

# NATURAL HERITAGE REPORT

## BEACH BOULEVARD COMMUNITY STORMWATER PONDING STUDY MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

prepared for:



prepared by:



DECEMBER 2022



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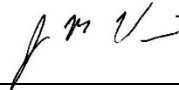
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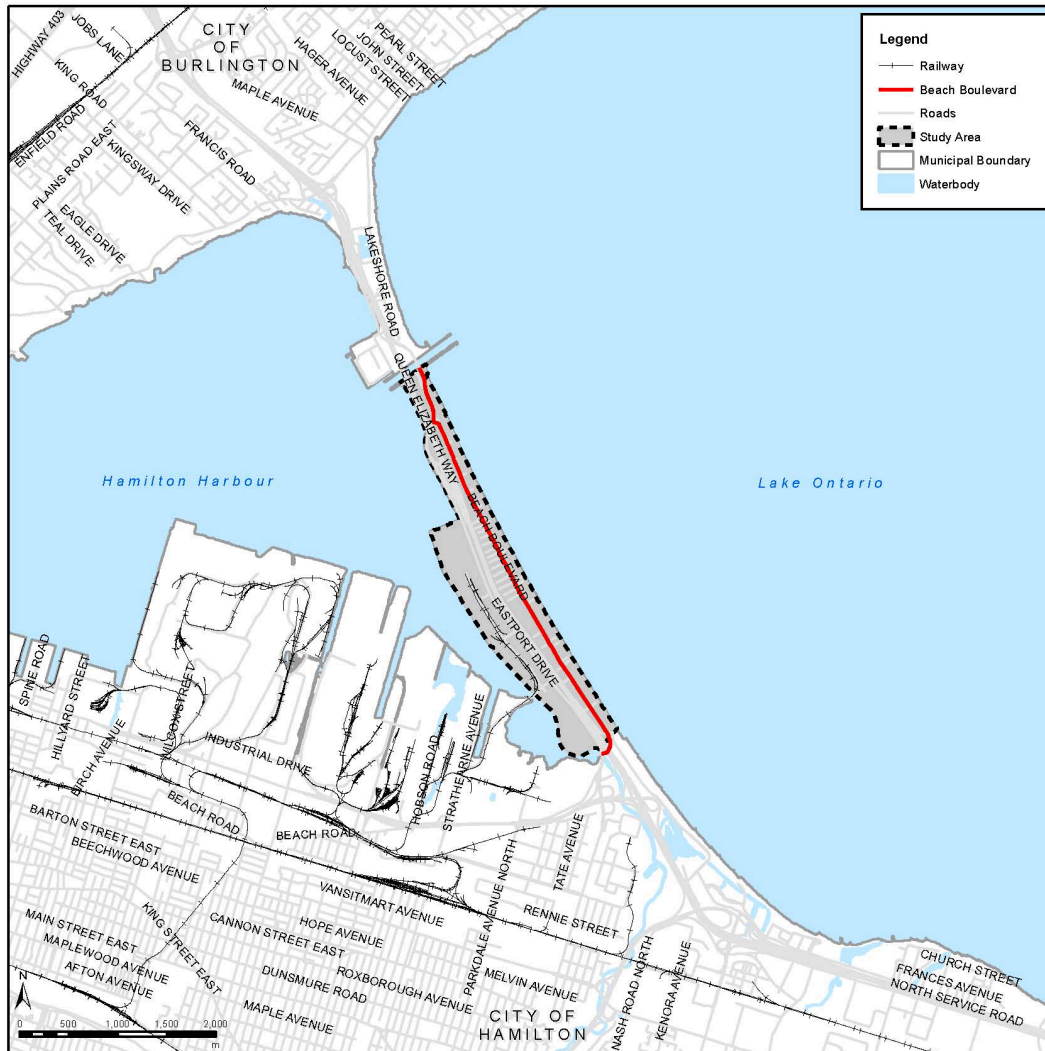
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## 1.0 INTRODUCTION

LGL Limited was retained by IBI Group to conduct a natural heritage investigation in support of a flood remediation Master Plan (Phases 1 and 2 Municipal Class EA) for the Beach Boulevard Community in the City of Hamilton. The study area includes Hamilton Beach from the Burlington Bay Canal to Nikola Tesla Boulevard. The study will recommend flood remediation measures, which may include but are not limited to new pumping stations, conveyance systems and outlet locations, designed to alleviate chronic surface and sub-surface flooding in this beachfront community.

## 2.0 STUDY AREA

The general study area is presented in **Figure 1**.



**FIGURE 1. STUDY AREA**

## **3.0 EXISTING CONDITIONS**

This section describes the existing conditions in the study area related to natural heritage, including physiography, bedrock and surficial geology and soils; fish and fish habitat; vegetation and vegetation communities; wildlife and wildlife habitat; and, designated natural areas.

### **3.1 Physiography, Bedrock and Surficial Geology and Soils**

#### **3.1.1 Purpose**

A secondary source investigation was undertaken to identify physiography, bedrock and surficial geology and soils within the study area.

#### **3.1.2 Data Sources**

Information regarding physiography, bedrock and surficial geology and soils within the study area was obtained through:

- Chapman, L.J. and D.F. Putnam. 1984. *The Physiography of Southern Ontario*. Published for the Ontario Geological Survey Special Volume 2
- Barnett, P.J., Cowan, W.R. and Henry, A.P. 1991. *Quaternary geology of Ontario, southern sheet*; Ontario Geological Survey, Map 2556, scale 1:1 000 000.

Ontario Geological Survey 1991. *Bedrock geology of Ontario, southern sheet*; Ontario Geological Survey, Map 2544, scale 1: 1 000 000.

Karrow, P.F. 1987. *Quaternary Geology of the Hamilton–Cambridge area, southern Ontario*; Ontario Geological Survey, Report 255.

#### **3.1.3 Findings**

The site is located within the Iroquois sand plain physiographic region (Chapman and Putnam 1984). The Iroquois sand plain was flooded by glacial Lake Iroquois and is comprised mostly of permeable sand deposits. Bedrock consists of the Queenston Formation, which is Upper Ordovician in age, and comprised of shale, limestone, dolostone and siltstone (Ontario Geological Survey 1991). Quaternary geology consists of recent Lake Ontario deposits of stratified sands and gravel, known locally as the Burlington Bar (Karrow 1987). The study area is mostly level and slightly above lake levels in Lake Ontario and Hamilton Harbour.

## **3.2 Aquatic Habitats and Communities**

### **3.2.1 Purpose**

A secondary source investigation and field surveys were carried out to characterize fisheries and aquatic ecosystems within the study area.

### **3.2.2 Data Sources**

LGL conducted a secondary source review to identify the fish community within each water feature located within the Beach Boulevard Flood Remediation study area. The secondary source review included a species at risk screening through the Department of Fisheries and Oceans Canada (DFO) Aquatic Species at Risk Mapping, as well as the 'Make a Map' feature of the Natural Heritage Information Centre (NHIC) of the Ministry of Northern Development, Mines, Natural Resources and Forestry (MNDMNR) website. An initial data request was sent to Hamilton Conservation Authority (HCA) on April 27, 2021, followed by subsequent data requests on June 2, 2021 and June 24, 2021 to obtain fisheries community information and watershed/subwatershed studies. Correspondence with HCA indicated that no information pertaining to fish or fish habitat was available. Additionally, LGL reviewed several reports related to fish habitat and communities including:

- City of Hamilton Beach Boulevard Community Stormwater Ponding Study (Dillon Consulting 2019);
- Queen Elizabeth Way – Burlington Skyway Bridge to Burlington Street Existing Conditions Drainage Investigation and Preliminary Design of Flood Protection For Beach Boulevard Community (MRC 2008);
- Master Drainage Plan Hamilton Beach (Marshall Macklin Monaghan 1999);
- Lake Ontario – St. Lawrence River Plan 2014 (International Joint Commission 2014);
- Summary of 2017 Great Lakes Basin Conditions and Water Level Impacts to Support Ongoing Regulation Plan Evaluation (Great Lakes – St. Lawrence River Adaptive Management (GLAM) Committee 2018);
- Greenhill, Hannon, Upper Davis and Upper Ottawa Creeks Stewardship Action Plan (Hamilton Conservation Authority 2013); and,
- Hamilton Harbour and Watershed Fisheries Management Plan (Ontario Ministry of Natural Resources and Royal Botanical Gardens 2010).

LGL fisheries specialists conducted a fish habitat assessment at each of the three Eastport Ditches, Red Hill Creek, Hamilton Harbour, Burlington Canal, and along the Lake Ontario shoreline on April 7, 2021 and November 9, 2021 to observe and document existing aquatic habitat conditions. Fish community sampling was also carried out along several reaches of the Eastport Ditch. It should be noted that the habitats

associated with Red Hill Creek, Hamilton Harbour, Burlington Canal and the Lake Ontario shoreline form the perimeter of the study area and are parts of relatively large bodies of water when compared with the Eastport Ditches. The weather conditions during the April 7, 2021 site visit were sunny and 10°C, with winds at 9 km/h from the southeast. The weather conditions during the November 9, 2021 site visit were sunny and 1°C, with winds at 9 km/h from the northeast. The fish habitat was assessed within the entirety of the Eastport Ditches and visually from the shorelines in the perimeter habitats, where access was permitted. Physical habitat features were surveyed in sufficient detail to enable mapping and identification of key habitat types. The physical habitat attributes assessed included: (a) instream cover, (b) bank stability, (c) substrate characteristics, (d) stream dimensions, (e) barriers, (f) stream morphology, (g) terrain characteristics, (h) stream canopy cover, (i) stream gradient, (j) aquatic vegetation, (k) ground water seepage areas, and (l) general comments. **Figure 2** presents the location of the watercourse features identified within this section of the study area. An aquatic habitat summary is presented below which describes existing conditions at each of the watercourse features. Representative photographs of the crossings were also taken during investigations and are provided in **Appendix A**.

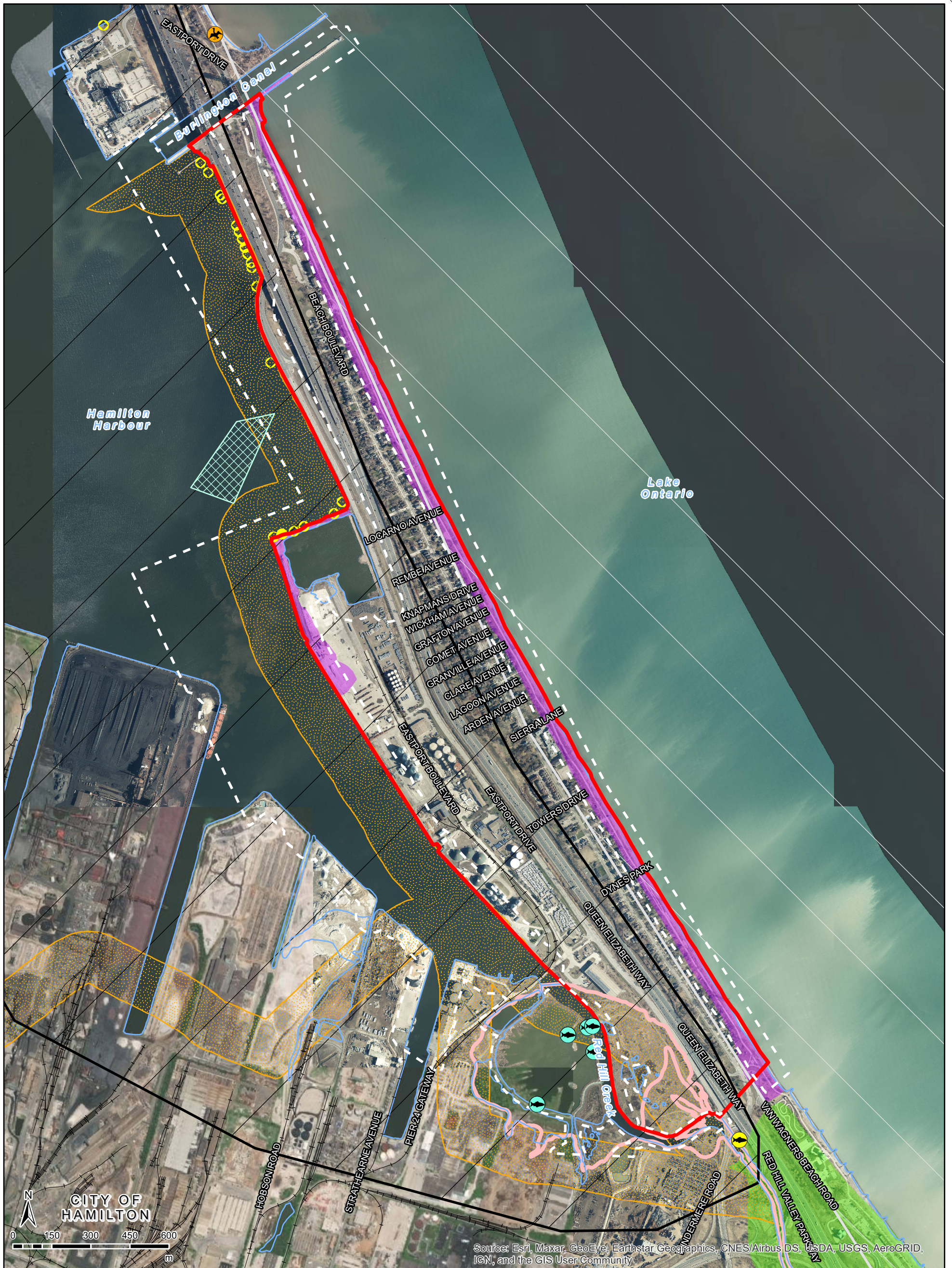
### 3.2.3 Watershed Characteristics

The study area lies within three watersheds; Urban Hamilton Core Watershed, Urban Hamilton Beach Strip Watershed, and the Red Hill Creek Watershed. Each of these watersheds, both portions within and adjacent to the study area, are under the jurisdiction of the Hamilton Conservation Authority (HCA) and the Ministry of Natural Resources and Forestry (MNDMNR) Guelph District.

#### **Urban Hamilton Core Watershed**
















The Urban Hamilton Core Watershed encompasses the City of Hamilton's downtown core, waterfront properties and Port of Hamilton Lands, including the Hamilton Harbour. The majority of this watershed is residential, with significant industrial and commercial land uses. All municipal services within this watershed drain into the Hamilton Harbour. Water levels within the Hamilton Harbour affect shoreline habitats including that of wetlands. Water quality within the Hamilton Harbour has been degraded due to industrial practices, industrial and sewage discharge, contaminated materials and dredging (Hamilton-Halton Source Protection Committee 2017). Several Walleye (*Sander vitreus*) spawning areas have been identified within the Hamilton Harbour by the MNDMNR (2022). Due to its diversity of habitats, the Hamilton Harbour originally contained coolwater, coldwater, and warmwater fish species, however, although it contains an abundance of species, Brown Bullhead (*Ameiurus nebulosus*) and White Perch (*Morone americana*) are among the dominant species as they are tolerant of high turbidity (Bowlby *et. al.* 2010).





### NATURAL HERITAGE

#### LEGEND

 ARA Survey Location (GU-7012-RED) (Red Hill Creek)	 Watercourse - Warm Thermal Regime	 Waterfowl Winter Concentration Area
 ARA Survey Location (GU-7013-RED) (Windermere Basin)	 Waterbody - Unknown Thermal Regime	 Important Bird Area (West End of Lake Ontario)
 Double-crested Cormorant ( <i>Phalacrocorax auritus</i> ) Nesting Site/Colony	 Beach Boulevard Study Area	 Important Bird Area (Hamilton Harbour Waterbird Colonies)
 Walleye ( <i>Sander vitreus</i> ) Spawning Area	 Regulation Limit (HCA)	 Environmentally Significant Area (Hamilton Beach Strip) (City of Hamilton)
 Railway	 Deepwater Sculpin ( <i>Myoxocephalus thompsonii</i> ) Distribution (DFO)	 Environmentally Significant Area (Van Wagner's Ponds and Marshes) (City of Hamilton)



<b>Project:</b> TA9030	<b>Figure:</b> 2
<b>Date:</b> March, 2022	<b>Prepared By:</b> JJP
<b>Scale:</b> 1 : 14,000	<b>Checked By:</b> GNK

## Urban Hamilton Beach Strip Watershed

The Urban Hamilton Beach Strip Watershed is located entirely along the spit of land that separates Lake Ontario from Hamilton Harbour. This sand bar extends to the Burlington Canal. Land use within this watershed is mostly comprised of residential and commercial zones, with some natural areas along the shoreline. All drainage flows to either Hamilton Harbour or Lake Ontario.

## Red Hill Creek Watershed

The Red Hill Creek Watershed is comprised of eight subwatersheds within the City of Hamilton, and covers approximately 68 km<sup>2</sup> (Hamilton Conservation Authority 2013). The watershed contains significant natural features including the Niagara Escarpment, Eramosa Karst/Escarpment, Felker's Falls Escarpment Valley and Red Hill Creek Escarpment Valley, and also contains valleylands, meadows and successional habitats (Hamilton Conservation Authority 2013). As a result of residential, commercial, and industrial development, this watershed is highly urbanized with many of its watercourses subjected to realignment, channelization, increased surface flows from stormwater runoff, and reduced groundwater flows, all of which have contributed to reduced water quality and thermal degradation (Bowlby *et al.* 2010). Channel erosion and changes in stream dimensions are noted throughout the watershed because of altered drainage and increased flows from urban sewer systems during high flow and storm events (Bowlby, McCormack and Heaton 2010). Red Hill Creek discharges into Hamilton Harbour through the highly industrialized Windermere Basin (Bowlby *et al.* 2010). The majority of stream reaches within the headwaters of the Red Hill Creek are small, coldwater riverine habitat. As the watercourse proceeds downstream below the Niagara Escarpment towards the Windermere Basin, thermal degradation occurs due to urbanization and low groundwater contribution to base flow, resulting in an intermediate warmwater riverine zone. Brook Stickleback (*Culaea inconstans*) followed by Northern Redbelly Dace (*Chrosomus eos*) make up the majority of the fish community in coldwater zones above the escarpment while Blacknose Dace (*Rhinichthys atratulus*) followed by Longnose Dace (*Rhinichthys cataractae*) are the most common members of the fish community in coldwater zones below the escarpment (Bowlby *et al.* 2010). The fish community within the intermediate warmwater zone is dominated by Fathead Minnow (*Pimephales promelas*) (Bowlby *et al.* 2010). Although spawning migrations of Atlantic Salmon (*Salmo salar*) were historically observed in Red Hill Creek, the lack of groundwater contribution and varying thermal regimes within the watershed do not currently provide ideal spawning habitat for salmonids (Bowlby *et al.* 2010). In efforts to enhance all the water bodies within the Hamilton Harbour watershed, the Hamilton Harbour and Watershed Fisheries Management Plan (HHWFMP) was created to improve aquatic community, aquatic habitat and planning within each watershed.

### 3.2.4 Findings

#### **Beach Boulevard Drainage Systems**

There are two drainage networks within the Beach Boulevard Community that operate independently of one another to convey storm water into either Hamilton Harbour or the Eastport Ditch. The Beach Boulevard Community is comprised of 17 residential streets that run westerly between Beach Boulevard and the QEW right-of-way. Stormwater runoff from the west ends of these streets is collected by municipal infrastructure or ditches and is conveyed beneath the QEW right-of-way, where it is intercepted by surface runoff from the QEW right-of-way. All Beach Boulevard Community drainage and QEW drainage contributed into the drainage network between Dunraven Avenue and Wickham Drive is directed into Hamilton Harbour by a large diameter storm sewer (MRC 2008). Alternatively, Beach Boulevard Community drainage and QEW drainage contributed into the drainage network between Wickham Drive and Kirk Avenue are directed into the Eastport Ditch and conveyed into Red Hill Creek (MRC 2008). A well-vegetated 2 m deep, flat-bottomed ditch was created along Eastport Drive (Eastport Ditch) and the QEW with significant depth and cross-sectional area to compensate for the extremely flat longitudinal gradient (MRC 2008). The Eastport Ditch water levels are coincident with the water levels within the Hamilton Harbour, and the groundwater levels within the Beach Strip which likely contributes to flooding (MRC 2008). Additionally, field investigations conducted by MRC (2008) during the winter of 2005 were not able to identify several pipe outlets into the Eastport Ditch and noted that they were likely covered beneath sediment or covered by dense, overgrown vegetation.

#### **Eastport Ditch 1**

Eastport Ditch 1 is located along the west side of Eastport Drive approximately 295 m south of the Windermere Basin Park entrance. This ditch was created in the late 1990s to redirect drainage from Windermere Basin into the Red Hill Creek (MRC 2008). To facilitate this, a berm with a series of sewers underneath was constructed to transport storm water from Eastport Ditch 2 upstream, towards Eastport Ditch 1. These sewers collect surface runoff from the QEW right-of-way and municipal storm water infrastructure which outlet into a large 1400 mm Corrugated Steel Pipe (CSP) sewer, and eventually into Eastport Ditch 1 (MRC 2008).

Flow enters the Eastport Ditch 1 via a CSP reinforced with rip rap. The culvert was wet with standing water during the April 7, 2021 site visit and a small pool approximately 0.5 m wide and 5 cm deep was observed at the downstream end of the CSP. This ditch is approximately 143 m long, confined by its steep banks approximately 2 m in height and is trapezoidal/U-shaped with a flat bottom (approximately 1 m to 1.2 m wide). The lower banks are reinforced with rip rap while the upper portions are well vegetated with deciduous trees, shrubs and grasses. For the first 10 m downstream of the CSP, very low flow was observed as the channel consisted mostly of rip rap, large boulders,

riparian grasses, and debris. Overhanging deciduous trees are also present. Approximately 10 m further downstream, the channel becomes wetted with dimensions of 0.5 m wide and 1 cm deep, however, rip rap along the banks had dried algae indicative of recent higher flows. Substrates consist of silt, gravel and muck while instream cover consists of sparse algae and some large woody debris (LWD). During the November 9, 2021, site visit, instream cover consisted of Duckweed (*Lemna minor*) and deciduous overhanging shrubs. Further downstream for approximately 40 m, the wetted dimensions increase to 1 m in width and range between 5 cm to 10 cm in depth, with approximately 20 cm to 25 cm of detritus and muck atop rip rap. Although severely corroded, a CSP culvert is present which appeared to be functional as it was wet during the April 7, 2021, site visit. Further downstream, and for the remainder of the downstream portion of the ditch, the channel deepened to 30 cm, with approximately 50 cm of detritus and muck overlying the bottom of the ditch. This drainage feature exhibits a straight planform with a morphology dominated by one long run. It has a very low gradient with nearly stagnant flows throughout the entirety of the ditch and, as a result, it appears that the water level, at least in the downstream half of the ditch, is dependent upon the water level in Red Hill Creek. A 1600 mm diameter culvert (MRC 2008) reinforced with rip rap is present at the downstream end of the ditch and conveys flow into Red Hill Creek. Leeches and a school of Fathead Minnow were observed in this drainage feature on April 7, 2021.

This drainage feature is permanent and constitutes direct fish habitat, as a result of its connectivity to Red Hill Creek. Although the thermal regime of this drainage ditch has not been evaluated by MNRF, it is identified as warmwater based on its fish community and direct connectivity to Red Hill Creek. In addition to historic fish data provided by MNRF (LIO), fish sampling conducted by LGL on November 9, 2021, identified two warmwater species, Fathead Minnow and Goldfish (*Carassius auratus*) utilizing this drainage ditch. LGL also identified White Sucker (*Catostomus commersonii*) within the drainage ditch during this sampling event. No species at risk are present within the study area; however, one provincially tracked species, American Eel (*Anguilla rostrata*), is identified as having the potential to be found within the study area through the Natural Heritage Information Center (NHIC) managed by MNDMNRF.

## **Eastport Ditch 2**

Located on the east side of Eastport Drive and situated adjacent to the QEW right-of-way, Eastport Ditch 2 flows in a southerly direction along Eastport Drive. Originally, water from this ditch outleted into the Windermere Basin; however, in the late 1990's fill was placed to create a berm separating Eastport Drive and the industrial development and facilitated the placement of a large diameter sewer along the west side of Eastport Drive (MRC 2008). This sewer is a 1400 mm diameter CSP that is approximately 520 m long with several pipes from the Beach Boulevard community and sewers from the

QEW connecting to it (MRC 2008). The CSP crosses Eastport Drive perpendicularly and outlets into Eastport Ditch 1 on the west side of Eastport Drive, which has been redirected to flow into Red Hill Creek (MRC 2008).

Flow enters Eastport Ditch 2 via a CSP which LGL fisheries specialists were unable to locate during their April 7, 2021, or November 9, 2021 field investigations as it has likely been buried in sediment. It is likely that this pipe outlet has been buried in sediment for nearly 15 years as field investigators from MRC (2008) that conducted field work in the winter of 2005 did not find this pipe outlet and suggested it was likely buried in sediment or dense vegetation. It should be noted that significantly more water was present within Eastport Ditch 2 during the November 2021 site visit than was present in April of the same year. Much of the description below is from the April 7, 2021 site visit.

The ditch displays a straight planform and is confined by its banks, which are 0.5 m in vertical height and lined with rip rap. Wetted dimensions in the upstream portion of the ditch are 3 m wide and range from 10 cm to 15 cm deep; however, it is estimated that 20 cm to 30 cm of muck is present beneath the substrate's surface. As noted by MRC (2008), the Eastport ditches were constructed to be 2 m in depth, therefore, it is likely that 0.5 m to 1 m of muck/sediment has collected below the surface of the water. Other substrates consist of silt, cobble, boulders and detritus. Much refuse was noted within the channel consisting of car tires, couches, a mattress, and other various kinds of litter. Riparian vegetation consists of deciduous trees, shrubs and grasses. Numerous dead Common Carp (*Cyprinus carpio*) were observed within the upstream portion of the channel during the April 2021 site visit. Two gated perched concrete culverts with aprons are located approximately 90 m downstream, which contribute flow to the channel (although dry during the April 7, 2021 site visit, but wet during the November 9, 2021 site visit). The bottom of the channel and both banks have been reinforced with cabled concrete blocks for 4 m upstream and 20 m downstream of the perched culverts. A small CSP is located within the concrete of the upstream right bank that also contributes flow. As the reinforced banks end, the channel banks and substrates return to their more naturalized state, with vegetated banks, dry and mucky conditions, and no apparent flow, although evidence of recent wet conditions was present in April 2021 (there were no dry areas in the ditch in November 2021). Two CSP culverts filled with muck are observed within the dry portion of ditch (April 2021). The channel continues to remain dry for approximately 200 m downstream with several stagnant pools ranging from 1 m and 3 m wide, 5 m to 15 m long and 5 cm to 10 cm deep dispersed throughout. A small patch of *Phragmites* is present further downstream spanning the width of the channel, restricting flow to a width of 0.1 m wide and depth of 1 cm for approximately 20 m. As the channel opens again, it widens to 3.5 m, with depths ranging between 35 cm and 50 cm. A narrow thalweg is apparent in the center of the ditch however, as it flows downstream, it becomes oriented close to the downstream

right bank. The banks vary in height between 0.5 m to 1 m and are lined with rip rap. Riparian vegetation consists of cattails, *Phragmites*, grasses, trees and shrubs. Substrates are similar to that within the upstream portion of channel, including silt, muck, and debris. Several schools of Goldfish were observed. Further downstream the channel alternates between dense patches of *Phragmites* with little to no flow, and wet conditions (wetted dimensions ranging between 2.5 m to 3 m wide and between 10 cm and 20 cm deep) with *Phragmites* localized to the outer edges of the ditch. These areas contained very turbid water with debris and ample algae growth. These habitat characteristics occur for approximately 200 m further downstream, before a pool (1.5 m wide, 10 m long and 10 cm in depth with approximately 20 cm of detritus below the surface) is present. Immediately downstream, a dense stand of cattails occupies the width of the ditch and restricts flow. A dry, narrow channel (0.8 m wide) emerges from the cattails and continues for approximately 10 m before it slightly meanders to the west, reaching the downstream CSP of Eastport Ditch 2. At this CSP, the ditch becomes piped and continues southerly along Eastport Drive and flows discharge into Eastport Ditch 1.

This drainage feature is permanent and provides direct fish habitat. Although it is piped at the upstream and downstream ends, the presence of fish within the features indicates that one or both pipes do not form a barrier to fish passage, which likely can occur during high flow conditions and/or flooding events. During the November 9, 2021, field investigations, three fish species were captured during sampling: Green Sunfish (*Lepomis cyanellus*), Fathead Minnow and Common Carp. The fish assemblage present suggests this drainage feature supports a warmwater thermal regime. No species at risk are present within the study area; however, one provincially tracked species, American Eel, is identified as having the potential to be found within the study area through the Natural Heritage Information Center (NHIC) managed by MNRF.

### **Eastport Ditch 3**

This drainage feature is located along the west side of Eastport Drive, situated between Eastport Drive and the Hamilton Harbour basin. Flow is contributed to Eastport Ditch 3 via a 600 mm CSP (MRC 2008) on the upstream right bank, however, LGL could not locate this outfall during either April 7, 2021 or November 9, 2021 field investigations. Flows in and out of this ditch are unknown as its connectivity to surrounding water (Eastport Ditch 2, storm water system, Tollgate Ponds, Hamilton Harbour), if any, are not visible. The ditch has a wetted width of 5 m and depth of approximately 2 m. It is confined within steeply sloped banks; the upstream left bank is an earth berm which contains the holding pond (Tollgate Ponds) and is approximately 5 m high while the upstream right bank is approximately 2 m high and entirely rip-rap. Substrates, where visible, consist of silt, muck and debris. The ditch is straight, and morphology consists of one long pool as flow is stagnant. Eastport Ditch 3 is divided by berm comprised of fill

located approximately 285 m downstream a berm vegetated with deciduous shrubs. Eastport Ditch 3 continues downstream for another 120 m. This area was dry during the April 7, 2021 visit with patches of substrate and algae growth present indicating recent water presence. During the November 9, 2021 site visit, this portion of Eastport Ditch 3 was wet and densely vegetated with Duckweed. Riparian vegetation consisting of *Phragmites*, grasses, and deciduous trees and shrubs were also observed. This area contained a large amount of garbage and debris as well.

This drainage feature is permanent and likely constitutes indirect fish habitat. This drainage feature provides poor quality fish habitat; however, given its proximity to Hamilton Harbour, fish may access this drainage feature via culvert access or during flooding events. No thermal regime has been prescribed by the MRNF; however, given the little influx of flow, it is likely warmwater. No fish community records have been identified for this drainage feature, nor were any fish observed or captured during LGL field investigations, as site conditions did not provide a safe working environment for fish sampling. No species at risk are present within the study area, however, one provincially tracked species, American Eel, is identified as having the potential to be found within the study area through the Natural Heritage Information Center (NHIC) managed by MNR.

### **Red Hill Creek**

An approximately 1 km reach of Red Hill Creek forms the perimeter of the southwest portion of the study area and it is the watercourse into which water from Eastport Ditches 1 and 2 flow. This portion of Red Hill Creek comprises the last reach of the watercourse before it discharges into Hamilton Harbour just outside of the study area. The 1 km reach is bounded by the Eastport Drive crossing/Beach Boulevard intersection at the upstream end and the Pier 24/25 Gateway bridge at the downstream end. The north/east shoreline of this reach is located entirely within Windermere Basin Park. The banks are steeply sloped and comprised of rip rap boulders and concrete rubble/debris. Substrates nearshore, where visible, were of the same materials overlaid by silt. Instream cover is provided by substrates and large woody debris. Morphology is flat/run and the water, during the time of the site visits, was moderately turbid. No instream vegetation, submerged or emergent, was observed. The riparian areas of both banks was fairly well vegetated with grasses, shrubs and trees which grew almost down to the water's edge, depending on bank slope heights. The vegetation in Windermere Basin Park consists mainly of open meadow with scattered deciduous trees. Two species of fish were observed within the watercourse during site investigations: Common Carp and Gizzard Shad (*Dorosoma cepedianum*).

### **Hamilton Harbour**

Hamilton Harbour forms the northeastern boundary of the study area from the Burlington Canal south to the “Tollgate Ponds”, a length of approximately 1.5 km. The shoreline in this section of the harbour is comprised of steep, rock (armourstone, rubble) slopes. This rock protection extends into the lakebed and comprises the nearshore substrates. From Garmin LakeVu data, the bathymetry of the nearshore area is a gradually sloping shallow area (0.3-3.0 m) that extends approximately 120 m into the harbour. West of this shallow area there is a steep drop off that reaches depths of approximately 20 m over a short distance. Although no fish were observed during the site investigations, the Hamilton Harbour shoreline is likely used by a several fish species for a variety of life history functions.

### **Burlington Canal**

The Burlington Canal is a human-made channel that divides the Hamilton Beach area from the Burlington portion of the beach that comprises the northern boundary of the study area. It is approximately 835 m long and 85 m wide. There are no banks as the canal edges are formed by vertical sheet piling walls with groynes that extend approximately 385 m into Lake Ontario and 115 into Hamilton Harbour. South of the harbour groyne there is a boat launch. Bathymetry mapping (Garmin LakeVu) indicated that the canal exhibits a steep drop from the sheet pile wall of approximately 1.5 m to 3.0 m to as deep as 12 m. The canal likely experiences strong wind-driven currents and contains transitional habitats for fish moving between habitats in Lake Ontario and Hamilton Harbour.

### **Lake Ontario Shoreline**

The open shoreline of Lake Ontario forms the eastern boundary of the study area. It is characterized by a riparian area comprised of sand that is between 12 m and 20 m in width. There is a section of armourstone/boulder rock protection at the north end near the Burlington Canal, but most of the substrates in the area are comprised solely of sand. Garmin LakeVu mapping illustrates a gradually sloping bathymetry for approximately 385 m out to a depth of 20 m. Due to the open lake exposure to winds, wave scour, currents and weather-related phenomena (e.g. ice in winter), habitats for fish along the beach are likely limited to fish moving through the area in search of more suitable habitats within Hamilton Harbour or elsewhere along the Lake Ontario shoreline.

A summary of fish habitat conditions found at each watercourse is presented in **Table 1**.



**TABLE 1.  
 EXISTING FISH COMMUNITY AND FISH HABITAT CONDITIONS SUMMARY TABLE**

<b>Watercourse/ Waterbody</b>	<b>Flow*</b>	<b>Thermal Regime</b>	<b>Fish Habitat</b>	<b>Fish Species Present</b>	<b>Substrate Type</b>	<b>Vegetation</b>	<b>Species at Risk/ Critical Habitat Present</b>	<b>In Water Works Timing Window</b>
Eastport Ditch 1	Permanent	Warmwater	Direct	Not provided by HCA (MNRF, 2019) Goldfish, White Sucker, Fathead Minnow (LGL 2021)	Silt, muck, gravel, boulders, detritus	Grasses, cattails ( <i>Typha</i> sp.), Phragmites, Duckweed ( <i>Lemna minor</i> )	American Eel	July 1 – March 31
Eastport Ditch 2	Permanent	Warmwater	Direct	Not provided by HCA (MNRF, 2019) Common Carp, Green Sunfish, Fathead Minnow (LGL 2021)	Silt, muck, gravel, boulders, detritus	Grasses, cattails ( <i>Typha</i> sp.), Phragmites, Duckweed ( <i>Lemna minor</i> )	American Eel	July 1 – March 31
Eastport Ditch 3	Permanent	Warmwater	Indirect	Not provided by HCA Blacknose Dace, Fathead Minnow, Johnny/Tesselated Darter, Longnose Dace, Northern Redbelly Dace, Pumpkinseed, Rainbow Trout, Redside Dace, White Sucker (MNRF, 2019) Not sampled by LGL	Silt, muck, gravel, boulders, detritus	Grasses, cattails ( <i>Typha</i> sp.), Phragmites, Duckweed ( <i>Lemna minor</i> )	American Eel	July 1 – March 31
Red Hill Creek	Permanent	Warmwater	Direct	Not provided by HCA Blacknose Dace, Bluntnose Minnow, Creek Chub, Green Sunfish, Pumpkinseed, White Sucker (MNRF, 2017 (2022) Not sampled by LGL	Silt, gravel, cobble, boulders	Grasses	American Eel	July 1 – March 31
Hamilton Harbour	Permanent	Unknown	Direct	Not provided by HCA Threespine Stickleback, Emerald Shiner, Longnose Dace, Muskellunge, Tesselated Darter, White Sucker, Lake Trout, Common Carp, Spottail Shiner, Round Whitefish, Alewife, Northern Pike, Central Mudminnow, River Chub, Goldfish, Coho Salmon, Central Stoneroller, Rock Bass, Lake Whitefish, Blacknose Dace, Pumpkinseed, Creek Chub, Walleye, Bluegill, Johnny Darter, Mottled Sculpin, Round Goby, White	Boulders	N/A	Deepwater Sculpin, American Eel	June 15 – September 15

**TABLE 1.  
 EXISTING FISH COMMUNITY AND FISH HABITAT CONDITIONS SUMMARY TABLE**

Watercourse/ Waterbody	Flow*	Thermal Regime	Fish Habitat	Fish Species Present	Substrate Type	Vegetation	Species at Risk/ Critical Habitat Present	In Water Works Timing Window
				Bass, White Perch, Bluntnose Minnow, Lake Chub, Gizzard Shad, Smallmouth Bass, Rainbow Smelt, Logperch, Black Crappie, Yellow Perch, Common Shiner, Bowfin, Rainbow Trout, Longnose Sucker, Chinook Salmon, Sea Lamprey, Brook Trout, Brown Bullhead, Shorthead Redhorse, Golden Shiner, Spotfin Shiner, Brown Trout, Fathead Minnow, Longnose Gar, Channel Catfish, Brook Stickleback, Freshwater Drum, Slimy Sculpin, Largemouth Bass, Walleye (MNRF, 2021) Not sampled by LGL				
Burlington Canal	Permanent	Unknown	Direct	Not provided by HCA Threespine Stickleback, Emerald Shiner, Longnose Dace, Muskellunge, Tessellated Darter, White Sucker, Lake Trout, Common Carp, Spottail Shiner, Round Whitefish, Alewife, Northern Pike, Central Mudminnow, River Chub, Goldfish, Coho Salmon, Central Stoneroller, Rock Bass, Lake Whitefish, Blacknose Dace, Pumpkinseed, Creek Chub, Walleye, Bluegill, Johnny Darter, Mottled Sculpin, Round Goby, White Bass, White Perch, Bluntnose Minnow, Lake Chub, Gizzard Shad, Smallmouth Bass, Rainbow Smelt, Logperch, Black Crappie, Yellow Perch, Common Shiner, Bowfin, Rainbow Trout, Longnose Sucker, Chinook Salmon, Sea Lamprey, Brook Trout, Brown Bullhead, Shorthead Redhorse, Golden Shiner, Spotfin Shiner, Brown Trout, Fathead Minnow,	Boulders, unknown	N/A	American Eel	June 15 – September 15

**TABLE 1.  
 EXISTING FISH COMMUNITY AND FISH HABITAT CONDITIONS SUMMARY TABLE**

Watercourse/ Waterbody	Flow*	Thermal Regime	Fish Habitat	Fish Species Present	Substrate Type	Vegetation	Species at Risk/ Critical Habitat Present	In Water Works Timing Window
				Longnose Gar, Channel Catfish, Brook Stickleback, Freshwater Drum, Slimy Sculpin, Largemouth Bass (MNRF, 2021) Not sampled by LGL				
Lake Ontario Shoreline	Permanent	Unknown	Direct	Not provided by HCA Threespine Stickleback, Emerald Shiner, Longnose Dace, Muskellunge, Tessellated Darter, White Sucker, Lake Trout, Common Carp, Spottail Shiner, Round Whitefish, Alewife, Northern Pike, Central Mudminnow, River Chub, Goldfish, Coho Salmon, Central Stoneroller, Rock Bass, Lake Whitefish, Blacknose Dace, Pumpkinseed, Creek Chub, Walleye, Bluegill, Johnny Darter, Mottled Sculpin, Round Goby, White Bass, White Perch, Bluntnose Minnow, Lake Chub, Gizzard Shad, Smallmouth Bass, Rainbow Smelt, Logperch, Black Crappie, Yellow Perch, Common Shiner, Bowfin, Rainbow Trout, Longnose Sucker, Chinook Salmon, Sea Lamprey, Brook Trout, Brown Bullhead, Shorthead Redhorse, Golden Shiner, Spotfin Shiner, Brown Trout, Fathead Minnow, Longnose Gar, Channel Catfish, Brook Stickleback, Freshwater Drum, Slimy Sculpin, Largemouth Bass (MNRF, 2021) Not sampled by LGL	Sand, boulders	N/A	American Eel	June 15 – September 15

### 3.2.5 Species at Risk

A review of the MNR Natural Heritage Information Centre (NHIC) database and DFO Species at Risk mapping identified one aquatic species at risk, American Eel, as present within the Beach Boulevard Municipal Class EA study area. DFO mapping also indicates that a distribution of Deepwater Sculpin (*Myoxocephalus thompsonii*) is located within a pocket of the Hamilton Harbour approximately 100 m west of the study area.

American Eel is regulated provincially as “Endangered” under the Ontario *Endangered Species Act, 2007* (ESA) and listed as “Threatened” by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). American Eel is not regulated or afforded protection under the federal Species at Risk Act (SARA). Deepwater Sculpin is regulated federally under SARA and COSEWIC as “Special Concern”. Deepwater Sculpin is not afforded protection under the ESA.

## 3.3 Vegetation and Vegetation Communities

### 3.3.1 Purpose

The geographical extent, composition, structure and function of the vegetation communities were identified through air photo interpretation and field investigations. Air photos were interpreted to determine the limits and characteristics of the vegetation communities in the study area. Multi-season botanical field investigations were undertaken within the study area on May 27<sup>th</sup>, July 21<sup>st</sup>, and October 7<sup>th</sup>, 2021. The field investigations of the vegetation communities were undertaken within the Beach Boulevard Flood Remediation study area.

The vegetation communities were classified according to the *Ecological Land Classification for Southern Ontario: First Approximation and Its Application* (Lee et al. 1998). A plant list and a description of the general structure of vegetation were obtained during the field investigations. Plant species status was reviewed for Ontario (Oldham 2009) and Hamilton (2014). Vascular plant nomenclature follows Newmaster et al. (1998) with a few exceptions that have been updated to Newmaster et al. (2005).

### 3.3.2 Data Sources

- Lee, H., W. Bakowsky, J. Riley, J. Bowles, M. Puddister, P. Uhlig, and S. McMurray. 1998. *Ecological Land Classification for Southern Ontario: First Approximation and Its Application*. Natural Heritage Information Centre;
- Newmaster, S.G., A. Lehela, P.W.C. Uhlig, S. McMurray and M.J. Oldham. 1998. *Ontario Plant List*. Ontario Ministry of Natural Resources, Ontario Forest Research Institute, Sault Ste. Marie, Ontario, Forest Research Information Paper No. 123, 550 pp. + appendices;
- Newmaster, S.G. 2005. *Flora Ontario - Integrated Botanical Information System (FOIBIS)* 2006 species scientific names obtained March 2007 from the University of Guelph;

- Oldham, M.J. 2009. *Natural Heritage Resources of Ontario: Rare Vascular Plants*. Natural Heritage Information Centre, Ontario Ministry of Natural Resources, Peterborough, Ontario;
- Ontario Ministry of Natural Resources and Forestry. 2020. *Natural Heritage Information Centre*. Website available online at: <https://www.ontario.ca/environment-and-energy/natural-heritage-information-centre>. Accessed June 2017, Ministry of Natural Resources and Forestry. Peterborough, Ontario;
- Hamilton Conservation Authority. 2014. *Hamilton Natural Areas Inventory Project 3<sup>rd</sup> Edition: Species Checklist Document*.

### 3.3.3 Findings

Vegetation communities identified within the study area consist of a mixture of cultural communities and natural/semi-natural communities including: forest, wetlands, and, sand dunes.

Cultural communities include Dry-Moist Old Field Meadow (CUM1-1), Mineral Cultural Thicket (CUT1), Mineral Cultural Savannah (CUS1), and Mineral Cultural Woodland (CUW1). In general, the cultural vegetation communities were identified in areas where regular or past disturbances have occurred (i.e. adjacent to roadways or previous industrial sites) and were observed to be in a disturbed state. These areas contained a high proportion of invasive and/or non-native plant species that are disturbance tolerant. Overall, the quality of these communities is considered to be low.

As noted above, the natural/semi-natural features identified with the study area include forest, wetland and sand dune communities. A single deciduous forest (FOD4) type was identified within the study area. Two FOD4 communities were identified within the study area including a linear community adjacent to the Queen Elizabeth Way and a small community adjacent to the Waterfront Trail. Given the close proximity of these communities to infrastructure, they were observed to be highly influenced by anthropogenic disturbance and generally supported a high proportion of non-native, disturbance tolerant plant species. In general, the deciduous forest communities within the study area would be considered to be of low quality.

A total of three wetland community types were identified within the study area including Meadow Marsh (MAM and MAM2-2), Shallow Marsh (MAS) and Swamp Thicket (SWT2-2). The wetlands within the study area were generally associated with the drainage features within the study area. The wetlands within the study area generally supported a low diversity of plant species and would be considered to be of low to moderate quality.

A large sand dune system was identified along the Waterfront Trail adjacent to Lake Ontario and extends the entire length of the study area. The sand dunes consisted of a

mixture of Open Sand Dunes (SDO and SDO1-1), Shrub Sand Dune (SDS1), and Tree Sand Dune (SDT1 and SDT1-1) communities. Restoration efforts have been undertaken within the north portion of the sand dunes including the removal of non-native plant species and the planting of native dune plant species including short-liguled beach grass (*Ammophila breviligulata*) and Indian grass (*Sorghastrum nutans*). Restoration efforts were most evident in the SDO1-1 communities where the species composition was almost entirely native plant species. Anthropogenic disturbance was widespread across the dunes including the planting of ornamental, non-native plant species by adjacent landowners and previous clearing of the hydro corridor which resulted in the removal of a large portion of tree cover. Overall, the sand dunes are considered to be of moderate habitat quality.

Overall, the vegetation communities identified within the study area are considered widespread and common in Ontario and are secure globally with the exception of one community. A review of the NHIC indicates that the Little Bluestem-Switch Grass-Beach grass Open Dune (SDO1-1) community identified along the Waterfront Trail is considered a S2 (Imperilled) vegetation community within Ontario. The limits of the vegetation communities are delineated in **Figure 3** and described in **Table 2**.

### **Flora**

A total of 136 plant species have been recorded within the study area. Four of these plants could only be identified to genus and are not included in the following calculations. Of the 132 plant species identified, 51 (39%) plant species identified are native to Ontario and 81 (61%) plant species are considered introduced and non-native to Ontario. A list of vascular plants is presented in **Appendix B**. Definitions of the acronyms and species ranks used in **Appendix B** are described in **Appendix C**.

**TABLE 2.**  
**SUMMARY OF ECOLOGICAL LAND CLASSIFICATION VEGETATION COMMUNITIES**

ELC Code	Vegetation Type	Species Association	Comments
<b>Terrestrial-Natural/Semi-Natural</b>			
BBO	OPEN BEACH/BAR		
BBO1	Mineral Open/Beach Bar		<ul style="list-style-type: none"> <li>• Subject to active shoreline processes: ice scour, wave energy, erosion and deposition (BB).</li> <li>• Tree cover ≤ 25%, shrub cover ≤ 25% (O).</li> <li>• Unconsolidated mineral substrate (1).</li> </ul>
SDO	OPEN SAND DUNE		
SDO1	Open Sand Dune	<p><b>Emergent Trees/Shrubs:</b> includes Siberian elm (<i>Ulmus pumila</i>), staghorn sumac (<i>Rhus hirta</i>), and cottonwood (<i>Populus deltoides</i>).</p> <p><b>Ground Cover:</b> includes riverbank grape (<i>Vitis riparia</i>), bouncing bet (<i>Saponaria officinalis</i>), short-liguled beach grass (<i>Ammophila breviligulata</i>), downy chess (<i>Bromus tectorum</i>), and Jerusalem artichoke (<i>Helianthus tuberosus</i>).</p>	<ul style="list-style-type: none"> <li>• Active rolling sand hills formed by shoreline processes and aeolian processes (SD).</li> <li>• Tree cover ≤ 25%, shrub cover ≤ 25% (O).</li> <li>• Vegetation cover from patch to barren to continuous meadow (1).</li> </ul>
SDO1-1	Little Bluestem-Switch Grass-Beachgrass Open Dune	<p><b>Emergent Trees/Shrubs:</b> includes Siberian elm (<i>Ulmus pumila</i>), staghorn sumac (<i>Rhus hirta</i>), and cottonwood (<i>Populus deltoides</i>).</p> <p><b>Ground Cover:</b> includes scouring-rush (<i>Equisetum hyemale</i> var. <i>affine</i>), short-liguled beach grass, riverbank grape, and Indian grass (<i>Sorghastrum nutans</i>).</p>	<ul style="list-style-type: none"> <li>• Active rolling sand hills formed by shoreline processes and aeolian processes (SD).</li> <li>• Tree cover ≤ 25%, shrub cover ≤ 25% (O).</li> <li>• Vegetation cover from patchy to barren to continuous meadow (1).</li> <li>• Little bluestem, switch grass, or beachgrass dominant (-1).</li> </ul>
SDS	SHRUB SAND DUNE		
SDS1	Shrub Sand Dune	<p><b>Canopy:</b> includes cottonwood, Siberian elm, fruit tree (<i>Prunus</i> sp.), and staghorn sumac.</p> <p><b>Ground Cover:</b> includes riverbank grape, downy chess, Jerusalem artichoke, short-liguled beach grass and Kentucky blue grass (<i>Poa pratensis</i> ssp. <i>pratensis</i>).</p>	<ul style="list-style-type: none"> <li>• Active rolling sand hills formed by shoreline processes and aeolian processes (SD).</li> <li>• Tree cover ≤ 25%, shrub cover &gt; 25% (S).</li> <li>• Vegetation cover from patchy to barren to continuous thicket, scattered to dense shrub cover (1).</li> </ul>

**TABLE 2.**  
**SUMMARY OF ECOLOGICAL LAND CLASSIFICATION VEGETATION COMMUNITIES**

ELC Code	Vegetation Type	Species Association	Comments
SDT	TREED SAND DUNE		
SDT1	Treed Sand Dune	<p><b>Canopy:</b> includes Siberian elm, cottonwood, black locust (<i>Robinia pseudo-acacia</i>), and Manitoba maple (<i>Acer negundo</i>).</p> <p><b>Understory:</b> includes black locust, staghorn sumac, choke cherry (<i>Prunus virginiana</i> var. <i>virginiana</i>), and black walnut (<i>Juglans nigra</i>).</p> <p><b>Ground Cover:</b> includes garlic mustard (<i>Alliaria petiolata</i>), downy chess, short-ligued beach grass, American wild mint (<i>Mentha arvensis</i>), and Canada goldenrod (<i>Solidago canadensis</i>).</p>	<ul style="list-style-type: none"> <li>• Active rolling sand hills formed by shoreline processes and aeolian processes (SD).</li> <li>• 25% &lt; tree cover ≤ 60% (T).</li> <li>• Vegetation cover from savannah to woodland (1).</li> </ul>
SDT1-1	Cottonwood Treed Dune	<p><b>Canopy:</b> includes cottonwood and Siberian elm.</p> <p><b>Understory:</b> includes cottonwood, staghorn sumac, Manitoba maple, black walnut, and black locust.</p> <p><b>Ground Cover:</b> includes riverbank grape, awnless brome (<i>Bromus inermis</i> spp. <i>inermis</i>), field cress (<i>Lepidium campestre</i>), horseweed (<i>Conyza canadensis</i>), and catnip (<i>Nepeta cataria</i>).</p>	<ul style="list-style-type: none"> <li>• Active rolling sand hills formed by shoreline processes and aeolian processes (SD).</li> <li>• 25% &lt; tree cover ≤ 60% (T).</li> <li>• Vegetation cover from savannah to woodland (1).</li> <li>• Cottonwood dominant (-1).</li> </ul>
FOD	DECIDUOUS FOREST		
FOD4	Dry-Fresh Deciduous Forest	<p><b>Canopy:</b> includes Austrian pine (<i>Pinus nigra</i>), Siberian elm, black walnut, Manitoba maple, Norway maple (<i>Acer platanoides</i>), and cottonwood.</p> <p><b>Understory:</b> includes eastern white cedar (<i>Thuja occidentalis</i>), Japanese barberry (<i>Berberis thunbergii</i>), common buckthorn (<i>Rhamnus cathartica</i>), choke cherry, and staghorn sumac.</p> <p><b>Ground Cover:</b> includes Kentucky blue grass, awnless brome, creeping Charlie (<i>Glechoma hederacea</i>), catnip, garlic mustard, dame's rocket (<i>Hesperis matronalis</i>), and Japanese knotweed (<i>Polygonum cuspidatum</i>).</p>	<ul style="list-style-type: none"> <li>• Tree cover &gt; 60% (FO).</li> <li>• Deciduous trees &gt; 75% of canopy cover (D).</li> <li>• Tree species associations that are relatively common or a result of disturbance (4).</li> </ul>
<b>Terrestrial-Cultural</b>			
CUM	CULTURAL MEADOW		



**TABLE 2.**  
**SUMMARY OF ECOLOGICAL LAND CLASSIFICATION VEGETATION COMMUNITIES**

ELC Code	Vegetation Type	Species Association	Comments
CUM1-1	Dry – Moist Old Field Meadow	<b>Emergent Trees/Shrubs:</b> includes white spruce ( <i>Picea glauca</i> ), Japanese barberry, cottonwood, and Russian olive ( <i>Elaeagnus angustifolia</i> ). <b>Ground Cover:</b> includes Japanese knotweed, Canada goldenrod, orchard grass ( <i>Dactylis glomerata</i> ), common ragweed ( <i>Ambroisia artemisiifolia</i> ), Kentucky bluegrass, nipplewort ( <i>Lapsana communis</i> ), and common dandelion ( <i>Taraxacum officinale</i> ).	<ul style="list-style-type: none"> <li>• Cultural community (CU).</li> <li>• Tree cover and shrub cover &lt; 25% (M).</li> <li>• Mineral soil (1).</li> <li>• This community can occur on a wide range of soil moisture regimes (Dry-Moist) (-1).</li> </ul>
CUT/CUM	CULTURAL THICKET/CULTURAL MEADOW		
CUT1/CUM1	Mineral Cultural Thicket/Mineral Cultural Meadow	<b>Canopy:</b> includes sweet gum ( <i>Liquidambar styraciflua</i> ), white mulberry ( <i>Morus alba</i> ), common buckthorn, and cottonwood. <b>Ground Cover:</b> includes Japanese knotweed, Canada thistle ( <i>Cirsium arvense</i> ), Kentucky bluegrass, Timothy ( <i>Phleum pratense</i> ), catnip, and orchard grass.	<ul style="list-style-type: none"> <li>• Cultural communities (CU).</li> <li>• Tree cover &lt;25%; shrub cover &gt;25% (T).</li> <li>• Mineral soil (1).</li> <li>• Cultural communities (CU).</li> <li>• Tree cover and shrub cover &lt; 25% (M).</li> <li>• Mineral soil (1).</li> </ul>
CUT	CULTURAL THICKET		
CUT1	Mineral Cultural Thicket	<b>Canopy:</b> includes Siberian elm, white mulberry, balsam poplar ( <i>Populus balsamifera</i> ssp. <i>balsamifera</i> ), black locust, and honey locust ( <i>Gleditsia triacanthos</i> ). <b>Understory:</b> includes common apple ( <i>Malus pumila</i> ), choke cherry, red paniced dogwood ( <i>Cornus racemosa</i> ), tree of heaven ( <i>Ailanthus altissima</i> ), and Russian olive ( <i>Elaeagnus angustifolia</i> ). <b>Ground Cover:</b> includes false Soloman’s seal ( <i>Maianthemum racemosum</i> spp. <i>racemosum</i> ), periwinkle ( <i>Vinca minor</i> ), smooth rose ( <i>Rosa blanda</i> ), mossy stonecrop ( <i>Sedum acre</i> ), garlic mustard, and dame’s rocket.	<ul style="list-style-type: none"> <li>• Cultural communities (CU).</li> <li>• Tree cover &lt;25%; shrub cover &gt;25% (T).</li> <li>• Mineral soil (1).</li> </ul>
CUT	CULTURAL THICKET		
CUT1-1	Sumac Cultural Thicket	<b>Canopy:</b> includes staghorn sumac and Manitoba maple. <b>Ground Cover:</b> includes Kentucky bluegrass, awnless brome, Japanese knotweed, and riverbank grape.	<ul style="list-style-type: none"> <li>• Cultural communities (CU).</li> <li>• Tree cover &lt;25%; shrub cover &gt;25% (T).</li> <li>• Mineral soil (1).</li> <li>• Sumac dominant (-1).</li> </ul>

**TABLE 2.**  
**SUMMARY OF ECOLOGICAL LAND CLASSIFICATION VEGETATION COMMUNITIES**

ELC Code	Vegetation Type	Species Association	Comments
CUS	CULTURAL SAVANNAH		
CUS1	Mineral Cultural Savannah	<p><b>Canopy:</b> includes white spruce, cottonwood, Russian olive, red osier dogwood (<i>Cornus sericea</i> ssp. <i>sericea</i>), and Manitoba maple.</p> <p><b>Ground Cover:</b> includes snowberry (<i>Symphoricarpus albus</i>), Kentucky bluegrass, reed canary grass (<i>Phalaris arundinacea</i>), wild carrot (<i>Daucus carota</i>), Canada goldenrod and, teasel (<i>Dipsacus fullonum</i> ssp. <i>sylvestris</i>).</p>	<ul style="list-style-type: none"> <li>• Cultural communities (CU).</li> <li>• &lt;25% tree cover shrub ≤ 35% (S).</li> <li>• Mineral soil (1).</li> </ul>
CUW	CULTURAL WOODLAND		
CUW1	Mineral Cultural Woodland	<p><b>Canopy:</b> includes Norway spruce (<i>Picea abies</i>), Austrian pine, cottonwood, and white birch (<i>Betula papyrifera</i>).</p> <p><b>Understory:</b> includes white mulberry, Russian olive, staghorn sumac, and Manitoba maple.</p> <p><b>Ground Cover:</b> includes Kentucky bluegrass, European stinging nettle (<i>Urtica dioica</i> ssp. <i>dioica</i>), dame's rocket, and catnip.</p>	<ul style="list-style-type: none"> <li>• Cultural communities (CU).</li> <li>• 35% &lt; tree cover &lt; 60% (W).</li> <li>• Mineral Soil (1).</li> </ul>
<b>Wetland</b>			
MAM	MEADOW MARSH		
MAM2	Mineral Meadow Marsh	<p><b>Emergent Trees/Shrubs:</b> includes cottonwood and willow.</p> <p><b>Ground Cover:</b> includes European reed (<i>Phragmites australis</i> ssp. <i>australis</i>), and Canada goldenrod.</p>	<ul style="list-style-type: none"> <li>• Tree or shrub cover &lt;25% (MA).</li> <li>• Flooding seasonal, species less tolerant of prolonged flooding (M).</li> <li>• Mineral soil (2).</li> </ul>
MAM2-2	Reed-Canary Grass Mineral Meadow Marsh	<p><b>Emergent Trees/Shrubs:</b> includes red osier dogwood and crack willow (<i>Salix fragilis</i>).</p> <p><b>Ground Cover:</b> includes European reed, reed canary grass and broad-leaved cattail (<i>Typha latifolia</i>).</p>	<ul style="list-style-type: none"> <li>• Tree or shrub cover &lt;25% (MA).</li> <li>• Flooding seasonal, species less tolerant of prolonged flooding (M).</li> <li>• Mineral soil (2).</li> <li>• Reed-canary grass dominant (-2).</li> </ul>
MAS	SHALLOW MARSH		
MAS	Shallow Marsh	<p><b>Emergent Trees/Shrubs:</b> includes red osier dogwood and crack willow (<i>Salix fragilis</i>), cottonwood, and Manitoba maple.</p>	<ul style="list-style-type: none"> <li>• Tree or shrub cover &lt;25% (MA).</li> </ul>

**TABLE 2.**  
**SUMMARY OF ECOLOGICAL LAND CLASSIFICATION VEGETATION COMMUNITIES**

ELC Code	Vegetation Type	Species Association	Comments
		<b>Ground Cover:</b> includes reed canary grass, European reed, and broad-leaved cattail ( <i>Typha latifolia</i> ) and purple loosestrife ( <i>Lythrum salicaria</i> ).	<ul style="list-style-type: none"> <li>• Water up to 2 m deep, with standing or flowing water for much of the growing season (S).</li> </ul>
SWT	THICKET SWAMP		
SWT2-2	Willow Mineral Thicket Swamp	<b>Canopy:</b> includes willow species ( <i>Salix</i> spp.), cottonwood, bur oak ( <i>Quercus macrocarpa</i> ), and red osier dogwood. <b>Ground Cover:</b> includes European reed, dame's rocket, and Japanese knotweed.	<ul style="list-style-type: none"> <li>• Tree or shrub cover &gt;25% and dominated by hydrophytic shrub and tree species (SW).</li> <li>• Deciduous tree cover &lt;25%; hydrophytic shrubs &gt; 25% (T).</li> <li>• Mineral soil (2).</li> <li>• Willows are dominant (-2).</li> </ul>

### 3.3.4 Species at Risk

No plant species that are regulated under the Ontario *Endangered Species Act* (ESA) or the Canada *Species at Risk Act* (SARA) were encountered during LGL’s botanical investigation within the study area (those plant species regulated as Endangered, Threatened, or Special Concern). A description of provincial species ranks is provided in **Appendix C**.

### Provincially/Locally Rare Plant Species

Five plant species that are considered rare or uncommon within Hamilton were identified within the study area. In addition, short-liguled beach grass is considered provincially rare. **Table 3** provides a list of the rare species that were identified, the applicable SRank and which vegetation community each species was identified within. The majority of rare species occurrences were within the dune system along the Waterfront Trail. A description of species rank definitions is presented in **Appendix C**.

**TABLE 3.**  
**SIGNIFICANT PLANT SPECIES IDENTIFIED WITHIN THE STUDY AREA**

Scientific Name	Common Name	SRank	Hamilton	Vegetation Community							
				CUM1-1	CUT1	FOD4	SDO	SDO1-1	SDS	SDT	SDT1-1
<i>Celtis occidentalis</i>	common hackberry	S4	h		X	X					
<i>Ammophila breviligulata</i>	short-liguled beach grass	S3	H				X	X	X	X	X
<i>Elymus canadensis</i>	nodding wild rye	S4S5	H	X							
<i>Schizachyrium scoparium</i>	little bluestem	S4	H				X				
<i>Sorghastrum nutans</i>	Indian grass	S4	H					X			

H – indicates a rare species in Hamilton, h – indicates an uncommon species in Hamilton

## 3.4 Wildlife and Wildlife Habitat

### 3.4.1 Purpose

Field investigations were conducted with the purpose of documenting wildlife and wildlife habitat and to characterize the nature, extent, and significance of wildlife usage within the study area. In addition to targeted breeding bird and anuran call surveys, incidental observations of wildlife species were also documented during each site visit. Direct observations, calls and tracks were used to record wildlife presence within the study area. Field investigations were conducted on April 8, May 13, June 10, June 20 and July 10, 2021.

### 3.4.2 Data Sources

Information regarding wildlife and wildlife habitat within the study area was obtained through:

- The Natural Heritage Information Centre data available through *Make a Map* (MNRF 2021);
- Bird Studies Canada, Environment Canada, Ontario Field Ornithologists, Ontario Ministry of Natural Resources, and Ontario Nature. Editors: Michael D. Cadman, Donald A. Sutherland, Gregor G. Beck, Denis Lepage, and Andrew R. Couturier. Ontario Breeding Bird Atlas. 2001 – 2005;
- Couturier, A. 1999. Conservation Priorities for the Birds of Southern Ontario. Bird Studies Canada;
- Ministry of Natural Resources and Forestry (MNRF). 2000. *Significant Wildlife Habitat Technical Guide*. Fish and Wildlife Branch – Wildlife Section; and,
- Schwetz, N. 2014. Hamilton Natural Areas Inventory Project 3rd Edition - Species Checklist Document. Report prepared by the City of Hamilton, Hamilton Conservation Authority, and Hamilton Naturalists Club
- Dobbyn, J.S. 1994. *Atlas of the Mammals of Ontario*. Federation of Ontario Naturalists. Toronto.

Secondary source data from the Ministry of Natural Resource and Forestry (NHIC) was reviewed to screen for wildlife, wildlife habitat and records of species at risk found within the study area and its immediate vicinity. Natural heritage data from HCA was also reviewed.

### 3.4.3 Wildlife Habitat

The study area is located along a relatively narrow spit of land between Lake Ontario and Hamilton Harbour. Overall, lands within the study area are highly disturbed as a result of residential development and wide-spread industrial land use. Natural heritage features were identified in association with Red Hill Creek, which is located in the southwest section of the study area. Red Hill Creek may provide important function for aquatic bird and herpetofauna species. Red Hill Creek and portions of Hamilton Harbour (in the vicinity of the study area) may function as waterfowl stop-over areas in the spring and fall. Eastport Ditch is also located between Eastport Drive and the QEW along much of the study area; however, this drainage feature was found to be highly disturbed and offered limited habitat function for wildlife species. Windermere Basin Park contained several ephemeral meadow marsh communities; however, these features were found to be dominated by invasive vegetation (*Phragmites spp.*) and targeted surveys did not find significant function for anuran or bird species.

No interior forest habitat was identified within the limits of the study area. Interior forest is generally defined as forested cover located at least 100 m from non-forested land cover. Only relatively small and highly disturbed deciduous forest communities were identified at several locations across the study area. Based on the habitat types present, wildlife species which occupy woodland edges, open country/agricultural, aquatic and anthropogenic communities are expected to occupy the study area.

There are no provincially significant wetlands (PSWs) or areas of natural and scientific interest (ANSIs) located within the study area; however, there are several natural heritage areas that are associated with municipal parks including Hamilton Beach, Windemere Basin Park, Skyway Park, Reg Wheeler Park, Nixon Park, Kinsman Park, Dieppe Veterans Memorial Park, and Jimmy Lomax Park. The Hamilton Beach Strip, located along the Lake Ontario and Hamilton Harbour shorelines, is designated as an Environmentally Sensitive Area (ESA). The West End of Lake Ontario and Hamilton Harbour Waterbird Colonies are recognized as Important Bird Areas (IBA) and Waterfowl Winter Concentration Areas.

#### 3.4.4 Fauna

Targeted breeding bird and anuran call surveys were conducted within the study area.

##### **Anuran Surveys**

The purpose of these surveys was to document the occurrence of frog and toad species, identify potential breeding areas, and estimate breeding population levels. Anuran surveys were conducted between April 8 and July 20, 2021, and each evening's survey began one half hour after sunset and ended prior to midnight (see **Table 4**).

Methodologies outlined in the Great Lakes Marsh Monitoring Program (2000) (<https://www.birdscanada.org/volunteer/glmmp/index.jsp?targetpg=glmmpfrog>) were used including calling index codes to estimate the abundance of frogs and toads at each station.

We also estimated the number of calling individuals if possible. Call level index codes were assigned to all calling frog and toad species at each survey location as follows:

Code 1: individual calls do not overlap and calling individuals can be discretely counted;

Code 2: calls of individuals sometimes overlap, but numbers of individuals can still be estimated; and,

Code 3: overlap among calls seems continuous (full chorus), and a count estimate is impossible.

**TABLE 4.**  
**SUMMARY OF DATE OF WILDLIFE INVENTORY, TASK, WEATHER AND PERSONNEL**

<b>Date of Inventory</b>	<b>Task</b>	<b>Weather</b>	<b>Personnel Involved</b>
April 8, 2021	Anuran survey	Partly cloudy, 9°C, wind 8km/h NW	David Smith (LGL)
May 13, 2021	Anuran survey	Clear, 14°C, wind 5km/h E	David Smith (LGL)
June 20, 2021	Anuran survey	Overcast, 23°C, wind 1km/h S	Jordan Pietroniro (LGL)

Stations were strategically placed where amphibian breeding habitat was suspected, based on air-photo interpretation and a ground-truthing review of the study area (see **Figure 3**). Field investigations within the study area were conducted on three separate nights during the spring and summer of 2021, ran from one half hour after sunset and ended prior to midnight and were conducted during appropriate weather conditions. Investigations were undertaken during periods of peak anuran breeding activity and vocalization.





Three anuran breeding stations were established within or immediately adjacent to the study area. Stations #1 and #2 were located within meadow marsh habitat (wet depressions dominated by *Phragmites* spp. within Windermere Basin Park) and Station #3 was located immediately northeast of the study area, within roadside ditch habitat (see **Figure 3**). No evidence of anuran breeding evidence was documented during 2021 surveys. No herpetofauna species were identified during field investigations.

### **Breeding Bird Surveys**


Breeding bird surveys were conducted on two mornings during the 2021 breeding bird season (June 10 and July 10, 2021) to document breeding bird evidence (BBE) and to characterize the nature, extent and significance of breeding bird usage of the habitats within the study area. Breeding bird survey methodology and breeding bird behaviours used as evidence of breeding success were categorized according to the Breeding Bird Atlas five-year surveys organized by Bird Studies Canada (Cadman et al., 2007). Fourteen breeding bird point count stations were established and bisected the study area from east to west (see **Figures 3.1-3.12**). Wandering transects were also used to record incidental bird species.



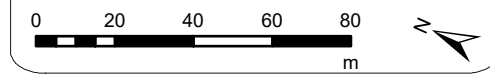
**LEGEND**

-  Amphibian Monitoring Station
-  Breeding Bird Point Count Station
-  Eastport Ditch Drainage System
-  Beach Boulevard Study Area

**Vegetation Communities**

-  Vegetation Community Boundary
- BBO1** Mineral Open Beach/Bar Ecosite
- CUM1-1** Dry-Moist Old Field Meadow Type
- CUS1** Mineral Cultural Savannah Ecosite
- CUT1** Mineral Cultural Thicket Ecosite
- CUT1-1** Sumac Cultural Thicket Type
- CUW1** Mineral Cultural Woodland Ecosite
- D** Disturbed
- FOD4** Dry-Fresh Deciduous Forest Ecosite
- M** Manicured
- MAM2** Mineral Meadow Marsh Ecosite
- MAM2-2** Reed-canary Grass Mineral Meadow Marsh Type
- MAS** Shallow Marsh
- SDO1** Open Sand Dune Ecosite
- SDO1-1** Little Bluestem-Switchgrass-Beachgrass Open Dune Type
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- SDT1** Treed Sand Dune Ecosite
- SDT1-1** Cottonwood Treed Dune Type
- SWT2** Mineral Thicket Swamp Ecosite
- SWT2-2** Willow Mineral Thicket Swamp Type

Data Sources: LGL Limited field surveys, City of Hamilton & Ministry of Natural Resources and Forestry (LIO). Contains information licenced under the Open Government Licence - Ontario.



**EXISTING CONDITIONS**








<b>Project:</b> TA9030	<b>Figure:</b> 3.1
<b>Date:</b> March, 2022	<b>Prepared By:</b> JJP
<b>Scale:</b> 1 : 2,000	<b>Checked By:</b> LMC

Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the Community

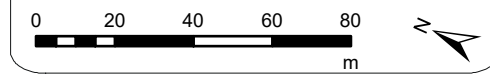




**LEGEND**

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**EXISTING CONDITIONS**








<b>Project:</b> TA9030	<b>Figure:</b> 3.2
<b>Date:</b> March, 2022	<b>Prepared By:</b> JJP
<b>Scale:</b> 1 : 2,000	<b>Checked By:</b> LMC

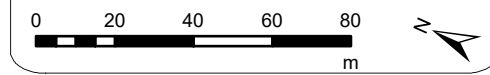
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**LEGEND**

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**EXISTING CONDITIONS**







<b>Project:</b> TA9030	<b>Figure:</b> 3.3
<b>Date:</b> March, 2022	<b>Prepared By:</b> JJP
<b>Scale:</b> 1 : 2,000	<b>Checked By:</b> LMC


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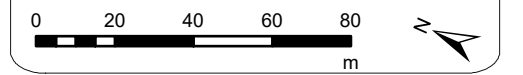
**LEGEND**

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**EXISTING CONDITIONS**








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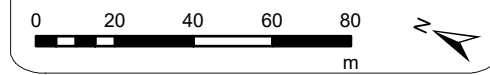
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**LEGEND**

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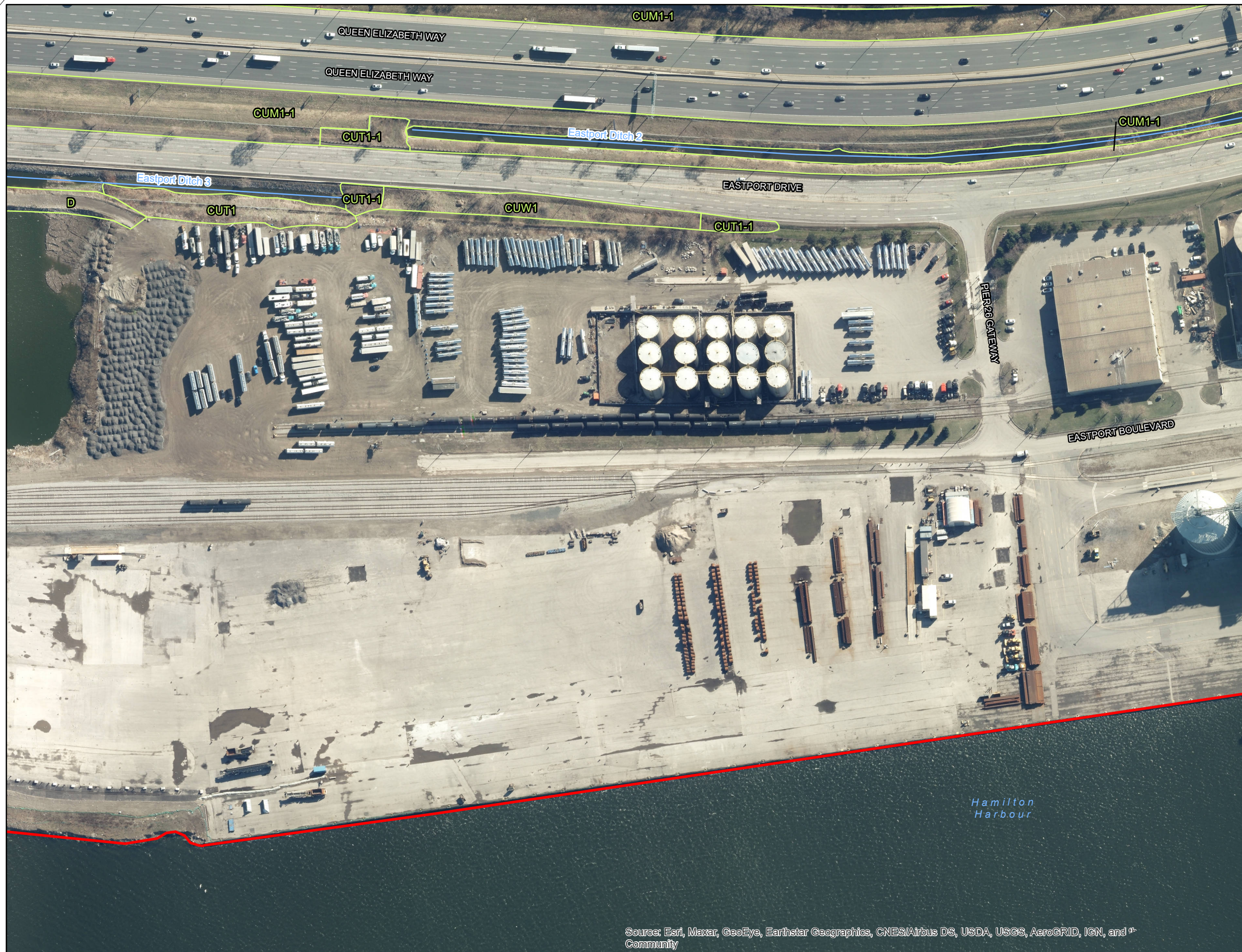


**EXISTING CONDITIONS**







<b>Project:</b> TA9030	<b>Figure:</b> 3.5
<b>Date:</b> March, 2022	<b>Prepared By:</b> JJP
<b>Scale:</b> 1 : 2,000	<b>Checked By:</b> LMC

Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the Community



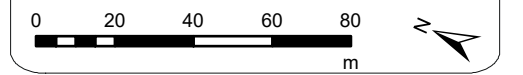
**LEGEND**

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**EXISTING CONDITIONS**







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<b>Date:</b> March, 2022	<b>Prepared By:</b> JJP
<b>Scale:</b> 1 : 2,000	<b>Checked By:</b> LMC

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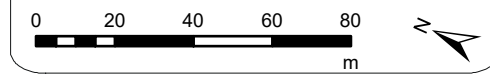
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**EXISTING CONDITIONS**




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<b>Date:</b> March, 2022	<b>Prepared By:</b> JJP
<b>Scale:</b> 1 : 2,000	<b>Checked By:</b> LMC



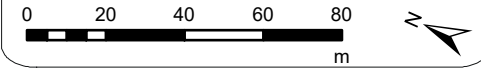
**LEGEND**

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**Vegetation Communities**

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**EXISTING CONDITIONS**







<b>Project:</b> TA9030	<b>Figure:</b> 3.8
<b>Date:</b> March, 2022	<b>Prepared By:</b> JJP
<b>Scale:</b> 1 : 2,000	<b>Checked By:</b> LMC


Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the Community



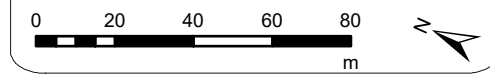
**LEGEND**

-  Amphibian Monitoring Station
-  Breeding Bird Point Count Station
-  Eastport Ditch Drainage System
-  Beach Boulevard Study Area

**Vegetation Communities**

-  Vegetation Community Boundary
- BBO1** Mineral Open Beach/Bar Ecosite
- CUM1-1** Dry-Moist Old Field Meadow Type
- CUS1** Mineral Cultural Savannah Ecosite
- CUT1** Mineral Cultural Thicket Ecosite
- CUT1-1** Sumac Cultural Thicket Type
- CUW1** Mineral Cultural Woodland Ecosite
- D** Disturbed
- FOD4** Dry-Fresh Deciduous Forest Ecosite
- M** Manicured
- MAM2** Mineral Meadow Marsh Ecosite
- MAM2-2** Reed-canary Grass Mineral Meadow Marsh Type
- MAS** Shallow Marsh
- SDO1** Open Sand Dune Ecosite
- SDO1-1** Little Bluestem-Switchgrass-Beachgrass Open Dune Type
- SDS1** Shrub Sand Dune Ecosite
- SDT1** Treed Sand Dune Ecosite
- SDT1-1** Cottonwood Treed Dune Type
- SWT2** Mineral Thicket Swamp Ecosite
- SWT2-2** Willow Mineral Thicket Swamp Type

Data Sources: LGL Limited field surveys, City of Hamilton & Ministry of Natural Resources and Forestry (LFO). Contains information licenced under the Open Government Licence - Ontario.



**EXISTING CONDITIONS**






<b>Project:</b> TA9030	<b>Figure:</b> 3.9
<b>Date:</b> March, 2022	<b>Prepared By:</b> JJP
<b>Scale:</b> 1 : 2,000	<b>Checked By:</b> LMC

Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the Community

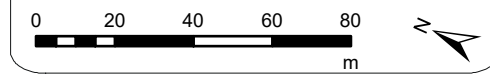




**LEGEND**

-  Amphibian Monitoring Station
-  Breeding Bird Point Count Station
-  Eastport Ditch Drainage System
-  Beach Boulevard Study Area
- Vegetation Communities**
-  Vegetation Community Boundary
- BE01** Mineral Open Beach/Bar Ecosite
- CUM1-1** Dry-Moist Old Field Meadow Type
- CUS1** Mineral Cultural Savannah Ecosite
- CUT1** Mineral Cultural Thicket Ecosite
- CUT1-1** Sumac Cultural Thicket Type
- CUW1** Mineral Cultural Woodland Ecosite
- D** Disturbed
- FOD4** Dry-Fresh Deciduous Forest Ecosite
- M** Manicured
- MAM2** Mineral Meadow Marsh Ecosite
- MAM2-2** Reed-canary Grass Mineral Meadow Marsh Type
- MAS** Shallow Marsh
- SD01** Open Sand Dune Ecosite
- SD01-1** Little Bluestem-Switchgrass-Beachgrass Open Dune Type
- SDS1** Shrub Sand Dune Ecosite
- SDT1** Treed Sand Dune Ecosite
- SDT1-1** Cottonwood Treed Dune Type
- SWT2** Mineral Thicket Swamp Ecosite
- SWT2-2** Willow Mineral Thicket Swamp Type

Data Sources: LGL Limited field surveys, City of Hamilton & Ministry of Natural Resources and Forestry (LFO). Contains information licenced under the Open Government Licence - Ontario.



**EXISTING CONDITIONS**








<b>Project:</b> TA9030	<b>Figure:</b> 3.10
<b>Date:</b> March, 2022	<b>Prepared By:</b> JJP
<b>Scale:</b> 1 : 2,000	<b>Checked By:</b> LMC

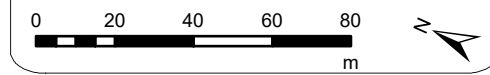
Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the Community



**LEGEND**

-  Amphibian Monitoring Station
  -  Breeding Bird Point Count Station
  -  Eastport Ditch Drainage System
  -  Beach Boulevard Study Area
- Vegetation Communities**
-  Vegetation Community Boundary
  - BB01** Mineral Open Beach/Bar Ecosite
  - CUM1-1** Dry-Moist Old Field Meadow Type
  - CUS1** Mineral Cultural Savannah Ecosite
  - CUT1** Mineral Cultural Thicket Ecosite
  - CUT1-1** Sumac Cultural Thicket Type
  - CUWH** Mineral Cultural Woodland Ecosite
  - D** Disturbed
  - FOD4** Dry-Fresh Deciduous Forest Ecosite
  - M** Manicured
  - MAM2** Mineral Meadow Marsh Ecosite
  - MAM2-2** Reed-canary Grass Mineral Meadow Marsh Type
  - MAS** Shallow Marsh
  - SD01** Open Sand Dune Ecosite
  - SD01-1** Little Bluestem-Switchgrass-Beachgrass Open Dune Type
  - SDS1** Shrub Sand Dune Ecosite
  - SDT1** Treed Sand Dune Ecosite
  - SDT1-1** Cottonwood Treed Dune Type
  - SWT2** Mineral Thicket Swamp Ecosite
  - SWT2-2** Willow Mineral Thicket Swamp Type

Data Sources: LGL Limited field surveys, City of Hamilton & Ministry of Natural Resources and Forestry (LFO). Contains information licenced under the Open Government Licence - Ontario.



**EXISTING CONDITIONS**



<b>Project:</b> TA9030	<b>Figure:</b> 3.11
<b>Date:</b> March, 2022	<b>Prepared By:</b> JJP
<b>Scale:</b> 1 : 2,000	<b>Checked By:</b> LMC

Source: Esri, Maxar, GeoEye, Earthstar-Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the Community



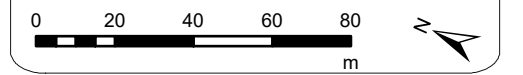
**LEGEND**

- Amphibian Monitoring Station
- Breeding Bird Point Count Station
- Eastport Ditch Drainage System
- Beach Boulevard Study Area

**Vegetation Communities**

- Vegetation Community Boundary
- BB01** Mineral Open Beach/Bar Ecosite
- CUM1-1** Dry-Moist Old Field Meadow Type
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- CUT1** Mineral Cultural Thicket Ecosite
- CUT1-1** Sumac Cultural Thicket Type
- CUW1** Mineral Cultural Woodland Ecosite
- D** Disturbed
- FOD4** Dry-Fresh Deciduous Forest Ecosite
- M** Manicured
- MAM2** Mineral Meadow Marsh Ecosite
- MAM2-2** Reed-canary Grass Mineral Meadow Marsh Type
- MAS** Shallow Marsh
- SD01** Open Sand Dune Ecosite
- SD01-1** Little Bluestem-Switchgrass-Beachgrass Open Dune Type
- SDS1** Shrub Sand Dune Ecosite
- SDT1** Treed Sand Dune Ecosite
- SDT1-1** Cottonwood Treed Dune Type
- SWT2** Mineral Thicket Swamp Ecosite
- SWT2-2** Willow Mineral Thicket Swamp Type

Data Sources: LGL Limited field surveys, City of Hamilton & Ministry of Natural Resources and Forestry (LFO). Contains information licenced under the Open Government Licence - Ontario.



**EXISTING CONDITIONS**



<b>Project:</b> TA9030	<b>Figure:</b> 3.12
<b>Date:</b> March, 2022	<b>Prepared By:</b> JJP
<b>Scale:</b> 1 : 2,000	<b>Checked By:</b> LMC

Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the Community

Thirty-eight bird species were documented during targeted breeding bird surveys conducted within the study area. Based on BBE criteria, six species were categorized as 'confirmed breeding', 21 species as 'probable breeding' and 11 species as 'possible breeding'. Species identified as 'confirmed breeding' were categorized based on adults observed carrying food (for young) and nests with young. Specifically, Tree Swallow (*Tachycineta bicolor*) and House Wren (*Troglodytes aedon*) were recorded using man-made nest boxes associated with Breeding Bird Station # 4. Species diversity and breeding evidence was highest within aquatic and meadow habitats associated with Breeding Bird Station # 1-4. The bird species identified during field investigations are species typically associated with open-country/agricultural, forest edge, aquatic and anthropogenic habitat types. Results of breeding bird surveys are summarized in **Appendix D**.

Notably, Barn Swallow (*Hirundo rustica*), Chimney Swift (*Chaetura pelagica*) and Peregrine Falcon (*Falco peregrinus*) (all species at risk) were identified within the study area; however, no evidence of nesting by these species was identified. Migratory bird species are expected to be nesting across much of the study area.

#### 3.4.5 Findings

A summary of the wildlife species recorded is presented in **Table 5**.

#### **Mammal Species**

Two mammal species were recorded in the study area during field investigations. Several eastern cottontail (*Sylvilagus floridanus*) were observed along trails within Windermere Basin Park. Scat from American mink (*Neovison vison*) was noted along rocky shorelines associated with Windermere Basin Park. A modest assemblage of mammal species which occupy aquatic, treed and open country/anthropogenic habitats are expected to occupy the study area. Small areas of deciduous forest habitat found across the study area contained trees which would be considered limited in their suitability to support bat roosting habitat.

#### 3.4.6 Species at Risk

A number of the bird species recorded within the study area are protected under the *Migratory Birds Convention Act* (MBCA). Both mammal species and several bird species recorded are afforded protection under the *Fish and Wildlife Conservation Act*.

Endangered and threatened species are identified by the MNRF using procedures established by the Committee on the Status of Species at Risk in Ontario (COSSARO). Species and their habitats are protected under the *Endangered Species Act, 2007*. In order to address the most current species at risk (SAR) requirements, LGL completed a SAR habitat screening, whereby available data for the area was screened for SAR occurrences. Targeted breeding bird, anuran breeding surveys, and habitat analysis was used to determine presence of species at risk during 2021 field investigations.

**TABLE 5.  
 WILDLIFE SPECIES DOCUMENTED IN THE STUDY AREA BY LGL (2021)**

Wildlife	Scientific Name	Common Name	SARA	ESA	Legal Status	Other
Birds	<i>Larus delawarensis</i>	Ring-billed Gull			MBCA	A
	<i>Larus argentatus</i>	Herring Gull			MBCA	C
	<i>Sterna hirundo</i>	Common Tern			MBCA	Cq
	<i>Cygnus olor</i>	Mute Swan			MBCA	I; R
	<i>Branta canadensis</i>	Canada Goose			MBCA	I; C
	<i>Falco peregrinus anatum</i>	Peregrine Falcon	No Status	SC	FWCA(P)	R
	<i>Anas platyrhynchos</i>	Mallard			MBCA	C
	<i>Anas clypeata</i>	Northern Shoveler			MBCA	R
	<i>Phalacrocorax auritus</i>	Double-crested Cormorant			MBCA	A
	<i>Ardea Herodias</i>	Great-blue Heron			MBCA	U
	<i>Charadrius vociferous</i>	Killdeer			MBCA	A
	<i>Actitis macularius</i>	Spotted Sandpiper			MBCA	C
	<i>Zenaida macroura</i>	Mourning Dove			MBCA	A
	<i>Columba livia</i>	Rock Dove			-	I; A
	<i>Picoides pubescens</i>	Downy Woodpecker			MBCA	C
	<i>Vireo gilvus</i>	Warbling Vireo			MBCA	C
	<i>Cyanocitta cristata</i>	Blue Jay			FWCA (P)	A
	<i>Chaetura pelagica</i>	Chimney Swift	THR	THR	MBCA	U
	<i>Corvus brachyrhynchos</i>	American Crow			MBCA	C
	<i>Stelgidopteryx serripennis</i>	Northern Rough-winged Swallow			MBCA	C
	<i>Hirundo rustica</i>	Barn Swallow	THR	THR	MBCA	A
	<i>Tachycineta bicolor</i>	Tree Swallow			MBCA	A
	<i>Poecile atricapillus</i>	Black-capped Chickadee			MBCA	A
	<i>Sitta carolinensis</i>	White-breasted Nuthatch			MBCA	C
	<i>Troglodytes aedon</i>	House Wren			MBCA	C
	<i>Turdus migratorius</i>	American Robin			MBCA	C
	<i>Drumetella carolinensis</i>	Gray Catbird			MBCA	C
	<i>Stumus vulgaris</i>	European Starling			-	I; A
	<i>Bombycilla garrulous</i>	Cedar Waxwing			MBCS	C
	<i>Dendroica petechial</i>	Yellow Warbler			MBCA	A
	<i>Spizella passerine</i>	Chipping Sparrow			MBCA	A
	<i>Icterus galbula</i>	Northern Oriole			MBCA	C
<i>Melospica melodia</i>	Song Sparrow			MBCA	A	

**TABLE 5.  
 WILDLIFE SPECIES DOCUMENTED IN THE STUDY AREA BY LGL (2021)**

Wildlife	Scientific Name	Common Name	SARA	ESA	Legal Status	Other
	<i>Cardinalis cardinalis</i>	Northern Cardinal			MBCA	A
	<i>Agelaius phoeniceus</i>	Red-winged Blackbird			-	A
	<i>Quiscalus quiscula</i>	Common Grackle			-	A
	<i>Carduelis tristis</i>	American Goldfinch			MBCA	A
	<i>Passer domesticus</i>	House Sparrow			-	I; A
<b>Mammals</b>	<i>Sylvilagus floridanus</i>	Eastern Cottontail			FWCA (G)	C
	<i>Neovison vison</i>	American Mink			FWCA (F)	C
All acronyms used in this table are defined in <b>Appendix B</b> (Acronyms and Definitions Used in Species Lists). COSEWIC - Committee on the Status of Endangered Wildlife in Canada: END - Endangered THR – Threatened SC - Special Concern ESA - <i>Ontario Endangered Species Act, 2007</i> END – Endangered THR – Threatened SC - Special Concern		Other: SWH - SWH-TG Area Sensitive Species INT - Interior Species NY - Nest with young seen or heard. Other: (Nature Counts Project: Hamilton Natural Areas Inventory 2003); R-rare, C-common, U-uncommon, EXT-extirpated, I-introduced, UNC-uncertain, A-abundant, M-migrant For definitions of species ranks, refer to Appendix D. Legal Status: MBCA - <i>Migratory Birds Convention Act</i> ESA - <i>Endangered Species Act</i> SARA - <i>Species at Risk Act</i> FWCA - <i>Fish and Wildlife Conservation Act</i> (P) Protected Species (G) Game species (F) Furbearing mammals				

Of the wildlife species recorded within the study area, two species are regulated under the Ontario *Endangered Species Act, 2007* (ESA) and one species is listed by COSSARO but is not regulated under the ESA. A query for rare species was conducted using the Natural Heritage Information Centre (NHIC) Ontario GeoHub database (MNR 2022), which identified ten wildlife species at risk, as previously recorded within or in the vicinity of the study area. A discussion of potential SAR within the study area is presented below. Four bat species were also identified as having the potential to occupy the study area based on a habitat screening conducted by LGL. A SAR Screening (**Appendix E**) has been prepared with the benefit of biophysical inventories and includes general recommendations for mitigation, as appropriate.

### 3.4.7 Locally Significant Species

Several species classified as ‘Rare’ or ‘Uncommon’ by the Nature Counts Project: Hamilton Natural Areas Inventory (Schwetz, N. 2014). Each of these species are discussed below.

### **Great Blue Heron (Uncommon)**

Great blue herons depend on wetlands where they feed on fish, amphibians, reptiles, small mammals, insects and birds. They are colonial nesters and build stick nests in trees. There were no observations of nesting great blue herons in the study area. Individuals were observed wading through Red Hill Creek, presumably hunting.

### **Chimney Swift (Uncommon)**

Historically found in deciduous and coniferous, usually wet forest types, all with a well-developed, dense shrub layer; now most are found in urban areas in large, uncapped chimneys. No observations of nesting by this species was identified within the study area; however, nesting within industrial portions of the study area could occur. Observations were limited to individuals foraging individuals over meadow and aquatic habitats.

### **Peregrine Falcon (Rare)**

The Peregrine Falcon is found in a wide range of habitats, from Arctic tundra to sea coasts, prairies and urban centres. These falcons usually build solitary nests on cliff ledges or crevices, but they sometimes build their nests on the ledges of tall buildings or bridges, always near an abundant source of prey. Individuals were observed flying over the study area. A breeding pair is known to nest annually on the Burlington Canal Lift Bridge structure, adjacent to the study area.

### **Mute Swan (Introduced; Rare)**

Mute Swans are not native to North America (native to Europe). In North America this species is found in wide variety of wetland areas including all types of marshes, lakes, park ponds, often in close association with humans, but also in some remote wild areas. Observations of individuals in the study area was limited to foraging/feeding; no nests were identified.

#### 3.4.8 Significant Wildlife Habitat, Ecoregion 7E

Significant Wildlife Habitat (SWH) has been identified as a natural heritage area for the purposes of Section 2.1 of the PPS. The PPS 2020 defines wildlife habitat as: *“Areas where plants, animals, and other organisms live, and find adequate amounts of food, water, shelter, and space needed to sustain their populations. Specific wildlife habitats of concern may include areas where species concentrate at a vulnerable point in their annual or life cycle; and areas which are important to migratory or non-migratory species.”*

Wildlife habitat is considered significant by the province where it is:

*“Ecologically important in terms of features, functions, representation, or amount, and contributing to the quality and diversity of an identifiable geographic area or Natural Heritage System. Criteria for determining significance may be*

*recommended by the Province, but municipal approaches that achieve the same objective may also be used.”*

SWH Criteria Schedules for Ecoregion 7E (MNRF 2015) was referenced to identify potential SWH within or in immediate proximity to the study area.

Data for ELC and the identified/potential wildlife assemblage and habitat was compiled and assessed according to the criteria outlined in MNRF’s Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E (MNRF 2015). Targeted SWH surveys were not conducted; however, data collected from 2021 anuran breeding surveys, breeding bird surveys, incidental observations and habitat review were undertaken to identify potential SWH Criteria Schedules for Ecoregion 7E. The analysis is provided in **Appendix F**. Site specific mitigation to address potential impacts to SWH will be prescribed, as appropriate, during a later phase of the project.

### **3.5 Designated Natural Areas**

Designated natural areas include areas identified for protection by the Ontario Ministry of Natural Resources and Forestry (MNRF), Hamilton Conservation Authority and upper and lower-tier municipalities. A review of relevant background data was undertaken to identify designated natural areas within and adjacent to the study. Designated natural areas within the vicinity of the study area are presented in **Figure 2**.

#### **3.5.1 Provincially Significant Wetlands (PSWs)**

There are no Provincially Significant Wetlands located within or 120 m beyond the limits of the study area.

#### **3.5.2 Areas of Natural and Scientific Interest (ANSIs)**

There are no Areas of Natural and Scientific Interest (ANSIs) located within or 120 m beyond the limits of the study area.

#### **3.5.3 Environmentally Significant Area (ESAs)**

A review of the City of Hamilton mapping indicates that the Hamilton Beach Strip Environmentally Significant Area (ESA) is located within the study area. Within the study area the Hamilton Beach Strip ESA is located along the Waterfront Trail adjacent to Lake Ontario and in addition, a small portion is adjacent to the Hamilton Harbour. The limits of the Hamilton Beach Strip ESA are presented in **Figure 2**.

Additionally, the Van Wagner’s Ponds and Marshes ESA is located outside of the study area, but within 200 m of the southern portion of the study area. The limits of the Van Wagner’s Ponds and Marshes ESA are presented in **Figure 2**.



### 3.5.4 City of Hamilton Official Plan

Based on a review of Schedule B (Natural Heritage System) of the City of Hamilton Urban Official Plan (2013) a portion of the study area is identified as 'core areas' and 'linkages' of the City of Hamilton Natural Heritage System. In addition, a review of all pertinent schedules of the City of Hamilton Official Plan (2013) was undertaken and the following designations were identified in the study area:

- Schedule B-4 (Detailed Natural Heritage Features Wetlands) a portion of the study area is identified as a Key Natural Heritage and Key Hydrological Feature - Wetlands;
- Schedule B-5 (Detailed Natural Heritage Features Lakes and Littoral Zones) a portion of the study area is identified as a Key Hydrological Feature - Lakes and Littoral Zones;
- Schedule B-6 (Detailed Natural Heritage Features Environmentally Significant Areas) a portion of the study area is identified as Local Natural Area - Environmentally Significant Area; and,
- Schedule B-8 (Detailed Natural Heritage Features Streams) a portion of the study area is identified as a Key Hydrological Feature - Streams.

### 3.5.5 Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses

A portion of the study area along the Lake Ontario and Hamilton Harbour waterfront is regulated under Ontario Regulation 161/06 (HCA) Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses. A permit will be required from HCA for development within these regulated areas. The regulated areas are presented in **Figure 2**.

## 4.0 PROJECT DESCRIPTION

The project entails several improvements to address flooding along Beach Boulevard including:

- Storm sewer inspection within three segments including: Eastport Outlet and QEW crossing; Lagoon Outlet and QEW crossing; and, trunk storm sewer between Eastport Channel and Windemere Basin Park;
- Storm sewer replacement within two segments including: Harbour Outlet and QEW crossing (twin or larger replacement); and, Dunraven Outlet and QEW crossing (twin or larger replacement);
- New storm sewer installation along two segments including: Wark Outlet and QEW crossing for the proposed pumping station; and, connection from Eastport Ditch to Hamilton Harbour opposite Dunraven Avenue;
- New storm sewer installation and ditch restoration on the east side of QEW from Towers Drive to Van Wagners Drive to support pumping station construction;
- Ditch rehabilitation along two segments including Eastport Drive and the QEW and Windemere Basin Park and Red Hill Creek;
- Modifications to road grading on Eastport Drive at Beach Boulevard intersection to address a sag point; and,
- New pumping station located at Wark Avenue.

The location of the proposed drainage improvements is presented in **Figures 4 and 5**.



**FIGURE 4. RECOMMENDED WORKS**

Storm sewer inspections would be non-invasive and involve damming each end, pumping out the water and then placing a camera within the pipe. The storm sewer replacement/installation would be a combination of open cut, and trenchless for sections under the QEW. The open cut trench would be approximately 4 m wide in total. Ditch rehabilitation/restoration depends on the location. For the section along the east side of the QEW draining to the new PS at Wark Avenue, it would be restoring the disturbance from the sewer construction and re-grading what is likely to be the result of MTO's planned work. For the larger ditch along Eastport Drive, that would mean removing all sediment and accumulated vegetation from the primary channel limits, and also invasive species management (phragmites) and restoration.



**FIGURE 5. WARK AVENUE PUMPING STATION**

## **5.0 IMPACT ASSESSMENT AND ENVIRONMENTAL PROTECTION**

This section focuses on the potential effects on significant environmental features and outlines the environmental protection/mitigation measures proposed to manage adverse effects related to terrestrial and aquatic ecosystems. Environmental effects are identified based on natural heritage issues/concerns anticipated associated with design plans and work zone impacts.

### **5.1 Aquatic Habitats and Communities**

The proposed flood remediation measures along Beach Boulevard have the potential to result in impacts fish and fish habitat due to the following effects:

- temporary disruption or permanent loss of site-specific habitat;
- changes to water quality and quantity;
- changes in water temperature; and,
- barriers to fish passage.

#### **5.1.1 Temporary Disruption or Permanent Loss of Site-Specific Habitat**

The Eastport Ditch will require in-water work to dredge and rehabilitate the channel. Within Reach 1, approximately 145 m of channel will require clean-out. Given that the channel is approximately 5.0 m wide, a total wetted area of 725 m<sup>2</sup> will be impacted on a temporary basis. Within Reach 2, approximately 1,470 m of channel will require clean-out. Given that the channel is approximately 5.0 m wide, a total wetted area of 7,350 m<sup>2</sup> will be impacted on a temporary basis. Both of these reaches directly support warmwater fish habitat and are connected to Red Hill Creek or other reaches of the Eastport Ditch. To reduce the potential for a HADD, the following environmental protection measures will be implemented:

- in-water work/work within riparian habitat should be permitted from July 1 to March 31 based on the presence of a warmwater fish community;
- work areas will be unwatered to establish dry conditions;
- where cofferdams are to be employed to isolate the work area, unwatering effluent will be treated prior to discharge to the receiving watercourse;
- where cofferdams are to be employed, a fish screen will be used at the end of the unwatering pump to prevent fish impingement and/or entrainment;
- fish isolated by unwatering activities will be captured and safely released to the watercourse;

- good housekeeping practices related to materials storage/stockpiling, equipment fuelling/ maintenance, etc. will be implemented during construction;
- dredge spoils will be managed such that sediment is prevented from re-entry to the watercourse; and,
- disturbed riparian areas will be vegetated and/or covered with an erosion control blanket as quickly as possible to stabilize the banks and minimize the potential for erosion and sedimentation.

These environmental protection measures will greatly reduce the potential adverse effects to fish and fish habitat resulting from construction activities.

#### 5.1.2 Temporary Change to Water Quality

The construction associated with the proposed works has the potential to alter water quality through on-site erosion of exposed materials and the subsequent impairment of downstream water quality with sediments and other contaminants.

Changes to water quality will be mitigated through the isolation of the work areas behind cofferdams, the treatment of effluent from unwatering prior to its release back into the receiving watercourses, and the deployment and maintenance of erosion and sediment controls (silt fencing, flow checks, etc.) which will prevent sediments from reaching the watercourses from exposed soils upslope. If the work area cannot be entirely isolated, turbidity curtains will be used to maintain water quality adjacent to the work area. In addition, all exposed areas should be vegetated as quickly as possible once the work is completed.

The implementation of these mitigation measures should eliminate potential changes to water quality to the receiving watercourses.

#### 5.1.3 Changes in Water Temperature

The thermal regime of a receiving watercourse may be altered by storm water runoff or removal of riparian vegetation that shades the watercourse. In the summer, runoff can become superheated through contact with paved surfaces, which, when discharged to a receiving watercourse can result in thermal shock, thereby injuring or killing aquatic organisms. Coldwater or coolwater streams are usually considered more sensitive to changes in water temperature than warmwater streams.

It is expected that there will be no significant increase in temperature as a result of the proposed works as long as appropriate storm water management strategies are implemented. The Eastport Ditch directly supports a warmwater fish community, which is considered less sensitive to thermal impacts.

#### 5.1.4 Barriers to Fish Passage

No permanent barriers to fish passage will result from this project.

#### 5.1.5 Restoration/Enhancement

The Eastport Drain will be stabilized following dredging and riparian areas will be revegetated. The goal of the restoration/enhancement plan is to provide an overall benefit to the watercourse at these locations through restoration of riparian habitat. These restoration and enhancement works will increase the quality of habitat in relation to what is present by increasing riparian cover, enhance habitat diversity through plantings of species that provide allochthonous inputs, and provide good floodplain connectivity.

#### 5.1.6 Permitting and Approvals

DFO's Fish and Fish Habitat Protection Program (FFHPP) ensures compliance with relevant provisions under the *Fisheries Act*. Proponents are required to determine if a *Harmful Alteration, Disruption or Destruction* (HADD) to fish or fish habitat is expected to occur as a result of activities from the project. Proponents use DFO screening criteria to determine if a review of the project by DFO is required, including measures to protect fish and fish habitat and Codes of Practice for routine works. The works proposed at the Eastport Drain are not likely to avoid a HADD to fish or fish habitat and are not covered by a Code of Practice. Therefore, a Request for Review of the project by DFO will be required during detail design. Depending on the results of the DFO review, a Letter of Advice or *Fisheries Act* authorization will be obtained prior to the start of construction.

### 5.2 Vegetation and Vegetation Communities

The proposed flood remediation measures along Beach Boulevard have the potential to result in impacts to vegetation and vegetation communities including:

- displacement of / disturbance to vegetation and vegetation communities; and,
- displacement of rare, threatened or endangered vegetation or significant vegetation communities.

#### 5.2.1 Displacement and/or Disturbance to Vegetation Communities/Vegetation

Clearing of vegetation will be required to accommodate new storm sewers constructed using the open trench method and the new pumping station at Wark Avenue. The largest area of impact will be to lands that have been anthropogenically influenced, including cultural vegetation communities and manicured areas. A total of 0.516 ha of vegetation communities will be removed as a result of the proposed drainage improvements. This includes the following ELC vegetation communities: Cultural Meadow (CUM1-1); Cultural Thicket (CUT1-1); Deciduous Forest (FOD4); and, Meadow

Marsh (MAM2). **Table 6** provides a summary of the total area of vegetation communities that will be removed for the flood remediation work. **Figure 6** shows the location of vegetation removals based on the preliminary design grading limits, which assumed a 4.0 m wide open trench to install storm sewers.

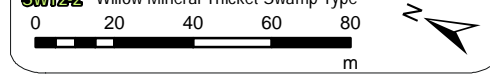
### **Cultural Vegetation Communities**

A total of two cultural community types will be impacted as a result of the proposed drainage improvements to Beach Boulevard involving an area of 0.212 ha. These include: Dry-Moist-Old Field Meadow (CUM1-1); and, Sumac Cultural Thicket (CUT1-1). Overall, impacts resulting in the loss of vegetation within these cultural communities are considered to be minor. Cultural vegetation communities typically persist in areas that are regularly disturbed, and as a result, generally contain a high proportion of invasive and non-native plant species that are tolerant of these conditions. It is expected that plant species displaced and / or disturbed within the cultural communities will return once trenches have been filled to match adjacent grades. Restoration of these areas can be promoted using a meadow seed mix.



**LEGEND**

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- Channel Rehabilitation
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- New Stormwater Sewer Installation - Open Cut
- New Stormwater Sewer Installation - Trenchless
- Upgrade to Stormwater Sewer - Open Cut
- Upgrade to Stormwater Sewer - Trenchless
- New Stormwater Sewer (Open Cut) and Channel Rehabilitation
- Pumping Station
- Vegetation Communities**
- Vegetation Community Boundary
- BBO1** Mineral Open Beach/Bar Ecosite
- CUM1-1** Dry-Moist Old Field Meadow Type
- CUS1** Mineral Cultural Savannah Ecosite
- CUT1** Mineral Cultural Thicket Ecosite
- CUT1-1** Sumac Cultural Thicket Type
- CUM1** Mineral Cultural Woodland Ecosite
- D** Disturbed
- FOD4** Dry-Fresh Deciduous Forest Ecosite
- M** Manicured
- MAM2** Mineral Meadow Marsh Ecosite
- MAM2-2** Reed-canary Grass Mineral Meadow Marsh Type
- MAS** Shallow Marsh
- SDO1** Open Sand Dune Ecosite
- SDO1-1** Little Bluestem-Switchgrass-Beachgrass Open Dune Type
- SDS1** Shrub Sand Dune Ecosite
- SDT1** Treed Sand Dune Ecosite
- SDT1-1** Cottonwood Treed Dune Type
- SWT2** Mineral Thicket Swamp Ecosite
- SWT2-2** Willow Mineral Thicket Swamp Type



**IMPACT ASSESSMENT**

















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<b>Date:</b> December, 2022	<b>Prepared By:</b> JJP
<b>Scale:</b> 1 : 2,000	<b>Checked By:</b> LMC

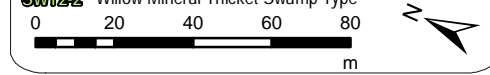
Data Sources: LGL Limited field surveys, City of Hamilton & Ministry of Natural Resources and Forestry (LIO). Contains information licenced under the Open Government Licence - Ontario.





**LEGEND**

-  Existing Stormwater Maintenance Hole
-  Existing Stormwater Sewers
-  Eastport Ditch Drainage System
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-  Area of Disturbance
- Proposed Design**
-  Channel Rehabilitation
-  Stormwater Sewer Inspections
-  New Stormwater Sewer Installation - Open Cut
-  New Stormwater Sewer Installation - Trenchless
-  Upgrade to Stormwater Sewer - Open Cut
-  Upgrade to Stormwater Sewer - Trenchless
-  New Stormwater Sewer (Open Cut) and Channel Rehabilitation
-  Pumping Station
- Vegetation Communities**
-  Vegetation Community Boundary
- BBO1** Mineral Open Beach/Bar Ecosite
- CUM1-1** Dry-Moist Old Field Meadow Type
- CUM1** Mineral Cultural Savannah Ecosite
- CUT1** Mineral Cultural Thicket Ecosite
- CUT1-1** Sumac Cultural Thicket Type
- CUM1** Mineral Cultural Woodland Ecosite
- D** Disturbed
- FOD4** Dry-Fresh Deciduous Forest Ecosite
- M** Manicured
- MAM2** Mineral Meadow Marsh Ecosite
- MAM2-2** Reed-canary Grass Mineral Meadow Marsh Type
- MAS** Shallow Marsh
- SDO1** Open Sand Dune Ecosite
- SDO1-1** Little Bluestem-Switchgrass-Beachgrass Open Dune Type
- SDS1** Shrub Sand Dune Ecosite
- SDT1** Treed Sand Dune Ecosite
- SDT1-1** Cottonwood Treed Dune Type
- SWT2** Mineral Thicket Swamp Ecosite
- SWT2-2** Willow Mineral Thicket Swamp Type



**IMPACT ASSESSMENT**

















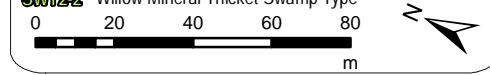
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<b>Date:</b> December, 2022	<b>Prepared By:</b> JJP
<b>Scale:</b> 1 : 2,000	<b>Checked By:</b> LMC

Data Sources: LGL Limited field surveys, City of Hamilton & Ministry of Natural Resources and Forestry (LIO). Contains information licenced under the Open Government Licence - Ontario.



**LEGEND**

-  Existing Stormwater Maintenance Hole
-  Existing Stormwater Sewers
-  Eastport Ditch Drainage System
-  Beach Boulevard Study Area
-  Area of Disturbance
- Proposed Design
  -  Channel Rehabilitation
  -  Stormwater Sewer Inspections
  -  New Stormwater Sewer Installation - Open Cut
  -  New Stormwater Sewer Installation - Trenchless
  -  Upgrade to Stormwater Sewer - Open Cut
  -  Upgrade to Stormwater Sewer - Trenchless
  -  New Stormwater Sewer (Open Cut) and Channel Rehabilitation
  -  Pumping Station
- Vegetation Communities
  -  Vegetation Community Boundary
  - BBO1** Mineral Open Beach/Bar Ecosite
  - CUM1-1** Dry-Moist Old Field Meadow Type
  - CUS1** Mineral Cultural Savannah Ecosite
  - CUT1** Mineral Cultural Thicket Ecosite
  - CUT1-1** Sumac Cultural Thicket Type
  - CUM1** Mineral Cultural Woodland Ecosite
  - D** Disturbed
  - FOD4** Dry-Fresh Deciduous Forest Ecosite
  - M** Manicured
  - MAM2** Mineral Meadow Marsh Ecosite
  - MAM2-2** Reed-canary Grass Mineral Meadow Marsh Type
  - MAS** Shallow Marsh
  - SDO1** Open Sand Dune Ecosite
  - SDO1-1** Little Bluestem-Switchgrass-Beachgrass Open Dune Type
  - SDS1** Shrub Sand Dune Ecosite
  - SDT1** Treed Sand Dune Ecosite
  - SDT1-1** Cottonwood Treed Dune Type
  - SWT2** Mineral Thicket Swamp Ecosite
  - SWT2-2** Willow Mineral Thicket Swamp Type



**IMPACT ASSESSMENT**



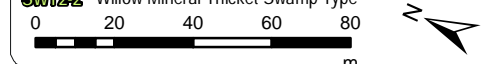
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<b>Date:</b> December, 2022	<b>Prepared By:</b> JJP
<b>Scale:</b> 1 : 2,000	<b>Checked By:</b> LMC

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**LEGEND**

- Existing Stormwater Maintenance Hole
- Existing Stormwater Sewers
- Eastport Ditch Drainage System
- Beach Boulevard Study Area
- Area of Disturbance
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  - Channel Rehabilitation
  - Stormwater Sewer Inspections
  - New Stormwater Sewer Installation - Open Cut
  - New Stormwater Sewer Installation - Trenchless
  - Upgrade to Stormwater Sewer - Open Cut
  - Upgrade to Stormwater Sewer - Trenchless
  - New Stormwater Sewer (Open Cut) and Channel Rehabilitation
  - Pumping Station
- Vegetation Communities
  - Vegetation Community Boundary
  - BBO1** Mineral Open Beach/Bar Ecosite
  - CUM1-1** Dry-Moist Old Field Meadow Type
  - CUS1** Mineral Cultural Savannah Ecosite
  - CUT1** Mineral Cultural Thicket Ecosite
  - CUT1-1** Sumac Cultural Thicket Type
  - CUM1** Mineral Cultural Woodland Ecosite
  - D** Disturbed
  - FOD4** Dry-Fresh Deciduous Forest Ecosite
  - M** Manicured
  - MAM2** Mineral Meadow Marsh Ecosite
  - MAM2-2** Reed-canary Grass Mineral Meadow Marsh Type
  - MAS** Shallow Marsh
  - SDO1** Open Sand Dune Ecosite
  - SDO1-1** Little Bluestem-Switchgrass-Beachgrass Open Dune Type
  - SDS1** Shrub Sand Dune Ecosite
  - SDT1** Treed Sand Dune Ecosite
  - SDT1-1** Cottonwood Treed Dune Type
  - SWT2** Mineral Thicket Swamp Ecosite
  - SWT2-2** Willow Mineral Thicket Swamp Type



**IMPACT ASSESSMENT**



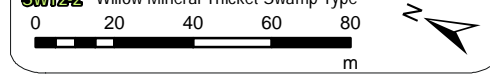
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<b>Scale:</b> 1 : 2,000	<b>Checked By:</b> LMC

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**LEGEND**

- Existing Stormwater Maintenance Hole
- Existing Stormwater Sewers
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  - New Stormwater Sewer Installation - Trenchless
  - Upgrade to Stormwater Sewer - Open Cut
  - Upgrade to Stormwater Sewer - Trenchless
  - New Stormwater Sewer (Open Cut) and Channel Rehabilitation
  - Pumping Station
- Vegetation Communities
  - Vegetation Community Boundary
  - BBO1** Mineral Open Beach/Bar Ecosite
  - CUM1-1** Dry-Moist Old Field Meadow Type
  - CUM1** Mineral Cultural Savannah Ecosite
  - CUT1** Mineral Cultural Thicket Ecosite
  - CUT1-1** Sumac Cultural Thicket Type
  - CUM1** Mineral Cultural Woodland Ecosite
  - D** Disturbed
  - FOD4** Dry-Fresh Deciduous Forest Ecosite
  - M** Manicured
  - MAM2** Mineral Meadow Marsh Ecosite
  - MAM2-2** Reed-canary Grass Mineral Meadow Marsh Type
  - MAS** Shallow Marsh
  - SDO1** Open Sand Dune Ecosite
  - SDO1-1** Little Bluestem-Switchgrass-Beachgrass Open Dune Type
  - SDS1** Shrub Sand Dune Ecosite
  - SDT1** Treed Sand Dune Ecosite
  - SDT1-1** Cottonwood Treed Dune Type
  - SWT2** Mineral Thicket Swamp Ecosite
  - SWT2-2** Willow Mineral Thicket Swamp Type

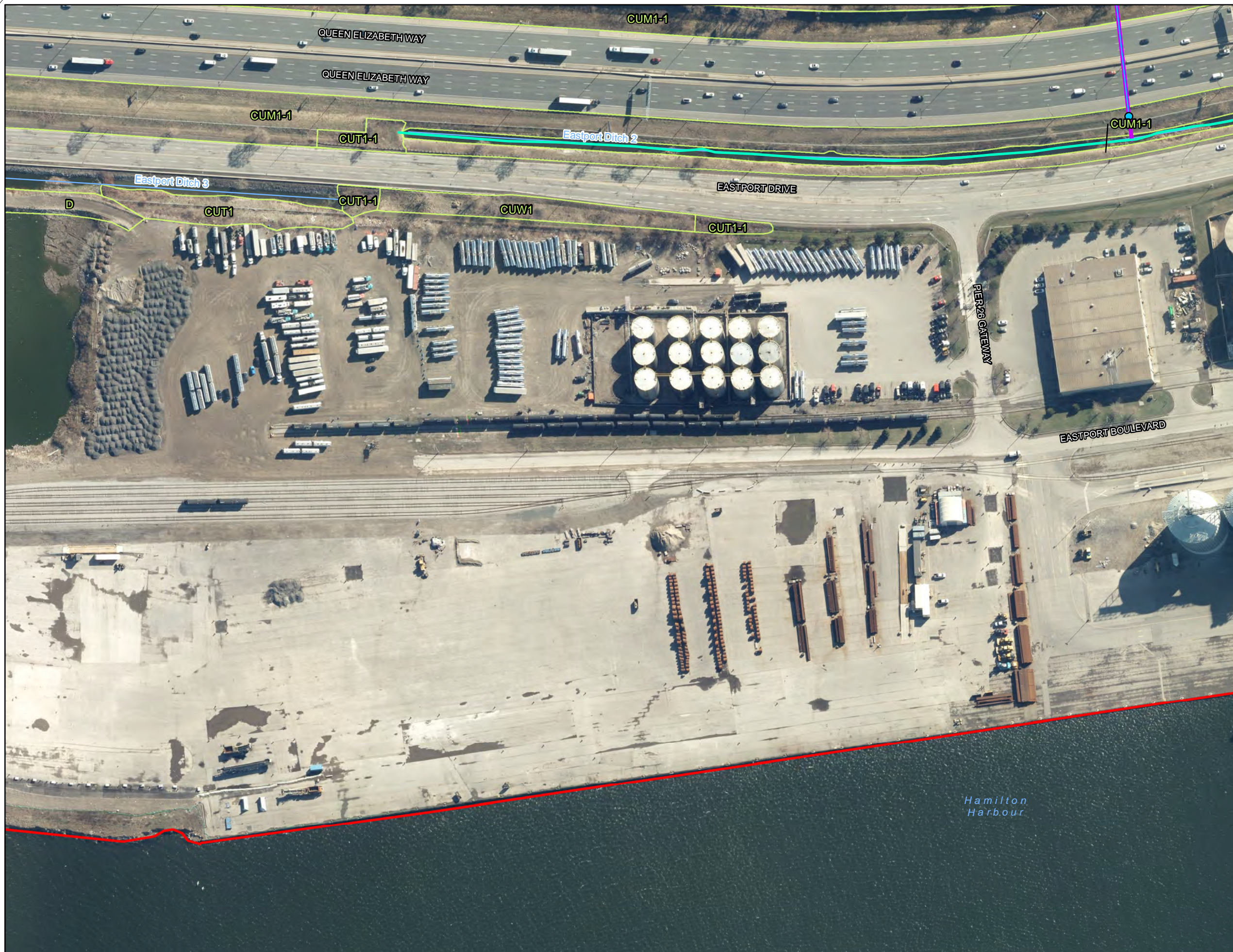


**IMPACT ASSESSMENT**

















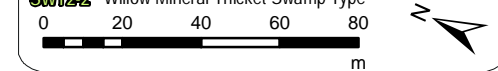
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<b>Date:</b> December, 2022	<b>Prepared By:</b> JJP
<b>Scale:</b> 1 : 2,000	<b>Checked By:</b> LMC

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**LEGEND**

-  Existing Stormwater Maintenance Hole
-  Existing Stormwater Sewers
-  Eastport Ditch Drainage System
-  Beach Boulevard Study Area
-  Area of Disturbance
- Proposed Design
  -  Channel Rehabilitation
  -  Stormwater Sewer Inspections
  -  New Stormwater Sewer Installation - Open Cut
  -  New Stormwater Sewer Installation - Trenchless
  -  Upgrade to Stormwater Sewer - Open Cut
  -  Upgrade to Stormwater Sewer - Trenchless
  -  New Stormwater Sewer (Open Cut) and Channel Rehabilitation
  -  Pumping Station
- Vegetation Communities
  -  Vegetation Community Boundary
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  - CUM1-1** Dry-Moist Old Field Meadow Type
  - CUW1** Mineral Cultural Savannah Ecosite
  - CUT1** Mineral Cultural Thicket Ecosite
  - CUT1-1** Sumac Cultural Thicket Type
  - CUW1** Mineral Cultural Woodland Ecosite
  - D** Disturbed
  - FOD4** Dry-Fresh Deciduous Forest Ecosite
  - M** Manicured
  - MAM2** Mineral Meadow Marsh Ecosite
  - MAM2-2** Reed-canary Grass Mineral Meadow Marsh Type
  - MAS** Shallow Marsh
  - SD01** Open Sand Dune Ecosite
  - SD01-1** Little Bluestem-Switchgrass-Beachgrass Open Dune Type
  - SDS1** Shrub Sand Dune Ecosite
  - SDT1** Treed Sand Dune Ecosite
  - SDT1-1** Cottonwood Treed Dune Type
  - SWT2** Mineral Thicket Swamp Ecosite
  - SWT2-2** Willow Mineral Thicket Swamp Type

















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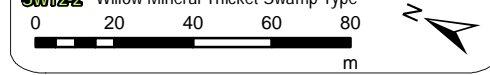


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<b>Date:</b> December, 2022	<b>Prepared By:</b> JJP
<b>Scale:</b> 1 : 2,000	<b>Checked By:</b> LMC



**LEGEND**

-  Existing Stormwater Maintenance Hole
-  Existing Stormwater Sewers
-  Eastport Ditch Drainage System
-  Beach Boulevard Study Area
-  Area of Disturbance
- Proposed Design
  -  Channel Rehabilitation
  -  Stormwater Sewer Inspections
  -  New Stormwater Sewer Installation - Open Cut
  -  New Stormwater Sewer Installation - Trenchless
  -  Upgrade to Stormwater Sewer - Open Cut
  -  Upgrade to Stormwater Sewer - Trenchless
  -  New Stormwater Sewer (Open Cut) and Channel Rehabilitation
  -  Pumping Station
- Vegetation Communities
  -  Vegetation Community Boundary
  - BBO1** Mineral Open Beach/Bar Ecosite
  - CUM1-1** Dry-Moist Old Field Meadow Type
  - CUS1** Mineral Cultural Savannah Ecosite
  - CUT1** Mineral Cultural Thicket Ecosite
  - CUT1-1** Sumac Cultural Thicket Type
  - CUM1** Mineral Cultural Woodland Ecosite
  - D** Disturbed
  - FOD4** Dry-Fresh Deciduous Forest Ecosite
  - M** Manicured
  - MAM2** Mineral Meadow Marsh Ecosite
  - MAM2-2** Reed-canary Grass Mineral Meadow Marsh Type
  - MAS** Shallow Marsh
  - SDO1** Open Sand Dune Ecosite
  - SDO1-1** Little Bluestem-Switchgrass-Beachgrass Open Dune Type
  - SDS1** Shrub Sand Dune Ecosite
  - SDT1** Treed Sand Dune Ecosite
  - SDT1-1** Cottonwood Treed Dune Type
  - SWT2** Mineral Thicket Swamp Ecosite
  - SWT2-2** Willow Mineral Thicket Swamp Type



**IMPACT ASSESSMENT**

















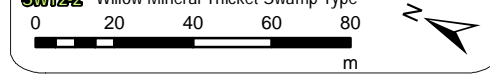
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<b>Date:</b> December, 2022	<b>Prepared By:</b> JJP
<b>Scale:</b> 1 : 2,000	<b>Checked By:</b> LMC

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**LEGEND**

-  Existing Stormwater Maintenance Hole
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  - CUS1** Mineral Cultural Savannah Ecosite
  - CUT1** Mineral Cultural Thicket Ecosite
  - CUT1-1** Sumac Cultural Thicket Type
  - CUW1** Mineral Cultural Woodland Ecosite
  - D** Disturbed
  - FOD4** Dry-Fresh Deciduous Forest Ecosite
  - M** Manicured
  - MAM2** Mineral Meadow Marsh Ecosite
  - MAM2-2** Reed-canary Grass Mineral Meadow Marsh Type
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  - SDT1-1** Cottonwood Treed Dune Type
  - SWT2** Mineral Thicket Swamp Ecosite
  - SWT2-2** Willow Mineral Thicket Swamp Type



**IMPACT ASSESSMENT**



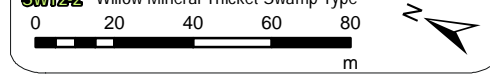
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<b>Scale:</b> 1 : 2,000	<b>Checked By:</b> LMC

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**IMPACT ASSESSMENT**



<b>Project:</b> TA9030	<b>Figure:</b> 6.9
<b>Date:</b> December, 2022	<b>Prepared By:</b> JJP
<b>Scale:</b> 1 : 2,000	<b>Checked By:</b> LMC

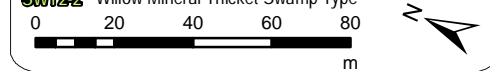
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**IMPACT ASSESSMENT**

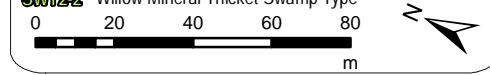


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<b>Date:</b> December, 2022	<b>Prepared By:</b> JJP
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**IMPACT ASSESSMENT**

















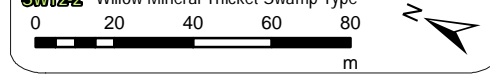
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<b>Date:</b> December, 2022	<b>Prepared By:</b> JJP
<b>Scale:</b> 1 : 2,000	<b>Checked By:</b> LMC

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**IMPACT ASSESSMENT**



<b>Project:</b> TA9030	<b>Figure:</b> 6.12
<b>Date:</b> December, 2022	<b>Prepared By:</b> JJP
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**TABLE 6.**  
**IMPACTS TO VEGETATION COMMUNITIES WITHIN THE STUDY AREA**

<b>Vegetation Community Type</b>	<b>Vegetation Community</b>	<b>Total Area (ha) to be Impacted</b>
Cultural	Dry-Moist Old Field Meadow (CUM1-1)	0.084
	Sumac Cultural Thicket (CUT1-1)	0.128
	<b>Sub-total</b>	<b>0.212</b>
Forest	Dry-Fresh Deciduous Forest (FOD4)	0.30
	<b>Sub-total</b>	<b>0.30</b>
Wetland	Mineral Meadow Marsh (MAM2)	0.005
	<b>Sub-total</b>	<b>0.0005</b>
<b>Total Area</b>		<b>0.516</b>

**Forest Communities**

A total of 0.30 ha of Dry-Fresh Deciduous Forest (FOD4) will be removed as a result of the proposed drainage improvements to Beach Boulevard. Impacts to the deciduous forest will include the removal of a small portion of the community located adjacent to the proposed pumping station at Wark Avenue and installation of a new storm sewer in several locations. New forest edges are exposed to greater potential for non-native and invasive species infiltration further into the forest, and as such, implementation of a forest edge management plan is recommended as outlined below.

All of the forest communities located within the study area are widespread throughout Ontario and the loss of a small portion of these vegetation communities is not expected to have any negative impacts to the remaining forest communities.

**Wetland Communities**

A total of 0.005 ha of Mineral Meadow Marsh (MAM2) will be removed as a result of the proposed drainage improvements to Beach Boulevard. Impacts to the wetland communities will generally result in the removal of a narrow strip along the new storm sewer located at Beach Boulevard and the QEW on ramp. It is anticipated that these wetlands will return once trenches have been filled to match existing grades. Restoration of these areas can be promoted using a wetland seed mix.

### 5.2.2 Displacement of Rare, Threatened or Endangered Vegetation and Vegetation Communities

All of the vegetation communities identified within the study area are considered to be widespread and common in Ontario and secure globally. No plant species that are regulated under the Ontario *Endangered Species Act, 2007* or the Canada *Species at Risk Act* were observed during LGL's botanical investigation. In addition, no plant species that are provincially ranked as "critically imperilled" to "vulnerable" (S1 to S3) were observed within the study area. As a result, there will be no impacts on rare, threatened or endangered vegetation and vegetation communities.

As noted in **Section 3.3.4**, a total five plant species considered rare in Hamilton were identified in the study area. **Table 3** presents a list of these species. It is recommended that the regionally and locally rare plant species be retained, to the extent possible. If impacts are unavoidable, it is recommended that regionally and locally significant plant species, including individual shrub and trees that measure less than 10 cm DBH, be transplanted into suitable habitat conditions. Where possible, these plants should be transplanted into the newly created edges of those impacted communities, but outside the limit of disturbance.

### 5.2.3 Mitigation

Impacts to wetland and forest communities within the study area will primarily result in the removal of a narrow strip of vegetation for the open cut trench and creation of new vegetation community edges. Edge management will be implemented to protect the new community edge, although the total encroachment into existing forest and wetlands is considered negligible.

#### **Edge Management**

Where new forest edges are exposed, forest management techniques will be implemented to mitigate the associated impacts to the forest communities. As part of the forest edge management, mitigation measures will include, but not be limited to, the following:

- Planting of appropriate native trees, shrubs and ground flora which shall be undertaken as soon as possible following vegetation removals. Plantings along the disturbed forest edges will provide a protective buffer. Newly exposed forest edges become exposed to a greater potential for aggressive and invasive species infiltration further into the forest interior causing greater impacts. Micro-habitat conditions are also altered due to a greater incident of light penetrating further into the forest resulting in decreased soil moisture and increased windthrow. Plant species used within the buffer shall be somewhat similar to those in the adjacent habitat and be non-invasive in nature;

- Grading within areas where edges will be newly created shall be designed to meet existing grades a minimum of 3.0 m away from the tree drip-line;
- Compaction of soils on lands immediately adjacent to the newly exposed forest edge will be minimized to the extent possible. Construction activities can result in cut roots, and soil compaction due to re-grading and fill placement. Cut tree roots can reduce a tree's capacity to uptake and transfer water and nutrients, and soil compaction can result in a decrease in air spaces within the soil which can reduce the infiltration capacity of the soil, limits soil oxygen and limits root penetration. Decompaction efforts and methodology shall be site specific. Where decompaction is required, it shall extend to a minimum depth of approximately 25 cm;
- Drainage patterns adjacent to newly created edges shall be maintained to avoid changes in soil moisture, this is especially important around wetland areas and forest communities with substrates that maintain increased moisture capacity;
- A plan must be in place to immediately mitigate the spread/invasion of aggressive plant species; and,
- A monitoring plan must be developed to ensure that the newly planted material survives and fulfils the intended function and to ensure that the inadvertent spread of aggressive or non-native plant species is appropriately managed.

During the detail design phase, a forest edge management plan shall be prepared for those communities where forest edge management is recommended.

### **Invasive Species Management**

Efforts to control non-native and invasive plant species that have become established, as well as prevent the establishment of new non-native and invasive plant species at a minimum should include the following:

- minimize the exposure of bare soil, where bare soil must persist over a period of time these should be planted with a non-invasive annual cover crop for an interim period; and,
- no non-native and invasive ornamentals plants should be used for landscaping (e.g., Norway maple, purple loosestrife, Japanese knotweed, Japanese honeysuckle, etc.).

In addition, efforts should be made to prevent the spread of invasive plant species during construction both on and off site. Sanitation of construction equipment should be undertaken in accordance with the *Clean Equipment Protocol for Industry* (Halloran, Anderson and Tassie 2013) and at a minimum should include sanitation of construction

vehicles and equipment prior to leaving and moving to the next site. A cleaning station should be set up, so vehicles and equipment can be inspected and cleaned regularly.

### **Construction Best Management Practices**

At a minimum, the following mitigation measures will be implemented during construction:

- vegetation cover will be used to protect any exposed surfaces in accordance with OPSS 804 -Construction Specification for Seed and Cover;
- topsoil from stockpiles to be in accordance with OPSS 802 - Construction Specification for Topsoil;
- old field seed mix and mulching or erosion control blanket will be placed in areas of soil disturbance to provide adequate slope protection and long-term slope stabilization; and,
- tree protection will be installed in accordance with OPSS 801 - Construction Specification for the Protection of Trees and/or the City of Hamilton Tree Protection Guidelines (Hamilton 2022).

### **5.3 Wildlife and Wildlife Habitat**

The proposed flood remediation measures along Beach Boulevard have the potential to result in impacts to wildlife and wildlife habitat including:

- displacement of wildlife and wildlife habitat;
- barrier effects on wildlife passage;
- disturbance to wildlife from noise, light and visual intrusion;
- potential impacts to migratory birds; and
- displacement of rare, threatened or endangered wildlife and significant wildlife habitat.

#### **5.3.1 Displacement of Wildlife and Wildlife Habitat**

Clearing of wildlife habitat will be required to accommodate new storm sewers constructed using the open trench method and the new pumping station at Wark Avenue. The largest area of impact will be to lands that have been anthropogenically influenced, including cultural vegetation communities and manicured areas. A total of 0.516 ha of wildlife habitat will be removed as a result of the proposed drainage improvements. Much of this wildlife habitat will be reinstated following backfilling of the open trench used to install storm sewers.

Wildlife salvage will be carried out prior to and during vegetation clearing activities. Wildlife will be captured or made to disperse during vegetation clearing. A Scientific Collectors Permit under the *Fish and Wildlife Conservation Act* will be obtained prior to salvage activities. Wildlife that are captured will be relocated to nearby natural areas with similar habitat conditions.

### 5.3.2 Barrier Effects on Wildlife Passage

No new permanent movement barriers to wildlife will be created as a result of drainage improvements.

### 5.3.3 Disturbance to Wildlife from Noise, Light and Visual Intrusion

Noise, light and visual intrusion may alter wildlife activities and patterns. In urban settings, such as the study area, wildlife has become acclimatized to urban conditions and only those fauna that are tolerant of human activities remain. Given that wildlife are acclimatized to urban conditions, the tolerance of the wildlife assemblage to human activities, the limited zone of influence and short duration of the proposed construction activities, disturbance to wildlife from noise, light and visual intrusion will have no significant adverse effects.

### 5.3.4 Potential Impacts to Migratory Birds

Numerous bird species listed under the *Migratory Birds Convention Act* (MBCA) are located within the study area. The MBCA prohibits the killing, capturing, injuring, taking or disturbing of migratory birds (including eggs) or the damaging, destroying, removing or disturbing of nests. While migratory insectivorous and non-game birds are protected year-round, migratory game birds are only protected from March 10 to September 1. To comply with the requirements of the MBCA, disturbance, clearing or disruption of vegetation where birds may be nesting should be completed outside the window of April 1 to July 31. In the event that these activities must be undertaken between April 1 and July 31, a nest survey will be conducted by a qualified avian biologist to identify and locate active nests of species covered by the MBCA. If an active nest is located, a mitigation plan shall be developed and provided to Environment Canada – Ontario Region for review prior to implementation.

### 5.3.5 Displacement of Rare, Threatened or Endangered Wildlife or Significant Wildlife Habitat

Two species at risk regulated under the *Endangered Species Act* were found within the study area based on field surveys – Barn Swallow and Chimney Swift. Both of these species were observed foraging in the study area and no nesting habitat for either of these two species will be destroyed to accommodate drainage improvements. There is a potential for species at risk bats to be present within the study area. A snag/cavity tree survey should be carried out within FOD4 vegetation communities to confirm the



presence/absence of roosting habitat. Should wildlife trees be present within areas of disturbance, acoustic surveys accompanied by exit surveys should be carried out to confirm the presence of species at risk bats. A summary of SAR species recorded or with potential to reside in the study area, targeted survey requirements, and proposed mitigation is presented in **Table 7**.

#### **5.4 Designated Natural Areas**

No designated natural areas will be impacted by the proposed drainage improvements.

**TABLE 7.  
 SPECIES AT RISK ANTICIPATED IMPACTS AND PROPOSED SURVEY REQUIREMENTS AND MITIGATION**

<b>Common Name</b>	<b>Scientific Name</b>	<b>Species at Risk Act (Sch 1)</b>	<b>Endangered Species Act</b>	<b>Potential to Occur</b>	<b>Rationale for Potential to Occur</b>	<b>Impacts Anticipated (if present)</b>	<b>Targeted Surveys/Mitigation Development Required During D.D.</b>
Barn Swallow	<i>Hirundo rustica</i>	THR	THR	Confirmed	This species was observed foraging within the study area. No nesting habitat was recorded.	No impacts anticipated.	No targeted surveys required.
Chimney Swift	<i>Chaetura pelagica</i>	THR	THR	Confirmed	This species was observed foraging within the study area. No nesting habitat was recorded.	No impacts anticipated.	No targeted surveys required.
Eastern small-footed myotis	<i>Myotis leibii</i>	—	END	Low	No suitable rock piles were identified for roosting and no potential hibernacula were identified in the study area.	No impacts anticipated.	No targeted surveys required.

**TABLE 7.  
 SPECIES AT RISK ANTICIPATED IMPACTS AND PROPOSED SURVEY REQUIREMENTS AND MITIGATION**

<b>Common Name</b>	<b>Scientific Name</b>	<b>Species at Risk Act (Sch 1)</b>	<b>Endangered Species Act</b>	<b>Potential to Occur</b>	<b>Rationale for Potential to Occur</b>	<b>Impacts Anticipated (if present)</b>	<b>Targeted Surveys/Mitigation Development Required During D.D.</b>
Little brown myotis	<i>Myotis lucifugus</i>	END	END	Moderate	Buildings and mature trees are present within the study area that may provide roosting habitat. No potential hibernacula were identified in the study area.	No/minor impacts anticipated.	Review of habitat conditions (using standardized protocols) and development of mitigation to protect species/habitat.
Tri-colored bat	<i>Perimyotis subflavus</i>	END	END	Moderate	Mature trees are present within the study area that may provide roosting habitat. No potential hibernacula were identified in the study area.	No/minor impacts anticipated.	Review of habitat conditions (using standardized protocols) and development of mitigation to protect species/habitat.
Northern myotis	<i>Myotis septentrionalis</i>	END	END	Moderate	Mature trees are present within the study area that may provide roosting habitat. No potential hibernacula were identified in the Study area.	No/minor impacts anticipated.	Review of habitat conditions (using standardized protocols) and development of mitigation to protect species/habitat.

## 6.0 CONCLUSIONS AND RECOMMENDATIONS

There are several areas that exist in a natural to semi-natural state that will require site-specific environmental management measures. The following tasks shall be carried out in greater detail during future design phases including:

- Preparation of the following environmental management plans: Edge Management Plan; Compensation/Restoration Plans; Erosion and Sediment Control Plan; and, Environmental Inspection and Monitoring Plan;
- Further correspondence shall take place with MECP to discuss permitting requirements for species at risk bats including preparation of an Information Gathering Form (IGF), Avoidance Alternatives Form (AAF) and an application for an overall benefit permit under Section 17(2)(c) of the ESA; and,
- A Request for Review will be submitted to DFO to determine the potential for “harmful alteration of fish habitat” once dredging requirements have been confirmed in the Eastport Drain as DFO’s “measures to protect fish and fish habitat” cannot be fully implemented and there are no ‘standards and codes of practices’ that apply to proposed activities.

## 7.0 REFERENCES

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**APPENDIX A**  
**PHOTOGRAPHIC RECORD OF WATERCOURSE CROSSINGS**

PROJECT #TA9076  
April 2020

## PHOTO APPENDIX

### Burlington Canal, Lake Ontario open coast, Hamilton Harbour



East portion of the Burlington Canal facing east



Central portion of the Burlington Canal facing west. Note lift bridge (Eastport Drive) in foreground and Burlington Skyway (QEW) in background



West portion of the Burlington Canal facing west into Hamilton Harbour



Open coast of Lake Ontario facing south along Hamilton Beach



East shoreline of Hamilton Harbour facing south. Note boat launch in foreground and Burlington Skyway to left



# PHOTO APPENDIX

## Red Hill Creek



Upstream end of Red Hill Creek facing downstream (NW) from Eastport Drive crossing. Note CSP outlet from Eastport Ditch 1 along shoreline



Typical shoreline of Red Hill Creek in upstream portion investigated facing downstream (NW)



Typical shoreline of Red Hill Creek in middle section investigated facing upstream (S)



Red Hill Creek facing W across channel to rehabilitated wetland separated from watercourse by berm



Downstream (north) portion of Red Hill Creek showing shoreline, riparian area and instream woody debris. Note Pier 24/25 Gateway bridge in background



Downstream portion of Red Hill Creek facing upstream (SE)

# PHOTO APPENDIX

## Eastport Ditch 1



Downstream end of outlet to Red Hill Creek, facing S.  
Note Eastport Drive crossing in upper left



Upstream end of outlet to Red Hill Creek, facing SE



Eastport Ditch 1 facing upstream (NW) from outlet culvert



Eroded storm water outlet pipe midway upstream in ditch,  
facing NW. Note sediment accumulation



Downstream end of outlet pipe from Eastport Ditch 2,  
facing downstream (SE)



Downstream end of Eastport Ditch 1 at the end of the growing  
season showing dense riparian and emergent vegetation growth.  
Facing downstream (SE). Outlet to Red Hill Creek in background

# PHOTO APPENDIX

## Eastport Ditch 2



Upstream end of CSP pipe connecting downstream end of Eastport Ditch 2 to Eastport Ditch 1, facing upstream (NW)



Downstream portion of Eastport Ditch 2, facing upstream (NW)



Same area as previous photo but at end of growing season showing dense vegetation growth and duckweed



Areas of standing open water and sparse vegetation separated by dry/dryer areas of dense emergent vegetation are typical. Facing downstream (SE)



Outlet from storm water system of Beach Boulevard community, facing east



North end of Eastport Ditch 2, facing north

# PHOTO APPENDIX

## Eastport Ditch 3



South end of Eastport Ditch 3 at end of growing season. Facing south



South end of Eastport Ditch 3 prior to growing season. Facing northeast



Middle portion of Eastport Ditch 3 showing bermed area at end of growing season. Facing south



Middle portion of Eastport Ditch 3 in same area as previous photo but prior to growing season. Facing south



North portion of Eastport Ditch 3, facing northwest (November 2021)



North end of Eastport Ditch 3. Note no obvious connection to Hamilton Harbour or Tollgate Ponds. Facing west

**APPENDIX B**  
**VASCULAR PLANT LIST**





Appendix B.  
Vascular Plant List

Scientific Name	Common Name	GRank	SRank	MNR	COSEWIC	Hamilton	CUM1-1	CUS1	CUT1	CUT1/CUM1-1	CUT1-1	CUW1	FOD4	MAM2	MAM2-2	MAS	SDO	SDO1-1	SDS	SdT1	SDT1-1	SWT2-2
<i>Gleditsia triacanthos</i>	honey locust	G5				I			X													
* <i>Medicago lupulina</i>	black medick	G?	SE5			I	X		X													
* <i>Medicago sativa</i> ssp. <i>sativa</i>	alfalfa	G?T?	SE5			I	X															
* <i>Melilotus alba</i>	white sweet-clover	G?	SE5			I	X															
* <i>Robinia pseudo-acacia</i>	black locust	G5	SE5			I	X		X											X	X	
* <i>Trifolium pratense</i>	red clover	G?	SE5			I	X															
* <i>Vicia cracca</i>	tufted vetch	G?	SE5			I		X														
<b>ELAEAGNACEAE</b>	<b>OLEASTER FAMILY</b>																					
* <i>Elaeagnus angustifolia</i>	Russian olive	G?	SE3			I	X	X	X			X										X
<b>LYTHRACEAE</b>	<b>LOOSESTRIFE FAMILY</b>																					
* <i>Lythrum salicaria</i>	purple loosestrife	G5	SE5			I										X						
<b>ONAGRACEAE</b>	<b>EVENING-PRIMROSE FAMILY</b>																					
<i>Oenothera biennis</i>	common evening-primrose	G5	S5									X					X	X			X	
<b>CORNACEAE</b>	<b>DOGWOOD FAMILY</b>																					
<i>Cornus racemosa</i>	red paniced dogwood	G5?	S5						X													
<i>Cornus sericea</i> ssp. <i>sericea</i>	red-osier dogwood	G5	S5					X	X						X	X						X
<b>EUPHORBIACEAE</b>	<b>SPURGE FAMILY</b>																					
<i>Chamaesyce maculata</i>	hairy-fruited spurge	G5	SE5			I											X			X		
<b>RHAMNACEAE</b>	<b>BUCKTHORN FAMILY</b>																					
* <i>Rhamnus cathartica</i>	common buckthorn	G?	SE5			I	X	X	X	X		X	X							X		
<b>VITACEAE</b>	<b>GRAPE FAMILY</b>																					
<i>Parthenocissus vitacea</i>	inserted Virginia-creeper	G5	S5						X	X	X		X				X		X	X	X	X
<i>Vitis aestivalis</i>	summer grape	G5	S4				X															
<i>Vitis riparia</i>	riverbank grape	G5	S5					X	X	X	X	X	X	X			X	X	X	X	X	X
<b>HIPPOCASTANACEAE</b>	<b>BUCKEYE FAMILY</b>																					
* <i>Aesculus hippocastanum</i>	horse chestnut	G?	SE2			I			X													
<b>ACERACEAE</b>	<b>MAPLE FAMILY</b>																					
<i>Acer negundo</i>	manitoba maple	G5	S5					X	X		X	X	X			X				X	X	X
* <i>Acer platanoides</i>	norway maple	G?	SE5			I			X				X							X		
<i>Acer saccharum</i> var. <i>saccharum</i>	sugar maple	G5T?	S5						X													
<i>Acer X freemanii</i>	freeman's maple						X															
<b>ANACARDIACEAE</b>	<b>SUMAC FAMILY</b>																					
* <i>Cotinus coggygria</i>	smoke-tree	G?	SE1			I															X	
<i>Rhus hirta</i>	staghorn sumac	G5	S5				X		X		X	X	X				X	X	X	X	X	





Appendix B.  
Vascular Plant List

Scientific Name	Common Name	GRank	SRank	MNR	COSEWIC	Hamilton	CUM1-1	CUS1	CUT1	CUT1/CUM1-1	CUT1-1	CUW1	FOD4	MAM2	MAM2-2	MAS	SDO	SDO1-1	SDS	SdT1	SDT1-1	SWT2-2
<b>CAPRIFOLIACEAE</b>	<b>HONEYSUCKLE FAMILY</b>																					
* <i>Lonicera tatarica</i>	tartarian honeysuckle	G?	SE5			I				X			X							X		
<i>Symphoricarpos albus</i>	snowberry	G5	S5				X	X														
* <i>Viburnum opulus</i>	guelder rose	G5	SE4			I			X													
<b>DIPSACACEAE</b>	<b>TEASEL FAMILY</b>																					
* <i>Dipsacus fullonum</i> ssp. <i>sylvestris</i>	wild teasel	G?T?	SE5			I	X	X	X	X												
<b>ASTERACEAE</b>	<b>ASTER FAMILY</b>																					
* <i>Achillea millefolium</i> var. <i>millefolium</i>	common yarrow	G5T?	SE?			I	X		X													
<i>Ambrosia artemisiifolia</i>	common ragweed	G5	S5				X										X					
* <i>Arctium minus</i>	common burdock	G?T?	SE5			I	X		X	X		X	X					X				
* <i>Artemisia biennis</i>	biennial wormwood	G5	SE5			I			X				X									
<i>Aster ericoides</i> var. <i>ericoides</i>	white heath aster	G5T?	S5				X					X									X	
<i>Aster lanceolatus</i> ssp. <i>lanceolatus</i>	tall white aster	G5T?	S5						X													X
* <i>Carduus acanthoides</i>	plumeless thistle	G?	SE5			I	X															
* <i>Cichorium intybus</i>	chicory	G?	SE5			I	X	X				X					X					
* <i>Cirsium arvense</i>	Canada thistle	G?	SE5			I	X	X		X												
* <i>Cirsium vulgare</i>	bull thistle	G5	SE5			I	X		X	X		X										
<i>Conyza canadensis</i>	horseweed	G5	S5									X	X						X		X	
<i>Euthamia graminifolia</i>	flat-topped bushy goldenrod	G5	S5					X			X											
* <i>Helianthus tuberosus</i>	Jerusalem artichoke	G5	SE5			I			X								X		X		X	
* <i>Lapsana communis</i>	nipplewort	G?	SE5			I	X															
* <i>Leucanthemum vulgare</i>	ox-eye daisy	G?	SE5			I	X	X		X												
* <i>Matricaria discoidea</i>	pineapple-weed	G5	SE5			I					X											
<i>Solidago canadensis</i>	canada goldenrod	G5	S5				X	X	X		X	X	X	X					X	X	X	
* <i>Sonchus arvensis</i> ssp. <i>arvensis</i>	field sow-thistle	G?T?	SE5			I	X	X				X									X	
<i>Symphotrichum novae-angliae</i>	New England aster	G5	S5				X	X	X		X								X		X	X
* <i>Tanacetum vulgare</i>	common tansy	G?	SE5			I															X	
* <i>Taraxacum officinale</i>	common dandelion	G5	SE5			I	X				X		X						X		X	
* <i>Tragopogon dubius</i>	doubtful goat's-beard	G?	SE5			I			X	X							X				X	
* <i>Tussilago farfara</i>	coltsfoot	G?	SE5			I													X			
<b>POACEAE</b>	<b>GRASS FAMILY</b>																					
<i>Ammophila breviligulata</i>	short-liguled beach grass	G5	S3			H											X	X	X	X	X	
* <i>Bromus inermis</i> ssp. <i>inermis</i>	awnless brome	G4G5T?	SE5			I		X	X		X	X	X	X					X		X	
* <i>Bromus tectorum</i>	downy chess	G?	SE5			I	X		X								X		X	X		

**Appendix B.  
Vascular Plant List**

Scientific Name	Common Name	GRank	SRank	MNR	COSEWIC	Hamilton	CUM1-1	CUS1	CUT1	CUT1/CUM1-1	CUT1-1	CUW1	FOD4	MAM2	MAM2-2	MAS	SDO	SDO1-1	SDS	SDT1	SDT1-1	SWT2-2
* <i>Dactylis glomerata</i>	orchard grass	G?	SE5			I	X	X		X								X				
<i>Elymus canadensis</i>	nodding wild rye	G5	S4S5			H	X															
* <i>Elymus repens</i>	quack grass	G?	SE5			I	X															
* <i>Miscanthus sinensis</i>	Japanese plume grass	G?	SE1			I							X									
<i>Phalaris arundinacea</i>	reed canary grass	G5	S5				X	X							X	X						
* <i>Phleum pratense</i>	timothy	G?	SE5			I				X		X										
<i>Phragmites australis</i> ssp. <i>australis</i>	European reed					I	X		X					X	X	X						X
<i>Poa compressa</i>	Canada blue grass	G?	S5								X											
<i>Poa pratensis</i> ssp. <i>pratensis</i>	Kentucky bluegrass	G5T	S5			I	X	X	X	X	X	X	X						X	X		
<i>Schizachyrium scoparium</i>	little bluestem	G5	S4			H											X					
<i>Sorghastrum nutans</i>	Indian grass	G5	S4			H												X				
<b>TYPHACEAE</b>	<b>CATTAIL FAMILY</b>																					
<i>Typha latifolia</i>	broad-leaved cattail	G5	S5											X	X	X						
<b>LILIACEAE</b>	<b>LILY FAMILY</b>																					
<i>Allium</i> sp.									X													
* <i>Asparagus officinalis</i>	garden asparagus	G5?	SE5			I	X		X											X	X	
* <i>Hemerocallis fulva</i>	orange day-lily	G?	SE5			I											X			X		
<i>Maianthemum racemosum</i> ssp. <i>racemosum</i>	false Solomon's seal	G5T	S5						X													
<b>IRIDACEAE</b>	<b>IRIS FAMILY</b>																					
<i>Iris</i> sp.																	X			X		

X – indicates presence / \* - indicates non-native

**APPENDIX C**  
**ACRONYMS AND DEFINITIONS USED IN SPECIES LISTS**

## ACRONYMS AND DEFINITIONS USED IN SPECIES LISTS

### **G-Rank**                      **Global Rank**

Global ranks are assigned by a consensus of the network of Conservation Data Centres, scientific experts, and the Nature Conservancy to designate a rarity rank based on the range-wide status of a species, subspecies or variety.

The most important factors considered in assigning global ranks are the total number of known, extant sites world-wide, and the degree to which they are potentially or actively threatened with destruction. Other criteria the number of known populations considered to be securely protected, the size of the various populations, and the ability of the taxon to persist at its known sites. The taxonomic distinctness of each taxon has also been considered. Hybrids, introduced species, and taxonomically dubious species, subspecies and varieties have not been included.

G1=	Extremely rare; usually 5 or fewer occurrences in the overall range or very few remaining individuals; or because of some factor(s) making it especially vulnerable to extinction.
G2 =	Very rare; usually between 5 and 20 occurrences in the overall range or with many individuals in fewer occurrences; or because of some factor(s) making it vulnerable to extinction.
G3 =	Rare to uncommon; usually between 20 and 100 occurrences; may have fewer occurrences, but with a large number of individuals in some populations; may be susceptible to large-scale disturbances.
G4 =	Common; usually more than 100 occurrences; usually not susceptible to immediate threats.
G5 =	Very common; demonstrably secure under present conditions.
GH =	Historic, no records in the past 20 years.
GU =	Status uncertain, often because of low search effort or cryptic nature of the species; more data needed.
GX =	Globally extinct. No recent records despite specific searches.
? =	Denotes inexact numeric rank (i.e. G4?).
G" " =	A "G" (or "T") followed by a blank space means that the NHIC has not yet obtained the Global Rank from The Nature Conservancy.
G? =	Unranked, or, if following a ranking, rank tentatively assigned (e.g. G3?).
Q =	Denotes that the taxonomic status of the species, subspecies, or variety is questionable.
T =	Denotes that the rank applies to a subspecies or variety.

## **S-Rank**                      **Provincial Rank**

Provincial (or Sub-national) ranks are used by the Ontario Ministry of Natural Resources Natural Heritage Information Centre (NHIC) to set protection priorities for rare species and natural communities. These ranks are not legal designations. Provincial ranks are assigned in a manner similar to that described for the global ranks, but consider only those factors within the political boundaries of Ontario. By comparing the global and provincial ranks, the status, rarity, and the urgency of conservation needs can be ascertained. The NHIC evaluates provincial ranks on a continual basis and produces updated list at least annually.

S1 =	Critically imperiled in Ontario because of extreme rarity (often 5 or fewer occurrences) or because of some factor (s) such as very steep declines making it especially vulnerable to extirpation.
S2 =	Imperiled in Ontario because of rarity due to very restricted range, very few populations (often 20 or fewer occurrences) steep declines or other factors making it very vulnerable to extirpation.
S3 =	Vulnerable in Ontario due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.
S4 =	Apparently secure - uncommon but not rare; some cause for long-term concern due to declines or other factors.
S5 =	Secure - common, widespread, and abundant in Ontario.
SX =	Presumed Extirpated - specie or community is believed to be extirpated from Ontario.
SNR =	Unranked - conservation status in Ontario not yet assessed
SU =	Unrankable - currently unrankable due to lack of information or due to substantially conflicting information about status or trends.
SNA =	Not applicable - a conservation status rank is not applicable because the species is not a suitable target for conservation activities.
S#S# =	Range rank - a numeric range rank (e.g. S2S3) is used to indicate any range of uncertainty about the status of the species or community. Ranges cannot skip more than one rank (e.g. SU is used rather than S1S4).

## **COSEWIC**                      **Committee On The Status Of Endangered Wildlife in Canada**

The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) assesses the national status of wild species that are considered to be at risk in Canada.

Extinct (X)	A wildlife species that no longer exists.
Extirpated (XT)	A wildlife species no longer existing in the wild in Canada, but occurring elsewhere.
Endangered (E)	A wildlife species facing imminent extirpation or extinction.
Threatened (T)	A wildlife species likely to become endangered if limiting factors are not reversed.
Special Concern (SC)	A wildlife species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats.
Not at Risk (NAR)	A wildlife species that has been evaluated and found to be not at risk of extinction given the current circumstances.
Data Deficient (DD)	A category that applies when the available information is insufficient (a) to resolve a wildlife species' eligibility for assessment or (b) to permit an assessment of the wildlife species' risk of extinction.

**COSSARO/OMNR Committee On The Status Of Species At Risk In Ontario/Ontario Ministry Of Natural Resources**

The Committee on the Status of Species at Risk in Ontario (COSSARO)/Ontario Ministry of Natural Resources (OMNR) assess the provincial status of wild species that are considered to be at risk in Ontario.

Extinct (EXT)	A species that no longer exists anywhere.
Extirpated (EXP)	A species that no longer exist in the wild in Ontario but still occurs elsewhere.
Endangered (Regulated) (END-R)	A species facing imminent extinction or extirpation in Ontario which has been regulated under Ontario's <i>Endangered Species Act</i> .
Endangered (END)	A species facing imminent extinction or extirpation in Ontario which is a candidate for regulation under Ontario's Endangered Species Act.
Threatened (THR)	A species that is at risk of becoming endangered in Ontario if limiting factors are not reversed.
Special Concern (SC)	A species with characteristics that make it sensitive to human activities or natural events.
Not at Risk (NAR)	A species that has been evaluated and found to be not at risk.
Data Deficient (DD)	A species for which there is insufficient information for a provincial status recommendations.

**Local Status Niagara Haldimand (Riley 1989)**

Species status within the Durham Region was used to determine local vascular plant status for the study area.

R-# = R- Native species present and rare; # - number of stations at which the species has been identified.

U = Uncommon

X = Not classified as rare or uncommon within Niagara Haldimand

**APPENDIX D**  
**BREEDING BIRD SPECIES DOCUMENTED**



**APPENDIX D. BREEDING BIRD SPECIES DOCUMENTED**

Scientific Name	Common Name	SARA <sup>1</sup>	ESA <sup>1</sup>	Legal Status <sup>1</sup>	Other <sup>1</sup>	BBE <sup>2</sup>	Station # <sup>3</sup>
<i>Larus delawarensis</i>	Ring-billed Gull			MBCA	A	T	4, 5, 8, 20
<i>Larus argentatus</i>	Herring Gull			MBCA	C	T	4, 5, 21
<i>Sterna hirundo</i>	Common Tern			MBCA	C	T	4, 5
<i>Cygnus olor</i>	Mute Swan			MBCA	I; R	T	1, 2, 4
<i>Branta canadensis</i>	Canada Goose			MBCA	I; C	T	1, 2, 4
<i>Falco peregrinus anatum</i>	Peregrine Falcon	No Status	SC	FWCA(P)	R	S	20, 21
<i>Anas platyrhynchos</i>	Mallard			MBCA	C	T	1, 2, 4
<i>Anas clypeata</i>	Northern Shoveler			MBCA	R	S	4
<i>Phalacrocorax auritus</i>	Double-crested Cormorant			MBCA	A	T	1, 2, 4, 9, 20, 21
<i>Ardea herodias</i>	Great-blue Heron			MBCA	U	S	2
<i>Charadrius vociferus</i>	Killdeer			MBCA	A	T, A	1, 3
<i>Actitis macularius</i>	Spotted Sandpiper			MBCA	C	T, A	1, 3, 4
<i>Zenaida macroura</i>	Mourning Dove			MBCA	A	T	2, 10, 14, 21
<i>Columba livia</i>	Rock Dove			-	I; A	T	5, 6, 8, 9
<i>Picoides pubescens</i>	Downy Woodpecker			MBCA	C	H	1, 2
<i>Vireo gilvus</i>	Warbling Vireo			MBCA	C	T	1
<i>Cyanocitta cristata</i>	Blue Jay			FWCA (P)	A	H	1, 4
<i>Chaetura pelagica</i>	Chimney Swift	THR	THR	MBCA	U	S	1, 4
<i>Corvus brachyrhynchos</i>	American Crow			MBCA	C	T	2, 4, 10, 15
<i>Stelgidopteryx serripennis</i>	Northern Rough-winged Swallow			MBCA	C	T	1, 2, 3, 4
<i>Hirundo rustica</i>	Barn Swallow	THR	THR	MBCA	A	T	1, 2, 3, 4
<i>Tachycineta bicolor</i>	Tree Swallow			MBCA	A	NY	1, 2, 3, 4
<i>Poecile atricapillus</i>	Black-capped Chickadee			MBCA	A	T	2, 3, 9, 14, 21
<i>Sitta carolinensis</i>	White-breasted Nuthatch			MBCA	C	H	1, 2, 21
<i>Troglodytes aedon</i>	House Wren			MBCA	C	NY	1, 2
<i>Turdus migratorius</i>	American Robin			MBCA	C	T, A	2, 3, 4, 9, 20, 21, 13, 14
<i>Dumetella carolinensis</i>	Gray Catbird			MBCA	C	T, A	1, 2
<i>Sturnus vulgaris</i>	European Starling			-	I; A	CF	2, 5, 6, 7, 16, 17
<i>Bombycilla garrulus</i>	Cedar Waxwing			MBCA	C	H	2
<i>Dendroica petechia</i>	Yellow Warbler			MBCA	A	CF	1, 2, 3
<i>Spizella passerina</i>	Chipping Sparrow			MBCA	A	H	2
<i>Icterus galbula</i>	Northern Oriole			MBCA	C	T	1, 2, 3
<i>Melospica melodia</i>	Song Sparrow			MBCA	A	CF	2
<i>Cardinalis cardinalis</i>	Northern Cardinal			MBCA	A	T	2, 4, 14
<i>Agelaius phoeniceus</i>	Red-winged Blackbird			-	A	CF	1, 2, 3, 4, 5

APPENDIX D. BREEDING BIRD SPECIES DOCUMENTED							
Scientific Name	Common Name	SARA <sup>1</sup>	ESA <sup>1</sup>	Legal Status <sup>1</sup>	Other <sup>1</sup>	BBE <sup>2</sup>	Station # <sup>3</sup>
<i>Quiscalus quiscula</i>	Common Grackle			-	A	T	1, 2, 6, 20, 21
<i>Carduelis tristis</i>	American Goldfinch			MBCA	A	H	1, 4, 21
<i>Passer domesticus</i>	House Sparrow			-	I; A	S	4, 6, 8, 15, 16, 20, 21

<sup>1</sup>For definitions of species ranks, refer to **Appendix C**.

<sup>2</sup>BBE - Breeding Bird Evidence (according to Bird Studies Canada):

Possible Breeding:

H - Species observed in its breeding season in suitable nesting habitat.

S - Singing male present in its breeding season in suitable nesting habitat.

Probable Breeding:

T - Permanent territory presumed through registration of territorial song on at least two days, a week or so apart, at the same place.

A - Agitated behaviour or anxiety calls of an adult.

Confirmed Breeding:

NU - Used nest or egg shell found (occupied or laid within the period of study).

FY - Recently fledged young or downy young, including young incapable of sustained flight.

CF - Adult carrying food for young.

NE - Nest containing eggs.

NY - Nest with young seen or heard.

Other: (Nature Counts Project: Hamilton Natural Areas Inventory 2003); R-rare, C-common, U-uncommon, EXT-extirpated, I-introduced, UNC-uncertain, A-abundant, M-migrant

\*only the highest BBE is presented for each species when observed at multiple stations.

<sup>3</sup>Breeding Bird Point Count Station.

**APPENDIX E**  
**SCREENING FOR SPECIES AT RISK**

**Gordon Street, Guelph SAR list (DRAFT)**

Type	Common Name <i>Scientific Name</i>	NHIC database	LGL Habitat Screening	Recorded in Study Area (LGL 2021)	Ontario Butterfly Atlas	SARA Schedule 1	SARO	Provincial Rank	ESA Habitat Protection Provisions	Habitat Preference	Biophysical Survey Result of Conservative Consideration	Recommendations for Mitigation
Bird	<b>Chimney Swift</b> <i>Chaetura pelagica</i>			x		THR	THR	S4B, S4N	Species Protection and General Habitat Regulation	Historically found in deciduous and coniferous, usually wet forest types, all with a well developed, dense shrub layer; now most are found in urban areas in large uncapped chimneys	Breeding habitat potential within industrial areas. No nesting colonies identified, species observations limited to foraging individuals.	Impacts not anticipated.
	<b>Barn Swallow</b> <i>Hirundo rustica</i>			x		THR	THR	S4B	Species Protection and General Habitat Regulation	Prefers farmland; lake/river shorelines; wooded clearings; urban populated areas; rocky cliffs; and wetlands. They nest inside or outside buildings; under bridges and in road culverts; on rock faces and in caves etc.	Individuals observed foraging over meadow/aquatic habitat found within the study area. Nesting sites/colonies not identified.	Appropriate site selection and timing windows for vegetation removal.
Bird	<b>Peregrine Falcon</b> <i>Falco peregrinus</i>			x		No Status	SC	S3B	Not regulated/protected	The Peregrine Falcon is found in a wide range of habitats, from Arctic tundra to sea coasts, prairies and urban centres. These falcons usually build solitary nests on cliff ledges or crevices, but they sometimes build their nests on the ledges of tall buildings or bridges, always near an abundant source of prey.	Individual observed flying over study area. A breeding pair is known to nest annually on the Burlington Canal Lift Bridge structure.	Impacts not anticipated.
Bird	<b>Eastern Meadowlark</b> <i>Sturnella magna</i>	x				THR	THR	S4B	Species Protection and General Habitat Regulation	Generally prefers grassy pastures, meadows and hay fields. Nests are always on the ground and usually hidden in or under grass clumps.	No suitable habitat present within in the study area. Not documented during biophysical surveys.	Appropriate site selection and timing windows for vegetation removal.
Bird	<b>Piping Plover</b> <i>Charadrius melodus</i>	x				END	END	S1B	Species Protection and General Habitat Regulation	The Piping Plover nests on wide sand, gravel, or cobble beaches, barrier island sandspits, or peninsulas in marine coastal areas. Early successional habitat, most often free of dense vegetation, is preferred for nest sites.	Portions of Lake Ontario shoreline contain potentially suitable habitat. However, this species is extremely rare within Ontario (limited to several breeding pairs) and was not detected during breeding bird surveys conducted in 2021.	Appropriate site selection and timing windows for vegetation removal/shoreline disturbance.
Bird	<b>Henslow's Sparrow</b> <i>Ammodramus henslowii</i>	x				END	END	SHB	Species Protection and General Habitat Regulation	Generally found in old fields, pastures and wet meadows. They prefer areas with dense, tall grasses, and thatch, or decaying plant material.	No suitable habitat present within in the study area. Not documented during biophysical surveys. Species is extremely rare within Ontario.	Appropriate site selection and timing windows for vegetation removal.
	<b>Northern Bobwhite</b> <i>Colinus virginianus</i>	x				END	END	S1B	Species Protection and General Habitat Regulation	The Northern Bobwhite requires an early successional habitat that can be provided in a variety of vegetation types.	No suitable habitat present within in the study area. Not documented during biophysical surveys. Species is extremely rare within Ontario.	Appropriate site selection and timing windows for vegetation removal.
Bird	<b>Least Bittern</b> <i>Ixobrychus exilis</i>	x				THR	THR	S4B	Species Protection and General Habitat Regulation	Generally located near pools of open water in relatively large marshes and swamps that are dominated by cattail and other robust emergent plants.	No suitable habitat present within in the study area. Not documented during biophysical surveys. Species is extremely rare within Ontario.	Appropriate site selection and timing windows for vegetation removal.
Insect	<b>Monarch Butterfly</b> <i>Danaus plexippus</i>				x	SC	SC	S2N, S4B	N/A	Exist primarily wherever milkweed and wildflowers exist; abandoned farmland, along roadsides, and other open spaces.	Not documented during biophysical surveys. Potential habitat present within the study area. Meadow habitat not impacted by works.	Native pollinator plant species to be included in planting plan for LID swale.
Mammal	<b>Eastern Small-footed Myotis</b> <i>Myotis leibii</i>		x			END	END	S2S3	Species Protection and General Habitat Regulation	Overwintering habitat: Caves and mines that remain above 0 degrees Celsius. Maternal Roosts: This species is not known to roost within trees, but there is very little known about its roosting habits. The species generally roosts on the ground under rocks, in rock crevices, talus slopes and rock piles. It occasionally inhabits buildings.	Maternal roosting habitat (rock piles) not present on the Subject Lands.	Timing windows for site clearing/grubbing.

## Gordon Street, Guelph SAR list (DRAFT)

Type	Common Name <i>Scientific Name</i>	NHIC database	LGL Habitat Screening	Recorded in Study Area (LGL 2021)	Ontario Butterfly Atlas	SARA Schedule 1	SARO	Provincial Rank	ESA Habitat Protection Provisions	Habitat Preference	Biophysical Survey Result of Conservative Consideration	Recommendations for Mitigation
Mammal	<b>Little Brown Myotis</b> <i>Myotis lucifugus</i>		x			END	END	S4	Species Protection and General Habitat Regulation	Overwintering habitat: Caves and mines that remain above 0 degrees Celsius. Maternal Roosts: roost in both natural and man-made structures. They require a number of large dead trees, in specific stages of decay and that project above the canopy in relatively open areas (Lacki, 2007). May form nursery colonies in the attics of buildings within 1 km.	Maternal roosting habitat (trees with cavities or peeling bark) present on Subject Lands in low abundance. IGF submitted to MECP recommending timing windows received no objection.	Timing windows for site clearing/grubbing.
Mammal	<b>Northern Myotis</b> <i>Myotis septentrionalis</i>		x			END	END	S3	Species Protection and General Habitat Regulation	Overwintering habitat: Caves and mines that remain above 0 degrees Celsius. Maternal Roosts: usually roost in hollows, crevices, and under loose bark of mature trees. Roosts may be established in the main trunk or a large branch of either living or dead	Maternal roosting habitat (trees with cavities or peeling bark) generally lacking within study area.	Timing windows for vegetation removals.
Mammal	<b>Tri-colored Bat</b> <i>Perimyotis subflavus</i>		x			END	END	S3?	Species Protection and General Habitat Regulation	Overwintering habitat: Caves and mines that remain above 0 degrees Celsius. Maternal Roosts: may roost in foliage, in clumps of old leaves, hanging moss or squirrel nests. They are occasionally found in buildings although there are no records of this in Canada (Poissant et al, 2010). They typically feed over aquatic areas with an affinity to large bodied water and will likely	Maternal roosting habitat (leaf clumps) present on study area in low abundance.	Timing windows for vegetation removals.
Reptile	<b>Painted Turtle</b> <i>Chrysemys picta</i>	x				THR	THR	S3	Not regulated/protected	Slow-moving water, such as ponds, marshes, and lakes and slow-moving creeks with soft mud and plenty of aquatic vegetation. Adults are generally found in open or partially vegetated sites, and juveniles prefer areas that contain thick aquatic vegetation including sphagnum, water lilies and algae. They dig their nest in a variety of loose substrates, including sand, organic soil, gravel and	Not documented during biophysical studies. Aquatic habitats found within the study area are limited in their suitability for the species.	Appropriate site selection and timing windows for vegetation removal.
Reptile	<b>Milksnake</b> <i>Lampropeltis triangulum</i>	x				SC	NAR	S3	Not regulated/protected	Uses a wide range of habitats including prairies, pastures, hayfields, wetlands and various forest types, and is well-known in rural areas where it frequents older buildings. Proximity to water and cover enhances habitat suitability. Hibernation takes place in mammal burrows, hollow logs, gravel or soil banks, and old foundations (COSEWIC 2014).	Potential habitat exists within Windermere Basin Park; however, suitability is limited given the highly disturbed and fragmented nature of the study area.	Appropriate site selection and timing windows for aquatic habitat disturbance/alteration.
Reptile	<b>Northern Map Turtle</b> <i>Graptemys geographica</i>	x				SC	SC	S3	Not regulated/protected	Generally inhabits both lakes and rivers, showing a preference for slow moving currents, muddy bottoms, and abundant aquatic vegetation. These turtles need suitable basking sites (such as rocks and logs) and exposure to the sun for at least part of the day.	Not documented during biophysical studies. Aquatic habitat found along Red Hill Creek could provide suitable habitat for the species - basking habitat for the species is limited however.	Appropriate site selection and timing windows for aquatic habitat disturbance/alteration.
Reptile	<b>Snapping Turtle</b> <i>Chelydra serpentina</i>	x				SC	SC	S3	Not regulated/protected	Generally inhabit shallow waters where they can hide under the soft mud and leaf litter. Nesting sites usually occur on gravelly or sandy areas along streams. Snapping Turtles often take advantage of man-made structures for nest sites, including roads (especially gravel shoulders), dams and aggregate pits.	Not documented during biophysical studies. Aquatic habitats found within the study area are limited in their suitability for the species.	Appropriate site selection and timing windows for aquatic habitat disturbance/alteration.

References:

<sup>1</sup> Dr. Jim Bogart, Email Communication April 20, 2021

S-Rank – Sub-national (provincial or territorial)

S1 = Critically Imperiled;

**Gordon Street, Guelph SAR list (DRAFT)**

Type	Common Name <i>Scientific Name</i>	NHIC database	LGL Habitat Screening	Recorded in Study Area (LGL 2021)	Ontario Butterfly Atlas	SARA Schedule 1	SARO	Provincial Rank	ESA Habitat Protection Provisions	Habitat Preference	Biophysical Survey Result of Conservative Consideration	Recommendations for Mitigation
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S2 = Imperiled;  
 S3 = Vulnerable;  
 S4 = Apparently Secure;  
 S5 = Secure  
 B = breeding; and U = Unrankable.

**APPENDIX F  
SCHEDULE 3  
ECOREGION 7E CRITERIA**

## **SCHEDULE 3: ECOREGION 7E CRITERIA**

This Schedule is designed to provide the recommended criteria for identifying Candidate Significant Wildlife Habitat within ecoregion 7E. Tables 1.1 through 1.4 within the Schedules provide guidance for Candidate SWH designation for the four categories of SWH outlined in the Significant Wildlife Habitat Technical Guide and its Appendices cxlviii, cxlix for ecoregion 7E. Table 1.5 contains and provides descriptions for exceptions to Eco-regional candidate SWH which will be identified at an ecodistrict scale. Exceptions occur when criteria for a specific habitat is different within an ecodistrict compared to the remainder of an ecoregion or if a habitat only occurs within a restricted area of the ecoregion.

The Schedules, including description of wildlife habitat, wildlife species, and the criteria provided for determining Candidate SWH, are based on science and expert knowledge. The information within these Schedules will require periodic updating to keep pace with changes to wildlife species status in Species at Risk schedules, or as new scientific information pertaining to wildlife habitats becomes available. Therefore, MNR will occasionally need to review and update these schedules and provide addenda. A reference document for all SWH found after the schedules, includes citations for all ecoregional schedules. Each citation used to assist with the criteria for SWH will be indicated by a roman numeric symbol. Where no reference exists, MNR expert opinion is used for determination of criteria, this symbol “I” represents when MNR expert opinion is utilized.

### **3.1 Seasonal Concentration Areas**

Seasonal Concentration Areas are areas where wildlife species occur in aggregations at certain times of the year, on an annual or predictable basis. Such areas are sometimes highly concentrated with members of a given species, or several species, within relatively small areas. In spring and autumn, migratory wildlife species will concentrate where they can rest and feed. Other wildlife species require habitats where they can survive winter. Examples of Seasonal Concentration Areas include deer wintering areas, breeding bird colonies, and hibernation sites for reptiles or bats (OMNR 2000a), amphibians, and some mammals. Table 1.1 outlines which Seasonal Concentration Areas constitute Candidate SWH.



**Table 1.1** Seasonal Concentration Areas for Wildlife Species.

Wildlife Habitat	Wildlife Species	CANDIDATE SWH*		CONFIRMED SWH	LGL Discussion/ Analysis	SWH
		ELC Ecosite Codes	Habitat Characteristics and Information Sources	Defining Criteria		
<p><b>Waterfowl Stopover and Staging Areas (Terrestrial)</b></p> <p><b>Rationale:</b> Habitat important to migrating waterfowl.</p>	<p>American Black Duck Northern Pintail Gadwall Blue-winged Teal American Green-winged Teal American Wigeon Northern Shoveler Tundra Swan</p>	<p>CUM1 CUT1 Plus evidence of annual spring flooding from melt water or run-off within these Ecosites.</p> <p>Fields with waste grain in the Long Point, Rondeau, Lk. St. Clair, Grand Bend and Pt. Pelee areas may be important to Tundra Swans.</p>	<p>Fields with sheet water or fields utilized by Tundra Swans during Spring (March to May).</p> <ul style="list-style-type: none"> <li>• Fields flooding during spring melt and run-off provide important invertebrate foraging habitat for migrating waterfowl.</li> <li>• Anecdotal information from the landowner, adjacent landowners, or local naturalist clubs may be good information in determining occurrence.</li> <li>• ESA Reports prepared by Conservation Authorities</li> <li>• Sites documented through waterfowl planning processes (e.g., EHJV implementation plan)</li> <li>• local naturalist clubs</li> <li>• Ducks Unlimited Canada</li> <li>• Long Point Bird Observatory</li> </ul>	<p>Studies carried out and verified presence of an annual concentration of any listed species:</p> <ul style="list-style-type: none"> <li>• Aggregation of 100<sup>1</sup> or more of any one of the listed species is required.</li> <li>• Annual use of habitat is documented from information sources or field studies (annual can be based on study or determined anecdotally).</li> <li>• Agricultural fields with waste grains are commonly used by waterfowl; these are not considered SWH, except when used by Tundra Swans during the spring migration and staging period.</li> <li>• SWHDSS cxlix Index #7 provides development effects and mitigation measures.</li> </ul>	<p>No sheet water was observed on field habitats, and none was noted in incidental observations.</p> <p>None of the wildlife species identified were observed on the property.</p> <p>No grain species present within the study area.</p> <p>No aggregations of waterfowl in terrestrial habitat were noted at any time nor were criteria threshold numbers over 100 or more individuals of the species listed documented on the terrestrial habitat.</p>	<p>No candidate SWH identified.</p>
<p><b>Waterfowl Stopover and Staging Areas (Aquatic)</b></p> <p><b>Rationale:</b> 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 ecodistrict.</p>	<p>American Green-winged Teal American Black Duck Northern Pintail Northern Shoveler American Wigeon Gadwall Blue-winged Teal Wood Duck Hooded Merganser Common Merganser Red-breasted Merganser Lesser Scaup Greater Scaup Ring-necked duck Common Goldeneye Bufflehead Long-tailed Duck Surf Scoter White-winged Scoter Black Scoter Canvasback Redhead Ruddy Duck Brant</p>	<p>MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 SWD1 SWD3</p>	<ul style="list-style-type: none"> <li>• Ponds, marshes, lakes, bays, coastal inlets, and watercourses used during migration. Sewage treatment ponds and storm water ponds do not qualify as SWH, but a reservoir managed as large wetland or pond/lake does.</li> <li>• These habitats have an abundant food supply (mostly aquatic invertebrates and vegetation in shallow water).</li> <li>• Canadian Wildlife Service staff know the larger, most significant sites. Check website: <a href="http://wildspace.ec.gc.ca">http://wildspace.ec.gc.ca</a></li> <li>• Naturalist clubs often are aware of staging/stopover areas.</li> <li>• OMNR Wetland Evaluations indicate presence of locally and regionally significant waterfowl staging.</li> <li>• Sites documented through waterfowl planning processes (e.g., EHJV implementation plan)</li> </ul>	<p>Studies carried out and verified presence of:</p> <ul style="list-style-type: none"> <li>• Habitat used annually during spring, fall, or both seasons of any listed species.</li> <li>• Annual use of habitat is documented from information sources or field studies (annual can be based on study or determined anecdotally).</li> <li>• Aggregations of 100<sup>1</sup> or more of any one of listed species <b>and</b> 2-3 birds/ha for 7-20 days<sup>1</sup>.</li> <li>• SWHDSS cxlix Index #7 provides development effects and mitigation measures.</li> </ul>	<p>Suitable ELC ecosites generally small in size. However, potential exists for species listed to occupy identified ELC ecosites within study area.</p>	<p>Targeted surveys not conducted. Potential SWH identified within identified ELC ecosites; however, given relatively small site of suitable habitats, aggregations numbers are not expected to meet identified threshold.</p>

Wildlife Habitat	Wildlife Species	CANDIDATE SWH*		CONFIRMED SWH	LGL Discussion/ Analysis	SWH
		ELC Ecosite Codes	Habitat Characteristics and Information Sources	Defining Criteria		
	White-winged Scoter Black Scoter Tundra Swans		<ul style="list-style-type: none"> <li>Ducks Unlimited Canada</li> </ul>			
<b>Colonial Nesting Bird Habitat</b>  <b>Rationale:</b> 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 populations in Ontario are declining cxcix.	Bank Swallow Cliff Swallow	Eroding banks, sandy hills, pits, steep slopes, rock faces or piles within these ecosites:  CUM1    CUT1 CUS1    BLO1 BLS1    BLT1 CLO1    CLS1 CLT1	<ul style="list-style-type: none"> <li>Any exposed soil banks, undisturbed or naturally eroding for 10 years or more.</li> <li>Does not include man-made structures (bridges or buildings) or recently (2 years) disturbed soil areas, such as berms, embankments, or soil or aggregate stockpiles.</li> <li>Does not include an active Mineral Aggregate Operation.</li> <li>ESA Reports prepared by Conservation Authorities</li> <li>Ontario Breeding Bird Atlas</li> <li>local Naturalist clubs</li> </ul>	Studies confirming: <ul style="list-style-type: none"> <li>Presence of 1 or more nesting sites with 8 or more Cliff Swallow pairs or 100<sup>1</sup> Bank Swallow pairs during the spring breeding season.</li> <li>Anecdotal information from the landowner or adjacent landowners may be good information for determining occurrence.</li> <li>SWHDSS cxlix Index #4 provides development effects and mitigation measures.</li> </ul>	No exposed soil along the banks of any watercourse feature within the study area. Suitable habitat does not exist within the study area and no species listed were confirmed during site surveys.	No candidate SWH identified.
<b>Shorebird Migratory Stopover Area</b>  <b>Rationale:</b> High-quality shorebird stopover habitat is extremely rare and typically has a long history of use.	Wilson's Snipe Greater Yellowlegs Lesser Yellowlegs Marbled Godwit Hudsonian Godwit Black-bellied Plover Am. Golden Plover Semipalmated Plover Solitary Sandpiper Spotted Sandpiper Pectoral Sandpiper White-rumped Sandpiper Baird's Sandpiper Western Sandpiper Buff-breasted Sandpiper Least Sandpiper Purple Sandpiper Semipalmated Sandpiper Long-billed Dowitcher Short-billed Dowitcher Wilson's Phalarope Red Phalarope Red-necked Phalarope Whimbrel	BBO1    BBO2 BBS1    BBS2 BBT1    BBT2 SDO1    SDS2 SDT1    MAM1 MAM2    MAM3 MAM4    MAM5	<ul style="list-style-type: none"> <li>Shorelines of lakes, rivers and wetlands, including beach areas, bars, and seasonally flooded shoreline, usually muddy and unvegetated.</li> <li>Great Lakes coastal shorelines are extremely important for migratory shorebirds from May to mid-June and July to October.</li> <li>Western Hemisphere Shorebird Reserve Network.</li> <li>Canadian Wildlife Service (CWS) Ont. Shorebird Survey</li> <li>Bird Studies Canada</li> <li>local birders and naturalist clubs</li> </ul>	Studies confirming: <ul style="list-style-type: none"> <li>Presence of 3 or more of listed species and &gt; 1000 Shorebird Use Days<sup>1</sup> 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).</li> <li>Whimbrel stop briefly (&lt;24hrs) during spring migration; any site with &gt;100 Whimbrel<sup>1</sup> used for 3 years or more would be considered significant.</li> <li>SWHDSS cxlix Index #8 provides development effects and mitigation measures.</li> </ul>	Suitable ELC ecosites generally small in size. However, potential exists for species listed to occupy identified ELC ecosites within study area.	Targeted surveys not conducted. Potential SWH identified within identified ELC ecosites; however, given relatively small site of suitable habitats, aggregations numbers are not expected to meet identified threshold.

Wildlife Habitat	Wildlife Species	CANDIDATE SWH*		CONFIRMED SWH	LGL Discussion/ Analysis	SWH
		ELC Ecosite Codes	Habitat Characteristics and Information Sources	Defining Criteria		
	Ruddy Turnstone Killdeer Red Knot Sanderling Dunlin					
<b>Songbird Migratory Stopover Areas</b>  <b>Rationale:</b> Sites with a high diversity of species as well as high numbers are most significant.	All migratory songbirds.  Canadian Wildlife Service Ontario website: <a href="http://www.on.ec.gc.ca/wildlife_e.html">http://www.on.ec.gc.ca/wildlife_e.html</a>	All Ecosites associated with these ELC Community Series; FOC FOM FOD SWC SWM SWD	<ul style="list-style-type: none"> <li>Woodlots located within 5km of Lake Erie. Woodlots directly on the shore of Lake Erie that are associated with peninsula or are adjacent to islands are potentially important migratory habitats. cxlviii</li> <li>Bird Studies Canada</li> <li>Ontario Nature</li> <li>Ontario Important Bird Areas (IBA) Program</li> <li>local birders and naturalist club</li> </ul>	<ul style="list-style-type: none"> <li>Woodlots need to be &gt;5 ha<sup>1</sup> in size and within 5 km iv, v, vi, vii, viii, ix, x, xi, xii, xiii, xiv, xv of Lake Erie.</li> </ul> Studies confirm: <ul style="list-style-type: none"> <li>Use of the woodlot by 35 <sup>1</sup> migratory bird species. This number of migrant bird species in a woodlot would be considered above average.</li> <li>Studies should be completed during spring (Apr./May) and fall (Aug/Oct) migration, using standardized assessment techniques; observation records and/or mist netting (permits required) are good methods to determine use of the area.</li> <li>SWHDSS cxlix Index #9 provides development effects and mitigation measures.</li> </ul>	Forest communities within the study area are not within 5 km of Lake Erie/Lake Ontario.	No candidate SWH identified.
<b>Raptor Wintering Area</b>  <b>Rationale:</b> 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	Combination of ELC Community Series; need to have present one Community Series from each landclass:  <u>Forest</u> FOC      FOD FOM  <u>Upland</u> CUM      CUT CUS      CUW	The habitat provides a combination of fields and woodlands that provide roosting, foraging, and resting habitats for wintering raptors. <ul style="list-style-type: none"> <li>OMNR ecologist or biologist may be aware of locations of wintering raptors. In addition, these staff may know local naturalists that may be aware of the locations of raptor wintering habitats.</li> <li>Bird Studies Canada</li> <li>ESA reports and other studies prepared by Conservation Authorities</li> </ul>	<ul style="list-style-type: none"> <li>Raptor Wintering sites need to be &gt; 20ha cxlvii, cxlix with a combination of forest and upland xvi, xvii, xviii, xix, xx, xxi.</li> </ul> Studies confirm the use of these habitats by: <ul style="list-style-type: none"> <li>1 or more Short-eared Owls <b>or</b>;</li> <li>2 or more of listed spp and 10 or more individuals<sup>1</sup>.</li> <li>To be significant a site must be used annually for a minimum of 20 days by the above number of birds<sup>1</sup>.</li> <li>SWHDSS cxlix Index #10 provides development effects and mitigation measures.</li> </ul>	Natural vegetation communities does not meet the size criteria.  No prior documented or confirmed nests for raptor species were observed within the study area. Study area surrounded by residential properties, and major thorough fares.	No candidate SWH identified.
<b>Bat Hibernacula</b>  <b>Rationale:</b>	Big Brown Bat Tri-coloured Bat	Bat Hibernacula may be found in these ecosites:	<ul style="list-style-type: none"> <li>Hibernacula may be found in caves, mine shafts underground Karsts.</li> </ul>	<ul style="list-style-type: none"> <li>All sites with confirmed hibernating bats are SWH<sup>ⓔ</sup></li> <li>The area includes 200m radius around the entrance of the</li> </ul>	No caves, mine shafts or underground karsts which could support hibernacula were identified within the study area.	No candidate SWH identified on site.

Wildlife Habitat	Wildlife Species	CANDIDATE SWH*		CONFIRMED SWH	LGL Discussion/ Analysis	SWH
		ELC Ecosite Codes	Habitat Characteristics and Information Sources	Defining Criteria		
Bat hibernacula are extremely rare in all Ontario landscapes.		CCR1 CCR2 CCA1 CCA2  Maternal Colonies are not found in caves and mines in Ontario xxii. Maternal colonies can be found in tree cavities, vegetation and often buildings xxii, xxv, xxvi, xxvii, xxxi (buildings are not to be considered SWH)	<ul style="list-style-type: none"> <li>Active mine sites should not be considered as SWH</li> <li>The locations and site characteristics of bat hibernacula are relatively poorly known.</li> </ul> <u>Information Sources</u> <ul style="list-style-type: none"> <li>OMNR for possible locations and contact information for local experts</li> <li>Natural Heritage Information Centre (NHIC) Bat Hibernaculum</li> <li>Ministry of Northern Development and Mines for location of (active or abandoned) mine shafts.</li> <li>clubs that explore caves (e.g., Sierra Club)</li> <li>University Biology Departments with bat experts</li> </ul>	<p>hibernaculum<sup>cxlviii, ccvii</sup>, (E) for most development types and 1000m for wind farms<sup>ccv</sup>.</p> <ul style="list-style-type: none"> <li>Studies are to be conducted during peak swarming period (Aug.- Sept) Suveys should be conducted following methods outlined in the “Bats and Bat Habitats: Guidelines for Wind Power Projects”<sup>ccv</sup>.</li> <li>SWH MIST<sup>cxlix</sup> Index #1 provides development effects and mitigation measures</li> </ul>		
<p><b>Bat Maternity Colonies</b></p> <p><b>Rationale:</b> Known locations of forested bat maternity colonies are extremely rare in all Ontario landscapes.</p>	Big Brown Bat Silver-haired Bat	<p>Maternity colonies considered SWH are found in Forested Ecosites.</p> <p>All ELC Ecosites in ELC Community Series: FOD FOM SWD SWM</p>	<ul style="list-style-type: none"> <li>Maternity colonies can be found in tree cavities, vegetation and often in buildings<sup>xxii, xxv, xxvi, xxvii, xxxi</sup> (buildings are not considered to be SWH).</li> <li>Maternity roosts are not found in caves and mines in Ontario<sup>xxii</sup>.</li> <li>Maternity colonies located in Mature deciduous or mixed forest stands<sup>ccix, ccx, ccv</sup> with &gt;10/ha large diameter (&gt;25cm dbh) wildlife trees<sup>ccvii</sup></li> <li>Female Bats prefer wildlife tree (snags) in early stages of decay, class 1-3<sup>ccxiv</sup> or class 1 or 2<sup>ccxii</sup>.</li> <li>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<sup>ccx, lxiv</sup></li> </ul> <u>Information Sources</u> <ul style="list-style-type: none"> <li>OMNRF for possible locations and contact for local experts</li> </ul>	<ul style="list-style-type: none"> <li>Maternity Colonies with confirmed use by; <ul style="list-style-type: none"> <li>&gt;10 Big Brown Bats(E)</li> <li>&gt;5 Adult Female Silver- haired Bats(E)</li> </ul> </li> <li>The area of the habitat includes the entire woodland or a forest stand ELC Ecosite or an Ecoelement containing the maternity colonies(E).</li> <li>Evaluation methods for maternity colonies should be conducted following methods outlined in the “Bats and Bat Habitats: Guidelines for Wind Power Projects”<sup>ccv</sup>.</li> <li>SWH MiST<sup>cxlix</sup> Index #12 provides development effects and mitigation measures</li> </ul>	Only small areas of ELC communities (FOD) which meet identified criteria are present within the study area.	Targeted surveys not conducted. Low potential for candidate SWH identified on site. Only small areas of low quality FOD ecosite found within study area.

Wildlife Habitat	Wildlife Species	CANDIDATE SWH*		CONFIRMED SWH	LGL Discussion/ Analysis	SWH
		ELC Ecosite Codes	Habitat Characteristics and Information Sources	Defining Criteria		
			<ul style="list-style-type: none"> <li>University Biology Departments with bat experts.</li> </ul>			
<b>Turtle Wintering Areas</b>  <b>Rationale:</b> Generally sites are the only known sites in the area. Sites with the highest number of individuals are most significant.	Midland Painted Turtle  <b>Special Concern:</b> Northern Map Turtle Snapping Turtle	Snapping and Midland Painted Turtles; ELC Community  Classes; SW, MA, OA and SA: ELC Community Series; FEO and BOO  Northern Map Turtle; Open Water areas such as deeper rivers or streams and lakes with current can also be used as over-wintering habitat.	<ul style="list-style-type: none"> <li>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</li> <li>Over-wintering sites are permanent water bodies, large wetlands, and bogs or fens with adequate Dissolved Oxygen<sup>cix, cx, cxi, cxii</sup></li> <li>Man-made ponds such as sewage lagoons or storm water ponds should not be considered SWH.</li> </ul> <b>Information Sources</b> <ul style="list-style-type: none"> <li>EIS studies carried out by Conservation Authorities.</li> <li>OMNRF Ecologist or Biologist</li> <li>Field Naturalist clubs</li> <li>Natural Heritage Information Center (NHIC)</li> </ul>	<ul style="list-style-type: none"> <li>Presence of 5 over-wintering Midland Painted Turtles is significant<sup>Ⓔ</sup>.</li> <li>One or more Northern Map Turtle or Snapping Turtle over-wintering within a wetland is significant<sup>Ⓔ</sup>.</li> <li>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.</li> <li>Over wintering areas may be identified by searching for congregations (Basking Areas) of turtles on warm, sunny days during the fall (Sept. – Oct.) or spring (Mar. – May) cvii.</li> <li>Congregation of turtles is more common where wintering areas are limited and therefore significant cix, cx, cxi, cxii.</li> <li>SWHMiSTcxlix Index #28 provides development effects and mitigation measures for turtle wintering habitat.</li> </ul>	No suitable wintering habitat observed within the stud area. No turtle species observed during field investigations. Aquatic habitats identified within the study area contain limited suitability for turtle species.	No candidate SWH identified.
<b>Reptile Hibernaculum</b>  <b>Rationale:</b> Generally sites are the only known sites in the area. Sites with the highest number of individuals are most significant	<b>Snakes:</b> Eastern Gartersnake Northern Watersnake Northern Red-bellied Snake Northern Brownsnake Smooth Green Snake Northern Ring-necked Snake  <b>Special Concern:</b> Eastern Ribbonsnake	For all snakes, habitat may be found in any ecosite other than very wet ones. Talus, Rock Barren, Crevice, Cave, and Alvar sites may be directly related to these habitats.  Observations or congregations of snakes on sunny warm days in the spring or fall is a good indicator.	<ul style="list-style-type: none"> <li>For snakes, hibernation takes place in sites located below frost lines in burrows, rock crevices and other natural or naturalized locations. The existence of features that go below frost line; such as rock piles or slopes, old stone fences, and abandoned crumbling foundations assist in identifying candidate SWH.</li> <li>Areas of broken and fissured rock are particularly valuable since they provide access to subterranean sites below the frost line<sup>xliv, l, li, lii, cxii</sup>.</li> <li>Wetlands can also be important over-wintering habitat in</li> </ul>	<b>Studies confirming:</b> <ul style="list-style-type: none"> <li>Presence of snake hibernacula used by a minimum of five individuals of a snake sp. <u>or</u>; individuals of two or more snake spp. Congregations of a minimum of five individuals of a snake sp. <u>or</u>; individuals of two or more snake spp. near potential hibernacula (egg. foundation or rocky slope) on sunny warm days in Spring (Apr/May) and Fall (Sept/Oct)<sup>Ⓔ</sup></li> <li><u>Note:</u> If there are Special Concern Species present, then site is SWH</li> <li><u>Note:</u> Sites for hibernation possess specific habitat parameters (e.g. temperature, humidity, etc.) and</li> </ul>	<ul style="list-style-type: none"> <li>No aggregations of snakes were observed during the field investigation.</li> <li>No Talus, Rock Barren, Crevice, Cave, or Alvar sites identified on the property.</li> <li>None of the wildlife species identified were observed on the property.</li> </ul>	No candidate SWH identified.

Wildlife Habitat	Wildlife Species	CANDIDATE SWH*		CONFIRMED SWH	LGL Discussion/ Analysis	SWH
		ELC Ecosite Codes	Habitat Characteristics and Information Sources	Defining Criteria		
			<p>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> <ul style="list-style-type: none"> <li>Five-lined skink prefer mixed forests with rock outcrop openings providing cover rock overlaying granite bedrock with fissures cciii.</li> </ul> <p><u>Information Sources</u></p> <ul style="list-style-type: none"> <li>In spring, local residents or landowners may have observed the emergence of snakes on their property (e.g. old dug wells).</li> <li>Reports and other information available from Conservation Authorities.</li> <li>Field Naturalists clubs</li> <li>University herpetologists</li> <li>Natural Heritage Information Center (NHIC)</li> <li>OMNRF ecologist or biologist may be aware of locations of wintering skinks</li> </ul>	<p>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 30 m radius area is the SWH<sup>ⓔ</sup></p> <ul style="list-style-type: none"> <li>SWHMISTcxlix Index #13 provides development effects and mitigation measures for snake hibernacula.</li> <li>Presence of any active hibernaculum for skink is significant.</li> <li>SWHMISTcxlix Index #37 provides development effects and mitigation measures for five-lined skink wintering habitat.</li> </ul>		
<p><b>Colonial Bird Nesting Sites (Tree/Shrubs)</b></p> <p><b>Rationale:</b> Colonies important to local bird population; typically, sites are only known colony in area.</p>	<p>Great Blue Heron Black-crowned Night-Heron Great Egret Green Heron</p>	<p>SWM2 SWM3 SWM5 SWM6 SWD1 SWD2 SWD3 SWD4 SWD5 SWD6 SWD7 FET1</p>	<ul style="list-style-type: none"> <li>Nests in live or dead standing trees in wetlands, lakes, islands, and on peninsulas.</li> <li>Most nests in trees are 11- 15 m from ground, near the top of the tree</li> <li>Ontario Breeding Bird Atlas, colonial nest records</li> <li>Ontario Nest Records Scheme (Royal Ontario Museum)</li> <li>Ontario Heronry Inventory 1991 available from Bird Studies Canada</li> <li>Sometimes aerial photographs can help identify large heronries.</li> <li>ESA reports and other studies prepared by Conservation Authorities</li> <li>OMNR District Offices</li> <li>local naturalist clubs</li> </ul>	<p>Studies confirming:</p> <ul style="list-style-type: none"> <li>Presence of 1 or more active nests of any of the listed species Í.</li> <li>Studies would be done during April/June when actively nesting.</li> <li>SWHDSS cxlix Index #5 provides development effects and mitigation measures.</li> </ul>	<ul style="list-style-type: none"> <li>No nests/nesting colonies were identified during field investigations.</li> </ul>	<p>No candidate SWH identified.</p>

Wildlife Habitat	Wildlife Species	CANDIDATE SWH*		CONFIRMED SWH	LGL Discussion/ Analysis	SWH
		ELC Ecosite Codes	Habitat Characteristics and Information Sources	Defining Criteria		
<b>Colonial-Nesting Bird Breeding Habitat (Ground)</b>  <b>Rationale:</b> Colonies important to local bird population; typically, sites are only known colony in area.	Herring Gull Great Black-backed Gull Common Tern Caspian Tern Little Gull	Any rocky island or peninsula (natural or artificial) within a lake or large river (two-lined on a 1:50,000 NTS map).	<ul style="list-style-type: none"> <li>Nesting colonies are on islands or peninsulas associated with open water</li> <li>Ontario Breeding Bird Atlas, colonial nest records</li> <li>Ontario Nest Record Scheme (Royal Ontario Museum)</li> <li>Canadian Wildlife Service</li> <li>ESA reports and other studies prepared by Conservation Authorities               <ul style="list-style-type: none"> <li>OMNR District Offices</li> <li>local naturalist clubs</li> </ul> </li> </ul>	Studies confirming: <ul style="list-style-type: none"> <li>Presence of &gt; 100 nests Herring Gulls, and &gt; 75 nests Caspian or Common Terns<sup>cxlix</sup>.</li> <li>Any nesting colony of 1 or more Little Gull or Great Black-backed Gull is to be considered significant.<sup>Í</sup></li> <li>Studies would be done during May/June when actively nesting.</li> <li>SWHDSS <sup>cxlix</sup> Index #6 provides development effects and mitigation measures</li> </ul>	<ul style="list-style-type: none"> <li>Gull spp. identified observed in the vicinity of the study area. Nest colonies identified immediately outside of the study area on peninsula/rocky island habitat.</li> </ul>	No candidate SWH identified within study area. Potential SWH located immediately outside of study area.
<b>Butterfly Migratory Route/Stopover Areas</b>  <b>Rationale:</b> Butterfly stopover areas are extremely rare habitats and are biologically important for Butterfly species that migrate south for the winter.	Painted lady White Admiral  <u>Special Concern</u> Monarch Butterfly	Combination of ELC Community Series; need to have present one Community Series from each landclass:  <u>Field</u> CUM      CUT CUS  <u>Forest</u> FOC      FOD FOM      CUP  Anecdotally, a candidate sight for butterfly stopover will have a history of butterflies being observed.	<ul style="list-style-type: none"> <li>Butterfly stopover areas are rare habitats located within 5 km of Lake Erie or Lake Ontario (OMNR 2000b). 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. <sup>xxxii, xxxiii, xxxiv, xxxv, xxxvi,</sup></li> <li>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 <sup>xxxvii, xxxviii, xxxix, xl, xli,</sup></li> <li>OMNR for list of local butterfly experts</li> <li>Agriculture Canada in Ottawa may have list of butterfly experts.</li> <li>Other sources of information would include naturalist clubs, the Toronto Entomologists Association, and Conservation Authorities.</li> </ul>	<ul style="list-style-type: none"> <li>A butterfly stopover area will be a minimum of 10 ha in size with a combination of field and forest habitat present and will be located within 5 km of Lake Erie or Lake Ontario. <sup>cxlix</sup></li> <li>Studies will confirm the presence of Monarch Use Days (MUD) during fall migration (Aug/Oct) <sup>xlili</sup>. 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<sup>xxxvii</sup>, significant variation can occur between years and multiple years of sampling should occur <sup>xl, xlii</sup>.</li> <li>MUD of &gt;5000 <b>or</b> &gt;3000 with the presence of Painted Ladies or White Admiral's is to be considered significant.<sup>Í</sup></li> <li>SWHDSS <sup>cxlix</sup> Index #16 provides development effects and mitigation measures.</li> </ul>	<ul style="list-style-type: none"> <li>Vegetation communities present on site however are less than the minimum ha per criteria.</li> </ul>	No candidate SWH identified
<b>Deer Winter Congregation Areas</b>  <b>Rationale:</b> Deer movement during winter in the southern	White-tailed Deer	All Forested Ecosites with these ELC Community Series: FOC FOM FOD SWC	<ul style="list-style-type: none"> <li>Woodlots will typically be &gt;100 ha in size<sup>É</sup>. Woodlots &lt;100ha may be considered as significant based on MNRF studies or assessment.</li> <li>Deer movement during winter in the southern areas of Ecoregion 6E are not constrained by snow</li> </ul>	Studies confirm: <ul style="list-style-type: none"> <li>Deer management is an MNRF responsibility, deer winter congregation areas considered significant will be mapped by MNRF <sup>cxlviii</sup>.</li> <li>Use of the woodlot by white-tailed deer will be determined</li> </ul>	<ul style="list-style-type: none"> <li>No available layers from LIO indicated the presence of this SWH type. Woodlots and vegetation communities within the study area do not meet the minimum size criteria.</li> </ul>	No candidate SWH identified

Wildlife Habitat	Wildlife Species	CANDIDATE SWH*		CONFIRMED SWH	LGL Discussion/ Analysis	SWH
		ELC Ecosite Codes	Habitat Characteristics and Information Sources	Defining Criteria		
areas of Ecoregion 6E 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>SWM SWD</p> <p>Conifer plantations much smaller than 50 ha may also be used.</p>	<p>depth, however deer will annually congregate in large numbers in suitable woodlands cxlviii.</p> <ul style="list-style-type: none"> <li>• If deer are constrained by snow depth refer to the Deer Yarding Area habitat within Table 1.1 of this Schedule.</li> <li>• Large woodlots &gt; 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.</li> <li>• Woodlots with high densities of deer due to artificial feeding are not significant(E).</li> </ul> <p>Information Sources</p> <ul style="list-style-type: none"> <li>• MNRF District Offices. LIO/NRVIS</li> </ul>	<p>by MNRF, all woodlots exceeding the area criteria are significant, unless determined not to be significant by MNRF (E)</p> <ul style="list-style-type: none"> <li>• Studies should be completed during winter (Jan/Feb) when &gt;20cm of snow is on the ground using aerial survey techniques<sup>ccxxiv</sup>, ground or road surveys. or a pellet count deer density survey<sup>ccxxv</sup>.</li> <li>• If a SWH is determined for Deer Wintering Area or if a proposed development is within Stratum II yarding area then Movement Corridors are to be considered as outlined in Table 1.4.1 of this Schedule.</li> <li>• SWHMiST<sup>cxlix</sup> Index #2 provides development effects and mitigation measures.</li> </ul>		



### 3.2 Rare Vegetation Communities or Specialized Habitat for Wildlife

#### 3.2.1 Rare Vegetation Communities

The majority of Rare Vegetation Communities are protected within the Greenbelt planning area through the protection of Key Natural Heritage Features. For example, sand barrens, tallgrass prairie, alvars, and savannahs are all identified as Key Natural Heritage Features by the Greenbelt Plan. However, outside of the Natural Heritage System of the Protected Countryside landuse designation, the PPS is the relevant policy document and many rare vegetation habitats are candidate SWH, including: sand barrens, tallgrass prairies, alvars, and savannahs. Woodlands not protected as Significant Woodlands have the potential to be a Rare Vegetation Community, and therefore Candidate SWH. Table 1.2.1 contains a listing of Rare Vegetation Communities that are considered SWH for the Greenbelt planning area and where the PPS policy is the direction to be followed.

**Table 1.2.1** Rare Vegetation Communities.

Rare Vegetation Community	ELC Ecosite Code	Habitat Description	Detailed Information and Sources	CONFIRMED SWH and Defining Criteria	LGL Discussion/ Analysis	SWH
<b>Cliff and Talus Slopes</b>  <b>Rationale:</b> Cliffs and Talus Slopes are extremely rare habitats in Ontario.	CLO1 CLS1 CLS2 CLT1 CLT2 TAO1 TAO2 TAS1 TAS2 TAT1 TAT2	A Cliff is vertical to near vertical bedrock >3m in height. A Talus Slope is rock rubble at the base of a cliff made up of coarse rocky debris.	<ul style="list-style-type: none"> <li>Most cliff and talus slopes occur along the Niagara Escarpment.</li> <li>The Niagara Escarpment Commission has detailed information on location of these habitats.</li> <li>Natural Heritage Information Centre.</li> <li>Conservation Authorities.</li> </ul>	<ul style="list-style-type: none"> <li>Confirm any ELC Vegetation Type for Cliffs or Talus Slopes lxxviii</li> <li>SWHDSS (OMNR 2000c) Index #21 provides development effects and mitigation measures.</li> </ul>	No ELC Ecosites described of this type documented.	None identified
<b>Sand Barren</b>  <b>Rationale:</b> Sand barrens are rare in Ontario and support rare species. Most Sand Barrens have been lost due to cottage development and forestry.	SBO1 SBS1 SBT1  Vegetation cover varies from patchy and barren to continuous meadow (SBO1), thicket-like (SBS1), or more closed and treed (SBT1). Tree cover always ≤ 60%.	Sand Barrens typically are exposed sand habitats, 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 savanna.	<ul style="list-style-type: none"> <li>Sand Barrens support rare species such as provincially Endangered Forked Three-awned Grass and American Badger lxxxv, lxxxvi. By extension, sand barren sites that could support These rare species (close proximity to other populations), historically or currently should be considered for higher priority conservation.</li> <li>Natural Heritage Information Centre</li> <li>OMNR Ecologists</li> <li>District SAR Biologists</li> <li>local Naturalist clubs</li> <li>Conservation Authorities</li> </ul>	<ul style="list-style-type: none"> <li>No minimum size to site<sup>1</sup>.</li> <li>Confirm any ELC Vegetation Type for Sand Barrens lxxviii</li> <li>Site must not be dominated by exotic or introduced species</li> <li>SWHDSS cxlix Index #20 provides development effects and mitigation measures.</li> <li></li> </ul>	No ELC Ecosites described of this type documented.	None identified
<b>Alvar</b>  <b>Rationale:</b> Alvars are extremely rare habitats in Ontario.	ALO1 ALS1 ALT1	An alvar will be level unfractured or partially fractured limestone, a patchy mosaic of bare rock pavement, or shallow substrate over limestone bedrock. The site will vary between being seasonally dry or inundated with water. Vegetation cover varies from	<ul style="list-style-type: none"> <li>In Ontario, alvars occur in a series of clusters just south of the contact line with the granitic uplands of the Canadian Shield and in a few small isolated areas to the south.</li> </ul>	<ul style="list-style-type: none"> <li>Site to be &gt; 0.5 ha in size lxxv.</li> <li>Confirm any ELC Vegetation Type for Alvars lxxviii</li> <li>Site must not be dominated by exotic or introduced species. The alvar must be in excellent condition and fit in with</li> </ul>	No ELC Ecosites described of this type documented.	None identified

Rare Vegetation Community	ELC Ecosite Code	Habitat Description	Detailed Information and Sources	CONFIRMED SWH and Defining Criteria	LGL Discussion/ Analysis	SWH
		<p>patchy and barren with a less than 60% tree cover<sup>lxxviii</sup>.</p> <p>Alvar is particularly rare in ecoregion 7E where the only known sites are found in the western islands Lake Erie.<sup>cxix</sup></p>	<ul style="list-style-type: none"> <li>Alvars of Ontario (2000), Federation of Ontario Naturalists.</li> <li>Natural Heritage Information Centre.</li> <li>OMNR Ecologists.</li> <li>Local Naturalist clubs</li> <li>Conservation Authorities.</li> </ul>	<p>surrounding landscape with few conflicting landuses <sup>lxxv</sup>.</p> <ul style="list-style-type: none"> <li>Three or more of the Alvar indicator species <sup>lxxv</sup> listed in <sup>cxlix</sup> Appendix N should be present.</li> <li>SWHDSS <sup>cxlix</sup> Index #17 provides development effects and mitigation measures.</li> </ul>		
<p><b>Old-Growth Forest</b></p> <p><u>Rationale:</u> Old Growth forest stands are rare in S. Ontario.</p>	<p>Forest Community Series: FOD FOC FOM</p>	<p>Old-growth forests tend to be relatively undisturbed, structurally complex, and contain a wide variety of trees and shrubs in various age classes. These habitats usually support a high diversity of wildlife species.</p>	<ul style="list-style-type: none"> <li>OMNR Ecologists and Foresters</li> <li>Conservation Authorities</li> </ul>	<ul style="list-style-type: none"> <li>No minimum size to site<sup>Í</sup></li> <li>Determine ELC Vegetation Type for forest stand <sup>lxxviii</sup></li> <li>If dominant trees species of ELC Vegetation Type are &gt;100 years old, then stand is Significant Wildlife Habitat.<sup>Í</sup></li> <li>Human activity within the stand must be minimal, old growth characteristics require a relatively undisturbed forest stand.</li> <li>SWHDSS <sup>cxlix</sup> Index #23 provides development effects and mitigation measures.</li> </ul>	No forest habitat was noted with trees of age class to meet criteria.	None identified
<p><b>Savannah</b></p> <p><u>Rationale:</u> Savannahs are extremely rare habitats in Ontario.</p>	<p>TPS1 TPS2 25%&lt;tree cover&lt;35% <sup>lxxviii</sup></p> <p>TPW1 TPW2 35%&lt;tree cover&lt;60%<sup>lxxviii</sup></p>	<p>A savannah is a tallgrass prairie habitat that has tree cover between 25-60%.</p> <p>Tallgrass Prairie (TGP) and savannah were historically common in the near-shore areas of the Great Lakes.</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). <sup>cc</sup></p>	<ul style="list-style-type: none"> <li>Natural Heritage Information Centre</li> <li>OMNR Ecologists</li> <li>local Naturalist clubs</li> <li>Conservation Authorities</li> </ul>	<ul style="list-style-type: none"> <li>No minimum size to site<sup>Í</sup>. Site must be restored or a natural site, remnant sites such as railway right of ways not to be considered significant.</li> <li>Confirm any ELC Vegetation Type for Savannahs <sup>lxxviii</sup></li> <li>Site must not be dominated by exotic or introduced species.</li> <li>One or more of the Savannah indicator species listed in <sup>lxxv</sup> Appendix N should be present<sup>Í</sup>.</li> <li>SWHDSS <sup>cxlix</sup> Index #18 provides development effects and mitigation measures.</li> </ul>	No ELC Ecosites described of this type documented.	None identified

Rare Vegetation Community	ELC Ecosite Code	Habitat Description	Detailed Information and Sources	CONFIRMED SWH and Defining Criteria	LGL Discussion/ Analysis	SWH
<p><b>Tallgrass Prairie</b></p> <p><b>Rationale:</b> 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 tall grass prairie habitat will have less than 25% tree cover.</p> <p>Tallgrass Prairie (TGP) and savannah were historically common in the near-shore areas of the Great Lakes</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).<sup>cc</sup></p>	<ul style="list-style-type: none"> <li>Natural Heritage Information Centre.</li> <li>OMNR Ecologists.</li> <li>District SAR Biologists</li> <li>Stewardship Councils specializing in TGP (e.g., Brant, Lambton Counties</li> <li>Local Naturalist clubs</li> <li>Conservation Authorities.</li> </ul>	<ul style="list-style-type: none"> <li>No minimum size to site.</li> <li>Site must be restored or a natural site, remnant sites such as railway right of ways not to be considered significant.</li> <li>Confirm any ELC Vegetation Type for Tall Grass Prairies lxxviii</li> <li>Site must not be dominated by exotic or introduced species.</li> <li>One or more of the tall grass prairie indicator species listed in lxxv Appendix N should be present.</li> <li>SWHDSS cxlix Index #19 provides development effects and mitigation measures..</li> </ul>	<p>No ELC Ecosites described of this type documented.</p>	<p>None identified</p>
<p><b>Other Rare Vegetation Communities</b></p> <p><b>Rationale:</b> 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 SWHTGcxlvi. 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 cxlvi</p> <p>The OMNRF/NHIC will have up to date listing for rare vegetation communities.</p> <p>Information Sources</p> <ul style="list-style-type: none"> <li>Natural Heritage Information Center (NHIC) has location information available on their website</li> <li>OMNRF Districts</li> <li>Feld Naturalist clubs.</li> <li>Conservation Authorities.</li> </ul>	<p>Field studies should confirm if an ELC Vegetation Type is a rare vegetation community based on listing within Appendix M of SWHTGcxlvi .</p> <ul style="list-style-type: none"> <li>Area of the ELC Vegetation Type polygon is the SWH.</li> <li>SWHMiST cxlix Index #37 provides development effects and mitigation measures.</li> </ul>	<p>Several dune ELC Ecosites were identified along the Lake Ontario Shoreline, northeast of Beach Boulevard.</p>	<p>SWH identified. Appropriate mitigation to protect these ELC Ecosites will be developed.</p>

### 3.2.2 Specialized Habitat for Wildlife

Some wildlife species require large areas of suitable habitat for their long-term survival. Many wildlife species require substantial areas of suitable habitat for successful breeding. Their populations decline when habitat becomes fragmented and reduced in size (OMNR 2000a). The largest and least fragmented habitats within a planning area will support the most significant populations of wildlife. Specialized habitat for wildlife is a community- or diversity-based category, therefore the more wildlife species a habitat contains the more significant the habitat becomes to the planning area. The specialized habitats for wildlife that are Candidate SWH are outlined in Table 1.2.2.

**Table 1.2.2** Specialized Habitats of Wildlife considered Candidate SWH.

Specialized Wildlife Habitat	Wildlife Species	ELC Ecosite Codes	Habitat Characteristics and Information Sources	CONFIRMED SWH and Defining Criteria	LGL Discussion/ Analysis	SWH
<p><b>Waterfowl Nesting Area</b></p> <p><b>Rationale:</b> Important to local waterfowl populations, sites with greatest number of species and highest number of individuals are significant.</p>	<p>American Black Duck Northern Pintail Northern Shoveler Gadwall Blue-winged Teal Green-winged Teal Wood Duck Hooded Merganser Mallard</p>	<p>All upland habitats located adjacent to these wetland ELC Ecosites are Candidate SWH:</p> <p>MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 SWT1 SWT2 SWD1 SWD2 SWD3 SWD4</p> <p><b>Note: includes adjacency to Provincially Significant Wetlands</b></p>	<ul style="list-style-type: none"> <li>A waterfowl nesting area extends 120 m cxlix from a wetland (&gt; 0.5 ha) or a cluster of 3 or more small (&lt;0.5 ha) wetlands within 150 m of each other where waterfowl nesting is known to occur cxlix Í.</li> <li>Upland areas should be at least 120 m wide so that predators such as racoons, skunks, and foxes have difficulty finding nests.</li> <li>Wood Ducks and Hooded Mergansers utilize large diameter trees (&gt;40cm dbh) in woodlands for cavity nest sites.</li> <li>Ducks Unlimited staff may know the locations of particularly productive nesting sites.</li> <li>OMNR Wetland Evaluations for indication of significant waterfowl nesting habitat.</li> <li>ESA reports prepared by Conservation Authorities.</li> </ul>	<p>Studies confirmed:</p> <ul style="list-style-type: none"> <li>Presence of 3 or more nesting pairs for listed species except MallardÍ, or;</li> <li>Presence of 10 or more nesting pairs for listed species including MallardÍ.</li> <li>Nesting studies should be completed during the spring breeding season (April-June).</li> <li>A field study confirming waterfowl nesting habitat will determine the boundary of the waterfowl nesting habitat for the SWH; this may be greater or less than 120 m from the wetland and will provide enough habitat for waterfowl to nest successfully.</li> <li>SWHDSS cxlix Index #25 provides development effects and mitigation measures.</li> </ul>	<p>Targeted surveys not completed; however, breeding bird surveys did not identify nests/nesting by these species. Wetland ELC ecosite are not expected to meet the minimum size criteria.</p>	<p>No candidate SWH identified.</p>
<p><b>Bald Eagle and Osprey Nesting, Foraging and Perching Habitat</b></p> <p><b>Rationale:</b> Nest sites are fairly uncommon in Ecoregion 7E and are used by these species. Many suitable nesting locations may be lost due to increasing shoreline development</p>	<p>Osprey <b>Species Concern</b> Bald Eagle</p>	<p>Forest Communities Series: FOD, FOM, FOC, SWD, SWM and SWC directly adjacent to riparian areas – rivers, lakes, ponds and wetlands</p>	<p>Nests are associated with lakes, ponds, rivers or wetlands along forested shorelines, islands, or on structures over water.</p> <ul style="list-style-type: none"> <li>Osprey nests are usually at the top of trees whereas Bald Eagle nests are typically in super canopy trees in a notch within the tree’s canopy.</li> <li>Nests located on man-made objects are not to be included as SWH (e.g. telephone poles and constructed nesting platforms).</li> </ul> <p><b>Information Sources</b></p> <ul style="list-style-type: none"> <li>Natural Heritage Information Centre (NHIC) compiles all known nesting sites for Bald Eagles in Ontario.</li> </ul>	<p>Studies confirm the use of these nest by::</p> <ul style="list-style-type: none"> <li>One or more active Osprey or Bald Eagle nests in an area<sup>cxlviii</sup>.</li> <li>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.</li> <li>For Osprey, the active nest and a 300 m radius around the nest or contiguous woodland stand is the SWH<sup>ccvii</sup>, maintaining undisturbed shorelines with large trees</li> </ul>	<p>No existence of an existing or previous nests for Bald Eagle were observed within the study area. Study area surrounded by residential properties, and major thorough fares. Super canopy trees not present.</p>	<p>No significant SWH identified</p>

Specialized Wildlife Habitat	Wildlife Species	ELC Ecosite Codes	Habitat Characteristics and Information Sources	CONFIRMED SWH and Defining Criteria	LGL Discussion/ Analysis	SWH
pressures and scarcity of habitat.			<ul style="list-style-type: none"> <li>• MNRF values information (LIO/NRVIS) will list known nesting locations. Note: data from NRVIS is provided as a point and does not represent all the habitat.</li> <li>• Nature Counts, Ontario Nest Records Scheme data.</li> <li>• OMNRF Districts.</li> <li>• Check the Ontario Breeding Bird Atlas or Rare Breeding Birds in Ontario for species documented.</li> <li>• Reports and other information available from Conservation Authorities.</li> <li>• Field Naturalist clubs.</li> </ul>	<p>within this area is important <sup>cxlvii</sup>.</p> <ul style="list-style-type: none"> <li>• For a Bald Eagle the active nest and a 400-800 m radius around the nest is the SWH. <sup>cvi, ccvii</sup> Area of the habitat from 400-800 m is dependent on site lines from the nest to the development and inclusion of perching and foraging habitat <sup>cvi</sup></li> <li>• 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 &gt;5 years before being considered not significant. <sup>ccvii</sup></li> <li>• Observational studies to determine nest site use, perching sites and foraging areas need to be done from early March to August</li> <li>• Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”<sup>ccxii</sup></li> <li>• SWHDSS cxlix Index #26 provides development effects and mitigation measures</li> </ul>		
<p><b>Woodland Raptor Nesting Habitat</b></p> <p><u>Rationale:</u> Nest sites for these species are rarely identified, these habitats are often used annually by these species.</p>	<p>Broad-winged Hawk N. Goshawk Cooper’s Hawk Sharp-shinned Hawk Red-shouldered Hawk Barred Owl</p>	<p>May be found in all forested ELC Ecosites.</p> <p>May also be found in SWC SWM SWD CUP3</p>	<p>All natural or conifer plantation woodland/forest stands &gt;30 ha with &gt;4ha of interior habitat <sup>lxxxviii, lxxxix, xc, xci, xciii, xciv, xcv, xcvi, cxxxiii</sup> Interior habitat determined with a 200m buffer.<sup>cxlviii</sup></p> <ul style="list-style-type: none"> <li>• 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.</li> <li>• In undisturbed sites, nests may be used again, or a new nest will be in close proximity to old nest</li> </ul>	<p>Studies confirm;</p> <ul style="list-style-type: none"> <li>• Presence of 1 or more active nests from species list is considered significant.</li> <li>• Red-shouldered Hawk and Northern Goshawk - A 400m radius around the nest or 28 ha area of habitat is the SWH<sup>ccvii</sup>. (the 28 ha habitat area would be applied where optimal habitat is irregularly shaped around the nest)</li> <li>• Broad-winged Hawk and Coopers Hawk, - A 100, radius around the nest is the SWH<sup>ccvii</sup></li> </ul>	<p>No evidence of an active nest or the presence of any species listed were identified during the field inventory. Forested communities within the study do not meet the size criteria nor do they contain interior habitat.</p>	<p>No significant SWH identified</p>

Specialized Wildlife Habitat	Wildlife Species	ELC Ecosite Codes	Habitat Characteristics and Information Sources	CONFIRMED SWH and Defining Criteria	LGL Discussion/ Analysis	SWH
			<p><u>Information Sources</u></p> <ul style="list-style-type: none"> <li>• OMNRF Districts.</li> <li>• Check the Ontario Breeding Bird Atlas</li> <li>• Rare Breeding Birds Atlas or Rare Breeding Birds in Ontario for species documented</li> <li>• Check data from Birds Studies Canada</li> <li>• ESA reports and other studies prepared by Conservation Authorities</li> </ul>	<ul style="list-style-type: none"> <li>• Sharp-Shinned Hawk – A 50m radius around the nest is the SWH<sup>cxvii</sup></li> <li>• Conduct field investigations from March to the 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.</li> <li>• SWHDSS cxlix Index #27 provides development effects and mitigation measures.</li> </ul>		
<p><b>Turtle Nesting Habitat and Turtle Over-wintering Areas</b></p> <p><u>Rationale:</u> These habitats are rare and when identified will often be the only breeding or hibernating site for local populations of turtles.</p>	<p>Midland Painted Turtle <u>Special Concern Species</u> Northern Map Turtle Snapping Turtle</p>	<p>Exposed mineral soil (sand or gravel) areas adjacent (&lt;100m)<sup>cxivii</sup> or within the following ELC Ecosites: MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 BOO1 FEO1</p>	<ul style="list-style-type: none"> <li>• 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.</li> <li>• For an area to function as a turtle-nesting area, it must provide sand and/or 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.</li> <li>• Sand and gravel beaches adjacent to undisturbed shallow weedy areas of marshes, lakes, and rivers are most frequently used.</li> <li>• Over-wintering sites are permanent water bodies, large wetlands, and bogs or fens with adequate Dissolved Oxygen. cix, cx, cxi, cxviii</li> </ul> <p><u>Information Sources</u></p> <ul style="list-style-type: none"> <li>• Use Ontario Soil Survey reports and maps to help find suitable substrate for nesting turtles (well-drained sands and fine gravels).</li> <li>• Check the Ontario Herpetofaunal Summary records for uncommon turtles; location information may help to find potential nesting habitat for them.</li> </ul>	<p>Studies confirm:</p> <ul style="list-style-type: none"> <li>• Presence of 5 or more nesting Midland Painted Turtles</li> <li>• One or more Northern Map Turtle or snapping Turtle nesting is SWH</li> <li>• The area of collection of sites within an area of exposed mineral soils where the turtles nest, plus a radius of 30-100m around the nesting area dependent on slope, riparian vegetation and adjacent land use is SWH.<sup>cxlviii</sup></li> <li>• Travel routes from wetland to nesting area are to be considered within the SWH as part of the 30-100m area of habitat.</li> <li>• Field investigations should be conducted in prime nesting season (May-July). Observational studies observing the turtles nesting is a recommended method.</li> <li>• SWHDSS cxlix Index #28 provides development effects and mitigation measures for turtle nesting habitat.</li> </ul>	<p>Midland Painted Turtle, Northern Map Turtle and Snapping Turtle were not observed within the study area.</p>	<p>No significant SWH identified. Modest potential for trails associated with Windermere Basin Park to function as turtle nesting habitat.</p>

Specialized Wildlife Habitat	Wildlife Species	ELC Ecosite Codes	Habitat Characteristics and Information Sources	CONFIRMED SWH and Defining Criteria	LGL Discussion/ Analysis	SWH
			<ul style="list-style-type: none"> <li>Natural Heritage Information Centre (NHIC)</li> <li>ESA reports and other studies prepared by Conservation Authorities</li> <li>local Naturalist groups</li> </ul>			
<b>Seeps and Springs</b>  <b>Rationale:</b> Seeps/Springs are typical of headwater areas and are often at the source of coldwater streams.	Wild Turkey Ruffed Grouse White-tailed Deer	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>Any predominantly forested area (with &lt;25% meadow/field/pasture) within the headwaters of a stream or river system cxvii, cxlix.</p> <ul style="list-style-type: none"> <li>Important feeding and drinking areas; will typically support a variety of plant and animal species, especially in the winter cxix, cxx, cxxi, cxxii, cxxiii, cxxiv.</li> </ul> <p><u>Information Sources</u></p> <ul style="list-style-type: none"> <li>topographical map</li> <li>thermography</li> <li>Hydrological surveys conducted by Conservation Authorities and Ministry of Environment</li> <li>local naturalists and landowners</li> <li>Municipalities and Conservation Authorities may have drainage maps and headwater areas mapped..</li> </ul>	<p>Studies confirm:</p> <ul style="list-style-type: none"> <li>Presence of a site with &gt;2 or more seeps/springs confirmed by studies should be considered SWH.</li> <li>The area of a ELC forest ecosite or an ecoelement within ecosite contain the seeps/springs is the SWH. The protection of the recharge area considering the slope, vegetation, height of trees and ground water condition need to be considered in delineation the habitat cxlviii</li> <li>SWHDSS cxlix Index #30 provides development effects and mitigation measures</li> </ul>	No seeps were observed within the study area during the field investigations.	No significant SWH identified
<b>Amphibian Breeding Habitat (Woodland).</b>  <b>Rationale:</b> These habitats are extremely important to amphibian biodiversity within a landscape and often represent the only breeding habitat for local amphibian populations	Eastern Newt Blue-spotted Salamander Spotted Salamander Gray Treefrog Spring Peeper Western Chorus Frog Wood Frog	<p>All Ecosites associated with these ELC Community Series;</p> <p>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</p>	<ul style="list-style-type: none"> <li>Presence of a wetland, pond or woodland pool (including vernal pools) &gt;500m<sup>2</sup> (about 25m diameter) ccvii within or adjacent (within 120m) to a woodland (no minimum size).clxxxii, lxiii, lxv, lxvi, lxvii, lxviii, lxix, lxx Some small wetlands may not be mapped and may be important breeding pools for amphibians.</li> <li>Woodlands with permanent ponds or those containing water in most years until mid-July are more likely to be used as breeding habitat cxlviii</li> </ul> <p><u>Information Sources</u></p> <ul style="list-style-type: none"> <li>Ontario Herpetofaunal Summary Atlas (or other similar atlases) for records</li> <li>Local landowners may also provide assistance as they may hear spring- time choruses of</li> </ul>	<p>Studies confirm;</p> <ul style="list-style-type: none"> <li>Presence of breeding population of 1 or more of the listed newt/salamander species or 2 or more of the listed frog species with at least 20 individuals (adults or eggs masses) lxxi or 2 or more of the listed frog species with Call Level Codes of 3ⓔ.</li> <li>A combination of observational study and call count surveys cviii will be required during the spring (March-June) when amphibians are concentrated around suitable breeding habitat within or near the woodland/wetlands.</li> </ul>	No Ecosites/ELC communities which meet identified criteria are present within the study area.	No significant SWH identified

Specialized Wildlife Habitat	Wildlife Species	ELC Ecosite Codes	Habitat Characteristics and Information Sources	CONFIRMED SWH and Defining Criteria	LGL Discussion/ Analysis	SWH
		migrating amphibians	amphibians on their property. <ul style="list-style-type: none"> <li>• OMNRF District.</li> <li>• OMNRF wetland evaluations</li> <li>• Field Naturalist clubs</li> <li>• Canadian Wildlife Service Amphibian Road Call Survey</li> </ul> Ontario Vernal Pool Association: <a href="http://www.ontariovernalpools.org">http://www.ontariovernalpools.org</a>	<ul style="list-style-type: none"> <li>• The habitat is the wetland area plus a 230m radius of woodland arealxiii, lxv, lxvi, lxvii, lxviii, lxix, lxx, 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.</li> </ul> SWHMiST cxlix Index #14 provides development effects and mitigation measures.		
<b>Amphibian Breeding Habitat (Wetlands)</b>  <u>Rationale:</u> Wetlands supporting breeding for these amphibian species are extremely important and fairly rare within Central Ontario landscapes.	Eastern Newt American Toad Spotted Salamander Four-toed Salamander Blue-spotted Salamander Gray Treefrog Western Chorus Frog Northern Leopard Frog Pickerel Frog Green Frog Mink Frog Bullfrog	ELC Community Classes SW, MA, FE, BO, OA and SA.  Typically these wetland ecosites will be isolated (>120m) from woodland ecosites, however larger wetlands containing predominantly aquatic species (e.g. Bull Frog) may be adjacent to woodlands.	<ul style="list-style-type: none"> <li>• Wetlands&gt;500m2 (about 25m diameter) ccvii), supporting high species diversity are significant; some small or ephemeral habitats may not be identified on MNRF mapping and could be important amphibian breeding habitats clxxxii.               <ul style="list-style-type: none"> <li>• Presence of shrubs and logs increase significance of pond for some amphibian species because of available structure for calling, foraging, escape and concealment from predators.</li> <li>• Bullfrogs require permanent water bodies with abundant emergent vegetation.</li> </ul> </li> </ul> <u>Information Sources</u> <ul style="list-style-type: none"> <li>• Ontario Herpetofaunal Summary Atlas (or other similar atlases)</li> <li>• Canadian Wildlife Service Amphibian Road Surveys and Backyard Amphibian Call Count.</li> <li>• OMNRF Districts and wetland evaluations</li> </ul> Reports and other information available from Conservation Authorities	Studies confirm: <ul style="list-style-type: none"> <li>• 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) lxxi or 2 or more of the listed frog/toad species with Call Level Codes of 3(Ⓔ). <b>or;</b> Wetland with confirmed breeding Bullfrogs are significant Ⓔ.</li> <li>• The ELC ecosite wetland area and the shoreline are the SWH.</li> <li>• A combination of observational study and call count surveys cviii will be required during the spring (March-June) when amphibians are concentrated around suitable breeding habitat within or near the wetlands.</li> <li>• If a SWH is determined for Amphibian Breeding Habitat (Wetlands) then</li> </ul>	No Ecosites/ELC communities which meet identified criteria are present within the study area. No breeding amphibians recorded during targeted anuran surveys.	No significant SWH identified.



Specialized Wildlife Habitat	Wildlife Species	ELC Ecosite Codes	Habitat Characteristics and Information Sources	CONFIRMED SWH and Defining Criteria	LGL Discussion/ Analysis	SWH
				Movement Corridors are to be considered as outlined in Table 1.4.1 of this Schedule. SWHMiST cxlix Index #15 provides development effects and mitigation measures.		
<p><b>Woodland Area-Sensitive Bird Breeding Habitat</b></p> <p><b>Rationale:</b> Large, natural blocks of mature woodland habitat within the settled areas of Southern Ontario are important habitats for area sensitive interior forest song birds.</p>	<p>Yellow-bellied Sapsucker            Red-breasted Nuthatch            Veery            Blue-headed Vireo            Northern Parula            Black-throated Green Warbler            Blackburnian Warbler            Black-throated Blue Warbler            Ovenbird            Scarlet Tanager            Winter Wren</p> <p><b>Special Concern:</b>            Cerulean Warbler            Canada Warbler</p>	<p>All Ecosites associated with these ELC Community Series;            FOC            FOM            FOD            SWC            SWM            SWD</p>	<ul style="list-style-type: none"> <li>Habitats where interior forest breeding birds are breeding, typically large mature (&gt;60 yrs old) forest stands or woodlots &gt;30 ha. cv, cxxxix, cxxxii, cxxxiii, cxxxiv, cxxxv, cxxxvi, cxxxvii, cxxxviii, cxxxix, cxl, cxli, cxlii, cxliii, cxliv, cxlv, cxlvi, cl, cli, clii, cliii, cliv, clv, clvi, clvii, clviii, clix,</li> <li>Interior forest habitat is at least 200 m from forest edge habitat. clxiv</li> </ul> <p><u>Information Sources</u></p> <ul style="list-style-type: none"> <li>Local bird clubs.</li> <li>Canadian Wildlife Service (CWS) for the location of forest bird monitoring.</li> <li>Bird Studies Canada conducted a 3- year study of 287 woodlands to determine the effects of forest fragmentation on forest birds and to determine what forests were of greatest value to interior species</li> <li>Reports and other information available from Conservation Authorities.</li> </ul>	<p>Studies confirm:</p> <ul style="list-style-type: none"> <li>Presence of nesting or breeding pairs of 3 or more of the listed wildlife species. (E)</li> <li>Note: any site with breeding Cerulean Warblers or Canada Warblers is to be considered SWH.(E)</li> <li>Conduct field investigations in spring and early summer when birds are singing and defending their territories.</li> <li>Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”ccxi</li> </ul> <p>SWHMiST cxlix Index #34 provides development effects and mitigation measures.</p>	<p>No Ecosites/ELC communities which meet identified criteria are present within the study area.</p>	<p>No significant SWH identified</p>

### 3.3 Habitat for Species of Conservation Concern (not including Endangered or Threatened Species)

Habitats of Species of Conservation Concern for the purposes of this Technical Paper include wildlife species that are listed as Special Concern or rare, that are declining, or are featured species. Habitats of Species of Conservation Concern do not include habitats of Endangered or Threatened species, as their habitats are a separate Key Natural Heritage Feature, as outlined in the Greenbelt Plan and the PPS. Table 1.3 assists with the identification of Candidate SWH for Species of Conservation Concern.

**Table 1.3** Habitats of Species of Conservation Concern considered Candidate SWH.

Wildlife	Species	ELC Ecosite	Habitat Description , Defining Criteria and Information Sources	CONFIRMED SWH	LGL Discussion/Analysis	SWH
<p><b>Marsh Bird Breeding Habitat</b></p> <p><b>Rationale:</b> Wetlands for these bird species are typically productive and fairly rare in Southern Ontario landscapes.</p>	<p>American Bittern Virginia Rail Sora Common Moorhen American Coot Pied-billed Grebe Marsh Wren Sedge Wren Common Loon Green Heron</p> <p><b>Special Concern:</b> Black Tern Yellow Rail</p>	<p>MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 SAS1 SAM1 SAF1 FEO1 BOO1</p>	<ul style="list-style-type: none"> <li>Nesting occurs in wetlands.</li> <li>All wetland habitat is to be considered as long as there is shallow water with emergent aquatic vegetation present<sup>cxv</sup>.</li> <li>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.</li> </ul> <p><u>Information Sources</u></p> <ul style="list-style-type: none"> <li>OMNRF District and wetland evaluations.</li> <li>Field Naturalist clubs</li> <li>Natural Heritage Information Center (NHIC) Records.</li> <li>Reports and other information available from Conservation Authorities.</li> <li>Ontario Breeding Bird Atlas.</li> </ul>	<p>Studies confirm:</p> <ul style="list-style-type: none"> <li>Presence of 5 or more nesting pairs of Sedge Wren or Marsh Wren <b>or</b> 4 nesting pairs for any other listed; <b>or</b> breeding by any combination of 5 or more of the listed species.<sup>Í</sup></li> <li><u>Note:</u> any wetland with breeding Black Terns or Yellow Rail is to be considered SWH.<sup>Í</sup></li> <li>Breeding surveys should be done in May/June when these species are actively nesting in wetland habitats.</li> <li>SWHDSS cxlix Index #35 provides development effects and mitigation measures</li> </ul>	<p>Criteria species not observed in the vicinity of the study area.</p>	<p>No candidate SWH identified within study area. Potential SWH located immediately outside of study area.</p>
<p><b>Open Country Bird Breeding Habitat</b></p> <p><b>Rationale:</b> This wildlife habitat is declining throughout Ontario and North America. Species such as the Upland Sandpiper have declined significantly the</p>	<p>Sparrow Vesper Sparrow Northern Harrier Savannah Sparrow</p> <p><b>Special Concern</b> Short-eared Owl</p>	<p>CUM1 CUM2</p>	<ul style="list-style-type: none"> <li>Large grassland areas (includes natural and cultural fields and meadows) &gt;30 ha clx, clxi, clxii, clxiii, clxiv, clxv, clxvi, clxvii, clxviii, clxix.</li> <li>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 years) <sup>Ⓔ</sup></li> <li>Grassland sites considered significant should have a</li> </ul>	<p>Field Studies confirm:</p> <ul style="list-style-type: none"> <li>Presence of nesting or breeding of 2 or more of the listed species. <sup>Ⓔ</sup></li> <li>A field with 1 or more breeding Short-eared Owls is to be considered SWH.</li> <li>The area of SWH is the contiguous ELC ecosite field areas.</li> <li>Conduct field investigations of the most likely areas in spring and early summer when birds are singing and</li> </ul>	<p>Vegetation communities present within the study area; however, combined they do meet the size criteria of &gt;30ha.</p>	<p>No significant SWH identified</p>

<p>past 40 years based on CWS (2004) trend records.</p>			<p>history of longevity, either abandoned fields, mature hayfields and pasturelands that are at least 5 years or older.</p> <ul style="list-style-type: none"> <li>The Indicator bird species are area sensitive requiring larger grassland areas than the common grassland species.</li> </ul> <p><u>Information Sources</u></p> <ul style="list-style-type: none"> <li>Agricultural land classification maps, Ministry of Agriculture.</li> <li>Local bird clubs.</li> <li>Ontario Breeding Bird Atlas Reports and other information available from Conservation Authorities.</li> </ul>	<p>defending their territories.</p> <ul style="list-style-type: none"> <li>Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”ccxi SWHMiST cxlix Index #32 provides development effects and mitigation measures</li> </ul>		
<p><b>Shrub/Early Successional Bird Breeding Habitat;</b></p> <p><b>Rationale:</b> This wildlife habitat is declining throughout Ontario and North America. The Brown Thrasher has declined significantly over the past 40 years based on cxcix trend records.</p>	<p><u>Indicator Spp:</u> Brown Thrasher Clay-coloured Sparrow</p> <p><u>Common Spp.</u> Field Sparrow Black-billed Cuckoo E. Towhee Willow Flycatcher Blue-winged Warbler</p> <p><b>Special Concern:</b> Yellow-breasted Chat Golden-winged Warbler</p>	<p>CUT1 CUS1</p>	<ul style="list-style-type: none"> <li>Large older field areas succeeding to shrub and thicket habitats.</li> <li>Larger shrub thicket habitats (&gt;10ha) are most likely to support and sustain a diversity of these species. clxxiii,</li> <li>Shrub and thicket habitat sites considered significant should have a history of longevity, either abandoned fields or pasturelands.</li> <li>Use agricultural land classification maps and recent aerial photographs to determine the locations of potential shrub and thicket habitats.</li> <li>Ask local birders for location of shrub and thicket habitats that support abundant and species-rich populations of area-sensitive species.</li> <li>ESA reports and other studies prepared by Conservation Authorities</li> </ul>	<p>Shrubland or Successional fields 10 ha or larger in size, not class 1 or 2 agricultural lands, not being actively used for farming (i.e., no row-cropping in the last 5 years).Í</p> <p>Studies confirm:</p> <ul style="list-style-type: none"> <li>Presence of nesting or breeding of 2 or more indicator or special concern species and at least 1 of the common species.Í</li> <li>A field with breeding Yellow-breasted Chat or Golden-winged Warbler is to be considered as Significant Wildlife Habitat. Í</li> <li>Conduct field investigations of the most likely areas in spring and early summer when birds are singing and defending their territories</li> </ul> <p>SWHDSS cxlix Index #33 provides development effects and mitigation measures.</p>	<p>Thicket vegetation communities present on the valley slopes however they do not meet the &gt; 10 ha size criteria.</p>	<p>No significant SWH identified</p>
<p><b>Terrestrial Crayfish;</b></p> <p><b>Rationale:</b> Terrestrial Crayfish are only found within SW Ontario</p>	<p>Chimney or Digger Crayfish; {<u>Fallicambarus fodiens</u>}</p> <p>Devil Crawfish or Meadow Crayfish;</p>	<p>MAM1 MAM2 MAM3 MAM4 MAM5 MAM6</p>	<p>Wet meadow and edges of shallow marshes (no minimum size) should be surveyed for terrestrial crayfish.</p> <ul style="list-style-type: none"> <li>Constructs burrows in marshes, mudflats, meadows, the ground can't be too moist. Can</li> </ul>	<p>Studies Confirm:</p> <ul style="list-style-type: none"> <li>Presence of 1 or more individuals of species listed or their chimneys (burrows) in suitable meadow marsh, swamp or moist terrestrial sites cci</li> </ul>	<p>Wetland vegetation communities present within the study area no evidence of crayfish burrows were identified during the field investigations.</p>	<p>No significant SWH identified</p>

<p>in Canada and their habitats are very rare. ccii</p>	<p>{<u>Cambarus</u> <u>Diogenes</u>}</p>		<p>often be found far from water.</p> <ul style="list-style-type: none"> <li>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.</li> </ul> <p>Information Sources Information sources from “Conservation Status of Freshwater Crayfishes” by Dr. Premek Hamr for the WWF and CNF March 1998</p>	<ul style="list-style-type: none"> <li>Area of ELC ecosite or an ecoelement area of meadow marsh or swamp within the larger ecosite area is the SWH. Surveys should be done April to August in temporary or permanent water. Note the presence of burrows or chimneys are often the only indicator of presence, observance or collection of individuals is very difficult cci</li> </ul> <p>SWHMiST cxlix Index #36 provides development effects and mitigation measures.</p>		
<p><b>Special Concern and S1-S3 Species and Communities</b></p> <p><b>Rationale:</b> Special Concern and rare specie occurrences are significant due to their status or due to the relative number of occurrences within Ontario.</p>	<p>All Special Concern and rare (S1-S3, SH) plant and animal species or communities. Lists of these species and communities are tracked by the Natural Heritage Information Centre.</p>	<p>All plant and animal species or community element occurrences (EO).</p>	<ul style="list-style-type: none"> <li>Natural Heritage Information Centre will have the special concern and rare (S1-S3, SH) species lists and element occurrences for these species.</li> <li>NHIC Website: <a href="http://nhic.mnr.gov.on.ca/nhic">http://nhic.mnr.gov.on.ca/nhic</a></li> </ul>	<p>Studies Confirm:</p> <ul style="list-style-type: none"> <li>When an element occurrence is identified for a Special Concern or rare species then mapping of the habitat on the site needs to be completed to ELC Vegetation Type lxxviii I.</li> <li>Assessment/Inventory of the site for the identified special concern or rare species needs to be completed during the time of year when the wildlife species is present or easily identifiable.</li> <li>Habitat form and function needs to be assessed from the assessment of vegetation types and an area of significant habitat that will protect the rare or special concern specie identified.</li> <li>SWHDSS cxlix Index #37 provides development effects and mitigation measures</li> </ul>	<p>Several rare communities (dune ELC Ecosites) were identified along the Lake Ontario Shoreline, northeast of Beach Boulevard.</p>	<p>SWH identified. Appropriate mitigation to protect these rare communities/ELC Ecosites will be developed.</p>

### **3.4 Animal Movement Corridors**

Animal Movement Corridors are elongated areas used by wildlife to move from one habitat to another. They are important to ensure genetic flow within and between populations, to allow seasonal migration of animals (e.g., deer moving from summer to winter range), and to allow animals to move throughout their home range from feeding areas to cover areas. Animal movement corridors function at different scales, often related to the size and home range of the animal. For example, short, narrow areas of natural habitat may function as corridors between amphibian breeding areas and their summer range, while wider, longer corridors are needed to allow deer to travel from their winter habitat to their summer habitat.

Identifying the most important corridors that provide connectivity across the landscape is challenging because of a lack of specific information on animal movements. There is also some uncertainty about the optimum width and mortality risks of corridors. Furthermore, a corridor may be beneficial for some species but detrimental to others. For example, narrow linear corridors may allow increased access for raccoons, cats, and other predators associated with edges. Also, narrow corridors dominated by edge habitat may encourage invasion by weedy generalist plants and opportunistic species of birds and mammals. Corridors often consist of naturally vegetated areas that run through more open or developed landscapes. However, sparsely vegetated areas can also function as corridors. For example, many species move freely through agricultural land to reach natural areas. Despite the difficulty of identifying exact movement corridors for all species, these landscape features are important to the long-term viability of certain wildlife populations.

#### **Animal Movement Corridors, should only be identified as Candidate SWH where:**

1. A Confirmed or Candidate SWH has been identified by MNR or the planning authority based on documented evidence of a wildlife species identified within this Technical Paper using a distinct passageway or relying on well defined natural features for movements between habitats required by the species to complete its life cycle.

**Table 1.4.1** Animal Movement Corridors considered Candidate Significant Wildlife Habitat.

Habitat	SPECIES	ELC Eco-sites	HABITAT - FUNCTION/Form and INFORMATION SOURCES	CONFIRMED SWH	LGL Description
<p><b>Amphibian Movement Corridors</b></p> <p><b>Rationale:</b> Movement corridors for amphibians moving from their terrestrial habitat to breeding habitat can be extremely important for local populations.</p>	<p>Eastern Newt Blue-spotted Salamander Spotted Salamander Gray Treefrog Spring Peeper Chorus Frog Wood Frog</p>	<ul style="list-style-type: none"> <li>• habitat not ELC specific</li> <li>• Corridors will be determined based on identifying the significant breeding habitat for these species in Table 1.1.</li> </ul>	<p>Movement corridors between breeding habitat and summer habitat. clxxiv, clxxv, clxxvi, clxxvii, clxxviii, clxxix, clxxx, clxxxi.</p> <p>Movement corridors must be determined when Amphibian breeding habitat is confirmed as SWH from Table 1.2.2 (<b>Amphibian Breeding Habitat –Wetland</b>) of this Schedule ⑤.</p> <p><u>Information Sources</u></p> <ul style="list-style-type: none"> <li>• MNRF District Office.</li> <li>• Natural Heritage Information Center (NHIC).</li> <li>• Reports and other information available from Conservation Authorities.</li> <li>• Field Naturalist Clubs.</li> </ul>	<ul style="list-style-type: none"> <li>• Field Studies must be conducted at the time of year when species are expected to be migrating or entering breeding sites.</li> <li>• Corridors should consist of native vegetation, with several layers of vegetation. Corridors unbroken by roads, waterways or bodies, and undeveloped areas are most significant.</li> <li>• Corridors should have at least 15m of vegetation on both sides of waterway or be up to 200m wide of woodland habitat and with gaps &lt;20m.</li> <li>• Shorter corridors are more significant than longer corridors, however amphibians must be able to get to and from their summer and breeding habitat.</li> <li>• SWHMiST Index #40 provides development effects and mitigation measures</li> </ul>	<p>Amphibian information recorded within the study area did not meet the criteria for SWH based on lack of criteria species and calling levels. No SWH identified.</p>

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