details |
| Wildlife Habitat: Colonially - Nesting Bird Breeding Habitat (Ground) | | | | | |
| <p>Rationale: Colonies are important to local bird population, typically sites are only known colony in area and are used annually.</p> | <p>Herring Gull Great Black-backed Gull Little Gull Ring-billed Gull Common Tern Caspian Tern Brewer's Blackbird</p> | <p>Any rocky island or peninsula (natural or artificial) within a lake or large river (two-lined on a 1:50,000 NTS map).</p> <p>Close proximity to watercourses in open fields or pastures with scattered trees or shrubs (Brewer's Blackbird)</p> <p>MAM1 – 6 MAS1 – 3 CUM CUT CUS</p> | <p>• 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> <p><u>Information Sources</u></p> <ul style="list-style-type: none"> • Ontario Breeding Bird Atlas^{ccv}, rare/colonial species records. • Canadian Wildlife Service • Reports and other information available from CAs • Natural Heritage Information Centre (NHIC) Colonial Waterbird Nesting Area • MNRF District Offices • Field naturalist clubs | <p>Studies confirming:</p> <ul style="list-style-type: none"> • Presence of >25 active nests for Herring Gulls, >5 active nests for Common Tern or >2 active nests for Caspian Tern^l. • Any active nesting colony of one or more Little Gull, and Great Black-backed Gull is significant^l. • Presence of 5 or more pairs for Brewer's Blackbird^l. • The edge of the colony and a minimum 150m radius area of the habitat, or the extent of the ELC ecosites containing the colony or any island <3.0ha with a colony is the SWH^{cc, ccvii}. • Studies would be done during May/June when actively nesting. Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"^{cccxi}. • SWHMIST^{cxlix} Index #6 provides development effects and mitigation measures. | <p>Suitable habitat is not present in the study area.</p> <p>Not SWH.</p> |
| Wildlife Habitat: Migratory Butterfly Stopover Areas | | | | | |
| <p>Rationale: Butterfly stopover areas are extremely rare habitats and are biologically important for butterfly species that migrate south for the winter</p> | <p>Painted Lady Red Admiral</p> <p><u>Special Concern:</u> Monarch</p> | <p>Combination of ELC Community Series; need to have present one Community Series from each landclass:</p> <p>Field: CUM CUT CUS</p> <p>Forest: FOC FOD FOM CUP</p> <p>Anecdotally, a candidate sight for butterfly stopover will have a history of butterflies being observed.</p> | <p>A butterfly stopover area will be a minimum of 10ha in size with a combination of field and forest habitat present, and will be located within 5km of Lake Ontario and Erie^{cdix}.</p> <ul style="list-style-type: none"> • The habitat is typically a combination of field and forest, and provides the butterflies with a location to rest prior to their long migration south^{xxxii, xxxiii, xxxiv, xxxv, xxxvi}. • 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^{cxlviii, cxlix}. • Staging areas usually provide protection from the elements and are often spits of land or areas with the shortest distance to cross the Great Lakes^{xxxvii, xxxviii, xxxix, xl, xli}. <p><u>Information Sources</u></p> <ul style="list-style-type: none"> • MNRF District Offices • Natural Heritage Information Centre (NHIC) • Agriculture Canada in Ottawa may have list of butterfly experts. • Field Naturalist Clubs • Toronto Entomologists Association • Conservation Authorities | <p>Studies confirm:</p> <ul style="list-style-type: none"> • The presence of Monarch Use Days (MUD) during fall migration (Aug/Oct)^{xiii}. 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^{xxxvii}, significant variation can occur between years and multiple years of sampling should occur^{xi, xii}. • 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 White Admiral's is to be considered significant^l. • SWHMIST^{cxlix} Index #16 provides development effects and mitigation measures. | <p>Subject property not within 5 km of Lake Ontario.</p> <p>Not SWH.</p> |

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 7E.

| | Wildlife Species ¹ | ELC Ecosite Codes ¹ | Candidate SWH Habitat Criteria and Information Sources ¹ | Confirmed SWH Defining Criteria ¹ | Study Area Assessment Details |
|--|--|---|---|---|---|
| Wildlife Habitat: Landbird Migratory Stopover Areas | | | | | |
| <p>Rationale: Sites with a high diversity of species as well as high numbers are most significant</p> | <p>All migratory songbirds Canadian Wildlife Service Ontario website: http://www.on.ec.gc.ca/wildlife_e.html All migrant raptors species Ontario Ministry of Natural Resources: Fish and Wildlife Conservation Act, 1997. Schedule 7: Specially Protected Birds (Raptors)</p> | <p>All Ecosites associated with these ELC Community Series: FOC FOM FOD SWC SWM SWD</p> | <p>Woodlots need to be >5 ha¹ in size and within 5km^{iv, v, vi, vii, viii, ix, x, xi, xii, xiv, xv} of 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 or Ontario are more significant^{cxlix}. • Sites have a variety of habitats: forest, grassland and wetland complexes^{cxlix}. • The largest sites are more significant^{cxlix}. • Woodlots and forest fragments are important habitats to migrating birds^{ccxviii}, these features located along the shore and located within 5km of Lake Ontario and Lake Erie are Candidate SWH^{cxlviii}.</p> <p>Information Sources • Bird Studies Canada • Ontario Nature • Local birders and naturalist clubs • Ontario Important Bird Areas (IBA) Program</p> | <p>Studies confirm: • Use of the habitat by >200 birds/day and with >35 spp. with at least 10 bird spp. recorded on at least 5 different survey dates.¹ This abundance and diversity of migrant bird species is considered above average and significant. • Studies should be completed during spring (March/May) and fall (Aug/Oct) migration using standardized assessment techniques. Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"^{ccxi}. • SWHMIST^{cxlix} Index #9 provides development effects and mitigation measures.</p> | <p>Subject property not within 5 km of Lake Ontario. Not SWH.</p> |
| Wildlife Habitat: Deer Winter Congregation Areas | | | | | |
| <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^{cxlviii}</p> | <p>White-tailed Deer</p> | <p>All Forested Ecosites with these ELC Community Series: FOC FOM FOD SWC SWM SWD Conifer plantations (CUP) smaller than 50 ha may also be used.</p> | <p>• Woodlots >100 ha in size or if large woodlots are rare in a planning area woodlots>50ha¹. • Deer movement during winter in Ecoregion 7E are not constrained by snow depth, however deer will annually congregate in large numbers in suitable woodlands^{cxlviii}. • 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^{ccxxiv}. • Woodlots with high densities of deer due to artificial feeding are not significant¹.</p> <p>Information Sources • MNR District Offices • LIO/NRVIS</p> | <p>Studies confirm: • Deer management is an MNR responsibility, deer winter congregation areas considered significant will be mapped by MNR^{cxlviii}. • Use of the woodlot by white-tailed deer will be determined by MNR, all woodlots exceeding the area criteria are significant, unless determined not to be significant by MNR¹. • Studies should be completed during winter (Jan/Feb) when >20cm of snow is on the ground using aerial survey techniques^{ccxxiv}, ground or road surveys, or a pellet count deer density survey^{ccxxv}. • SWHMIST^{cxlix} Index #2 provides development effects and mitigation measures.</p> | <p>White-tailed Deer have been documented within the vicinity of the study area. Deer overwintering habitat not identified within or adjacent to the subject property. Not SWH.</p> |

Significant Wildlife Habitat Assessment Tables

Table 2. Characteristics of Rare Vegetation Communities for Ecoregion 7E.

| Rare Vegetation Community ¹ | Candidate SWH | | | Confirmed SWH | Study Area |
|---|---|---|---|---|---|
| | ELC Ecosite Codes ¹ | Habitat Description ¹ | Detailed Information and Sources ¹ | Defining Criteria ¹ | Assessment Details |
| Cliff and Talus Slopes | | | | | |
| <p><u>Rationale:</u> 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^{lxviii} • SWHMIST^{cxlix} Index #21 provides development effects and mitigation measures. | <p>Vegetation community not present within subject property.</p> <p>Not SWH.</p> |
| Sand Barrens | | | | | |
| <p><u>Rationale:</u> 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. They have little or no soil and the underlying rock protrudes through the surface. 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 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 Sand Barrens^{lxviii} • Site must not be dominated by exotic or introduced species (<50% vegetative cover are exotics sp)^l. • SWHMIST^{cxlix} Index #20 provides development effects and mitigation measures. | <p>Vegetation community not present within subject property.</p> <p>Not SWH.</p> |

Table 2. Characteristics of Rare Vegetation Communities for Ecoregion 7E.

| Rare Vegetation Community ¹ | Candidate SWH | | | Confirmed SWH | Study Area |
|---|---|--|--|---|---|
| | ELC Ecosite Codes ¹ | Habitat Description ¹ | Detailed Information and Sources ¹ | Defining Criteria ¹ | Assessment Details |
| Alvar | | | | | |
| <p><u>Rationale:</u> Alvars are extremely rare habitats in Ecoregion 7E</p> | <p>ALO1 ALS1 ALT1 FOC1 FOC2 CUM2 CUS2 CUT2-1 CUW2</p> <p>Five Alvar Indicator Species: 1) Carex crawei 2) Panicum philadelphicum 3) Eleocharis compressa 4) Scutellaria parvula 5) Trichostema brachiatum</p> <p>These indicator species are very specific to Alvars within Ecoregion 7E^{cxlix}</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 animals species. Vegetation cover varies from patchy to barren with a less than 60% tree cover^{bxviii}.</p> | <p>An Alvar site > 0.5ha in size^{bxv}. Alvar is particularly rare in Ecoregion 7E where the only known sites are found in the western islands of Lake Erie^{cxix}.</p> <p><u>Information Sources</u> <ul style="list-style-type: none"> Alvars of Ontario (2000), Federation of Ontario Naturalists^{bxvi}. Ontario Nature – Conserving Great Lakes Alvars^{cxvii}. Natural Heritage Information Centre (NHIC) has location information available on their website OMNRF Staff Field Naturalist clubs Conservation Authorities </p> | <p>Field studies identify four of the five Alvar indicator species^{bxv} 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^{bxv}. SWHMIST^{cxlix} Index #17 provides development effects and mitigation measures. | <p>Vegetation community not present within subject property.</p> <p>Not SWH.</p> |
| Old Growth Forest | | | | | |
| <p><u>Rationale:</u> 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 overstorey trees resulting in a mosaic of gaps that encourage development of a multi-layered canopy and an abundance of snags and downed woody debris.</p> | <p>Woodland area is >0.5ha</p> <p><u>Information Sources</u> <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> | <p>Field Studies will determine:</p> <ul style="list-style-type: none"> If dominant trees species of the ecosite are >140 years old, then stand is Significant Wildlife Habitat^{cxviii}. The forested area containing the old growth characteristics will have experienced no recognizable forestry activities^{cxlviii} (cut stumps will not be present) Determine ELC Vegetation Type for forest area containing the old growth characteristics^{bxviii}. SWHMIST^{cxlix} Index #23 provides development effects and mitigation measures. | <p>Vegetation community not present within subject property.</p> <p>Not SWH.</p> |

Table 2. Characteristics of Rare Vegetation Communities for Ecoregion 7E.

| Rare Vegetation Community ¹ | Candidate SWH | | | Confirmed SWH | Study Area |
|---|---|--|---|---|---|
| | ELC Ecosite Codes ¹ | Habitat Description ¹ | Detailed Information and Sources ¹ | Defining Criteria ¹ | Assessment Details |
| Savannah | | | | | |
| <p><u>Rationale:</u> Savannahs are extremely rare habitats in Ontario.</p> | <p>TPS1 TPS2 TPW1 TPW2 CUS2</p> | <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)^{cc}.</p> | <p>No minimum size to site¹. 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 Centre (NHIC) has location data available on their website • Field naturalists clubs • Conservation Authorities | <p>Field studies confirm one or more of the Savannah indicator species listed in^{boxv} Appendix N should be present¹. Note: Savannah plant spp. list from Ecoregion 7E should be used.</p> <ul style="list-style-type: none"> • Area of the ELC Vegetation type is the SWH^{boxviii}. • Site must not be dominated by exotic or introduced species (<50% vegetative cover exotics). • SWHMIST^{cxlix} Index #18 provides development effects and mitigation measures. | <p>Vegetation community not present within subject property.</p> <p>Not SWH.</p> |
| Tallgrass Prairie | | | | | |
| <p><u>Rationale:</u> Tallgrass Prairies are extremely rare habitats in Ontario.</p> | <p>TPO1 TPO2</p> | <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)^{cc}.</p> | <p>No minimum size to site¹. 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 Centre (NHIC) has location information available on their website • OMNRF Districts • Field naturalists clubs • Conservation Authorities | <p>Field studies confirm one or more of the Prairie indicator species listed in^{boxv} Appendix N should be present¹. Note: Prairie plant spp. list from Ecoregion 7E should be used.</p> <ul style="list-style-type: none"> • Area of the ELC Vegetation Type is the SWH^{boxviii}. • Site must not be dominated by exotic or introduced species (<50% vegetative cover exotics). • SWHMIST^{cxlix} Index #19 provides development effects and mitigation measures. | <p>Vegetation community not present within subject property.</p> <p>Not SWH.</p> |

Table 2. Characteristics of Rare Vegetation Communities for Ecoregion 7E.

| Rare Vegetation Community ¹ | Candidate SWH | | | Confirmed SWH | Study Area |
|--|---|---|---|--|---|
| | ELC Ecosite Codes ¹ | Habitat Description ¹ | Detailed Information and Sources ¹ | Defining Criteria ¹ | Assessment Details |
| Other Rare Vegetation Communities | | | | | |
| <p><u>Rationale:</u> Plant communities that often contain rare species which depend on the habitat for survival.</p> | <p>Provincially Rare S1, S2 and S3 vegetation communities are listed in Appendix M of the SWHTG^{cxlviii}. Any ELC Ecosite Code that has a possible ELC Vegetation Type that is Provincially Rare is Candidate SWH.</p> | <p>Rare Vegetation Communities may include beaches, fens, forest, marsh, barrens, dunes and swamps.</p> | <p>ELC Ecosite codes that have the potential to be a rare ELC Vegetation Type as outlined in appendix M^{cxlviii}.</p> <p>The OMNRF/NHIC will have up to date listing for rare vegetation communities.</p> <p><u>Information Sources</u></p> <ul style="list-style-type: none"> • Natural Heritage Information Centre (NHIC) has location information available on their website • OMNRF Districts • Field naturalists clubs • Conservation Authorities | <p>Field studies should confirm if an ELC Vegetation Type is a rare vegetation community based on listing within Appendix M of SWHTG^{cxlviii}.</p> <ul style="list-style-type: none"> • Area of the ELC Vegetation Type polygon is the SWH. • SWHMIST^{cxlix} Index #37 provides development effects and mitigation measures. | <p>No other rare vegetation communities are present within the subject property.</p> <p>Not SWH.</p> |

Significant Wildlife Habitat Assessment Tables

Table 3. Characteristics of Specialized Wildlife Habitat for Ecoregion 7E.

| | Wildlife Species ¹ | Candidate SWH | | Confirmed SWH | Study Area |
|--|--|---|--|--|---|
| | | ELC Ecosite Codes ¹ | Habitat Criteria and Information Sources ¹ | Defining Criteria ¹ | Assessment Details |
| Wildlife Habitat: Waterfowl Nesting Area | | | | | |
| Rationale: Important to local waterfowl populations, sites with greatest number of species and highest number of individuals are significant | American Black Duck Northern Pintail Northern Shoveler Gadwall Blue-winged Teal Green-winged Teal Wood Duck Hooded Merganser Mallard | All upland habitats located adjacent to these wetland ELC Ecosites are Candidate SWH: MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 SWT1 SWT2 SWD1 SWD2 SWD3 SWD4 Note: includes adjacency to Provincially Significant Wetlands | A waterfowl nesting area extends: 120m ^{cxlx} from a wetland (>0.5ha) or a wetland (>0.5ha) with small wetlands (0.5ha) within 120m or a cluster of 3 or more small (<0.5 ha) wetlands within 120m of each individual wetland where waterfowl nesting is known to occur ^{cxlx} . • 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. <u>Information Sources</u> • 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 CAs | Studies confirmed: • Presence of 3 or more nesting pairs for listed species excluding Mallards ¹ , or, • Presence of 10 or more nesting pairs for listed species including Mallards ¹ . • 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" ^{ncxli} • 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 120m ^{cxlvi} from the wetland and will provide enough habitat for waterfowl to successfully nest. • SWHMIST ^{cxlx} Index #25 provides development effects and mitigation measures. | Suitable habitat is not present in the study area. Not SWH. |

Table 3. Characteristics of Specialized Wildlife Habitat for Ecoregion 7E.

| | Wildlife Species ¹ | Candidate SWH | | Confirmed SWH | Study Area |
|--|---|--|---|---|--|
| | | ELC Ecosite Codes ¹ | Habitat Criteria and Information Sources ¹ | Defining Criteria ¹ | Assessment Details |
| Wildlife Habitat: Bald Eagle and Osprey Nesting, Foraging and Perching Habitat | | | | | |
| <p><u>Rationale:</u> Nest sites are fairly uncommon in Ecoregion 7E and are used annually by these species. Many suitable nesting locations may be lost due to increasing shoreline development pressures and scarcity of habitat.</p> | <p>Osprey</p> <p><u>Special Concern:</u> 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> <p>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.</p> <p>Nests located on man-made 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 format and does not include all the habitat. • Nature Counts, Ontario Nest Records Scheme data • OMNRF Districts • Check the Ontario Breeding Bird Atlas^{ccv} or Rare Breeding Birds in Ontario for species documented • Reports and other information available from CAs • Field naturalists clubs | <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^{cxviii}. • 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. • For an Osprey, the active nest and a 300m radius around the nest or the contiguous woodland stand is the SWH^{ccvii}, maintaining undisturbed shorelines with large trees within this area is important^{cxviii}. • For a Bald Eagle the active nest and a 400-800m radius around the nest is the SWH^{cvi, ccvii}. Area of the habitat from 400-800m is dependant on site lines from the nest to the development and inclusion of perching and foraging habitat^{cvi}. • 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^{ccvii}. • 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”^{cccd} • SWHMIST^{cxlix} Index #26 provides development effects and mitigation measures. | <p>Suitable habitat is not present in the study area.</p> <p>Not SWH.</p> |

Table 3. Characteristics of Specialized Wildlife Habitat for Ecoregion 7E.

| | Wildlife Species ¹ | Candidate SWH | | Confirmed SWH | Study Area |
|---|---|--|--|---|--|
| | | ELC Ecosite Codes ¹ | Habitat Criteria and Information Sources ¹ | Defining Criteria ¹ | Assessment Details |
| Wildlife Habitat: Woodland Raptor Nesting Habitat | | | | | |
| <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.</p> <p>May also be found in SWC, SWM, SWD and CUP3</p> | <p>All natural or conifer plantation woodland/forest stands combined >30ha or with >4ha of interior habitat^[xxxviii, xxxix, xc, xci, xciii, xciv, xcvi, cxviii]. Interior habitat determined with a 200m buffer^{cxlviii}.</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^{ccv} or Rare Breeding Birds in Ontario for species documented. Check data from Bird Studies Canada Reports and other information available from CAs | <p>Studies confirm:</p> <ul style="list-style-type: none"> Presence of 1 or more active nests from species list is considered significant^{cxlviii}. Red-shouldered Hawk and Northern Goshawk – A 400m radius around the nest or 28 ha of habitat is the SWH^{ccvii} (the 28ha 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^{ccvii}. Broad-winged Hawk and Coopers Hawk – A 100m radius around the nest is the SWH^{ccvii}. Sharp-Shinned Hawk – A 50m radius around the nest is the SWH^{ccvii}. Conduct field investigations from early 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. SWHMIST^{cxlix} Index #27 provides development effects and mitigation measures. | <p>Suitable habitat is not present in the study area.</p> <p>Not SWH.</p> |
| Wildlife Habitat: Turtle Nesting Area | | | | | |
| <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>Special Concern: 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> | <p>• 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.</p> <p>• 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.</p> <p>• Sand and gravel beaches adjacent to undisturbed shallow weedy areas of marshes, lakes, and rivers are most frequently used.</p> <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 Summary 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 Turtlesⁱ One or more Northern Map Turtle or Snapping Turtle nesting is a SWHⁱ 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 dependant on slope, riparian vegetation and adjacent land use is the SWH^{cxlviii}. Travel routes from wetland to nesting area are to be considered within the SWH as part of the 30-100m area of habitat^{cxlix}. Field investigations should be conducted in prime nesting season typically late spring to early summer. Observation studies observing the turtles nesting is a recommended method. SWHMIST^{cxlix} Index #28 provides development effects and mitigation measures for turtle nesting habitat. | <p>Suitable habitat is not present in the study area.</p> <p>Not SWH.</p> |

Table 3. Characteristics of Specialized Wildlife Habitat for Ecoregion 7E.

| | Wildlife Species ¹ | Candidate SWH | | Confirmed SWH | Study Area |
|--|--|--|---|--|--|
| | | ELC Ecosite Codes ¹ | Habitat Criteria and Information Sources ¹ | Defining Criteria ¹ | Assessment Details |
| Wildlife Habitat: Seeps and Springs | | | | | |
| <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^{cxvii, cxlix}</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^{cxix, cxx, cxxi, cxxii, cxlii, cxliv} <p><u>Information Sources</u></p> <ul style="list-style-type: none"> Topographical Map Thermography Hydrological surveys conducted by CAs and MOE Field naturalists 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^l seeps/springs should be considered SWH. The area of a ELC forest 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 of the habitat^{cxviii}. SWHMIST^{cxlix} Index #30 provides development effects and mitigation measures. | <p>Suitable habitat is not present in the study area.</p> <p>Not SWH.</p> |
| Wildlife Habitat: Amphibian Breeding Habitat (Woodland) | | | | | |
| <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 or woodland pool (including vernal pools) >500m² (about 25m diameter) ^{cxvii} within or adjacent (within 120m) to a woodland (no minimum size) ^{cbxxii, bxii, lxx, lxvi, lxvii, lxviii, lxxx, lxx}. 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^{cxlviii}. <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/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. A combination of observational study and call count surveys ^{cxviii} 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 woodland area ^{lxiii, lxx, lxvi, lxvii, lxviii, lxxx, lxxi}. 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. SWHMIST^{cxlix} Index #14 provides development effects and mitigation measures. | <p>Suitable habitat is not present in the study area.</p> <p>Not SWH.</p> |

Significant Wildlife Habitat Assessment Tables

Table 4. Characteristics of Habitat for Species of Conservation Concern for Ecoregion 7E.

| | Wildlife Species ¹ | Candidate SWH | | Confirmed SWH | Study Area |
|---|--|---|---|---|--|
| | | ELC Ecosite Codes ¹ | Habitat Criteria and Information Sources ¹ | Defining Criteria ¹ | Assessment Details |
| Wildlife Habitat: Marsh Bird Breeding Habitat | | | | | |
| <p><u>Rationale:</u> Wetlands for these bird species are typically productive and fairly rare in Southern Ontario landscapes.</p> | <p>American Bittern Virginia Rail Sora Common Gallinule American Coot Pied-billed Grebe Marsh Wren Sedge Wren Common Loon Green Heron Trumpeter Swan</p> <p><u>Special Concern:</u> Black Tern Yellow Rail</p> | <p>MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 SAS1 SAM1 SAF1 FEO1 BOO1</p> <p>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^{ccxiv}. 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 Districts and wetland evaluations Field naturalist clubs Natural Heritage Information Centre (NHIC) Reports and other information available from CAs Ontario Breeding Bird Atlas^{ccv} | <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 species¹. Note: any wetland with breeding of 1 or more Trumpeter Swans, Black Terns, Green Heron or Yellow Rail is SWH¹. 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"^{ccxi} SWHMIST^{cclix} Index #35 provides development effects and mitigation measures | <p>Suitable habitat is not present in the study area.</p> <p>Not SWH.</p> |
| Wildlife Habitat: Open Country Bird Breeding Habitat | | | | | |
| <p><u>Rationale:</u> 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><u>Special Concern:</u> Short-eared Owl</p> | <p>CUM1 CUM2</p> | <p>Large grassland areas (includes natural and cultural fields and meadows) >30ha^{clx, clxi, clxii, clxiii, clxiv, clxv, clxvi, clxvii, clxviii, clxix}. Grasslands not Class 1 or 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 years¹).</p> <p>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.</p> <p>The Indicator bird species are 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 birder clubs Ontario Breeding Bird Atlas^{ccv} EIS Reports and other information available from CAs | <p>Field Studies confirm:</p> <ul style="list-style-type: none"> Presence of nesting or breeding of 2 or more of the listed species¹. 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. Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"^{ccxi} SWHMIST^{cclix} Index #32 provides development effects and mitigation measures | <p>Suitable habitat is not present in the study area.</p> <p>Not SWH.</p> |

Table 4. Characteristics of Habitat for Species of Conservation Concern for Ecoregion 7E.

| | Wildlife Species ¹ | Candidate SWH | | Confirmed SWH | Study Area |
|---|--|--|--|--|--|
| | | ELC Ecosite Codes ¹ | Habitat Criteria and Information Sources ¹ | Defining Criteria ¹ | Assessment Details |
| Wildlife Habitat: Shrub/Early Successional Bird Breeding Habitat | | | | | |
| <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 (2004) trend records.</p> | <p>Indicator Spp: Brown Thrasher Clay-coloured Sparrow</p> <p>Common Spp. Field Sparrow Black-billed Cuckoo Eastern Towhee Willow Flycatcher</p> <p><u>Special Concern:</u> Yellow-breasted Chat Golden-winged Warbler</p> | <p>CUT1 CUT2 CUS1 CUS2 CUW1 CUW2</p> <p>Patches of shrub ecosites can be complexed into a larger habitat such as woodland area for some bird species.</p> | <p>Large natural field areas succeeding to shrub and thicket habitats >10ha^{clxiv} in size. 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)^l.</p> <p>Shrub thicket habitats (>10 ha) are most likely to support and sustain a diversity of these species^{clxxiii}.</p> <p>Shrub and thicket habitat sites considered significant should have a history of longevity, either abandoned fields or pasturelands.</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^{ccv} • Reports and other information available from CAs | <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^l. • A field with breeding Yellow-breasted Chat or Golden-winged Warbler is to be considered as Significant Wildlife Habitat^l. • 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"^{ccxi} • SWHMIST^{cdlix} Index #33 provides development effects and mitigation measures. | <p>Suitable habitat is not present in the study area.</p> <p>Not SWH.</p> |
| Wildlife Habitat: Terrestrial Crayfish | | | | | |
| <p><u>Rationale:</u> Terrestrial Crayfish are only found within SW Ontario in Canada and their habitats are very rare.^{ccii}</p> | <p>Chimney or Digger Crayfish (<i>Fallicambarus fodiens</i>)</p> <p>Devil Crawfish or Meadow Crayfish (<i>Cambarus Diogenes</i>)</p> | <p>MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 MAS1 MAS2 MAS3 SWD SWT SWM</p> <p>CUM1 with inclusions of above meadow marsh ecosites can be used by terrestrial crayfish</p> | <p>Wet meadow and edges of shallow marshes (no minimum size) identified should be surveyed for terrestrial crayfish.</p> <ul style="list-style-type: none"> • Constructs burrows in marshes, mudflats, meadows, the ground can't be too moist. Can often be 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. <p><u>Information Sources</u></p> <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. | <p>Studies Confirm:</p> <ul style="list-style-type: none"> • Presence of 1 or more individuals of species listed or their chimneys (burrows) in suitable marsh meadow or terrestrial sites^{cccl}. • Area of ELC Ecosite or an ecoelement area of meadow marsh or swamp within the large 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^{cccl} • SWHMIST^{cdlix} Index #36 provides development effects and mitigation measures. | <p>Suitable habitat is not present in the study area.</p> <p>Not SWH.</p> |

Table 4. Characteristics of Habitat for Species of Conservation Concern for Ecoregion 7E.

| | Wildlife Species ¹ | Candidate SWH | | Confirmed SWH | Study Area |
|--|--|--|--|---|---|
| | | ELC Ecosite Codes ¹ | Habitat Criteria and Information Sources ¹ | Defining Criteria ¹ | Assessment Details |
| Wildlife Habitat: Special Concern and Rare Wildlife Species | | | | | |
| <p><u>Rationale:</u> 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.</p> <p>Older element occurrences were recorded prior to GPS being available, therefore location information may lack accuracy.</p> | <p>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^{boxviii}.</p> <p><u>Information Sources</u></p> <ul style="list-style-type: none"> • Natural Heritage Information Centre (NHIC) will have the Special Concern and Provincially Rare (S1-S3, SH) species lists and element occurrences for these species. • NHIC Website: "Get Information" http://nhic.mnr.gov.on.ca • Ontario Breeding Bird Atlas^{ccv} • 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 to be easily mapped and cover an important life stage component for a species e.g. specific nesting habitat for foraging habitat. • SWHMIST^{cxlix} Index #37 provides development effects and mitigation measures. | <p>No Special Concern or Provincially Rare species are present within the study area.</p> <p>Not SWH</p> |

Significant Wildlife Habitat Assessment Tables

Table 5. Characteristics of Animal Movement Corridors for Ecoregion 7E.

| | Wildlife Species ¹ | Candidate SWH | | Confirmed SWH | Study Area |
|---|--|---|---|---|---|
| | | ELC Ecosite Codes ¹ | Habitat Criteria and Information Sources ¹ | Defining Criteria ¹ | Assessment Details |
| Wildlife Habitat: Amphibian Movement Corridors | | | | | |
| Rationale: Movement corridors for amphibians moving from their terrestrial habitat to breeding habitat can be extremely important for local populations. | Eastern Newt American Toad Blue-spotted Salamander Spotted Salamander Four-toed Salamander Gray Treefrog Northern Leopard Frog Pickerel Frog Western Chorus Frog | Corridors may be found in all ecosites associated with water. • Corridors will be determined based on identifying the significant breeding habitat for these species in Table 1.1. | Movement corridors between breeding habitat and summer habitat ^{cxix, cxov, cxovi, cxovii, cxoviii, cxobx, cxoox, cxooi} Movement corridors must be considered when Amphibian breeding habitat is confirmed as SWH from Table 1.2.2 (Amphibian Breeding Habitat – Wetland) of this Schedule ¹ . <u>Information Sources</u> • MNR District Office • Natural Heritage Information Centre NHIC • Reports and other information available from CAs • Field naturalist Clubs | • 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 ^{cxix} . • Corridors should have at least 15m of vegetation on both sides of waterway ^{cxix} or be up to 200m wide ^{cxix} of woodland habitat and with gaps <20m ^{cxix} • Shorter corridors are more significant than longer corridors, however amphibians must be able to get to and from their summer and breeding habitat ^{cxix} . • SWHMIST ^{cxix} Index #40 provides development effects and mitigation measures. | Suitable habitat is not present in the study area. Not SWH. |

Appendix II
Vascular Plant and Wildlife Species Reported from the Study Area and Vicinity

2258A - Clark Blvd. / Eastern Ave. EA
 Vascular Plant Species Reported From the Study Area

| Scientific Name | Common Name | CC ¹ | CW ¹ | Weed ¹ | SRANK ² | SARO ² | COSEWIC ³ | SARA Schedule ³ | TRCA Rank ⁴ | NHIC Data ⁵ | FOD7 |
|--|----------------------------------|-----------------|-----------------|-------------------|--------------------|-------------------|----------------------|----------------------------|------------------------|------------------------|------|
| Gymnosperms | Conifers | | | | | | | | | | |
| Pinaceae | Pine Family | | | | | | | | | | |
| <i>Pinus nigra</i> | Austrian Pine | | -5 | -1 | SE2 | | | | L+ | | X |
| Dicotyledons | Dicots | | | | | | | | | | |
| Aceraceae | Maple Family | | | | | | | | | | |
| <i>Acer ginnala</i> | Amur Maple | | 5 | -2 | SE1 | | | | | | X |
| <i>Acer negundo</i> | Manitoba Maple | 0 | -2 | | S5 | | | | L+? | | X |
| <i>Acer platanoides</i> | Norway Maple | | 5 | -3 | SE5 | | | | L+ | | X |
| Asteraceae | Composite or Aster Family | | | | | | | | | | |
| <i>Arctium minus ssp. minus</i> | Common Burdock | | 5 | -2 | SE5 | | | | | | X |
| <i>Leucanthemum vulgare</i> | Ox-eye Daisy | | 5 | -1 | SE5 | | | | L+ | | X |
| <i>Solidago altissima var. altissima</i> | Tall Goldenrod | 1 | 3 | | S5 | | | | L5 | | X |
| Boraginaceae | Borage Family | | | | | | | | | | |
| <i>Cynoglossum officinale</i> | Hound's-tongue | | 5 | -1 | SE5 | | | | L+ | | X |
| <i>Myosotis arvensis</i> | Rough Forget-me-not | | | | SNA | | | | L+ | | X |
| Brassicaceae | Mustard Family | | | | | | | | | | |
| <i>Alliaria petiolata</i> | Garlic Mustard | | 0 | -3 | SE5 | | | | L+ | | X |
| <i>Hesperis matronalis</i> | Dame's Rocket | | 5 | -3 | SE5 | | | | L+ | | X |
| <i>Lepidium densiflorum</i> | Common Pepper-grass | | 0 | -2 | SE5 | | | | L+? | | X |
| Campanulaceae | Bellflower Family | | | | | | | | | | |
| <i>Campanula rapunculoides</i> | Creeping Bellflower | | 5 | -2 | SE5 | | | | L+ | | X |
| Caprifoliaceae | Honeysuckle Family | | | | | | | | | | |
| <i>Lonicera tatarica</i> | Tartarian Honeysuckle | | 3 | -3 | SE5 | | | | L+ | | X |
| <i>Viburnum opulus</i> | Guelder Rose | | 0 | -1 | SE4 | | | | | | X |
| Cornaceae | Dogwood Family | | | | | | | | | | |
| <i>Cornus stolonifera</i> | Red-osier Dogwood | 2 | -3 | | S5 | | | | L5 | | X |
| Elaeagnaceae | Oleaster Family | | | | | | | | | | |
| <i>Elaeagnus angustifolia</i> | Russian Olive | | 4 | -1 | SE3 | | | | L+ | | X |
| <i>Elaeagnus umbellata</i> | Autumn Olive | | 3 | -3 | SE3 | | | | L+ | | X |
| Euphorbiaceae | Spurge Family | | | | | | | | | | |
| <i>Euphorbia esula</i> | Leafy Spurge | | 5 | -2 | SE5 | | | | L+ | | X |
| Fabaceae | Pea Family | | | | | | | | | | |
| <i>Lotus corniculatus</i> | Bird's-foot Trefoil | | 1 | -2 | SE5 | | | | L+ | | X |
| <i>Medicago lupulina</i> | Black Medick | | 1 | -1 | SE5 | | | | L+ | | X |
| <i>Melilotus alba</i> | White Sweet-clover | | 3 | -3 | SE5 | | | | | | X |

2258A - Clark Blvd. / Eastern Ave. EA
 Vascular Plant Species Reported From the Study Area

| Scientific Name | Common Name | CC ¹ | CW ¹ | Weed ¹ | SRANK ² | SARO ² | COSEWIC ³ | SARA Schedule ³ | TRCA Rank ⁴ | NHIC Data ⁵ | FOD7 |
|--|--------------------------------|-----------------|-----------------|-------------------|--------------------|-------------------|----------------------|----------------------------|------------------------|------------------------|------|
| <i>Robinia pseudo-acacia</i> | Black Locust | | 4 | -3 | SE5 | | | | | | X |
| <i>Trifolium aureum</i> | Yellow Clover | | 5 | -1 | SE5 | | | | L+ | | X |
| <i>Vicia cracca</i> | Tufted Vetch | | 5 | -1 | SE5 | | | | L+ | | X |
| Fagaceae | Beech Family | | | | | | | | | | |
| <i>Quercus macrocarpa</i> | Bur Oak | 5 | 1 | | S5 | | | | L4 | | X |
| <i>Quercus robur</i> | English Oak | | | | SE1 | | | | L+ | | X |
| Grossulariaceae | Currant Family | | | | | | | | | | |
| <i>Ribes rubrum</i> | Red Currant | | 5 | -2 | SE5 | | | | L+ | | X |
| Guttiferae | St. John's-wort Family | | | | | | | | | | |
| <i>Hypericum perforatum</i> | Common St. John's-wort | | 5 | -3 | SE5 | | | | L+ | | X |
| Lamiaceae | Mint Family | | | | | | | | | | |
| <i>Prunella vulgaris ssp. lanceolata</i> | Heal-all | 5 | 5 | | S5 | | | | L4 (L5) | | X |
| Lythraceae | Loosestrife Family | | | | | | | | | | |
| <i>Lythrum salicaria</i> | Purple Loosestrife | | -5 | -3 | SE5 | | | | L+ | | X |
| Oleaceae | Olive Family | | | | | | | | | | |
| <i>Fraxinus excelsior</i> | European Ash | | | | SE2 | | | | L+ | | X |
| <i>Fraxinus pennsylvanica</i> | Green Ash | 3 | -3 | | S5 | | | | L5 | | X |
| <i>Ligustrum vulgare</i> | Common Privet | | 1 | -2 | SE5 | | | | L+ | | X |
| <i>Syringa reticulata</i> | Japanese Silk Lilac | | | | SE5 | | | | | | X |
| <i>Syringa vulgaris</i> | Common Lilac | | 5 | -2 | SE5 | | | | L+ | | X |
| Onagraceae | Evening-primrose Family | | | | | | | | | | |
| <i>Oenothera biennis</i> | Common Evening-primrose | 0 | 3 | | S5 | | | | L5 | | X |
| Plantaginaceae | Plantain Family | | | | | | | | | | |
| <i>Plantago rugelii</i> | Rugel's Plantain | 1 | 0 | | S5 | | | | L5 | | X |
| Polygonaceae | Smartweed Family | | | | | | | | | | |
| <i>Rumex crispus</i> | Curly-leaf Dock | | -1 | -2 | SE5 | | | | L+ | | X |
| Ranunculaceae | Buttercup Family | | | | | | | | | | |
| <i>Ranunculus acris</i> | Tall Buttercup | | -2 | -2 | SE5 | | | | L+ | | X |
| Rhamnaceae | Buckthorn Family | | | | | | | | | | |
| <i>Rhamnus cathartica</i> | European Buckthorn | | 3 | -3 | SE5 | | | | L+ | | X |

2258A - Clark Blvd. / Eastern Ave. EA
 Vascular Plant Species Reported From the Study Area

| Scientific Name | Common Name | CC ¹ | CW ¹ | Weed ¹ | SRANK ² | SARO ² | COSEWIC ³ | SARA Schedule ³ | TRCA Rank ⁴ | NHIC Data ⁵ | FOD7 |
|---|-----------------------|------------------------------|-----------------|-------------------|--------------------|-------------------|----------------------|----------------------------|------------------------|------------------------|------|
| Rosaceae | | Rose Family | | | | | | | | | |
| <i>Crataegus monogyna</i> | English Hawthorn | | 5 | -1 | SE5 | | | | L+ | | X |
| <i>Fragaria virginiana</i> | Wild Strawberry | | | | S5 | | | | L5 | | X |
| <i>Geum urbanum</i> | Wood Avens | | 5 | -1 | SE2 | | | | L+ | | X |
| <i>Malus domestica</i> | Apple | | | | | | | | | | X |
| <i>Prunus avium</i> | Cherry Plum | | 5 | -2 | SE4 | | | | L+ | | X |
| <i>Prunus virginiana ssp. virginiana</i> | Choke Cherry | 2 | 1 | | S5 | | | | L5 | | X |
| <i>Pyrus communis</i> | Common Pear | | 5 | -1 | SE4 | | | | L+ | | X |
| <i>Rosa multiflora</i> | Multiflora Rose | | 3 | -3 | SE4 | | | | L+ | | X |
| <i>Rosa rubiginosa</i> | Sweetbrier Rose | | 5 | -1 | SE4 | | | | | | X |
| <i>Sorbus aucuparia</i> | European Mountain-ash | | 5 | -2 | SE4 | | | | L+ | | X |
| Salicaceae | | Willow Family | | | | | | | | | |
| <i>Populus balsamifera ssp. balsamifera</i> | Balsam Poplar | 4 | -3 | | S5 | | | | L5 | | X |
| <i>Populus deltoides ssp. deltoides</i> | Eastern Cottonwood | 4 | -1 | | S5 | | | | L5 | | X |
| <i>Populus tremuloides</i> | Trembling Aspen | 2 | 0 | | S5 | | | | L5 | | X |
| <i>Salix amygdaloides</i> | Peach-leaved Willow | 6 | -3 | | S5 | | | | L4 | | X |
| <i>Salix exigua</i> | Sandbar Willow | 3 | -5 | | S5 | | | | | | X |
| <i>Salix fragilis</i> | Crack Willow | | -1 | -3 | SE5 | | | | | | X |
| Scrophulariaceae | | Figwort Family | | | | | | | | | |
| <i>Linaria vulgaris</i> | Butter-and-eggs | | 5 | -1 | SE5 | | | | L+ | | X |
| Solanaceae | | Nightshade Family | | | | | | | | | |
| <i>Solanum dulcamara</i> | Bitter Nightshade | | 0 | -2 | SE5 | | | | L+ | | X |
| Tiliaceae | | Linden Family | | | | | | | | | |
| <i>Tilia americana</i> | American Basswood | 4 | 3 | | S5 | | | | L5 | | X |
| <i>Tilia cordata</i> | Small Leaf Linden | | | | SE1 | | | | L+ | | X |
| Ulmaceae | | Elm Family | | | | | | | | | |
| <i>Ulmus americana</i> | White Elm | 3 | -2 | | S5 | | | | L5 | | X |
| <i>Ulmus pumila</i> | Siberian Elm | | 5 | -1 | SE3 | | | | L+ | | X |
| Vitaceae | | Grape Family | | | | | | | | | |
| <i>Parthenocissus vitacea</i> | Woodbine | 3 | 3 | | S5 | | | | L5 | | X |
| <i>Vitis riparia</i> | Riverbank Grape | 0 | -2 | | S5 | | | | L5 | | X |
| Monocotyledons | | Monocots | | | | | | | | | |
| Alismataceae | | Water-plantain Family | | | | | | | | | |
| <i>Alisma plantago-aquatica</i> | Common Water-plantain | 3 | -5 | | S5 | | | | L5 | | X |
| Cyperaceae | | Sedge Family | | | | | | | | | |
| <i>Carex normalis</i> | Larger Straw Sedge | 6 | -3 | | S4 | | | | L3 | | X |
| <i>Carex spicata</i> | Spiked Sedge | | 5 | -1 | SE5 | | | | L+ | | X |

2258A - Clark Blvd. / Eastern Ave. EA
 Vascular Plant Species Reported From the Study Area

| Scientific Name | Common Name | CC ¹ | CW ¹ | Weed ¹ | SRANK ² | SARO ² | COSEWIC ³ | SARA Schedule ³ | TRCA Rank ⁴ | NHIC Data ⁵ | FOD7 |
|-------------------------------------|----------------------|-----------------|-----------------|-------------------|--------------------|-------------------|----------------------|----------------------------|------------------------|------------------------|-----------|
| Iridaceae | Iris Family | | | | | | | | | | |
| <i>Iris pseudacorus</i> | Yellow Iris | | -5 | -2 | SE3 | | | | L+ | | X |
| Juncaceae | Rush Family | | | | | | | | | | |
| <i>Juncus tenuis</i> | Path Rush | 0 | 0 | | S5 | | | | L5 | | X |
| Liliaceae | Lily Family | | | | | | | | | | |
| <i>Hemerocallis fulva</i> | Orange Day-lily | | 5 | -3 | SE5 | | | | L+ | | X |
| Orchidaceae | Orchid Family | | | | | | | | | | |
| <i>Epipactis helleborine</i> | Common Helleborine | | 5 | -2 | SE5 | | | | L+ | | X |
| Poaceae | Grass Family | | | | | | | | | | |
| <i>Bromus inermis ssp. inermis</i> | Awnless Brome | | 5 | -3 | SE5 | | | | | | X |
| <i>Dactylis glomerata</i> | Orchard Grass | | 3 | -1 | SE5 | | | | L+ | | X |
| <i>Elymus repens</i> | Quack Grass | | 3 | -3 | SE5 | | | | L+ | | X |
| <i>Festuca pratensis</i> | Meadow Fescue | | 4 | -1 | SE5 | | | | | | X |
| <i>Hordeum jubatum ssp. jubatum</i> | Squirrel-tail Grass | | -1 | -1 | SE5 | | | | L+ | | X |
| <i>Phalaris arundinacea</i> | Reed Canary Grass | 0 | -4 | | S5 | | | | L+? | | X |
| <i>Phragmites australis</i> | Common Reed | 0 | -4 | | S5 | | | | | | X |
| <i>Poa compressa</i> | Canada Blue Grass | 0 | 2 | | S5 | | | | L+ | | X |
| <i>Poa pratensis ssp. pratensis</i> | Kentucky Bluegrass | 0 | 1 | | S5 | | | | L+ | | X |
| | | | | | | | | | Total | 0 | 81 |

¹Oldham et al. 1995; ²MNRF 2019a; ³Government of Canada 2019; ⁴Toronto Region Conservation Authority 2008a/2008b; ⁵MNRF 2019b

| LEGEND |
|-------------------------|
| SRANK |
| S1 Critically Imperiled |
| S2 Imperiled |
| S3 Vulnerable |
| S4 Apparently Secure |
| S5 Secure |
| SNA Unranked |
| TRCA (2008) |

L5 Able to withstand high levels of disturbance; generally secure throughout the jurisdiction, including the urban matrix. May be of very localized concern in highly degraded areas.

L4 Able to withstand some disturbance; generally secure in rural matrix; of concern in urban matrix.

L3 Able to withstand minor disturbance; generally secure in natural matrix; considered to be of regional concern.

L+ Exotic. Not native to TRCA jurisdiction. Includes hybrids between a native species and an exotic.

L+? Origin uncertain or disputed, i.e. may or may not be native.

L3 (L4) For example, indicates "treat species as an L4"

2258A - Clark Blvd. / Eastern Ave. EA
 Vascular Plant Species Reported From the Study Area

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|-----------------|-------------|-----------------|-----------------|-------------------|--------------------|-------------------|----------------------|----------------------------|------------------------|------------------------|------|
|-----------------|-------------|-----------------|-----------------|-------------------|--------------------|-------------------|----------------------|----------------------------|------------------------|------------------------|------|

| FLORISTIC SUMMARY & ASSESSMENT¹ | | | |
|--|---------------------------------|--------|--------|
| Species Diversity* | | | |
| Total Species: | 75 | | |
| Native Species: | 26 | 34.67% | |
| Exotic Species | 48 | 64.00% | |
| Total Taxa in Region (List Region, Source) | 1391 | | |
| % Regional Taxa Recorded | 5.39% | | |
| Regionally Significant Species | 2 | 3% | |
| S1-S3 Species | 0 | 0% | |
| S4 Species | 1 | 2% | |
| S5 Species | 24 | 2% | |
| Co-efficient of Conservatism and Floral Quality Index | | | |
| Co-efficient of Conservatism (CC) (average) | | 2.00 | |
| CC 0 to 3 | lowest sensitivity | 18 | 69.23% |
| CC 4 to 6 | moderate sensitivity | 6 | 23.08% |
| CC 7 to 8 | high sensitivity | 0 | 0.00% |
| CC 9 to 10 | highest sensitivity | 0 | 0.00% |
| Floral Quality Index (FQI) | | 10.20 | |
| Presence of Weedy & Invasive Species | | | |
| mean weediness | | -2.00 | |
| weediness = -1 | low potential invasiveness | 16 | 34.78% |
| weediness = -2 | moderate potential invasiveness | 16 | 34.78% |
| weediness = -3 | high potential invasiveness | 14 | 30.43% |

2258A - Clark Blvd. / Eastern Ave. EA
 Bird Species Reported From the Study Area

| Scientific Name | Common Name | SRANK ¹ | SARO ² | COSEWIC ³ | SARA Schedule ⁴ | TRCA Status ⁵ | OBBA ⁶ | NHIC Data ¹ | NRSI Observed |
|----------------------------------|---|--------------------|-------------------|----------------------|----------------------------|--------------------------|-------------------|------------------------|---------------|
| | | | | | | | 17PJ04 | | |
| Anatidae | Ducks, Geese & Swans | | | | | | | | |
| <i>Branta canadensis</i> | Canada Goose | S5 | | | | L5 | CO | | X |
| <i>Aix sponsa</i> | Wood Duck | S5 | | | | L4 | PR | | |
| <i>Anas platyrhynchos</i> | Mallard | S5 | | | | L5 | CO | | |
| <i>Lophodytes cucullatus</i> | Hooded Merganser | S5B, S5N | | | | L3 | PR | | |
| | | | | | | | | | |
| Phasianidae | Partridges, Grouse & Turkeys | | | | | | | | |
| <i>Phasianus colchicus</i> | Ring-necked Pheasant | SNA | | | | L+ | PO | | |
| <i>Bonasa umbellus</i> | Ruffed Grouse | S4 | | | | L2 | PR | | |
| <i>Meleagris gallopavo</i> | Wild Turkey | S5 | | | | L3 | PO | | |
| | | | | | | | | | |
| Columbidae | Pigeons & Doves | | | | | | | | |
| <i>Columba livia</i> | Rock Pigeon | SNA | | | | L+ | CO | | PR |
| <i>Zenaida macroura</i> | Mourning Dove | S5 | | | | L5 | CO | | |
| | | | | | | | | | |
| Cuculiformes | Cuckoos & Anis | | | | | | | | |
| <i>Coccyzus americanus</i> | Yellow-billed Cuckoo | S4B | | | | L3 | CO | | |
| <i>Coccyzus erythrophthalmus</i> | Black-billed Cuckoo | S5B | | | | L3 | CO | | |
| | | | | | | | | | |
| Caprimulgidae | Goatsuckers | | | | | | | | |
| <i>Chordeiles minor</i> | Common Nighthawk | S4B | SC | SC | Schedule 1 | L3 | PO | | |
| | | | | | | | | | |
| Apodidae | Swifts | | | | | | | | |
| <i>Chaetura pelagica</i> | Chimney Swift | S4B, S4N | THR | T | Schedule 1 | L4 | PR | | |
| | | | | | | | | | |
| Trochilidae | Hummingbirds | | | | | | | | |
| <i>Archilochus colubris</i> | Ruby-throated Hummingbird | S5B | | | | L4 | PO | | |
| | | | | | | | | | |
| Rallidae | Railes, Gallinules & Coots | | | | | | | | |
| <i>Porzana carolina</i> | Sora | S4B | | | | L3 | PO | | |
| | | | | | | | | | |
| Charadriidae | Plovers | | | | | | | | |
| <i>Charadrius vociferus</i> | Killdeer | S5B, S5N | | | | L5 | CO | | X |
| | | | | | | | | | |
| Scolopacidae | Waders | | | | | | | | |
| <i>Gallinago delicata</i> | Wilson's Snipe | S5B | | | | L3 | PO | | |
| <i>Scolopax minor</i> | American Woodcock | S4B | | | | L3 | PR | | |
| <i>Actitis macularia</i> | Spotted Sandpiper | S5 | | | | L4 | CO | | |
| | | | | | | | | | |
| Laridae | Gulls, Terns & Skimmers | | | | | | | | |
| <i>Larus delawarensis</i> | Ring-billed Gull | S5B, S4N | | | | L4 | | | X |
| | | | | | | | | | |
| Ardeidae | Herons & Bitterns | | | | | | | | |
| <i>Ardea herodias</i> | Great Blue Heron | S4B | | | | L3 | PO | | |
| <i>Butorides virescens</i> | Green Heron | S4B | | | | L4 | PR | | |
| | | | | | | | | | |
| Cathartidae | Vultures | | | | | | | | |
| <i>Cathartes aura</i> | Turkey Vulture | S5B | | | | L4 | PO | | X |

2258A - Clark Blvd. / Eastern Ave. EA
 Bird Species Reported From the Study Area

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|--|-------------------------------|--------------------|-------------------|----------------------|----------------------------|--------------------------|-------------------|------------------------|---------------|
| | | | | | | | 17PJ04 | | |
| Accipitridae | | | | | | | | | |
| Hawks, Kites, Eagles & Allies | | | | | | | | | |
| <i>Circus cyaneus</i> | Northern Harrier | S4B | NAR | NAR | | L3 | PO | | |
| <i>Accipiter striatus</i> | Sharp-shinned Hawk | S5 | NAR | | | L3 | PR | | |
| <i>Accipiter cooperii</i> | Cooper's Hawk | S4 | NAR | NAR | | L4 | CO | | |
| <i>Buteo jamaicensis</i> | Red-tailed Hawk | S5 | NAR | NAR | | L5 | CO | | |
| Strigidae | | | | | | | | | |
| Typical Owls | | | | | | | | | |
| <i>Megascops asio</i> | Eastern Screech-Owl | S4 | NAR | NAR | | L4 | CO | | |
| <i>Bubo virginianus</i> | Great Horned Owl | S4 | | | | L4 | CO | | |
| <i>Asio otus</i> | Long-eared Owl | S4 | | | | L3 | CO | | |
| Alcedinidae | | | | | | | | | |
| Kingfishers | | | | | | | | | |
| <i>Megaceryle alcyon</i> | Belted Kingfisher | S4B | | | | L4 | CO | | |
| Picidae | | | | | | | | | |
| Woodpeckers | | | | | | | | | |
| <i>Sphyrapicus varius</i> | Yellow-bellied Sapsucker | S5B | | | | L3 | PR | | |
| <i>Dryobates pubescens</i> | Downy Woodpecker | S5 | | | | L5 | CO | | |
| <i>Dryobates villosus</i> | Hairy Woodpecker | S5 | | | | L4 | CO | | |
| <i>Colaptes auratus</i> | Northern Flicker | S4B | | | | L4 | CO | | |
| <i>Dryocopus pileatus</i> | Pileated Woodpecker | S5 | | | | L3 | CO | | |
| Falconidae | | | | | | | | | |
| Caracaras & Falcons | | | | | | | | | |
| <i>Falco sparverius</i> | American Kestrel | S4 | | | | L4 | CO | | |
| Tyrannidae | | | | | | | | | |
| Tyrant Flycatchers | | | | | | | | | |
| <i>Contopus virens</i> | Eastern Wood-Pewee | S4B | SC | SC | | L4 | CO | | |
| <i>Empidonax alnorum</i> | Alder Flycatcher | S5B | | | | L4 | PR | | |
| <i>Empidonax traillii</i> | Willow Flycatcher | S5B | | | | L4 | CO | | |
| <i>Empidonax minimus</i> | Least Flycatcher | S4B | | | | L4 | PR | | |
| <i>Sayornis phoebe</i> | Eastern Phoebe | S5B | | | | L5 | CO | | |
| <i>Myiarchus crinitus</i> | Great Crested Flycatcher | S4B | | | | L4 | CO | | |
| <i>Tyrannus tyrannus</i> | Eastern Kingbird | S4B | | | | L4 | CO | | |
| Vireonidae | | | | | | | | | |
| Vireos | | | | | | | | | |
| <i>Vireo solitarius</i> | Blue-headed Vireo | S5B | | | | L3 | PO | | |
| <i>Vireo gilvus</i> | Warbling Vireo | S5B | | | | L5 | CO | | |
| <i>Vireo olivaceus</i> | Red-eyed Vireo | S5B | | | | L4 | CO | | |
| Corvidae | | | | | | | | | |
| Crows & Jays | | | | | | | | | |
| <i>Cyanocitta cristata</i> | Blue Jay | S5 | | | | L5 | CO | | |
| <i>Corvus brachyrhynchos</i> | American Crow | S5B | | | | L5 | CO | | X |
| Alaudidae | | | | | | | | | |
| Larks | | | | | | | | | |
| <i>Eremophila alpestris</i> | Horned Lark | S5B | | | | L4 | CO | | |
| Hirundinidae | | | | | | | | | |
| Swallows | | | | | | | | | |
| <i>Progne subis</i> | Purple Martin | S4B | | | | L4 | PO | | |
| <i>Tachycineta bicolor</i> | Tree Swallow | S4B | | | | L4 | CO | | |
| <i>Stelgidopteryx serripennis</i> | Northern Rough-winged Swallow | S4B | | | | L4 | CO | | |
| <i>Riparia riparia</i> | Bank Swallow | S4B | THR | T | | L4 | CO | | |
| <i>Petrochelidon pyrrhonota</i> | Cliff Swallow | S4B | | | | L4 | CO | | |

2258A - Clark Blvd. / Eastern Ave. EA
 Bird Species Reported From the Study Area

| Scientific Name | Common Name | SRANK ¹ | SARO ² | COSEWIC ³ | SARA Schedule ⁴ | TRCA Status ⁵ | OBBA ⁶ | NHIC Data ¹ | NRSI Observed |
|--------------------------------|-------------------------|---|-------------------|----------------------|----------------------------|--------------------------|-------------------|------------------------|---------------|
| | | | | | | | 17PJ04 | | |
| <i>Hirundo rustica</i> | Barn Swallow | S4B | THR | T | | L4 | CO | | |
| Paridae | | Chickadees & Titmice | | | | | | | |
| <i>Poecile atricapillus</i> | Black-capped Chickadee | S5 | | | | L5 | CO | | |
| Sittidae | | Nuthatches | | | | | | | |
| <i>Sitta canadensis</i> | Red-breasted Nuthatch | S5 | | | | L4 | CO | | |
| <i>Sitta carolinensis</i> | White-breasted Nuthatch | S5 | | | | L4 | CO | | |
| Certhiidae | | Creepers | | | | | | | |
| <i>Certhia americana</i> | Brown Creeper | S5B | | | | L3 | PR | | |
| Troglodytidae | | Wrens | | | | | | | |
| <i>Troglodytes aedon</i> | House Wren | S5B | | | | L5 | CO | | |
| <i>Troglodytes hiemalis</i> | Winter Wren | S5B | | | | L3 | PO | | |
| <i>Cistothorus platensis</i> | Sedge Wren | S4B | NAR | NAR | | L3 | PR | | |
| Poliopitilidae | | Gnatcatchers | | | | | | | |
| <i>Poliopitila caerulea</i> | Blue-gray Gnatcatcher | S4B | | | | L4 | CO | | |
| Regulidae | | Kinglets | | | | | | | |
| <i>Regulus satrapa</i> | Golden-crowned Kinglet | S5B | | | | L3 | PO | | |
| Muscicapidae | | Old world Flycatchers | | | | | | | |
| Turdidae | | Thrushes | | | | | | | |
| <i>Catharus fuscescens</i> | Veery | S4B | | | | L3 | CO | | |
| <i>Hylocichla mustelina</i> | Wood Thrush | S4B | SC | T | | L3 | CO | | |
| <i>Turdus migratorius</i> | American Robin | S5B | | | | L5 | CO | | PR |
| Mimidae | | Mockingbirds, Thrashers & Allies | | | | | | | |
| <i>Dumetella carolinensis</i> | Gray Catbird | S4B | | | | L4 | CO | | |
| <i>Toxostoma rufum</i> | Brown Thrasher | S4B | | | | L3 | CO | | |
| <i>Mimus polyglottos</i> | Northern Mockingbird | S4 | | | | L5 | CO | | |
| Sturnidae | | Starlings | | | | | | | |
| <i>Sturnus vulgaris</i> | European Starling | SNA | | | | L+ | CO | | CO |
| Bombycillidae | | Waxwings | | | | | | | |
| <i>Bombycilla cedrorum</i> | Cedar Waxwing | S5B | | | | L5 | CO | | |
| Passeridae | | Old World Sparrows | | | | | | | |
| <i>Passer domesticus</i> | House Sparrow | SNA | | | | L+ | CO | | PR |
| Fringillidae | | Finches & Allies | | | | | | | |
| <i>Carpodacus mexicanus</i> | House Finch | SNA | | | | L+ | CO | | |
| <i>Carpodacus purpureus</i> | Purple Finch | S4B | | | | L4 | PO | | |
| <i>Spinus tristis</i> | American Goldfinch | S5B | | | | L5 | CO | | |
| Parulidae | | Wood Warblers | | | | | | | |
| <i>Seiurus aurocapillus</i> | Ovenbird | S4B | | | | L3 | PR | | |
| <i>Oreothlypis ruficapilla</i> | Nashville Warbler | S5B | | | | L3 | PO | | |
| <i>Geothlypis philadelphia</i> | Mourning Warbler | S4B | | | | L3 | CO | | |

2258A - Clark Blvd. / Eastern Ave. EA
Bird Species Reported From the Study Area

| Scientific Name | Common Name | SRANK ¹ | SARO ² | COSEWIC ³ | SARA Schedule ⁴ | TRCA Status ⁵ | OBBA ⁶ | NHIC Data ¹ | NRSI Observed | |
|----------------------------------|------------------------|--|-------------------|----------------------|----------------------------|--------------------------|-------------------|------------------------|---------------|----|
| | | | | | | | 17PJ04 | | | |
| <i>Geothlypis trichas</i> | Common Yellowthroat | S5B | | | | L4 | CO | | | |
| <i>Setophaga citrina</i> | Hooded Warbler | S4B | NAR | NAR | Schedule 1 | L3 | PO | | | |
| <i>Setophaga ruticilla</i> | American Redstart | S5B | | | | L4 | CO | | | |
| <i>Setophaga petechia</i> | Yellow Warbler | S5B | | | | L5 | CO | | | |
| <i>Setophaga pensylvanica</i> | Chestnut-sided Warbler | S5B | | | | L3 | PO | | | |
| <i>Setophaga pinus</i> | Pine Warbler | S5B | | | | L3 | PR | | | |
| Emberizidae | | New World Sparrows & Allies | | | | | | | | |
| <i>Pipilo erythrophthalmus</i> | Eastern Towhee | S4B | | | | L3 | CO | | | |
| <i>Spizella passerina</i> | Chipping Sparrow | S5B | | | | L5 | CO | | | |
| <i>Spizella pallida</i> | Clay-colored Sparrow | S4B | | | | L3 | CO | | | |
| <i>Spizella pusilla</i> | Field Sparrow | S4B | | | | L4 | CO | | | |
| <i>Poocetes gramineus</i> | Vesper Sparrow | S4B | | | | L3 | PR | | | |
| <i>Passerculus sandwichensis</i> | Savannah Sparrow | S4B | | | | L4 | CO | | | |
| <i>Ammodramus savannarum</i> | Grasshopper Sparrow | S4B | SC | SC | | L2 | PO | | | |
| <i>Melospiza melodia</i> | Song Sparrow | S5B | | | | L5 | CO | | PO | |
| <i>Melospiza georgiana</i> | Swamp Sparrow | S5B | | | | L4 | PR | | | |
| <i>Zonotrichia albicollis</i> | White-throated Sparrow | S5B | | | | L3 | PR | | | |
| Cardinalidae | | Cardinals, Grosbeaks & Allies | | | | | | | | |
| <i>Piranga olivacea</i> | Scarlet Tanager | S4B | | | | L3 | PO | | | |
| <i>Cardinalis cardinalis</i> | Northern Cardinal | S5 | | | | L5 | CO | | PO | |
| <i>Pheucticus ludovicianus</i> | Rose-breasted Grosbeak | S4B | | | | L4 | CO | | | |
| <i>Passerina cyanea</i> | Indigo Bunting | S4B | | | | L4 | CO | | | |
| Icteridae | | Blackbirds | | | | | | | | |
| <i>Dolichonyx oryzivorus</i> | Bobolink | S4B | THR | T | No Schedule | L3 | CO | | | |
| <i>Agelaius phoeniceus</i> | Red-winged Blackbird | S4 | | | | L5 | CO | | PR | |
| <i>Sturnella magna</i> | Eastern Meadowlark | S4B | THR | T | No Schedule | L4 | CO | | | |
| <i>Quiscalus quiscula</i> | Common Grackle | S5B | | | | L5 | CO | | PO | |
| <i>Molothrus ater</i> | Brown-headed Cowbird | S4B | | | | L5 | CO | | | |
| <i>Icterus spurius</i> | Orchard Oriole | S4B | | | | L5 | CO | | | |
| <i>Icterus galbula</i> | Baltimore Oriole | S4B | | | | L5 | CO | | | |
| | | | | | | | Total | 106 | 0 | 13 |

¹MNRF 2019a; ²MNRF 2019b; ³COSEWIC 2019; ⁴Government of Canada 2019; ⁵Toronto Region Conservation Authority 2008a/2008b; ⁶Cadman et al. 2019

| LEGEND | |
|----------------------|---|
| SRANK | TRCA |
| S4 Apparently Secure | L5 Generally Secure |
| S5 Secure | L4 Generally Secure (Rural), Of Concern (Urban) |
| SNA Unranked | L3 Generally Secure (Natural), Regional Concern |
| COSSARO | L2 Likely Rare, Regional Concern |
| THR Threatened | L1 Rare, Regional Concern |
| SC Special Concern | LX Extirpated |
| NAR Not at Risk | L+ Exotic |
| COSEWIC | SARA Schedule |
| T Threatened | Schedule 1 Officially Protected under SARA |
| SC Special Concern | |
| NAR Not at Risk | |

2258A - Clark Blvd./ Eastern Ave. EA
 Reptile and Amphibian Species Reported From the Study Area

| Scientific Name | Common Name | SRANK ¹ | SARO ² | COSEWIC ³ | SARA Schedule ⁴ | TRCA Status ⁵ | Ontario Reptile and Amphibian Atlas ⁶ | NHIC Data ¹ | NRSI Observed |
|---|-------------------------------|--------------------|-------------------|----------------------|----------------------------|--------------------------|--|------------------------|---------------|
| Turtles | | | | | | | | | |
| <i>Chelydra serpentina serpentina</i> | Snapping Turtle | S3 | SC | SC | Schedule 1 | L2 | X | | |
| Snakes | | | | | | | | | |
| <i>Storeria occipitomaculata occipitoma</i> | Northern Red-bellied Snake | S5 | | | | L3 | X | | |
| Salamanders | | | | | | | | | |
| <i>Ambystoma jeffersonianum</i> | Jefferson Salamander | S2 | END | E | Schedule 1 | L1 | X | | |
| <i>Plethodon cinereus</i> | Eastern Red-backed Salamander | S5 | | | | L3 | X | | |
| Toads and Frogs | | | | | | | | | |
| <i>Anaxyrus americanus</i> | American Toad | S5 | | | | L4 | X | | |
| <i>Hyla versicolor</i> | Tetraploid Gray Treefrog | S5 | | | | L2 | X | | |
| <i>Pseudacris crucifer</i> | Spring Peeper | S5 | | | | L2 | X | | |
| <i>Lithobates clamitans melanota</i> | Northern Green Frog | S5 | | | | L4 | X | | |
| <i>Lithobates pipiens</i> | Northern Leopard Frog | S5 | NAR | NAR | | L3 | X | | |
| <i>Lithobates sylvaticus</i> | Wood Frog | S5 | | | | L2 | X | | |
| | | | | | | | Total | 9 | 0 |

¹MNRF 2019a; ²MNRF 2019b; ³COSEWIC 2019; ⁴Government of Canada 2019; ⁵Toronto Region Conservation Authority 2008a/2008b; ⁶Ontario Nature 2019

| Legend |
|--|
| SRANK |
| S2 Imperiled |
| S3 Vulnerable |
| S5 Secure |
| SARO/COSEWIC |
| NAR/NAR Not at Risk |
| SC/SC Special Concern |
| END/E Endangered |
| SARA Schedule |
| Schedule 1 Officially Protected under SARA |
| TRCA L-Rank |
| L4 Of Concern (Urban) |
| L3 Regional Concern |
| L2 Likely Rare, Regional Concern |

2258A - Clark Blvd. / Eastern Ave. EA
 Butterfly Species Reported From the Study Area

| Scientific Name | Common Name | SRANK ¹ | SARO ² | COSEWIC ³ | SARA Schedule ⁴ | TEA Atlas ⁵ | NHIC Data ¹ | NRSI Observed |
|------------------------------------|----------------------------|--|-------------------|----------------------|----------------------------|------------------------|------------------------|---------------|
| Hesperiidae | | Skippers | | | | | | |
| <i>Ancyloxypha numitor</i> | Least Skipper | S5 | | | | X | | |
| <i>Erynnis baptisiae</i> | Wild Indigo Duskywing | S4 | | | | X | | |
| <i>Euphyes vestris</i> | Dun Skipper | S5 | | | | X | | |
| <i>Polites peckius</i> | Peck's Skipper | S5 | | | | X | | |
| Papilionidae | | Swallowtails | | | | | | |
| <i>Papilio canadensis</i> | Canadian Tiger Swallowtail | S5 | | | | X | | |
| <i>Papilio cressphontes</i> | Giant Swallowtail | S4 | | | | X | | |
| <i>Papilio glaucus</i> | Eastern Tiger Swallowtail | S5 | | | | X | | |
| <i>Papilio polyxenes</i> | Black Swallowtail | S5 | | | | X | | |
| Pieridae | | Whites and Sulphurs | | | | | | |
| <i>Colias eurytheme</i> | Orange Sulphur | S5 | | | | X | | |
| <i>Colias philodice</i> | Clouded Sulphur | S5 | | | | X | | |
| <i>Pieris rapae</i> | Cabbage White | SNA | | | | X | | |
| Lycaenidae | | Harvesters, Coppers, Hairstreaks, Blues | | | | | | |
| <i>Feniseca tarquinius</i> | Harvester | S4 | | | | X | | |
| <i>Glaucopsyche lygdamus</i> | Silvery Blue | S5 | | | | X | | |
| Nymphalidae | | Brush-footed Butterflies | | | | | | |
| <i>Aglais milberti</i> | Milbert's Tortoiseshell | S5 | | | | X | | |
| <i>Coenonympha tullia</i> | Common Ringlet | S5 | | | | X | | |
| <i>Danaus plexippus</i> | Monarch | S2N, S4B | SC | E | Schedule 1 | X | | |
| <i>Limenitis archippus</i> | Viceroy | S5 | | | | X | | |
| <i>Limenitis arthemis astyanax</i> | Red-spotted Purple | S5 | | | | X | | |
| <i>Megisto cymela</i> | Little Wood-Satyr | S5 | | | | X | | |
| <i>Nymphalis antiopa</i> | Mourning Cloak | S5 | | | | X | | |
| <i>Polygonia comma</i> | Eastern Comma | S5 | | | | X | | |
| <i>Polygonia interrogationis</i> | Question Mark | S5 | | | | X | | |
| <i>Vanessa atalanta</i> | Red Admiral | S5 | | | | X | | |
| Total | | | | | | 23 | 0 | 0 |

¹MNRF 2019a; ²MNRF 2019b; ³COSEWIC 2019; ⁴Government of Canada 2018; ⁵Macnaughton et al. 2019

| Legend | |
|--|--------------------|
| SRANK | SARO |
| S2 Imperiled | SC Special Concern |
| S4 Apparently Secure | COSEWIC |
| S5 Secure | E Endangered |
| SARA Schedule | |
| Schedule 1 Officially Protected under SARA | |

2258A - Clark Blvd. / Eastern Ave. EA
 Dragonfly and Damselfly Species Reported From the Study Area

| Scientific Name | Common Name | SRANK ¹ | SARO ² | COSEWIC ³ | SARA Schedule ⁴ | Odonate Atlas ⁵ | NHIC Data ¹ | NRSI Observed |
|----------------------------------|----------------------------------|--------------------|-------------------|----------------------|----------------------------|----------------------------|------------------------|---------------|
| Calopterygidae | Broadwinged Damselflies | | | | | | | |
| <i>Calopteryx aequabilis</i> | River Jewelwing | S5 | | | | X | | |
| <i>Calopteryx maculata</i> | Ebony Jewelwing | S5 | | | | X | | |
| <i>Hetaerina americana</i> | American Rubyspot | S4 | | | | X | | |
| | | | | | | | | |
| Coenagrionidae | Narrow-winged Damselflies | | | | | | | |
| <i>Argia fumipennis violacea</i> | Violet Dancer | S5 | | | | X | | |
| <i>Argia moesta</i> | Powdered Dancer | S5 | | | | X | | |
| <i>Enallagma civile</i> | Familiar Bluet | S5 | | | | X | | |
| <i>Enallagma exsulans</i> | Stream Bluet | S5 | | | | X | | |
| <i>Ischnura verticalis</i> | Eastern Forktail | S5 | | | | X | | |
| | | | | | | | | |
| Aeshnidae | Darners | | | | | | | |
| <i>Anax junius</i> | Common Green Darner | S5 | | | | X | | |
| | | | | | | | | |
| Libellulidae | Skimmers | | | | | | | |
| <i>Erythemis simplicicollis</i> | Eastern Pondhawk | S5 | | | | X | | |
| <i>Libellula luctuosa</i> | Widow Skimmer | S5 | | | | X | | |
| <i>Libellula pulchella</i> | Twelve-spotted Skimmer | S5 | | | | X | | |
| <i>Pachydiplax longipennis</i> | Blue Dasher | S5 | | | | X | | |
| <i>Plathemis lydia</i> | Common Whitetail | S5 | | | | X | | |
| <i>Tramea lacerata</i> | Black Saddlebags | S4 | | | | X | | |
| | | | | | | | | |
| | | | | | | Total | 15 | 0 |
| | | | | | | | 0 | 0 |

¹MNRF 2019a; ²MNRF 2019b; ³COSEWIC 2019; ⁴Government of Canada 2019; ⁵MNRF 2019c

| Legend |
|----------------------|
| SRANK |
| S4 Apparently Secure |
| S5 Secure |

2258A - Clark Blvd. / Eastern Ave. EA
Mammal Species Reported From the Study Area

| Scientific Name | Common Name | SRANK ¹ | SARO ² | COSEWIC ³ | SARA Schedule ⁴ | TRCA Status ⁵ | Ontario Mammal Atlas ⁶ | NHIC Data ¹ | NRSI Observed | |
|--------------------------------|-----------------------------|--------------------|-------------------|----------------------|----------------------------|--------------------------|-----------------------------------|------------------------|---------------|---|
| Didelphimorphia | Opossums | | | | | | | | | |
| <i>Didelphis virginiana</i> | Virginia Opossum | S4 | | | | L4 | X | | | |
| Insectivora | Shrews and Moles | | | | | | | | | |
| <i>Blarina brevicauda</i> | Northern Short-tailed Shrew | S5 | | | | L3 | X | | | |
| <i>Parascalops breweri</i> | Hairy-tailed Mole | S4 | | | | L3 | X | | | |
| <i>Sorex hoyi</i> | Pygmy Shrew | S4 | | | | | X | | | |
| Chiroptera | Bats | | | | | | | | | |
| <i>Eptesicus fuscus</i> | Big Brown Bat | S4 | | | | L4 | X | | | |
| <i>Lasiurus cinereus</i> | Hoary Bat | S4 | | | | L3 | X | | | |
| <i>Myotis lucifugus</i> | Little Brown Myotis | S4 | END | E | Schedule 1 | L4 | X | | | |
| Lagomorpha | Rabbits and Hares | | | | | | | | | |
| <i>Lepus europaeus</i> | European Hare | SNA | | | | L+ | X | | | |
| <i>Sylvilagus floridanus</i> | Eastern Cottontail | S5 | | | | L4 | X | | X | |
| Rodentia | Rodents | | | | | | | | | |
| <i>Castor canadensis</i> | Beaver | S5 | | | | L4 | X | | | |
| <i>Erethizon dorsatum</i> | Porcupine | S5 | | | | L2 | X | | | |
| <i>Marmota monax</i> | Woodchuck | S5 | | | | L4 | X | | | |
| <i>Microtus pennsylvanicus</i> | Meadow Vole | S5 | | | | L4 | X | | | |
| <i>Ondatra zibethicus</i> | Muskrat | S5 | | | | L4 | X | | | |
| <i>Peromyscus leucopus</i> | White-footed Mouse | S5 | | | | L4 | X | | | |
| <i>Peromyscus maniculatus</i> | Deer Mouse | S5 | | | | L4 | X | | | |
| <i>Rattus norvegicus</i> | Norway Rat | SNA | | | | L+ | X | | | |
| <i>Sciurus carolinensis</i> | Eastern Gray Squirrel | S5 | | | | L5 | X | | X | |
| <i>Tamiasciurus hudsonicus</i> | Red Squirrel | S5 | | | | L4 | X | | | |
| <i>Zapus hudsonius</i> | Meadow Jumping Mouse | S5 | | | | L3 | X | | | |
| Carnivora | Carnivores | | | | | | | | | |
| <i>Canis latrans</i> | Coyote | S5 | | | | L5 | X | | | |
| <i>Mephitis mephitis</i> | Striped Skunk | S5 | | | | L5 | X | | | |
| <i>Mustela erminea</i> | Ermine | S5 | | | | L3 | X | | | |
| <i>Mustela vison</i> | American Mink | S4 | | | | L4 | X | | | |
| <i>Procyon lotor</i> | Northern Raccoon | S5 | | | | L5 | X | | | |
| <i>Vulpes vulpes</i> | Red Fox | S5 | | | | L4 | X | | | |
| Artiodactyla | Deer and Bison | | | | | | | | | |
| <i>Odocoileus virginianus</i> | White-tailed Deer | S5 | | | | L4 | X | | | |
| | | | | | | Total | 26 | 27 | 0 | 2 |

¹MNRF 2019a; ²MNRF 2019b; ³COSEWIC 2019; ⁴Government of Canada 2019; ⁵TRCA 2008a/2008b; ⁶Dobbyn 1994

| Legend | |
|--|----------------------------------|
| SRANK | TRCA L-Rank |
| S4 Apparently Secure | L5 Generally Secure |
| S5 Secure | L4 Of Concern (Urban) |
| SNA Unranked | L3 Regional Concern |
| SARO/COSEWIC | L2 Likely Rare, Regional Concern |
| END/E Endangered | L+ Exotic |
| SARA Schedule | |
| Schedule 1 Officially Protected under SARA | |

**Appendix III
Tree Preservation Plan**



Draft

Clark Boulevard Extension and Eastern Avenue Improvements – Municipal Class Environmental Assessment, Schedule C

Tree Preservation Plan

Prepared for:

HDR Inc.
255 Adelaide Street West
Toronto, Ontario
M5H 1X9

Project No. 2258A | September 2022



NATURAL RESOURCE SOLUTIONS INC.

Aquatic, Terrestrial and Wetland Biologists

**Clark Boulevard Extension and Eastern Avenue Improvements – Municipal Class
Environmental Assessment, Schedule C
Tree Preservation Plan**

Project Team

| | |
|---------------------------|---|
| Katharina Richter | Senior Biologist, Project Advisor |
| Jennifer McCarter | Terrestrial and Wetland Biologist, Project Manager |
| Tara Brenton | Senior Terrestrial & Wetland Biologist / Certified Arborist |
| Joseph Lance ¹ | Terrestrial & Wetland Biologist / Certified Arborist |
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¹Former NRSI employee

Draft Report submitted on September 6, 2022



Tara Brenton
Senior Terrestrial & Wetland Biologist/Certified Arborist

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- Appendix IV Tree Data Summary Tables

1.0 Introduction

Natural Resource Solutions Inc. (NRSI) was retained by HDR Inc. on behalf of the City of Brampton in April 2019 to complete a Natural Environment Assessment Report (NEAR) and Tree Evaluation Report (TER) as part of the Class Environmental Assessment (EA) for Clark Boulevard and Eastern Avenue within the City of Brampton, Ontario (Map 1).

The Class EA was initiated by the City for the proposed road widening of Eastern Avenue and the extension of Clark Boulevard. The NEAR and TER reports were submitted in 2019 in accordance with the requirements of the Municipal Class Environmental Assessment (MCEA 2015). Information from the NEAR and TER reports was used to evaluate several alternatives for the road improvements from a natural heritage perspective. An Environmental Impact Study (EIS) has been prepared by NRSI (2022) that is to be read in conjunction with this Tree Preservation Plan (TPP) that evaluates and assesses impacts for the preferred alignment.

The area around and between the western extent of Clark Boulevard and Eastern Avenue is highly developed and is dominated by commercial areas and industrial facilities; existing natural features are limited. The tree inventory was conducted in 2019 by NRSI Certified Arborists within the Subject Lands extent as shown on Map 1. The inventory was generally along Eastern Avenue from west of Kennedy Road South to Clark Boulevard east of Rutherford Road South. The far western portion (i.e., upstream extent) of the channel corridor was not inventoried as the Project Team and City determined that the Clark Boulevard extension was not likely to be impacted during the evaluation of alternatives process.

This TPP report has been prepared to satisfy the City of Brampton's *Tableland Tree Assessment Guidelines* (2018), and in accordance with the City's Tree Preservation By-law 317-2012 that aims to regulate tree protection on private lands within City limits. Within the By-law, a regulated tree is defined as:

“any species of woody perennial plant, including its root system, which has reached or can reach a height of at least 4.5 metres at physiological maturity. For clarity, where multiple stems grow from the same root system, the number of Trees shall be the number of stems that can be counted at a point of measurement 1.37 metres from the highest point on the ground touching the trunk”.

As stated in section 10 of the By-law, in accordance with the *Municipal Act, 2001*, S.O. 2001, c.25, the prohibitions of the Tree Preservation By-law do not apply to, among other things, “activities or matters undertaken by a municipality or a local board of a municipality” (City of Brampton 2012). However, it is noted in the City’s *Tableland Tree Assessment Guidelines* (June 2018) that “a Tree Preservation Plan will be required to support the City and Region’s capital projects that necessitate the removal or protection of healthy tableland trees [...]. Capital Projects completed by the City of Brampton or the Region of Peel are anticipated to follow the City’s tree standards and compensation ratios outlined in this [*Tableland Tree Assessment Guidelines*] document.”

This report provides the findings of the tree inventory, a description of the overall health and structural integrity (referring to the potential for structural failure) of trees, an analysis of tree retention and removals based on the preferred alignment details prepared by HDR (March 31, 2022), protection measures for trees to be retained, and recommended mitigation and compensation measures. In the case of trees that may require removal based on the preferred alignment and watercourse works, compensation is discussed according to City requirements.

2.0 Tree Inventory and Methods

2.1 Tree Inventory

A comprehensive inventory of trees $\geq 10\text{cm}$ in Diameter-at-Breast-Height (DBH) within the scoped area was completed by NRSI Certified Arborists on June 21, 24, and July 9, 2019. The inventory included an assessment by a Certified Arborist, tagging on-site trees with pre-numbered aluminum forestry tags, and surveying the location of each inventoried tree with a SXBlue II GNSS GPS unit. Off-property trees (e.g., outside of the Eastern Avenue right-of-way, ROW) were not tagged, but were assigned an alpha-identifier for mapping purposes. Multi-stemmed trees were recorded and assessed as one tree, but DBH for these is presented as the sum of the diameters for each stem.

At a project team meeting on May 10, 2019, Toronto and Region Conservation Authority (TRCA) staff indicated that they would not be supportive of new road construction parallel to the existing watercourse channel, and that a perpendicular creek crossing was preferred. This position is supported in section 2 of the Crossings Guideline for Valley and Stream Corridors (TRCA 2015). The location of inventoried trees is shown on Map 2 and a complete list of trees that were assessed and their overall health is included in Appendix I. The mapping excludes areas where no trees were observed/inventoried.

The overall health of each tree and potential for structural failure was assessed based on the criteria outlined in Appendix II, and the following information was recorded for each inventoried tree:

- Tree location;
- Tag number (public trees) / alpha-identifier (private trees);
- Species (common and scientific name);
- DBH (cm);
- Crown radius (m);
- Number of stems;
- General health (excellent, good, fair, poor, very poor, dead);
- Potential for structural failure (improbable, possible, probable, imminent);
- General comments (i.e., disease, aesthetic quality, development constraints, sensitivity to development, etc.); and
- Presence of candidate bat maternity roost habitat using Northern Development, Mine, Natural Resources and Forestry (NDMNRNF) bat habitat assessment protocol.

In carrying out these assessments, NRSI has exercised a reasonable standard of care, skill and diligence as would be customarily and normally provided in carrying out these assessments. The assessments have been made using accepted arboricultural techniques. These include a visual examination of each tree for structural defects, scars, external indications of decay such as fungal fruiting bodies, evidence of insect attack, the condition of any visible root structures, the degree and direction of lean (if any), the general condition of the tree(s) and the surrounding site, and the current or planned proximity of property and people. None of the trees examined were dissected, cored, probed or climbed and detailed root examinations involving excavation were not undertaken. The conditions for this assessment, including restrictions, professional responsibility and third-party liability, are provided in Appendix III. As the inventory was originally conducted in 2019 to inform the preliminary design phase and trees are living organisms, subject to change, damage, disease, etc., it may be necessary to re-assess condition of trees immediately adjacent to the proposed undertaking just prior to any works in the area to confirm health.

2.2 Bat Habitat Tree Assessment

As described in the EIS (NRSI 2022), 3 Species at Risk (SAR) bat species, Little Brown Myotis (*Myotis lucifungus*), Northern Myotis (*Myotis septentrionalis*), and Tri-colored Bat (*Perimyotis subflavus*), reported from within 10km of the Study Area based on the background review data, were identified as having potentially suitable habitat within the Study Area. These species are all listed as Endangered both provincially and federally (MECP 2022, Government of Canada 2022) and are afforded general habitat protection under the *Endangered Species Act (ESA)*; Government of Ontario 2007).

Little Brown Myotis and Northern Myotis are known to roost in tree cavities, hollows, or under loose bark, as well as within buildings (MNR 2000). As part of the tree health assessments, NRSI's Certified Arborists, who are trained and experienced in the NDMNRF bat habitat assessment protocols (MNRF 2017), visually scanned all trees $\geq 10\text{cm}$ DBH for the presence of features (i.e., cavities, loose bark, etc.) that may provide bat maternity colony habitat. The NDMNRF's protocol (MNRF 2017) for assessing the potential habitat suitability for SAR bats specifies that this survey should be conducted during the leaf-off season so that suitable features are not obscured by foliage. Since the tree inventory work was conducted in the summer, these visual assessments were done as best as conditions permitted.

Tri-colored Bat summer roosting habitats in Ontario are poorly understood. Elsewhere in their range this species has been documented to roost in deciduous or mixed forests in dead leaf clusters belonging to broken branches, those formed by natural causes, and those created as nests by Eastern Gray Squirrel (*Sciurus carolinensis*) (Humphrey and Fotherby 2019). They have also been observed to use dense clusters of live foliage, arboreal lichens or epiphytes, and anthropogenic structures (Humphrey and Fotherby 2019). Treed vegetation communities that contain Oak spp. (*Quercus* spp.) and/or Maple spp. (*Acer* spp.), are considered candidate roosting habitat for Tri-colored Bat in Ontario due to their potential to provide suitable foliage roost sites (MNRF 2017, MECP 2022a, MECP 2022b). Therefore, all Oak and Maple trees ≥ 10 cm DBH were documented as they have the potential to provide suitable roosting habitat for Tri-colored Bat.

3.0 Summary of Tree Inventory Findings

3.1 Tree Inventory Results

In total, 274 trees were inventoried, comprising 22 species. Of the trees inventoried, 32 are within or near to the ROW of roads within the scoped Study Area, while the remainder (242) are in the channel corridor along the watercourse. A high proportion (41.6%) of the trees inventoried are non-native species, dominated by European Ash (*Fraxinus excelsior*) and Norway Maple (*Acer platanoides*) that have naturalized in the channel corridor. In total, 158 native trees were inventoried, of which 59.5% are Manitoba Maple (*Acer negundo*), a fast-growing tree that colonizes disturbed areas.

Forty-four, making up 16.0% of all trees inventoried, were Green Ash (*Fraxinus pennsylvanica*). Of these, 40 were assessed as dead or in very poor health, with most exhibiting signs of infestation by the Emerald Ash Borer (EAB; *Agrilus planipennis*), a non-native insect pest that has ravaged the Ash trees (*Fraxinus* spp.) of eastern North America.

No SAR or Species of Conservation Concern trees were inventoried that would need to be considered in the preparation of detailed design.

A complete list of trees inventoried is provided in Appendix I and tree locations within the Study Area are shown on Map 2. Appendix IV provides a summary of the inventory data.

3.2 Bat Habitat Assessment Results

During the bat habitat assessment completed within the Study Area, NRSI identified 71 candidate bat roost trees for Little Brown Myotis and Northern Myotis and 108 candidate foliage bat roost trees for Tri-colored Bat (Maples and Oaks) were documented. Of these trees, 154 are within the proposed development area. Refer to NRSI's EIS report (2022) for a summary of the bat habitat assessment results.

4.0 Tree Retention Analysis and Compensation

4.1 Retention and Removal Analysis

The tree removal and retention analysis in this report is based on the following considerations:

- 1) Trees identified as having a probable or imminent potential for structural failure, trees in poor to very poor health, or trees that are dead. The removal of some of these trees may be recommended for safety, especially if they are located within striking distance of a component of the proposed project, or existing sidewalks, roads or buildings. Of the inventoried trees, 85 were assessed as dead or in poor to very poor condition. Trees identified to be in this condition are recommended for removal, especially where they may pose a potential hazard to people or property.
- 2) Trees that require removal based on the extent of proposed site grading (including the watercourse works). This is determined by comparing the location of inventoried trees to the location of the components of the infrastructure work outlined in the design plans prepared by HDR.

Of the 274 trees inventoried within the scoped Study Area, 237 are proposed to be removed, of which 162 are in excellent to fair condition (231 removed and 6 removed/to be confirmed in the field). Appendix I provides a list of trees inventoried, their overall health and potential for structural failure, recommended action (retain, remove, etc.), and rationale for removal if applicable. Retention and removals are shown on Map 2. The following categories were included in the analysis:

- **Retain** – tree is located outside of the proposed disturbance area and is unlikely to incur any damage that would alter existing condition;
- **Retain/Confirm in Field** – extent of final grading associated with the preferred alignment and watercourse works should be confirmed in the field just prior to site preparation to confirm retention opportunity. Where tree, crown and/or root system overlaps with limit of grading, there may be an opportunity to retain the tree in certain circumstances. Extent of grading/disturbance may be impacted by equipment utilized;
- **Remove** – tree is entirely within the proposed disturbance area and/or root system is likely to incur extensive damage that would result in tree no longer being structurally safe.
- **Remove/Confirm in Field** – extent of final grading associated with the preferred alignment and watercourse works should be confirmed in the field just prior to site preparation to confirm if trees will need to be removed, or can be retained.

4.2 Compensation Plan

Section 3 of the City's *Tableland Tree Assessment Guidelines* (2018) describes the value and functions of the urban forest, and sets out which trees comprise the urban forest in Brampton. In order to mitigate the loss of healthy tableland trees through land use change, the City has set out compensation planting ratios per diameter class in order to maintain the benefits conferred by trees upon the local environment and citizens. Table 1 outlines the number and diameter of trees to be removed and the resulting number of compensation trees to be planted from each of the diameter classes. For the purposes of this analysis, where multi-stem trees were inventoried, the largest stem diameter has been used in the DBH Class calculation below. As per the *Tableland Tree Assessment Guidelines* (City of Brampton 2018), trees <15cm DBH do not require compensation, and since compensation is meant for "healthy tableland trees", compensation for those trees assessed as dead or in poor to very poor health were not included.

Table 1. Tree Compensation Schedule¹

| DBH Class (cm) | Trees to be Removed (Requiring Compensation) | Compensation Ratio | # of Compensation Plantings |
|-----------------------|---|---------------------------|------------------------------------|
| 15-20 | 31 | 1:1 | 31 |
| 21-35 | 48 | 2:1 | 96 |
| 36-50 | 11 | 3:1 | 33 |
| 51-65 | 6 | 4:1 | 24 |
| >65 | 4 | 5:1 | 20 |
| Total | 100 | - | 204 |

¹From the City of Brampton's *Tableland Tree Assessment Guidelines* (2018).

Note: 137 trees do not require compensation as per the City's *Guidelines* (2018).

The City's policies indicate that where compensation for healthy tableland trees is required, planting shall occur on the site of the proposed development. In order to be considered compensation, new plantings must exceed the City's tree planting standards such as those required as street trees, park trees, requisite buffer plantings, or invasive species removal. Compensation trees are to be 70mm caliper stock, unless otherwise approved by the City. Where compensation planting cannot be completed on a subject property, cash-in-lieu will be considered to "*provide the City with the ability to plant compensation trees in a different location*" (City of Brampton 2018). The cash-in-lieu rate for compensation is \$500 per tree.

The following recommendations are to be considered during development of Landscape Plans and the final Ecological Enhancement Plan.

Species used for compensation plantings, with the possible exception of street trees, should be native to Peel Region and not include any species that are listed as introduced. Trees may be planted within the ROW over and above the City's street tree requirement, which will contribute to the compensation requirement. The proximity of the project to the watercourse means that there will be potential for the seeds of introduced species to be transported to other parts of the watershed, especially at times of powerful high flows that are evidenced in this channel.

The use of hardy species will ensure successful early establishment and minimize the potential for invasive species proliferation. For street tree plantings (over and above standard City requirements), the use of non-native species that are sometimes more tolerant of urban conditions (i.e., salt and drought tolerant) may be suitable as long as they do not include invasive species such as the often-planted Norway Maple.

To accommodate the preferred alignment, a section of watercourse will be realigned and restored/enhanced from its current degraded condition. As such, there are opportunities within the watercourse works that will allow higher densities of compensation plantings than the City requires for street and park trees. A preliminary Ecological Habitat Enhancement plan is shown on Map 4 of the EIS (NRSI 2022) that identifies habitat enhancement areas and a recommended planting schedule to compensate for the removal of approximately 0.38ha of Fresh-Moist Lowland Deciduous Forest community for the proposed extension of the Clark Boulevard ROW and re-aligned watercourse. The Ecological Habitat Enhancement Plan includes a mix of native tree, shrub and herbaceous species known to occur in the area in stock sizes and densities aimed at achieving naturalization. Opportunities for additional plantings within the subject property can also be considered as part of the street tree planting plan to be prepared at the detailed design stage.

The Landscape Development Guidelines (City of Brampton 2019) should be consulted for more information about landscape requirements and compensation planting. The following recommendations are offered for consideration in the development of the planting plans at the detailed design stage:

- Plantings near to the watercourse are to be limited to native, non-invasive tree and shrub species indigenous to Peel Region that complement the surrounding natural features;
- Plantings associated with the watercourse should be comprised of a mix of native tree and shrub species, as well as a variety of smaller stock sizes in an attempt to naturalize the area, increase the presence of native species, and provide wildlife habitat;
- A variety of species should be identified so as to avoid a monoculture;
- Tree species to be situated in close proximity to roads and sidewalks should be salt and drought tolerant;
- Plantings should avoid Ash species due to the risk of the EAB;
- All plant material is to conform to the latest edition of the Canadian Nursery Trades Association Specifications and Standards;
- Plantings are to be installed as per specifications outlined in planting plans to be prepared by a member in good standing of the Ontario Association of Landscape Architects (OALA) or Certified Arborist (e.g., place a minimum of 10cm of shredded pine-bark mulch or equivalent around all planted material);
- Spacing of plant material should account for the ultimate size and form of the selected species and the purpose of the planting, whether it be for screening, shade, naturalization, rehabilitation, etc.;
- Special attention to location and height of trees in proximity to utilities and buildings, and;
- Ensure that there is sufficient soil volume for all plantings.

5.0 Tree Protection Measures

5.1 Prior to Construction and Site Alteration

Tree Protection Fencing (TPF) will be installed along the limit of disturbance in order to prevent detrimental impacts to trees from construction activities. The City's specification L110 in Site Preparation – Series 100 states that TPF should be installed at a distance of twice the dripline from the stem of a tree >30cm DBH to be protected, and at the dripline of a tree <30cm DBH. Trees to be protected will be afforded as much protection as is possible within the preferred alignment and watercourse area, while intending to retain as many trees as possible, even where proposed impacts are within a zone representing their tree protection zone. The recommended positions of TPF are shown on Map 3.

The TPF is to be installed prior to any construction activities, such as rough grading, vegetation/tree removal, etc. and is to be maintained by the City and/or its agents. The TPF will take the form of 1200mm high heavy-duty paige-wire fencing secured to t-bar stakes or wooden posts, as per the City's specification L110 shown on Map 3 of this report. An Erosion and Sediment Control (ESC) plan will be prepared during the Detailed Design Stage by the project engineers which may be combined with the TPF.

Where fence installation prior to any vegetation removal may not be feasible (i.e., vegetation too thick, or contractor cannot access area), an alternative installation strategy may be required to be discussed with the City and TRCA, such as oversight by a Certified Arborist/Registered Forester where removals are required to accommodate fence installation.

Prior to works commencing on-site, a Certified Arborist/Registered Forester or Landscape Architect is to inspect and provide written certification to the City that all protective fencing and sediment control measures have been satisfactorily installed. Signage indicating the purpose of the protection fencing is to be attached to the TPF a minimum of every 45m. The signage is to identify the function of the TPF and that no dumping or storing of materials or equipment, soil grade changes or compaction, damage to tree parts, vehicle/machine traffic or refueling within the tree protection areas are to occur.

5.1.1 Migratory Birds Convention Act

The removal of trees within the subject property has the potential to disrupt nesting birds. The *Migratory Birds Convention Act* (MBCA; Government of Canada 1994) identifies a list of

migratory bird species that are protected. It prohibits the destruction of nests, individuals and activities that would cause an adult bird to abandon a nest. Tree removal is to occur outside of the core nesting period for migratory birds as established by the Canadian Wildlife Service (CWS 2012) which extends from approximately April 1 through August 31. Every developer/consultant/contractor, etc. is legally obliged to carry out due diligence to protect migratory birds from harm during all construction projects. If vegetation clearing cannot be avoided during the core bird nesting season, a qualified avian biologist must be retained to carry out a nest search ahead of clearing activities within “simple” (i.e., non-forested) habitats. Tree removal may only occur if no active nests are present.

5.1.2 Endangered Species Act

Although the Study Area is located within an extensively industrial and developed area, potentially suitable roosting habitat for SAR bats was identified in 71 candidate bat roost trees for Little Brown Myotis and Northern Myotis and 108 candidate foliage bat roost trees for Tri-colored Bat (Maples and Oaks). Of these trees, 154 are within the proposed development area. In addition to these candidate roost trees, suitable foraging habitat for Little Brown Myotis and Tri-colored Bat may also be present along the watercourse and along the edges of the Fresh-Moist Lowland Deciduous Forest (FOD7) community. Suitable habitats for these species are considered ‘candidate’, since no leaf-off bat cavity surveys or targeted bat exit surveys were completed.

These 3 species are listed as Endangered both provincially and federally (MECP 2022c, Government of Canada 2022) and are afforded general habitat protection under the *ESA* (Government of Ontario 2007). The Ministry of Environment Conservation and Parks (MECP) should be consulted regarding the candidate SAR bat roost trees that are within the proposed development area. The MECP will likely require that the trees are removed outside the bat active season (outside of April 1 to September 30) and may request that updated leaf-off and leaf-on bat habitat assessments be completed, and/or that acoustic bat surveys be completed to understand the extent and quality of candidate habitat proposed to be removed and to determine what (if any) bat species are using the candidate habitat during the peak maternity roosting period. Any correspondence with the MECP regarding the removal of candidate SAR bat roosting trees should be shared with the other reviewing agencies.

To compensate for the removal of 154 candidate roost trees, 655 native trees, over 4x the number of roost trees to be removed, are proposed to be planted within the Ecological Enhancement Areas. Native trees, including Oaks and Maples, will be planted in a 0.72ha area of forest habitat to be restored on either side of the re-aligned watercourse and a 0.09ha area of upland forest habitat to be created on the lands southwest of the intersection of Clark Boulevard and Rutherford Road South. See NRSI's EIS report (2022) for additional details.

5.2 During Construction

The TPF shall be maintained by the City and/or its agents during the entire construction period to ensure that trees being retained and their root systems are protected. Any minimal damage (i.e., damage to limbs or roots) to trees to be retained during construction must be pruned using proper arboricultural techniques. Should any trees identified to be retained be seriously damaged or die as a result of construction activities, the City will be presented with a proposed plan of action, such as treatment or replacement. Any replacement species are to be reviewed by a member in good standing with the OALA or Certified Arborist.

5.3 Post Construction

To ensure that fencing is not abandoned to degrade into the environment over time, the TPF (and ESC) is to be removed after completion of construction activities and adjacent areas are stabilized with a vegetative cover (i.e., sod in urban area or native vegetation along riparian edge) to the satisfaction of an environmental inspector or qualified biologist. Watering and pruning of newly planted trees will be carried out by the City as required during the warranty period (approximately 2 years). Any areas of bare soil within the construction area are to be re-vegetated as soon as feasible to prevent erosion of soils and keep dust to a minimum.

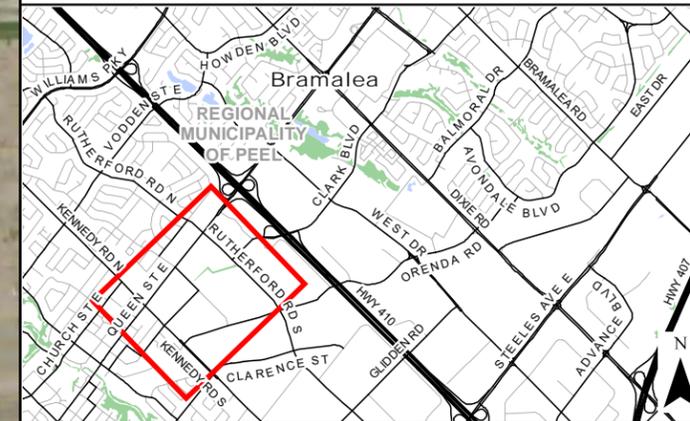
6.0 References

- Canadian Wildlife Service (CWS). 2012. Explanation for the Core Nesting Periods Table. Ottawa, ON: Canadian Wildlife Service.
- Canadian Wildlife Service (CWS). 2013. Migratory Birds Convention Act (MBCA) and Regulations. May 3, 2013. Available online: <http://www.ec.gc.ca/nature/default.asp?lang=En&n=7CEBB77D-1>
- City of Brampton. 2012. Tree Preservation By-law 317-2012. Effective November 14, 2012.
- City of Brampton. 2018. Tableland Tree Assessment Guidelines. Updated June 2018. Available online: https://www.brampton.ca/EN/Business/planning-development/guidelines-manuals/Documents/Tableland_Tree_Assessment_Guidelines.pdf
- Dunster, J.A. 2009. Tree Risk Assessment in Urban Areas and the Urban/Rural Interface Course Manual. Silverton, Oregon: Pacific Northwest Chapter, International Society of Arboriculture.
- Dunster, J.A., E.T. Smiley, N. Matheny, and S. Lily. 2013. Tree Risk Assessment Manual. Champaign, Illinois: International Society of Arboriculture.
- Natural Resource Solutions Inc. 2019. Clark Boulevard and Eastern Avenue Natural Environment Assessment Report. Prepared for HDR Inc. September 24, 2019.
- Natural Resource Solutions Inc. 2019. Clark Boulevard and Eastern Avenue, Brampton: Tree Evaluation Report. Prepared for HDR Inc. September 24, 2019.
- Natural Resource Solutions Inc. 2022. Clark Boulevard and Eastern Avenue – Class C Environmental Assessment: Environmental Impact Study. Prepared for HDR Inc. August, 2022.
- Ontario Ministry of Natural Resources (OMNR). 2000. Significant Wildlife Habitat Technical Guide. October 2000. Available online: <https://dr6j45jk9xcmk.cloudfront.net/documents/3620/significant-wildlife-habitat-technical-guide.pdf>
- Ontario Ministry of Natural Resources and Forestry (OMNRF) Guelph District. 2014. Use of Buildings and Isolated Trees by Species at Risk Bats Survey Methodology. October 2014.
- Ontario Ministry of Natural Resources and Forestry (OMNRF). 2017. Survey Protocol for Species at Risk Bats within Treed Habitats: Little Brown Myotis, Northern Myotis & Tri-Colored Bat. April 2017.
- Toronto and Region Conservation Authority (TRCA). 2015. Crossings Guideline for Valley and Stream Corridors. September 2015. Available online: <http://www.trca.on.ca/dotAsset/214493.pdf>

Maps

Clark Boulevard and Eastern Avenue Environmental Assessment

Study Area



Legend

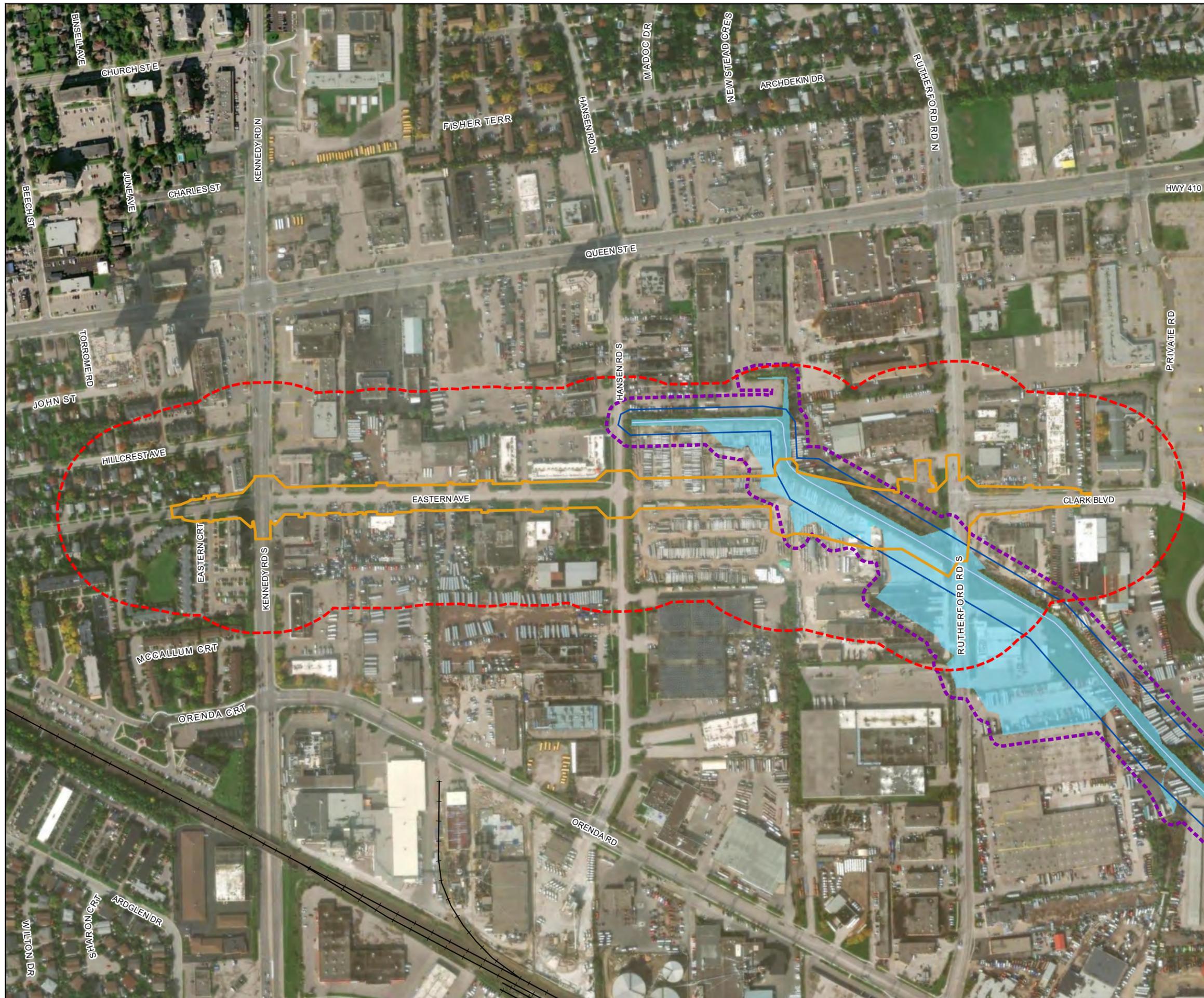
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- Subject Lands
- Railway
- Permanent Watercourse
- Floodplain (TRCA)
- Regulation Limit (TRCA)
- Meander Belt (TRCA)



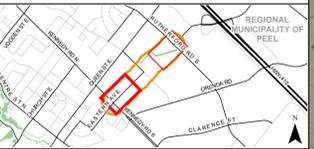
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Project: 2258
Date: August 3, 2022

NAD83 - UTM Zone 17
Size: 11x17"
1:4,800



Map 2A
 Clark Blvd. and Eastern Ave., Brampton EA
 Tree Inventory and Preservation Plan



- Legend**
- Study Area
 - Tree to be Removed (Crown to Scale)
 - Tree to be Retained / Confirm in Field (Crown to Scale)
 - Tree to be Retained / Confirm in Field (Crown to Scale)
 - Tree to be Retained / Confirm in Field (Crown to Scale)
 - Back of Curb
 - Edge of Pavement
 - Gutter Line
 - Driveway
 - Grading Limit - Cut
 - Grading Limit - Fill
 - Killstrip (Splash Guard)
 - Multi Use Trail
 - Sidewalk
 - Retaining Wall
 - Pavement Marking
 - Proposed ROW
 - Temporary Grading Easement

NATURAL RESOURCE SOLUTIONS INC.
 Aquatic, Terrestrial and Wetland Biologists

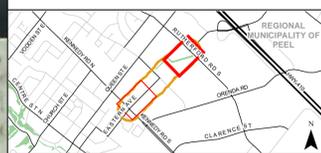
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|-------------------------|--------------------------|
| Project: 2258 | NAD83 - UTM Zone 17 |
| Date: September 7, 2022 | Scale: 30' x 30' / 1:400 |



Clark Blvd. and Eastern Ave., Brampton EA

Tree Inventory and Preservation Plan



- Legend**
- Study Area
 - Tree to be Removed (Crown to Scale)
 - Tree to be Retained/Confirm in Field (Crown to Scale)
 - Tree to be Retained (Crown to Scale)
 - Tree to be Retained / Confirm in Field (Crown to Scale)
 - Permanent Watercourse
 - Grading Limit - Cut
 - Killstrip (Splash Guard)
 - Multi Use Trail
 - Sidewalk
 - Pavement Marking
 - Proposed ROW
 - Temporary Grading Easement
 - Property Line
 - Alignment CL
 - Grading
 - Back of Curb
 - Edge of Pavement
 - Gutter Line
 - Ditch
 - Driveway

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

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|-------------------------|-----------------------|
| Project 2258 | NAD83 - UTM Zone 17 |
| Date: September 7, 2022 | Scale: 24.00" = 1:400 |



Clark Blvd. and Eastern Ave., Brampton EA Tree Protection Plan



Legend

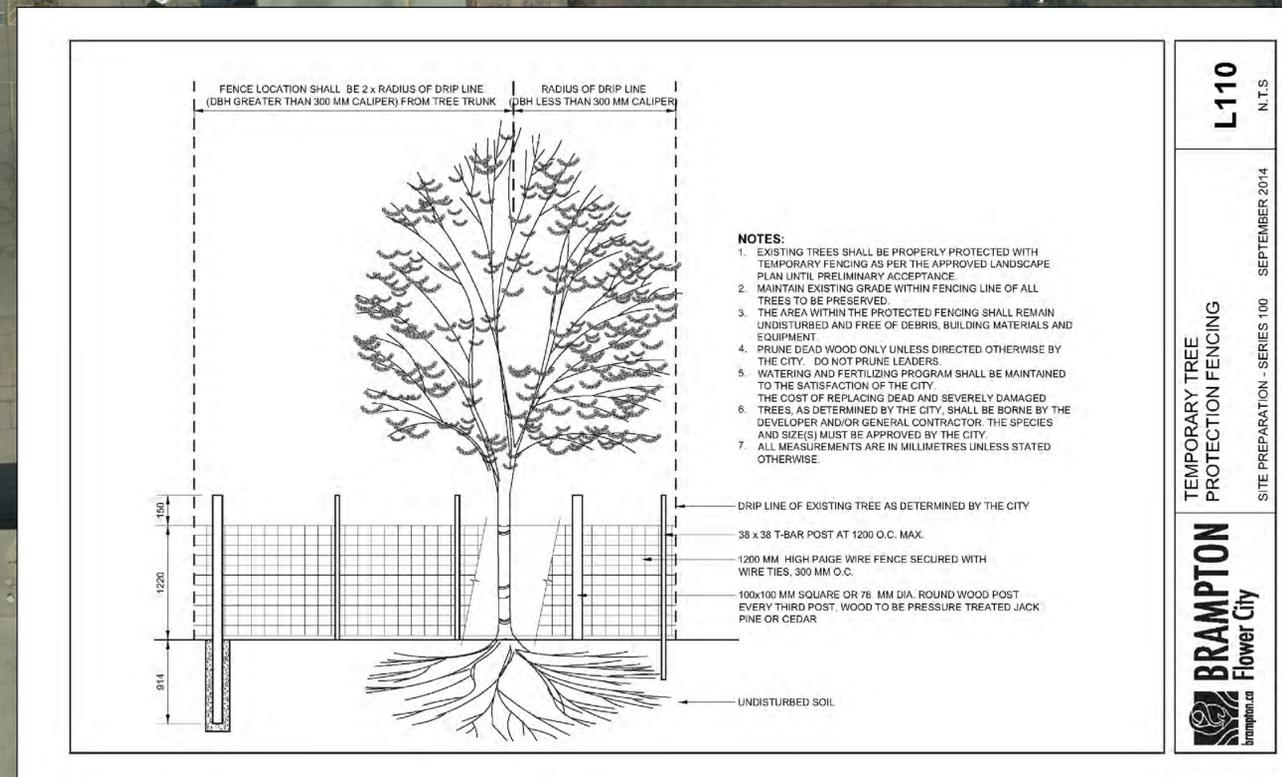
- Study Area
- Tree to be Removed (Crown to Scale)
- Tree to be Retained / Confirm in Field (Crown to Scale)
- Tree Protection Fencing Signage
- Tree Protection Fencing (TPF)
- Grading Limit - Cut
- Kiktrip (Splash Guard)
- Multi Use Trail
- Sidewalk
- Retaining Wall
- Pavement Marking
- Proposed ROW
- Temporary Grading Easement
- Back of Curb
- Edge of Pavement
- Outer Line
- Driveway

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Project 2258 MAD93 - UTM Zone 17
Date: September 7, 2022 Size: 34.00" x 1.000"

0 4 8 12 16 20 24 Meters

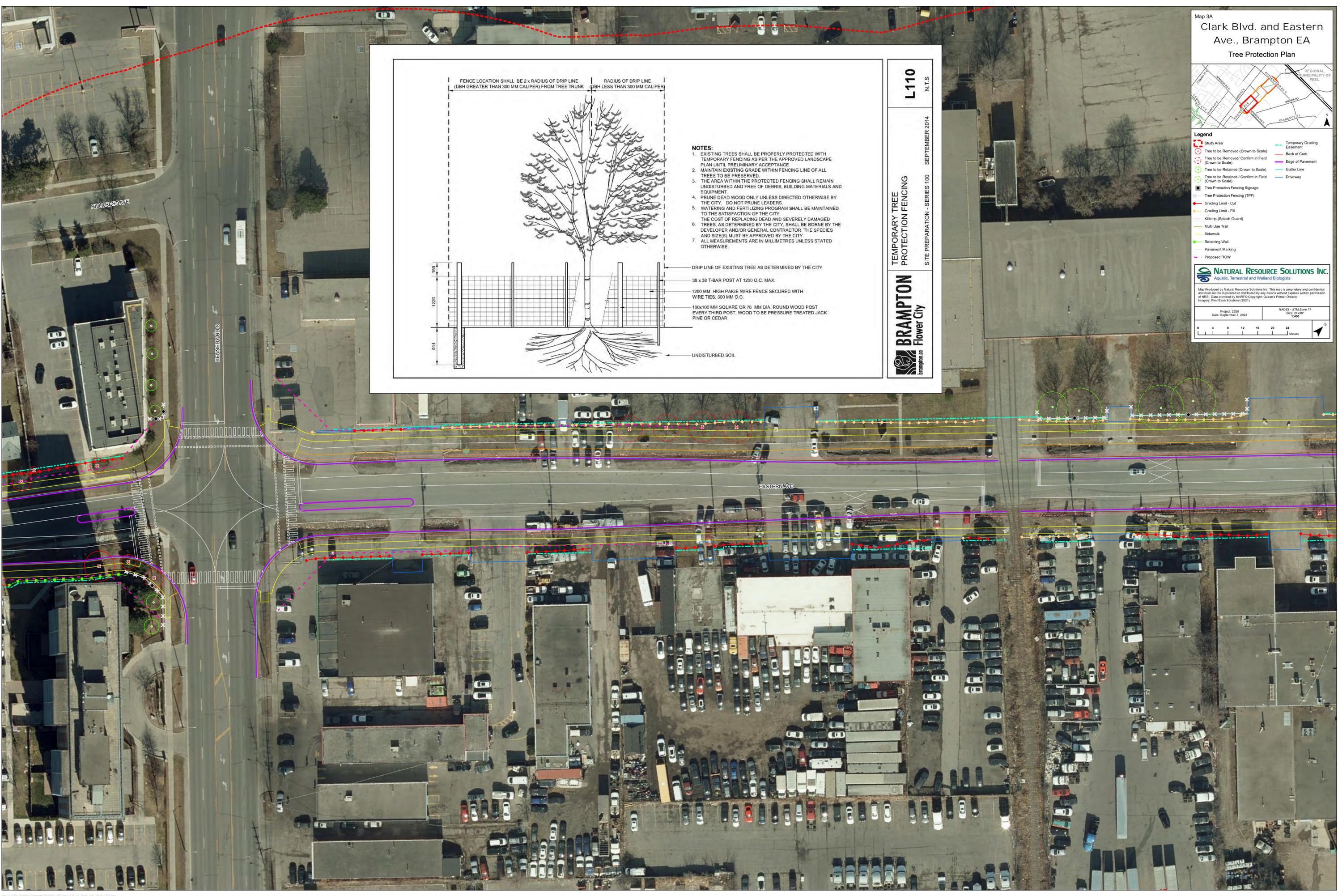


L110 N.T.S.

TEMPORARY TREE PROTECTION FENCING

SITE PREPARATION - SERIES 100 SEPTEMBER 2014

BRAMPTON
Flower City



Map 3B
 Clark Blvd. and Eastern Ave., Brampton EA
 Tree Protection Plan



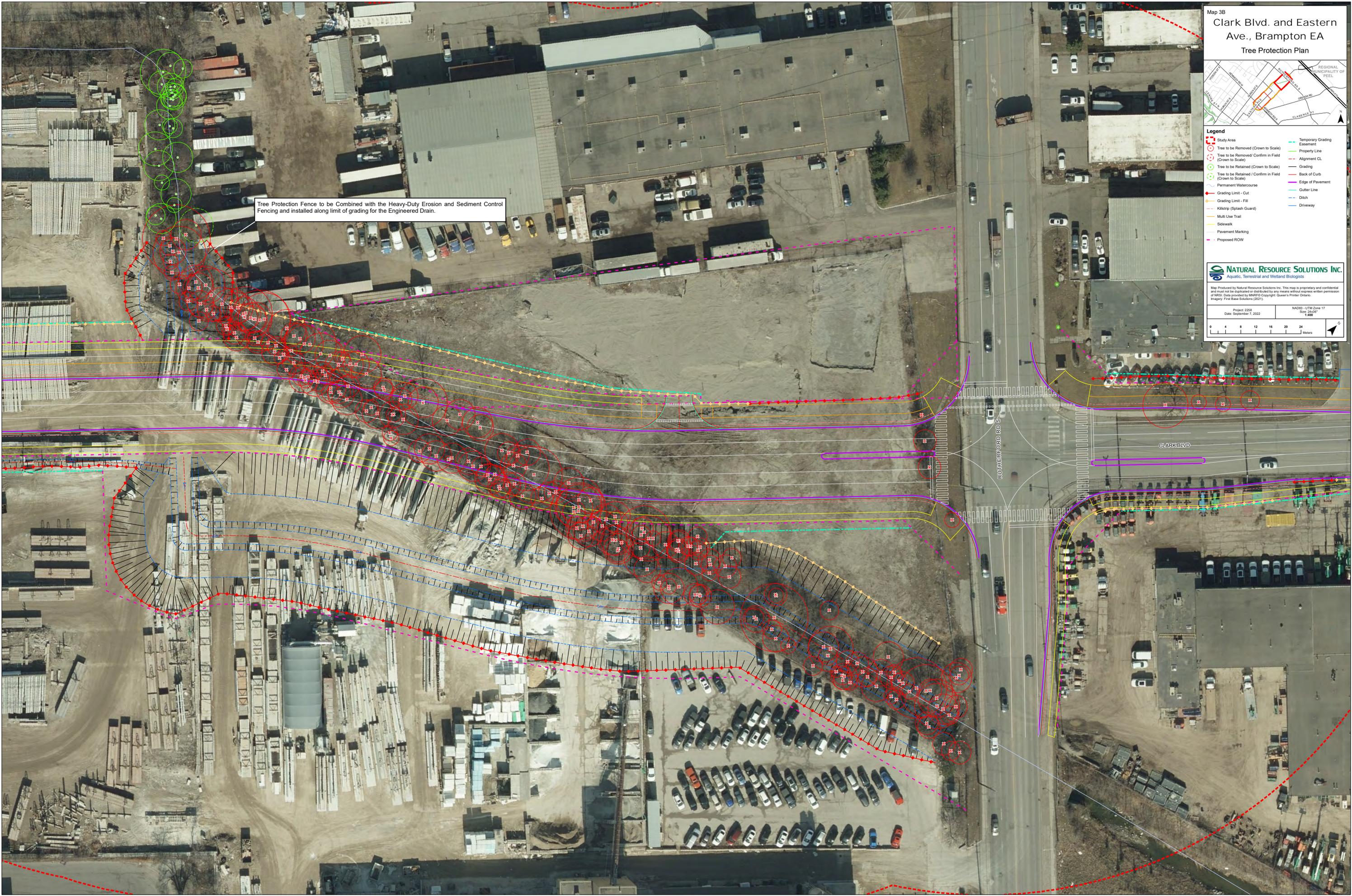
- Legend**
- Study Area
 - Tree to be Removed (Crown to Scale)
 - Tree to be Retained / Confirm in Field (Crown to Scale)
 - Tree to be Retained / Confirm in Field (Crown to Scale)
 - Permanent Watercourse
 - Grading Limit - Cut
 - Grading Limit - Fill
 - Kilstrip (Splash Guard)
 - Multi Use Trail
 - Sidewalk
 - Pavement Marking
 - Proposed ROW
 - Temporary Grading Easement
 - Property Line
 - Alignment CL
 - Grading
 - Back of Curb
 - Edge of Pavement
 - Gutter Line
 - Ditch
 - Driveway

NATURAL RESOURCE SOLUTIONS INC.
 Aquatic, Terrestrial and Wetland Biologists

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| | |
|-------------------------|---------------------|
| Project 2258 | NAD83 - UTM Zone 17 |
| Date: September 7, 2022 | Scale: 24.00" |
| | 1:400 |

Tree Protection Fence to be Combined with the Heavy-Duty Erosion and Sediment Control Fencing and installed along limit of grading for the Engineered Drain.



**Appendix I
Tree Inventory Data**

Clark Boulevard and Eastern Avenue, Brampton Environmental Assessment
Tree Inventory Data

| Tree Number | Common Name | Scientific Name | Native/ Non-native | Stem Count | DBH Sum (cm) | Crown Radius (m) | Potential for Structural Failure Rating | Overall Condition | Location | Proposed Action | Rationale for Removal | Compensation Required | Comments |
|-------------|--------------------|-------------------------------|--------------------|------------|--------------|------------------|---|-------------------|------------------|-----------------|-----------------------|-----------------------|--|
| 1123 | Norway Maple | <i>Acer platanoides</i> | Non-native | 1 | 24.0 | 3.0 | Improbable | Fair | Channel Corridor | Remove | Engineered Drain | 2:1 | 20% dieback; minor epicormic growth; growing near fence, bark rubbing on scaffold branch. |
| 1124 | Manitoba Maple | <i>Acer negundo</i> | Native | 2 | 29.4 | 3.0 | Possible | Fair | Channel Corridor | Remove | Engineered Drain | 2:1 | Codominant stems with included bark; pistol butt on slope; 2 dead branches; minor dieback. |
| 1125 | Green Ash | <i>Fraxinus pennsylvanica</i> | Native | 1 | 15.7 | 2.5 | Possible | Very Poor | Channel Corridor | Remove | Engineered Drain | None | Dead crown; live basal shoots. |
| 1126 | Green Ash | <i>Fraxinus pennsylvanica</i> | Native | 1 | 13.5 | 2.0 | Possible | Dead | Channel Corridor | Remove | Engineered Drain | None | Dead crown; minor shedding bark, sapwood decay. |
| 1127 | Green Ash | <i>Fraxinus pennsylvanica</i> | Native | 1 | 15.8 | 4.0 | Possible | Dead | Channel Corridor | Remove | Engineered Drain | None | Dead crown; EAB exit holes. |
| 1128 | European Ash | <i>Fraxinus excelsior</i> | Non-native | 1 | 13.1 | 2.5 | Improbable | Fair | Channel Corridor | Remove | Engineered Drain | None | 20% dieback. |
| 1129 | Willow species | <i>Salix sp.</i> | ** | 4 | 60.8 | 4.0 | Possible | Fair | Channel Corridor | Remove | Engineered Drain | 4:1 | Creekside, erosion in root zone; 10% dieback; minor epicormic growth. |
| 1130 | Little-leaf Linden | <i>Tilia cordata</i> | Non-native | 2 | 25.0 | 2.0 | Improbable | Fair | Channel Corridor | Remove | Engineered Drain | 2:1 | Exposed roots; upright form of codominant stems and large basal shoots. |
| 1131 | Little-leaf Linden | <i>Tilia cordata</i> | Non-native | 1 | 15.7 | 2.5 | Improbable | Good | Channel Corridor | Remove | Engineered Drain | 1:1 | Exposed roots; tight branch unions; minor dieback. |
| 1132 | Little-leaf Linden | <i>Tilia cordata</i> | Non-native | 1 | 15.8 | 3.5 | Improbable | Fair | Channel Corridor | Remove | Engineered Drain | 1:1 | Exposed roots; branch-bark ridges absent at some unions; 10% dieback. |
| 1133 | Common Apple | <i>Malus pumila</i> | Non-native | 1 | 16.1 | 2.5 | Possible | Dead | Channel Corridor | Remove | Engineered Drain | None | Dead crown; shedding bark. |
| 1134 | Little-leaf Linden | <i>Tilia cordata</i> | Non-native | 1 | 13.1 | 1.5 | Possible | Dead | Channel Corridor | Remove | Engineered Drain | None | Bark lesions; sapwood decay, fruiting bodies. |
| 1135 | Green Ash | <i>Fraxinus pennsylvanica</i> | Native | 1 | 13.7 | 3.0 | Possible | Dead | Channel Corridor | Remove | Engineered Drain | None | EAB exit holes; pistol butted over concrete; exposed roots. |
| 1136 | Little-leaf Linden | <i>Tilia cordata</i> | Non-native | 1 | 13.7 | 2.5 | Improbable | Fair | Channel Corridor | Remove | Engineered Drain | None | Full crown; epicormic growth. |
| 1137 | Siberian Elm | <i>Ulmus pumila</i> | Non-native | 1 | 30.2 | 4.0 | Improbable | Fair | Channel Corridor | Remove | Engineered Drain | 2:1 | Few dead branches; foliar spots; creekside. |
| 1138 | Manitoba Maple | <i>Acer negundo</i> | Native | 2 | 23.1 | 2.5 | Possible | Dead | Channel Corridor | Remove | Engineered Drain | None | Codominant stems, broken tops; arching dead branches. |
| 1139 | Green Ash | <i>Fraxinus pennsylvanica</i> | Native | 1 | 11.1 | 2.0 | Possible | Very Poor | Channel Corridor | Remove | Engineered Drain | None | Dead crown; live basal shoots; insect exit holes. |
| 1140 | Green Ash | <i>Fraxinus pennsylvanica</i> | Native | 1 | 40.2 | 3.5 | Possible | Dead | Channel Corridor | Remove | Engineered Drain | None | Dead crown; shedding bark; centre rot. |
| 1141 | Green Ash | <i>Fraxinus pennsylvanica</i> | Native | 1 | 20.4 | 2.5 | Possible | Very Poor | Channel Corridor | Remove | Engineered Drain | None | Bark cracks; exposed roots; live epicormic growth. |
| 1142 | Manitoba Maple | <i>Acer negundo</i> | Native | 1 | 21.3 | 3.5 | Possible | Dead | Channel Corridor | Remove | Engineered Drain | None | Dead crown with vines; leaning south. |
| 1143 | Green Ash | <i>Fraxinus pennsylvanica</i> | Native | 1 | 11.3 | 2.5 | Probable | Dead | Channel Corridor | Remove | Engineered Drain | None | Leaning southwest; rooted in creek; shedding bark. |
| 1144 | Crack Willow | <i>Salix euxina</i> | Non-native | 5 | 176.2 | 9.0 | Possible | Fair | Channel Corridor | Remove | Engineered Drain | 5:1 | Large tree in creek; exposed roots; history of major branch failures; 10% dieback. |
| 1145 | Manitoba Maple | <i>Acer negundo</i> | Native | 2 | 51.8 | 4.5 | Possible | Poor | Channel Corridor | Remove | Engineered Drain | None | Relatively full crown; 2 failed stems; basal rot; epicormic growth. |
| 1146 | Manitoba Maple | <i>Acer negundo</i> | Native | 1 | 15.9 | 3.0 | Possible | Fair | Channel Corridor | Remove | Engineered Drain | 1:1 | Codominant leaders; leaning west. |
| 1147 | Manitoba Maple | <i>Acer negundo</i> | Native | 1 | 13.7 | 3.0 | Possible | Fair | Channel Corridor | Remove | Engineered Drain | None | Leaning west; epicormic growth; bark rubbing wound, main stem. |
| 1148 | Manitoba Maple | <i>Acer negundo</i> | Native | 1 | 10.8 | 2.5 | Possible | Fair | Channel Corridor | Remove | Engineered Drain | None | Leaning west; epicormic growth. |
| 1149 | Manitoba Maple | <i>Acer negundo</i> | Native | 1 | 25.6 | 5.0 | Possible | Fair | Channel Corridor | Remove | Engineered Drain | 2:1 | Lifted root plate; bark wounds; poor union at codominant leaders; mostly full crown. |
| 1150 | Manitoba Maple | <i>Acer negundo</i> | Native | 1 | 14.3 | 2.0 | Improbable | Fair | Channel Corridor | Remove | Engineered Drain | None | Crown bound up with neighbour; epicormic growth. |
| 1151 | European Ash | <i>Fraxinus excelsior</i> | Non-native | 1 | 13.6 | 4.0 | Possible | Fair | Channel Corridor | Remove | Engineered Drain | None | Significant wound where stem rubs fence crossbar; full crown. |
| 1152 | European Ash | <i>Fraxinus excelsior</i> | Non-native | 1 | 10.5 | 2.0 | Improbable | Good | Channel Corridor | Remove | Engineered Drain | None | Healthy crown. |
| 1153 | Manitoba Maple | <i>Acer negundo</i> | Native | 2 | 33.2 | 3.5 | Possible | Fair | Channel Corridor | Remove | Engineered Drain | 2:1 | Codominant stems leaning east; 1 stem topped; epicormic growth. |
| 1154 | Crack Willow | <i>Salix euxina</i> | Non-native | 2 | 47.0 | 2.5 | Probable | Very Poor | Channel Corridor | Remove | Engineered Drain | None | Codominant stems with broken tops; decay throughout stems; in middle of creek. |
| 1155 | Manitoba Maple | <i>Acer negundo</i> | Native | 2 | 38.7 | 4.5 | Possible | Fair | Channel Corridor | Remove | Engineered Drain | 3:1 | Growing on undercut bank; slight lean southeast; minor dieback. |
| 1156 | Manitoba Maple | <i>Acer negundo</i> | Native | 1 | 12.6 | 3.0 | Improbable | Fair | Channel Corridor | Remove | Engineered Drain | None | Leaning southeast, phototropic growth. |
| 1157 | Balsam Poplar | <i>Populus balsamifera</i> | Native | 1 | 19.9 | 4.0 | Improbable | Good | Channel Corridor | Remove | Engineered Drain | 1:1 | |
| 1158 | Balsam Poplar | <i>Populus balsamifera</i> | Native | 1 | 14.1 | 0.5 | Probable | Dead | Channel Corridor | Remove | Engineered Drain | None | Stem cracked, leaning on neighbouring tree. |
| 1159 | Balsam Poplar | <i>Populus balsamifera</i> | Native | 1 | 21.7 | 4.0 | Improbable | Fair | Channel Corridor | Remove | Engineered Drain | 2:1 | Few dead branches. |
| 1160 | American Basswood | <i>Tilia americana</i> | Native | 1 | 16.2 | 4.0 | Improbable | Good | Channel Corridor | Remove | Engineered Drain | 1:1 | Crossing stem of neighbour. |
| 1161 | American Basswood | <i>Tilia americana</i> | Native | 1 | 22.2 | 4.0 | Improbable | Good | Channel Corridor | Remove | Engineered Drain | 2:1 | Crossing stem of neighbour; gravel fill in root zone; minor epicormic growth. |
| 1162 | Manitoba Maple | <i>Acer negundo</i> | Native | 3 | 39.1 | 4.0 | Improbable | Fair | Channel Corridor | Remove | Engineered Drain | 3:1 | Only 1 live stem, arching south. |
| 1163 | Manitoba Maple | <i>Acer negundo</i> | Native | 2 | 28.4 | 3.5 | Possible | Fair | Channel Corridor | Remove | Engineered Drain | 2:1 | Primary stem arches south, with wound from rubbing fence; 1 former stem cut. |

**Clark Boulevard and Eastern Avenue, Brampton Environmental Assessment
Tree Inventory Data**

| Tree Number | Common Name | Scientific Name | Native/ Non-native | Stem Count | DBH Sum (cm) | Crown Radius (m) | Potential for Structural Failure Rating | Overall Condition | Location | Proposed Action | Rationale for Removal | Compensation Required | Comments |
|-------------|-----------------------|-------------------------------|--------------------|------------|--------------|------------------|---|-------------------|------------------|-----------------|-----------------------|-----------------------|---|
| 1164 | Norway Maple | <i>Acer platanoides</i> | Non-native | 1 | 19.6 | 4.0 | Improbable | Good | Channel Corridor | Remove | Engineered Drain | 1:1 | Upright, healthy crown; epicormic growth. |
| 1165 | European Mountain-Ash | <i>Sorbus aucuparia</i> | Non-native | 1 | 13.8 | 3.0 | Improbable | Good | Channel Corridor | Remove | Engineered Drain | None | Full crown. |
| 1166 | Green Ash | <i>Fraxinus pennsylvanica</i> | Native | 1 | 11.3 | 1.5 | Probable | Dead | Channel Corridor | Remove | Engineered Drain | None | EAB exit holes; shedding bark. |
| 1167 | Crack Willow | <i>Salix euxina</i> | Non-native | 2 | 43.0 | 7.5 | Possible | Fair | Channel Corridor | Remove | Engineered Drain | 3:1 | 1 major branch failure; codominant stems; light pruning; minor epicormic growth. |
| 1168 | Crack Willow | <i>Salix euxina</i> | Non-native | 2 | 50.9 | 6.0 | Improbable | Fair | Channel Corridor | Remove | Roadwork Grading | 4:1 | Leaning south; girdling roots. |
| 1169 | Manitoba Maple | <i>Acer negundo</i> | Native | 1 | 16.6 | 3.0 | Possible | Dead | Channel Corridor | Remove | Roadwork Grading | None | Leaning south; pistol butt; dead crown with vines. |
| 1170 | Green Ash | <i>Fraxinus pennsylvanica</i> | Native | 1 | 23.8 | 5.0 | Possible | Very Poor | Channel Corridor | Remove | Roadwork Grading | None | Bark cracks; insect galleries; epicormic growth; dead top. |
| 1171 | Balsam Poplar | <i>Populus balsamifera</i> | Native | 1 | 19.7 | 3.0 | Improbable | Good | Channel Corridor | Remove | Roadwork Grading | 1:1 | Slight pistol butt; sedimentation around stem; healthy crown. |
| 1172 | Manitoba Maple | <i>Acer negundo</i> | Native | 1 | 14.3 | 3.0 | Possible | Poor | Channel Corridor | Remove | Roadwork Grading | None | Codominant leaders; 40% live crown lost. |
| 1173 | Manitoba Maple | <i>Acer negundo</i> | Native | 1 | 19.2 | 3.5 | Improbable | Fair | Channel Corridor | Remove | Roadwork Grading | 1:1 | Phototrophic growth south; 10% dieback. |
| 1174 | Balsam Poplar | <i>Populus balsamifera</i> | Native | 1 | 26.7 | 3.0 | Possible | Fair | Channel Corridor | Remove | Roadwork Grading | 2:1 | Bark cracks, potential sapwood decay; unbalanced crown due to dieback. |
| 1175 | Manitoba Maple | <i>Acer negundo</i> | Native | 2 | 28.0 | 3.5 | Possible | Dead | Channel Corridor | Remove | Roadwork Grading | None | EAB exit holes; loose bark; insect galleries. |
| 1176 | Manitoba Maple | <i>Acer negundo</i> | Native | 1 | 12.9 | 2.5 | Possible | Fair | Channel Corridor | Remove | Roadwork Grading | None | Leaning south; wounded by fence; epicormic growth. |
| 1177 | Green Ash | <i>Fraxinus pennsylvanica</i> | Native | 1 | 19.8 | 3.0 | Possible | Poor | Channel Corridor | Remove | Roadwork Grading | None | Broken top; loose bark; insect galleries; large epicormic growth comprises live crown. |
| 1178 | Manitoba Maple | <i>Acer negundo</i> | Native | 5 | 86.8 | 4.0 | Possible | Fair | Channel Corridor | Remove | Roadwork Grading | 5:1 | Included bark. |
| 1179 | Green Ash | <i>Fraxinus pennsylvanica</i> | Native | 2 | 32.9 | 2.5 | Possible | Very Poor | Channel Corridor | Remove | Roadwork Grading | None | EAB exit holes; loose bark. |
| 1180 | European Ash | <i>Fraxinus excelsior</i> | Non-native | 1 | 13.3 | 3.0 | Improbable | Fair | Channel Corridor | Remove | Roadwork Grading | None | Crooked stem; epicormic growth; irregular bark texture. |
| 1181 | Manitoba Maple | <i>Acer negundo</i> | Native | 1 | 17.2 | 2.5 | Possible | Poor | Channel Corridor | Remove | Roadwork Grading | None | Dead top; basal and stem wounds. |
| 1182 | Manitoba Maple | <i>Acer negundo</i> | Native | 2 | 31.2 | 4.0 | Possible | Fair | Channel Corridor | Remove | Roadwork Grading | 2:1 | Codominant stems leaning south; included bark. |
| 1183 | Manitoba Maple | <i>Acer negundo</i> | Native | 2 | 26.7 | 3.5 | Possible | Poor | Channel Corridor | Remove | Roadwork Grading | None | Codominant stems with dead tops; epicormic growth; included bark. |
| 1184 | Manitoba Maple | <i>Acer negundo</i> | Native | 4 | 64.8 | 4.0 | Possible | Poor | Channel Corridor | Remove | Roadwork Grading | None | Codominant stems, 2 partially failed but recovered; 20% live crown lost; branches crossing. |
| 1185 | Green Ash | <i>Fraxinus pennsylvanica</i> | Native | 1 | 18.9 | 1.0 | Possible | Dead | Channel Corridor | Remove | Roadwork Grading | None | Dead, broken top. |
| 1186 | Manitoba Maple | <i>Acer negundo</i> | Native | 4 | 59.8 | 4.0 | Possible | Fair | Channel Corridor | Remove | Roadwork Grading | 4:1 | 20% live crown lost; codominant stems; epicormic growth. |
| 1187 | Manitoba Maple | <i>Acer negundo</i> | Native | 3 | 46.9 | 4.0 | Possible | Fair | Channel Corridor | Remove | Roadwork Grading | 3:1 | Significant dieback, 25% live crown lost; included bark; epicormic growth. |
| 1188 | Manitoba Maple | <i>Acer negundo</i> | Native | 2 | 36.6 | 3.0 | Possible | Poor | Channel Corridor | Remove | Roadwork Grading | None | Dieback; 1 former stem failed; basal rot. |
| 1189 | European Ash | <i>Fraxinus excelsior</i> | Non-native | 1 | 27.3 | 4.0 | Improbable | Fair | Channel Corridor | Remove | Roadwork Grading | 2:1 | 25% live crown lost; roots exposed by creek erosion; epicormic growth. |
| 1190 | Manitoba Maple | <i>Acer negundo</i> | Native | 1 | 12.0 | 2.0 | Possible | Poor | Channel Corridor | Remove | Roadwork Grading | None | Codominant leaders; 50% live crown lost; epicormic growth. |
| 1191 | Manitoba Maple | <i>Acer negundo</i> | Native | 3 | 15.3 | 2.0 | Possible | Poor | Channel Corridor | Remove | Roadwork Grading | None | Basal rot; broken top; fruiting bodies. |
| 1192 | Manitoba Maple | <i>Acer negundo</i> | Native | 1 | 12.8 | 2.0 | Possible | Fair | Channel Corridor | Remove | Roadwork Grading | None | Stem wounds, partially closed; dieback. |
| 1193 | Green Ash | <i>Fraxinus pennsylvanica</i> | Native | 1 | 18.4 | 3.5 | Probable | Dead | Channel Corridor | Remove | Roadwork Grading | None | Shedding bark; insect galleries; EAB exit holes; longitudinal crack. |
| 1194 | Manitoba Maple | <i>Acer negundo</i> | Native | 3 | 42.8 | 4.0 | Possible | Fair | Channel Corridor | Remove | Roadwork Grading | 3:1 | 20% dieback; basal rot at included bark. |
| 1195 | Green Ash | <i>Fraxinus pennsylvanica</i> | Native | 1 | 11.8 | 2.0 | Probable | Dead | Channel Corridor | Remove | Roadwork Grading | None | Little bark intact. |
| 1196 | Manitoba Maple | <i>Acer negundo</i> | Native | 1 | 13.9 | 3.0 | Improbable | Fair | Channel Corridor | Remove | Roadwork Grading | None | Minor dieback; some epicormic growth; fence may eventually girdle root flare. |
| 1197 | Manitoba Maple | <i>Acer negundo</i> | Native | 2 | 28.7 | 4.0 | Improbable | Fair | Channel Corridor | Remove | Roadwork Grading | 2:1 | Growing through fence; 1 former stem failed. |
| 1198 | Manitoba Maple | <i>Acer negundo</i> | Native | 2 | 13.2 | 3.0 | Possible | Fair | Channel Corridor | Remove | Roadwork Grading | None | Secondary stem dead; dieback; roots exposed by creek erosion. |
| 1199 | Manitoba Maple | <i>Acer negundo</i> | Native | 3 | 33.1 | 3.5 | Possible | Poor | Channel Corridor | Remove | Roadwork Grading | None | 2 tops dead; water sprouts; fence girdling; epicormic growth. |
| 1200 | Manitoba Maple | <i>Acer negundo</i> | Native | 2 | 26.8 | 3.0 | Possible | Poor | Channel Corridor | Remove | Roadwork Grading | None | 1 stem dead and broken; included bark; dieback. |
| 1201 | Manitoba Maple | <i>Acer negundo</i> | Native | 2 | 22.4 | 2.5 | Possible | Fair | Channel Corridor | Remove | Roadwork Grading | 2:1 | 1 stem dead and broken; epicormic growth. |
| 1202 | Manitoba Maple | <i>Acer negundo</i> | Native | 2 | 25.8 | 4.0 | Possible | Fair | Channel Corridor | Remove | Roadwork Grading | 2:1 | Codominant stems leaning to creek; centre rot, 1 stem. |
| 1203 | Manitoba Maple | <i>Acer negundo</i> | Native | 1 | 11.3 | 2.5 | Possible | Poor | Channel Corridor | Remove | Roadwork Grading | None | Growing on undercut bank; 40% dieback; epicormic growth. |

**Clark Boulevard and Eastern Avenue, Brampton Environmental Assessment
Tree Inventory Data**

| Tree Number | Common Name | Scientific Name | Native/ Non-native | Stem Count | DBH Sum (cm) | Crown Radius (m) | Potential for Structural Failure Rating | Overall Condition | Location | Proposed Action | Rationale for Removal | Compensation Required | Comments |
|-------------|--------------------|-------------------------------|--------------------|------------|--------------|------------------|---|-------------------|------------------|-----------------|-----------------------|-----------------------|--|
| 1204 | Manitoba Maple | <i>Acer negundo</i> | Native | 1 | 14.0 | 2.5 | Possible | Fair | Channel Corridor | Remove | Roadwork Grading | None | Asymmetrical crown; dieback. |
| 1205 | Manitoba Maple | <i>Acer negundo</i> | Native | 2 | 32.6 | 4.0 | Possible | Poor | Channel Corridor | Remove | Roadwork Grading | None | 1 stem dead; epicormic growth; wounds from growing into fence. |
| 1206 | Manitoba Maple | <i>Acer negundo</i> | Native | 1 | 17.4 | 4.0 | Improbable | Fair | Channel Corridor | Remove | Roadwork Grading | 1:1 | Stem wound from concrete block pushed into tree; 1 dead branch; minor dieback. |
| 1207 | Manitoba Maple | <i>Acer negundo</i> | Native | 1 | 10.0 | 2.5 | Possible | Poor | Channel Corridor | Remove | Roadwork Grading | None | Pistol butt, growing on undercut bank; dead leaders; epicormic growth. |
| 1208 | Manitoba Maple | <i>Acer negundo</i> | Native | 1 | 11.1 | 2.0 | Possible | Poor | Channel Corridor | Remove | Roadwork Grading | None | Growing on undercut bank; dead leader; epicormic growth. |
| 1209 | Manitoba Maple | <i>Acer negundo</i> | Native | 2 | 10.2 | 2.0 | Improbable | Fair | Channel Corridor | Remove | Roadwork Grading | None | Codominant stems; epicormic growth; minor dieback. |
| 1210 | Manitoba Maple | <i>Acer negundo</i> | Native | 1 | 15.3 | 2.5 | Improbable | Good | Channel Corridor | Remove | Roadwork Grading | 1:1 | Closed branch stubs; light pruning; minor epicormic growth. |
| 1211 | Manitoba Maple | <i>Acer negundo</i> | Native | 1 | 19.2 | 3.0 | Possible | Fair | Channel Corridor | Remove | Roadwork Grading | 1:1 | Basal wound missing bark; closed branch stubs; healthy crown with only minor dieback. |
| 1212 | Manitoba Maple | <i>Acer negundo</i> | Native | 2 | 11.9 | 1.5 | Possible | Fair | Channel Corridor | Remove | Roadwork Grading | None | Secondary stem has dead top; suppressed crown; roots exposed by creek erosion. |
| 1213 | Manitoba Maple | <i>Acer negundo</i> | Native | 2 | 11.6 | 1.5 | Probable | Dead | Channel Corridor | Remove | Roadwork Grading | None | Dead; bark wounds; roots exposed by creek erosion. |
| 1214 | Manitoba Maple | <i>Acer negundo</i> | Native | 2 | 10.1 | 1.5 | Possible | Fair | Channel Corridor | Remove | Roadwork Grading | None | Crooked stem; epicormic growth; basal rot; crack in scaffold branch. |
| 1215 | Manitoba Maple | <i>Acer negundo</i> | Native | 6 | 67.2 | 3.5 | Possible | Fair | Channel Corridor | Remove | Roadwork Grading | 5:1 | 3 main stems; growing through fence; included bark. |
| 1216 | Manitoba Maple | <i>Acer negundo</i> | Native | 2 | 12.7 | 2.5 | Possible | Good | Channel Corridor | Remove | Roadwork Grading | None | Codominant stems with included bark; leaning toward creek; minor epicormic growth. |
| 1217 | Common Apple | <i>Malus pumila</i> | Non-native | 1 | 10.4 | 2.0 | Improbable | Fair | Channel Corridor | Remove | Roadwork Grading | None | Bark cracks; suppressed crown; roots exposed by creek erosion. |
| 1218 | Manitoba Maple | <i>Acer negundo</i> | Native | 2 | 13.9 | 3.0 | Possible | Dead | Channel Corridor | Remove | Roadwork Grading | None | Dead top; loose bark; leaning away from creek. |
| 1219 | Green Ash | <i>Fraxinus pennsylvanica</i> | Native | 1 | 14.7 | 2.0 | Probable | Dead | Channel Corridor | Remove | Roadwork Grading | None | EAB exit holes; loose bark; insect galleries. |
| 1220 | Manitoba Maple | <i>Acer negundo</i> | Native | 3 | 44.7 | 3.5 | Improbable | Fair | Channel Corridor | Remove | Engineered Drain | 3:1 | Included bark, crossing branches; epicormic growth; minor dieback. |
| 1221 | European Ash | <i>Fraxinus excelsior</i> | Non-native | 1 | 16.1 | 3.0 | Improbable | Fair | Channel Corridor | Remove | Engineered Drain | 1:1 | Evidence of canker: bark cracks and sunken tissue; full crown; minor epicormic growth. |
| 1301 | Green Ash | <i>Fraxinus pennsylvanica</i> | Native | 1 | 16.2 | 1.5 | Possible | Dead | Channel Corridor | Remove | Engineered Drain | None | EAB exit holes; insect galleries; broken top. |
| 1302 | European Ash | <i>Fraxinus excelsior</i> | Non-native | 3 | 22.9 | 2.5 | Possible | Fair | Channel Corridor | Remove | Engineered Drain | 2:1 | 1 stem dead; significant epicormic growth; roots exposed by bank scouring caused by culvert outlet immediately downstream. |
| 1303 | Green Ash | <i>Fraxinus pennsylvanica</i> | Native | 1 | 11.2 | 2.0 | Possible | Very Poor | Channel Corridor | Remove | Engineered Drain | None | Insect galleries; dead crown; live basal shoots. |
| 1304 | Norway Maple | <i>Acer platanoides</i> | Non-native | 1 | 10.2 | 2.5 | Improbable | Good | Channel Corridor | Remove | Engineered Drain | None | Exposed roots; pistol butt; healthy crown. |
| 1305 | Green Ash | <i>Fraxinus pennsylvanica</i> | Native | 1 | 16.5 | 3.5 | Possible | Very Poor | Channel Corridor | Remove | Engineered Drain | None | EAB exit holes; insect galleries; exposed roots; live basal shoots. |
| 1306 | Manitoba Maple | <i>Acer negundo</i> | Native | 2 | 35.2 | 2.5 | Possible | Fair | Channel Corridor | Remove | Engineered Drain | 3:1 | Codominant stems; 1 dead leader; epicormic growth. |
| 1307 | Siberian Elm | <i>Ulmus pumila</i> | Non-native | 1 | 21.7 | 2.5 | Improbable | Fair | Channel Corridor | Remove | Engineered Drain | 2:1 | Pistol butt; growing through concrete blocks at creek side; codominant leaders; brown spots on leaves. |
| 1308 | Crack Willow | <i>Salix euxina</i> | Non-native | 1 | 24.8 | 3.5 | Possible | Fair | Channel Corridor | Remove | Engineered Drain | 2:1 | Crooked stem leaning along creek; growing through concrete blocks at creek side; water sprouts. |
| 1309 | Norway Maple | <i>Acer platanoides</i> | Non-native | 1 | 16.6 | 2.5 | Improbable | Good | Channel Corridor | Remove | Engineered Drain | 1:1 | Once lost leader; full crown supports squirrel's nest. |
| 1309 | Green Ash | <i>Fraxinus pennsylvanica</i> | Native | 1 | 10.7 | 2.0 | Improbable | Fair | Channel Corridor | Remove | Engineered Drain | None | Sparse crown; bark cracks. |
| 1310 | American Basswood | <i>Tilia americana</i> | Native | 1 | 13.7 | 2.0 | Improbable | Good | Channel Corridor | Remove | Engineered Drain | None | Mostly healthy crown, asymmetrical due to neighbouring tree; some foliar discoloration at top. |
| 1312 | Eastern Cottonwood | <i>Populus deltoides</i> | Native | 1 | 28.6 | 3.5 | Improbable | Good | Channel Corridor | Remove | Engineered Drain | 2:1 | Pistol butt; root flare and large roots exposed by creek erosion; growing over concrete blocks; healthy crown. |
| 1313 | Norway Maple | <i>Acer platanoides</i> | Non-native | 1 | 10.0 | 2.5 | Improbable | Good | Channel Corridor | Remove | Engineered Drain | None | Roots exposed by creek erosion; healthy crown. |
| 1314 | European Ash | <i>Fraxinus excelsior</i> | Non-native | 1 | 10.4 | 2.0 | Possible | Poor | Channel Corridor | Remove | Engineered Drain | None | Roots exposed by creek erosion; dieback; epicormic growth. |
| 1315 | Norway Maple | <i>Acer platanoides</i> | Non-native | 1 | 19.6 | 4.0 | Improbable | Good | Channel Corridor | Retain | | None | Roots exposed by creek erosion; dieback; bark seam; full crown. |
| 1316 | Green Ash | <i>Fraxinus pennsylvanica</i> | Native | 1 | 19.4 | 2.5 | Possible | Dead | Channel Corridor | Retain | | None | Loose bark; no live crown. |
| 1317 | Manitoba Maple | <i>Acer negundo</i> | Native | 1 | 13.4 | 2.0 | Improbable | Fair | Channel Corridor | Retain | | None | Light pruning from neighbouring trees; phototrophic growth; branch stubs partially closed. |

Clark Boulevard and Eastern Avenue, Brampton Environmental Assessment
Tree Inventory Data

| Tree Number | Common Name | Scientific Name | Native/ Non-native | Stem Count | DBH Sum (cm) | Crown Radius (m) | Potential for Structural Failure Rating | Overall Condition | Location | Proposed Action | Rationale for Removal | Compensation Required | Comments |
|-------------|----------------|-------------------------------|--------------------|------------|--------------|------------------|---|-------------------|------------------|-----------------|-----------------------|-----------------------|--|
| 1318 | Manitoba Maple | <i>Acer negundo</i> | Native | 1 | 17.6 | 4.0 | Improbable | Fair | Channel Corridor | Retain | | None | Light pruning from dense competition. |
| 1319 | European Ash | <i>Fraxinus excelsior</i> | Non-native | 1 | 30.4 | 4.5 | Possible | Poor | Channel Corridor | Retain | | None | Dead leader; some live crown. |
| 1320 | European Ash | <i>Fraxinus excelsior</i> | Non-native | 1 | 26.1 | 4.0 | Possible | Fair | Channel Corridor | Retain | | None | Vigorous lateral scaffold branch; 20% dieback; squirrel's nest. |
| 1321 | European Ash | <i>Fraxinus excelsior</i> | Non-native | 1 | 16.3 | 3.5 | Improbable | Fair | Channel Corridor | Retain | | None | Minor crown thinning; sunken tissue. |
| 1322 | Crack Willow | <i>Salix euxina</i> | Non-native | 5 | 96.5 | 6.0 | Possible | Fair | Channel Corridor | Retain | | None | Codominant stems spreading; history of branch failure; erosion in root zone; longitudinal wound in 1 stem. |
| 1323 | Norway Maple | <i>Acer platanoides</i> | Non-native | 2 | 32.0 | 3.5 | Improbable | Good | Channel Corridor | Retain | | None | Full crown; minor epicormic growth; secondary stem slightly suppressed. |
| 1325 | Manitoba Maple | <i>Acer negundo</i> | Native | 2 | 14.9 | 2.5 | Possible | Fair | Channel Corridor | Retain | | None | Pistol butt with included bark; asymmetrical crown due to neighbouring trees; bark rubbing wound with fence. |
| 1326 | Norway Maple | <i>Acer platanoides</i> | Non-native | 1 | 10.9 | 2.0 | Improbable | Good | Channel Corridor | Retain | | None | Stem crossing neighbouring tree. |
| 1327 | Norway Maple | <i>Acer platanoides</i> | Non-native | 1 | 15.9 | 3.5 | Improbable | Good | Channel Corridor | Retain | | None | Stem crossing neighbouring tree. |
| 1328 | Green Ash | <i>Fraxinus pennsylvanica</i> | Native | 1 | 11.5 | 2.0 | Probable | Very Poor | Channel Corridor | Retain | | None | EAB exit holes; basal shoots; bark cracks. |
| 1329 | Green Ash | <i>Fraxinus pennsylvanica</i> | Native | 1 | 10.1 | 1.5 | Probable | Very Poor | Channel Corridor | Retain | | None | Dead top; live basal shoots; EAB exit holes. |
| 1330 | Norway Maple | <i>Acer platanoides</i> | Non-native | 1 | 15.2 | 3.0 | Improbable | Good | Channel Corridor | Retain | | None | Small tree twisting around subject tree. |
| 1331 | Green Ash | <i>Fraxinus pennsylvanica</i> | Native | 1 | 13.4 | 2.5 | Possible | Very Poor | Channel Corridor | Retain | | None | Leaning over creek; dead top; live basal shoots; EAB exit holes. |
| 1332 | Manitoba Maple | <i>Acer negundo</i> | Native | 1 | 16.6 | 2.5 | Improbable | Good | Channel Corridor | Retain | | None | Leaning south; good wound closure. |
| 1333 | Manitoba Maple | <i>Acer negundo</i> | Native | 1 | 34.2 | 3.5 | Possible | Poor | Channel Corridor | Retain | | None | Codominant leaders, both with broken tops; included bark; basal wounds and deadwood; epicormic growth. |
| 1334 | Manitoba Maple | <i>Acer negundo</i> | Native | 1 | 25.5 | 3.5 | Possible | Fair | Channel Corridor | Retain | | None | Leaning away from creek; missing bark at base; some centre rot; full crown with epicormic growth. |
| 1335 | Green Ash | <i>Fraxinus pennsylvanica</i> | Native | 1 | 20.0 | 2.0 | Possible | Very Poor | Channel Corridor | Retain | | None | EAB exit holes; dead top; live basal shoots; roots exposed by creek erosion. |
| 1336 | Green Ash | <i>Fraxinus pennsylvanica</i> | Native | 1 | 19.2 | 2.5 | Possible | Dead | Channel Corridor | Retain | | None | EAB exit holes; dead top; bark cracks. |

Appendix II
Tree Assessment Criteria

Tree Health Assessment Criteria

| Assessment Criteria* | Definition ¹ |
|----------------------|---|
| Excellent | Represents a tree in near perfect form, health, and vigour. This tree would exhibit no deadwood, no decline, and no visible defects. |
| Good | Represents a tree ranging from a generally healthy tree to a near perfect tree in terms of health, vigour and structure. This tree exhibits a complete, balanced crown structure with little to no deadwood and minimal defects as well as a properly formed root flare. |
| Fair | Represents a tree with minor health, balance or structural issues with minimal to moderate deadwood. Branching structure shows signs of included bark or minor rot within the branch connections or trunk wood. The root flare shows minimal signs of mechanical injury, decay, poor callusing, or girdling roots. Trees in the category require minor remedial actions to improve the vigour and structure of the tree. |
| Poor | Represents a tree that exhibits a poor vigour, reduced crown size (<30% of crown typical of species caused by overcrowding or decline), extreme crown unbalance, or extensive rot in the branching and trunk wood. Fungus could be seen from these rotting areas, suggesting further decay. These trees have extensive crown die back with a large amount of deadwood, and possibly dead sections. These weakened areas can lead to a potential failure of tree sections. Rooting zones show signs of extensive root decay or damage (fruiting bodies or mechanical damage) or girdling roots. Trees in this category require more extensive actions to prevent failure. A tree identified as poor would be a candidate for removal in the near future. |
| Very Poor | Represents a tree that exhibits major health and structural defects. Quite often the defects or diseases affecting this tree will be fatal. Large quantities of fungus, large dead sections with possible cavities and bark falling off all are signs that a tree is in a major state of decline and would be identified as very poor. These trees have a probable or imminent potential for structural failure. These trees should be identified for removal. |
| Dead | Represents a tree that exhibits no sign of new growth, including buds, foliage, or shoot growth. These trees have a probable or imminent potential for structural failure. These trees should be identified for removal. |

¹Dunster 2009

Tree Risk Assessment Criteria

| Assessment Criteria* | Definition ² |
|--|---|
| Improbable | The tree or branch is not likely to fail during normal weather conditions and may not fail in many severe weather conditions within the specified time frame. |
| Possible | Failure could occur, but it is unlikely during normal weather conditions within the specified time frame. |
| Probable | Failure may be expected under normal weather conditions within the specified time frame. |
| Imminent | Failure has started or is most likely to occur in the near future, even if there is no significant wind or increased load. This is a rare occurrence for a risk assessor to encounter, and it may require immediate action to protect people from harm. |
| *A specified time frame of 2 years will be used when assessing potential for structural failure. | |

²Dunster et al. 2013

Appendix III
Conditions of Assessment

Conditions of Tree Assessment

Limitations

This tree inventory and assessment is based on the circumstances and observations by Natural Resource Solutions Inc. (NRSI) as they existed at the time of the site inspection(s) of the study area as described in this report (the "Property") and the trees situated thereon, and upon information provided by the Client to NRSI. The opinions in this assessment are based on observations made and using professional judgment, however, because trees are living organisms and subject to change, damage and disease, the analysis and recommendations as set out in this assessment are valid for 2 years from the date any such observations and assessment took place. As a result, the Client shall not rely upon this assessment, save and except for representing the circumstances and observations at the date of site inspection(s), and the analysis and recommendations made in relation to the proposed undertaking. It is recommended that the inventoried trees discussed in this assessment should be re-assessed periodically, where required (i.e. after 2 years).

Further Services

Neither NRSI, nor any assessor employed or retained by NRSI (the "Assessor") for the purpose of preparing or assisting in the preparation of this assessment shall be required to provide any further consultation or services to the Client including, without limitation, acting as an expert witness or witness in any court in any jurisdiction unless the Client has first made specific arrangements with respect to such further services, including providing payment of the Assessor's regular hourly billing fees.

NRSI accepts no responsibility for the implementation of all or any part of this report, unless specifically requested to examine the implementation of such activities recommended herein. Any request for the inspection or supervision of all or part of the implementation shall be made in writing and the details agreed to in writing by both parties.

Assumptions

The Client is hereby notified that where any of the information set out and referenced in this assessment are based on assumptions, facts or information provided to NRSI, NRSI

will in no way be responsible for the veracity or accuracy of any such information. Further, the Client acknowledges and agrees that NRSI has, for the purposes of preparing their assessment, assumed that the Property is in full compliance with all applicable federal, provincial, municipal and local statutes, regulations, by-laws, guidelines and other related laws. NRSI explicitly denies any legal liability for any and all issues with respect to non-compliance with any of the above-referenced statutes, regulations, by-laws, guidelines and laws as it may pertain to or affect the Property.

Restriction of Assessment

The assessment carried out was restricted to the Property as described in this report. No assessment of any other trees has been undertaken by NRSI. NRSI is not legally liable for any other trees except those expressly discussed herein. The conclusions of this assessment do not apply to any areas, trees, or any other property not covered or referenced in this assessment.

Professional Responsibility

In carrying out this assessment, NRSI and any Assessor appointed for and on behalf of NRSI to perform and carry out the assessment has exercised a reasonable standard of care, skill and diligence. The assessment has been made using accepted arboricultural techniques. These include a visual examination of each tree for structural defects, scars, external indications of decay such as fungal fruiting bodies, evidence of insect attack, discolored foliage (during the leaf-on period), the condition of any visible root structures, the degree and direction of lean (if any), the general condition of the tree(s) and the surrounding site, and the current or planned proximity of property and people. Except where specifically noted in the assessment, none of the trees examined on the property were dissected, cored, probed, or climbed, and detailed root crown examinations involving excavation were not undertaken.

No guarantees are offered, or implied, that trees recommended for retention, or all parts of them, will remain standing. It is professionally impossible to predict with absolute certainty the behaviour of any single tree or group of trees, or all their component parts, in all given circumstances. Inevitably, a standing tree will always pose some risk. Most trees have the potential to fall, lean, or otherwise pose a danger to property and persons

in the event of extreme weather conditions, and this risk can only be eliminated if the tree is removed.

Without limiting the foregoing, no liability is assumed by NRSI or its directors, officers, employers, contractors, agents or Assessors for:

- a) any legal description provided with respect to the Property;
- b) issues of title and/or ownership with respect to the Property;
- c) the accuracy of the Property line locations or boundaries with respect to the Property; and
- d) the accuracy of any other information provided to NRSI by the Client or third parties;
- e) any consequential loss, injury or damages suffered by the Client or any third parties, including but not limited to replacement costs, loss of use, earnings and business interruption; and
- f) the unauthorized distribution of the assessment.

Third Party Liability

This assessment was prepared by NRSI for the Client. The data collected reflect NRSI's best assessment of the inventoried trees situated on the Property with the information available at the time of observation. Data analysis and the assessment of potential impacts to inventoried trees is specific to the proposed undertaking as described in this report. NRSI accepts no responsibility for any damages or loss suffered by any third party or by the Client as a result of decisions made or actions based upon the use of this assessment for purposes unrelated to the proposed undertaking.

General

Any plans and/or illustrations in this assessment are included only to help the Client visualize the issues in this assessment and shall not be relied upon for any other purpose.

This report shall be considered as a whole, no sections are severable, and the assessment shall be considered incomplete if any pages are missing.

**Appendix IV
Tree Data Summary Tables**

Summary of Inventoried Trees

| Common Name | Scientific Name | Excellent | Good | Fair | Poor | Very Poor | Dead | Total |
|---------------------------|---|-----------|-----------|------------|-----------|-----------|-----------|------------|
| Native Species | | | | | | | | |
| American Basswood | <i>Tilia americana</i> | 1 | 6 | | | | | 7 |
| Balsam Poplar | <i>Populus balsamifera</i> | | 2 | 2 | | | 1 | 5 |
| Eastern Cottonwood | <i>Populus deltoides</i> | | 2 | | 1 | | | 3 |
| Green Ash | <i>Fraxinus pennsylvanica</i> | | | 1 | 3 | 20 | 20 | 44 |
| Manitoba Maple | <i>Acer negundo</i> | | 6 | 61 | 19 | 2 | 6 | 94 |
| Sugar Maple | <i>Acer saccharum</i> ssp. <i>saccharum</i> | | | 1 | | | | 1 |
| White Elm | <i>Ulmus americana</i> | | | | | 1 | | 1 |
| White Oak | <i>Quercus alba</i> | | | 2 | 1 | | | 3 |
| Total | | 1 | 16 | 67 | 24 | 23 | 27 | 158 |
| Non-Native Species | | | | | | | | |
| Austrian Pine | <i>Pinus nigra</i> | | | 2 | | | | 2 |
| Black Locust | <i>Robinia pseudoacacia</i> | | 2 | 5 | | | | 7 |
| Common Apple | <i>Malus domestica</i> | | | 4 | | | 1 | 5 |
| Common Pear | <i>Pyrus communis</i> | | | 1 | | | | 1 |
| Crack Willow | <i>Salix fragilis</i> | | 1 | 5 | | 1 | | 7 |
| English Hawthorn | <i>Crataegus monogyna</i> | | 2 | 2 | | | | 4 |
| European Ash | <i>Fraxinus excelsior</i> | | 6 | 16 | 3 | 1 | 1 | 27 |
| European Mountain-Ash | <i>Sorbus aucuparia</i> | | 1 | | | | | 1 |
| Japanese Silk Lilac | <i>Syringa reticulata</i> | | 3 | 1 | | | | 4 |
| Norway Maple | <i>Acer platanoides</i> | 1 | 14 | 10 | 2 | | | 27 |
| Siberian Elm | <i>Ulmus pumila</i> | | | 9 | | | | 9 |
| Small Leaf Linden | <i>Tilia cordata</i> | | 3 | 14 | 1 | | 1 | 19 |
| Sweet Cherry | <i>Prunus avium</i> | | 1 | | | | | 1 |
| Total | | 1 | 33 | 69 | 6 | 2 | 3 | 114 |
| Unknown | | | | | | | | |
| Willow species | <i>Salix</i> sp. | | 1 | 1 | | | | 2 |
| Total | | 0 | 1 | 1 | 0 | 0 | 0 | 2 |
| Overall Total | | 2 | 50 | 137 | 30 | 25 | 30 | 274 |

Overall Health of Trees Inventoried

| Potential for Structural Failure Rating | Overall Condition | | | | | | Total |
|---|-------------------|-----------|------------|-----------|-----------|-----------|------------|
| | Excellent | Good | Fair | Poor | Very Poor | Dead | |
| Improbable | 2 | 47 | 71 | 2 | | | 122 |
| Possible | | 3 | 66 | 28 | 17 | 19 | 133 |
| Probable | | | | | 8 | 11 | 19 |
| Imminent | | | | | | | 0 |
| Total | 2 | 50 | 137 | 30 | 25 | 30 | 274 |

Appendix IV
Preferred Alternative Draft Plan and Cross Section



CLARK BLVD EA DRAFT PLAN LAYOUT

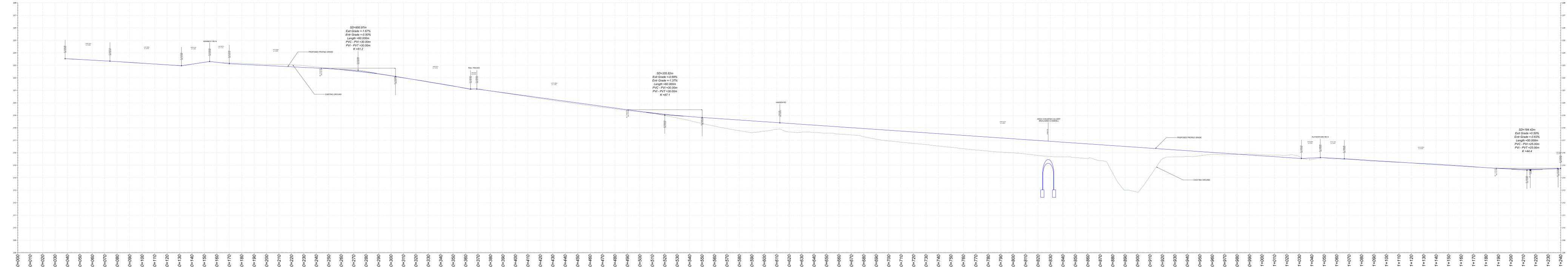
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| 2 | SEP 16, 2014 | ISSUED FOR PERMIT |
| 3 | SEP 16, 2014 | ISSUED FOR PERMIT |
| 4 | SEP 16, 2014 | ISSUED FOR PERMIT |
| 5 | SEP 16, 2014 | ISSUED FOR PERMIT |
| 6 | SEP 16, 2014 | ISSUED FOR PERMIT |
| 7 | SEP 16, 2014 | ISSUED FOR PERMIT |
| 8 | SEP 16, 2014 | ISSUED FOR PERMIT |
| 9 | SEP 16, 2014 | ISSUED FOR PERMIT |
| 10 | SEP 16, 2014 | ISSUED FOR PERMIT |




PLAN
 STA 0+000 - 1+240




CLARK AVENUE CL



| NO. | DATE | BY | CHKD. | DESCRIPTION |
|-----|------------|-----|-------|-------------|
| 1 | 03/11/2024 | ... | ... | ... |
| 2 | 03/11/2024 | ... | ... | ... |
| 3 | 03/11/2024 | ... | ... | ... |
| 4 | 03/11/2024 | ... | ... | ... |
| 5 | 03/11/2024 | ... | ... | ... |

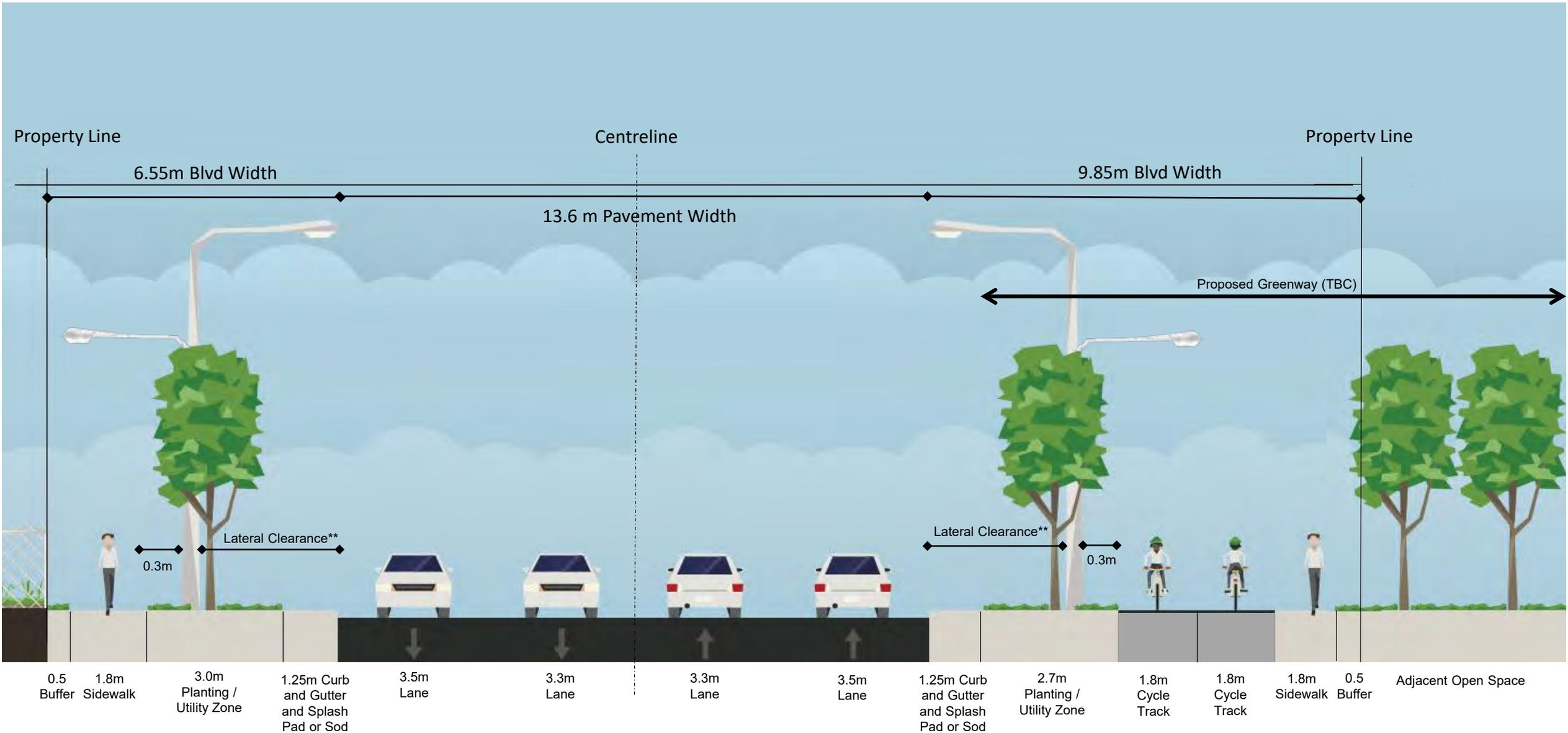
HR
Public Works & Engineering
Capital Works

PROFILE
 STA 0+000 - 1+240

CLARK BLVD EA
 STA 0+000 - 1+240
 SCALE: 1:1000
 SHEET NO. 2

Cycling facilities on north side and sidewalk on south side (Ver. 1)

ROW – 30m



**Lateral clearance from face of curb to face of pole (0.6m dia): ~ 3.15m on the south side and ~2.85m on the north side