Terrestrial and Aquatic Environment Existing Conditions Report - Interim Draft

Walker South Landfill Phase 2 Environmental Assessment

Walker Environmental

March 03, 2025

→ The Power of Commitment

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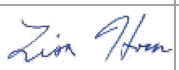
S4		Keenan Shelly Simon Chute	Lisa Horn				Mar 3, 2025

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1. Introduction

This report provides an overview of the existing Terrestrial and Aquatic Environment conditions within the study areas for the South Landfill Phase 2 Environmental Assessment (EA). The Minister of the Environment, Conservation and Parks (Minister) Approved Terms of Reference (ToR) for the EA included a preliminary description of the existing environmental conditions and made a commitment to expand upon this description during the EA[1].

Walker Environmental Group (Walker) initiated a Comprehensive EA under the Ontario *EA Act* seeking approval to expand the capacity of its existing South Landfill located at the Walker Resource Management Campus (Campus) in Niagara Falls. The South Landfill is an essential component of Walker's Campus since it began operating in 2009 under Environmental Compliance Approval (ECA) No. 008-78RKAM, as amended, and provides safe, reliable, and affordable disposal capacity for solid, non-hazardous waste from residential and industrial, commercial, and institutional (IC&I) sources to its customer base within the City of Niagara Falls, the Regional Municipality of Niagara, and the Province of Ontario. The South Landfill's total approved disposal capacity is 17.7 million m^3 and is expected to reach maximum capacity by 2029 to 2031.

The proposed Phase 2 of the South Landfill would extend its approved capacity by approximately 18 million m^3 over a 20-year period, ensuring Walker can continue to provide essential residual waste disposal services to its existing customer base. Walker is proposing to locate the additional disposal capacity (Phase 2) to the east of the existing South Landfill within the area currently occupied by Walker's Southeast Quarry. The proposal would maintain the existing landfill service area, as well as the annual volume of solid, non-hazardous waste from the sources currently accepted.

The *EA Act* requires that proponents describe the environment that may potentially be affected or may reasonably be expected to be affected, directly or indirectly, by the Alternative Methods of Carrying Out the Undertaking (Alternative Methods) proposed as part of an EA. The description of the existing environmental conditions will provide the baseline for the assessment of potential effects for the proposed Undertaking, which will be conducted during the EA. This report focuses on characterizing the existing conditions within the study areas for the South Landfill Phase 2 EA for the Terrestrial and Aquatic Environment.

2. Study Areas

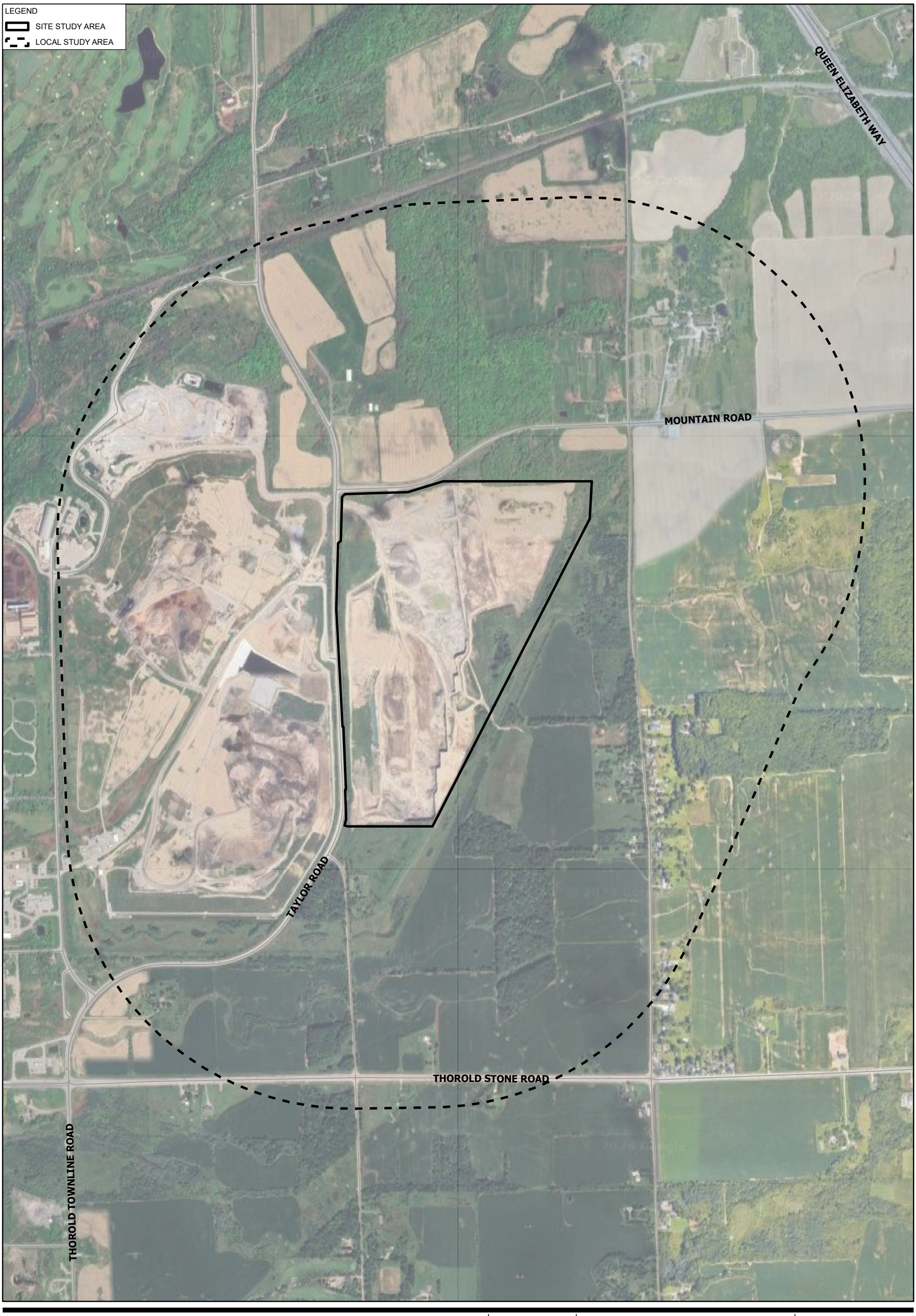
From a Terrestrial and Aquatic Environment perspective, the characterization of existing conditions within the following study areas are appropriate to this EA:

– **Site Study Area (SSA)**, including all lands (76.12 ha) owned and operated by Walker that are within the existing approved boundaries of the Southeast Quarry; and
– **Local Study Area (LSA)**, including all lands within a 1 km radius of the SSA boundaries.

Although field investigations are focused in the areas more likely to be affected by the proposed project (i.e. in the areas of the LSA that border the SSA), a 1 km LSA allowed for a more complete investigation of potentially sensitive ecological receptors.

The Terrestrial and Aquatic Environment study areas are illustrated in **Figure 2.1**, below.

[1] A more detailed description of the environment will be provided during preparation of the South Landfill Phase 2 EA reflecting the final study area using available existing information sources and investigative studies.



Paper Size ANSI B

0 125 250 375 500

Meters

Map Projection: Transverse Mercator
Horizontal Datum: North American 1983
Grid: NAD 1983 UTM Zone 17N

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WALKER INDUSTRIES
TERRESTRIAL AND AQUATIC ENVIRONMENT
EXISTING CONDITION REPORT

TERRESTRIAL AND AQUATIC STUDY AREAS

Project No. **12567140**
Revision No. **-**
Date **Jan 9, 2025**

FIGURE 2.1

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3. Methodology

3.1 Secondary Source Review

Available secondary sources of information were collected and reviewed to characterize Terrestrial and Aquatic Environment existing conditions within the Study Areas. The following sources of secondary information were collected and reviewed:

Table 3.1 Secondary Source Information Reviewed

Source	Information Reviewed
Ministry of Environment, Conservation, and Parks (MECP)	– Species at Risk in Ontario (SARO) records for the Study Area
Ministry of Natural Resources (MNR)	– Natural Heritage Features data layers from Geospatial Ontario and the Natural Heritage Information Centre (NHIC) database – Aquatic Resource Area (ARA) data
Fisheries and Oceans Canada (DFO)	– Species at Risk Fish and Mussel Maps
Niagara Peninsula Conservation Authority (NPCA)	– Applicable regulations and policies – Regulated Areas and Watershed Explorer mapping (NPCA 2024) – Natural heritage databases and species records for the Study Area – Beaverdams and Shriners Creek Watershed Plans
Niagara Region Open Data	– Contemporary Mapping of Watercourses Dataset – Permanent or Intermittent Watercourses mapping – Waterbodies mapping – Shoreline Areas mapping – Quaternary Watersheds mapping – Other Wetlands Non PSW mapping – Other Woodlands mapping – Linkages mapping – Significant Woodlands mapping – Ecological Land Classification (Niagara 2020)
Niagara Escarpment Plan (NEP)	– Applicable NEP Designation Mapping for the Study Area
Niagara Official Plan 2022 (May 2024 Consolidation)	– Land Use Designations – Applicable Schedules and Natural Heritage Systems Mapping
City of Niagara Falls Official Plan 1993 (Office Consolidation January 1, 2024)	– Land Use Designations – Applicable Schedules and Natural Heritage Systems Mapping
Ontario Breeding Bird Atlas (OBBA)	– Breeding bird data for the squares that include the Study Area
Ontario Butterfly Atlas (OBA)	– Species records for the squares that include the Study Area
Ontario Reptile and Amphibian Atlas (ORAA)	– Species records for the squares that include the Study Area
Distribution and Status of the Vascular Plants of Southwestern Ontario (Oldham 1993)	– Species records and rarity of vascular plants within local landscape
List of the Vascular Plants of Ontario's Carolinian Zone (Ecoregion 7E) (Oldham 2017)	– Species records and rarity of vascular plants within local landscape
eBird	– Species records for Species at Risk or locally rare species
iNaturalist	– Species records for Species at Risk or locally rare species

Source	Information Reviewed
Atlas of Canada	– Toporama map for applicable designations and features
Other	– Draft List of Plant Species of Importance to the Community of Six Nations – Previous site surveys – Site investigations – Natural Environment Existing Conditions – Facility Layout and Figures

3.2 Agency Consultation

GHD consulted with a number of review agencies throughout the EA to request natural environmental information. The Ministry of Natural Resources' (MNR) Natural Heritage Information Centre (NHIC) was consulted on November 28, 2024, to request available natural heritage information, Species at Risk (SAR) records, and relevant wildlife records for the Study Areas. A response has not yet been received. Information from Niagara Peninsula Conservation Authority (NPCA) was requested on April 22, 2024, and a response was received on June 6, 2024 including aquatic and terrestrial natural heritage data and mapping.

3.3 Field Study Methodology

GHD staff conducted various field investigations in 2023 to identify habitats, species and features present within the Study Areas (**Table 3.2**). Field surveys were conducted within the LSA that was directly adjacent to the SSA to accurately characterize the neighbouring habitat and natural features present. Limited investigations were conducted within the SSA due to active operation of the quarry and limited suitable habitat; however, incidental observations were collected at all field visits and are discussed in **Section 4.2.5**.

Table 3.2 Field Investigations

Field Investigation	Dates	GHD Staff
Amphibian Call Count Surveys	2023-04-11 2023-05-08 2023-05-29	Jenn Christie, Keenan Shelly, Laura Lawlor
Aquatic Habitat Assessment	2023-05-30	Jordan Widmaier, Katrina Greenfield
Breeding Bird Surveys	2023-05-24 2023-06-29	Jason Caldwell, Jenn Christie
Ecological Land Classification and Botanical Inventory	2023-05-24 2023-06-29 2023-09-26	Jason Caldwell, Jenn Christie, Keenan Shelly
Snake Coverboard Surveys	2023-05-24 2023-05-29 2023-06-29 2023-09-26	Jason Caldwell, Jenn Christie, Keenan Shelly

Additional ecological field investigations will be conducted in spring/summer 2025 and this draft report will be updated and finalized at the completion of the 2025 field season.

Methodology for each field survey is provided below.

3.3.1 Terrestrial Habitat and Species

3.3.1.1 Vegetation Communities and Botanical Inventory

Vegetation communities within the SSA and LSA were mapped and described following the *First Approximation – ELC System for Southern Ontario* (Lee et al. 1998). A botanical inventory (including a search for rare plant species) was completed for each Ecological Land Classification (ELC) unit where access permitted within the LSA. The vegetation inventory was compiled and refined by incidental observations recorded throughout all field visits.

3.3.1.2 Amphibian Call Surveys

Anuran call count (ACC) surveys were conducted to determine the presence and abundance of frogs and toads within the Study Areas. These surveys followed the methods described in the Ontario Marsh Monitoring Program (MMP; BSC 2009) for amphibian surveys. Four stations were surveyed within the SSA and LSA (**Figure 3.1**).

Three visits were conducted between April and June 2023 during appropriate night-time air temperatures, with surveys commencing a half hour after sunset and ceasing before midnight. At each station, experienced surveyors waited for 2 minutes in silence before starting the survey, then listened for frog and toad calls for a period of 3 minutes. The survey was focused on a semi-circle area with a radius of 100 m, recording any frogs and toads heard within and outside of that survey area, and estimating the location where the calls originated. The abundance of frogs and toads calling was based on standardized abundance codes, applied on a per-species basis: 1) few individuals calling, no call overlap, number of individuals can be accurately counted; 2) moderate number of individuals calling with some overlap, an accurate estimate of individuals calling can be made; and 3) full chorus, counting or estimating number of individuals calling is not possible.

During the first survey, night-time temperatures should be a minimum of 5 degrees Celsius (°C) with low wind and no precipitation. This survey was conducted on April 11, 2023, at a temperature of 15°C, with no wind or precipitation. During the second survey, night-time temperatures should be between 10 – 15°C with low wind and no precipitation. This survey was conducted on May 8, 2023, at temperatures between 12 – 15°C, with wind between 6 – 19 kilometres per hour (km/h), and no precipitation. During the third survey, night-time temperatures should be at least 17°C. This survey was conducted on May 29, 2023, at temperatures between 19 – 21°C, with no wind or precipitation.

3.3.1.3 Breeding Bird Surveys

Breeding bird surveys (BBS) were conducted in accordance with the Ontario Breeding Bird Atlas Survey protocols (Cadman et al. 2021). These surveys occur during the breeding bird season when most birds are on their territories engaged in breeding activities. The first visit occurs between May 24 to June 15 and the second visit between June 15 and July 10. These surveys commence a half hour before sunrise and include the 5 hours following.

A point count methodology was utilized, where a point count location was surveyed for 10 minutes and all the species seen and heard were recorded. Breeding evidence was recorded to determine whether the species was a possible, probable, or confirmed breeder. Point count locations were situated to ensure representation of all habitat types within the Study Areas. Incidental species observations were also collected on all visits.

A total of eight BBS point count locations were established in the SSA and LSA to capture all habitat conditions (**Figure 3.1**). The first survey was conducted on May 24, 2023, from 5:20 am until 10:00 am. The weather conditions were between 13 – 16°C, 0-80 percent cloud cover, with 1 – 19 km/h winds, and no precipitation. The second survey was conducted on June 29, 2023, from 5:30 am until 7:30 am. The weather conditions were between 13 – 15°C, 0-20 percent cloud cover, with 2 – 5 km/h winds, and no precipitation.

3.3.1.4 Snake Coverboard Surveys

Based on the correspondence with MECP and available background information, GHD ecologists conducted surveys throughout the LSA to determine presence of snakes (including SAR) in accordance with the *Survey Protocol for Ontario's Species at Risk Snakes* (Government of Ontario, 2021), with survey methods adapted from the Protocol to fit

the project needs. Artificial coverboard objects (ACO) were deployed in three locations throughout the SSA and LSA on May 24, 2023, and monitored through to September 26, 2023. ACO surveys are a standard, effective method for carrying out presence/absence surveys for snakes.

Prior to site visits, aerial photographs were reviewed to identify potential habitat (e.g., open-canopy and semi-open habitat, edge habitats) within the SSA and LSA. All suitable habitat was characterized and mapped to inform the ACO survey design. To capture all habitat types within the Study Area, a total of 12 ACO were deployed across three locations of the SSA. The 12 ACO were cut from ½ inch thick plywood boards with dimensions of 100 centimetres (cm) x 100 cm. By placing three to four ACOs per location within suitable habitat, it increased the capture potential within microhabitats of each location to promote chances of detecting snake species.

Each ACO was labelled with the object's ID name as well as contact information that correlated to the GHD staff member that was conducting the surveys. As part of ACO installation, excess weedy vegetation was removed to provide a relatively flush connection with the ground while still maintaining suitable habitat at each board.

A total of three surveys of all ACOs were carried out by GHD ecologists from spring until late summer of 2023 during the reptile active season. Surveys were conducted in accordance with the Protocol when air temperature were between 10-25°C in sunny conditions or between 15-30°C in overcast conditions. Surveys were completed during daylight hours when visibility of reptiles was at its highest. Timing during the day was variable as it was dependant on conditions during the day. The surveys were typically completed between 8 am and 12 pm or 5 pm and 8 pm with no surveys being carried out on days with wind speeds higher than 24 kilometres per hour (kph).

3.3.1.5 Significant Wildlife Habitat

After the background review and field inventories, GHD ecologists analyzed the information they collected to determine which, if any, Significant Wildlife Habitat (SWH) features could be confirmed based on their observations. The SSA and LSA were assessed for habitat identified within the criteria outlined from applicable guidance documents (i.e., Natural Heritage Reference Manual [OMNR 2010]; Significant Wildlife Habitat Technical Guidelines [OMNR 2000]; and Significant Wildlife Habitat Criteria for Ecoregion 7E, [MNRF 2015]). The analysis was conducted using the criteria for Significant Wildlife Habitat in Ecoregion 7E.

There are four categories of SWH:

– Seasonal Concentration Areas of Animals
– Rare Vegetation Communities or Specialized Habitat for Wildlife
– Habitat for SCC
– Animal Movement Corridors

Each of these categories includes various SWH types and specific criteria to evaluate their significance. These four categories were assessed based on aerial photography, background review, and field investigations.

3.3.1.6 Species at Risk Screening

Prior to conducting the field surveys, a screening of SAR with potential to be present within the Study Areas was completed. The term SAR is used to encompass species that are listed as END, THR, or SC under the provincial Endangered Species Act (ESA) (Government of Ontario 2007) or under the federal Species at Risk Act (SARA) (Government of Canada 2002). Only species listed as THR and END receive protection under the ESA. SC species may be protected under other policy instruments such as those for Significant Wildlife Habitat (OMNR 2000). With the exception of migratory birds protected by the Migratory Birds Convention Act (MBCA) and aquatic species, SARA generally does not apply on non-federal lands.

3.3.2 Wetlands

A formal wetland delineation as per the Ontario Wetland Evaluation System (OWES): Southern Manual (2014) was not completed in 2023. However, relevant natural heritage mapping was reviewed to determine the presence of

mapped wetlands within the Study Areas, and the ELC and botanical field investigations also identified the presence of wetland vegetation communities within the Study Areas.

3.3.3 Aquatic Habitat Assessment

3.3.3.1 Aquatic Habitat and Fish Community

The aquatic habitat was assessed within three reaches of the Ten Mile Creek watercourse within the LSA using a modified version of the Ontario Stream Assessment Protocol (OSAP; Stanfield 2017). The objective of this assessment was to characterize the local aquatic habitat. Characteristics of high-quality aquatic habitat include natural sinuosity with a well-defined riffle/pool sequence, variability in water depth and bed substrate, naturally occurring woody debris, undercut banks and natural riparian vegetation overhanging the banks that provides food for various aquatic organisms. The greater the quantity of preferred habitat features present, the higher potential aquatic habitat ranking.

Data collected included documentation and assessment of the following watercourse conditions:

- General watercourse characteristics (i.e., stream pattern, general gradient and flow).
- Channel characteristics (i.e., wetted width and depth, bankfull width and depth and depth of riffles/pools/run).
- Geomorphic features (i.e., riffles, pools and runs).
- Substrate and bank materials.
- Other pertinent habitat features (i.e., spawning, nursery and refuge areas, barriers to fish movement and macrophyte growth).
- Disturbances and evidence of past habitat alterations (i.e., channelization, channel hardening or straightening).
- Existing structures within the watercourse (i.e., culverts, corrugated steel pipes [CSP]).

Additionally, surface water quality parameters were measured using an in-situ Horiba U-52 Water Quality Meter. Parameters collected included temperature, pH, conductivity, turbidity, dissolved oxygen, total dissolved solids and salinity. The Canadian Water Quality Guidelines for the Protection of Aquatic Life (Canadian Council of Ministers of the Environment 2024) were used to interpret water quality data.

After the completion of the aquatic habitat assessment, field data was summarized to determine the habitat potential.

Existing fish community data for Ten Mile Creek Area was gathered through review of secondary source information from the NPCA, Fisheries and Oceans Canada (DFO), NHIC Aquatic Resources Area (ARA) and Niagara Region Open Data. Based on the available data set, GHD did not conduct fish community sampling within the Study Area.

3.3.3.2 Headwater Drainage Feature Assessment

Potential Headwater Drainage Features (HDF) within the Study Areas were assessed using a modified rapid HDF assessment using the Credit Valley Conservation (CVC)/Toronto Region and Conservation Authority (TRCA) 2014 ‘Evaluation, Classification and Management of Headwater Drainage Features Guidelines’ (herein referred to as the HDFA Guidelines). These guidelines provide a standardized means of identifying and assessing the value of HDFs and identifying the long-term management recommendations to protect or maintain the important ecological or biophysical functions provided by HDFs in a developing landscape.

A full HDF assessment was not requested and therefore only one site assessment was completed. The assessments were conducted within the second assessment period (late April – May). Further assessments may be required to determine the appropriate classification for mitigations.

4. Characterization of the Existing Environment

4.1 Designated Features

The LSA contains natural landscape features with varying levels of provincial significance (**Figure 4.1**).

Two non-provincially significant wetland complexes are found within the LSA: the Ten Mile Creek Wetland Complex and the Shriners Creek Wetland Complex. The Ten Mile Creek Wetland Complex is found on the north and east sides of the LSA, directly bordering much of the SSA. In recent years, the historic flow pathway of the Ten Mile Creek has been adjusted and forced southward to facilitate quarry operations in the current SSA, though online mapping still shows the creek and wetland complex entering the SSA on its east side. The Shriners Creek Wetland Complex is present in the southeast portion of the LSA and travels south towards Highway 57.

Portions of the north, south, and east sides of the LSA are classified as Stratum 2 white-tailed deer (*Odocoileus virginianus*) wintering area as delineated by the MNR (**Figure 4.1**). These areas are tied to the larger wooded communities within the LSA.

Northern and western portions of the LSA fall within the Niagara Escarpment Plan Designation Boundary, with the very northwest corner of the SSA also being included in this boundary. Designations within this boundary include Escarpment Protection Area and Escarpment Natural Area. Other designation areas within the LSA include Escarpment Rural Area, Escarpment Resource Extraction Area, and Urban Area. The entirety of the SSA and LSA that are included within the Niagara Escarpment Plan Designation Boundary are also included within the Greenbelt Boundary.

Various wetlands, waterways, and waterbodies scattered across the LSA are considered NPCA Regulated Area. Many of the evaluated, non-provincially significant wetlands within the LSA are considered locally significant by the NPCA. The NPCA also designates much of the SSA as well as the western and northern portions of the LSA as Highly Vulnerable Aquifer areas. As mentioned above, a portion of Ten Mile Creek and its associated NPCA regulated area is shown traversing the eastern side of the SSA, although this section of mapping is outdated as the watercourse was realigned through previous works.

Portions of the SSA and LSA have been designated by the Niagara Official Plan (2024) under Schedule B as Niagara Escarpment Plan Area; under Schedule C-1 as Natural Environment System Overlay; under Schedule C-2 as Linkages, Significant Woodlands, Other Woodlands, and Other Wetlands; under Schedule C-3 as Significant Groundwater Area and Highly Vulnerable Aquifers; and under Schedule D as within the Welland Canal North and Four Mile Creek and NOTL quaternary watersheds as well as the Lake Ontario tertiary watersheds.

Portions of the SSA and LSA have been designated by the Niagara Falls Official Plan (2024) under Schedule A as Environmental Conservation Area, Environmental Protection Area, Extractive Industrial, Niagara Escarpment Plan Area, and Good General Agriculture; under Schedule A-1 as Environmental Protection Area, Environmental and Conservation Area; under Schedule A-2 as Rural Area; under Appendix III as outside of the Urban Area Boundary and containing multiple Wooded and Treed Sites, under Schedule III-A as Top of Slope, NPCA Regulated Wetland >/= 2 ha, and Regulated Floodplain; under Schedule III-B as Adjacent Lands to natural features identified under Schedule III-A; under Schedule III-C as Locally Significant Wetland, NPCA Wetland < 2 ha, Significant Woodland, and Fish Habitat.

4.2 Terrestrial Habitat and Species

4.2.1 Vegetation Communities and Botanical Inventory

On May 24, June 29, and September 26, 2023, GHD conducted vegetation inventories and ELC of the Study Areas, primarily focusing on accessible areas of the LSA. These surveys determined that the LSA is dominated by agricultural lands under active row crops, cultural meadows, forests, and wetlands. The areas on the north, east, and south sides of the LSA provide relatively high habitat heterogeneity for a wide array of potential SAR in the area. A total of 13 vegetation communities were observed during field investigations. The full vegetation inventory is presented in **Appendix A**. A photographic log of SSA and LSA conditions is presented in **Appendix B**. ELC communities are shown on **Figure 4.2**.

4.2.1.1 Upland Communities

AG: Agriculture

This community comprises large portions of the LSA and consists of land being managed for agricultural purposes. The agricultural communities that were accessed during 2023 field surveys were heavily disturbed and therefore no formal vegetation survey was conducted in these communities.

CUM1-1: Dry – Moist Old Field Meadow

This community is common and present within multiple areas of the SSA and LSA, most notably along the eastern border of the SSA and LSA. This community is dominated by reed canary grass (*Phalaris arundinacea*), Kentucky bluegrass (*Poa pratensis ssp. Pratensis*), Canada goldenrod (*Solidago canadensis*), common dandelion (*Taraxacum officinale*), common timothy (*Phleum pratense ssp. Pratense*), and red clover (*Trifolium pratense*). Invasive species of note within this community include European reed (*phragmites australis*) and European buckthorn (*Rhamnus cathartica*). A native plant of note within this community is common milkweed (*Asclepias syriaca*), the larval foodplant for monarch butterflies (*Danaus plexippus*).

CUP: Mixed Plantation

This community is present in the southern portion of the LSA. The canopy is dominated by Norway spruce (*Picea abies*) and trembling aspen (*Populus tremuloides*).

CUT1: Mineral Cultural Thicket

This community is present in the eastern portion of the LSA, just east of the SSA boundary. The canopy consists of species such as eastern cottonwood (*Populus deltoides ssp. Deltoides*), white ash (*Fraxinus americana*), and balsam poplar (*Populus balsamifera*). The understory includes species such as staghorn sumac (*Rhus typhina*), red-osier dogwood (*Cornus stolonifera*), and New England aster (*Symphyotrichum novae-angliae*). Invasive European buckthorn was observed in this community.

FOD2: Dry - Fresh Oak - Maple - Hickory Deciduous Forest

This community is located in the eastern portion of the SSA as well as the southeastern portion of the LSA. Dominant canopy species include northern red oak (*Quercus rubra*), shagbark hickory (*Carya ovata var. ovata*), and pin oak (*Quercus palustris*). The understory includes species such as eastern poison ivy (*Toxicodendron radicans var. radicans*), thicket creeper (*Parthenocissus vitacea*), North American red raspberry (*Rubus idaeus ssp. Strigosus*), and grey dogwood (*Cornus racemosa*). This community contains invasive European buckthorn.

FOD7-4: Fresh-Moist Black Walnut Lowland Deciduous Forest

This community is present in the northeastern portion of the LSA. The canopy consisted of black walnut (J*uglans nigra*), white ash, pin oak, and invasive European buckthorn. The understory consisted of Canada goldenrod, North American red raspberry, and common timothy.

Hedge: Hedgerow

These narrow and linear hedgerows primarily run along the SSA and LSA boundary, as well as in field margins surrounding agricultural fields within the greater LSA. The canopy is dominated by red maple (*Acer rubrum*), silver maple (*Acer rubrum*), eastern white pine (*Pinus strobus*), and honey locust (*Gleditsia triacanthos*). The understory includes riverbank grape (*Vitis riparia*), red-osier dogwood, and tufted vetch (*Vicia cracca*). Common milkweed was noted in this community.

4.2.1.2 Wetland Communities

MAM2: Mineral Meadow Marsh

This community runs just outside the eastern boundary of the SSA. The community is dominated by bluejoint reedgrass (*Calamagrostis canadensis var. canadensis*) but also consists of broad-leaved cattail (*Typha latifolia*), tufted vetch, and reed canary grass. Invasive European reed was observed within this community.

MAM2-2: Reed-canary Grass Mineral Meadow Marsh

This community is present in the northeastern portion of the LSA, intertwined with the FOD7-4 community also present in that area. The community is dominated by reed canary grass, while also containing species such as white ash, Canada goldenrod, early goldenrod (*Solidago juncea*), and an unidentified sedge species (*Carex sp.*).

MAM2-5: Narrow-leaved Sedge Mineral Meadow Marsh

This community is present in the eastern portion of the LSA and dominated by a number of narrow-leaved sedge species.

MAS2: Mineral Shallow Marsh

This community is scattered along the southern and southwestern portions of the LSA and is dominated by cattail species and European reed.

SWD1-3: Silver Maple Deciduous Swamp

This community is present in the eastern portion of the LSA. The community is dominated by pin oak, silver maple, and eastern poison ivy. Multiple vernal pools were observed within this community.

SWD3-1: Red Maple Mineral Deciduous Swamp

This community is located in the southeastern portion of the LSA and is dominated by red maple.

4.2.1.3 Botanical Inventory

A total of 83 vascular plants were identified to species level during field investigations. An additional six plants were identified to genus level (wood fern [*Dryopteris sp.*], hawthorn [*Crataegus sp.*], willow [*Salix sp.*], elm [*Ulmus sp.*], sedge [*Carex sp.*], fescue [*Festuca sp.*]). A full list of species is presented in **Appendix A.**

Of the species identified, 54 (65%) are native and 29 (35%) are non-native. Of the native species, 46 species (85%) have an S-Rank[2] of 'S5', indicating they are 'secure' in the province; five species (9%) have an S-Rank of 'S4'

[2] Provincial (or Subnational) ranks are used by the 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 global ranks, but consider only those factors within the political boundaries of Ontario.

indicating they are ‘apparently secure’ in the province; one species (2%) has an S-Rank of ‘S4?’ indicating it is ‘apparently secure’ in the province though there is uncertainty with the assigned rank; one species (2%) has an S-Rank of ‘S2’ indicating it is ‘imperilled’ in the province; and one species (2%) has an S-Rank of ‘S2?’ indicating it is ‘imperilled’ in the province though there is some uncertainty with the assigned rank.

Of the native species identified, 52 (96%) have Co-efficient of Conservatism[3] (CC) values of 0 to 6, indicating they are tolerant to moderately tolerant of disturbance. Pin oak, and bushy aster (*Symphyotrichum dumosum*) possess rankings of 9-10 which indicate they have a very low tolerance for disturbance. Four locally rare species, bushy aster, honey locust, balsam poplar, and Canada rush (*Juncus canadensis*), were observed during botanical inventories (Oldham 2017). No SAR or SCC plants were identified during the botanical inventories.

4.2.2 Amphibians

Over the course of the surveys, amphibians were heard calling from all four stations within the Study Areas. The results of the surveys are summarized in **Table 4.1,** which indicates the call levels and abundance of each species present at each station.

Amphibians were generally heard calling in low numbers (one to three individuals) and consisted of common and secure species in Ontario (i.e., S5 or S4 ranked), apart from higher numbers of western chorus frog (*Pseudacris triseriata*; listed as THR federally and not-at-risk [NAR] provincially). Multiple individuals and groups (up to 4 individuals) of this species were heard calling at all stations on April 11 and May 8, 2023. No additional SAR, SCC, or locally rare amphibian species were observed.

[3] Rank of 0 to 10 based on plant's degree of fidelity to a range of synecological parameters: (0-3) Taxa found in a variety of plant communities; (4-6) Taxa typically associated with a specific plant community but tolerate moderate disturbance; (7-8) Taxa associated with a plant community in an advanced successional stage that has undergone minor disturbance; (9-10) Taxa with a high fidelity to a narrow range of synecological parameters (Oldham et al. 1995).

Table 4.1 Amphibian Call Survey Data

Species	AC-23-01			AC-23-02			AC-23-03			AC-23-04		
	Orientation: South			Orientation: Northwest			Orientation: Southeast			Orientation: East		
	04-11-23	05-08-23	05-29-23	04-11-23	05-08-23	05-29-23	04-11-23	05-08-23	05-29-23	04-11-23	05-08-23	05-29-23
American toad (*Anaxyrus Americanus*)	-	-	-	1 (1)	2 (2) [a]	-	-	1 (1)	-	-	-	-
Green frog (*Lithobates clamitans*)	-	-	-	-	-	-	-	-	-	-	1 (1)	1 (1)
Northern leopard frog (*Lithobates pipiens*)	-	-	-	1 (1)	-	-	-	-	-	-	-	-
Spring peeper (*Pseudacris crucifer*)	1 (3)*	2 (2)[a]	-	1 (2)	-	-	1 (1) [a]	-	-	1 (1)	-	-
Western chorus frog (*Pseudacris triseriata*)	2 (4)*	2 (3)* [a]	-	2 (2) [a]	2 (2) [a]	-	2 (3)* [a]	2 (2) [a]	-	2 (3)* [a]	2 (2) [a]	-
Wood frog (*Lithobates sylvaticus*)	-	-	-	-	1 (1)	-		-	-	-	-	-

Notes

Format of table is “Call Level (Abundance)”

Call level: 1: Calls not simultaneous, number of individuals can be accurately counted; 2: Some calls simultaneous, number of individuals can be reliably estimated; 3: Full chorus, calls continuous and overlapping, number of individuals cannot be reliably estimated.

Abundance: Numbers in parentheses indicate estimated number of individuals of a species.

* Groups observed on each side of the survey area (i.e., multiple groups of that call level/abundance within survey area).

[a] Multiple calls observed, reporting the maximum call code for the species.

4.2.3 Breeding Birds

Breeding bird surveys (BBS) were conducted on May 24 and June 29, 2024, and detected a total of 52 bird species across the eight point-count locations within the Study Areas. Of the total species observed, one species was a confirmed breeder, fifteen were probable breeders, and 31 were possible breeders. The remaining five bird species are considered to be non-breeders, flyovers, or migrants. A list of the species detected with evidence of breeding is provided in **Appendix C**.

Through these BBS, three SAR listed as SC under the provincial ESA were observed: barn swallow (*Hirundo rustica*), grasshopper sparrow (*Ammodramus savannarum*), and olive-sided flycatcher (*Contopus cooperi*). These species are not afforded protection under the ESA; however, they may be protected as Species of Special Concern (SCC) under Significant Wildlife Habitat. Barn swallow (possible breeder within the Study Areas) are currently listed as THR under the federal SARA. None of the birds recorded during the BBS are identified as THR or END under the ESA, nor as a regionally rare, provincially rare or a species of interest by OBBA or NHIC. However, most of the species detected during the surveys and their nests, eggs, and young receive protection under the Migratory Birds Convention Act (MBCA; Government of Canada 1994).

4.2.4 Snakes

GHD ecologists conducted the ACO surveys from May to September 2023. Photographs of the locations where the ACOs were placed are included in **Appendix B.** After deployment, ACOs were checked three times throughout the period of monitoring. No snakes or evidence of snakes were found under the deployed ACOs during the surveys. ACO survey results are summarized in **Table 4.2.**

Table 4.2 Cover Board Survey Results

Survey Number	Survey Date	Weather Conditions	Observations
ACO Monitoring Survey #1	May 29, 2023	Temperature (°C): 22 Wind (km/h): 6-11 Cloud (%): 0	No snakes observed.
ACO Monitoring Survey #2	June 29, 2023	Temperature (°C): 14 Wind (km/h): 1-5 Cloud (%): 10	No snakes observed.
ACO Monitoring Survey #3	September 26, 2023	Temperature (°C): 14 Wind (km/h): 6-11 Cloud (%): 25	No snakes observed.

4.2.5 Incidental Wildlife Observations

In addition to the wildlife species detected during formal surveys, the following wildlife species were observed incidentally within the Study Areas.

Table 4.3 Incidental Wildlife Observations

Species		ESA	SARA	S-ranks	Date Observed	Notes
Common Name	Scientific Name					
Raccoon	*Procyon lotor*	-	-	S5	4/11/2023	Tracks observed
White-tailed deer	*Odocoileus virginianus*	-	-	S5	4/11/2023	Antler seen on ground
Red-bellied woodpecker	*Melanerpes carolinus*	-	-	S4	4/11/2023	Adult observed eating

Species		ESA	SARA	S-ranks	Date Observed	Notes
Common Name	Scientific Name					
Northern flicker	*Colaptes auratus*	-	-	S4B	4/11/2023 and 6/29/2023	Adult male calling – evidence of breeding

4.2.6 Significant Wildlife Habitat

An assessment of candidate or confirmed SWH is provided in **Appendix D**. Candidate SWH is generally identified where appropriate habitat may be present but targeted surveys were not included in the scope of the project and thus SWH presence or absence cannot be confirmed. However, several categories of SWH were confirmed through field investigations within the SSA and LSA.

Deer winter congregation areas were identified as confirmed SWH within the LSA due to applicable MNR mapping displaying deer wintering area (stratum 2) in the northern, eastern, and southern portions of the LSA. These mapped wintering areas correspond to woodlots suitable for the species.

Other rare vegetation communities were identified as confirmed SWH within the LSA due to ELC mapping recording the presence of a rare vegetation community (FOD7-4) within the LSA. This community is located in the northeastern portion of the LSA.

The LSA also currently supports confirmed SWH for Habitat for SCC: Special Concern and Rare Wildlife Species habitat within the CUM1-1 and FOD2 communities:

– Bushy aster (provincially imperilled: S2) was observed within the CUM1-1 community.
– Pileated woodpecker (*Dryocopus pileatus*) (breeding population provincially vulnerable: S3B) and rough-legged hawk (*Buteo lagopus*) (breeding population critically imperilled, non-breeding population apparently secure: S1B, S4N) were observed at BBS 06, within the CUM1-1 and FOD2 communities. In addition, several SC bird species (barn swallow, olive-sided flycatcher, and grasshopper sparrow) were observed in the SSA/LSA (**Sections 4.2.7.1.2 – 4.2.7.1.4**).

4.2.7 Species at Risk

GHD evaluated the potential for SAR to occur within the LSA through a combination of secondary source review, agency consultation, and field investigations (**Appendix E**). A list of 43 SAR with the potential to occur within the LSA was developed from a review of background sources.

Four SAR were confirmed within the LSA, one SAR was identified to have a high potential to occur in the LSA, and 24 SAR species were identified to have a moderate potential to occur in the LSA. GHD ecologists will revisit this list following the 2025 field season to determine if any of these SAR should be re-classified and/or are anticipated to be impacted by the proposed works.

4.2.7.1 Confirmed

4.2.7.1.1 Western Chorus Frog

Western chorus frog (*Pseudacris triseriata*) is listed as THR under the SARA and not listed under the ESA. In Ontario, habitat of this amphibian species typically consists of marshes or wooded wetlands, particularly those with dense shrub layers and grasses, as this species is a poor climber. They will breed in almost any fishless pond including roadside ditches, gravel pits and flooded swales in meadows. This species hibernates in terrestrial habitats under rocks, dead trees or leaves, in loose soil or in animal burrows. During hibernation, this species is tolerant of flooding (Environment Canada 2015). This species was observed at all survey stations during amphibian call count surveys within the LSA (**Figure 3.1**).

4.2.7.1.2 Barn Swallow

Barn swallow (*Hirundo rustica*) is listed as THR under the SARA and SC under the ESA. In Ontario, barn swallow breeds in areas that contain a suitable nesting structure, open areas for foraging, and a body of water. This species nests in human made structures including barns, buildings, sheds, bridges, and culverts. Preferred foraging habitat includes grassy fields, pastures, agricultural cropland, lake and river shorelines, cleared right-of-ways, and wetlands (COSEWIC 2021). Mud nests are fastened to vertical walls or built on a ledge underneath an overhang. Suitable nests from previous years are reused (Brown and Brown 1999). This species was observed during breeding bird surveys at various stations within the LSA (**Appendix C**).

4.2.7.1.3 Grasshopper Sparrow

Grasshopper sparrow (*Ammodramus savannarum pratensis*) is listed as SC under the SARA and the ESA. In Ontario, grasshopper sparrow is found in medium to large grasslands with low herbaceous cover and few shrubs. It also uses a wide variety of agricultural fields, including cereal crops and pastures. Close-grazed pastures and limestone plains (e.g., Carden and Napanee Plains) support highest density of this bird in the province (COSEWIC 2013). This species was observed during breeding bird surveys at station BBS-23-05 within the SSA (**Figure 3.1**).

4.2.7.1.4 Olive-sided Flycatcher

Olive-sided flycatcher (*Contopus cooperi*) is listed as SC under the SARA and the ESA. In Ontario, olive-sided flycatcher breeding habitat consists of natural openings in coniferous or mixed forests, including bogs, burns, riparian zones, and cutover areas. They are also found in semi-open forest stands and early successional forest when tall snags and residual live trees are present. In the boreal forest it is often associated with muskeg, bogs, fens and swamps dominated by spruce and tamarack. Open areas with tall trees or snags for perching are used for foraging (COSEWIC 2007). Nests are usually built on horizontal branches of conifers (Peck and James 1987). This species was observed during breeding bird surveys at station BBS-23-05 within the SSA (**Figure 3.1**).

4.2.7.2 High Potential

4.2.7.2.1 Monarch

Monarch is listed as END under the SARA and SC under the ESA. In Ontario, monarch is found throughout the northern and southern regions of the province. This butterfly is found wherever there are milkweed (*Asclepias spp*.) plants for its caterpillars and wildflowers that supply a nectar source for adults. It is often found on abandoned farmland, meadows, open wetlands, prairies and roadsides, but also in city gardens and parks. Important staging areas during migration occur along the north shores of the Great Lakes (COSEWIC 2010). This species is considered to have a high likelihood of occurrence within the LSA due to the presence of its larval foodplant, common milkweed (*Asclepias syriaca*), within the CUM1-1 and Hedge communities.

4.3 Wetlands

A variety of evaluated non-PSW wetlands were identified within the LSA as confirmed by background sources and field verification. They are primarily confined to waterways and mapped wetland ecosites within the LSA. One provincially significant wetland (PSW) complex is located just northwest of the LSA; the Welland Canal North Turn Basin Wetland Complex (**Figure 4.1**). This PSW is located northwest of existing Walker operations and will not be influenced by the proposed Phase 2 of the South Landfill.

4.4 Aquatic Habitat and Species

4.4.1 Aquatic Habitat Conditions

Ten Mile Creek originates northeast of the LSA and flows southwest through the LSA, adjacent to the eastern side of the SSA. A total of three reaches were assessed within Ten Mile Creek for aquatic habitat on May 30, 2024, by GHD

aquatic ecologists (**Figure 3.1**). Surrounding land use of the watercourse was agricultural with potential sources of pollution from agricultural runoff, road use and industrial processes. No barriers or fish passage constraints were observed within the watercourse.

The first reach (Reach 1) was approximately 300 meters (m) in length and represents the southern-most reach of the watercourse within the southern portion of the LSA. This reach was constrained to a defined channel and assessed to have intermittent flow and was mostly dry with minimal standing water during the time of GHD's field survey. There was a small amount of standing water within the middle section of the reach. Channel morphology was characterized as generally uniform, containing mostly clay substrate and other fine materials. A pond was observed west of the reach with standing water, surrounded by cattails (*Typha sp.*) and European reed. An existing concrete box culvert was located within the southern-most extent of the reach where the watercourse flowed under Beechwood Road. The box culvert was observed to be in good condition and lined with large cobble.

The second reach (Reach 2) was approximately 1,250 m in length and represented the middle section of the watercourse within the central and eastern portion of the LSA. The reach was channelized and constrained and assessed to have an intermittent flow. The reach was mostly dry with minor standing water during GHD's field survey. The reach flowed through a shallow pond that was filled with cattails and contained standing water. An existing double CSP was observed within the middle portion of the reach where the watercourse flowed beneath a gravel road. The double CSP was observed to contain minor standing water at the outlet.

The third reach (Reach 3) was approximately 290 m in length and represented the northern-most reach of the watercourse in the eastern portion of the LSA. This reach was channelized and constrained and assessed to have an intermittent flow. The reach was mainly dry during the time of GHD's field survey. An existing box culvert constructed of cement and flagstone was observed within the eastern-most extent of the reach where the watercourse flows underneath of Garner Road and enters the SSA.

Channel characteristics within the three reaches of Ten Mile Creek are presented in **Table 4.4**.

Table 4.4 Ten Mile Creek Channel Characteristics

Reach	Average Velocity (m/sec)	Substrate Type (%)	Average Channel Dimensions (m)
Reach 1	0	Clay (60) Silt (30) Sand (10)	Wetted Width: 0.02 Wetted Depth: 0.51 Bankfull Width: 2.48 Bankfull Depth: 7.13
Reach 2	0	Clay (60) Silt (30) Sand (10)	Wetted Width: 0.06 Wetted Depth: 0.01 Bankfull Width: 2.22 Bankfull Depth: 0.31
Reach 3	0	Clay (80) Silt (15) Sand (5)	Wetted Width: 1.26 Wetted Depth: 0.07 Bankfull Width: 2.78 Bankfull Depth: 0.37

The riparian vegetation communities that surrounded the entire watercourse consisted of cultural thicket (CUT1), cultural meadow (CUM1-1) and mineral meadow marsh (MAM2).

Reach 1 banks were generally stable and low, acting as a floodplain for the watercourse. Instream cover consisted mostly of vascular macrophytes as well as organic debris. Instream vegetation was comprised almost entirely of emergent phragmites or cattails.

As with Reach 1, Reach 2 banks were generally stable and low, acting as a floodplain for the watercourse. Instream cover consisted mostly of vascular macrophytes as well as organic debris. Overhanging vascular macrophytes were also observed within Reach 2. Instream vegetation was comprised almost entirely of emergent phragmites or cattails.

Minor evidence of erosion was observed within Reach 3 along the outer bends of the watercourse. Instream cover consisted mostly of vascular macrophytes, organic debris and instream woody debris. Instream vegetation was comprised almost entirely of emergent phragmites or cattails, however within Reach 3 submergent water weed was observed.

The watercourse substrate was uniform throughout all reaches, largely comprised of clay with smaller proportions of silt and sand. Overall, Ten Mile Creek provides direct and indirect fish habitat. Creek characteristics that provide habitat for fish are outlined in **Table 4.5.**

Table 4.5 Ten Mile Creek Habitat Characteristics

Reach	Sediment Deposition	Canopy Cover (%)	Aerial Cover Composition (%)	Instream Cover Composition (%)	Instream Vegetation Type (%)	Bank Characteristics	
						Left Upstream Bank	Right Upstream Bank
Reach 1	Minimal <5mm	75-100	Phragmites (90) Trees (5) Shrubs (5)	Instream vascular macrophytes (80) Organic debris (20)	Emergent – Phragmites (100)	Stable Height = 0.1 m	Stable Height = 0.1 m
Reach 2	Minimal <5mm	50-74	Cattails (45) Grass (40) Shrubs (10) Trees (5)	Instream vascular macrophytes (75) Organic debris (15) Overhanging vascular macrophytes (10)	Emergent – Cattails (100)	Stable Height = 0.1 m	Stable Height = 0.28 m
Reach 3	Minimal <5mm	75-100	Shrubs (60) Trees (30) Bridge/Crossing (10)	Instream vascular macrophytes (65) Instream woody debris (20) Organic debris (10) Overhanging vascular macrophytes (5)	Emergent – Cattails and Phragmites (65) Submergent – Water weed (35)	Slightly stable Height = 0.25 m Some bank erosion on outer bends	Moderately stable Height = 0.25 Some bank erosion on outer bends m

4.4.2 Fish Community

Fish sampling surveys were not conducted by GHD. Secondary source data was used to determine fish community. Fish sampling surveys were conducted in Ten Mile Creek by the NPCA, which identified a total of five species of fish including central mudminnow (*Umbra limi*), common carp (*Cyprinus carpio*), fathead minnow (*Pimephales promelas*), Iowa darter (*Etheostoma exile*) and spottail shiner (*Notropis hudsonius* (NPCA 2011; Gartner Lee 2001). Through correspondence with NPCA, fisheries data from MNRF was also provided, which identified bluegill (*Lepomis*

macrochirus), fathead minnow and pumpkinseed (*Lepomis gibbosus*) within Ten Mile Creek. Based on correspondence and fisheries data, Ten Mile Creek is representative of a tolerant warm water watercourse that includes different species of fish with varying tolerances to environmental change and contains Type II Fish Habitat (NPCA 2011; NPCA 2024). The NPCA defines Type II Fish Habitat as Important Fish Habitat, which includes spawning grounds and any other areas, including nursery, rearing, food supply, and migration areas on which fish depend directly or indirectly in order to carry out their life processes (NPCA 2022). NPCA also identified in-water restricted timing windows for the Welland Canal Tributaries, which includes Ten Mile Creek, of March 1 to July 1 (i.e. no in-water work is to occur between these dates).

Review of secondary sources found no provincially and/or nationally rare species documented within the Study Areas. As well, no critical habitat for Aquatic SAR was identified within the Study Areas (Fisheries and Oceans Canada 2024).

5. Conclusions

The LSA contains a variety of designated ecological features such as wetlands, woodlands, and NPCA regulated areas. Although the SSA is heavily impacted by active aggregate extraction, the LSA provides a mosaic of different habitat types which provide habitat for a wide variety of plant and animal species, including SAR. Four SAR (Western chorus frog, barn swallow, grasshopper sparrow, and olive-sided flycatcher) were confirmed through field investigations within the SSA/LSA, and there is moderate to high potential for additional SAR species to occur. Several types of SWH were also confirmed within the Study Areas, including deer wintering areas, rare vegetation communities, and habitat for species of conservation concern. Ten Mile Creek, immediately adjacent to the SSA, was found to provide direct and indirect fish habitat. Additional field investigations in 2025 will continue to characterize the terrestrial and aquatic features within the Study Areas.

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Figures

LEGEND

- SITE STUDY AREA
- LOCAL STUDY AREA
- NES PERMANENT AND INTERMITTENT WATERCOURSES
- OHN WATERCOURSE - LIO
- BREEDING BIRD SURVEY STATION
- SNAKE COVERBAORD SURVEY STATION
- AMPHIBIAN CALL COUNT SURVEY STATION
- AQUATIC HABITAT SURVEY STATION

Six Mile Creek
QUEEN ELIZABETH WAY
Eight Mile Creek
BBS-23-08
MOUNTAIN ROAD
TAYLOR ROAD
BBS-23-03
AC-23-04
BBS-23-01
BBS-23-04
Reach ID: 3
AC-23-03
BBS-23-05
AC-23-02
BBS-23-02
BBS-23-06
AC-23-01
Ten Mile Creek
Reach ID: 2
Reach ID: 1
BBS-23-07
THOROLD STONE ROAD
THOROLD TOWNLINE ROAD

Paper Size ANSI B

0 125 250 375 500

Meters

Map Projection: Transverse Mercator
Horizontal Datum: North American 1983
Grid: NAD 1983 UTM Zone 17N

N

GHD

WALKER INDUSTRIES
TERRESTRIAL AND AQUATIC ENVIRONMENT
EXISTING CONDITION REPORT

SURVEY STATIONS

Project No. **12567140**
Revision No. **-**
Date **Jan 9, 2025**

FIGURE 3.1

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LEGEND

- SITE STUDY AREA
- LOCAL STUDY AREA
- OHN WATERCOURSE - LIO
- AREA OF NATURAL AND SCIENTIFIC INTEREST (ANSI)
- NPCA APPROXIMATE REGULATION LANDS
- WILDLIFE VALUES AREA
- WHITE-TAILED DEER WINTERING AREA (STRATUM 2)
- PROVINCIALLY SIGNIFICANT WETLAND - LIO
- WETLANDS OTHER / NOT PROVINCIALLY SIGNIFICANT - LIO
- WATERBODIES
- SIGNIFICANT WOODLANDS - NIAGARA REGION

Six Mile Creek
QUEEN ELIZABETH WAY
Eight Mile Creek
MOUNTAIN ROAD
Ten Mile Creek
Ten Mile Creek Wetland Complex
Shriner's Creek Wetland Complex
Ten Mile Creek
Shriner's Creek Wetland Complex
Shriner's Creek Wetland Complex
THOROLD STONE ROAD
THOROLD TOWNLINE ROAD

Paper Size ANSI B

0 100 200 300 400 500

Meters

Map Projection: Transverse Mercator
Horizontal Datum: North American 1983
Grid: NAD UTM Zone 17N

N

GHD

WALKER INDUSTRIES
TERRESTRIAL AND AQUATIC ENVIRONMENT
EXISTING CONDITION REPORT

DESIGNATED FEATURES

Project No. 12567140
Revision No. -
Date Jan 20, 2025

FIGURE 4.1

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Print date: 20 Jan 2025 - 15:24

Data source: . Created by: stomic

ELC Types - 1st Approximation

Ecological Land Classification for Southern Ontario First Approximation and its Application

ELC Code	Ecosite Vegetation Type Description
AG	Agricultural
CUM1-1	Dry – Moist Old Field Meadow Type
CUP	Plantation
CUT1	Mineral Cultural Thicket Ecosite
FOD2	Dry – Fresh Oak – Maple – Hickory Deciduous Forest Ecosite
FOD7-4	Fresh – Moist Black Walnut Lowland Deciduous Forest Type
MAM	Meadow Marsh
MAM2	Mineral Meadow Marsh Ecosite
MAM2-2	Reed-canary Grass Mineral Meadow Marsh Type
MAM2-5	Narrow-leaved Sedge Mineral Meadow Marsh
MAS2	Mineral Shallow Marsh Ecosite
RES	Residential
SWD	Deciduous Swamp
SWD1-3	Pin Oak Mineral Deciduous Swamp Type
SWD3-1	Red Maple Mineral Deciduous Swamp Type

LEGEND
- SITE STUDY AREA
- LOCAL STUDY AREA
- ECOLOGICAL LAND CLASSIFICATION
- OHN WATERCOURSE

Paper Size ANSI B

0 90 180 270 360 450

Meters

Map Projection: Transverse Mercator
Horizontal Datum: North American 1983
Grid: NAD 1983 UTM Zone 17N

N

GHD

WALKER INDUSTRIES
TERRESTRIAL AND AQUATIC ENVIRONMENT
EXISTING CONDITION REPORT

ECOLOGICAL LAND CLASSIFICATION

Project No. 12567140
Revision No. -
Date Feb 26, 2025

FIGURE 4.2

Q:\GIS\PROJECTS\12567000s\12567140\GIS\Maps\Deliverables\202411_LandfillEA\12567140_202411_LandfillEA\12567140_202411_LandfillEA.aprx
Print date: 26 Feb 2025 - 15:34

Data source: Tiled service layer: © OpenStreetMap (and) contributors, CC-BY-SA. Created by: stomic

Appendices

Appendix A

Vascular Plant List

Appendix A

Vascular Plant List
Terrestrial and Aquatic Environment Existing Conditions Report

Scientific Name	Common Name	Coefficient of Conservatism (CC)	Wetness Index	Weediness Index	Provincial Status (S-Rank)	ESA Status	SARA Status	Local Status Niagara Oldham 2017	Ecological Land Classification											
									AG	CU	CUM1-1	CUP	CUT1	FOD2	FOD7-4	Hedge	MAM2	MAM2-2	MAM2-5	SWD1-3
Dryopteridaceae	**Wood Fern Family**																			
Dryopteris carthusiana	Spinulose Wood Fern	5	-2		S5			C						x						
Dryopteris sp.	Wood fern sp.													x						
Pinaceae	**Pine Family**																			
Picea abies	Norway Spruce		5	-1	SNA			IC				x								
Picea glauca	White Spruce	6	3		S5			IU										x		
Pinus strobus	Eastern White Pine	4	3		S5			C								x				
Adoxaceae	**Moschatel Family**																			
Sambucus canadensis	Common Elderberry	5	-2		S5			C			x		x							
Anacardiaceae	**Cashew Family**																			
Rhus typhina	Staghorn Sumac	1	5		S5			C					x							
Toxicodendron radicans var. radicans	Eastern Poison Ivy	5	-1		S5			C			x			x		x				x
Apiaceae	**Carrot Family**																			
Daucus carota	Wild Carrot		5	-2	SNA			IC			x									
Apocynaceae	**Milkweed Family**																			
Apocynum cannabinum var. cannabinum	Hemp Dogbane	3	0		S5			C									x			
Asclepias incarnata ssp. incarnata	Swamp Milkweed	6	-5		S5			C			x						x			
Asclepias syriaca	Common Milkweed	0	5		S5			C			x					x				
Asteraceae	**Aster Family**																			
Ambrosia artemisiifolia	Common Ragweed	0	3		S5			C			x									
Arctium lappa	Great Burdock		3		SNA			IU								x				
Bidens cernua	Nodding Beggarticks	2	-5		S5			C						x						
Cichorium intybus	Wild Chicory		5	-1	SNA			IC			x									
Cirsium arvense	Canada Thistle		3	-1	SNA			IC					x							
Euthamia graminifolia	Grass-Leaved Goldenrod	2	-2		S5			C			x		x							
Leucanthemum vulgare	Oxeye Daisy		5	-1	SNA			IC								x				
Solidago altissima var. altissima	Tall Goldenrod	1	3		S5			C								x				
Solidago canadensis	Canada Goldenrod	1	3		S5			C			x		x	x	x		x	x		
Solidago juncea	Early Goldenrod	3	5		S5			C										x		
Sonchus arvensis ssp. arvensis	Field Sow-Thistle		3		SNA			IC			x									
Symphyotrichum dumosum	Bushy Aster	10	-1		S2			R			x									
Symphyotrichum novae-angliae	New England Aster	2	-3		S5			C			x		x							
Symphyotrichum pilosum var. pilosum	Old Field Aster	4	2		S5			C			x									
Taraxacum officinale	Common Dandelion		3	-2	SNA			IC			x									
Balsaminaceae	**Touch-Me-Not Family**																			
Impatiens capensis	Spotted Jewelweed	4	-3		S5			C						x						
Betulaceae	**Birch Family**																			
Betula papyrifera	Paper Birch	2	2		S5			C								x				
Carpinus caroliniana ssp. Virginiana	Blue-Beech	6	0		S5			C						x						
Brassicaceae	**Mustard Family**																			
Alliaria petiolata	Garlic Mustard		0	-3	SNA			IC						x						
Thlaspi arvense	Field Pennycress		5	-1	SNA			IC			x									
Caprifoliaceae	**Honeysuckle Family**																			
Dipsacus fullonum	Common Teasel		3	-1	SNA			IC			x						x			
Convolvulaceae	**Bindweed Family**																			
Ipomoea purpurea	Common Morning Glory		3	-1	SNA			IH									x			
Cornaceae	**Dogwood Family**																			
Cornus alternifolia	Alternate-Leaved Dogwood	6	5		S5			C								x				
Cornus racemosa	Grey Dogwood	2	-2		S5			C						x						
Cornus stolonifera	Red-Osier Dogwood	2	-3		S5			U			x		x			x				
Elaeagnaceae	**Oleaster Family**																			
Elaeagnus angustifolia	Russian Olive		3	-1	SNA			IR								x				
Fabaceae	**Legume Family**																			
Gleditsia triacanthos	Honey Locust	3	0		S2?			R								x				
Melilotus officinalis	Yellow Sweet-Clover		3	-1	SNA			IC			x									
Trifolium pratense	Red Clover		3	-2	SNA			IX			x							x		
Vicia cracca	Tufted Vetch		5	-1	SNA			IC			x					x	x	x		
Fagaceae	**Beech Family**																			
Quercus macrocarpa	Burr Oak	5	1		S5			U					x			x				
Quercus palustris	Pin Oak	9	-3		S4			C						x	x	x				x
Quercus rubra	Northern Red Oak	6	3		S5			C						x		x				
Grossulariaceae	**Currant Family**																			
Ribes cynosbati	Eastern Prickly Gooseberry	4	5		S5			C						x						
Juglandaceae	**Walnut Family**																			
Carya ovata var. ovata	Shagbark Hickory	6	3		S5			C						x						
Juglans nigra	Black Walnut	5	3		S4?			C					x	x	x					
Lamiaceae	**Mint Family**																			
Lycopus europaeus	European Water-Horehound		-5	-2	SNA			IU			x									
Oleaceae	**Olive Family**																			
Fraxinus americana	White Ash	4	3		S4			C			x		x		x	x		x		
Fraxinus excelsior	European Ash		3		SNA			IR					x							
Fraxinus pennsylvanica	Green Ash	3	-3		S4			C			x		x	x						
Ligustrum vulgare	European Privet		3	-2	SNA			IC						x						

Appendix A

Vascular Plant List
Terrestrial and Aquatic Environment Existing Conditions Report

Scientific Name	Common Name	Coefficient of Conservatism (CC)	Wetness Index	Weediness Index	Provincial Status (S-Rank)	ESA Status	SARA Status	Local Status Niagara Oldham 2017	Ecological Land Classification											
									AG	CU	CUM1-1	CUP	CUT1	FOD2	FOD7-4	Hedge	MAM2	MAM2-2	MAM2-5	SWD1-3
Plantaginaceae	**Plantain Family**																			
Plantago lanceolata	English Plantain		3	-1	SNA			IC			x									
Polygonaceae	**Buckwheat Family**																			
Rumex crispus	Curled Dock		0	-2	SNA			IC			x									
Rhamnaceae	**Buckthorn Family**																			
Rhamnus cathartica	European Buckthorn		0	-3	SNA			IC			x		x	x	x					
Rosaceae	**Rose Family**																			
Crataegus sp.	Hawthorn sp.												x			x				
Crataegus crus-galli var. crus-galli	Cockspur Hawthorn	4	0		S4									x						
Crataegus macracantha	Large-Thorned Hawthorn	4	5		S5			U						x						
Fragaria vesca	Woodland Strawberry	4	4		S5			C								x				
Prunus serotina var. serotina	Black Cherry	3	3		S5			C						x						
Rosa canina	Dog Rose		5	-1	SNA			IR								x				
Rubus idaeus ssp. strigosus	North American Red Raspberry	0	-2		S5			C						x	x					
Rubus occidentalis	Black Raspberry	2	5		S5			C			x									
Salicaceae	**Willow Family**																			
Populus balsamifera	Balsam Poplar	4	-3		S5			R					x			x				
Populus deltoides ssp. deltoides	Eastern Cottonwood	4	-1		S5			C					x							
Populus tremuloides	Trembling Aspen	2	0		S5			C				x	x							
Salix sp.	Willow sp.												x							
Sapindaceae	**Maple Family**																			
Acer rubrum	Red Maple	4	0		S5			X								x				
Acer saccharinum	Silver Maple	5	-3		S5			X								x				x
Ulmaceae	**Elm Family**																			
Ulmus americana	White Elm	3	-2		S5			C						x						
Ulmus sp.	Elm sp.													x						
Urticaceae	**Nettle Family**																			
Urtica dioica ssp. Dioica	European Stinging Nettle		0	-1	SNA			IR						x						
Vitaceae	**Grape Family**																			
Parthenocissus vitacea	Thicket Creeper	4	3		S5			C						x		x				
Vitis riparia	Riverbank Grape	0	-2		S5			C					x	x		x		x		
Araceae	**Arum Family**																			
Arisaema triphyllum	Jack-In-The-Pulpit	5	-2		S5			C						x						
Cyperaceae	**Sedge Family**																			
Carex pensylvanica	Pennsylvania Sedge	5	5		S5			C						x						
Carex sp.	Sedge sp.																	x		
Carex tribuloides var. tribuloides	Blunt Broom Sedge	5	-4		S4			U			x									
Juncaceae	**Rush Family**																			
Juncus canadensis	Canada Rush	6	-5		S5			R			x							x		
Liliaceae	**Lily Family**																			
Erythronium americanum ssp. americanum	Yellow Trout Lily	5	5		S5									x						
Poaceae	**Grass Family**																			
Calamagrostis canadensis var. canadensis	Bluejoint Reedgrass	4	-5		S5			C			x						x			
Dactylis glomerata	Orchard Grass		3	-1	SNA			IC			x									
Festuca sp.	Fescue sp.										x									
Phalaris arundinacea var. arundinacea	Reed Canary Grass	0	-3		S5			C			x		x				x	x		
Phleum pratense ssp. pratense	Common Timothy		3	-1	SNA			IC			x				x					
Phragmites australis ssp. australis	European Reed		-3		SNA			IC			x						x			
Poa pratensis ssp. pratensis	Kentucky Bluegrass		3		SNA			IC			x				x			x		
Typhaceae	**Cattail Family**																			
Typha latifolia	Broad-Leaved Cattail	3	-5		S5			C									x			

Notes

Co-efficient of Conservatism, Wetness & Weediness

Oldham, M.J., W.D. Bakowsky and D.A. Sutherland. 1995. Floristic quality assessment for southern Ontario. OMNR, Natural Heritage Information Centre, Peterborough. 68 pp.

Co-efficient of Conservatism: This value, ranging from 0 (low) to 10 (high), is based on a species tolerance of disturbance and fidelity to a specific habitat integrity.

Weediness Index: This value, ranging from -1 (low) to -3 (high) quantifies the potential invasiveness of non-native plants. In combination with the percentage of non-native plants, it can be used as an indicator of disturbance.

Wetness Index: This value, ranging from -5 (obligate wetland) to 5 (upland) provides the probability of a species occurring in wetland or upland habitats.
FACW (Facultative Wetland): usually occurs in wetlands, but occasionally found in non-wetlands (estimated 67-99% probability)
FAC (Facultative) equally likely to occur in wetlands or non-wetlands (estimated 34-66% probability)
FACU (Facultative Upland): occasionally occurs in wetlands, but usually occurs in non-wetlands (estimated 1-33% probability)
UPL (Upland): occurs almost never in wetlands under natural conditions (estimated <1% probability)

Further refinement of the Facultative categories are denoted by a "+" or "-" to express exaggerated tendencies for those species. The "+" denotes a greater estimated probability occurring in wetlands than species in the general indicator category, but a lesser probability than species occurring in the next higher category. The "-" denotes a lesser estimated probability of occurring in wetlands than species in the general indicator category, but a greater probability than species occurring in the next lower general category.

Each wetland category has been assigned a numerical value to facilitate the quantification of the wetness index. The wetland categories and their corresponding values are as follows:
OBL : -5
FACW+: -4
FACW: -3
FACW-: -2
FAC+: -1
FAC: 0
FAC-: 1
FACU+: 2
FACU: 3
FACU-: 4
UPL: 5

Appendix A

Vascular Plant List
Terrestrial and Aquatic Environment Existing Conditions Report

Scientific Name	Common Name	Coefficient of Conservatism (CC)	Wetness Index	Weediness Index	Provincial Status (S-Rank)	ESA Status	SARA Status	Local Status Niagara Oldham 2017	Ecological Land Classification											
									AG	CU	CUM1-1	CUP	CUT1	FOD2	FOD7-4	Hedge	MAM2	MAM2-2	MAM2-5	SWD1-3

Provincial Status S Rank

Natural Heritage Information Centre (NHIC). (2020) Provincial status of plants, wildlife and vegetation communities database. http://www.mnr.gov.on.ca/MNR/nhic/nhic.html. OMNR, Peterborough.

Provincial ranks are used by the NHIC to set protection priorities for rare species and natural communities. Provincial ranks are used by the NHIC to set protection priorities for rare species and natural communities. These rankings are based on the total number of extant Ontario populations and the degree to which they are potentially or actively threatened with destruction. These ranks are not legal designations. S4 and S5 species are generally uncommon to common in the province. Species ranked S1-S3 are considered to be rare in Ontario.

S2: Imperiled - *Imperiled in the nation or state/province because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the nation or state/province.*

S3: Vulnerable - Vulnerable in the nation or state/province 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 the nation or state/province.

SH: Possibly Extirpated (Historical)—Species or community occurred historically in the nation or state/province, and there is some possibility that it may be rediscovered. Its presence may not have been verified in the past 20-40 years. A species or community could become NH or SH without such a 20-40 year delay if the only known occurrences in a nation or state/province were destroyed or if it had been extensively and unsuccessfully looked for. The NH or SH rank is reserved for species or communities for which some effort has been made to relocate occurrences, rather than simply using this status for all elements not known from verified extant occurrences.

SNA: Unranked — Status not assigned.

"?" following a rank indicates uncertainty about the assigned rank.

Q: Questionable taxonomy —Taxonomic distinctiveness of this entity is questionable; resolution of this uncertainty may result in change from a species to a subspecies or hybrid, or the inclusion of this taxon in another taxon, with the resulting taxon having a lower-priority conservation status.

Status in Carolinian Zone (CZ) Oldham, 2017

Oldham, M.J. 2017. List of the Vascualr Plants of Ontario's Carolinian Zone (Ecoregion 7E). Carolinian Canada and Ontario Ministry of Natural Resources and Forestry. Peterborough, ON. 132 pp.

I - Introduced; thought to have been present in the Carolinian Zone or individual CZ area prior to European settlement; believed to be deliberately or inadverently introduced to the CZ by humans (followed by a status, below)

C - Common

U - uncommon

R - rare

H - Historic records only (generally >30 years)

X - present; status unkown or not specified in source lists

? - unconfirmed report

hyb - hybrid

ESA Status

Endangered Species Act (ESA), 2007. Extirpated - EXP, Endangered - END, Threatened - THR, Special Concern - SC

SARA Status

Species at Risk Act (SARA), 2002. Extirpated - EXP, Endangered - END, Threatened - THR, Special Concern - SC

Appendix B

Photo Log

Photo 1 View of access road just west of BBS-23-07. Photo facing north and taken on April 11, 2023.

Photo 2 View of cultural meadow and deciduous forest communities present southeast of the active quarry. Forest community contains ACC-23-01. Photo facing northeast and taken on April 11, 2023.

Photo 3 Vernal pool present in deciduous forest community just north of the active quarry. This forest contains ACC-23-04 and BBS-23-03. Photo facing southeast and taken on May 8th.

Photo 4 View of meadow marsh community present on the east side of the Study Area. This community contains AC-23-03. Photo facing east and taken on May 8th, 2023.

Photo 5 View of rock piles and rock face within the active quarry. Photo facing east and taken on May 24th, 2023.

Photo 6 View of field staff deploying snake coverboards on the east side of the Study Area. Photo facing south and taken on May 24th, 2023.

Photo 7 View of hedgerow on the east side of the Study Area. Photo facing southeast and taken on May 29th, 2023.

Photo 8 View of deciduous forest just east of the active quarry. This forest contains AC-23-02 and BBS-23-05. Photo facing southeast and taken on May 29th, 2023.

Appendix C

Breeding Bird Survey Results

Appendix C

Breeding Bird Survey Results
Natural Environment Existing Conditions Report
Walker Landfill Expansion

Common Name	Scientific Name	Ontario Status	ESA	SARA	BBS-23-01		BBS-23-02		BBS-23-03		BBS-23-04		BBS-23-05		BBS-23-06		BBS-23-07		BBS-23-08		Highest Breeding Evidence
					24-May-23	29-Jun-23	24-May-23	29-Jun-23	24-May-23	29-Jun-23	24-May-23	29-Jun-23	24-May-23	29-Jun-23	24-May-23	29-Jun-23	24-May-23	29-Jun-23	24-May-23	29-Jun-23	
American Crow	*Corvus brachyrhynchos*	S5B									O:X	P:S		O:X							P
American Goldfinch	*Carduelis tristis*	S5B				O:X		P:S	PR:P	P:S	P:S	PR:P	PR:P	P:S			P:H	PR:P	P:S	P:H	PR
American Redstart	*Setophaga ruticilla*	S5B										P:S									P
American Robin	*Turdus migratorius*	S5B				P:H	P:S			PR:P		P:H	P:S	P:S						PR:P	PR
Baltimore Oriole	*Icterus galbula*	S4B									P:S								P:S		P
Barn Swallow	*Hirundo rustica*	S4B	SC	THR		O:X											O:X		P:H		P
Black-capped Chickadee	*Poecile atricapillus*	S5							P:S												P
Blue Jay	*Cyanocitta cristata*	S5			P:H				P:H	P:S				P:S		P:S		P:S		P:S	PR
Brown-headed Cowbird	*Molothrus ater*	S4B			O:X			PR:P	P:H			PR:P		O:X				PR:M	O:X		PR
Canada Goose	*Branta canadensis*	S5							PR:P												PR
Chipping Sparrow	*Spizella passerina*	S5B									P:S										P
Common Grackle	*Quiscalus quiscula*	S5B			P:S												PR:M	P:H			PR
Common Yellowthroat	*Geothlypis trichas*	S5B							P:S		P:S	P:S	P:S	P:S		P:S	P:S	PR:P		P:S	PR
Dark-eyed Junco	*Junco hyemalis*	S5B										P:S									P
Eastern Kingbird	*Tyrannus tyrannus*	S4B											P:S								P
Eastern Phoebe	*Sayornis phoebe*	S5B											P:S								P
Eastern Towhee	*Pipilo erythrophthalmus*	S4B												P:S							P
European Starling	*Sturnus vulgaris*	SNA				P:H		PR:P		P:S			PR:P					P:S			PR
Field Sparrow	*Spizella pusilla*	S4B										P:S	P:S			P:S	P:S				P
Grasshopper Sparrow	*Ammodramus savannarum*	S4B	SC	SC										P:S							P
Gray Catbird	*Dumetella carolinensis*	S4B				P:S				P:S			P:S	PR:P				P:S			PR
Horned Lark	*Eremophila alpestris*	S5B												P:S							P
House Finch	*Carpodacus mexicanus*	SNA							P:S			P:S		P:S						P:S	P
House Sparrow	*Passer domesticus*	SNA					P:H													P:S	P
House Wren	*Troglodytes aedon*	S5B			P:H																P
Indigo Bunting	*Passerina cyanea*	S4B										P:S				P:S		P:H			P
Killdeer	*Charadrius vociferus*	S5B,S5N							P:S												P
Least Flycatcher	*Empidonax minimus*	S4B																P:S			P
Mallard	*Anas platyrhynchos*	S5											O:X								O
Marsh Wren	*Cistothorus palustris*	S4B				P:S															P
Mourning Dove	*Zenaida macroura*	S5				O:X															O
Northern Cardinal	*Cardinalis cardinalis*	S5							P:S		P:S	P:S	P:S	P:S				P:S			PR
Northern Mockingbird	*Mimus polyglottos*	S4										P:H							O:X		P
Northern Rough-winged Swallow	*Stelgidopteryx serripenni*	S4B														O:X					O
Olive-sided Flycatcher	*Contopus cooperi*	S4B	SC	SC										P:S							P
Orchard Oriole	*Icterus spurius*	S4B																	O:X		O
Pileated Woodpecker	*Dryocopus pileatus*	S3B														P:S					P
Purple Finch	*Carpodacus purpureus*	S4B											P:S								P
Red-breasted Nuthatch	*Sitta canadensis*	S5							P:H												P
Red-eyed Vireo	*Vireo olivaceus*	S5B							P:S	P:S											PR
Red-tailed Hawk	*Buteo jamaicensis*	S5											O:X		C:NB						C
Red-winged Blackbird	*Agelaius phoeniceus*	S4			P:S	PR:M	P:H	P:H	P:S	PR:P	O:X	PR:P	P:S	P:H	P:S	P:S	P:S	PR:M	P:S	P:S	PR
Ring-billed Gull	*Larus delawarensis*	S5B,S4N				O:X		O:X			O:X		O:X		O:X	O:X	O:X				P
Rough-legged Hawk	*Buteo lagopus*	S1B,S4N														P:H					P
Song Sparrow	*Melospiza melodia*	S5B			P:S		P:S		P:H	P:S	P:S	P:S	PR:P	P:S		P:S	P:S	P:H	P:S	PR:P	PR
Tree Swallow	*Tachycineta bicolor*	S4B							P:S												P
Turkey Vulture	*Cathartes aura*	S5B															O:X				O
Warbling Vireo	*Vireo gilvus*	S5B															P:S	P:S			PR
Willow Flycatcher	*Empidonax traillii*	S5B											P:S				P:S			P:S	P
Wood Duck	*Aix sponsa*	S5							P:S												P
Yellow Warbler	*Dendroica petechia*	S5B									P:S	P:S		P:S							PR
Yellow-bellied Sapsucker	*Sphyrapicus varius*	S5B															P:S				P

Notes

S-Ranks-

S1: Critically Imperiled - Critically imperiled in the nation or state/province 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 from the state/province.

S2: Imperiled - Imperiled in the nation or state/province because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the nation or

S3: Vulnerable - Vulnerable in the nation or state/province 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 the nation or state/province.

SH: Possibly Extirpated (Historical)—Species or community occurred historically in the nation or state/province, and there is some possibility that it may be rediscovered. Its presence may not have been verified in the past 20-40 years. A species or community could become NH or SH without such a 20-40 year delay if the only known occurrences in a nation or state/province were destroyed or if it had been extensively and unsuccessfully looked for. The NH or SH rank is reserved for species or communities for which some effort has been made to relocate occurrences, rather than simply using this status for all elements not known from verified extant occurrences.

SR: Reported in Ontario, but without persuasive documentation.

SX: Presumed Extirpated—Species or community is believed to be extirpated from the nation or state/province. Not located despite intensive searches of historical sites and other appropriate habitat, and virtually no likelihood that it

SE: Exotic; not believed to be a native component of Ontario's flora. Numerical rankings after SE follow designations described above for native species.

SNA: Unranked — Status not assigned.

SU: Unranked — Nation or state/province conservation status not yet assessed.

ESA Status

Endangered Species Act (ESA), 2007. Extirpated - EXP, Endangered - END, Threatened - THR, Special Concern - SC

SARA Status

Species at Risk Act (SARA), 2002. Extirpated - EXP, Endangered - END, Threatened - THR, Special Concern - SC

All species listed were identified by song/vocalizations unless otherwise noted

O: Species observed ('X': observed during breeding season but no evidence of breeding)

P: Possible breeding ('S': singing male present; 'H': species observed in breeding season in suitable nesting habitat)

PR: Probable breeding ('P': Pair observed; 'T': Permanent territory presumed through territorial behaviour on both visits; 'D': Courtship or display; 'V': visiting probable nest site; 'A': Agitated behaviour or anxiety calls of an adult; 'B': Brood Patch; 'N': Nest-building)

C: Confirmed breeding ('DD': Distraction display; 'NU': Used nest or eggshells found; 'FY': Recently fledged young; 'AE': Adult leaving or entering nest site; 'FS': Adult carrying fecal sac; 'CF': adult carrying food for young; 'NE': Nest with eggs; 'NY': Nest with young)

Appendix D

Significant Wildlife Habitat

Significant Wildlife Habitat – Candidate and Confirmed as identified within the Significant Wildlife Habitat Technical Guide 7E

Wildlife Habitat	Wildlife Species	Candidate SWH		Confirmed SWH	Habitat found within the Study Area and/or Site	SWH Analysis / Rationale
		ELC Ecosite	Habitat Criteria and Information Sources	Defining Criteria		
Raptor Wintering Area **Rationale:** Sites used by multiple species, a high number of individuals and used annually are most significant	– *Rough-legged Hawk* – *Red-tailed Hawk* – *Northern Harrier* – *American Kestrel* – *Snowy Owl* ***Special Concern:*** – *Short-eared Owl* – *Bald Eagle*	*Hawks/Owls:* *Combination of ELC Community Series; need to have present one Community series from each land class;* *Forest: FOD, FOM, FOC.* *Upland: CUM; CUT; CUS; CUW.* *Bald Eagle:* *Forest community Series: FOD, FOM, FOC, SWD, SWM or SWC on shoreline areas adjacent to large rivers or adjacent to lakes with open water (hunting area).*	*The habitat provides a combination of fields and woodlands that provide roosting, foraging and resting habitats for wintering raptors.* *Raptor wintering (hawk/owl) sites need to be > 20 ha cxlviii, cxlix with a combination of forest and upland. xvi, xvii, xviii, xix, xx, xxi.* *Least disturbed sites, idle/fallow or lightly grazed field/meadow (>15ha) with adjacent woodlands cxlix* *Field area of the habitat is to be wind swept with limited snow depth or accumulation.* *Eagle sites have open water and large trees and snags available for roosting cxlix* *<u>Information Sources:</u>* *OMNRF Ecologist or Biologist* *Naturalist clubs* *Natural Heritage Information Centre (NHIC) Raptor Winter Concentration Area* *Data from Bird Studies Canada* *Results of Christmas Bird Counts* *Reports and other information available from Conservation Authorities.*	*Studies confirm the use of these habitats by:* *One or more Short-eared Owls or; One of more Bald Eagles or; At least 10 individuals and two of the listed hawk/owl species(E)* *To be significant a site must be used regularly (3 in 5 years) cxlix for a minimum of 20 days by the above number of birds(E).* *The habitat area for an Eagle winter site is the shoreline forest ecosites directly adjacent to the prime hunting area(E)* *Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"ccxi* *SWH MISTcxlix Index #10 and #11 provides development effects and mitigation measures.*	– *FOD2* – *FOD7-4* – *CUM1-1*	**Candidate:** Winter raptor surveys were not completed, but breeding bird surveys detected raptors (rough-legged and red-tailed hawks); suitable forest and upland habitat combinations occur within the LSA.
Bat Maternity Colonies ***Rationale:*** *Known locations of forested bat maternity colonies are extremely rare in all Ontario landscapes*	– *Big Brown Bat* – *Silver-haired Bat*	*Maternity colonies considered SWH are found in forested Ecosites.* *All ELC Ecosites in ELC Community Series:* *FOD* *FOM* *SWD* *SWM*	*Maternity colonies can be found in tree cavities, vegetation and often in buildings (buildings not considered to be SWH)* *Maternity roosts are not found in caves and mines in Ontario* *Maternity colonies located in Mature deciduous or mixed forest stands with >10 ha large diameter (>25cm dbh) wildlife trees* *Female Bats prefer wildlife tree snags in early stages of decay, class 1-3 or class 1 or 2.* *Silver-haired Bats prefer older mixed or deciduous forest and form maternity colonies in tree cavities and small hollows. Olde forest areas with at least 21 snags/ha are preferred.* *<u>Information Sources:</u>* *OMNRF for possible locations and contact for local experts* *University Biology Departments with bat experts.*	*Maternity Colonies with confirmed use by;* *>10 Big Brown Bats* *>5 Adult Female Silver haired Bats* *The area of the habitat includes the entire woodland or a forest stand ELC Ecosite or an Eco element containing the maternity colonies.* *Evaluation methods for maternity colonies should be conducted following methods outlined in the "Bats and Bat Habitats: Guidelines for Wind Power Projects" ccv.* *SWH MISTcxlix Index #12 provides development effects and mitigation measures.*	– *FOD2* – *FOD7-4* – *SWD1-3*	**Candidate:** Snag surveys and bat acoustic monitoring were not completed; however suitable deciduous forest stands and snags are present within the LSA.

Significant Wildlife Habitat – Candidate and Confirmed as identified within the Significant Wildlife Habitat Technical Guide 7E

Wildlife Habitat	Wildlife Species	Candidate SWH		Confirmed SWH	Habitat found within the Study Area and/or Site	SWH Analysis / Rationale
		ELC Ecosite	Habitat Criteria and Information Sources	Defining Criteria		
Reptile Hibernaculum ***Rationale:*** *Generally sites are the only known sites in the area. Sites with the highest number of individuals are most significant*	***Snakes:*** – *Eastern Gartersnake* – *Northern Watersnake* – *Northern Red-bellied Snake* – *Northern Brownsnake* – *Smooth Green Snake* – *Northern Ring-necked Snake* ***Special Concern:*** – *Milksnake* – *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.*	*For snakes, hibernation takes place in sites located below frost lines in burrows, rock crevices and other natural or naturalized locations. The existence of features that go below frost line; such as rock piles or slopes, old stone fences, and abandoned crumbling foundations assist in identifying candidate SWH.* *Areas of broken and fissured rock are particularly valuable since they provide access to subterranean sites below the frost line xliv, l, li, lii, cxii .* *Wetlands can also be important over-wintering habitat in conifer or shrub swamps and swales, poor fens, or depressions in bedrock terrain with sparse trees or shrubs with sphagnum moss or sedge hummock ground cover.* *Information Sources* *In spring, local residents or landowners may have observed the emergence of snakes on their property (e.g.old dug wells).* *Reports and other information available from Conservation Authorities.* *Field Naturalists clubs* *University herpetologists* *Natural Heritage Information Center (NHIC)*	*Studies confirming:* – *Presence of snake hibernacula used by a minimum of five individuals of a snake sp. or; individuals of two or more snake spp.* – *Congregations of a minimum of five individuals of a snake sp. or; individuals of two or more snake spp. near potential hibernacula (eg. foundation or rocky slope) on sunny warm days in Spring (Apr/May) and Fall (Sept/Oct)Ⓔ* – *Note: If there are Special Concern Species present, then site is SWH* – *Note: Sites for hibernation possess specific habitat parameters (e.g. temperature, humidity, etc.) and consequently are used annually, often by many of the same individuals of a local population (i.e. strong hibernation site fidelity). Other critical life processes (e.g. mating) often take place in close proximity to hibernacula. The feature in which the hibernacula is located plus a 30 m radius area is the SWHⒺ* – *SWHMiST cxlix Index #13 provides development effects and mitigation measures for snake hibernacula.*	– *CU* – *CUM1-1* – *CUP* – *CUT1* – *FOD2* – *FOD7-4* – *Hedge*	**Candidate:** Artificial Cover Object surveys did not detect snakes, and field investigations did not confirm the presence of any hibernacula; however, potential suitable hibernation habitat exists within the LSA in the form of rock piles and slopes.
Colonially - Nesting Bird Breeding Habitat (Tree/Shrubs) **Rationale:** Large colonies are important to local bird population, typically sites are only known colony in area and are used annually.	*Great Blue Heron* *Black-crowned Night Heron* *Great Egret* *Green Heron*	*SWM2* *SWM3* *SWM5* *SWM6* *SWD1* *SWD2* *SWD3* *SWD4* *SWD5* *SWD6* *SWD7* *FET1*	*Nests in live or dead standing trees in wetlands, lakes, islands, and peninsulas. Shrubs and occasionally emergent vegetation may also be used.* *Most nests in trees are 11 to 15 m from ground, near the top of the tree. Information Sources* *Ontario Breeding Bird Atlas ccv, colonial nest records.* *Ontario Heronry Inventory 1991 available from Bird Studies Canada or NHIC (OMNRF).* *Natural Heritage Information Centre (NHIC) Mixed Wader Nesting Colony* *Aerial photographs can help identify large heronries.* *Reports and other information available from Conservation Authorities.* *MNRF District Offices.* *Field Naturalist Clubs*	*Studies confirming:* *Presence of 2Ⓔ or more active nests of Great Blue Heron or other listed species.* *The habitat extends from the edge of the colony and a minimum 300m radius or extent of the Forest Ecosite containing the colony or any island <15.0ha with a colony is the SWH cc, ccvii* *Confirmation of active heronries are to be achieved through site visits conducted during the nesting season (April to August) or by evidence such as the presence of fresh guano, dead young and/or eggshells* *SWH MISTcxlix Index #5 provides development effects and mitigation measures.*	– *SWD1-3*	**Candidate:** Field investigations did not confirm the presence of any colonially nesting bird breeding habitat (tree/shrubs); however, potential suitable swamp habitat is present within the LSA.

Significant Wildlife Habitat – Candidate and Confirmed as identified within the Significant Wildlife Habitat Technical Guide 7E

Wildlife Habitat	Wildlife Species	Candidate SWH		Confirmed SWH	Habitat found within the Study Area and/or Site	SWH Analysis / Rationale
		ELC Ecosite	Habitat Criteria and Information Sources	Defining Criteria		
Deer Winter Congregation Areas **Rationale:** Deer movement during winter in the southern areas of Ecoregion 7E are not constrained by snow depth, however deer will annually congregate in large numbers in suitable woodlands to reduce or avoid the impacts of winter conditions cxlviii	*White-tailed Deer*	*All Forested Ecosites with these ELC Community Series;* *FOC* *FOM* *FOD* *SWC* *SWM* *SWD* *Conifer plantations much smaller than 50 ha may also be used.*	*Woodlots >100 ha in size or if large woodlots are rare in a planning area woodlots >50ha(E)* *Deer movement during winter in the southern areas of Ecoregion 7E are not constrained by snow depth, however deer will annually congregate in large numbers in suitable woodlands cxlviii.* *Large woodlots > 100ha and up to 1500 ha are known to be used annually by densities of deer that range from 0.1-1.5 deer/ha ccxxiv.* *Woodlots with high densities of deer due to artificial feeding are not significant(E).* *Information Sources:* *MNRF District Offices.* *LIO/NRVIS*	*Studies confirm:* *Deer management is an MNRF responsibility, deer winter congregation areas considered significant will be mapped by MNRF cxlviii.* *Use of the woodlot by whitetailed deer will be determined by MNRF, all woodlots exceeding the area criteria are significant, unless determined not to be significant by MNRF (E)* *Studies should be completed during winter (Jan/Feb) when >20cm of snow is on the ground using aerial survey techniquesccxxiv , ground or road surveys. or a pellet count deer density surveyccxxv.* *SWH MIST cxlix Index #2 provides development effects and mitigation measures.*	– *FOD2* – *FOD7-4* – *SWD1-3*	**Confirmed:** MNR mapping confirms white-tailed deer wintering area (stratum 2) in the northern, eastern, and southern portions of the LSA.
Other Rare Vegetation Communities **Rationale:** Plant communities that often contain rare species which depend on the habitat for survival.	*Provincially Rare S1, S2 and S3 vegetation communities are listed in Appendix M of the SWHTGcxlviii . Any ELC Ecosite Code that has a possible ELC Vegetation Type that is Provincially Rare is Candidate SWH.*	*Rare Vegetation Communities may include beaches, fens, forest, marsh, barrens, dunes and swamps.*	*ELC Ecosite codes that have the potential to be a rare ELC Vegetation Type as outlined in appendix M cxlviii* *The OMNRF/NHIC will have up to date listing for rare vegetation communities.* *Information Sources:* *Natural Heritage Information Centre (NHIC) has location information available on their website.* *OMNRF Districts.* *Field Naturalists Clubs.* *Conservation Authorities*	*Field studies should confirm if an ELC Vegetation Type is a rare vegetation community based on listing within Appendix M of SWHTGcxlviii.* *Area of the ELC Vegetation Type polygon is the SWH.* *SWH MIST cxlix Index #37 provides development effects and mitigation measures.*	– *FOD7-4*	**Confirmed:** Rare vegetation community (FOD7-4) has been mapped within the LSA.

Significant Wildlife Habitat – Candidate and Confirmed as identified within the Significant Wildlife Habitat Technical Guide 7E

Wildlife Habitat	Wildlife Species	Candidate SWH		Confirmed SWH	Habitat found within the Study Area and/or Site	SWH Analysis / Rationale
		ELC Ecosite	Habitat Criteria and Information Sources	Defining Criteria		
Terrestrial Crayfish **Rationale:** Terrestrial Crayfish are only found within SW Ontario in Canada and their habitats are very rare. Ccii.	*Chimney or Digger Crayfish; (Fallicambarus fodiens)* *Devil Crayfish or Meadow Crayfish; (Cambarus Diogenes)*	*MAM1* *MAM2* *MAM3* *MAM4* *MAM5* *MAM6* *MAS1* *MAS2* *MAS3* *SWD* *SWT* *SWM* *CUM1 with inclusions of above meadow marsh ecosites can be used by terrestrial crayfish.*	*Wet meadow and edges of shallow marshes (no minimum size) should be surveyed for terrestrial crayfish.* *Constructs burrows in marshes, mudflats, meadows, the ground can't be too moist. Can often be found far from water.* *Both species are a semiterrestrial 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.* *Information Sources:* *Information sources from "Conservation Status of Freshwater Crayfishes" by Dr. Premek Hamr for the WWF and CNF March 1998*	*Studies Confirm:* *Presence of 1 or more individuals of species listed or their chimneys (burrows) in suitable meadow marsh, swamp or moist terrestrial sites cci* *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* *SWH MIST cxlix Index #36 provides development effects and mitigation measures.*	– *MAM2* – *MAM2-2* – *MAM2-5* – *SWD1-3* – *CUM1-1*	**Candidate:** Suitable habitat for terrestrial crayfish is present within the LSA; however, no specimen or burrows were observed during field investigations.
Special Concern and Rare Wildlife Species ***Rationale:*** *These species are quite rare or have experienced significant population declines in Ontario*	*All Special Concern and Provincially rare (S1-S3, SH) plant and animal species. Lists of these species are tracked by the Natural Heritage Information Centre.*	*All plant and animal element occurrences (EO) within a 1 or 10km grid.* *Older element occurrences were recorded prior to GPS being available, therefore location information may lack accuracy.*	*When an element occurrence is identified within a 1 or 10 km grid for a Special Concern or provincially rare species; linking candidate habitat on the site needs to be completed to ELC Ecosites lxxviii* *Information Sources:* *Natural Heritage Information Centre (NHIC) will have Special Concern and Provincially Rare (S1-S3, SH) species lists with element occurrences data.* *NHIC Website "Get Information": http://nhic.mnr.gov.on.ca* *Ontario Breeding Bird Atlas* *Expert advice should be sought as many of the rare spp. Have little information available about their requirements*	*Studies Confirm:* – *Assessment/inventory of the Site for the identified special concern or rare species needs to be completed during the time of year when the species is present or easily identifiable.* – *The area of the habitat to the finest ELC scale that protects the habitat form and function is the SWH, this must be delineated through detailed field studies. The habitat needs be easily mapped and cover an important life stage component for a species e.g. specific nesting habitat or foraging habitat.* – *SWHMiST cxlix Index #37 provides development effects and mitigation measures*	– *CUM1-1* – *FOD2*	**Confirmed:** Special concern and rare wildlife species were observed within the SSA and LSA; specifically, field thistle and bushy aster in the CUM1-1 community as well as pileated woodpecker and rough-legged hawk at BBS 06 (CUM1-1 and FOD2 communities), and other SC bird species (barn swallow, olive-sided flycatcher, and grasshopper sparrow).

Appendix E

Species at Risk Screening

Species		Conservation Status		Habitat Requirements	Likelihood of Occurrence within the LSA
Common Name	**Scientific Name**	**SARA[1]**	**ESA[2]**		
Amphibians					
Allegheny Mountain dusky salamander (Carolinian population)	*Desmognathus ochrophaeus*	END	END	In Ontario, Allegheny mountain dusky salamander has only been found in the Niagara River gorge, so it is at the edge of its range in Ontario. This salamander species is generally found near forested brooks, gorge cascades, springs, or seeps. It uses this habitat to forage, as well as for overwintering and brooding. In winter they seek out flowing water where they remain active as long as the substrate is unfrozen (Markle et. al. 2013).	Low - Very rare species only found in the Niagara River gorge.
Northern dusky salamander (Carolinian population)	*Desmognathus fuscus*	END	END	In Ontario, northern dusky salamander is restricted to two sites a few kilometres apart in streams in the Niagara Gorge, downstream of Niagara Falls. Adults are terrestrial and inhabit wooded or partly wooded terrain, but are always found in very close proximity to streams or seepage areas. They inhabit damp areas under leaves, rocks, and logs near streams. They can remain active all winter where moving water prevents freezing of the substrate (Markle et. al. 2013).	Low - Found at only two sites a few kilometres apart in streams in the Niagara Gorge, downstream of Niagara Falls.
Unisexual ambystoma (Jefferson salamander dependent population)	*Ambystoma laterale - (2) jeffersonianum*	END	END	This population of unisexual Ambystoma salamanders co-occurs with Jefferson salamanders. In Ontario, Jefferson salamander is found only in southern Ontario, along southern portions of the Niagara Escarpment and western portions of the Oak Ridges Moraine. Jefferson salamander prefers moist, well-drained deciduous and mixed forests with a closed canopy. It overwinters underground in mammal burrows and rock fissures, and moves to vernal pools and ephemeral wetlands in the early spring to breed. Breeding ponds are typically located in or near to forested habitats, and contain submerged debris (i.e. sticks, vegetation) for egg attachment sites. Ephemeral breeding pools need to have water until at least mid-summer (mid to late July) (Jefferson Salamander Recovery Team 2010).	Low - Population dependant jefferson salamanders not present therefore this species is also not present.
Western chorus frog (Great Lakes St. Lawrence/ Canadian Shield Population)	*Pseudacris triseriata*	THR		In Ontario, habitat of this amphibian species typically consists of marshes or wooded wetlands, particularly those with dense shrub layers and grasses, as this species is a poor climber. They will breed in almost any fishless pond including roadside ditches, gravel pits and flooded swales in meadows. This species hibernates in terrestrial habitats under rocks, dead trees or leaves, in loose soil or in animal burrows. During hibernation, this species is tolerant of flooding (Environment Canada 2015).	Confirmed - Multiple wooded wetlands and fishless ponds / waterbodies present within the Study Area, providing suitable habitat for this species. Species was observed during amphibian call count surveys within the LSA.
Arthropods					
Monarch	*Danaus plexippus*	END	SC	In Ontario, monarch is found throughout the northern and southern regions of the province. This butterfly is found wherever there are milkweed (Asclepias spp.) plants for its caterpillars and wildflowers that supply a nectar source for adults. It is often found on abandoned farmland, meadows, open wetlands, prairies and roadsides, but also in city gardens and parks. Important staging areas during migration occur along the north shores of the Great Lakes (COSEWIC 2010).	High - Larval foodplant (common milkweed) was observed within CUM1-1 and Hedgerow communities on the east side of the LSA.
Birds					
Acadian flycatcher	*Empidonax virescens*	END	END	In Ontario, the Acadian flycatcher breeds in the understory of large, mature, closed-canopy forests, swamps and forested ravines. This bird prefers forests greater than 40 ha in size, and exhibits edge sensitivity preferring the deep interior of the forest. Its nest is loosely woven and placed near the tip of branch in a small tree or shrub often, but not always, near water (Whitehead and Taylor 2002).	Low - No suitable habitat found within the Study Area. Species not observed during breeding bird surveys.
Bank swallow	*Riparia riparia*	THR	THR	In Ontario, the bank swallow breeds in a variety of natural and anthropogenic habitats, including lake bluffs, stream and river banks, sand and gravel pits, and roadcuts. Nests are built in a vertical or near-vertical bank. Breeding sites are typically located near open foraging sites such as rivers, lakes, grasslands, agricultural fields, wetlands and riparian woods. Forested areas are generally avoided (Garrison 1999).	Low - Vertical bank provided by quarry face within the SSA creates potential suitable habitat for the species, though it is limited due to human disturbance. This species was not recorded breeding bird surveys.
Barn swallow	*Hirundo rustica*	THR	SC	In Ontario, barn swallow breeds in areas that contain a suitable nesting structure, open areas for foraging, and a body of water. This species nests in human made structures including barns, buildings, sheds, bridges, and culverts. Preferred foraging habitat includes grassy fields, pastures, agricultural cropland, lake and river shorelines, cleared right-of-ways, and wetlands (COSEWIC 2011). Mud nests are fastened to vertical walls or built on a ledge underneath an overhang. Suitable nests from previous years are reused (Brown and Brown 1999).	Confirmed - Both nesting and foraging habitat present within the LSA, specifially human made structures such as barns as well as grassy fields. Species was observed during breeding bird surveys.
Bobolink	*Dolichonyx oryzivorus*	THR	THR	In Ontario, bobolink breeds in grasslands or graminoid dominated hayfields with tall vegetation (Gabhauer 2007). Bobolink prefers grassland habitat with a forb component and a moderate litter layer. They have low tolerance for presence of woody vegetation and are sensitive to frequent mowing within the breeding season. They are most abundant in established, but regularly maintained, hayfields, but also breed in lightly grazed pastures, old or fallow fields, cultural meadows and newly planted hayfields. Their nest is woven from grasses and forbs. It is built on the ground, in dense vegetation, usually under the cover of one or more forbs (Martin and Gavin 1995).	Moderate - Potential habitat in the multiple cultural meadow and agricultural communities within the LSA. Species was not observed during breeding bird surveys.

Species		Conservation Status		Habitat Requirements	Likelihood of Occurrence within the LSA
Common Name	Scientific Name	SARA[1]	ESA[2]		
Chimney swift	*Chaetura pelagica*	THR	THR	In Ontario, chimney swift breeding habitat is varied and includes urban, suburban, rural and wooded sites. They are most commonly associated with towns and cities with large concentrations of chimneys. Preferred nesting sites are dark, sheltered spots with a vertical surface to which the bird can grip. Unused chimneys are the primary nesting and roosting structure, but other anthropogenic structures and large diameter cavity trees are also used (COSEWIC 2007).	Moderate - Potential suitable habitat within the LSA in the form of chimneys. Species was not observed during field investigations.
Common nighthawk	*Chordeiles minor*	THR	SC	These aerial foragers require areas with large open habitat. This includes farmland, open woodlands, clearcuts, burns, rock outcrops, alvars, bog ferns, prairies, gravel pits and gravel rooftops in cities (Sandilands 2007).	Moderate - Expansive farmland within the LSA provides potential suitable habitat for this species. Species was not observed during field investigations.
Eastern meadowlark	*Sturnella magna*	THR	THR	In Ontario, the eastern meadowlark breeds in pastures, hayfields, meadows and old fields. Eastern meadowlark prefers moderately tall grasslands with abundant litter cover, high grass proportion, and a forb component (Hull 2003). They prefer well drained sites or slopes, and sites with different cover layers (Roseberry and Klimstra 1970).	Moderate - Potential habitat in the multiple cultural meadow and agricultural communities within the LSA. Species was not observed during breeding bird surveys.
Eastern whip-poor-will	*Antrostomus vociferus*	THR	THR	In Ontario, the whip-poor-will breeds in semi-open forests with little ground cover. Breeding habitat is dependent on forest structure rather than species composition, and is found on rock and sand barrens, open conifer plantations and post-disturbance regenerating forest. Territory size ranges from 3 to 11 ha (COSEWIC 2009). No nest is constructed and eggs are laid directly on the leaf litter (Mills 2007).	Moderate - Potential suitable habitat in forested communities within the LSA. Species was not observed during breeding bird surveys.
Eastern wood-pewee	*Contopus virens*	SC	SC	The eastern wood-pewee inhabits a wide variety of wooded upland and lowland habitats but is most commonly associated with the mid-canopy of forest clearings, and edge habitat in deciduous and mixed forests. It also occurs in anthropogenic habitats that provide an open forested aspect such as parks and suburban neighborhoods. It prefers intermediate-age mature forest stands with little understory vegetation (COSEWIC 2012).	Moderate - The multiple woodland communities in the LSA that border the active quarry provide potential suitable woodland edge habitat for this species
Grasshopper sparrow (pratensis subspecies)	*Ammodramus savannarum*	SC	SC	In Ontario, grasshopper sparrow is found in medium to large grasslands with low herbaceous cover and few shrubs. It also uses a wide variety of agricultural fields, including cereal crops and pastures. Close-grazed pastures and limestone plains (e.g., Carden and Napanee Plains) support highest density of this bird in the province (COSEWIC 2013).	Confirmed - Suitable habitat in the multiple cultural meadow and active agricultural communities within the LSA. Species was observed during breeeding bird surveys.
Least bittern	*Ixobrychus exilis*	THR	THR	In Ontario, the least bittern breeds in marshes, usually greater than 5 ha, with emergent vegetation, relatively stable water levels and areas of open water. Preferred habitat has water less than 1 m deep (usually 10 – 50 cm). Nests are built in tall stands of dense emergent or woody vegetation (Woodliffe 2007). Clarity of water is important as siltation, turbidity, or excessive eutrophication hinders foraging efficiency (COSEWIC 2009).	Low - No suitable habitat found within the LSA. Species was not observed during breeding bird surveys.
Northern bobwhite	*Colinus virginianus*	END	END	In Ontario, the northern bobwhite breeds in early successional habitats. This species requires a combination of three habitat types: woody cover, cropland and grassland. Croplands provide foraging habitat, grassland and fields are used for nesting, and dense brush provides both winter forage and year round cover. These birds nest on the ground in a shallow depression lined with grasses and other dead vegetation (Brennan 1999). The distribution of native populations are restricted to southwestern Ontario (ECCC 2018).	Moderate - Potential suitable habitat present due to the combination of woodland, cropland, and cultural meadow communities present within the LSA. Species was not observed during breeding bird surveys.
Olive-sided flycatcher	*Contopus cooperi*	SC	SC	In Ontario, olive-sided flycatcher breeding habitat consists of natural openings in coniferous or mixed forests, including bogs, burns, riparian zones, and cutover areas. They are also found in semi-open forest stands and early successional forest when tall snags and residual live trees are present. In the boreal forest it is often associated with muskeg, bogs, fens and swamps dominated by spruce and tamarack. Open areas with tall trees or snags for perching are used for foraging (COSEWIC 2007). Nests are usually built on horizontal branches of conifers (Peck and James 1987).	Confirmed - Species observed within the LSA during breeding bird surveys.
Peregrine falcon (anatum/tundrius subspecies)	*Falco peregrinus anatum/tu*	SC	SC	In Ontario, peregrine falcon breeds in areas containing suitable nesting locations and sufficient prey resources. Such habitat includes both natural locations containing cliff faces (heights of 50 - 200 m preferred) and also anthropogenic landscapes including urban centres containing tall buildings, open pit mines and quarries, and road cuts. Peregrine falcons nest on cliff ledges and crevices and building ledges. Nests consist of a simple scrape in the substrate (COSEWIC 2007).	Moderate - The combination of natural features and anthropogenic landscapes (quarry) within the SSA and LSA provides potential suitable habitat for this species. Species was not observed during breeding bird surveys.
Red-headed woodpecker	*Melanerpes erythrocephalu*	END	END	In Ontario, the red-headed woodpecker breeds in open, deciduous woodlands or woodland edges and are often found in parks, cemeteries, golf courses, orchards and savannahs (Woodliffe 2007). They may also breed in forest clearings or open agricultural areas provided that large trees are available for nesting. They prefer forests with little or no understory vegetation. They are often associated with beech or oak forests, beaver ponds and swamp forests where snags are numerous. Nests are excavated in the trunks of large dead trees (Smith et. al. 2000).	Moderate - Various woodland communities with ample edge habitat within the LSA provide suitable habitat for this species. Species was not observed during breeding bird surveys.

Species		Conservation Status		Habitat Requirements	Likelihood of Occurrence within the LSA
Common Name	**Scientific Name**	**SARA[1]**	**ESA[2]**		
Wood thrush	*Hylocichla mustelina*	THR	SC	In Ontario, wood thrush breeds in moist, deciduous hardwood or mixed stands that are often previously disturbed, with a dense deciduous undergrowth and with tall trees for singing perches. This species selects nesting sites with the following characteristics: lower elevations with trees less than 16 m in height, a closed canopy cover (>70 %), a high variety of deciduous tree species, moderate subcanopy and shrub density, shade, fairly open forest floor, moist soil, and decaying leaf litter (COSEWIC 2012).	Moderate - Various woodland communities within the LSA provide potential suitable habitat, though suitability is limited due to lack of dense deciduous undergrowth in these areas. Species was not observed during breeding bird surveys.
Fish					
American eel	*Anguilla rostrata*	—	END	In Ontario, the American Eel is native to the Lake Ontario, St. Lawrence River and Ottawa River watersheds. Their current distribution includes lakes Huron, Erie, and Superior and their tributaries. The Ottawa River population is considered extirpated. The preferred habitat of the American eel is cool water of lakes and streams with muddy or silty substrates in water temperatures between 16 and 19°C. The American eel is a catadromous fish that lives in fresh water until sexual maturity then migrates to the Sargasso Sea to spawn (Eakins 2012; Burridge et. al. 2010).	Low - Current LSA structure presents no suitable habitat for this species.
Mammals					
Eastern red bat	*Lasiurus borealis*	END*	—	The eastern red bat has an extensive range that covers much of the province of Ontario but is centralized in Southern Ontario. They are a solitary species that roosts in the terminal foliage of mature deciduous and coniferous trees typically at the edge of a clearing, often in dead leaf clusters or pine cone clusters (Dobbyn 1994; Robinson 2020). This species migrates to the south to the US each winter prior to hibernation.	Moderate - Potential suitable habitat present due to ample woodland edge habitat within the LSA.
Eastern small-footed myotis	*Myotis leibii*	—	END	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, or rock piles, and occasionally inhabits buildings. Areas near the entrances of caves or abandoned mines may be used for hibernaculum, where the conditions are drafty with low humidity, and may be subfreezing (Humphrey 2017).	Low - Potential suitable habitat present within the SSA and LSA, though human disturbance likely limits potential hibernaculum in these areas.
Hoary bat	*Lasiurus cinereus*	END*	—	The hoary bat has an extensive range that covers much of the province of Ontario but is centralized in Southern Ontario. They are a solitary species that roosts in the terminal foliage of mature deciduous and coniferous trees typically at the edge of a clearing (Dobbyn 1994). This species migrates to the south to the US each winter prior to hibernation.	Moderate - Potential suitable habitat present due to ample woodland edge habitat within the LSA.
Little brown myotis	*Myotis lucifugus*	END	END	In Ontario, this species range is extensive and covers much of the province. It will roost in both natural and man-made structures. 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 of water. Caves or abandoned mines may be used for hibernaculum, but high humidity and stable above freezing temperatures are required.	Low - No suitable habitat found within the LSA.
Northern myotis	*Myotis septentrionalis*	END	END	In Ontario, this species range is extensive and covers much of the province. It will usually roost in hollows, crevices, and under loose bark of mature trees. Roosts may be established in the main trunk or a large branch of either living or dead trees. Caves or abandoned mines may be used for hibernaculum, but high humidity and stable above freezing temperatures are required (COSSARO 2012).	Moderate - Potential suitable habitat present in woodland communities within the LSA.
Silver-haired bat	*Lasionycteris noctivagans*	END*	—	The silver-haired bat has an extensive range that covers much of the province of Ontario. They often form small maternity colonies in hollow trees and bark crevices, and do not make use of buildings or caves (Dobbyn 1994). This species migrates to the south to the US each winter prior to hibernation.	Moderate - Potential suitable habitat present in woodland communities within the LSA.
Tri-colored bat	*Perimyotis subflavus*	END	END	In Ontario, tri-colored bat may roost in foliage, in clumps of old leaves, hanging moss or squirrel nests. They are occasionally found in buildings although there are no records of this in Canada (Poissant et. al. 2010). They typically feed over aquatic areas with an affinity to large-bodied water and will likely roost in close proximity to these. Hibernation sites are found deep within caves or mines in areas of relatively warm temperatures. These bats have strong roost fidelity to their winter hibernation sites and may choose the exact same spot in a cave or mine from year to year.	Low - No suitable habitat found within the LSA.
Reptiles					
Eastern milksnake	*Lampropeltis triangulum*	SC	NAR	In Ontario, milksnake uses a wide range of habitats including prairies, pastures, hayfields, wetlands and various forest types, and is well-known in rural areas where it frequents older buildings. Proximity to water and cover enhances habitat suitability. Hibernation takes place in mammal burrows, hollow logs, gravel or soil banks, and old foundations (COSEWIC 2014).	Moderate - Potential suitable habitat present within with LSA due to the agricultural, wetland, and forest communities with close proximity to water within the LSA.
Midland painted turtle	*Chrysemys picta marginata*	SC	NAR	Painted Turtles occupy slow moving, relatively shallow and well-vegetated wetlands (e.g., swamps, marshes, ponds, fens, bogs, and oxbows) and water bodies (e.g., lakes, rivers, creeks, and streams) with abundant basking sites and organic substrate. The species is semi-tolerant of human-altered landscapes and may occasionally be found occupying urban ponds and lands subject to anthropogenic disturbance (e.g., farm ponds, impoundments, water treatment facilities) (COSEWIC 2018).	Moderate - Potential suitable aquatic habitat present within the LSA, though recent watercourse allignments may limit habitat quality.

Species		Conservation Status		Habitat Requirements	Likelihood of Occurrence within the LSA
Common Name	Scientific Name	SARA[1]	ESA[2]		
Northern map turtle	*Graptemys geographica*	SC	SC	In Ontario, the northern map turtle prefers large waterbodies with slow-moving currents, soft substrates, and abundant aquatic vegetation. Ideal stretches of shoreline contain suitable basking sites, such as rocks and logs. Along Lakes Erie and Ontario, this species occurs in marsh habitat and undeveloped shorelines. It is also found in small to large rivers with slow to moderate flow. Hibernation takes place in soft substrates under deep water (COSEWIC 2012).	Low - No suitable habitat found within the LSA.
Snapping turtle	*Chelydra serpentina*	SC	SC	In Ontario, snapping turtle utilizes a wide range of waterbodies, but shows preference for areas with shallow, slow-moving water, soft substrates and dense aquatic vegetation. Hibernation takes place in soft substrates under water. Nesting sites consist of sand or gravel banks along waterways or roadways (COSEWIC 2008).	Moderate - Potential suitable aquatic habitat present within the LSA, though recent watercourse allignments may limit habitat quality.
Timber rattlesnake	*Crotalus horridus*	EXP	EXP	The most recent Ontario record occurred in the Niagara Gorge in the 1940s. Timber rattlesnake's preferred habitat is coniferous or deciduous forests with rocky slopes and ledges (COSEWIC 2001).	Low - Current species status and habitat preferences limit likelihood of species within the LSA.
Vascular Plants					
Broad beech fern	*Phegopteris hexagonoptera*	—	SC	In Ontario, broad beech fern inhabits rich, undisturbed mature deciduous forest dominated by beech and maple. It typically grows in moist to wet, sandy soils of lower valley slopes and occasionally swamps (van Overbeeke et. al. 2013).	Moderate - Potential suitable mature deciduous forest habitat present within the LSA, though not observed during field investigations.
Butternut	*Juglans cinerea*	END	END	In Ontario, butternut is found along stream banks, on wooded valley slopes, and in deciduous and mixed forests. It is commonly associated with beech, maple, oak and hickory (Voss and Reznicek 2012). Butternut prefers moist, fertile, well-drained soils, but can also be found in rocky limestone soils. This species is shade intolerant (Farrar 1995).	Low - Preferred habitat not present within the LSA and no individuals were found during field investigations.
Cucumber tree	*Magnolia acuminata*	END	END	In Ontario, cucumber tree grows in deciduous woodlands in association with species such as black cherry, red maple, beech and white ash. It prefers moist to wet sites, with slightly acidic, sandy loam soils (Waldron 2003). It occurs only in the Niagara Region and Norfolk County.	Moderate - Potential suitable habitat present within the LSA, though not observed during field investigations
Deerberry	*Vaccinium stamineum*	THR	THR	In Ontario, deerberry inhabits open deciduous woodlands, especially oak, as well as rock barrens on both steep slopes and flat ground. It is currently found only in the Niagara Region and St. Lawrence Thousand Islands area. Deerberry grows in dry, acidic, sandy soils (NDRT 2010).	Moderate - Potential suitable habitat present within the LSA, though not observed during field investigations
Eastern flowering dogwood	*Cornus florida*	END	END	In Ontario, eastern flowernig dogwood grows in the understory of dry to rich deciduous forests, especially on hillsides and riverbanks. It prefers sandy acidic soils but occasionally is found in loams, clays and organic soils (Waldron 2003). This species is restricted to the Carolinian zone of southern Ontario.	Moderate - Potential suitable habitat present within the LSA, though not observed during field investigations
Kentucky coffee-tree	*Gymnocladus dioicus*	THR	THR*	*Only considered threatened in the following geographic areas and not classified as at risk in all other jurisdictions in Ontario: The County of Elgin, The County of Essex, The County of Lambton, The County of Middlesex, The County of Norfolk, The County of Oxford, The Municipality of Chatham-Kent. In Ontario, Kentucky coffee-tree is found in rich, mesic and floodplain forests. Populations are scattered throughout the Carolinian forest in Ontario, but are commonly found near streams, rivers, former swamps and wetlands. Kentucky coffee-tree thrives in disturbed areas, but can survive in most habitats, even difficult ones (e.g. bare or poor soils) as long as sunlight is present (Environment Canada 2014). This species prefers deep, rich soils.	Moderate - Potential suitable habitat present within the LSA, though not observed during field investigations
Round-leaved greenbrier (Great Lakes/Plains population)	*Smilax rotundifolia*	THR	THR	In Ontario, round-leaved greenbrier occurs only in the Carolinian forest region. It grows in open, moist to wet, woodlands, often on sandy soils. Disturbances that open up the canopy generally promote growth (COSEWIC 2007).	Moderate - Potential suitable habitat present within the LSA, though not observed during field investigations
Swamp rose-mallow	*Hibiscus moscheutos*	SC	SC	In Ontario, swamp rose mallow is restricted to shoreline marshes associated with lakes Erie, Ontario, and St. Clair. It is most commonly found in deep-water cattail marshes and meadow marshes, but is also found in dyked wetlands, open wet woods, thickets, spoil banks, and drainage ditches where it grows on organic or clay soils. Periodic water level fluctuations are necessary to sustain swamp rose mallow (Environment Canada 2013).	Low - Preferred habitat not present within the LSA and no individuals were found during field investigations.
White wood aster	*Eurybia divaricata*	THR	THR	In Ontario, white wood aster grows in open, dry to moist, deciduous woodlands with well-drained soils. It seems to grow along trails in forests dominated by sugar maple and American beech, with associates such as red, white, and black oak, shagbark hickory, and basswood (COSEWIC 2002).	Moderate - Potential suitable habitat present within the LSA, though not observed during field investigations

Notes

[1] *Species at Risk Act* (SARA), 2002. Schedule 1; Part 1 (Extirpated), Part 2 (Endangered), Part 3 (Threatened), Part 4 (Special Concern)

[2] *Endangered Species Act* (ESA), 2007. Schedule 1 (Extirpated - EXP), Schedule 2 (Endangered - END), Schedule 3 (Threatened - THR), Schedule 4 (Special Concern - SC)

* Recommended by COSEWIC in May 2023, but not on list as of December 2024