

Southampton Landfill Expansion

Natural Environment Assessment

Prepared for:

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Aquatic, Terrestrial and Wetland Biologists

Southampton Landfill Expansion

Natural Environment Assessment

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1.0 Introduction

Natural Resource Solutions Inc. (NRSI) was retained by GEI Consultants Canada (formerly GM BluePlan Engineering), on behalf of the Town of Saugeen Shores, to complete a Natural Environment Assessment (NEA) associated with the proposed expansion of the Southampton Landfill. The proposed landfill expansion is being planned to accommodate the future waste disposal needs of the community once the existing landfill site capacity has been reached. Landfill expansions are subject to a Comprehensive Environmental Assessment (EA) process, pursuant to the Ontario *Environmental Assessment Act*. GEI Consultants Canada has been retained by the Town of Saugeen Shores to undertake the EA planning process for the proposed landfill expansion. As part of the EA process, a NEA is required to characterize the existing natural features and ecological functions of the site, and to assess the significance and sensitivity of the natural features in order to inform constraints and opportunities for landfill expansion planning. The viability of various proposed landfill expansion options and Alternative Methods will also be reviewed. This NEA Report (March 2026) confirms the feasibility of landfill expansion at the Town's existing Southampton Landfill Site and provides an evaluation and assessment of landfill expansion options, which are reflected in adjustments to the northerly limit of fill. The review and comparative assessment of Alternative Methods will be advanced in conjunction with the initiation of the Environmental Assessment and is expected to be completed in 2026.

The Southampton Landfill is located at 126 Concession 14, immediately east of the community of Southampton. The site contains an existing waste disposal/transfer station located within the southeast corner of a larger parcel of land owned by the Town. The western portion of the existing landfill site property is bordered on the west by wooded natural features followed by an agricultural field further to the west. Bordering the landfill property to the north is a 50-acre parcel of land owned by the Town. Collectively, these two property parcels are considered the study area for the purposes of the NEA as shown on Map 1. The woodland and the agricultural field to the west of the landfill within the study area is identified as buffer lands for the existing approved landfill, while contaminant attenuation zones are located immediately outside of the study area to the southeast (Appendix I).

Lands to the north and west of the study area comprise additional wooded natural features, while lands to the south and east include agricultural and other natural feature land cover. The

study area abuts the Saugeen River to the northeast. The study area falls within the traditional territory and treaty lands of the Saugeen Ojibway Nation (SON).

The study area contains unevaluated wetlands as mapped by the Ontario Ministry of Natural Resources (OMNR) and the Saugeen Valley Conservation Authority (SVCA). A tributary to the Saugeen River is also mapped as originating within the north-central portion of the study area and flowing north off-property. The far northern extent of the study area lands is zoned Environmental Protection and mapped as Hazard Land Area in the Bruce County Official Plan (County of Bruce 2024). Portions of the study area are regulated by the SVCA due to the presence of watercourse and wetland features, and slope and erosion hazards.

This report summarizes background information on natural heritage features and species records, as well as results of field surveys completed within the study area. This information was used to assess the ecological significance and sensitivity of the study area natural features. An outcome of this assessment is to identify potential constraints to the future expansion of the Southampton Landfill, and conversely to identify areas of expansion opportunity. To support the feasibility assessment, a high-level impact assessment will be completed for each of three potential landfill expansion options. The main difference between the landfill expansion options is primarily reflected in the northerly limit of the proposed expansion area. As a result, the three expansion options will differ from each other in terms of the size of landfill expansion zone. The results of this impact assessment, and the associated mitigation measures, will be used to inform the EA process.

2.0 Project Scoping

2.1.1 Background Information Review

In order to determine a study approach for the NEA, existing natural heritage information was first gathered and reviewed to identify key natural heritage features and species that are known or have potential to occur within the study area. Existing background information was requested from the SVCA and the OMNR Midhurst District. A written response to the request was received from the OMNR on April 26, 2021.

Background information on the natural environment features within the study area vicinity was also gathered from the OMNR Natural Heritage Information Centre online database of provincially-tracked species (MNRF 2021), the OMNR's Land Information Ontario mapping, and relevant taxa-specific databases, as listed below.

Initial wildlife species lists were compiled to provide information on species reported from the vicinity of the study area (within 10x10km survey squares) using various atlases including the Ontario Mammal Atlas (Dobbyn 1994), the Ontario Reptile and Amphibian Atlas (Ontario Nature 2019), the Ontario Butterfly Atlas (MacNaughton et al. 2021), and the Ontario Odonata Atlas (OOAD 2021). Data on breeding birds in the area was extracted from the Ontario Breeding Bird Atlas (OBBA; BSC et al. 2008). Species records from the survey square that overlaps the study area (17MK72 as mapped in the OBBA) were compiled. Citizen science-derived species records compiled and mapped by eBird (eBird 2021) and iNaturalist (iNaturalist 2021) within or in the vicinity of the study area were also reviewed to further inform the background information review.

As part of its role in providing technical review and input to the EA process, the SON Environment Office reviewed an earlier version of this NEA report (dated May 2024) and provided written comments (SON 2025). These comments identified the need for the NEA impact assessment to consider species of cultural importance to SON. A subsequent letter containing a list of vascular plants of cultural importance to SON (SON 2026) was subsequently provided to NRSI in January 2026 and have been integrated into the impact assessment (Section 6.0). See Appendix II for the SON comments and list of culturally important vascular plant species.

Other information sources that were reviewed to inform project scoping included the following:

- Bruce County Official Plan (County of Bruce 2024);

- Saugeen Shores Official Plan (Town of Saugeen Shores 2024); and,
- SVCA online regulation mapping (SVCA 2021).

Following the completion of a site visit with NRSI staff on September 15, 2021, and review of wetland boundary mapping provided by NRSI in September 2021, the SVCA circulated pre-consultation comments on the proposed landfill expansion dated September 28, 2021. The SVCA letter provided an overview of the existing study area natural features, and included comments related to natural hazard and natural heritage matters in the event that a *Planning Act* application is required, as well as statutory comments related to its mandate under Ontario Regulation 169/06 (this regulation has since been replaced with Ontario Regulation 41/24). The SVCA pre-consultation comments are included in Appendix III.

2.1.2 Significant Species and Habitat Screenings

Species at Risk (SAR) are those listed on the Species at Risk in Ontario List (MECP 2026). These include species identified by the Committee on the Status of Species at Risk in Ontario (COSSARO) as provincially Endangered, Threatened, or Special Concern. Species listed as Endangered or Threatened are protected under the *Endangered Species Act* (ESA), which includes protection to their habitat. The provincial *Protect Ontario by Unleashing Our Economy Act* was invoked through Royal Assent on June 5, 2025, which enacted various amendments to the ESA including the definitions of SAR habitats. The updated definitions to SAR habitats as established through the amended ESA are represented in this NEA report.

Species considered Special Concern are included in the definition of Species of Conservation Concern (SCC), which includes the following:

- species designated provincially as Special Concern,
- species that have been assigned a conservation status (S-Rank) of S1 to S3 or SH by the Natural Heritage Information Centre (MNRF 2021), and
- species that are designated federally as Threatened or Endangered by the Committee for the Status of Endangered Wildlife in Canada (COSEWIC) but not provincially by the COSSARO. These species may be protected by the federal *Species at Risk Act* (SARA) if they are listed as Threatened or Endangered on Schedule 1 of the SARA.

Habitat for SCC is considered SWH (OMNR 2010), which is afforded protection under the Provincial Policy Statement (OMMAH 2020) and municipal natural heritage protection policies.

For the purposes of this report, the term “SAR” will refer to provincially Threatened and Endangered species regulated under the ESA while provincial species of Special Concern will be considered SCC.

Based on NRSI’s examination of background sources and federally or provincially significant species with occurrence records in the study area vicinity (within 10km), an assessment of SAR and SCC suitable habitat presence within the study area was completed. Assessments of habitat suitability in the study area were made by cross-referencing each species’ known habitat preferences or requirements (e.g., OMNR 2000) with habitat availability based on satellite imagery interpretation and available mapping.

Based on the results of the preliminary screening, the following SAR were identified as having potential for suitable habitat within the study area:

- American Badger (*Taxidea taxus jacksoni*) – provincially and federally Endangered
- American Eel (*Anguilla rostrata*) – provincially Endangered; listed as nationally Threatened by COSEWIC
- Bank Swallow (*Riparia riparia*) – provincially and federally Threatened
- Black Redhorse (*Moxostoma duquesnei*) – provincially Threatened; listed as nationally Threatened by COSEWIC
- Bobolink (*Dolichonyx oryzivorus*) – provincially and federally Threatened
- Eastern Meadowlark (*Sturnella magna*) – provincially and federally Threatened
- Eastern Red Bat (*Lasiurus borealis*) – provincially Endangered; listed as nationally Endangered by COSEWIC
- Hoary Bat (*Lasiurus cinereus*) – provincially Endangered; listed as nationally Endangered by COSEWIC
- Massasauga (*Sistrurus catenatus catenatus*) (Great Lakes/St. Lawrence population) – provincially and federally Threatened
- Lake Sturgeon (*Acipenser fulvescens*) – provincially Threatened; listed as nationally Threatened by COSEWIC
- Little Brown Myotis (*Myotis lucifugus*) – provincially and federally Endangered

- Northern Myotis (*Myotis septentrionalis*) – provincially and federally Endangered
- Red-headed Woodpecker (*Melanerpes erythrocephalus*) – provincially and federally Endangered
- Silver-haired Bat (*Lasionycteris noctivagans*) – provincially Endangered; listed as nationally Endangered by COSEWIC
- Silver Shiner (*Notropis photogenis*) – provincially and federally Threatened
- Tri-colored Bat (*Perimyotis subflavus*) – provincially and federally Endangered
- Yellow-breasted Chat (*Ictera virens*) – provincially and federally Endangered

See Appendix IV for the full habitat screening table for SAR and SCC with occurrence records in the study area vicinity. It should be noted that although the fish SAR American Eel, Black Redhorse, Lake Sturgeon, and Silver Shiner may have suitable habitat within the Saugeen River, which abuts the study area limits, impacts to the Saugeen River and its fish habitats are not anticipated as a result of the future landfill expansion. These fish SAR are therefore not considered further within this report.

A preliminary screening for the presence of Significant Wildlife Habitat (SWH) was also completed for the study area. The Significant Wildlife Habitat Technical Guide (SWHTG) outlines the types of habitats that the MNRF considers significant in Ontario as well as criteria to identify these habitats for Ecoregion 6E, in which the study area is located (OMNR 2000, MNRF 2015). The SWHTG groups SWH into four broad categories: seasonal concentration areas, rare vegetation communities and specialized wildlife habitat, habitats of SCC, and animal movement corridors.

Based on the results of this preliminary screening exercise, the following SWH types were initially considered Candidate SWH for the study area to inform the need for further assessment through the field work and analysis in the NEA:

- Turtle Wintering Area
- Snake Hibernaculum
- Colonially-Nesting Bird Breeding Habitat (Bank and Cliff)
- Colonially-Nesting Bird Breeding Habitat (Trees and Shrubs)

- Waterfowl Nesting Area
- Woodland Raptor Nesting Habitat
- Seeps and Springs
- Amphibian Breeding Habitat (Woodland)
- Woodland Area-Sensitive Bird Breeding Habitat
- Shrub/Early Successional Bird Breeding Habitat
- Special Concern and Rare Wildlife Species:
    - Barn Swallow (*Hirundo rustica*)
    - Canada Warbler (*Cardellina canadensis*)
    - Common Nighthawk (*Chordeiles minor*)
    - Eastern Whip-poor-will (*Caprimulgus vociferus*)
    - Wood Thrush (*Hylocichla mustelina*)
    - Grasshopper Sparrow (*Ammodramus savannarum*)
    - Eastern Wood-Pewee (*Contopus virens*)
    - Northern Map Turtle (*Graptemys geographica*)
    - Snapping Turtle (*Chelydra serpentina serpentina*)
    - Monarch (*Danaus plexippus*)
    - Rainbow (*Villosa iris*)

See Appendix V for the detailed SWH screening tables, including rationale as to whether the SWH types are considered “candidate” or not present within the study area.

Based on the results of the SAR/SCC habitat screening, NRSI submitted a technical memo to the Ontario Ministry of Environment, Conservation and Parks (MECP), dated May 5, 2021, identifying SAR with records in the vicinity that NRSI deemed to potentially be impacted by the proposed development. Additional information and guidance was requested with respect to these SAR and to identify any additional actions or measures that would be required in accordance with the ESA. In responses that were provided on May 21 and 25, 2021, the MECP identified other SAR with records in the general vicinity, which have been incorporated into the

screening table in Appendix IV and the list above. The MECP also recommended that targeted surveys for Massasauga and SAR bats be undertaken within the study area due to the potential for these species to occur on-site. See Appendix VI for records of MECP correspondence with respect to SAR.

2.1.3 Relevant Policies, Legislation and Regulations

Table 1 provides an overview of natural heritage-based policies, regulations and legislation that were considered and which informed the field program and analysis. To help inform the assessment of suitable landfill expansion opportunities and to identify areas to be protected, inventoried natural features were evaluated against relevant policies, regulations and legislation outlined in the following sections. The specific implications of these policies to the proposed development are discussed in further in Section 4.0.

Table 1. Relevant policies, legislation and regulations

Policy/Legislation	Description	Project Relevance

Provincial Planning Statement (OMMAH 2024)	• Issued under the authority of Section 3 of the *Planning Act* and came into effect on October 20, 2024, replacing the 2020 Provincial Policy Statement.
	• Section 4.1 of the PPS – Natural Heritage establishes clear direction on the adoption of an ecosystem approach and the protection of resources that have been identified as 'significant'.
	• The Natural Heritage Reference Manual (OMNR 2010) and the Significant Wildlife Habitat Technical Guide (OMNR 2000, MNRF 2015) were prepared by the OMNR to provide guidance on identifying natural features and in interpreting the Natural Heritage sections of the PPS.
		• Natural features that occur or may occur within the study area, and which receive protection under the PPS, include:
		  ○ Significant Woodland,
		  ○ Fish Habitat,
		  ○ Potential Significant Wildlife Habitat, and
		  ○ Potential habitat for Endangered and Threatened species.
		• Section 4.1.5 of the PPS states that development or site alteration shall not be permitted in Significant Woodlands or Significant Wildlife Habitat unless it has been demonstrated that there will be no negative impacts on the features or their ecological functions.
		• Section 4.1.6 of the PPS states that development or site alteration shall not be permitted in fish habitat except in accordance with provincial and federal requirements.
		• Section 4.1.8 of the PPS states that development and site alteration shall not be permitted on adjacent lands to the natural features described above unless it is demonstrated that there will be no negative impacts to the natural features or their ecological functions.
		• Section 4.1.7 of the PPS states that development or site alteration shall not be permitted in habitat of Endangered or Threatened species except in accordance with provincial or federal requirements.
		• Section 4.1.2 of the PPS states that the connectivity of natural features in an area should be maintained, restored, or where possible, improved.

Endangered Species Act	• The ESA prohibits killing, harming, harassing or capturing Endangered and Threatened species. • The ESA also protects habitat of Endangered and Threatened species from damage and destruction.	• Based on a preliminary assessment, multiple SAR were identified as having the potential to occur within the study area based on presence of suitable habitat.

Policy/Legislation	Description	Project Relevance
	• Ontario is planning to replace the ESA with the *Species Conservation Act*. The exact date the SCA will be in place is yet to be determined by the provincial government.	
Bruce County Official Plan (2024)	• The purpose of the Bruce County Official Plan is to establish a policy framework to guide the physical, social and economic development of the County and to protect the natural environment within the County. • County Council recognizes that natural areas or features within Bruce County provide a wide range of benefits to the residents of the County. Those areas shall be protected from the negative effects of development.	• Several natural features were identified within the Study Area as having potential implications under the plan: o Cold and Warmwater Streams o Locally Significant Wetlands o Significant Woodlands o Potential Habitat for Threatened and Endangered Species o Candidate SWH • Development that may impact Locally Significant Wetlands requires an EIS to ensure that the ecological function of the lands are not negatively impacted by the proposed development (Section 4.3.2.4). • Development may be permitted in a Significant Woodland if an EIS confirms that the development will not impact the habitat/resource function of the woodland (Section 4.3.2.6) • Development shall not be permitted within significant portions of the habitat of SAR or SWH. Development and site alteration may be permitted on adjacent lands only if it has been demonstrated through an EIS that there will be no negative impacts on the natural features or ecological functions (Section 4.3.2.7 and 4.3.2.10). • No development shall be permitted within 30m of the banks of a coldwater stream or 15m of a warmwater stream (Section 4.3.2.1).
Town of Saugeen Shores Official Plan (2024)	• Environmental features that are addressed under Town policy include habitat of Endangered and Threatened species, SWH, wetlands, Significant Valleylands, and fish habitat.	• Several natural features were identified within the Study Area as having potential implications under the plan: o Fish Habitat o Wetlands o Tree Preservation and Significant Woodlands

Policy/Legislation	Description	Project Relevance
	• Until such time when environmental features mapping is available and in incorporated into the Official Plan, the Plan will rely on Environmental Hazard designations, Special Policy Area #4 and the Significant Woodlands Study mapping to achieve much of the Town's environmental goals and objectives.	○ Potential Habitat for Threatened and Endangered Species ○ Candidate SWH ○ Linkages • No development or site alteration shall be permitted in habitat or Endangered or Threatened species or SAR. Development may be permitted on adjacent lands only if it has been demonstrated through an EIS that there will be no negative impacts on the habitat of the Endangered or Threatened species (Sections 2.6.3.2, 2.6.3.4). • Development or site alteration within or adjacent to SWH is not permitted unless and EIS has been approved by Council which demonstrates that there will be no negative impact on the SWH (Section 2.6.4.2). • Development or site alteration is not permitted in fish habitat, except in accordance with provincial and federal requirements (Section 2.6.5.2). • Development and site alteration shall not be permitted in any wetlands. Where development or site alteration is proposed on lands adjacent to a wetland, an EIS will be required (Sections 2.6.6.3, 2.6.6.4) • For woodlands having an area of 4ha or greater, development and site alteration shall not be permitted within these features. Development may be permitted on land adjacent to these woodlands in accordance with Section 2.6.11 (Section 2.6.8.2(c)) • Linkages are to be identified and improved between natural heritage features, and Site Plan Control or site-specific zoning may be used to protect and develop linkages (Sections 2.6.9.1, 2.6.9.2).
Conservation Authorities Act, 1990 Ontario Regulation 41/24: Prohibited Activities, Exemptions and Permits	• Through this regulation, the SVCA has the responsibility to regulate activities in natural and hazardous areas (i.e., areas in and near rivers, streams, floodplains, wetlands, and slopes). • Development, interference or alteration within a Regulated Area may be permitted	• Portions of the study area are regulated by the SVCA due to the presence of wetland, watercourse features, and slope and floodplain hazard areas. • Permitting from the SVCA must be obtained for proposed site works within regulated areas.

Policy/Legislation	Description	Project Relevance
	where it can be demonstrated through appropriate technical studies and/or assessments, site plans and/or other plans as required by the SVCA that there are no negative effects.	

3.0 Field Methods

Terrestrial and aquatic field surveys were undertaken within the study area to characterize the natural features and identify those that are ecologically significant and sensitive and that have potential to be adversely affected by the proposed undertaking. A total of 21 site visits were completed between April 2021 and May 2023. The following is a summary of the field tasks completed for this NEA.

3.1 Terrestrial Field Surveys

3.1.1 Vegetation Community Mapping and Species Inventories

Vegetation communities within the study area were mapped according to the Ecological Land Classification system for southern Ontario (Lee et al. 1998). Due to the size of the study area and the complexity of the wetland features, ELC mapping occurred progressively during site visits completed on April 1, May 11 and 21, July 7, and August 3, 2021. Detailed spring- and summer-based inventories of vascular flora species were completed on May 11 and August 3, respectively. During the fall-season site visit completed on September 17, the NRSI project botanist observed no additional vegetation species that were not already inventoried within the spring and summer periods. These inventories helped inform the ELC classification and mapping, particularly the wetland boundary delineations.

Wetland boundaries within the study area were delineated according to the Ontario Wetland Evaluation System methodology (MNRF 2014a). An NRSI biologist met on site with staff of the SVCA to review and confirm the wetland boundaries on September 17, 2021.

3.1.2 Breeding Bird Surveys

Two early morning breeding bird surveys were completed on June 11 and July 7, 2021 in accordance with Ontario Breeding Bird Atlas (OBBA) protocol (Birds Canada 2021). Surveys were completed between a half-hour before sunrise and 10:00am and were timed to occur at least 10 days apart. Surveys were completed through comprehensive area searches of each of the study area vegetation communities. Standard breeding evidence codes were recorded based on OBBA protocol. Any observed structures were inspected for the presence of bird nesting where suitable nesting habitat existed.

3.1.3 Nocturnal Bird Survey

Due to the presence of suitable habitat for the SCC Eastern Whip-poor-will and Common Nighthawk within the study area, a single nocturnal bird species was completed to target these

species. The survey followed a modification of the MNRF Eastern Whip-poor-will survey protocol (MNRF 2014b), in which a 10-minute passive-listening point count survey was completed. The survey was completed during the period of 1 hour before sunset to 30 minutes after sunset, and was undertaken during appropriate temperature and weather conditions. See Map 2 for the point count locations.

3.1.4 Snake Surveys

Twelve snake coverboards were placed within areas of suitable snake habitat within the study area to inform the assessment of snake species presence. See Map 2 for snake coverboard locations. Each coverboard comprised a 4x4-foot sheet of plywood with the upper side painted black. Where possible, boards were placed next to other snake microhabitat features (e.g., rock piles) to increase the likelihood of their use. The boards were placed on April 1, 2021 and were subsequently checked during site visits.

Due to the existence of a previous record of the SAR Massasauga within the study area vicinity (within 10km) and due to the presence of suitable habitat within the study area, the MECP recommended that targeted surveys for Massasauga be undertaken as part of the NEA. The MECP comment was provided in response to NRSI SAR screening memo submitted on May 5, 2021. See Appendix VI for the MECP response email.

In accordance with the standard survey protocol for Massasauga (MNRF 2016), the first five of a total required 10 visual encounter surveys were undertaken. The final five surveys were to be completed in 2022 since the protocol requires that surveys be split between two years. However, based on correspondence between NRSI and the MECP in April 2022 (Appendix VI), it was confirmed that the remaining five surveys to be completed in 2022 were not necessary to finalize the assessment of Massasauga species presence/absence (see Section 5.4.2). Visual encounter surveys were specifically completed on May 20, June 9, 17, and 23, and July 1, 2021. Surveys comprised thorough area searches of suitable snake habitat (e.g., open woodlands, forest clearings, woodland edges) including checks of natural cover objects.

Due to observation of several snakes within the study area during the 2021 visual encounter surveys (see Section 4.3.2) and because these surveys were undertaken after snakes would have emerged and dispersed from their overwintering hibernacula, NRSI completed supplementary snake visual encounter surveys during April 2023 to further assess whether snake overwintering habitats occur on-site. A total of five additional surveys were completed,

on April 9, 10, 12, 13, and 27, 2023. These supplementary surveys were targeted within the area of proposed landfill expansion, plus an additional 50m adjacent to the expansion zone, to the west of the existing operational area. The first four surveys were timed such that any observed snakes were likely to be in relative proximity to their overwintering hibernacula, since nighttime temperatures were cold enough that they would retreat to their hibernacula. If large groupings were observed, this would potentially signify the presence of Snake Hibernaculum SWH based on criteria established by the MNRF (2015). The final survey completed on April 27 provided additional general assessment of snake species presence within the study area.

3.1.5 Anuran Call Surveys

Three nighttime anuran call surveys were completed, in each of April, May and June, in accordance with the Marsh Monitoring Program amphibian survey protocol (BSC 2009). See Map 2 for the survey station locations. Surveys comprised three-minute passive-listening point counts. Species were recorded according to their three-level calling code categories of calling intensity. Number of calling individuals were also recorded for Calling Codes 1 and 2, while Calling Code 3 was recorded for full choruses whereby number of individuals could not be estimated. Anuran call surveys were completed on April 27, May 21, and June 28 under appropriate weather and temperature conditions.

3.1.6 Bat Habitat Assessment, Acoustic Surveys and Analysis

Bat Acoustic Surveys

Due to the abundance of forested habitat within the study area, it was assumed for the purposes of the SAR screening memo that SAR bat habitat was likely present within the study area (Appendix VI). In response, the MECP recommended that targeted surveys for SAR bats be undertaken as part of the NEA rather than assuming presence, which would automatically require that a permit under the ESA be sought. It should be noted that permitting requirements may change upon revocation of the ESA and enactment of the *Species Conservation Act* in 2026.

Bat passive acoustic monitoring was completed to assess species presence, the timing and abundance of recorded call sequences, and relative locations of SAR bat activity within the study area. The monitoring was undertaken in accordance with standard protocols (MNRF 2017, MECP 2020). Note, since the completion of the passive acoustic monitoring, updated guidelines have been released by the MECP, including the *Survey Protocol for Maternity Roost Surveys (Forests/Woodlands)* (MECP 2022a), and the *2022 Bat Survey Standards Note* (MECP

2022b). Although not designed based on the 2022 guidelines, the methods utilized as part of this study still adhere to the 2022 guidelines.

Based on the number and size of ELC communities present within the study area, a total of 24 acoustic monitoring stations were installed. Acoustic monitoring was completed in all treed communities within the study area that fall within identified potential landfill expansion areas (Map 3a). Acoustic monitoring was not completed in the northeast portion of the study area as no development is proposed in this area. Acoustic detectors were located within areas of suitable bat SAR habitat, including candidate roosting habitat, foraging habitat and travel corridors/flyways within the study area. Candidate foraging and travel corridors were surveyed by placing the acoustic monitoring station along the edge of the habitat to conceal the microphone from any foraging bats and avoid recording inspection calls.

One acoustic detector was installed per monitoring station. Monitoring stations BAT-005 and BAT-024 did not record any bat pass sequences during the monitoring period due to equipment error. Therefore, this data was removed from the analysis.

Bat activity was monitored with the use of an omnidirectional SMM-U1 microphone and Song Meter SM4 acoustic recorder (Wildlife Acoustics Inc., Massachusetts, USA). See NRSI's Bat Acoustic Summary Results report (Appendix VII) for details of the SM4 acoustic recorder settings that were used.

Passive acoustic monitoring was conducted between June 17 and July 6, 2021, for a total of 20 nights at all monitoring stations, with 14 nights in June. Acoustic detectors were set to record bat passes for a total of five hours each night during the monitoring period, commencing at sunset.

Upon review of weather conditions during the monitoring period, bat echolocation calls recorded on the 10 evenings with the most ideal weather conditions for bat activity (ambient air temperature >15°C, wind <12km/h, and no precipitation) were selected for further analyses. As per (MECP 2022a), the analysis of acoustic data from at least 10 monitoring nights that align with the above weather conditions where no SAR bat activity is detected is required to confirm the absence of SAR bats from a given habitat.

Bat Acoustic Data Analysis

Bat echolocation calls recorded during passive acoustic surveys were reviewed with the software program SonoBat 4.2.2 for the North/Northeastern US, Southern Ontario Region and initially identified to species with the SonoBat Auto-classifier. All bat call sequences with one or more of the following auto-classification results were manually vetted by NRSI biologists to bat species or species grouping:

- Classified as a high frequency call sequence (potential high frequency SAR including, Little Brown Myotis, Eastern Small-footed Myotis, Northern Myotis, or Tri-colored Bat) and not confidently classified to species level;
- Classified as a high frequency SAR (Little Brown Myotis, Eastern Small-footed Myotis, Northern Myotis, or Tri-colored Bat);
- A high frequency SAR was identified as one of the second or third suggested species identifications; and/or
- Not assigned a classification by the auto-classifier or classified as “No ID”.

Note, at the time the acoustic data was analyzed in 2021, only four bat species were listed as SAR, including Little Brown Myotis, Northern Myotis, Eastern Small-footed Myotis (*Myotis leibii*), and Tri-colored Bat. Three additional bat species were listed as SAR under the ESA in January 2025. The data has been reviewed, and the analysis updated to include the bat SAR Hoary Bat, Silver-haired Bat, and Eastern Red Bat. Call sequences auto-classified as a low frequency bat species (i.e., Silver-haired Bat, Hoary Bat, and Big Brown Bat (*Eptesicus fuscus*)), or as an Eastern Red Bat were not manually vetted.

Once the required files were manually vetted, the auto-classification program provided an estimated likelihood of presence for each species, also known as a maximum likelihood estimate (MLE). An MLE value provides an indication of the strength of evidence for the presence of a species. An MLE value of zero suggests that the data presents stronger evidence of species presence and a value of one suggests that the data presents weaker evidence of species presence. It is important to note that the likelihood estimate provides a probabilistic estimate and does not convey certainty.

See the Bat Acoustic Summary Results report (Appendix VII) for additional details about the analysis that was used to identify call sequences to individual species or species groupings, and to calculate an MLE for each.

Bat Habitat Assessment

Bat habitat assessments were completed on April 6 and 11, 2022, to document potential bat roosting habitat associated with trees (e.g., cracks, crevices, cavities, tree species that could provide suitable foliage roosts, etc.) following guidance from the *Survey Protocol for Species at Risk Bats within Treed Habitats* (MNRF 2017) and the *Maternity Roost Survey Protocol* (MECP 2021a). Within ELC vegetation communities that were ≤10ha in size, a full inventory of potential bat roost trees was completed. In ELC vegetation communities >10ha in size, a potential roost tree density was determined for each community based on a subsampling of potential roost trees in randomly-selected 0.05ha plots. A full (transect-based) inventory of potential bat roost trees was also conducted in an area of the study area consisting of the vegetation communities FOD8-1/CUP3, SWD4 and FOD3-2, to inform the selection of the northern limit of the proposed landfill expansion. See Map 3a for the areas of plot-based subsampling and full inventory of potential bat habitat trees.

All standing live or dead trees ≥10cm in DBH with cracks, crevices, hollows, and/or loose or naturally exfoliating bark were documented. Tree species, DBH, decay class according to Watt and Caceres (1999), and the number, height, and type (e.g., cavity, crevice, sloughing bark, etc.) of suitable roost sites was documented for each candidate roost tree. Oak species ≥10cm DBH and Maple species ≥25cm DBH were also identified for candidate foliage roosts for Tri-colored Bat. Other criteria were also considered, including the use of cavities by other wildlife, the potential for cavities to be used by predators, supporting/surrounding habitat, and other characteristics which may contribute to the habitat requirements of these species, such as temperature regulation. All identified candidate roost trees were surveyed with a Trimble SXBlue II GNSS GPS unit. Roost tree densities were determined for all vegetation communities assessed as part of the bat habitat assessment to characterize habitat availability within the study area.

3.1.7 Badger Habitat Assessment

Due to the potential for American Badger to occur within the study area, as determined through background information review, an assessment was completed during April and May 2023 to further investigate whether this species may occupy the study area. A search for potential badger burrows was completed in conjunction with snake visual encounter surveys on April 12 and 13, 2023. Surveys were completed by inspecting observed burrow entrances for signs that are indicative of potential badger use (e.g., D-shaped opening, lateral claw marks). A follow-up

visit was completed on May 17, 2023 to further inspect a subset of observed burrows that were identified as potential badger burrows. The badger habitat assessment was focused within the area of potential landfill expansion within the western portion of the study area, including woodland features where canopy clearings and trail openings occurred, and along the edges of other open habitats such as meadow features and the agricultural field.

Mammal hairs that were observed at the entrance to one of the investigated burrows (see Section 4.3.3) were submitted to a laboratory (Trent University, Natural Resources DNA Profiling & Forensic Centre, Peterborough, Ontario) for genetic testing to determine which species the hairs belonged to.

3.1.8 Wildlife Habitat Assessment

Natural features within the study area were investigated for the presence of other potentially significant habitats based on the screening exercise results presented in Section 2.1.2. For example, during the course of field surveys, NRSI biologists investigated for the presence of groundwater seepages, raptor or heron nests, and congregations of snakes during spring that would suggest potential location of a nearby hibernaculum.

3.1.9 Incidental Observations

During the field work program, all incidental observations of birds, mammals, herpetofauna, butterflies and odonates (dragonflies and damselflies) were documented during all field visits. This included direct observations of individuals, as well as signs of wildlife presence (i.e., tracks, scat, dens, nests, etc.).

3.2 Aquatic Field Surveys

3.2.1 Aquatic Habitat Assessment

An NRSI aquatic biologist completed a survey on June 11, 2021 to characterize the aquatic habitats within the study area. This work primarily focused on the tributary to the Saugeen River that is mapped by the MNRF within the study area (Map 1).

During this survey, a general assessment of the features' characteristics was recorded where possible, including the following information:

- riparian and aquatic vegetation;
- channel dimensions;
- general bank stability;

- cover type and quality;
- substrate type;
- flow conditions; and
- water temperature.

Since site development is not proposed within the northeast portion of the study area, only a cursory investigation of the adjacent reach of the Saugeen River was made. Furthermore, the steep slope along the northeastern boundary of the study area limited access to complete any in-depth analysis of the feature.

4.0 Existing Conditions

4.1 Soil, Terrain and Drainage

In general, the local landscape containing the study area is relatively flat tableland that in general gently slopes down to the west toward Lake Huron. The most notable physiographic feature within the study area is the steep, high bluff within the northeast corner, which borders a meander of the Saugeen River approximately 30m below the tableland elevation. At a smaller scale within the study area lands themselves, the topography gently slopes downwards toward the north and northeast in the direction of the Saugeen River.

Drainage within the site is mostly self-contained within a complex topography of small wetlands. Watercourse drainage within the site is limited to a single tributary that originates within the study area and flows in a northerly direction to lands north of the study area. The tributary outlets into the Saugeen River approximately 790m north of the study area.

Past site works/disturbances are suspected to have altered overland drainage, impounded water, and creating localized wetland conditions (i.e., SWT2, MAM2, SWD4 features). Overburden piles/berms were observed on-site associated with some of these wetland features. Wetland features are of anthropogenic origin, with the exception of a small portion of naturally occurring wetland at northeastern property limit (SWD3-1), extending off-site.

Soils within the subject property are generally sandy. During ELC characterization work, NRSI biologists observed sandy loam overlain on pure sand substrates.

4.2 Vegetation

4.2.1 Vegetation Communities

Most of the study area is dominated by wooded natural features that mainly comprise deciduous forest communities intermixed with deciduous or thicket swamp wetlands and re-naturalizing coniferous plantations. Forest communities within the north-central and northeastern portions of the study area represent the older, more mature wooded features on-site. A Cultural Meadow (CUM) community in the northwest of the study area represents a relict of the more open condition that historically existed in that portion of the study area (e.g., approximately 60 years ago) but which has since largely re-naturalized to young woodland with meadow clearings. Other Cultural Meadow features within the study area are of more recent anthropogenic origin and are a result of to the landfill land uses. The southeast quadrant of the study area is dominated by the existing Southampton Landfill operational areas. Southern portions of the

lands have also largely been cleared for landfill operations (e.g., public yard waste disposal area) as well as for other activities (e.g., containing a snowmobile club clubhouse). A network of trails extends throughout much of the study area, and the wooded features also contain small structures and cleared areas associated with a former Scouts camp. The western end of the study area entirely comprises an active agricultural field that lies within the landfill property. The field was planted in soybeans in 2021.

See Map 2 for vegetation community and other land cover mapping for the study area. Map 2 identifies wetland boundaries that were reviewed on-site with SVCA staff and surveyed to up to sub-50cm accuracy. A more detailed description of the ELC vegetation communities is provided in Table 2 below.

Table 2. Vegetation Communities within the Study Area

ELC Ecosite Type	ELC Description	Environmental Characteristics
Woodland		
FOD8-1	Fresh-Moist Poplar Deciduous Forest	Young forest community located in the north-central portion of the study area. Canopy: Trembling Aspen (*Populus tremuloides*), Green Ash (*Fraxinus pennsylvanica*), Paper Birch (*Betula papyrifera*), American Elm (*Ulmus americana*) Sub-canopy: Green Ash, American Elm, Eastern White Cedar (*Thuja occidentalis*) Understorey: Green Ash, Alternate-leaved Dogwood (*Cornus alternifolia*) Groundcover: Giant Goldenrod (*Solidago gigantea*), Self-heal (*Prunella vulgaris*), Calico Aster (*Symphyotrichum lateriflorum*)
FOD8-1/ CUP3	Fresh-Moist Poplar Deciduous Forest / Coniferous Plantation	Young forest community, with a distinct intermixed component of young to mid-aged coniferous plantation. This community's form exhibited relatively equal characteristics of both community types, and as such was assigned the two different communities. The coniferous plantation component consists of planted and naturalizing individuals. This community comprises a large portion of the western half of the study area. Canopy: Trembling Aspen, Green Ash, pines (*Pinus* spp.) Sub-canopy: Green Ash, Paper Birch, Alternate-leaved Dogwood Understorey: Choke Cherry (*Prunus virginiana*), Alternate-leaved Dogwood, Red-osier Dogwood (*Cornus sericea*) Groundcover: Calico Aster, Self-heal, Wild Strawberry (*Fragaria virginiana*), Sensitive Fern (*Onoclea sensibilis*)

ELC Ecosite Type	ELC Description	Environmental Characteristics
FOD6-3	Fresh-Moist Sugar Maple-Yellow Birch Deciduous Forest	Mature forest community located downslope from the FOD5-2. It is hummocky in nature and supports both wet and dry species. Canopy: Sugar Maple (*Acer saccharum*), Yellow Birch (*Betula alleghaniensis*) and Eastern Hemlock (*Tsuga canadensis*) Sub-canopy: Eastern Hemlock, Sugar Maple, Black Cherry (Prunus serotina) and Alternate-leaved Dogwood Understorey: Eastern White Cedar, Alternate-leaved Dogwood and Choke Cherry Groundcover: Sarsaparilla (*Aralia nudicaulis*), White Snakeroot (*Ageratina altissima*), Long-spurred Violet (*Viola rostrata*), Shinleaf (*Pyrola elliptica*) and Long-stalked Sedge (*Carex pedunculata*)
FOD5-2	Dry-Fresh Sugar Maple-Beech Deciduous Forest	Mature Sugar Maple upland forest located in the northeast portion of the study area. This community corresponds with the height of land for the study area. Canopy: Sugar Maple, American Beech (*Fagus grandifolia*), Black Cherry (*Prunus serotina*) Sub-canopy: Sugar Maple, Ironwood (*Ostrya virginiana*), Alternate-leaved Dogwood Understorey: Alternate-leaved Dogwood, Choke Cherry, Allegheny Blackberry (*Rubus allegheniensis*) Groundcover: Two-leaved Toothwort (*Cardamine diphylla*), Blue Cohosh (*Caulophyllum thalictroides*) and Zig-zag Goldenrod (*Solidago flexicaulis*)
FOD3-2	Dry-Fresh White Birch Deciduous Forest	Young forest stand of Paper Birch located centrally in the study area. Canopy: Paper Birch Sub-canopy: Alternate-leaved Dogwood Understorey: Alleghany Blackberry (*Rubus alleghaniensis*), Common Red Raspberry (*Rubus idaeus*) and Prickly Gooseberry (*Ribes cynostabi*) Groundcover: Wild Strawberry and Common Scouring-rush (*Equisetum hyemale*)
Wetland		
SWT2	Mineral Thicket Swamp	Dense stands of mature willow and dogwoods located in discontinuous patches roughly bisecting the study area. These communities are found along the main path of overland drainage originating near the northwest corner of the existing license area and culminating in the tributary to the Saugeen River Canopy: Silky Dogwood (*Cornus amomum*), Pussy Willow (*Salix discolor*)

ELC Ecosite Type	ELC Description	Environmental Characteristics
		Sub-canopy: Red-osier Dogwood and Heart-leaved Willow (*Salix eriocephala*) Groundcover: Reed Canary Grass (*Phalaris arundinacea*), Cottongrass Bulrush (*Scirpus cyperinus*) and American Water-horehounds (*Lycopus americanus*)
SWD4	Mineral Deciduous Swamp	Small, mid-aged deciduous swamp community occurring in the central portion of the study area. Corresponds with a low lying area. Canopy: Balsam Poplar (*Populus balsamifera*), Trembling Aspen (*Populus tremuloides*), Green Ash, and Red Maple Sub-canopy: Red Maple, Green Ash and American Elm Understorey: Silky Dogwood and Red-osier Dogwood Groundcover: Sensitive Fern, Fowl Mannagrass (*Glyceria striata*), Poison Ivy (*Toxicodendron radicans*)
SWD3-1	Red Maple Mineral Deciduous Swamp	Mid-aged deciduous swamp community occurring predominantly off-site to the east/northeast, with a very small portion located at the eastern limits of the study area. Evidence of groundwater seepage was documented within the feature. Canopy: Red Maple (*Acer rubrum*), Paper Birch, American Elm Sub-canopy: Red Maple, Green Ash, Yellow Birch (*Betula alleghaniensis*) Understorey: Green Ash, Red-osier Dogwood Groundcover: Sensitive Fern, Fowl Mannagrass, Calico Aster
MAM2	Mineral Meadow Marsh	Young meadow marsh community resulting from run-off from the western edge of the existing license area. This area is laden with sediment and extensive debris Canopy: Broad-leaved Cattail (*Typha latifolia*) and Reed Canary Grass Understorey: Cottongrass Bulrush (*Scirpus cyperinus*), Knotted Rush (*Juncus nodosus*), and Fox Sedge (*Carex vulpinoidea*)
Cultural		
CUM1	Mineral Cultural Meadow	Meadow communities found in a number of locations throughout the study area. The large one in the southwest is associated with the yard waste composting area and adjacent fill pile. The other areas are less disturbed and have a typical composition of native and non-native species Canopy: Goldernod species, Aster species and Spotted Knapweed (*Centaurea stoebe*) Sub-canopy: Sand Dropseed (*Sporobolus cryptandrus*)

ELC Ecosite Type	ELC Description	Environmental Characteristics
		Groundcover: Kentucky Bluegrass (*Poa pratensis)* and Canada Bluegrass (*Poa compressa*)
CUP3	Coniferous Plantation	Various areas of even-aged conifer plantation scattered throughout western portion of the study area. Canopy: Pure or mixed areas of Red Pine (*Pinus resinosa*), White Pine (*Pinus strobus*), Scot's Pine (*Pinus sylvestris*) and to lesser extents Jack Pine (*Pinus banksiana)* Understorey: Sparse with White Ash, Black Cherry and Choke Cherry Groundcover: Eastern Bracken Fern (*Pteridium aquilinum*), (Wild Strawberry, Common Yarrow (Achillea millefolium) and Poison-ivy

4.2.2 Vascular Flora

In total, 164 plant species were inventoried within the study area. A complete list of these species is appended to this report (Appendix VIII).

One plant SAR, Black Ash (*Fraxinus nigra*), was inventoried within the study area. Two individuals were located within the Fresh-Moist Poplar Deciduous Forest (FOD8-1) community near the edge of the Mineral Thicket Swamp (SWT2). Black Ash is designated as Endangered in Ontario (MECP 2026); therefore, individual trees and their habitat are protected under the ESA. No plant SCC were inventoried within the study area.

Six inventoried species are considered rare in Bruce County outside of the peninsula (OSFN 2010) (Map 4a):

- Narrow-leaved Glade Fern (*Homalosorus pycnocarpos*); with fewer than five individuals on hummocks in the Dry-Fresh Sugar Maple-Beech Deciduous forest (FOD5-2) along the Saugeen River Tributary at the far north end of the study area
- Blue-stemmed Goldenrod (*Solidago caesia*); occasional throughout the FOD5-2 and the Fresh-Moist Sugar Maple-Yellow Birch Deciduous Forest (FOD6-3)
- Early Goldenrod (*Solidago juncea*); very common within the Mineral Cultural Meadow (CUM1) (#2) and within canopy breaks
- Black Raspberry (*Rubus occidentalis*); although this species is listed as regionally significant it is potentially under-reported; relatively common within the study area. As

per Johnson (2016) The Vascular Plants of the Bruce Peninsula, Ontario – this species is “common overall due to its prevalence to the south”. This species is not included on Map 4a.

- Downy Serviceberry (*Amelanchier arborea*); rare occurrences within the FOD5-2, Coniferous Plantation (CUP3), FOD8-1 and Dry-Fresh White Birch Deciduous Forest (FOD3-2) communities.
- White Bear Sedge (*Carex albursina*); small, localized occurrence along a trailside near the boundary between FOD5-2 and FOD6-3.

In addition to the inventoried plant species considered rare in Bruce County (OSFN 2010), the observation of Whorled Milkweed (*Asclepias verticillata*) is notable in that it represents a probable new county record. Approximately 10 sterile stems were documented within the FOD8-1/CUP3 community in a canopy opening with exposed sandy substrates (located at UTM coordinates 17T 473217 4925900). Whorled Milkweed has not been documented within Bruce County according to the OSFN 2010 list, nor in The Vascular Plants of the Bruce Peninsula (Johnson 2016), which is the most recently accepted peer-reviewed resource for vascular plants in Bruce County, Ontario. Additionally, according to the submitted iNaturalist observations for this species (iNaturalist 2022), the closest known occurrences are near London (Middlesex County), and near Stoney Creek (City of Hamilton), both of which are approximately 200km south of the study area. According to Michigan Flora Online (2022), Whorled Milkweed is very recently becoming abundant along major highways, and increased northern records suggest relatively recent movement northwards. Observation of Whorled Milkweed within the study area is considered naturally occurring and not associated with population expansion along roadways. It is also considered to be disjunct within the county, and likely occurs elsewhere within the county but currently undocumented. For the reasons described above, the observation of Whorled Milkweed should be considered locally rare, and its disjunct presence within the county is uniquely notable.

The coefficient of conservatism (CC) is a value ranging from 0 (low) to 10 (high), which is based on a species’ tolerance of disturbance and fidelity to a specific habitat integrity (Oldham et al. 1995). Higher values are assigned to species that have specific environmental growing requirements and are less tolerant of disturbance. Overall, the inventoried plant species in the study area have an average CC value of 3.3, which is moderately low but includes species within culturally influenced and disturbed features associated with the operational landfill lands.

However, several high CC-value plant species were inventoried. These include Narrow-leaved Glade Fern and Drooping Sedge (*Carex prasina*) (CC values of 10), which have very specific habitat requirements and are therefore not widely distributed on the landscape. These species were found within the Red Maple Mineral Deciduous Swamp (SWD3-1) community at the east edge of the study area and are associated with seepage areas. Altogether, 15 species (representing 9% of the total number inventoried) had relatively high CC values of ≥7. Twenty percent (20%) of the inventoried species are non-native in Ontario.

For several of the plant species inventoried within the study area, the specific ELC community in which those species were inventoried was not recorded. However, based on the inventory data where the associated ELC community was recorded, some generalized conclusions can be drawn, albeit limited due to the number of species inventoried per community. Of the communities that had at least 10 species attributed to them, the highest average CC values were recorded in the FOD5-2 (4.33) and SWD3-1 (3.90) communities located in the northeast end of the study area. The FOD8-1 community type (subsequently to be complexed with CUP3 as shown on Map 2) had an average CC value of 3.55, followed by the CUP3 community (subsequently complexed with FOD8-1) (3.05) and the FOD3-2 forest community (2.57).

Of the 164 plant species that were inventoried within the study area, a relatively large proportion of them (85, comprising 52% of the total) represent species that are of cultural significance to SON. These include species that are significant for ceremonial, food, medicinal, products or other purposes (SON 2026). The majority of these species were inventoried within the FOD8-1 and CUP3 communities. SON-culturally significant species are identified in the plant species list (Appendix II).

4.3 Wildlife

4.3.1 Birds

In total, 106 bird species are reported from within 10km of the study area based on the OBBA (BSC et al. 2008). Sixty-six (66) bird species were documented within the study area during site investigations. Of these, 54 species were observed with some level of breeding evidence within the study area. Refer to Appendix IX for a list of bird species recorded within in the study area.

One bird SAR, Bank Swallow, was observed within the study area. Bank Swallow was confirmed to be breeding within the study area based on observation of a nesting colony along the south bluff of the Saugeen River, corresponding to the northeast study area boundary

corner. Multiple individuals were observed to be entering and exiting nests along the bluff and foraging over the river. No individuals were observed foraging over the study area lands.

Two bird SCC were recorded within the study area: Wood Thrush and Eastern Wood-Pewee. Eastern Wood-Pewee was recorded during multiple site visits during the bird breeding season, including during each of the breeding bird surveys. This species therefore exhibited evidence of probable breeding within the study area due to evidence of territoriality. Multiple singing male Eastern Wood-Pewees were recorded at various locations across these dates, including within the southwest, central, and northeast ends of the study area woodland features. A singing male was also heard within woodland to the immediate north of the study area.

Wood Thrush was not recorded during either of the breeding bird surveys. However, a singing male was incidentally recorded during other surveys undertaken during the bird breeding season, on June 23 and 28. Among these two dates, an individual was heard calling within the northwest end and in the south-central portion of the study area woodland features. Since these two dates were not at least 10 days apart, they cannot be considered separate observations as needed to represent evidence of a probable breeding territory (Birds Canada 2021). Therefore, Wood Thrush was recorded with evidence of “possible” breeding within the study area. The Wood Thrush individual(s) that were recorded within the study area may have been visiting the site but not actively breeding.

No Eastern Whip-poor-wills or Common Nighthawks were recorded during the nocturnal bird survey. However, supplementary crepuscular bird surveys are planned to be completed during 2026 to further refine and reinforce conclusions about Eastern Whip-poor-will or Common Nighthawk occurrence within the study area. Pending those additional future studies, Eastern Whip-poor-will and Common Nighthawk are considered absent within the study area for the purposes of this NEA. The results of the 2026 supplementary crepuscular bird surveys, including a re-assessment of Eastern Whip-poor-will and Common Nighthawk habitat presence within the study area, will be included in a planned update to the NEA report.

Other bird species recorded within the study area represented a mix of species including those associated with the landfill site and tolerant of ecologically disturbed conditions (e.g., Rock Pigeon (*Columba livia*), Red-winged Blackbird (*Agelaius phoeniceus*), and European Starling (*Sturnus vulgaris*)), woodland generalists and species commonly found near woodland edges and clearings (e.g., Northern Flicker (*Colaptes auratus*), Indigo Bunting (*Passerina cyanea*)),

and Great Crested Flycatcher (*Myiarchus crinitus*)), as well as less common species that are adapted to deciduous and mixed forest communities provided by the site (e.g., Broad-winged Hawk (*Buteo platypterus*), Northern Saw-whet Owl (*Aegolius acadicus*)). Blue-headed Vireo (*Vireo solitarius*) and Ovenbird (*Seiurus aurocapilla*) require large tracts of contiguous forest.

4.3.2 Herpetofauna

According to the Ontario Amphibian and Reptile Atlas (Ontario Nature 2019), 22 species of herpetofauna are reported from within 10km of the study area. Nine species, comprising five amphibian species and for reptile species, were recorded within the study area. No SAR or SCC herpetofauna species were observed. A complete list of herpetofauna species reported from the study area and vicinity is provided in Appendix X.

Anuran Call Surveys

Five anuran species were recorded during the anuran call surveys: American Toad (*Anaxyrus americanus*), Gray Treefrog (*Hyla versicolor*), Spring Peeper (*Pseudacris crucifer*), Green Frog (*Lithobates clamitans*), and Northern Leopard Frog (*Lithobates pipiens*). During the April 27, 2021 survey, Spring Peeper was recorded calling at full chorus (Code 3) at all survey stations except ANR-005, where only two individual Spring Peepers were recorded. American Toad and Gray Treefrog were recorded up to a maximum of Code 2 across surveys. Green Frog was only recorded at Calling Code 1. Northern Leopard Frog was not recorded calling during the surveys, but an individual was incidentally observed during the April survey at ANR-004.

Station ANR-002 was recorded with the most species (four), while ANR-003 was recorded with three species, and all other stations were recorded with two species. The abundance of calling anurans declined across surveys; no species was recorded at Calling Code 3 during the May or June surveys

Due to the relatively brief window of calling activity by certain early-breeding anuran species (i.e., Wood Frog (*Lithobates sylvaticus*) and Western Chorus Frog (*Pseudacris triseriata*)), coupled with the late April date of the first anuran survey as a result of spring 2021 weather/temperature conditions, it is recognized that early breeding species calling activity may have been missed. A supplementary anuran call survey will therefore be completed and timed to occur earlier during April 2026 in order to capture any additional calling activity by these early breeding species. The results of the 2026 supplementary anuran survey will be included in a planned update to the NEA report. The 2026 survey results will be integrated with the 2021

anuran survey results to present an updated assessment of anuran breeding activity within the study area, and to identify any areas of habitat significance.

Snake Surveys

Four snake species were observed within the study area. The majority of observed snakes were Eastern Gartersnakes (*Thamnophis sirtalis sirtalis*), followed in abundance by Red-bellied Snakes (*Storeria occipitomaculata*), DeKay's Brownsnakes (*Storeria dekayi*), and a single observed Milksnake (*Lampropeltis triangulum*). No SAR Massasaugas were observed within the study area.

Snakes were observed widely across the study area where suitable habitats exist (i.e., open, sun-exposed meadows and forest clearings). The majority of observations were at snake coverboards. Among the coverboards, the highest snake abundances and frequency of snake observations were at SNK-001 (Map 2). Up to nine Eastern Gartersnakes were observed using this board at one time, and snakes were observed using this board each time it was checked across site visits. Other coverboards with relatively high snake abundances and frequencies of occurrence included SNK-007 and SNK-011. By contrast, no snakes were observed under SNK-012 at any point, and only one snake was observed under each of SNK-004 and SNK-010 across surveys (an Eastern Gartersnake and DeKay's Brownsnake, respectively). Coverboard SNK-005 went missing part-way into the field season.

Eastern Gartersnakes and a single DeKay's Brownsnake were also observed during the course of visual encounter surveys of suitable habitat completed in 2021. These observations occurred within each of the CUM/CUM1 meadows, with the exception of the CUM1 (#1) meadow at the southwest study area corner, while the DeKay's Brownsnake was observed along a woodland trail near a meadow boundary.

Eastern Gartersnakes were observed at several locations during the supplementary 2023 snake visual encounter surveys within the western portion of the study area. Due to the timing of these surveys, it can be inferred that the Eastern Gartersnake observations were in close proximity to their overwintering hibernacula. One snake was observed escaping underground into what was likely its hibernaculum. Only one snake was observed at a given location in most cases; however, one location contained a group of four snakes. See Map 4b for the locations of 2023 Eastern Gartersnake observations that represent areas of likely snake hibernaculum

occurrence. See Section 5.5 for further discussion about the significance of these overwintering hibernacula.

4.3.3 Mammals

According to the Mammal Atlas of Ontario (Dobbyn 1994), 30 mammal species are reported from within 10km of the study area. A total of 16 mammal species were documented within the study area. Of these, 10 species were recorded through direct observation or observation of physical evidence (e.g., tracks). The remaining six species were bat species that were detected through completion of the bat acoustic study (see below).

Five mammal SAR were recorded within the study area: Little Brown Myotis, Tri-colored Bat, Eastern Red Bat, Hoary Bat, and Silver-haired Bat. Little Brown Myotis and Tri-colored Bat are provincially and federally Endangered (MECP 2026, Government of Canada 2025). Eastern Red Bat, Hoary Bat, and Silver-haired Bat are also listed as Endangered provincially, and receive general habitat protection under the ESA (MECP 2026). See below for further discussion about these observations.

Black Bear (*Ursus americanus*) tracks were observed within the forested portion of the study area. Although Black Bear is not considered a SAR in Ontario or Canada, the Black Bear population that is resident to the Bruce Peninsula is likely isolated from other Black Bear populations (Dobbyn 1994, Obbard et al. 2010). This isolation, coupled with historical and ongoing stressors associated with habitat loss and other human influences (SON 2026), makes this population more vulnerable to negative effects caused by land use change.

All other species have provincially secure populations (S5; MNRF 2021). A complete list of mammals reported from the study area and vicinity is included in Appendix XI.

Bat Acoustic Survey

Six bat species were documented as present during passive acoustic monitoring conducted within the study area. Other species groupings, which could not be discerned to species-level based on their call sequences, were recorded as listed below.

Table 3. Bat species and species grouping classification results (all stations)

Bat Species/Species Grouping	Proportion of Call Sequences
Big Brown Bat	25.8%
40kHz	24.4%
Low Frequency	22.9%
Little Brown Myotis	15.3%
Silver-haired Bat	5.2%
Myotis spp.	2.7%
Eastern Red Bat	1.9%
Hoary Bat	1.5%
Tri-colored Bat	0.3%
30kHz	0.1%

Consistent with these findings, the site-level MLE values (across all monitoring stations throughout the entire monitoring period) for each species suggest that there is strong evidence for the presence of Big Brown Bat (MLE=0), Hoary Bat (MLE=0), Silver-haired Bat (MLE=0), Eastern Red Bat (MLE=0) and Little Brown Myotis (MLE=0) within the study area. The data suggests that there is slightly weaker evidence for the presence of Tri-colored Bat (MLE=0.2). The 40kHz species grouping includes the *Myotis* species, Tri-colored Bat and Eastern Red Bat. All Myotis species which occur in Ontario, as well as the Tri-colored Bat and Eastern Red Bat, are listed as SAR. The Low Frequency and 30kHz species groupings, however, both include the non-SAR Big Brown Bat, and should therefore not independently be considered probable evidence of the presence of SAR.

Bat pass sequences were recorded on all monitoring nights. Bat activity peaked on the evening of July 1, 2021, when the highest number of bat pass sequences was recorded (4,362). See the Bat Acoustic Monitoring Results Report (Appendix VII) for a more detailed breakdown of the proportion of bat pass sequences recorded among species/species groupings across the survey period.

Acoustic monitoring station BAT-022 had the highest total number of bat pass sequences recorded with 2,359 records, while station BAT-025 had the lowest, with a total of 55 recorded bat pass sequences (Map 3a). See Appendix VII for a more detailed breakdown of the proportion of bat pass sequences recorded among species/species groupings among monitoring stations.

The timing of bat pass sequence recordings can provide information on how bats are using available habitats within the study area. Bat pass sequences recorded early in the evening can indicate the presence of roosting and maternity colony habitat. Sequences recorded later in the evening can indicate the presence of foraging habitat and movement or travel corridors (i.e., flyways). Across all monitoring stations throughout the entire monitoring period, overall bat activity was highest during the 22:00 monitoring hour, and gradually declined throughout the evening. Sunset was at approximately 21:13hrs during the monitoring period. For high frequency SAR bats and potential high frequency SAR bats specifically, activity increased from the 21:00 to 22:00 monitoring hour and remained relatively consistent until activity decreased in the 02:00 monitoring hour. For low frequency SAR bats, and potential low frequency SAR bats, activity increased from the 21:00 to 22:00 monitoring hour, and gradually declined throughout the remainder of the evening.

See Appendix VII for additional details about the bat acoustic monitoring results, including results broken down by individual ELC vegetation communities across the study area.

Bat Habitat Assessment

Candidate bat roost trees for Little Brown Myotis and Northern Myotis, as well as candidate foliage bat roost trees for Tri-colored Bat, were identified within three of five treed vegetation communities assessed for the presence of potential bat habitat within the study area (FOD8-1/CUP3, CUP3 and SWD4; Map 3b). A total of 75 candidate Little Brown Myotis and Northern Myotis roost trees and 71 candidate Tri-colored Bat roost trees were documented. Details of candidate bat roost trees are provided in Appendix XII. A summary of the plot-based and area search survey results is provided in Tables 4 and 5 below.

Roost tree density can be an indicator of the quality of potential maternity colony roost habitat in a treed feature (MECP 2022a). Roost tree densities calculated to be ≥10 roost trees/ha are considered to represent high-quality potential maternity colony roost habitat (MECP 2022b). This density assessment considers trees that are >10cm DBH. Roost tree densities for Little Brown Myotis and Northern Myotis were determined to be ≥10 roost trees/ha in two of the five treed vegetation communities: FOD8-1/CUP3 and SWD4 (Tables 4 and 5). One vegetation community, CUP3, was identified as having a roost tree density for Tri-colored Bat that was ≥10 roost trees/ha (Table 5).

At the time of the completion of the bat habitat assessment, only four bat species were listed as SAR, including Little Brown Myotis, Northern Myotis, Eastern Small-footed Myotis, and Tri-colored Bat. Three additional bat species were listed as SAR under the ESA in January 2025, comprising Hoary Bat, Silver-haired Bat, and Eastern Red Bat. Roosting preferences of Silver-haired Bat are similar to those of Little Brown Myotis and Northern Myotis, with observations of the species using roost sites located under loose bark and in cavities of large diameter coniferous and deciduous trees (COSEWIC 2023). The results of the bat habitat assessment, specific to Little Brown Myotis and Northern Myotis, can therefore also apply to Silver-haired Bat.

Table 4. Summary of Bat Habitat Assessment Plot Inventory Results by Vegetation Community

Vegetation Community	Plot Number	Plot Location (UTM Coordinates) Zone: 17T		No. Candidate Little Brown Myotis/Northern Myotis/Silver-haired Bat Roost Trees	No. Candidate Tri-colored Bat Roost Trees
		Easting	Northing		
FOD8-1/CUP3	BHA-001	473362	4926288	1	0
	BHA-002	473541	4926178	0	0
	BHA-003	473528	4926120	1	0
	BHA-004	473501	4926061	0	1
	BHA-005	473403	4926130	1	0
	BHA-006	473245	4926099	3	0
	BHA-007	473366	4926009	2	0
	BHA-008	473493	4925966	0	0
	BHA-009	473249	4926005	0	0
	BHA-010	473181	4925942	0	0
	BHA-011	473316	4925897	5	0
	BHA-012	473394	4925924	0	0
	BHA-013	473353	4925813	0	0
	BHA-014	473463	4925776	0	0
	BHA-015	473429	4925758	0	0
	BHA-016	473116	4925873	2	0
	BHA-017	473046	4925729	0	0
	BHA-018	472959	4925537	1	4
	BHA-019	473185	4925770	0	0
	BHA-020	473288	4925730	0	0
	BHA-021	473211	4925678	0	0
	BHA-022	473124	4925680	1	0
	BHA-023	473191	4925578	0	0
	BHA-024	473161	4925566	0	0
	BHA-025	473158	4925498	1	0
Roost Tree Density (No. Candidate Roost Trees/ha)				**14.4**	**4.0**

Table 5. Summary of Bat Habitat Assessment Area Search Results by Vegetation Community

Vegetation Community or Area Searched	Area (ha)	Little Brown Myotis, Northern Myotis, and Silver-haired Bat		Tri-colored Bat	
		No. Candidate Roost Trees	Roost Tree Density (No. Candidate Roost Trees/ha)	No. Candidate Roost Trees	Roost Tree Density (No. Candidate Roost Trees/ha)
Coniferous Plantation (CUP3)	0.50	2	4	12	24
Mineral Deciduous Swamp Ecosite (SWD4)	0.10	1	10	0	0
Dry-Fresh White Birch Deciduous Forest Type (FOD3-2)	0.33	0	0	0	0

With regards to Eastern Red Bat and Hoary Bat, these two species are known to roost in the foliage of trees, including in the upper foliage of typically large-diameter, supercanopy trees in deciduous and coniferous forests of any age (COSWIC 2023). Eastern Red Bat and Hoary Bat typically roost alone. During the maternity period, females will roost alone with their pups, and tend to switch roosts frequently. Due to the general lack of knowledge of their roosting preferences, and variability in observed roost sites, all treed communities within the study area may provide suitable roosting habitat, including for maternity roosting, for both Eastern Red Bat and Hoary Bat.

Badger Habitat Assessment and Genetic Testing

Six mammal burrows were identified as potential badger burrows during surveys completed on April 12 and 27, 2023. The majority of these were located interior to the FOD8-1/CUP3 forest-plantation complex, but along the edges of small clearings within that feature. Two burrows were located along the edges of the FOD8-1/CUP3 feature where it borders the CUM1 (#2) meadow. These burrows occurred in relatively sandy soil and were wider than they were high, suggesting a possible “D-shape”. None had tracks nearby them, and only one had residual hairs visible at the burrow opening. The hairs collected at that burrow could not be definitively distinguished through visual observation as belonging to badgers. The hairs, which were observed as two distinct groupings at the burrow entrance, were collected and stored in two sample bags.

To further evaluate whether the collected hairs belonged to American Badger, the two bagged mammal hair samples were submitted for laboratory genetic analysis (Trent University, Natural

Resources DNA Profiling & Forensic Centre, Peterborough, Ontario). NRSI received the findings of the laboratory genetic testing on August 23, 2023. The results indicated that one of the samples, which comprised >100 hairs, belonged to White-tailed Deer (*Odocoileus virginianus*), while the second sampled contained human hairs (NRDPFC 2023).

During the follow-up visit completed on May 17, all but one of the six identified burrows was determined to be old/inactive due to a lack of observed tracks around the entrance and because the entrances were partially covered by branches and other woody debris. The den that appeared to be actively used was determined to more likely belong to a Red Fox (*Vulpes vulpes*) based on its appearance. No hairs could be found around any of the burrows. No potential badger tracks were observed, although Coyote (*Canis latrans*) tracks were observed in the vicinity of certain burrows. Based on these results, including the results of the genetic analysis, no evidence of American Badger use was identified within the study area.

4.3.4 Insects

According to the Ontario Butterfly Atlas (McNaughton et al. 2020), 38 butterfly species are known to occur within 10km of the study area. Eighteen (18) butterfly species were documented during site investigations. Of these, one butterfly SCC, Monarch, was observed. Monarch is listed as a species of Special Concern both provincially and federally (MECP 2026, Government of Canada 2025). The remainder of the observed species are common with secure populations in Ontario (MNRF 2021). A complete list of butterfly species reported from the study area vicinity is provided in Appendix XIII.

According to the Ontario Odonate Atlas (MNRF 2020b), 23 odonate (dragonfly and damselfly) species are recorded within 10km of the study area. Four odonate species were recorded during field surveys. All recorded species are common with secure populations in Ontario (MECP 2026, Government of Canada 2025). A complete list of odonate species reported from the study area vicinity is provided in Appendix XIV.

4.4 Aquatic Features

4.4.1 Saugeen River

The Saugeen River is a large, perennial watercourse that originates east of the study area and flows generally west, with a meander present along the northeastern boundary of the study area. Specific characteristics were not measured within the Saugeen River due to access limitations, however the river is known to provide year-round fish habitat for a variety of species.

4.4.2 Saugeen River Tributary

A tributary to the Saugeen River originates northwest of the landfill area within the central study area and receives run-off from the adjacent agricultural field and forest. A series of swamp complexes remain loosely interconnected, conveying flow to the north towards the Saugeen River. The overall channel is poorly defined, with no evidence of erosion or substrate sorting. Rather, the poorly defined channel is visible only due to variation in abundance of rooted vegetation. The feature is linear, showing evidence that portions may have been historically channelized from previous agricultural practices prior to woodland regeneration. Within the identifiable channel, rooted terrestrial plants are much less abundant than the surrounding forest floor, signifying periods of seasonal inundation.

Within the swamp complex, the topography within the upper reaches is undulating, and provides disorganized drainage patterns that causes water to pool within depressions. As such, the feature lacks any defined channel and likely only conveys seasonal flows or heavy rainfall events. At the time of the assessment, the feature contained little to no standing water and was characterized by saturated soils within the delineated wetlands.

Substrates throughout the feature were consistent, characterized predominantly by heavy organics and silt which overlay sand. The feature contained rooted terrestrial vegetation within the poorly defined channel, primarily herbaceous plants and deciduous trees and shrubs. The trees and shrubs offer good canopy cover and high (80-90%) shading for the area.

Due to the lack of any standing water, the feature does not provide any direct fish habitat within the subject lands. Similarly, the topography has restricted any defined channel from forming, and is characterized by a series of loosely connected pools, which do not allow fish passage within the study area.

4.4.3 Drainage Feature

A more defined channel exists within a drain originating from the agricultural field to the west and flowing into the series of central swamps (Map 2). During the time of observation, the channel was completely dry, and was approximately 1.2m in width and 0.5m in depth. Various culverts were observed within the drain, and it has likely been historically channelized to drain the agricultural field to the west. The channel originates in an area with evidence of pooling water along the boundary of the agricultural field.

5.0 Natural Environment Significance and Sensitivity

Analysis of the significance of existing natural features was used to identify those features and habitats that are sensitive to disturbance based on the rarity or sensitivity of the feature or the functions/processes that contribute toward their significance. This assessment also considered the policies, legislation, and regulations that apply to the study area natural features which must be considered in the evaluation of the potential landfill expansion areas. The following summarizes significant and sensitive natural features and habitats present within the study area which may represent constraints to site alteration or areas requiring mitigative measures. Policy-based constraints were identified in accordance with the County and Town OPs, and the SVCA regulations and policies as summarized in Section 2.1.3.

5.1 Significant Woodland

The Bruce County OP defines woodland significance based on criteria that vary between municipalities with either less than or greater than 30% forest cover. The total area of forest cover within the Town of Saugeen Shores is not known for the purposes of this study; it is therefore assumed that forest cover represents <30% of the Town's geographic area. The study area woodland, in addition to the northerly off-site extension of this woodland, is >40ha in size. It should therefore be considered a Significant Woodland under County policies.

The southern woodland limits within the study area coincide with the wooded ELC community boundaries against open features and land uses including the southern Mineral Cultural Meadows (CUM1), the Mineral Meadow Marsh (MAM2), and the existing landfill area. The small southern Coniferous Plantation (CUP3), immediately west of the landfill area, represents a narrow projecting feature of anthropogenic origin and is not considered part of the contiguous natural Significant Woodland. See Map 4a for the mapped Significant Woodland area.

Although the woodland shown on Map 4a should be considered significant, the feature is not homogeneous in terms of its ecological characteristics and functions. In general, the woodland area within the eastern half of the study area and north of the active landfill (e.g., comprising the Fresh-Moist Sugar Maple-Yellow Birch Deciduous Forest (FOD6-3) and the easternmost community of Dry-Fresh Sugar Maple-Beech Deciduous Forest (FOD5-2)) is a more mature closed-canopy forest. The relative quality of the woodland also increases further north within the study area relative to the southern, more disturbed areas. Conversely, woodland within the west half of the study area is generally young (<60 years old) early successional forest with some areas dominated by pioneer species such as Trembling Aspen. This area comprises a

mosaic of regenerating woodland and open clearings and meadow areas. It is also intermixed with areas of mid-aged coniferous plantation. Natural recruitment of pine is occurring amongst birch and poplar-dominant deciduous growth. The west woodland area supports certain species that prefer these early successional and more sun exposed conditions, such as those with a preference for woodland edges (e.g., Indigo Bunting (*Passerina cyanea*), and snakes).

The study area woodland represents a significant proportion of a larger tract of forest that extends north of the study area up to the Saugeen River. Altogether this large woodland complex represents a significant area of forest cover on the landscape south of the Saugeen River and provides habitat for area-sensitive and forest-interior bird species. It also provides habitat for Black Bear, of which tracks were observed within the study area. The study area woodland itself supports some interior forest habitat, defined as being >200m from a woodland edge (MNRF 2015).

5.2 Wetlands

Based on the results of fieldwork, wetland area within the study area was found to be much smaller than what is mapped by the MNRF as unevaluated wetland (MNRF 2022), as confirmed by the SVCA. Naturally occurring wetland was confirmed to occur within the central portion of the study area woodland in the form of Mineral Thicket Swamp (SWT2) communities. A portion of these wetlands are generally coincident with the location of the Saugeen River Tributary. As discussed below, within the study area this tributary exists as a topographically low, undefined drainage area that is seasonally wet. The natural wetlands within the study area are anticipated to have resulted from areas of surface water collection within shallow topographic depressional areas over lower-pervious soils. No evidence of groundwater upwelling was found within the central study area wetlands.

The southernmost SWT2 (#1) community and the Mineral Meadow Marsh (MAM2) community are of anthropogenic origin and have resulted from impounded runoff from the landfill lands. The SWT2 wetland was specifically created by the creation of a berm and impounding of water. Placement of a fill pile along the east edge of the yard waste composting area also led to the creation of a wet area within the FOD8-1/CUP3 woodland area. This area was viewed on site by NRSI and SVCA staff and determined to not represent wetland.

The nearest Provincially Significant Wetland (PSW) complex to the study area wetlands is the Sangs Creek Complex over 2km to the northeast across the Saugeen River. Due to the

distance of these wetlands and the lack of hydrological connection between the PSW complex and the study area wetlands, there is no rationale for the study area wetlands to be combined into another PSW complex. The Bruce County OP maintains protection policies for Locally Significant Wetlands (LSW). Although the OP does not define LSW, the wetlands within the study area are considered to be locally significant due to their context within the larger Significant Woodland. However, the anthropogenic SWT2 (#1) and MAM2 wetlands that are located immediately adjacent to the landfill operational area, and which are significantly disturbed, are not included in this LSW designation. See Map 4a for the mapped Locally Significant Wetlands.

5.3 Watercourse and Fish Habitat

During the aquatic habitat assessment, it was determined that an ephemeral watercourse is present within the study area. This feature is mapped as a tributary to the Saugeen River, though lacks any defined channel. The feature receives surface run-off from adjacent agricultural fields in the west via the dug drainage channel and the surrounding forest, comprising an undefined drainage pattern collecting within the poorly connected centrally located swamps. The lack of any clear channel and connectivity indicates there is no fish passage available. Due to the nature of the watercourse and the lack of consistent connectivity and standing water, it does not provide fish habitat within the study area. The feature collects surface run-off from adjacent properties to sequester into the various swamps during high rainfall events and the spring freshet, and therefore is ephemeral in nature.

5.4 Species at Risk Habitat

5.4.1 Bat Species at Risk

Of the six bat species recorded during the bat acoustic monitoring, five species (Little Brown Myotis, Tri-colored Bat, Eastern Red Bat, Silver-haired Bat and Hoary Bat) are considered SAR in Ontario.

Little Brown Myotis

Little Brown Myotis was recorded within all monitored vegetation communities during the monitoring period. The timing of recorded bat pass sequences relative to the time of sunset can be indicative of bat habitat use type within the study area. Since several bat pass sequences attributed to Little Brown Myotis were recorded within one hour after sunset in all monitored vegetation communities, the results suggest the presence of roosting habitat (i.e., male/day roosting and/or maternity colony roosting).

The consistency of recorded bat pass sequences throughout a monitoring period can further suggest whether the habitat is being used for maternity colony roosting or male/day roosting. It can be expected to detect bat pass sequences within one hour after sunset on close to all monitored evenings with suitable weather conditions within the vicinity of a maternity colony roost. The number of evenings during which bat pass sequences classified to Little Brown Myotis were recorded within one hour after sunset ranged from one to nine of the 10 analyzed evenings in each of the monitored vegetation communities. Within those communities with a high number of evenings during which the species was detected within one hour after sunset, the data suggests the potential for Little Brown Myotis to be using these vegetation communities, or if detected within an open habitat (e.g., meadow), the adjacent treed vegetation communities, for maternity colony roosting. Where there is a lack of consistent recordings within one hour after sunset throughout the monitoring period, the data suggests the potential for this species to be using these communities for male/day roosting.

Given the relatively large maternity colonies that Little Brown Myotis is known to form, habitat use type can be further inferred by the abundance of recorded call sequences at a given location, which can suggest relative proximity of the monitoring location to the habitat feature/area. For example, relatively high numbers of bat pass sequences (≥10) attributed to Little Brown Myotis within one hour of sunset were recorded at approximately half of the monitoring stations (see Appendix VII, Table 3). These results suggest the potential presence of a maternity colony roost in the general vicinity of these monitoring stations. Conversely, a relatively low number of Little Brown Myotis call sequences recorded within one hour of sunset at the remainder of the monitoring stations suggests the lack of maternity roosts in those immediate vicinities, but the potential presence of male/day roost sites in the vicinity of those stations.

It is important to note that the number of recordings does not directly relate to the number of individuals, but simply, the degree of activity documented within the vicinity of the monitoring station. In addition, bats are capable of moving large distances quite quickly upon emergence. The bat pass sequences recorded during the suggested emergence period may therefore represent individuals roosting near the study area, not within, and instead using the treed features for foraging and/or as a flyway for movement between key habitat features shortly after emerging from the roost. A bat habitat assessment was therefore completed within select vegetation communities to inform the potential presence of candidate roosting habitat. The results of the bat habitat assessment do suggest the presence of candidate roost habitat for the

species within the vegetation communities FOD8-1/CUP3, CUP3 and SWD4 (Map 3b), and support the potential for the species to use these communities as roosting habitat.

The acoustic results further support the potential for this species to be using open, meadow communities and wetlands, including Mineral Swamp Thicket (SWT2) communities, for foraging, as well as forest edge habitats and the existing trail system as flyways to move between habitat features. See Appendix VII for additional discussion about Little Brown Myotis habitat as interpreted from the acoustic monitoring results.

Tri-colored Bat

Tri-colored Bat was detected in all monitored vegetation communities except the Dry-Fresh Sugar Maple-Beech Deciduous Forest (FOD5-2) (#1) community. Multiple bat pass sequences classified as Tri-colored Bat were recorded within one hour after sunset in the following vegetation communities: CUM1 (#3), CUM1 (#2), Cultural Meadow (CUM), and both the north and south portions of the Fresh-Moist Poplar Deciduous Forest/Coniferous Plantation complex (FOD8-1/CUP3). The number of evenings during which bat pass sequences classified to Tri-colored Bat were recorded within one hour after sunset ranged from one to three of the 10 monitored evenings in each of these vegetation communities. Due to the lack of consistent recordings throughout the monitoring period, as well as the timing and relatively low number of recorded bat pass sequences, the data suggests the potential that this species is using habitats within these treed communities, or treed communities that are immediately adjacent to the monitored meadow communities, as roosting habitat for male/day roosting, but does not indicate maternity colony roosting.

To inform the impact analysis, a bat habitat assessment was completed within select vegetation communities to characterize potential candidate roosting habitat for the species. The results of the bat habitat assessment do suggest the presence of candidate roost habitat for the species within the vegetation communities FOD8-1/CUP3 and CUP3 (Map 3b), and support the potential for the species to use these communities as roosting habitat. Although a bat habitat assessment was not completed within the FOD5-2 or Fresh-Moist Sugar Maple-Yellow Birch Deciduous Forest (FOD6-3) communities, occurrence of roosting habitat is likely also present, and potentially at a higher density, within these two maple-dominated communities given Tri-colored Bat roosting habitat is most often associated with dead/dying leaf clusters in oak and maple trees.

Note, due to the general lack of information available on the timing of emergence for Tri-colored Bat from roosting habitats, bat pass sequences recorded within one hour of sunset are considered as a potential indication of roosting habitat based on the results of Little Brown Myotis studies (Fidiam and Ludica 2011).

Silver-haired Bat

Silver-haired Bat was detected in all monitored vegetation communities during the monitoring period, and several bat pass sequences classified to the species were recorded within one hour after sunset in all monitored treed vegetation communities. The number of evenings during which bat pass sequences classified to the species were recorded within one hour after sunset ranged from one to nine of the 10 monitored evenings in each of these vegetation communities. Within those communities with a high number of evenings during which the species was detected within one hour after sunset, the data suggests the potential for Silver-haired Bat to be using these vegetation communities, or if detected within an open habitat (e.g., meadow), the adjacent treed vegetation communities, for maternity colony roosting. Where there is a lack of consistent recordings within one hour after sunset throughout the monitoring period, the data suggests the potential for this species to be using these communities for male/day roosting. Note, due to the general lack of information available on the timing of emergence for this species from roosting habitats, bat pass sequences recorded within one hour of sunset are considered a potential indication of roosting habitat based on the results of Little Brown Myotis studies (e.g., Fidiam and Ludica 2011).

This species is also likely using open meadow communities, wetlands, and forest edge habitats for foraging, as well as the existing trail system as travel corridors/flyways between habitat features.

Eastern Red Bat

Eastern Red Bat was detected in all monitored vegetation communities during the monitoring period, with the exception of the SWT2 and FOD5-2 (#1) communities. A small number of bat pass sequences classified as Eastern Red Bat were recorded within one hour after sunset in all vegetation communities within which the species was detected. The number of evenings during which bat pass sequences classified to Eastern Red Bat were recorded within one hour after sunset ranged from zero to five of the 10 monitored evenings in each of these vegetation communities. Due to the lack of consistent recordings throughout the monitoring period, as well as the timing and relatively low number of recorded bat pass sequences, the data suggests the

potential that this species is using habitats within these treed communities, or treed communities that are immediately adjacent to the monitored meadow communities, as roosting habitat for male/day roosting, but does not indicate maternity colony roosting. Note, due to the general lack of information available on the timing of emergence for this species from roosting habitats, bat pass sequences recorded within one hour of sunset are considered a potential indication of roosting habitat based on the results of Little Brown Myotis studies (e.g., Fidiam and Ludica 2011).

This species is also likely using open meadow communities, wetlands, and forest edge habitats for foraging, as well as the existing trail system as travel corridors/flyways between habitat features.

Hoary Bat

Hoary Bat was detected in all monitored vegetation communities during the monitoring period, with the exception of the SWT2 community. A small number of bat pass sequences classified as Hoary Bat were recorded within one hour after sunset in all vegetation communities within which the species was detected. The number of evenings during which bat pass sequences classified to Hoary Bat were recorded within one hour after sunset ranged from zero to five of the 10 monitored evenings in each of these vegetation communities. Due to the lack of consistent recordings throughout the monitoring period, as well as the timing and relatively low number of recorded bat pass sequences, the data suggests the potential that this species is using habitats within these treed communities, or treed communities that are immediately adjacent to the monitored meadow communities, as roosting habitat for male/day roosting, but does not indicate maternity colony roosting. Note, due to the general lack of information available on the timing of emergence for this species, bat pass sequences recorded within one hour of sunset are considered a potential indication of roosting habitat based on the results of Little Brown Myotis studies (e.g., Fidiam and Ludica 2011).

This species is also likely using open meadow communities, wetlands, and forest edge habitats for foraging, as well as the existing trail system as travel corridors/flyways between habitat features.

Summary of Species at Risk Bat Habitat Presence

The results of passive acoustic monitoring indicate that all monitored treed communities within the study area have the potential to provide roosting habitat for Little Brown Myotis, Tri-colored

Bat, Silver-haired Bat, Eastern Red Bat, and Hoary Bat. Bat maternity colony habitat may be widespread throughout the study area wooded features. However, based on the acoustic survey results, occurrence of a maternity colony is less likely in close vicinity to monitoring stations BAT-001, -003, -013, -014, -016, -017, and -025. The above monitoring stations are generally located within the CUM meadow, central/north portions of the FOD8-1/CUP3 complex, and along the south edge of FOD5-2 (#1). Conversely, monitoring stations for which the data suggested higher probability of nearby maternity roost habitat were generally located within the west/central and north portions of the FOD8-1/CUP3 complex, and woodland edges adjacent to CUM, CUM1 (#3), and CUM1 (#2) (see Map 3a). The relative proximity of some monitoring stations with high abundances of bat pass sequences to those with lower abundances is likely indicative of the importance of localized and microhabitat features in providing good quality maternity roost, foraging or flyway habitat conditions (e.g., small forest clearings, trees with high quality roosting features). Day/male roosting habitat is likely present throughout the study area treed features. However, day/male roosting habitat is a less sensitive form of bat habitat than maternity colony habitat as males tend to roost individually and do not generally return to the same roosts on consecutive nights. Note, due to the lack of acoustic monitoring stations within the northeast treed vegetation communities (i.e., FOD8-1, FOD6-3, and FOD5-2 (#1)), it is possible that all detected SAR within the study area may be using these treed vegetation communities for maternity colony roosting.

All open meadow communities and wetland communities, including SWT2 communities, provide foraging habitat for bat SAR. The trail network and forest edges within the study area also have the potential to provide flyways for bat SAR.

Under the ESA, habitat for animal species is defined as a dwelling place, such as a den, nest, or similar place, occupied or habitually occupied by one or more members of a species for the purposes of breeding, rearing, staging, wintering, or hibernating, and the area immediately surrounding a dwelling place that is essential for the purposes mentioned. For bat SAR, this includes hibernating/overwintering, swarming, maternity roosting, and migratory stopover habitats. Foraging and flyway habitats are not protected under the ESA, with the exception of those that are associated with the types of habitats that are afforded protection under the ESA (e.g., maternity roosting habitat). No hibernating or swarming habitat for Little Brown Myotis or Tri-colored Bat (e.g., cave, crevice, mine, tunnel, etc.) is present in the subject property, and no migratory stopover or overwintering habitat for Eastern Red Bat, Hoary Bat or Silver-haired Bat is present. Based on the results of the current study, maternity roosting habitats for Little Brown

Myotis and Silver-haired Bat likely occur within the study area, and maternity roosting habitats for Tri-colored Bat, Eastern Red Bat, and Hoary Bat may also occur in the study area. Natural maternity roost sites (e.g., tree) occupied for breeding and rearing pups, and the area up to 1000m with suitable habitat, including foraging and flyway habitats, is protected under the ESA (Map 4b).

The ESA prohibits killing, harming, or capturing SAR and protects their habitats from damage and destruction. A permit or authorization under the ESA may be required for proposed developments or site alterations with the potential to result in negative impacts to SAR and their habitats. Note that with the passing of the provincial *Protect Ontario by Unleashing our Economy Act* in 2025, amendments were made to the ESA that include its planned revocation and replacement with the new *Species Conservation Act,* 2025. Permitting requirements with respect to SAR bats may differ under the *Species Conservation Act* relative to the current ESA.

5.4.2 Massasauga

No Massasaugas were observed during the course of five comprehensive visual encounter surveys of suitable snake habitat, in addition to regular checks of the snake coverboards. Based on the standard MNRF survey protocols for SAR snakes, Massasauga surveys should comprise 10 surveys that are split between two years. This is recommended due to the cryptic nature of the species and because Massasaugas reproduce on a biennial basis and a specific gestation site may not be used every year (MNRF 2016). However, based on the results of the 2021 surveys in which no individuals were observed, in addition to the location of the 2013 species record that triggered the need for the survey (located well away from the study area along the Lake Huron shoreline), it was agreed between NRSI and the MECP that there was a low likelihood of Massasauga occurrence within the study area. MECP confirmed that the final five surveys would not be required to rule out presence of Massasauga within the study area (L. McShane, MECP, pers. comm., April 2022).

5.4.3 Bank Swallow

An active Bank Swallow nesting colony was observed on the southern bluff adjacent to the Saugeen River, coincident with the northeastern corner study area boundary (Map 4b). The bluff nesting colony therefore represents habitat for the species that is protected under the ESA. Bank Swallows were also seen actively foraging over the adjacent Saugeen River, which likely provides abundant insect prey and represents good foraging habitat. By contrast, the forested lands of the study area adjacent to the bluff do not provide good quality foraging habitat. No

Bank Swallows were observed foraging over study area lands. Furthermore, based on amendments to the ESA that changed how SAR habitats are defined, Bank Swallow foraging habitat do not fall under the protections of the ESA.

The northeastern quadrant of the study area has not been identified as an area of potential landfill expansion by the Town (Appendix I). No development or site alteration activity is therefore anticipated in proximity to the observed Bank Swallow nesting colony. Impacts to Bank Swallows and their habitat are not anticipated, and thus this species is not considered further within this study.

5.4.4 Black Ash

Black Ash is listed as Endangered in Ontario (MECP 2026); consequently, individual of this species and its habitat are protected under the ESA. Black Ash is typically found in mucky or peaty swamps as well as in river floodplains (Michigan Flora Online 2022). This species was observed at the north end of the study area within the Fresh-Moist Poplar Deciduous Forest (FOD8-1) near the edge of the SWT2 (#3) wetland. Two individual trees were observed.

ESA protections for Black Ash and its habitat are governed under Ontario Regulations 6/24 and 7/24, respectively. These regulations provide conditional exemptions for activities that would otherwise contravene Sections 9(1) and 10(1) of the ESA with respect to this species and its habitat. In accordance with O. Reg. 6/24, ESA-protected Black Ash individuals comprise trees that have a stem height that is ≥1.37m, a diameter that is ≥8cm at a stem height of 1.37m, and are determined to be healthy through completion of health assessment by a qualified professional. The specific size metrics and health of the two observed Black Ash trees were not recorded during the 2021 field survey; therefore, both individuals should be assumed to fall under ESA protection.

O. Reg. 7/24 states that the habitat of Black Ash is defined as an area within a radial distance of 30m from the stem of Black Ash individuals that are protected pursuant to O. Reg. 6/24. The precise locations of the observed Black Ash trees were not recorded during the 2021 field survey, and recognizing that additional Black Ash individuals may exist that were not observed within that general area, a more conservative approach has been taken to mapping Black Ash habitat for the purposes of the NEA as described below.

Although this species was observed in the FOD8-1 community, its presence is due to the wet conditions that are present within the SWT2 community. Recognizing that this species was

observed very near to the boundary of SWT2 (#3) and the relatively moist conditions that it requires, the mapped SAR habitat is considered to comprise community SWT2 (#3) as well as a 30m zone that extends into FOD8-1 and the FOD8-1/CUP3 complex (Map 4b). Black Ash is less likely to occur in the relatively drier FOD5-2 (#2) community, and so that community has been excluded from the mapped habitat. Since the area of mapped habitat is well outside of the potential landfill expansion area, it is not considered further in this report.

5.4.5 Red-headed Woodpecker

Red-headed Woodpeckers utilize a wide variety of treed habitats, but generally prefer more open canopy woodland structure where dead or dying trees occur (Frei et al. 2020). Within the study area, suitable habitat for this species occurs within the earlier successional, more fragmented and regenerating forest that is predominantly located within the southern and western portions of the study area. This species may also use woodland edges and clearings within more densely wooded portions of the study area. Red-headed Woodpecker is known to breed within the broad 10x10km area that corresponds to the Ontario Breeding Bird Atlas square that contains the study area (BSC et al. 2008), but the species is not known to have been recorded more locally to the study area (within 1-5km) based on other information sources (OMNR 2025, eBird 2025, iNaturalist 2025).

Despite the presence of suitable habitat, Red-headed Woodpecker was not recorded within the study area during the breeding bird surveys, and was not incidentally observed during other site investigations. This species is therefore not considered further in the NEA. However, it is recognized that Red-headed Woodpecker could conceivably use the study area natural features due to habitat suitability and its presence in the broader vicinity of the study area. This species can therefore be considered more generally in the context of further discussion regarding potential impacts to forest birds presented in this report.

5.5 Significant Wildlife Habitat

Two categories of SWH were confirmed within the study area (Area-Sensitive Bird Breeding Habitat and Special Concern and Rare Wildlife Species), while four categories were maintained as Candidate SWH (Bat Maternity Colonies, Turtle Wintering Area, Snake Hibernaculum, and Woodland Raptor Nesting Habitat). See below for further discussion about these SWH types.

5.5.1 Confirmed Significant Wildlife Habitat

Woodland Area-Sensitive Bird Breeding Habitat

Area-sensitive breeding birds comprise a large guild of birds that require relatively large tracts of forest in which to establish their breeding territories, even if their breeding territory size is relatively small compared to the total size of the forest. Some of these species prefer forest interior areas, but where forest cover is more widespread on the landscape they may occupy edge areas of large forests. Other species within this group may prefer forest edges but still require large forest areas. Therefore, effects of development impacts to this group of birds can be variable. For example, forest fragmentation may detrimentally affect birds that require interior forest conditions but may benefit edge specialist species. Reduction in the overall size of forest tracts may have a negative effect on these species. However, in areas with greater forest cover these species may potentially inhabit smaller woodlands than they would typically inhabit on landscapes with less forest cover (MNRF 2014c), and may therefore be less susceptible to negative effects caused by some forest area reduction. This may be the case for the Southampton Landfill study area, as the study area woodland represents a southern extent of what is a much more expansive area of forest cover on the landscape that extends north toward the Sauble Beach area.

Multiple bird species were documented within the study area that are considered area-sensitive species. These include Red-breasted Nuthatch (*Sitta canadensis*), Blue-headed Vireo, Black-throated Green Warbler (*Setophaga virens*), Blackburnian Warbler (*Setophaga fusca*), Black-throated Blue Warbler (*Setophaga caerulescens*), and Ovenbird. Of these, only Black-throated Green Warbler and Ovenbird were observed with “probable” breeding evidence within the study area, due to evidence of breeding territoriality, while the remainder displayed “possible” breeding evidence due to single observation during the breeding season. However, all of these species are considered potential breeders within the study area based on a precautionary approach. The area-sensitive species Yellow-bellied Sapsucker (*Sphyrapicus varius*) and Scarlet Tanager (*Piranga olivacea*) were also documented within the study area but were only observed outside of the core breeding period. Nevertheless, due to the presence of suitable habitat and the application of a precautionary principle, it can be assumed that these species also breed within the study area.

As several of the recorded indicator species were documented incidentally during surveys that coincided with the bird breeding season, their specific locations within the study area were not

always noted. Therefore, following a precautionary approach, all of the study area woodland communities are considered Woodland Area-Sensitive Bird Breeding SWH since all are contiguous with the large block of woodland that extends off-property to the north (Map 4b). This is with the recognition that some portions of the SWH (e.g., at the southern end where disturbance regimes associated with the landfill operation are more pronounced) are of relatively lower habitat quality than others. Certain deciduous and thicket swamp communities have been included in this designation, as shown on Map 4b, due to being surrounded by the upland forest habitat communities and as they are also likely used by the indicator species.

Special Concern and Rare Wildlife

Eastern Wood-Pewee

Eastern Wood-Pewee is a provincial species of Special Concern, and is therefore considered a SCC in Ontario. This species was recorded vocalizing during multiple site investigations, including during both breeding bird surveys. Eastern Wood-Pewees predominantly make use of intermediate-age to mature deciduous and mixed forests having a relatively open understorey. This species makes use of woodland edge habitats in proximity to its nest area for foraging purposes, and tends to select breeding territories with fewer pines (COSEWIC 2012). This species occupies woodlands of varying sizes, typically where lower-density canopy cover occurs and often near edge zones (Watt et al. 2020).

Eastern Wood-Pewee was recorded at various locations around and outside the study area, and based on these observations it is estimated that at least three breeding territories exist. These potential territories correspond to locations where the species was recorded on two or more occasions. These are generally located within the FOD8-1/CUP3 complex north of Mineral Cultural Meadow (CUM1) (#2) and within the FOD5-2 (#1) community within the northeast end of the study area. Eastern Wood-Pewee was also recorded on one occasion within the woodland at the southwest corner of the study area (FOD8-1/CUP3) as well as immediately north of the study area. This species is known to have breeding territories that are up to an average of 7.7ha (Watt et al. 2020). Therefore, the southwest study area corner may be part of the same breeding territory as the area north of CUM1 (#2) and occupied by the same breeding pair.

Based on the locations of the presumed breeding territories, the FOD8-1/CUP3 complex and the FOD5-2 (#1) community have been identified as SWH for Eastern Wood-Pewee breeding

habitat (Map 4b). The small SWD4 community has also been included in this habitat mapping since it is surrounded by FOD8-1/CUP3 and is likely used by the species.

5.5.2 Candidate Significant Wildlife Habitat

Bat Maternity Colonies

Bat maternity colonies represent a form of seasonal wildlife concentration area, and bat species maintain a high fidelity to these areas which are selected due to their optimal habitat conditions. Bat maternity colony habitat is highly sensitive and the success of colonies is critical to the survival of local bat populations (MNRF 2014c). These habitats are used by females for giving birth and raising young.

This SWH type is confirmed based on the presence of either a Big Brown Bat (*Eptesicus fuscus*) or Silver-haired Bat maternity colony (MNRF 2015). Although Silver-haired Bat has recently (2025) been uplisted to Endangered in Ontario and is now treated as a SAR (see Section 5.4.1), it is still considered here in conformance with the OMNR (2015) criteria to assess Bat Maternity Colonies SWH in the absence of more recent/updated SWH guidance from the OMNR.

Traditionally, Big Brown Bats formed maternity colonies beneath loose bark and in cavities of various tree species. Common maternity roosts today for this species are often found in buildings, barns and bridges; however, these anthropogenic structures are not considered to be SWH. Silver-haired Bats prefer older mixed or deciduous forest and form maternity colonies in tree cavities and small hollows. Mature forests with ≥21 snags/ha are preferred by Silver-haired Bats (OMNR 2000).

Deciduous or mixed forest or swamp vegetation communities that contain greater than 10 large diameter (≥25cm DBH) wildlife trees per hectare are considered candidate maternity roosting habitat for Big Brown Bat and/or Silver-haired Bat (OMNR 2000). Based on the results of the bat habitat assessment, the candidate ELC communities (i.e., FOD8-1/CUP3, SWD4, FOD3-2) for this SWH type do not meet the criteria of having >10 candidate roost trees/ha. Therefore, these communities are not considered SWH for Bat Maternity Colonies. Bat habitat assessments and bat acoustic surveys were not completed within the FOD5-2 (#2), FOD8-1, FOD6-3 communities as no development is proposed in the northeast portion of the study area. Because the candidate roost tree density of these communities is currently unknown, these communities are considered Candidate SWH for Bat Maternity Colonies.

Based on the results of the bat acoustic surveys completed within the FOD5-2 (#1) community, 106 bat pass sequences classified to Big Brown Bat and 38 classified to Silver-haired Bat were recorded within the estimated peak period of emergence from the roost (i.e., within one hour after sunset). While Big Brown Bats are likely roosting in anthropogenic structures within the study area or its vicinity, this community may provide maternity roosting habitat for Silver-haired Bat. Because a bat habitat assessment has not been completed within this community, the candidate roost tree density is currently unknown. Therefore, the FOD5-2 (#1) community is considered Candidate SWH for Bat Maternity Colonies.

Turtle Wintering Area

The Saugeen River, where it abuts the northeast corner of the study area, may provide suitable conditions for turtle overwintering (e.g., soft mud substrates, layer of unfrozen water at the substrate level). Since landfill expansion is not being contemplated within the northeast corner of the study area, spring turtle basking surveys that would assess the presence of overwintering habitat were not completed. The adjacent reach of the Saugeen River is therefore maintained as Candidate SWH for Turtle Wintering Area, but is not considered further in this study.

Reptile Hibernaculum

The results of snake visual encounter surveys and coverboard checks confirmed that an abundance of snakes occupy the study area and that the study area provides good snake habitat for thermoregulation and foraging. Coverboards that yielded the highest snake abundances were particularly suggestive of optimal habitat in the immediate surrounding area. However, due to the difficulties in identifying snake hibernacula at the surface and the broad areas of dispersal that can occur following spring emergence, it was not possible to attribute the visual encounter survey and coverboard check results that were completed between late May and June 2021 to a hibernaculum potentially being nearby the snake observation locations. For example, Red-bellied Snake, which was one of the observed species, is known to travel >300m between their hibernacula and summer habitats (Rowell 2012).

To further assess the presence of Reptile Hibernaculum SWH within the study area, NRSI completed supplementary snake visual encounter surveys within the area of potential landfill expansion during early spring 2023. Multiple Eastern Gartersnakes were observed during those surveys, which, due to the seasonal timing, were likely in close proximity to their overwintering hibernacula. One individual was directly observed escaping underground into what was likely its hibernaculum. The locations of Eastern Gartersnake observation were inferred to represent

approximate locations of snake hibernacula as shown on Map 4b. However, the criteria to render a hibernaculum as provincially significant (i.e., use of a hibernaculum by, or presence at/near a hibernaculum by congregations of, at least five individuals or individuals of two or more snake species) (MNRF 2015) was not met. Reptile Hibernaculum SWH is therefore considered absent within the area that was investigated during spring 2023 (i.e., the area of proposed landfill expansion plus an adjacent 50m area). Nonetheless, the confirmed presence of snake hibernaculum habitat within the landfill expansion zone should be carried forward for consideration in mitigation planning for the landfill expansion activities. Portions of the study area that are located outside of the landfill expansion zone (plus adjacent 50m) are still considered Reptile Hibernaculum Candidate SWH since these areas were not searched during early spring.

Woodland Raptor Nesting Habitat

Broad-winged Hawk was recorded within the study area with evidence of "possible" breeding based on the species being detected on one occasion during the breeding period. Broad-winged Hawks are part of a guild of woodland-nesting raptors whose habitats are sensitive due to the large size of forest that is typically required by these species for their home ranges and defended territories. This species typically nests in intermediate-aged, dense mixed and deciduous forests, and prefers areas that are close to swamps or open water. Nests are often at forest edges or near an opening, and prefer larger-sized trees that are >45cm DBH (MNRF 2014c). These conditions are consistent with the general area of observation of Broad-winged Hawk within the study area, which comprised the more mature forested communities of the northeast study area (i.e., FOD8-1, FOD6-3, FOD5-2). However, since Broad-winged Hawk was only documented with possible evidence of breeding within the study area, and because no nests were observed during site investigations, these ELC communities are considered to represent Candidate SWH for Woodland Raptor Nesting Habitat.

5.6 Regionally Significant Species

As described in Section 4.2.2, six regionally significant vegetation species were inventoried within the study area: Narrow-leaved Glade Fern, Blue-stemmed Goldenrod, Early Goldenrod, Black Raspberry, White Bear Sedge and Downy Serviceberry. As noted above, although Black Raspberry is listed as a regionally notable species, it is known to be more prevalent to the south within Bruce County (Johnson 2016) and was widespread within the study area. In addition to the above species, Whorled Milkweed was observed on-site, which represents the only known

disjunct observation of this species in Bruce County and is at least 200km from the nearest documented individuals on iNaturalist (iNaturalist 2025). Whorled Milkweed should therefore be considered a rare and significant species in Bruce County.

In addition to Black Raspberry, Early Goldenrod was common and widespread within the study area but specific to the open cultural meadow communities and smaller forest clearings. Most of the remaining significant species were specific to more northerly/northeasterly areas of the study area, comprising the FOD6-3 and FOD5-2 communities (White Bear Sedge and Blue-stemmed Goldenrod) and the north end of the FOD8-1 community near the north study area boundary (Narrow-leaved Glade Fern). Whorled Milkweed was observed roughly west-central within the FOD8-1/CUP3 complex (see Section 4.2.2 for location coordinates). Downy Serviceberry was more widespread in its study area distribution, but with few individuals. It was found within the FOD5-2 and FOD3-2 forest communities as well as the FOD8-1/CUP3 complex.

While regionally rare species in and of themselves do not represent policy-based constraints to future landfill expansion, their presence renders additional significance to the features in which they are located. Measures should be taken to avoid or minimize impacts to habitats that support regionally significant species. Efforts should be made to protect individual significant plants during site alteration/construction where necessary. If impacts cannot be avoided, the individual plants should be relocated to an appropriate site when feasible.

5.7 Saugeen Ojibway Nation Culturally Significant Species

Several species that are considered culturally significant to SON were identified within the study area. The vast majority of these species (85) comprise plant species based on the list of SON culturally significant vascular plant species that was provided to NRSI (SON 2026). These species are recognized to be important for ceremonial, food, medicinal, products, and other uses. It is also understood that other species are of cultural importance to SON. Among species recorded within the study area or known from the general study area vicinity, SON specifically referred to Black Bear and Snapping Turtle as being Anishinaabe clan animals, while gulls were also specifically noted (SON 2025).

6.0 Impact Assessment

6.1 Description of the Proposed Undertaking

A Waste Management Plan was completed by the Town in August 2020 to provide a "holistic" approach to the Town's waste management program that would provide the required support for both short-term and long-term waste management planning purposes. As of early 2021, the Town had an estimated 10 years of service life for residual waste disposal at the Southampton Landfill Site (i.e., until early 2032). One of the main focuses of the waste management plan was to evaluate the long-term residual waste disposal options for the Town (i.e., once the existing approved capacity at the Southampton Landfill was reached). The Waste Management Plan identified the continued use of the Town's Southampton Landfill Site, in the form of landfill expansion, as the most "secure" long-term waste management option.

Under the EAA, landfill expansion is subject to an Comprehensive Environmental Assessment (EA). The purpose of the EA is, in part, to identify a long-term solution for the management of the Town's solid waste disposal needs (i.e., residual waste) in a technically and economically feasible manner while minimizing impacts to the environment. The EA process includes the assessment of "environmental" effects, the consideration of alternatives and the development of mitigation measures to reduce potential effects on the environment. As per the EAA, "environments" makes reference to the social, economic, cultural, technical and natural conditions.

In order to better assess the different environments, several background studies were initiated in early 2021, including this NEA which informs the review of the natural environment, identifies potential ecological constraints, and, based on the constraints identified, confirms the feasibility of landfill expansion. The NEA presents the preliminary characterization of the significant and sensitive natural features and ecological functions to inform a high-level impact assessment associated with various landfill expansion options. Landfill expansion options are herein referred to as Options 1, 2 and 3 were used to confirm the feasibility of landfill expansion and the relative magnitude of potential impacts related to the location of the northerly limit of the expansion area. This information may then be used to inform the review and assessment of the landfill expansion alternatives (i.e., Alternative Methods) that may be considered within the EA for the Southampton Landfill.

For the purpose of this assessment, the main difference between the three landfill expansion options is reflected in the northerly limit of the proposed expansion area, in which Option 1

represents the southernmost limit and Option 3 comprises the northernmost limit. The proposed southerly limit of landfilling associated with all three options would remain the same, extending from the existing fill area to the west, parallel to the property boundary. Further, for the purpose of the NEA, all three options consider expansion through to the western boundary of the agricultural property. Thus, Option 1 would represent the alternative with the smallest spatial extent of landfill expansion (i.e., the smallest landfill footprint across the site from south to north) and Option 3 the greatest distance between the southerly and northerly limits of the fill area. It is noted that as part of the Environmental Assessment process the expansion area will be situated in the area to the west of the existing landfill footprint. The exact location and total area of the landfill footprint will also be adjusted, but will remain within the landfill expansion area identified. However, as the westerly limit of the proposed expansion area will likely extend to a location within the agricultural field, where natural heritage features and functions are minimal, options reviewed herein are limited to adjustments of the northerly limit of landfilling.

The northern limit of Option 1 was selected to approximately coincide with the northern limit of the existing operational landfill area, such that the expansion would extend due west but with minimal expansion to the north. The northern limit of Option 3 corresponds to a 30m offset from the ephemeral drainage feature. The northern limit of Option 2 represents a line 10m south of SNK-002, which would allow for the preservation of wildlife habitat that exists around that snake coverboard location. The northeast limits of both Options 2 and 3 were offset 30m from the Mineral Thicket Swamp (SWT) (#2) wetland to afford it an ecological buffer. See Map 5 for an illustration of the three landfill expansion options being considered in this impact assessment.

Details of the future landfill expansion (e.g., with respect to landfilling locations, buildings and structures, and internal access roads) will be determined at a future planning stage. For the purposes of the Feasibility Assessment, it is assumed that lands within the future landfill expansion zone will be entirely cleared of natural feature cover in order to be fully utilized for landfill facility operations. The general areas in which landfill expansion is being considered are currently within wooded buffer lands to the immediate west of the existing landfill operations and within the adjacent agricultural field that borders the westerly property boundary (Appendix I).

6.2 Approach to Impact Assessment

Potential impacts arising from the proposed landfill expansion are determined by comparing the details of the proposed undertaking with the characteristics of the existing natural features and their ecological functions. Where the expansion limits overlap with the natural features or

indirectly affect their functions, impacts may arise. The following is a description of the types of impacts which will be discussed.

- Direct impacts to the natural features within the study area associated with destruction or displacement caused by the actual proposed 'footprint' of the landfill expansion, including impacts caused by vegetation removal and site grading.

- Indirect impacts associated with changes in site conditions such as drainage, water balance and water quantity/quality, and effects of construction on adjacent natural features and habitats.

- Induced impacts associated with post-construction operational use of the expanded landfill facility such as disturbance or degradation of adjacent natural features and species habitats.

A key aspect of the impact assessment will also be to assess whether varying degrees of impact can be expected across the three landfill expansion options to be considered in the EA. Several forms of anticipated ecological impact are common to all three expansion options, as discussed below. However, the impact assessment will also identify where a given impact type may vary between Options 1, 2 and 3, such as in its extent, intensity or duration. Section 6.6 below summarizes the results of this assessment in presenting a comparative analysis of anticipated impact among Options 1, 2 and 3. These results will be used to directly inform the development of Alternative Methods as well as the comparative evaluation and assessment of Alternative Methods to be completed as part of the EA.

The impact assessment presented below is intended to be high-level and preliminary. Further review of the 'Alternative Methods' will be completed as part of the EA process to inform the assessment of Alternative Methods. A more detailed assessment will be completed at a subsequent planning stage associated with the detailed design of the selected landfill expansion plan.

6.3 Direct Impacts and Mitigations

6.3.1 Vegetation Removal and Site Grading

The proposed undertaking will require the direct removal of wooded natural features to accommodate the expansion. In all potential expansion scenarios this will result in direct impacts to Significant Woodland. As a form of essential municipal infrastructure, some

allowance for necessary natural environment impact may be permitted for landfill expansion subject to the EA process; however, efforts must be made to minimize and mitigate the degree of environmental impact to the extent feasible.

The proposed expansion is estimated to require the removal of the following spatial areas of Significant Woodland:

- Option 1: 8.27ha
- Option 2: 14.05ha
- Option 3: 15.42ha

The proportion of woodland requiring removal equates to 15.3%, 26.0%, or 28.5% of the total Significant Woodland mapped within the study area for Options 1, 2, and 3, respectively.

Although the woodland is considered significant according to provincial and municipal criteria (OMNR 2010, County of Bruce 2024, Town of Saugeen Shores 2024), as described in Section 5.1, the portion of woodland to be removed largely comprises the southern extents that have been characterized as being more ecologically disturbed. The southern woodland extent to be removed has been subject to more pronounced edge effects as it comprises smaller and much more fragmented configurations in comparison to the larger and more intact woodland land cover to the north. Its location immediately adjacent to the landfill site operational areas has resulted in large quantities of surface runoff- and wind-deposited garbage and debris, especially in the southern fringing edges. Its high edge-to-interior ratio likely results in significant penetration of sunlight, dust, and wind effects on more interior areas, limiting its ecological value primarily to species that prefer those woodland edge and transitional environments. Species that use these environments tend to be more common and resilient to disturbance, as opposed to more interior forest areas that provide habitat for more “specialist” habitat species.

While the proposed undertaking will result in a loss of woodland cover within the study area, the area to be removed therefore comprises the least sensitive portions of the on-site woodland. Conversely, the larger block of woodland to the north, which contains more mature forest growth, interior forest habitat, and is much more buffered from adjacent land use disturbances, will generally remain intact and outside of the area of landfill expansion.

Among the three expansion options being considered, the further north the northern limit of landfill expansion, the greater the degree of anticipated impact to the natural features and their

ecological functions. Some of these ecological impacts are described further below (e.g., with respect to wildlife habitats). However, as described in Section 5.1, the quality of the on-site woodland generally follows a gradient of increasing quality from south to north. Vegetation clearing required to accommodate the landfill expansion will create a new woodland edge. Regardless of its location, the northern edge of expansion will introduce new edge effects on the adjacent woodland features that were previously more interior within the woodland. These edge effects include, but are not limited to,

- increased penetration of light, dust, noise, and vibration;
- changes in the soil moisture regime;
- increases in the proportion of non-native species growth; and
- increase in predatory (e.g., American Crow (*Corvus brachyrhynchos*)) and parasitic (e.g., Brown-headed Cowbird (*Molothrus ater*)) wildlife (Environment Canada 2013; Region of Waterloo 2016).

The northern limit presented in Option 3 will introduce those edge effects more deeply into what are now interior forest habitats than Options 1 or 2. Edge effects are generally regarded as extending up to 200m of a forest edge, although some information sources consider edge effects to generally taper off at 100m from the woodland boundary (Environment Canada 2013). Consequently, the area of interior forest (i.e., >200m from a forest edge) will be reduced within the study area. Relative to the existing condition, in which the study area contains 14.22ha of interior forest habitat (if including contiguous forest to the north of the study area, interior forest totals 16.03ha), the following are the anticipated amounts of residual interior forest habitat in the study area post-landfill expansion.

- Option 1: 14.22ha (i.e., no change);
- Option 2: 11.60ha (reduction of 2.62ha);
- Option 3: 10.72ha (reduction of 3.50ha).

Implementation of expansion Options 2 or 3 will therefore result in a loss of interior forest ecological function, such as described further below in regards to breeding bird habitats.

Under all three scenarios, portions of woodland to be removed are relatively younger than the more mature forest to the northeast. These areas of young forest are dominated by earlier successional woodland species (e.g., Trembling Aspen) and contain several clearings and open

meadow areas that have not yet succeeded to thicket or woodland communities. These areas are also intermixed with re-naturalizing coniferous plantation. None of the vegetation communities to be removed are considered rare or ecologically sensitive. However, relative to Option 3, Option 1, and to a lesser extent Option 2, present less potential for disturbance effects on the adjacent retained woodlands by allowing retention of more young, successional woodland to act as a buffer to the more mature and interior woodland communities. Option 1 also allows for the retention of all or most of the small Mineral Deciduous Swamp (SWD4) community, which is considered one of the Locally Significant Wetlands mapped on the site.

The new woodland edge that is created along the north side of the expansion zone will introduce edge effects such as are currently experienced by the existing woodland along its south edge facing the landfill site operational areas (e.g., light, dust, noise and wind penetration). However, in general the existing woodland growth that will contain the new woodland edge (i.e., the Fresh-Moist Poplar Deciduous Forest/Coniferous Plantation complex (FOD8-1/CUP3)) is already resilient to edge disturbance by nature of the mosaic of open clearings of varying sizes within the feature as well as its composition of predominantly pioneer or early successional species. Therefore, while creation of the new woodland edge is expected to create edge effects that extend further into what is currently more interior forest (e.g., southern portions of the FOD8-1 and Fresh-Moist Sugar Maple-Yellow Birch Deciduous Forest (FOD6-3) communities), creation of the new edge is not expected to negatively affect the tree growth in the immediate vicinity of the edge (e.g., through sun-scalding, wind-throw effects) as would be expected if it were to cut through more interior forest habitat. Nonetheless, a woodland edge management plan will be required regardless of which expansion option is selected (see Section 7.0).

Options 2 and 3 will be off-set at least 30m from the Mineral Thicket Swamp (SWT2) (#2) wetland community. This will maintain a naturally vegetated buffer between the wetland and the open landfill area to mitigate adjacent land use disturbances. It will also maintain some of the natural topography surrounding the wetland that may contribute overland surface runoff to the feature. However, as described below (Section 6.4), additional study will be required to ensure a water balance with this and other wetlands is maintained pre- vs. post-development.

To the extent possible, it is recommended that some natural tree/vegetation growth be maintained along the northern edge of the expansion zone within the landfill site operational

area, to provide some additional buffering of the retained woodland to the north. The potential for this will be determined during a future detailed design phase for the landfill expansion.

Significant Woodland Compensation

In accordance with the Saugeen Shores OP Section 2.6.8.6 (b), the removal of Significant Woodland for the purposes of the landfill expansion must be compensated for at a ratio of at least 2:1. Since it is not feasible to determine the specific number of trees requiring removal, and in order to effectively offset the area of woodland being removed, the 2:1 compensation ratio should be based on the area (in hectares) of woodland that is removed. Based on the areas of Significant Woodland removal required for each of the landfill expansion options which consider expansion to the westerly property boundary, the following areas of woodland compensation will be required:

- Option 1: 16.5ha
- Option 2: 28.1ha
- Option 3: 30.8ha

The woodland compensation planting area(s) must be located on lands as close to the area of woodland removal as possible. Doing so will help to maintain the landscape-level functions of the woodland features. It is recommended that a portion of the required woodland compensation planting be established within the remaining northerly portion of agricultural field at the west end of the study area that will fall outside of the landfill expansion limits. In the case of all three options, a remaining area of woodland compensation will be required on an additional off-site property. In selecting an additional off-site compensation property, it is recommended that a site be selected that would allow woodland compensation plantings to build off of an existing wooded vegetation community so as to enhance its ecological value and functions.

Trees that are planted in compensation for the woodland removal must be of a number and density that exceeds the *Forestry Act* definition of “woodland” (i.e., 1,000 trees/ha) anticipating that some tree plantings will die-off. Compensation woodland plantings must comprise exclusively native species that are suitable to the site conditions and reflective of the adjacent vegetation community composition. Tree plantings should be of as large a size as feasible to help accelerate the maturation and ecological value of the compensation feature, and to

mitigate negative effects caused by deer browse. Woodland compensation requirements will be planned and implemented with regard to existing guidance and literature, such as Ontario Nature's principles and recommendations for biodiversity offsetting (Ontario Nature 2016).

Woodland compensation planting will be guided by a compensation strategy and planting plan that is approved in consultation with SVCA and other third parties (e.g., owner of additional compensation property) as required. The compensation area(s) will be subject to a Monitoring Plan and retained as a natural area(s) in perpetuity.

As an alternative to woodland compensation planting, and depending on the availability of suitable lands, the woodland compensation strategy may also be achieved, in part, via the acquisition of proximal lands by the Town that already contain woodland land cover with characteristics that meet the objectives of the strategy. For example, these may include lands containing intact forest or younger woodland communities that are determined to be of reasonable ecological quality and contain a diversity of native tree/vegetation species growth. For example, potential compensation lands may also provide an important ecological linkage function on the landscape that supports vegetative genetic dispersion and important wildlife movement corridors. Under this strategy, the Town's potential acquisition of proximal lands would be with the understanding that they are to be maintained in their natural condition in perpetuity. Further, such compensation lands could also be subject to some degree of ecological management and enhancement to improve their functional value. The potential incorporation of this approach into the broader compensation strategy for the landfill expansion would require consultation with regulatory agency staff.

Significant Vegetation Species

Under all expansion scenarios, vegetation removal and site grading will require the removal of regionally significant Early Goldenrod growth, particularly within open cultural meadow features. Despite its status as regionally significant, Early Goldenrod growth is widespread within open habitats in the study area, and likely elsewhere on the surrounding landscape. Localized removal of this species is not anticipated to represent a negative impact.

Expansion Options 2 and 3 will result in the removal of the regionally significant Whorled Milkweed individuals. If either of these options are selected it is recommended that the individual plants be relocated to a suitable alternate planting site within the study area. The relocation site should be of sufficient distance from the active landfill operations area that it will

not be subject to additional indirect disturbances, and should also be located away from areas that may be accessed by humans (e.g., off-road trails).

The specific locations of Downy Serviceberry individuals were not mapped; however, it can generally be assumed that the greater amount of FOD8-1/CUP3 removal among the expansion options will increase the potential for impact to this species. It is also recommended that any individuals that will be directly impacted be relocated to suitable alternate planting sites prior to site alteration activities, where feasible.

Other regionally significant vegetation species identified on the property, including habitat for the SAR Black Ash, will not be negatively impacted by the proposed undertaking.

Saugeen Ojibway Nation Culturally Significant Plant Species

As described in Section 4.2.2, 85 of the inventoried plant species within the study area represent species that are considered culturally significant by SON. Of these 85 species, up to 58 of the species may be impacted under landfill expansion Option 1, while up to 59 species (accounting for one additional species that was specifically inventoried within the SWD4 swamp feature) would be removed under Options 2 and 3. These represent conservative estimates, since some of the 59 species were not identified to a specific ELC vegetation community within the study area (see Appendix VIII) and may or may not occur within the landfill expansion zones. However, many of the 59 species are widespread across the study area natural features and the majority of these species are likely to be impacted as a result of the expansion. The majority of the species that would be impacted were inventoried within the FOD8-1 and/or CUP3 communities and could be impacted regardless of which expansion option is chosen.

The SON-culturally significant plant species that may be impacted range widely in CC values, from 0 and 1 (e.g., Common Milkweed (*Asclepias syriaca*), Sandbar Willow (*Salix interior*)) to 7 and 8 (e.g., Two-leaved Toothwort, Red Pine) (Oldham et al. 1995). To mitigate the loss of culturally significant species, it is recommended that seed collection and transplantation to suitable habitat be undertaken to the extent feasible prior to vegetation removal and site alteration. Culturally significant species relocations and seed dispersal can be completed as part of recommended woodland compensation and enhancement measures. Transplantation measures may be targeted to species that are more likely to survive and adapt to the relocations (e.g., habitat generalist species and younger trees or shrubs that can reasonably be relocated) depending on the characteristics of the receiving natural features; target species

selections will be determined by SON. It is recommended that seed collection and transplantation activities be undertaken by, or be completed in conjunction with, SON community members in accordance with their traditional practices and methods.

6.3.2 Impacts to Wildlife and their Habitats

Species at Risk Bats and Bat Maternity Colony Candidate Significant Wildlife Habitat

The proposed landfill expansion will require removal of confirmed habitat for the SAR Little Brown Myotis, Tri-colored Bat, Eastern Red Bat, Hoary Bat, and Silver-haired Bat, including potential maternity colony roost sites and natural areas within 1000m of these sites, as identified through the completion of the passive acoustic study (Map 4b). Potential habitats within and adjacent to the proposed landfill expansion footprint options were further characterized during bat habitat assessments to understand the quality of available roosting habitat to inform the selection of a landfill expansion option that would minimize adverse impacts to the species and their habitats.

Of the three landfill expansion options, Little Brown Myotis activity within one hour of sunset was highest (n=59 recorded call sequences) within Option 3 (at monitoring station BAT-007), followed by Option 2 and Option 1. Based on the results of the passive acoustic monitoring study, the data further suggests a higher probability of a Little Brown Myotis maternity roost colony to occur in Options 2 and 3, and within the vicinity of monitoring stations, BAT-004, -007, -008, and -011. High quality candidate roost habitat (i.e., roost tree densities ≥10 roost trees/ha) was identified for the species within the vegetation community FOD8-1/CUP3, which overlaps with all three landfill expansion options, as well as within the SWD4 community that is located within Options 2 and 3 (Tables 4 and 5). When considering all vegetation communities within Options 2 and 3, area search bat habitat assessments documented roost tree densities for the species of 4.67 and 8.76 roost trees/ha in Options 2 and 3, respectively (Table 6).

Table 6. Summary of Bat Habitat Assessment Area Search Results

Vegetation Community or Area Searched	Area (ha)	Little Brown Myotis, ,and Silver-haired Bat		Tri-colored Bat	
		No. Candidate Roost Trees	Roost Tree Density (No. Candidate Roost Trees/ha)	No. Candidate Roost Trees	Roost Tree Density (No. Candidate Roost Trees/ha)
Landfill Expansion Limit – Option 2	5.79	27	4.67	5	0.86

Vegetation Community or Area Searched	Area (ha)	Little Brown Myotis, ,and Silver-haired Bat		Tri-colored Bat	
		No. Candidate Roost Trees	Roost Tree Density (No. Candidate Roost Trees/ha)	No. Candidate Roost Trees	Roost Tree Density (No. Candidate Roost Trees/ha)
(Area searched = between northern limits of Option 1 and Option 2)					
Landfill Expansion Limit – Option 3 (Area searched = between northern limits of Option 2 and Option 3)	1.37	12	8.76	1	0.73

Tri-colored Bat activity was highest (n=3 recorded call sequences) within one hour of sunset within Option 1 at station BAT-018, followed by Option 3. No Tri-colored Bat call sequences were recorded at stations within the Option 2 footprint. Based on the results of the passive acoustic monitoring study, the data does not support the presence of a Tri-colored Bat maternity roost colony within any of Options 1, 2 or 3. High quality candidate roost habitat was identified for the species in one vegetation community (CUP3) within Option 1. When considering all vegetation communities in Options 2 and 3, area search bat habitat assessments documented roost tree densities for the species of 0.86 and 0.73 roost trees/ha in Options 2 and 3, respectively (Table 6). It is important to note that the majority of candidate Tri-colored Bat roost trees were identified beyond the limits of all proposed landfill expansion options (Map 3b).

Silver-haired Bat activity was highest (n=13 recorded call sequences) within one hour after sunset within Options 2 and 3 at stations, BAT-002, -004, and -011. Based on the results of the passive acoustic monitoring study, the data further suggests a higher probability of a Silver-haired Bat maternity roost colony to occur within the vicinity of monitoring stations BAT-002 and BAT-004, which overlap with Options 2 and 3, as well as BAT-006, which overlaps with all three landfill expansion options. High quality candidate roost habitat (i.e., roost tree densities ≥10 roost trees/ha) was identified for the species within the vegetation community FOD8-1/CUP3, which overlaps with all three landfill expansion options, as well as within the SWD4 community that is located within Option 2 (Tables 4 and 5). When considering all vegetation communities within Options 2 and 3, area search bat habitat assessments documented roost tree densities for the species of 4.67 and 8.76 roost trees/ha in Options 2 and 3, respectively (Table 6).

Eastern Red Bat activity was highest (n=12 recorded call sequences) within one hour after sunset within Options 2 and 3 at station BAT-004. Due to the general lack of knowledge of their roosting preferences, and variability in observed roost sites, all treed communities within all three landfill expansion options may provide suitable roosting habitat for Eastern Red Bat. However, based on the results of the passive acoustic monitoring study, the data does not support the presence of an Eastern Red Bat maternity roost colony within any of the landfill expansion option areas.

Hoary Bat activity was highest (n=23 recorded call sequences) within one hour after sunset within Options 2 and 3 at station BAT-002. Due to the general lack of knowledge of their roosting preferences, and variability in observed roost sites, all treed communities within all three landfill expansion options may provide suitable roosting habitat for both Hoary Bat. However, based on the results of the passive acoustic monitoring study, the data does not support the presence of a Hoary Bat maternity roost colony within any of the landfill expansion option areas.

All three landfill expansion options therefore have the potential to result in adverse impacts to the species and their habitats; however, the degree of impact will vary among the three options. Option 3, which will require the greatest extent of habitat removal, will impose the highest degree of impact to all bat SAR, and especially to Little Brown Myotis and Silver-haired Bat. By minimizing the extent of habitat removal, Option 1 would result in the least adverse impacts. Bat activity was also lowest within Option 1 for both Little Brown Myotis and Silver-haired Bat, suggesting the presence of lower quality habitat in this area in comparison to habitats within the proposed footprints for Options 2 and 3. Although Tri-colored Bat activity was highest at stations located within Option 1, very few call sequences were identified to the species and as mentioned above, the majority of candidate roost trees for the species were identified beyond the limits of all proposed landfill expansion options.

Impacts to bat SAR and their habitats should be avoided or otherwise minimized to the extent possible. Where impacts are unavoidable, consultation with MECP is required to determine the potential need for a permit under the ESA for the development to proceed. Note that upon the planned revocation of the ESA and enactment of its replacement legislation, the *Species Conservation Act*, permitting requirements may change. At a minimum, timing windows for habitat removal (i.e., avoidance of the period April 1-November 30) will need to be adhered to and woodland habitat offsetting should be considered in consultation with MECP. It is

recommended that habitat offsetting be provided through implementation of the Significant Woodland compensation plantings (see Section 6.3.1). Any proposed bat SAR habitat offsetting should be located in as close a proximity to the affected area as possible to minimize negative effects on the local landscape. To promote the continued use of the area as foraging and flyway habitat, woodland edges with high vegetation structural diversity that provide sheltered areas and support higher insect concentrations and diversity should be considered along new treed edges created as a result of vegetation removal or habitat restoration. Incorporating small openings in the canopy as part of the design of the woodland compensation planting can also be considered to support the presence of foraging habitat. Recognizing that the woodland plantings will require several years to mature, it is further recommended to consider temporary habitat compensation through the installation and monitoring of artificial roost structures for Little Brown Myotis. Additional mitigation measures that may be considered in consultation with MECP are provided in Appendix VII. See Section 7.0 for further discussion about proposed woodland restoration, enhancement and compensation measures.

Woodland Area-Sensitive Bird Breeding Significant Wildlife Habitat

As described in Section 5.5.1, the guild of woodland area-sensitive bird species varies widely in terms of habitat preferences (e.g., tolerant or intolerant of edge habitats) and how species may respond to impacts. However, the underlying requirement for these species is the need for large tracts of habitat in which to establish breeding territories. The area-sensitive species that are presumed to breed within the study area (Red-breasted Nuthatch, Blue-headed Vireo, Black-throated Green Warbler, Blackburnian Warbler, Black-throated Blue Warbler, Ovenbird, Yellow-bellied Sapsucker and Scarlet Tanager) generally prefer mixed forests; some are more heavily associated with coniferous tree growth while others are more often found in deciduous trees. The proposed landfill expansion will remove suitable habitat for these species. However, the likelihood that the area of woodland to be removed is occupied by these species may vary based on the habitat requirements of each species.

For example, Ovenbird is more associated with forest interior areas and typically avoids forest edge areas (Porneluzi et al. 2020). Red-breasted Nuthatch is generally found in more mature forest areas where suitable nesting cavity trees can be found (Ghalambor and Martin 2020). Scarlet Tanager also generally prefers more mature forest, including where American Beech is prominent (Mowbray 2020), such as occurs within the northeast end of the study area. These species are less likely to occupy the more fragmented southern portions of the on-site woodland

that is proposed to be removed. However, indirect effects of the clear-cut woodland removal can be expected on area-sensitive species that primarily inhabit the adjacent, more mature woodland areas that will remain. Species that currently occupy portions of the study area woodland that are more interior may be displaced once the new woodland edge is created through the landfill expansion, due to their avoidance of edge areas. This effect may not be uniform among species in this guild though. For example, Black-throated Green Warbler and Blackburnian Warbler may be more tolerant of woodland edge zones as they are known to nest in these areas (MNRF 2014c). However, this potential tolerance may be offset by other disturbance effects caused by the landfill activity itself (e.g., noise, vibrations) (see Section 6.4.1).

The landfill expansion will result in a reduction in the overall size of the woodland habitat area that exists within the study area. It is anticipated that certain species within this guild will be reduced in abundance if not entirely displaced from the study area woodland due to direct or indirect effects of the woodland removal. For example, Yellow-bellied Sapsucker, which prefers younger mixed forest communities (Walters et al. 2020) such as those of the southwest and west study area, would likely experience more direct habitat loss due to the landfill expansion (regardless of expansion option) than other species within the area-sensitive guild. However, when considering the broader landscape context, the area of proposed woodland removal is relatively small compared to the area of habitat available, particularly to the north. It is anticipated that these species will persist either on or in the vicinity of the study area within these other suitable habitat areas. This expectation would need to be further assessed as part of future, more detailed impact studies, as it is known that overall reductions in forest cover on a landscape can cause the disappearance of certain area-sensitive species if forest cover falls below a certain threshold (Environment Canada 2013). Nonetheless, the landfill expansion is expected to result in a negative impact to the SWH function within the study area.

The degree of impact will vary among the three landfill expansion options. Option 3, which requires the most northerly woodland removal extent and overall largest habitat area removal, will impose the greatest degree of impact. This will include the farthest extents of woodland edge effects into the remaining adjacent woodlands due to the more northerly expansion limit. By contrast, Option 1 will remove habitat that is less likely to be occupied by the majority of these species and will afford more natural buffer of the more mature and interior portions of the on-site woodland habitat.

Another consequence of direct habitat removal that will result regardless of expansion scenario is an increase in negative edge effects on this group of bird species, particularly those that prefer more interior habitats. For example, this will include easier accessibility of predatory bird (e.g., Blue Jay (*Cyanocitta cristata*), American Crow) and mammal (e.g., Eastern Gray Squirrel (*Sciurus carolinensis*), Striped Skunk (*Mephitis mephitis*)) species that occupy edge habitats. It will also alter the microclimate of the new woodland edge areas and increase the accessibility of the obligate nest parasite Brown-headed Cowbird.

The removal of woodland area-sensitive bird breeding SWH cannot be effectively mitigated at the location of impact, particularly where indirect effects occur on more mature, interior forest habitat zones. Impacts to this habitat type should therefore be avoided or otherwise minimized to the extent possible. However, where impacts are unavoidable, compensation for the lost habitat can be considered through woodland habitat offsetting. This may provide a degree of mitigation at the broader landscape scale. It is recommended that this habitat offsetting be provided through implementation of the Significant Woodland compensation plantings and may also consider 'compensation lands', subject to consultation with review agencies (see Section 6.3.1). As for Significant Woodland, the woodland area-sensitive bird habitat offsetting should be located in as close a proximity to the affected area as possible to minimize negative effects on the local landscape, and should ideally build off an existing large core habitat feature in order to maintain the habitat size threshold requirements of certain species (recognizing that the woodland plantings will require several years to mature). These objectives will be achieved by establishing woodland compensation plantings within the north portion of the adjacent Town-owned agricultural field. These principles should also be followed in selecting a second compensation planting site (or compensation lands, subject to agency review), as will be required to achieve the full extent of required Significant Woodland compensation. Candidate woodland compensation sites, as well as the planting concept and implementation plan, should be reviewed and approved by the SVCA. See Section 7.0 for further discussion about proposed woodland restoration, enhancement and compensation measures.

Eastern Wood-Pewee Significant Wildlife Habitat

The proposed undertaking will require the partial removal of Eastern Wood-Pewee habitat within the study area. In particular, it will likely eliminate a portion of the FOD8-1/CUP3 woodland that was used as a breeding territory in the southwest corner of the study area. However, the degree of impact will depend on which expansion option is selected. Based on site

observations, the breeding territory within the southwest study area may have extended north of CUM1 (#2) (Map 2). Nevertheless, it is expected that any of the expansion options will result in the displacement of a breeding pair from that portion of the land. Suitable habitat for re-establishment of a new territory is abundant on the surrounding landscape. In addition to adjacent portions of the large woodland block, Eastern Wood-Pewees are known to breed in much smaller woodland features (e.g., <2ha) (Watt et al. 2020). On a broader landscape-scale the proposed undertaking is not expected to negatively impact Eastern Wood-Pewee habitat. However, impacts to individual birds must be mitigated by timing tree removal activities to the period outside of the April 1-August 31 breeding period, when individuals are less likely to occupy the site (see below).

Woodland Raptor Nesting Candidate Significant Wildlife Habitat

The FOD8-1, FOD6-3, and FOD5-2 (#1) woodland communities in the northeast corner of the study area were identified as Candidate SWH due to the potential for these features to be used as breeding habitat for Broad-winged Hawk. These woodland communities will not be directly impacted by the proposed undertaking. However, the proposed landfill expansion may indirectly impact these adjacent habitat zones. For example, Broad-winged Hawk is believed to prefer large tracts of contiguous forest (e.g., ≥100ha) (MNRF 2014c), although this species' sensitivity to habitat patch size is uncertain. The greater the area of proposed woodland removal (due to overall reduction in contiguous forest patch size) and the farther north the landfill expansion zone limit (due to the extent of indirect woodland edge zone influences into the forest interior), the greater the potential for impact to this habitat function in the study area. For this reason, it is recommended that woodland habitat removals be minimized to the extent possible, or to leave some forested buffer between the expanded landfill and the northeast study area woodland communities. Impacts to this habitat type can be offset through the woodland compensation planting plan described above for Significant Woodland and Woodland Area-Sensitive Bird Breeding SWH.

Other Wildlife Species

The proposed undertaking will require the removal of woodland habitat for various other wildlife species. The majority of other wildlife species documented within the study area are relatively common on the landscape; all species have secure (S5) or apparently secure (S4) populations in Ontario (MNRF 2021). Additional suitable habitat for these species is present elsewhere within the study area and on the surrounding landscape. Although some of these will be

displaced within the study area where habitat is removed, negative impacts to their local populations within the study area vicinity are not anticipated. Core habitat for species that utilize more mature forest communities, such as within the northeast portion of the study area, will be retained, as will the majority of the small wooded wetland habitat features.

The proposed landfill expansion will eliminate habitat for breeding anurans within wetlands and seasonally wet areas within woodland. This will include habitat located at ANR-002 (Map 2) where four anuran species were recorded. All three expansion options will require the removal of breeding habitat at ANR-004 and ANR-002, where Spring Peeper was recorded calling at full chorus. Anuran breeding habitat at ANR-003 (surveying the SWT2 (#2) wetland), where Spring Peeper was also recorded at full chorus, may also be impacted by changes to surface drainage patterns caused by the nearby Option 2 and 3 landfill expansion limits, unless appropriately mitigated. Removal of wooded anuran breeding habitats may be mitigated through the establishment of compensatory deciduous swamp and thicket swamp plantings, as part of the larger woodland compensation planting strategy, if feasible. The expanded landfill will also likely contain detention ponds and/or areas of impounded water (similar to the MAM2 and SWT2 (#1) wetlands) which, while relatively poor quality, may also provide suitable breeding habitat. This latter habitat type should not be considered suitable compensation for existing habitat removals.

Vegetation clearing has the potential to directly impact bird breeding activity through damage and destruction of nests, eggs and young, or avoidance of the area by breeding adults. Vegetation clearing should therefore occur outside the bird nesting season that extends approximately from April 1-August 31 so as to limit disturbances to nesting activities of birds and to avoid destruction of active nests. The destruction of migratory birds and their nests is prohibited under the federal *Migratory Birds Convention Act*.

Snake Habitats

As stated in Section 5.5.2, snake hibernaculum habitat was confirmed to exist within the study area, including within the landfill expansion zone, although the criteria (MNRF 2015) to be considered Reptile Hibernaculum SWH within the landfill expansion zone and adjacent 50m areas were not met based on the relatively low numbers of snake individuals documented in any given location, and because only one species (Eastern Gartersnake) was documented in those locations.

Despite the absence of SWH within the expansion zone, each of the proposed landfill expansion options has the potential to destroy snake hibernaculum habitat, and individual overwintering snakes, unless appropriate measures are taken to mitigate these impacts. Based on the inferred locations of snake hibernacula as shown on Map 4b, Options 2 and 3 will present the greatest potential for impact, whereas Option 1 will present lesser impact potential. The more northern expansion limit of Option 3 will likely result in a greater impact potential than Option 2, based on probability and the understanding that NRSI biologists did not identify all existing hibernacula, although the majority of the potential hibernaculum locations documented on-site were located within the Option 2 expansion zone. NRSI biologists documented fewer snakes within the Option 1 expansion zone during the early spring period, suggesting that there is lesser likelihood of widespread hibernaculum presence within that area, although these results should be interpreted with caution due to the difficulties in detecting snake presence and assessing hibernaculum locations/use.

In order to avoid injury or mortality of individual overwintering snakes, it is recommended that a timing window be observed for the initiation of any site alteration activities that would disturb the soils (e.g., grubbing, earth-moving, soil excavation). Specifically, soil disturbance activities should be avoided during the general overwintering period of approximately October 1-April 30, with specific timing dependent on seasonal temperatures in a given year. This timing window would apply throughout the landfill expansion zone, given the uncertainty on the precise locations of snake hibernacula within that zone.

This timing window should be implemented in conjunction with the bird and bat-related timing windows identified above (i.e., prohibition on tree and other vegetation removal during the period April 1-November 30). In order to observe these timing windows, the following strategy is recommended:

- Tree felling and other vegetation cutting should be completed during the winter period, comprising surface cuts only, when the ground surface is frozen in order to avoid disturbance of the soils and subsurface snake hibernacula. These activities will remove habitat for bats and nesting birds outside of their habitat protection timing windows.

- Tree root grubbing and other soil disturbance activities can occur by approximately May 1, as directed by a qualified biologist based on ambient temperatures, once it can be reasonably expected that snakes have emerged and dispersed from their hibernacula.

- Subject to consultation with a qualified biologist, soil disturbance activities during the first few weeks after emergence (e.g., May 1-15) should only proceed when daytime temperatures are considered sufficient (i.e., low wind, no precipitation, sunny or partly cloudy and ≥ 10 °C) to allow emerged basking snakes to safely disperse from their hibernaculum locations, as snakes typically spend the first few days of emergence basking at or near the hibernaculum entrance.

Once soils have been disturbed outside of the approximate October 1-April 30 window, after which snakes will have emerged from their hibernacula, it can be assumed that the habitat has been destroyed and the timing windows prohibiting soil disturbance will no longer apply to those areas moving forward. The snakes occupying those habitats will be forced to find new hibernaculum sites during the following fall.

Each of the three landfill expansion options will also remove good quality snake habitat for foraging, thermoregulation and movement, including the areas around SNK-001 and SNK-011, at which relatively higher numbers of snakes were observed across surveys. Other areas of good quality snake habitat in the northwest portion of the study area, such as around SNK-007, will be retained outside of each of the landfill expansion options. The majority of snakes observed on-site were Eastern Gartersnake, which is a habitat generalist species and relatively tolerant of adjacent human activity. This species will continue to occupy retained suitable habitat areas around the expanded landfill, as well as disturbed areas along its margins or within certain operational areas.

Saugeen Ojibway Nation Culturally Significant Wildlife Species

As described in Section 5.7, SON had identified the need to consider potential impacts to wildlife species of cultural significance and had specifically noted the Anishinaabe clan animals Black Bear and Snapping Turtle, as well as species of gull that use the landfill site (SON 2025). These species occupy and move across large areas of land in completion of their life cycles and biological requirements. The following is an assessment of how the proposed landfill expansion may impact these species in the context of their larger landscape habitat needs.

<u>Black Bear</u>

No direct observations of Black Bears were made within the study area during site investigations. However, bear tracks were observed within the study area forest, which provides indirect evidence of their presence and use of the study area. The study area is

generally located within the far southern extent of the Bruce Peninsula population of Black Bears (OMNR 2009). The Bruce Peninsula population of Black Bear is relatively small and is physically and genetically isolated from other Black Bear populations in southern and central Ontario. It is therefore at risk of extirpation due to increasing human pressures unless suitable habitat conservation and management strategies are implemented (Howe et al. 2007, Obbard et al. 2010).

Black Bears are well known to be attracted to landfills since they provide a year-round, readily accessible and high-calorie source of food (Stringham 1989). Bears may use landfills to supplement their natural food sources, such as during times when natural food sources are less available (Lewis et al. 2015). However, bears are known to become accustomed to, or sometimes reliant upon, landfills as a food source. Under these situations they can become habituated to human presence within the landfill and more willing to enter human-occupied areas. This can lead to increased encounters between bears and humans, presenting associated safety risks to the public and landfill personnel. Increased bear use and presence around landfills can also increase competition and conflict among multiple bear individuals (often sub-adult males) seeking to use the landfill resource (Stringham 1989). It may also increase risk of road mortality due to increased bear road crossings and vehicle collisions.

Due to the study area's location at the extreme southern limit of the Bruce Peninsula Black Bear population range, the occurrence and density of individuals in the general vicinity of the study area is likely low. This expectation is supported by Town records indicating that only one bear sighting within the Southampton Landfill has occurred during operating hours over the past five years (C. Saunders, Town of Saugeen Shores, pers. comm., February 2026). Despite the attractant that the landfill would represent for bears, the relatively low occurrence rate of bears within the study area that this record suggests indicates that bears infrequently venture to this far southern end of their range.

The woodland communities located north and west of the existing landfill operational area do provide various plants species that bears would forage on for soft and hard mast, such as Wild Strawberry, Downy Serviceberry, American Beech, Pin Cherry (*Prunus pensylvanica*), and Allegheny Blackberry. However, given the study area location at the edge of the population range, likely infrequent visitation by bears, and that the study area lacks key forage food sources such as blueberries, hazelnuts and oak tree acorns, suggests that the study area does not provide key foraging habitat for Black Bears. If Black Bears are present in the study area,

they are more likely there to visit the landfill while the adjacent woodland communities provide secondary benefit as foraging and movement/cover habitat. The proposed removal of woodland for the purposes of landfill expansion, regardless of which expansion option is chosen, is therefore not expected to negatively impact Black Bear habitat integrity or functional use within the broader species range. Higher quality bear habitat, comprising the denser and more mature forest communities (Obbard et al. 2010) north and northwest of the existing operational landfill area, will remain intact.

The greater potential for negative impact to Black Bears associated with the proposed landfill expansion is due to the potential for increased bear access/use of the landfill resource, and associated increases in human-bear conflicts. When bears are considered nuisance wildlife at landfills, they are often relocated; this method is often ineffective as bears may return to the area (Lewis et al. 2015; Witmer and Whittaker 2001). Bears may also be killed by wildlife management officers or other authorities if they present a danger to people due to having become habituated to human presence. Although bears may benefit in the short-term due to the high-calorie diet that they can obtain from garbage and food waste within the landfill, reliance on landfills as a food source can result in long-term negative outcomes for bears due to the poor nutritional content relative to natural sources, and contamination of these food sources by plastics, chemicals and other toxins (Towns 2021). For these reasons, landfills can be considered a population sink for Black Bears.

It is therefore recommended that measures be implemented to inhibit bear access to the landfill as part of the landfill expansion plans. Specifically, it is recommended that permanent chain-link fencing be installed around the west, north and east perimeters of the operational landfill area to mitigate bear entry into the site. The fencing should be of appropriate height (e.g., up to 3m) (Huijser et al. 2015), with an overhanging lip toward the natural feature side to inhibit climbing, and buried into the ground to inhibit individuals from digging under. New fencing around the landfill expansion area may be tied in to existing fencing around the existing landfill if it is considered suitable to inhibit bear entry. The installation of barrier fencing should be accompanied by waste management practices within the landfill that lessen the attractiveness of the site to bears, such as through minimizing open-air exposure of food and organic waste. Given the low frequency of bear occurrence within the study area, and because there is no evidence that bears have become habituated to the existing landfill operation, the installation of a barrier fence in combination with waste management best practices is expected to effectively mitigate bear entry and associated increased risks of human-bear conflict. These measures

should be monitored for effectiveness by tracking bear occurrences (direct observations or indirect evidence (e.g., tracks, scat)) within the landfill and an adaptive management approach should be taken to re-evaluate and modify these measures if necessary. For example, electrification of the barrier fencing may be considered if additional measures are considered warranted. Periodic inspection of the fencing will also be required to ensure that it is in good repair, and to remove overgrowing vegetation or other objects that enable bears to more easily climb over the fence.

Provided measures are taken or continued to minimize the attractiveness of the landfill site, such as by limiting the open exposure of food wastes, unhabituated bears that occasionally encounter the landfill site may not attempt to climb the barrier fence with top lip overhang. Provided these measures are successful, increases in human-bear conflicts or increased bear road mortality occurrences associated with the landfill expansion are not expected.

Snapping Turtle

Snapping Turtles were not observed within the study area during NRSI site investigations. However, their use of the study area cannot be completely ruled out due to the presence of treed swamp and pond habitats within the site (see Appendix IV). Despite the presence of suitable habitat, the availability of suitable habitat is relatively limited within the study area and restricted to small swamp features that are semi-isolated amongst more upland terrestrial features. Although Snapping Turtles may travel widely across a variety of natural community types to reach key habitat features such as nesting areas, they are unlikely to utilize the study area for this purpose. The study area does not contain suitable overwintering habitat and although some areas of turtle nesting substrate (e.g., open sandy soils) are present, no evidence of turtle nesting was observed on-site despite several site investigations. Conversely, the Saugeen River to the immediate north is more likely to provide Snapping Turtle habitat, such as for overwintering, foraging and for movement across the landscape.

Based on the results of NRSI's site investigations, there is no evidence that the area of proposed landfill expansion functions as an important Snapping Turtle habitat area, such as for nesting. Therefore, the proposed expansion is not expected to negatively impact Snapping Turtle habitat that exists on the broader landscape. The recommendation for permanent wildlife barrier fencing described above with respect to Black Bear inclusion would also be effective at excluding most Snapping Turtles. Adult Snapping Turtles would be inhibited by the chain-link fencing, and the recommendation for a buried skirt along the fence bottom would inhibit

individuals from digging under the fence. Injury or mortality effects to Snapping Turtle individuals that could arise from entry into an active landfill will therefore be mitigated.

Gulls

A relatively high diversity of gull species is known to use the study area and surrounding lands due to their proximity to Lake Huron. Eight species of gull have been recorded within 5km of the landfill site; of these, Ring-billed Gull (*Larus delawarensis*) and Herring Gull (*Larus argentatus*) were recorded in significantly higher abundances than other species, including within the landfill site itself (NAS 2026, eBird 2026). Gulls that maintain breeding habitat within Lake Huron shoreline and island habitats use the Southampton Landfill as predictable and permanent foraging site that supplements other food sources. The landfill site therefore represents an important site within a much larger landscape area that gulls travel within for foraging. The landfill supports local gull populations through all phases of their annual life cycle, including during breeding, dispersal, migration and overwintering periods. Large numbers of individuals may transit between the landfill and the Lake Huron shoreline, or to other areas, throughout the year. Herring Gulls have also been documented to use landfills for loafing and social interaction purposes (Belant et al. 1993).

The planned landfill expansion, regardless of expansion option, will not remove key habitat for gulls since the study area woodland features are not used by these species. Sensitive breeding habitat for these species are located off-site and will not be impacted. The expanded landfill site will continue to function as a supplemental foraging site, and the expansion is not expected to alter the behaviour or broader habitat use for gulls occupying the study area vicinity. Despite the future landfill expansion, planned operational improvements at the landfill site are expected to mitigate increases to gull use of the site that could otherwise occur within a larger landfill area. These operational improvements that are to be implemented over the coming years include efforts to maintain a smaller ‘active area’ of landfilling, and to implement a Source Separated Organics program that will reduce the volume of putrescible waste (A. Nelson, GEI Consultants Canada, February 2026, pers. comm.). With the implementation of these measures, gull abundances or densities at the landfill site are not expected to increase in conjunction with the planned expansion. However, if gull use of the site is found to increase despite these measures, deterrence measures may be considered if necessary. Nonetheless, the expanded landfill area is not expected to negatively affect gull populations in the vicinity.

Wildlife Movement Corridors

Naturally vegetated lands and corridors link the study area natural features with other natural features to the north, east, south and west. This ecological connectivity is strongest to the north where broad contiguous forest cover exists, while the connectivity is much more fragmented elsewhere. Most of these ecological connections to adjacent features will remain intact following future landfill expansion. Moreover, ecological connectivity between the study area and forested lands to the west will be markedly enhanced through the recommended woodland compensation plantings within the north end of the study area agricultural field, as discussed above. These plantings will build off of what is currently a relatively narrow (approximately 110m-wide) forested corridor that connects these lands.

The area of proposed expansion will sever a potential north-south wildlife movement corridor between the study area lands and forested and re-naturalizing lands to the south of Concession 14. This potential corridor may be utilized by species such as medium-to-large sized mammals (e.g., White-tailed Deer), although evidence of heavy deer use of that area of the lands was not observed. The future landfill expansion may present a barrier to overland movements for most species. However, the wildlife species that would use this north-south travel corridor are relatively resilient and adaptable in their movement paths, and do not require specific habitat conditions to sustain their ecological movements. It is therefore anticipated that these species would alter their north-south movement paths to avoid the expanded landfill area by crossing Concession 14 in a different location and travelling through the relatively open or wooded lands south of the road. No negative impacts to wildlife connectivity are therefore anticipated.

6.4 Indirect Impacts and Mitigations

Vegetation clearing, site grading and construction of the proposed landfill expansion has the potential to cause indirect impacts to adjacent natural features and functions if not mitigated appropriately. Detailed site plans for the future landfill expansion will be developed as part of a future planning stage. Therefore, the recommendations provided in this section are of a general nature to be incorporated into future construction mitigation planning.

6.4.1 Disturbance to Adjacent Natural Features and Wildlife Habitats

Vegetation clearing and other construction activities have the potential to inadvertently destroy, damage and degrade existing vegetation along the development limits unless the development limit boundaries are clearly marked. For example, construction activities can cause scarring and decreased health of adjacent trees whose branches or root systems have been damaged

by machinery or affected by construction-related dust and sedimentation. Damage to trees and other vegetation can also be caused by the compaction of soils within tree rooting zones along woodland edges.

Direct damage and indirect disturbances can cause stresses on the natural features that weaken their ecological integrity. In these states, natural features are more prone to establishment and proliferation of invasive, non-native species such as Common Buckthorn (*Rhamnus cathartica*) or Garlic Mustard (*Allilaria petiolata*). Proliferation of invasive, non-native species within natural communities decreases their ecological value such as by suppressing native species, diminishing biodiversity and reducing habitat suitability.

To limit ecological impacts during construction, clearly marked construction limits should be established to avoid unnecessary vegetation removal. Tree protection fencing must be installed where directed by a future Tree Protection Plan and must conform to municipal guidelines in terms of fencing type, signage requirements, etc. Protective tree fencing should be installed at least 1m from dripline where possible to adequately protect the root zone from soil compaction and other disturbances. All tree protection fencing must be installed prior to site alteration and construction activities, and inspected by a certified arborist or environmental inspector. Where tree protection fencing is not required along construction area limits, other forms of boundary demarcation should be used which may include silt fencing for erosion and sediment control purposes or brightly-coloured snow fencing.

Designated areas for construction lay-down, vehicle access and parking, equipment storage, materials stockpiling, and any on-site construction offices should be located away from the adjacent natural features to limit potential to indirectly impact the features.

6.4.2 Changes to Hydrological Regime

The future landfill expansion has the potential to alter the topography and drainage catchments that support the existence of the swamp wetland communities located within the adjacent natural features. These effects may be specific to the wetland features that are in closest proximity to the expansion zone (i.e., the Mineral Deciduous Swamp ecosite (SWD4) and Mineral Thicket Swamp (SWT2) communities #1 and #2; Map 5), depending on which expansion option is selected. These wetlands are anticipated to be entirely fed by surface water runoff and precipitation. Changes to their surrounding catchments by site clearing and grading, or by impounding caused by soil stockpiling or berm creation, may increase or decrease flows to

the features. For naturally-occurring wetland features it is recommended that efforts be made to achieve a water balance between pre- and post-expansion conditions, such that existing surface flow volume inputs are maintained, to the extent feasible. The SWT2 (#1) thicket swamp feature, which entirely exists as a result of landfill-related earthworks and runoff impounding, is not considered a sensitive or significant wetland feature; maintenance of a water balance for this feature is considered unnecessary.

6.4.3 Sedimentation and Erosion

During vegetation removal and site grading activities, as well as during operation of the expanded landfill, areas of bare soil will be exposed which have the potential to erode during rainfall events and flow into the adjacent natural features. Increased stormwater surface flow and erosion processes may cause the deposition of sediments onto down-slope vegetation, ultimately causing vegetation die-back or impaired health.

Soil compaction also has potential to occur as a result of heavy machinery operation within the landfill. Soil compaction can greatly reduce the permeability of soils and affect their ability to retain water during rain/snow melt events. This will result in an increase in surface water run-off which will ultimately increase the erosion potential and the amount of sediment being transported into adjacent areas.

In order to protect on-site and adjacent natural features from potential impacts due to sediment, an Erosion and Sediment Control (ESC) Plan must be developed prior to any site alteration or construction for the purposes of the landfill expansion. The primary principles associated with ESC protection measures are to: (1) minimize the duration of soil exposure, (2) retain existing vegetation, where feasible, (3) encourage re-vegetation, (4) divert runoff away from exposed soils, (5) keep runoff velocities low, and (6) trap sediment as close to the source as possible.

A detailed ESC Plan must be prepared during future design planning for the landfill expansion. Detailed ESC recommendations will be provided at that time. Required measures will include the installation of geotextile silt fencing around the perimeter of the landfill area to prevent the off-site migration of water-borne sediments. Areas of required silt fencing will be detailed on the future ESC Plan, as will requirements for regular monitoring and maintenance of the silt fencing. Areas of silt fencing may be required for longer-term periods for portions of the landfill that will contain bare soils for longer durations of time (e.g., due to landfilling activities). In these areas,

periodic full replacement of silt fence sections may be required since the geotextile material degrades over time and becomes less effective.

Areas of bare soil that are no longer under active landfilling activities should be stabilized with a standard nurse crop (e.g., Annual Oats (*Avena sativa*), Annual Rye (*Lolium multiflorum*), or White Millet (*Panicum miliaceum*)) or a native seed mix. Materials stockpiles should be located away from adjacent natural features, or otherwise surrounded with silt fencing to capture sediment runoff.

6.4.4 Water Quality Impacts

Decreases in water quality, such as through discharge of deleterious substances in stormwater runoff, can cause both acute and chronic toxicity impacts within biological communities. These impacts include increased mortality rates, impaired health conditions, decreased reproductive productivity and other reproductive impairments in wildlife. Environmental contaminants are also known to biomagnify 'up the food chain' where higher-level predators are particularly susceptible to impacts. The adjacent natural features may be subject to runoff or leaching of contaminated surface or subsurface water flows from the expanded landfill if not appropriately controlled and mitigated.

A robust pollutant containment and control plan will be incorporated into future design of the expanded landfill facility. These plans must ensure that runoff is prevented from entering the adjacent natural features unless adequately treated to the satisfaction of the regulatory agencies. Other measures will be required to ensure that the quality of groundwater is not compromised. Regardless of which expansion option is selected, a comprehensive plan incorporating proven methodologies and technologies at pollution control will be required. Implementation of this plan, coupled with regular monitoring and adaptive management, should adequately mitigate the potential for water quality impacts on the adjacent natural features.

6.5 Induced Impacts and Mitigations

Induced impacts associated with the proposed landfill expansion are primarily associated with the introduction of additional noise, vibrations, dust and human presence adjacent to natural features and habitats that were previously not subject to these disturbances. Noise and vibration disturbances can be mitigated by limiting landfilling activities to daylight hours so as to avoid disturbances to adjacent wildlife roosting habitats and other sensitive nighttime wildlife activities (e.g., amphibian breeding, bat foraging).

Some degree of wildlife species disturbance may be unavoidable, and bird species that are generally more disturbance-sensitive (e.g., species that occupy more interior forest areas) may avoid portions of the new woodland edge and/or may be displaced further away from the expanded landfill. However, it is expected that the majority of species observed in the study area will be tolerant of some degree of disturbance and will continue to use the adjacent natural features. Black Bears, which are known to occur within the study area, may be more attracted to the site once the larger landfill area is established.

Any exterior artificial lighting should be turned off at night, or otherwise be directed away from the adjacent natural features. Exterior lighting fixtures should be downward-casting and Dark Sky-certified (Dark Sky International 2022) to mitigate light pollution effects.

Operation of the expanded landfill may cause dust-related effects on the adjacent natural features. The effects of dust can include the following:

- Changes in vegetation due to increased heat absorption and decreased transpiration,
- Immediate visual impacts.

Impacts due to dust should be mitigated for by moistening areas of bare, dry soil with water as needed during operation of the landfill to reduce the amount of dust produced.

The potential for human encroachment impacts within the adjacent natural features associated with the landfill operation are considered low. However, there is a high degree of potential disturbance associated with the effects of wind-blown debris deposition within adjacent portions of the natural features. NRSI biologists observed much debris within portions of the natural feature edges facing the existing landfill area. In order to mitigate both human encroachment and debris deposition (both intentional and natural/wind-blown), it is recommended that permanent chain-link fencing be installed along the perimeter of the landfill zone facing the natural areas. A portion of this fencing may be installed with a less permeable covering on the landfill side (i.e., with smaller openings than standard chain-link) in order to minimize the amount of small debris that can pass through chain-link fencing. The fencing, as well as the adjacent natural feature edges, should be checked on a periodic basis to remove accumulated debris.

6.6 Comparative Assessment of Landfill Expansion Option Impacts

Certain anticipated impacts described above may vary in terms of the degree of impact imposed on the adjacent natural features depending on whether landfill expansion Option 1, 2 or 3 is selected. For example, this variation may occur in regards to the severity, duration, extent or frequency of the impact. The variation in impact is primarily a function of the size of the natural area being removed and the degree and extent of disturbance to retained natural areas and habitats as a result of the expansion limits. The following is a summary of differential impact potential associated with each landfill expansion option.

Table 7. Comparative assessment of impact potential across landfill expansion options.

Impact Type	Landfill Expansion Option		
	Option 1	**Option 2**	**Option 3**
Removal of Significant Woodland	• 8.27ha of Significant Woodland will require removal • FOD8-1/CUP3 to be removed • The area of woodland to be removed represents the most fragmented portion of the study area woodland; is early successional woodland	• 14.05ha of Significant Woodland will require removal • FOD8-1/CUP3 and a small SWD4 community to be removed • The area of woodland to be removed is less fragmented by existing land uses; is early successional woodland	• 15.42ha of Significant Woodland will require removal • FOD8-1/CUP3 and a small SWD4 community to be removed • The area of woodland to be removed is less fragmented by existing land uses; is early successional woodland
Mitigation Strategy	• *Woodland removal to be offset by woodland compensation planting within the adjacent agricultural field and at another appropriate site to be selected.* • *Based on a 2:1 compensation ratio, at least 16.5ha of woodland compensation planting will be required.* • *This compensation strategy may include Town acquisition and permanent protection of existing forested land cover.*	• *Woodland removal to be offset by woodland compensation planting within the adjacent agricultural field and at another appropriate site to be selected.* • *Based on a 2:1 compensation ratio, at least 28.1ha of woodland compensation planting will be required.* • *This compensation strategy may include Town acquisition and permanent protection of existing forested land cover.*	• *Woodland removal to be offset by woodland compensation planting within the adjacent agricultural field and at another appropriate site to be selected.* • *Based on a 2:1 compensation ratio, at least 30.8ha of woodland compensation planting will be required.* • *This compensation strategy may include Town acquisition and permanent protection of existing forested land cover.*
Removal of Locally Significant Wetlands	• No Locally Significant Wetland will require removal	• 1.00ha of locally significant SWD4 swamp wetland will require removal	• 1.00ha of locally significant SWD4 swamp wetland will require removal
Mitigation Strategy	• *None required; however, see below re. replacement of anuran breeding habitat*	• *The woodland compensation planting area should include an area designed to replicate deciduous swamp where feasible.* • *The ratio of wetland area compensation to be at least 2:1; to be confirmed through agency consultation*	• *The woodland compensation planting area should include an area designed to replicate deciduous swamp where feasible.* • *The ratio of wetland area compensation to be at least 2:1; to be confirmed through agency consultation*

Impact Type	Landfill Expansion Option		
	Option 1	**Option 2**	**Option 3**
Increase in edge effects/reduction in interior forest habitat	• No loss of the current 14.22ha of interior forest habitat within the study area • Least extent of edge effects into the woodland as a result of the new woodland edge.	• 2.62ha of interior forest habitat will be lost through indirect edge effects of new woodland edge.	• 3.50ha of interior forest habitat will be lost through indirect edge effects of new woodland edge. • Greatest extent of edge effects into the woodland as a result of the new woodland edge.
Mitigation Strategy	• *Edge Management Plan to be developed and implemented for new woodland edge.* • *Implement construction- and operational-stage mitigation measures to minimize effects of artificial light, noise, dust, etc. on adjacent woodland communities.*	• *Loss of interior forest habitat cannot be effectively mitigated at the site of impact.* • *Within the broader landscape, particularly if in proximity to the study area, negative effects can be mitigated over the long-term through the 28.1ha woodland compensation planting plan, if building off of large core forest features.* • *Edge Management Plan to be developed and implemented for new woodland edge.* • *Implement construction- and operational-stage mitigation measures to minimize effects of artificial light, noise, dust, etc. on adjacent woodland communities.*	• *Loss of interior forest habitat cannot be effectively mitigated at the site of impact.* • *Within the broader landscape, particularly if in proximity to the study area, negative effects can be mitigated over the long-term through the 30.8ha woodland compensation planting plan, if building off of large core forest features.* • *Edge Management Plan to be developed and implemented for new woodland edge.* • *Implement construction- and operational-stage mitigation measures to minimize effects of artificial light, noise, dust, etc. on adjacent woodland communities.*
Alterations to wetland drainage catchments	• Least potential to alter drainage catchments due to greater distance between landfill expansion edge and retained wetlands	• Greater potential to alter drainage catchments of adjacent retained wetlands; landfill expansion up to 30m from retained wetland features.	• Greatest potential to alter drainage catchments of adjacent retained wetlands; landfill expansion up to 30m from retained wetland features.
Mitigation Strategy	• *To be determined based on future water balance analysis*	• *To be determined based on future water balance analysis*	• *To be determined based on future water balance analysis*
Removal of Significant Vegetation Species	• Will require removal of Early Goldenrod • May require removal of Downy Serviceberry	• Will require removal of Early Goldenrod • Will require removal of Whorled Milkweed • May require removal of Downy Serviceberry	• Will require removal of Early Goldenrod • Will require removal of Whorled Milkweed • May require removal of Downy Serviceberry

Impact Type	Landfill Expansion Option		
	Option 1	**Option 2**	**Option 3**
Mitigation Strategy	• *No mitigation required for Early Goldenrod removal* • *Downy Serviceberry to be replanted in suitable locations and monitored for successful establishment*	• *No mitigation required for Early Goldenrod removal* • *Whorled Milkweed and Downy Serviceberry to be replanted in suitable locations and monitored for successful establishment*	• *No mitigation required for Early Goldenrod removal* • *Whorled Milkweed and Downy Serviceberry to be replanted in suitable locations and monitored for successful establishment*
Impacts to SAR Bat Habitat and Individuals	• Will result in the removal of Little Brown Myotis and Silver-haired Bat maternity roosting habitat, and potential Tri-colored Bat, Eastern Red Bat and Hoary Bat maternity roosting habitat. • Will result in the least amount of habitat removal. • Least potential to result in adverse impacts to Little Brown Myotis, Silver-haired Bat, Eastern Red Bat and Hoary Bat based on a lower number of recorded call sequences (i.e., lower activity) identified to the species during the acoustic monitoring period within one hour after sunset at stations located in Option 1. • High potential to result in adverse impacts to Tri-colored Bat based on the highest number of recorded call sequences identified to the species within one hour after sunset at stations in Option 1, and the removal of a vegetation community (CUP3) identified as having potential high quality roost habitat (i.e., ≥10 roost trees/ha) for the species. • May require a C-permit under the ESA.	• Will result in the removal of Little Brown Myotis and Silver-haired Bat maternity roosting habitat, and potential Tri-colored Bat, Eastern Red Bat, and Hoary Bat maternity roosting habitat. • Will result in a greater amount of habitat removal • Greater potential to result in adverse impacts to Little Brown Myotis, Silver-haired Bat, Eastern Red Bat, and Hoary Bat based on higher numbers of recorded call sequences (i.e., higher bat activity) identified to the species within one hour after sunset at acoustic monitoring stations in Option 2. • In comparison to Option 1, not likely to result in greater adverse impacts to Tri-colored Bat due to a low number of recorded call sequences identified to the species within one hour after sunset at stations located in Option 2, and the calculation of a low roost tree density (0.86 roost trees/ha). • May require a C-permit under the ESA.	• Will result in the removal of Little Brown Myotis and Silver-haired Bat maternity roosting habitat, and potential Tri-colored Bat, Eastern Red Bat, and Hoary Bat maternity roosting habitat. • Will result in the greatest amount of habitat removal • Greatest potential to result in adverse impacts to Little Brown Myotis, Silver-haired Bat, Eastern Red Bat, and Hoary Bat based on higher numbers of recorded call sequences (i.e., higher bat activity) identified to the species within one hour after sunset at acoustic monitoring stations in Option 3. In comparison to Option 2, Option 3 was also determined to have the highest roost tree density for Little Brown Myotis and Silver-haired Bat. • Greatest potential to result in adverse impacts to Tri-colored Bat based on higher numbers of recorded call sequences identified to the species within one hour after sunset at acoustic monitoring stations in both Options 1 and 3. A low roost tree density was determined for Option 3, which suggests that this Option may not result in greater adverse impacts to roosting habitat in contrast to Option 1 and 2.

Impact Type	Landfill Expansion Option		
	Option 1	**Option 2**	**Option 3**
			• May require a C-permit under the ESA.
Mitigation Strategy	• *To be determined in consultation with MECP* • *Habitat removals to be timed outside of the bat active period (April 1 – November 30) to avoid impacts on individuals* • *Potential habitat removal to be offset through 16.5ha compensatory woodland plantings at off-site locations* • *Potential Little Brown Myotis roost habitat removal to be temporarily offset through installation and monitoring of artificial roost structures* • *Potential foraging and flyway habitat removal to be offset through the design of appropriate buffers, woodland edges and canopy openings in retained and restored woodland habitats* • *Post-construction acoustic monitoring can be considered to assess the effectiveness of mitigation measures*	• *To be determined in consultation with MECP* • *Habitat removals to be timed outside of the bat active period (April 1 – November 30) to avoid impacts on individuals* • *Potential habitat removal to be offset through 28.1ha compensatory woodland plantings at off-site locations* • *Potential Little Brown Myotis roost habitat removal to be temporarily offset through installation and monitoring of artificial roost structures* • *Potential foraging and flyway habitat removal to be offset through the design of appropriate buffers, woodland edges and canopy openings in retained and restored woodland habitats* • *Post-construction acoustic monitoring can be considered to assess the effectiveness of mitigation measures*	• *To be determined in consultation with MECP* • *Habitat removals to be timed outside of the bat active period (April 1 – November 30) to avoid impacts on individuals* • *Potential habitat removal to be offset through 30.8ha compensatory woodland plantings at off-site locations* • *Potential Little Brown Myotis roost habitat removal to be temporarily offset through installation and monitoring of artificial roost structures* • *Potential foraging and flyway habitat removal to be offset through the design of appropriate buffers, woodland edges and canopy openings in retained and restored woodland habitats* • *Post-construction acoustic monitoring can be considered to assess the effectiveness of mitigation measures*
Impacts to Woodland Area-Sensitive Bird Breeding SWH	• Will result in the least amount of overall woodland habitat size (8.27ha) • Area of woodland to be removed least likely to negatively affect area-sensitive birds • Least extent of woodland edge effects on interior habitat	• Will result in a greater amount of woodland habitat reduction (14.05ha) • Removal may cause displacement of area-sensitive bird breeding habitat • Greater extent of woodland edge effects on interior habitat	• Will result in the greatest amount of woodland habitat reduction (15.42ha) • Removal may cause displacement of area-sensitive bird breeding habitat • Greatest extent of woodland edge effects on interior habitat
Mitigation Strategy	• *Loss of area-sensitive woodland bird habitat cannot be effectively mitigated in the short term* • *Woodland habitat removal to be offset through 16.5ha compensatory*	• *Loss of area-sensitive woodland bird habitat cannot be effectively mitigated in the short term* • *Woodland habitat removal to be offset through 28.1ha compensatory*	• *Loss of area-sensitive woodland bird habitat cannot be effectively mitigated in the short term* • *Woodland habitat removal to be offset through 30.8ha compensatory*

Impact Type	Landfill Expansion Option		
	Option 1	**Option 2**	**Option 3**
	woodland plantings at off-site locations	*woodland plantings at off-site locations*	*woodland plantings at off-site locations*
Impacts to Eastern Wood-Pewee SWH	• Will require the least amount of habitat removal, but is expected to displace a breeding territory.	• Will require a greater amount of habitat removal, and is expected to displace a breeding territory	• Will require the greatest amount of habitat removal, and is expected to displace a breeding territory
Mitigation Strategy	• *Woodland habitat removal to be offset through 16.5ha compensatory woodland plantings at off-site locations*	• *Woodland habitat removal to be offset through 28.1ha compensatory woodland plantings at off-site locations*	• *Woodland habitat removal to be offset through 30.8ha compensatory woodland plantings at off-site locations*
Impacts to Woodland Raptor Nesting SWH	• Least potential for habitat impact due to smaller area of woodland habitat removal and greater offset of landfill expansion limit to core habitat in northeast	• Greater potential for habitat impact due to larger area of woodland habitat removal and less offset of landfill expansion limit to core habitat in northeast	• Greatest potential for habitat impact due to largest area of woodland habitat removal and less offset of landfill expansion limit to core habitat in northeast
Mitigation Strategy	• *Woodland habitat removal to be offset through 16.5ha compensatory woodland plantings at off-site locations*	• *Woodland habitat removal to be offset through 28.1ha compensatory woodland plantings at off-site locations*	• *Woodland habitat removal to be offset through 30.8ha compensatory woodland plantings at off-site locations*
Impacts to Snake Habitats	• Presents the least potential for impacts to habitat due to smallest expansion size • Will require the removal of 2 inferred locations of (non-SWH) Eastern Gartersnake hibernacula • Will require removal of good quality snake habitat (e.g., SNK-001, SNK-007)	• Presents a greater potential for impacts to habitat • Will require the removal of 7 inferred locations of (non-SWH) Eastern Gartersnake hibernacula • Will require removal of good quality snake habitat (e.g., SNK-001, SNK-007)	• Presents the greatest potential for impact to habitat due to largest expansion size • Will require the removal of 9 inferred locations of (non-SWH) Eastern Gartersnake hibernacula • Will require removal of good quality snake habitat (e.g., SNK-001, SNK-007)
Mitigation Strategy	• *Site alteration activities within the landfill expansion zone that will result in soil disturbance should be completed outside of the snake overwintering period of approximately October 1-April 30, depending on seasonal temperatures.* • *Trees and other vegetation should be removed (via surface cuts only) within the landfill expansion zone during the winter period when soils are frozen.*	• *Site alteration activities within the landfill expansion zone that will result in soil disturbance should be completed outside of the snake overwintering period of approximately October 1-April 30, depending on seasonal temperatures.* • *Trees and other vegetation should be removed (via surface cuts only) within the landfill expansion zone during the winter period when soils are frozen.*	• *Site alteration activities within the landfill expansion zone that will result in soil disturbance should be completed outside of the snake overwintering period of approximately October 1-April 30, depending on seasonal temperatures.* • *Trees and other vegetation should be removed (via surface cuts only) within the landfill expansion zone during the winter period when soils are frozen.*

Impact Type	Landfill Expansion Option		
	Option 1	**Option 2**	**Option 3**
	Tree grubbing, earth-moving, excavation and other soil disturbance activities can occur by approximately May 1, as directed by a qualified biologist based on ambient temperatures. • *Subject to consultation with a qualified biologist, soil disturbance activities during the first few weeks after snake emergence (e.g., May 1-15) should only proceed when daytime temperatures are considered sufficient that would allow emerged basking snakes to safely disperse from their hibernaculum locations*	*Tree grubbing, earth-moving, excavation and other soil disturbance activities can occur by approximately May 1, as directed by a qualified biologist based on ambient temperatures.* • *Subject to consultation with a qualified biologist, soil disturbance activities during the first few weeks after snake emergence (e.g., May 1-15) should only proceed when daytime temperatures are considered sufficient that would allow emerged basking snakes to safely disperse from their hibernaculum locations*	*Tree grubbing, earth-moving, excavation and other soil disturbance activities can occur by approximately May 1, as directed by a qualified biologist based on ambient temperatures.* • *Subject to consultation with a qualified biologist, soil disturbance activities during the first few weeks after snake emergence (e.g., May 1-15) should only proceed when daytime temperatures are considered sufficient that would allow emerged basking snakes to safely disperse from their hibernaculum locations*
Impacts to Other Wildlife Species	• Least effect on wildlife species in general, although certain species may be displaced • Allows greatest buffer of landfill expansion to core/interior forest habitat in the northeast • Will require removal of good quality anuran breeding habitat (e.g., ANR-002, ANR-004).	• Greater effect on wildlife species in general; certain species may be displaced • Allows less buffer of landfill expansion to core/interior forest habitat in the northeast • Will require removal of a larger amount of anuran breeding habitat, including good quality habitat at ANR-002, ANR-004, ANR-003	• Greatest effect on wildlife species in general; certain species may be displaced • Allows less buffer of landfill expansion to core/interior forest habitat in the northeast • Will require removal of a larger amount of anuran breeding habitat, including good quality habitat at ANR-002, ANR-004, ANR-003
Mitigation Strategy	• *Habitat removal to be offset through 16.5ha compensatory woodland plantings at off-site locations* • *Compensation woodland planting within the north end of the study area agricultural field will enhance the overall size of the surrounding forest block, and buffer adjacent areas of forest from landfill-related disturbances, over the long term.* • *Replicate wetland habitat to the extent possible within woodland compensation planting areas*	• *Habitat removal to be offset through 28.1ha compensatory woodland plantings at off-site locations* • *Compensation woodland planting within the north end of the study area agricultural field will enhance the overall size of the surrounding forest block, and buffer adjacent areas of forest from landfill-related disturbances, over the long term.* • *Replicate wetland habitat to the extent possible within woodland compensation planting areas*	• *Habitat removal to be offset through 30.8ha compensatory woodland plantings at off-site locations* • *Compensation woodland planting within the north end of the study area agricultural field will enhance the overall size of the surrounding forest block, and buffer adjacent areas of forest from landfill-related disturbances, over the long term.* • *Replicate wetland habitat to the extent possible within woodland compensation planting areas*

Impact Type	Landfill Expansion Option		
	Option 1	**Option 2**	**Option 3**
	• *Habitat removals to be timed to avoid/minimize impacts on individuals*	• *Habitat removals to be timed to avoid/minimize impacts on individuals*	• *Habitat removals to be timed to avoid/minimize impacts on individuals*
Construction Disturbance to Adjacent Natural Features	• Each landfill expansion option presents the same potential for construction-stage disturbances to adjacent features		
Mitigation Strategy	• *Clear demarcation of vegetation clearing and grading limits* • *Proper placement of tree protection fencing* • *Storage, parking, stockpiling areas, etc. to be located away from adjacent natural features*		
Changes to Hydrological Regime	• Least potential to alter drainage catchments of retained wetlands due to greater distance between landfill expansion edge and wetlands	• Greater potential to alter drainage catchments of retained wetlands due to less distance between landfill expansion edge and wetlands	• Greater potential to alter drainage catchments of retained wetlands due to less distance between landfill expansion edge and wetlands
Mitigation Strategy	• *To be determined based on future water balance analysis*	• *To be determined based on future water balance analysis*	• *To be determined based on future water balance analysis*
Sedimentation and Erosion	• Each landfill expansion option presents the same potential for erosion of bare soils and sedimentation of downslope vegetation		
Mitigation Strategy	• *To be detailed in a future ESC Plan*		
Water Quality Impacts	• Each landfill expansion option presents the same potential for release of contaminants/pollutants to adjacent features unless properly mitigated		
Mitigation Strategy	• *A Hydrogeological Investigation is being completed. This will review the potential impacts to groundwater and surface water resources and will propose a set of mitigative measures to address the potential impacts identified.*		
Landfill operational-stage disturbances to natural features and wildlife	• Each landfill expansion option will result in wind-blown deposition of garbage/debris, and introduce additional sensory disturbances to wildlife within the natural area that were previously less exposed to these. • Will impose the least spatial extent of disturbance based on the smaller landfill footprint	• Each landfill expansion option will result in wind-blown deposition of garbage/debris, and introduce additional sensory disturbances to wildlife within the natural area that were previously less exposed to these. • Will impose a greater spatial extent of disturbance based on the larger landfill footprint	• Each landfill expansion option will result in wind-blown deposition of garbage/debris, and introduce additional sensory disturbances to wildlife within the natural area that were previously less exposed to these. • Will impose the greatest spatial extent of disturbance based on the largest landfill footprint
Mitigation Strategy	• *Restrict landfilling activities to daytime periods only* • *Direct artificial lighting away from natural areas* • *Implement dust control measures* • *Install permanent fencing around landfill perimeter, including additional measures to capture and contain wind-blown garbage*		

7.0 Restoration and Enhancement

Creation of the landfill expansion area may result in perimeter areas of the expansion that require site alteration/grading but are not integral to the future operation of the landfill. These perimeter areas should be restored with a native seed mix and native woody vegetation plantings in accordance with a future Restoration Planting Plan. In combination with efforts to retain existing tree growth within the landfill expansion area perimeter to the extent feasible, these restoration measures will help to create a naturalized transition between the landfill operations area and the adjacent retained natural features. Native seeding and planting should also be established within the landfill operational area where these can be accommodated (e.g., along interior roads).

A Woodland Edge Management Plan will be required to restore and stabilize the new woodland edge that is created by the north side of the landfill expansion. This plan will generally include, but not be limited to, the following:

- a detailed planting plan for native tree and shrub plantings, and native seed mix application, to create a new and robust natural woodland edge that transitions out from the cut edge;
    - inclusion of woodland edge design measures that benefit bats, including vegetation structural diversity;
- removal of hazard trees, including newly exposed trees that are susceptible to wind throw;
- thinning of tree growth, where necessary, to incorporate the above plantings and to increase diversity;
- invasive species management, if warranted; and,
- installation of wildlife habitat features as a form of habitat enhancement, where beneficial.

A woodland planting compensation plan will be required to offset the removal of Significant Woodland within the study area. Woodland compensation tree plantings must be of a density that meets or exceeds the definition of “woodland” (see Section 6.3.1) and comprises a diversity of native species that are conducive to the site conditions. The woodland compensation plantings should be in relative proximity to the area of woodland removal so that over the long

term a net gain in woodland cover can be achieved in the same area of landscape. It should also reflect the landscape context of the study area woodland as best as possible to maintain the landscape-level functional values that it provides. This can be achieved in part through planting up northern portions of the adjacent agricultural field as contribution toward the overall compensation requirement.

The woodland planting area should emulate a natural woodland to the extent possible. This should include pre-planting pit-and-mound site preparation to create an irregular topography reminiscent of shallow depressions created by tree falls. These depressions may also serve to replicate the wet conditions existing in the study area forest that provide anuran breeding habitat, or have established as wetland features. Selected seed species and woody plantings for these depressional areas will be appropriate to wetter conditions. The woodland compensation area should also incorporate various wildlife microhabitat features (e.g., woody debris piles for snakes; bat artificial roost structures) to enhance its value as wildlife habitat. The woodland planting area will also be designed with the aim of replacing lost habitat functionality, such as for bats, area-sensitive forest birds and woodland-nesting raptors. Some of these objectives are long-term and will not be realized until established tree growth further matures. Where feasible, the planting plan should incorporate varying tree densities across the planting area, such that some patches of more open habitat result that would benefit certain wildlife species (e.g., snakes, bats, edge-tolerant birds). The compensation planting details, including appropriate locations, selected species and restoration methods, will be developed in conjunction with agency staff and will be detailed in a Woodland Compensation Planting Plan.

8.0 Summary

NRSI was retained by GEI Consultants Canada, on behalf of the Town of Saugeen Shores, to complete a NEA associated with the proposed expansion of the Southampton Landfill. The NEA is required to characterize the existing natural features and ecological functions of the site, and to assess the significance and sensitivity of the natural features in order to inform constraints and opportunities for landfill expansion planning. A preliminary impact assessment was undertaken for three landfill expansion plans (or Options), all of which would comprise an expansion of existing landfill operations to the west within the Town-owned lands. Each expansion option primarily varies with respect to its northern expansion limit within the lands. A high-level comparative impact assessment was undertaken for these three options based on the assessment of natural feature characteristics and ecological function, and their significance and sensitivity to disturbance. The results of this assessment will be carried forward for use in a future EA that will guide planning for the landfill expansion.

The majority of the study area's natural features represent Significant Woodland that comprises one part of a larger expanse of woodland that exists on the surrounding landscape. This large woodland complex includes interior forest habitat that exists within the northern portion of the study area and, together with contiguous off-site woodland, supports habitat specialist species that rely on large landscape-scale habitat patches and interior forest conditions. However, western and southern portions of the on-site woodland are comparatively younger and include more open habitat conditions. The southern extent of the on-site woodland is highly fragmented and subject to disturbances caused by the existing landfill site operations.

Surface water drainage within the site is limited to largely undefined ephemeral flows within topographically low areas and a historically-dug drainage channel. Small wetland features have arisen within these topographically lower areas. Multiple wetlands and wet areas within the study area have directly resulted from landfill site alterations (e.g., earth berming and impoundment of water).

Evidence of potential roosting habitat, including maternity colony roosting, for the SAR Little Brown Myotis and Silver-haired Bat, was observed throughout the monitored/surveyed portions of the on-site woodland. However, the likelihood of nearby roosting habitat for these species varies at different locations within the woodland based on the results of passive acoustic monitoring and targeted bat habitat assessments. Future consultation with MECP will be required to determine the need for future actions, authorizations or permitting to ensure that the

proposed landfill expansion is carried out in conformance with the ESA or the future *Species Conservation Act*.

Two forms of SWH that are of consequence to the landfill expansion plans were identified: Woodland Area-sensitive Bird Breeding Habitat and Habitat for the SCC Eastern Wood-Pewee. Field studies confirmed the presence of snake overwintering hibernacula for Eastern Gartersnake within the study area. Although these hibernacula did not meet criteria to be considered SWH and there are no policy-based protections for the hibernaculum habitat features themselves, it is recommended that initial site alteration activities within the landfill expansion zone that would disturb soils (e.g., earth-moving, excavation) be maintained outside of the snake overwintering period to avoid injury or mortality of individual snakes.

An important means of mitigating the anticipated impacts that will result from the landfill expansion, affecting multiple aspects of the site's ecological importance, will be to offset the loss of habitat through compensatory woodland plantings at a 2:1 area-based ratio. A portion of this woodland compensation area should be established within the northern portion of the Town-owned agricultural field that will fall outside of the landfill expansion zone. One or more additional properties will be required on which to establish the remainder of the required woodland compensation area. The woodland compensation plan should be designed to achieve multiple objectives in replicating or emulating woodland characteristics (e.g., structural diversity, species composition, surface topography) that support various ecological functions that may be impacted by the landfill expansion. Recommendations have been provided to guide the development of a future woodland restoration plan. Subject to agency consultation, the compensation strategy may also include the acquisition and permanent protection of one or more properties with existing natural feature cover by the Town. This may present opportunities to incorporate forested communities into a broader landscape-level conservation strategy, such as to create large-scale ecological corridors, particularly where those properties may otherwise have been considered for other land use plans.

Based on the results of the NEA's comparative assessment of impact potential among the expansion options, overall, Option 3 presents the greatest degree of natural environment impact on the natural features and ecological functions within the study area. Conversely, Option 1 presents the least potential for impacts. Various recommendations have been provided to avoid, minimize or mitigate impacts which should be considered as part of future landfill design, and construction and operational planning.

It is recommended that the effects of landfill expansion on the adjacent retained wetlands, including potential changes in site drainage and water balance, be assessed as part of future supplemental work to inform mitigation strategies or SVCA regulatory approvals.

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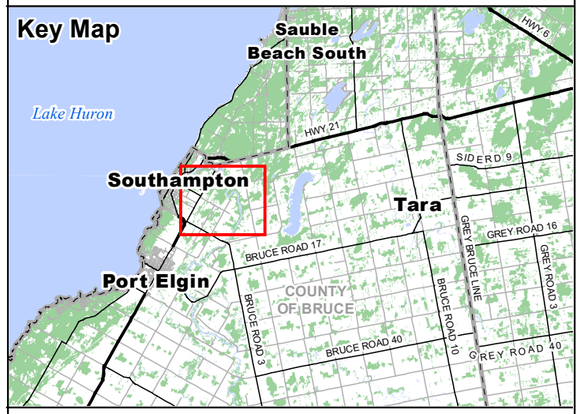
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Maps

Map 1

Southampton Landfill NEA

Study Area and Natural Features



Legend

- Property Parcel
- Study Area (Boundary Approximate)
- Utility Line
- Highway
- Primary Road
- Secondary Road
- Permanent Watercourse
- Intermittent Watercourse
- Water Body

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

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Project: 2559
Date: December 30, 2025

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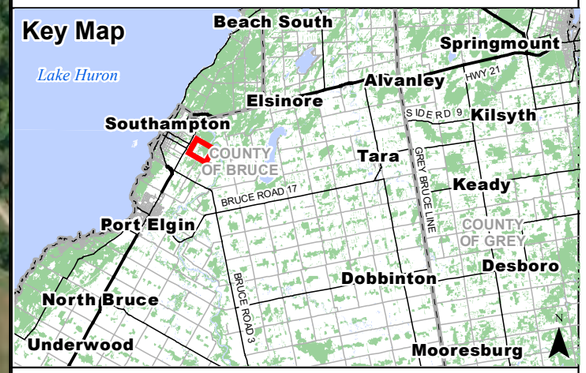
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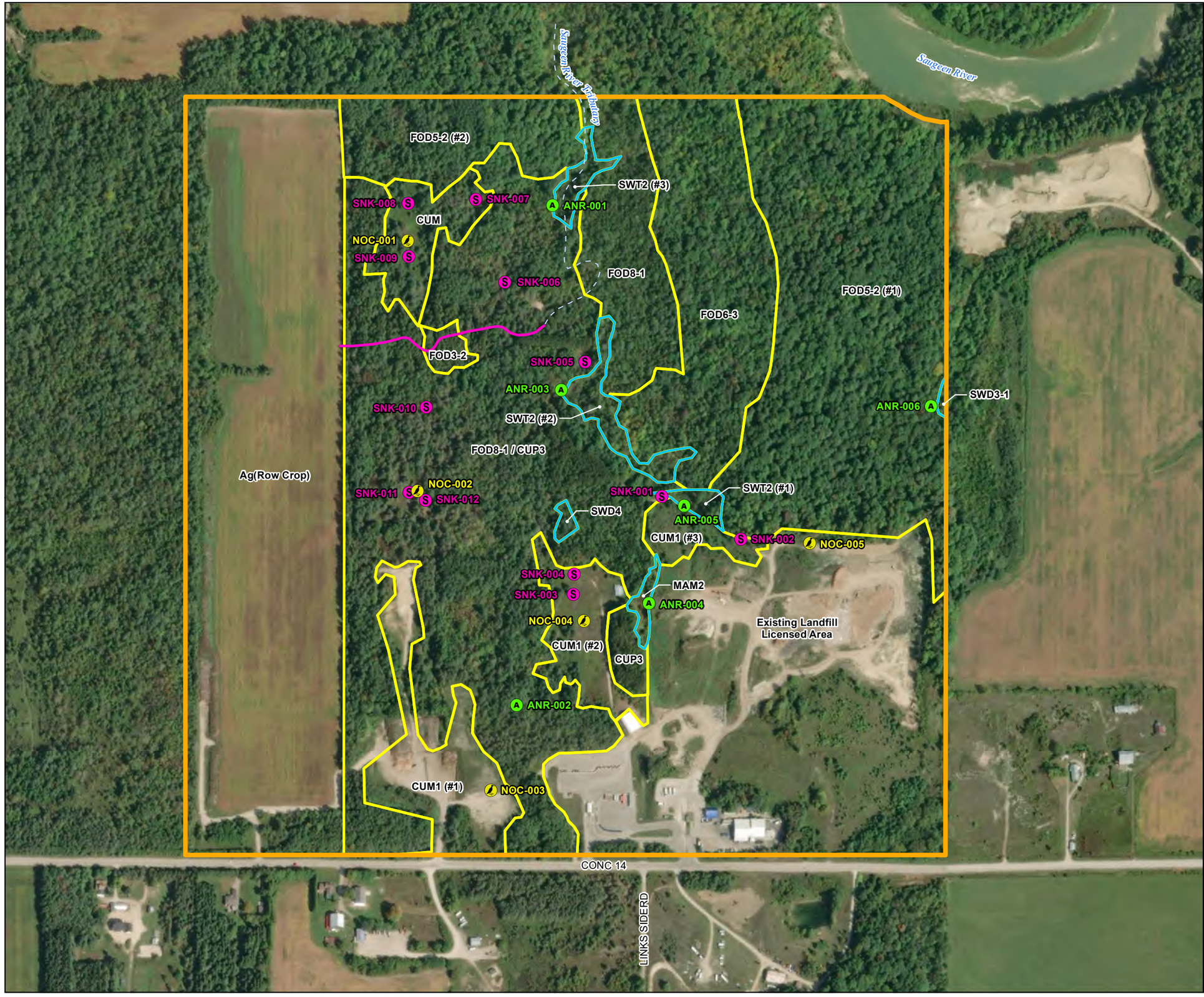
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Map 2

Southampton Landfill NEA

Vegetation Communities and Survey Locations





Legend

- Study Area (Boundary Approximate)
- Surveyed Wetland Boundary (NRSI, 2021)
- Ephemeral Drainage Features
- Ephemeral Watercourse
- Ecological Land Classification (ELC)
- (CUM) Cultural Meadow
- (CUM1) Mineral Cultural Meadow Ecosite
- (CUP3) Coniferous Plantations
- (FOD3-2) Dry - Fresh White Birch Deciduous Forest Type
- (FOD5-2) Dry - Fresh Sugar Maple - Beech Deciduous Forest Type
- (FOD6-3) Fresh - Moist Sugar Maple - Yellow Birch Deciduous Forest Type
- (FOD8-1) Fresh - Moist Poplar Deciduous Forest Type
- (MAM2) Mineral Meadow Marsh Ecosite
- (SWD3-1) Red Maple Mineral Deciduous Swamp Type
- (SWD4) Mineral Deciduous Swamp Ecosite
- (SWT2) Mineral Thicket Swamp Ecosite

Monitoring Stations

- Anuran Station (ANR)
- Nocturnal Bird Survey Station (NOC)
- Snake Board Station (SNK)

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Imagery: ESRI (2024).

Project: 2559 Date: December 30, 2025	NAD83 - UTM Zone 17 Size: 11x17" **1:5,000**

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Map 3a

Southampton Landfill NEA

Bat Habitat Assessment



Legend

- Study Area (Boundary Approximate)
- Bat Passive Acoustic Monitoring Stations (BAT)
- Bat Habitat Assessment Search Area
- Bat Habitat Assessment Plot (BHA)
- Ephemeral Drainage Features
- Ephemeral Watercourse
- Ecological Land Classification (ELC)
- (CUM) Cultural Meadow
- (CUM1) Mineral Cultural Meadow Ecosite
- (CUP3) Coniferous Plantations
- (FOD3-2) Dry - Fresh White Birch Deciduous Forest Type
- (FOD5-2) Dry - Fresh Sugar Maple - Beech Deciduous Forest Type
- (FOD6-3) Fresh - Moist Sugar Maple - Yellow Birch Deciduous Forest Type
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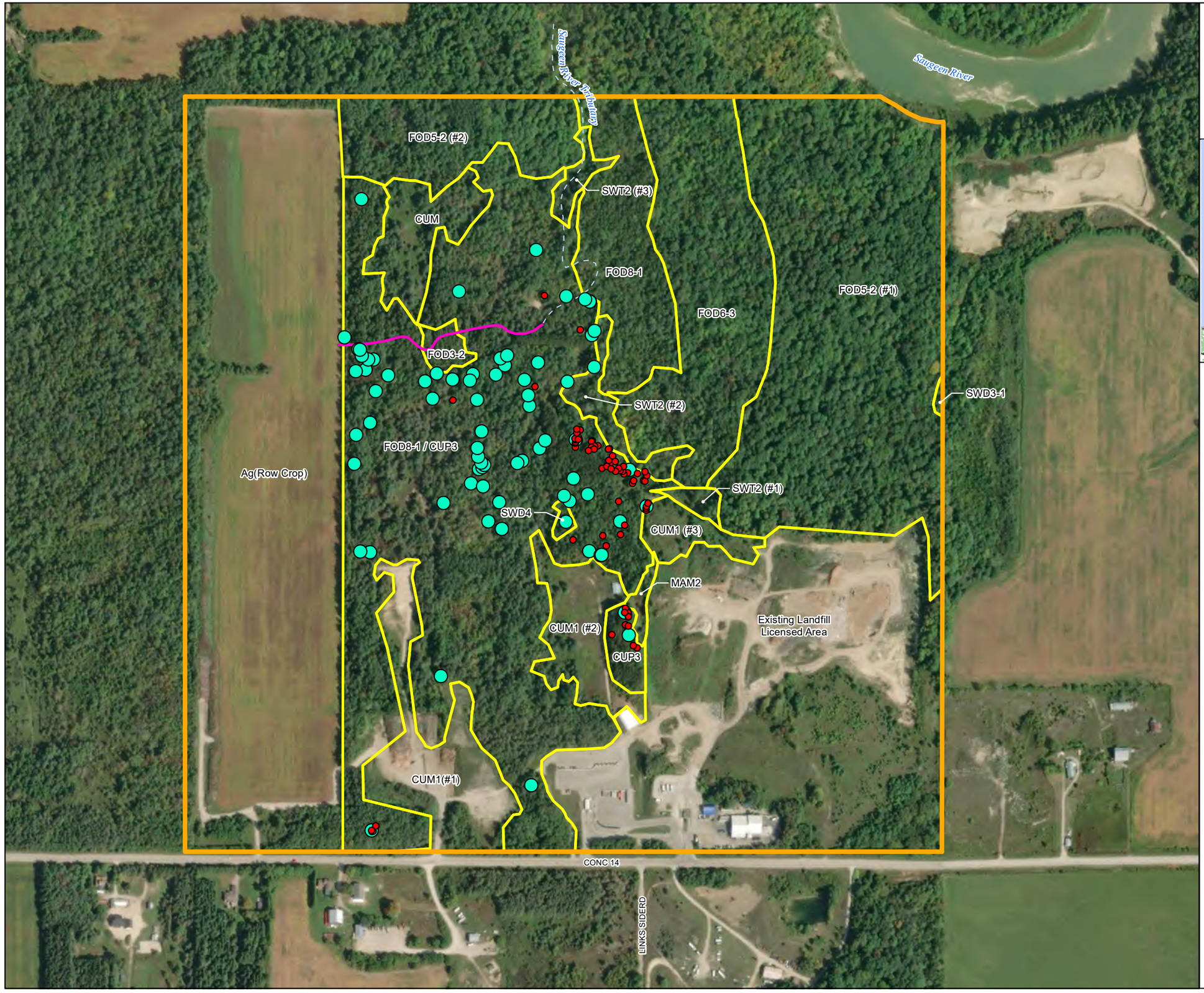
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Map 3b

Southampton Landfill NEA

Candidate Species at Risk Bat Roost Trees





Legend

- Study Area (Boundary Approximate)
- Candidate Tri-colored Bat Roost Tree
- Candidate Little Brown Myotis, Northern Myotis and Silver-haired Bat Roost Tree
- Ephemeral Drainage Features
- Ephemeral Watercourse
- Ecological Land Classification (ELC)

(CUM) Cultural Meadow
(CUM1) Mineral Cultural Meadow Ecosite
(CUP3) Coniferous Plantations
(FOD3-2) Dry - Fresh White Birch Deciduous Forest Type
(FOD5-2) Dry - Fresh Sugar Maple - Beech Deciduous Forest Type
(FOD6-3) Fresh - Moist Sugar Maple - Yellow Birch Deciduous Forest Type
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Project: 2559 Date: December 30, 2025	NAD83 - UTM Zone 17 Size: 11x17" **1:5,000**

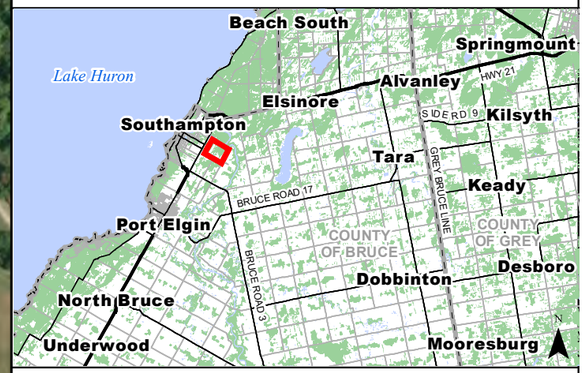
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Map 4a

Southampton Landfill NEA

Significant and Sensitive Natural Features





Legend

- Study Area (Boundary Approximate)
- Surveyed Wetland Boundary (NRSI, 2021)
- Ephemeral Drainage Features
- Ephemeral Watercourse
- Fish Habitat
- Wetland
- Locally Significant Wetland
- Significant Woodland
- Ecological Land Classification (ELC)

Regionally Significant Plant Species

- Blue-stemmed Goldenrod
- Early Goldenrod
- Narrow-leaved Glade Fern
- White Bear Sedge
- Whorled Milkweed

- (CUM) Cultural Meadow
- (CUM1) Mineral Cultural Meadow Ecosite
- (CUP3) Coniferous Plantations
- (FOD3-2) Dry - Fresh White Birch Deciduous Forest Type
- (FOD5-2) Dry - Fresh Sugar Maple - Beech Deciduous Forest Type
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Project: 2559 Date: December 30, 2025	NAD83 - UTM Zone 17 Size: 11x17" **1:5,000**

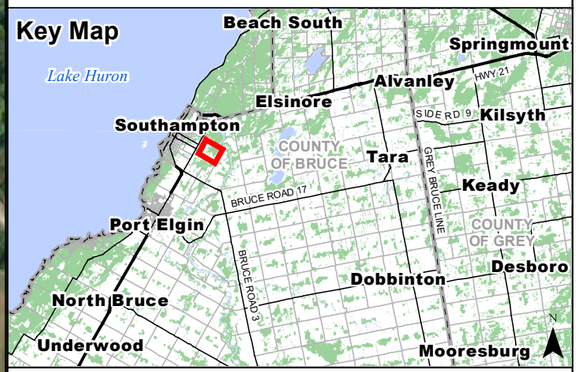
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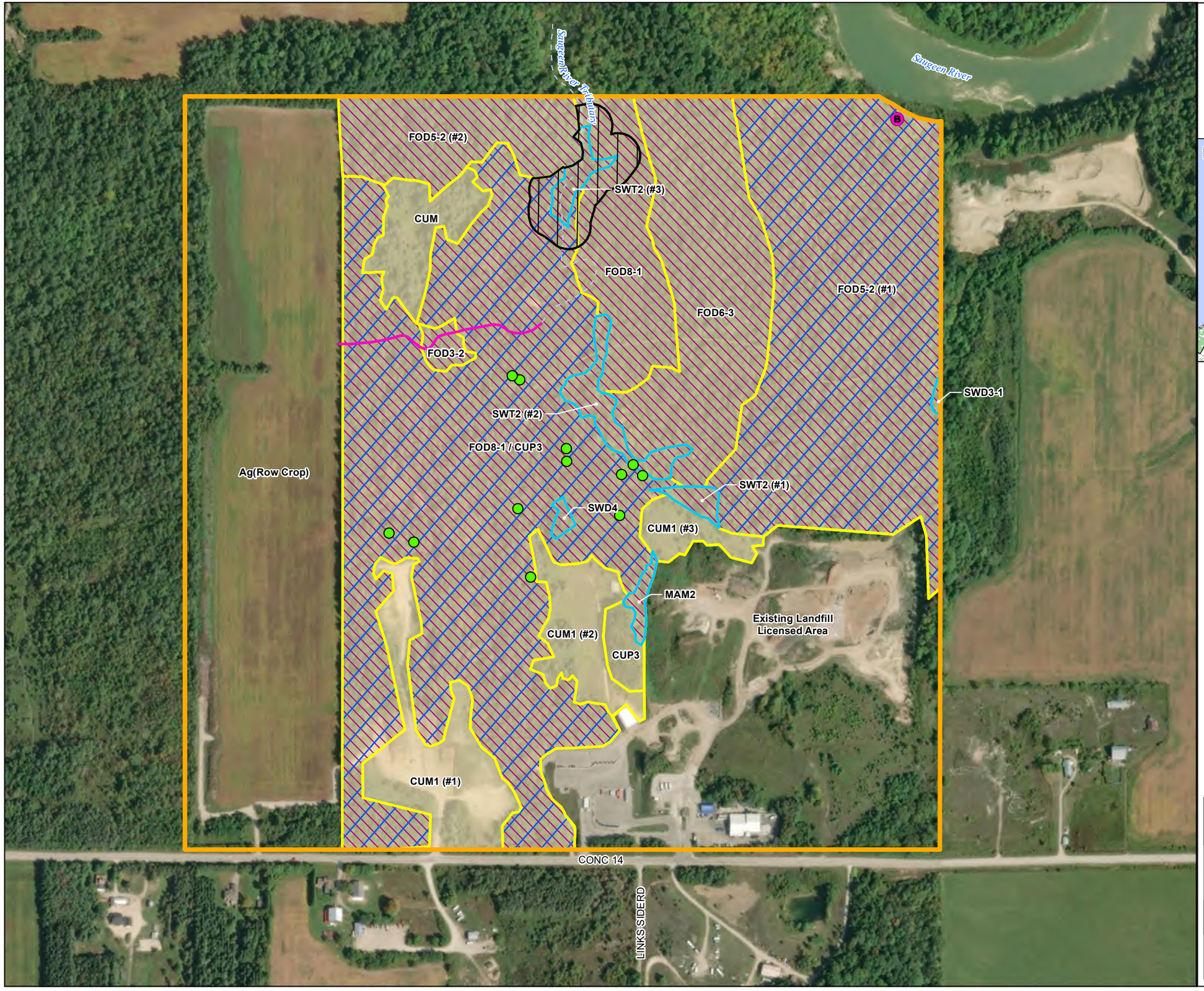
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Map 4b

Southampton Landfill NEA

Significant and Sensitive Natural Features





Legend

- Study Area (Boundary Approximate)
- Surveyed Wetland Boundary (NRSI, 2021)
- Ephemeral Drainage Features
- Ephemeral Watercourse
- Inferred Snake Hibernaculum Location (Approximate)
- Ecological Land Classification (ELC)

(CUM) Cultural Meadow
(CUM1) Mineral Cultural Meadow Ecosite
(CUP3) Coniferous Plantations
(FOD3-2) Dry - Fresh White Birch Deciduous Forest Type
(FOD5-2) Dry - Fresh Sugar Maple - Beech Deciduous Forest Type
(FOD6-3) Fresh - Moist Sugar Maple - Yellow Birch Deciduous Forest Type
(FOD8-1) Fresh - Moist Poplar Deciduous Forest Type
(MAM2) Mineral Meadow Marsh Ecosite
(SWD3-1) Red Maple Mineral Deciduous Swamp Type
(SWD4) Mineral Deciduous Swamp Ecosite
(SWT2) Mineral Thicket Swamp Ecosite

Species at Risk Habitat

- Bank Swallow Nesting Habitat
- Species at Risk Bat Habitat
- Black Ash Habitat

Significant Wildlife Habitat

- Eastern Wood-Pewee SWH
- Woodland Area-Sensitive Bird Breeding SWH

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Imagery: ESRI (2024).

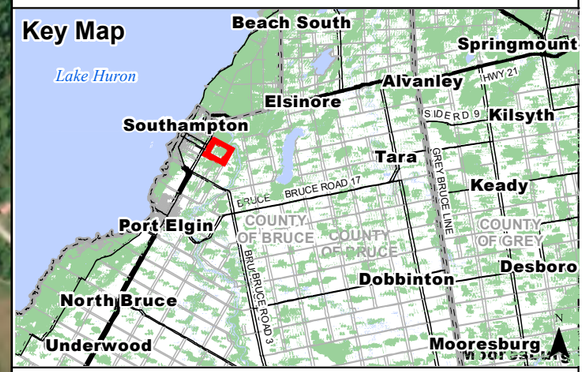
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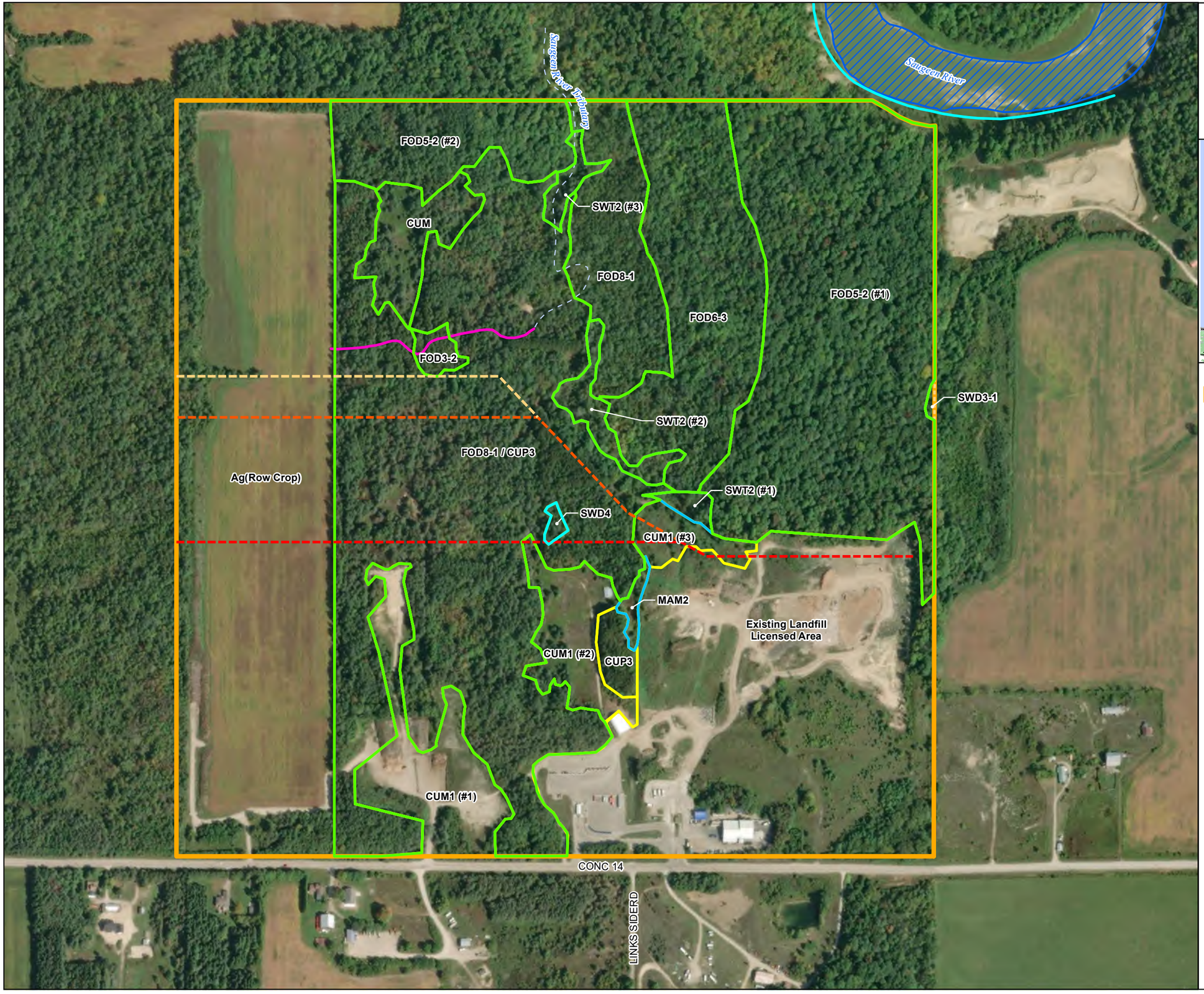
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Map 5

Southampton Landfill NEA

Proposed Landfill Expansion





Legend

- Study Area (Boundary Approximate)
- North Landfill Expansion Limit - Option 1
- North Landfill Expansion Limit - Option 2
- North Landfill Expansion Limit - Option 3
- Surveyed Wetland Boundary (NRSI, 2021)
- Locally Significant Wetland
- Significant Woodland
- Ephemeral Drainage Features
- Ephemeral Watercourse
- Fish Habitat
- Ecological Land Classification (ELC)

(CUM) Cultural Meadow
(CUM1) Mineral Cultural Meadow Ecosite
(CUP3) Coniferous Plantations
(FOD3-2) Dry - Fresh White Birch Deciduous Forest Type
(FOD5-2) Dry - Fresh Sugar Maple - Beech Deciduous Forest Type
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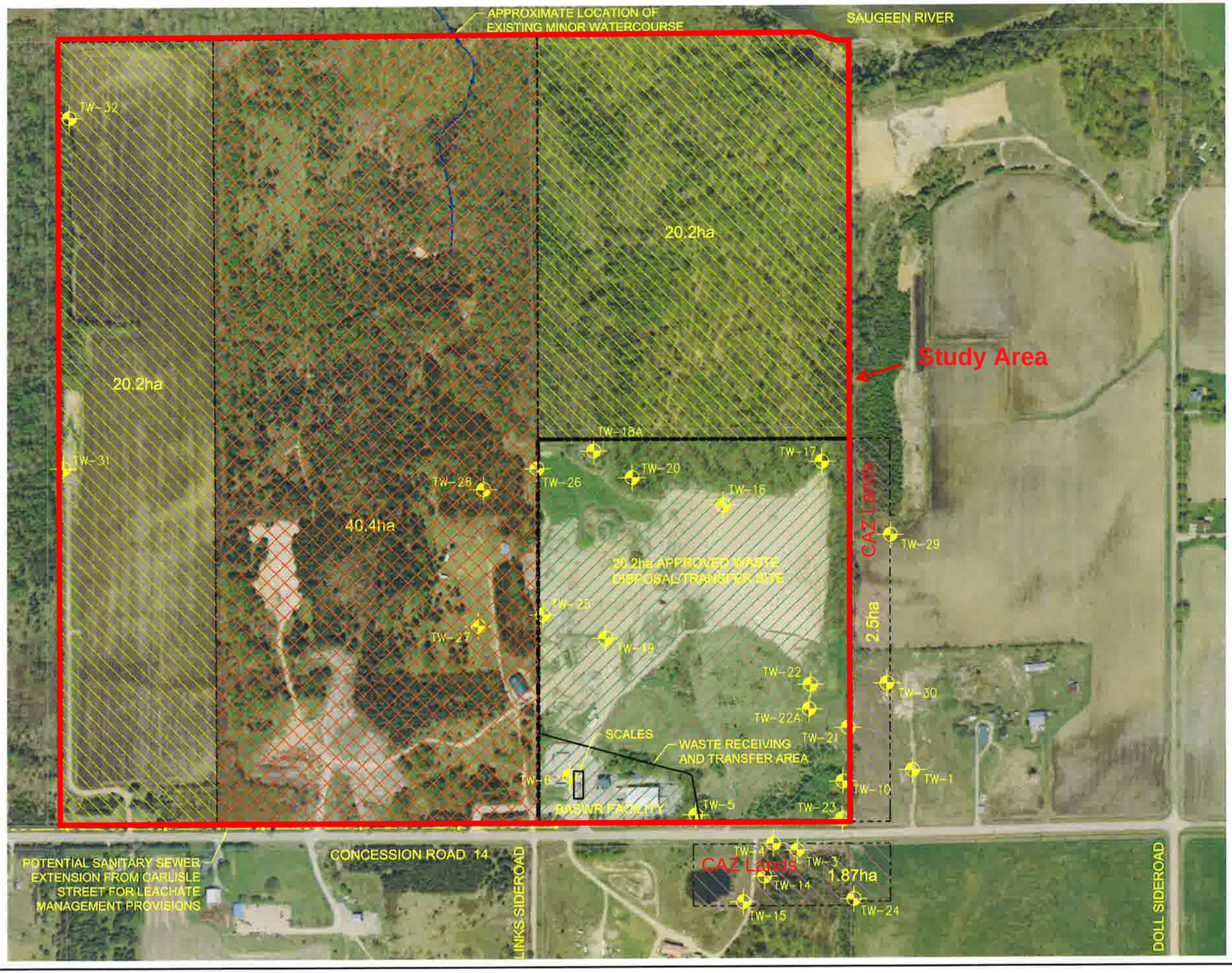
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Project: 2559 Date: January 5, 2026	NAD83 - UTM Zone 17 Size: 11x17" **1:5,000**

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Appendix I
Southampton Landfill Site Plan and Potential Expansion Areas



219181
Town of Saugeen Shores Waste Management Plan

LEGEND

- TW-28 — MONITORING WELL LOCATION
- LANDS CURRENTLY ASSOCIATED WITH LANDFILL OPERATIONS
- CONTAMINATION ATTENUATION ZONE (CAZ) LANDS
- BUFFER LANDS
- ADDITIONAL LANDS OWNED BY THE TOWN
- POTENTIAL SANITARY SEWER EXTENSION

SCALE : 1:5,000
DECEMBER 2019

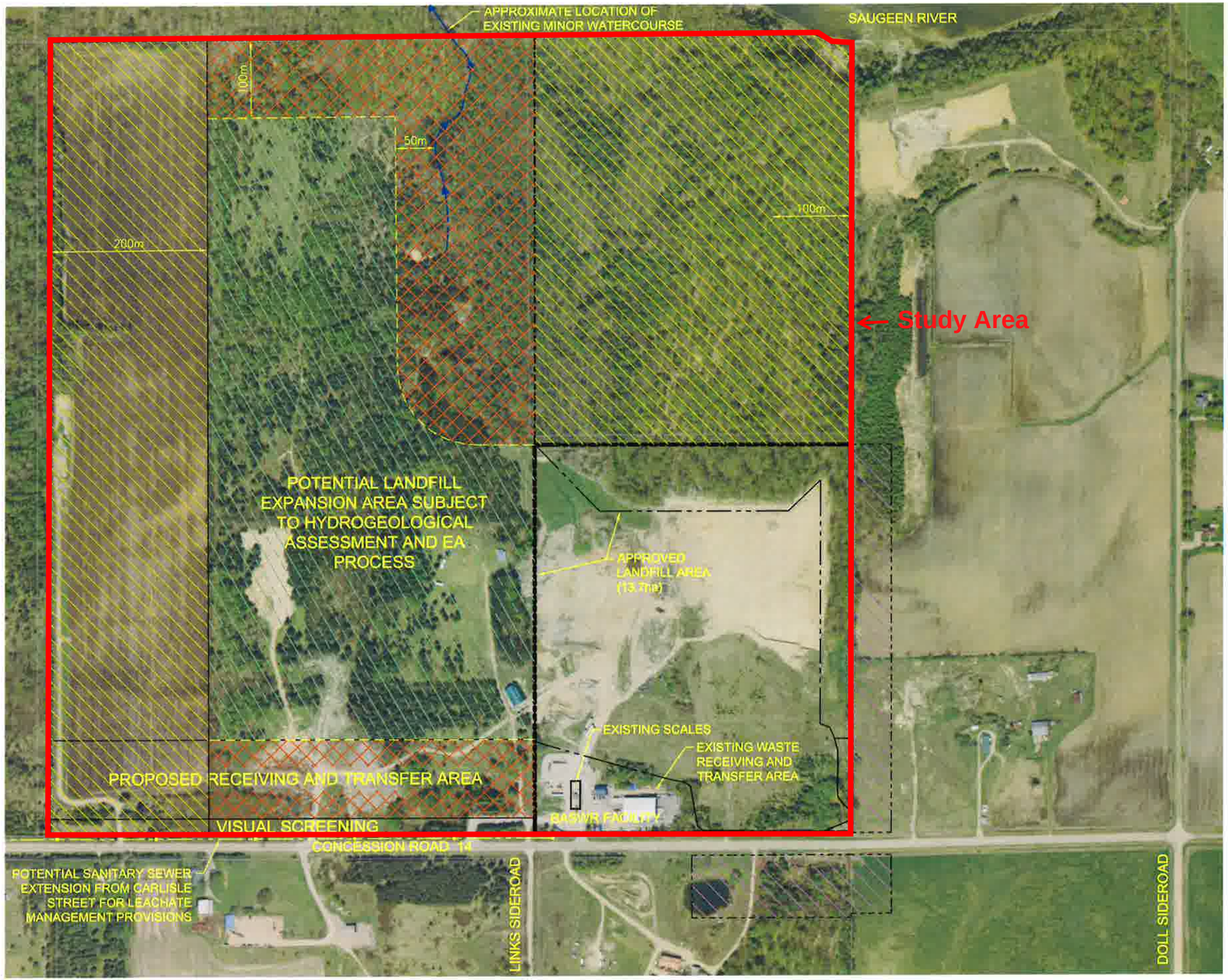
SOUTHAMPTON LANDFILL OVERALL SITE PLAN

Town of Saugeen Shores
County of Bruce

Figure No. 8-2

BluePlan ENGINEERING

FILE:C:\Civil 3D Projects\219181 Figures-K.dwg LAYOUT:Fig. 8-2-Overall Site Plan
LAST SAVED BY:Kboers, 12/10/2019 4:15:48 PM PLOTTED BY:Ken Boers - GM BluePlan 12/11/2019 3:56:12 PM



219181
Town of Saugeen Shores Waste Management Plan

LEGEND

- CONTAMINATION ATTENUATION ZONE (CAZ) LANDS
- BUFFER LANDS
- ADDITIONAL LANDS OWNED BY THE TOWN
- POTENTIAL LANDFILL EXPANSION AREA
- POTENTIAL SANITARY SEWER EXTENSION

NOTE:
AIR PHOTO BACKGROUND WAS TAKEN IN 2015.

SCALE : 1:5,000
DECEMBER 2019

SOUTHAMPTON LANDFILL EXPANSION SITE PLAN

Town of Saugeen Shores
County of Bruce

Figure No. 8-6

BluePlan ENGINEERING

FILE:C:\Civil 3D Projects\219181 Figures-K.dwg LAYOUT:Fig. 8-6-Overall Site Plan
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Appendix II
Saugeen Ojibway Nation Comments (August 12, 2025) and List of Culturally Significant Vegetation Species

010129 Highway 6,
Georgian Bluffs, ON
N0H 2T0
(519) 534-5507
saugeenojibwaynation.ca

Environment Office
Saugeen Ojibway Nation.

August 12, 2025

SENT VIA EMAIL

Town of Saugeen Shores % Colin Saunders
colin.saunders@saugeenshores.ca

VIA

Ontario Ministry of the Environment, Conservation and Parks % Antonia Testa
Antonia.Testa@ontario.ca

cc' GEI Consultants % Andrea Nelson
ANelson@geiconsultants.com

Re: Saugeen Ojibway Nation Recommendations for Saugeen Shores Waste Management Environmental Assessment, a Comprehensive Environmental Assessment/Review of Proposed Terms of Reference by Town of Saugeen Shores % Colin Saunders at 126 Concession 14, Town of Saugeen Shores

The Saugeen Ojibway Nation ("SON") Environment Office and **Town of Saugeen Shores** entered into a Letter of Agreement ("LOA") on **July 8, 2025** with respect to our mutual goal to set out a framework for consultation and accommodation with SON regarding the proposed **Saugeen Shores Waste Management Environmental Assessment** development in SON's Territory. SON's Territory has been significantly altered through ongoing development pressure. Over the past few decades, SON has seen a decline in biodiversity and an erosion of healthy ecosystems, resulting in the undermining of SON's rights, culture and way of life. The individual and cumulative impacts from projects on the SON's Territory are ongoing concerns for us, as we strive to maintain our relationships with the land and waters, which we have used and protected for time immemorial.

The LOA supported SON's participation in and input into the technical assessments undertaken as part of the **Saugeen Shores Waste Management Environmental Assessment** application process. More specifically, the LOA allowed SON and the **Town of Saugeen Shores** to identify a plan for addressing any potential impacts of the **Saugeen Shores Waste Management Environmental Assessment** on SON's lands and constitutionally protected Aboriginal and Treaty rights, proven and asserted, including SON's land claims. This enabled a process that ensured appropriate and meaningful consultation and accommodation of SON's rights and interests throughout the life of the Proponent's proposed operation.

Town of Saugeen Shores, Saugeen Shores Waste Management Environmental Assessment, the expansion of the town's Southampton landfill site, at 126 Concession 14, Town of Saugeen Shores

As per the LOA, SON Environment Office has conducted a peer review of the following documents to measure the impact of the development on SON's Indigenous rights and interests:

GEI Consultants. (2025, March). Saugeen Shores waste management EA: Review of potential for landfill optimization – Proposed terms of reference (Project No. 2401298, Version 3). Prepared for the Town of Saugeen Shores. viii + 86 pp. + maps + appendices.

Natural Resource Solutions Incorporated. (2024, May). Southampton landfill expansion – Natural environment assessment (Project No. 2559). Prepared for GM BluePlan and Town of Saugeen Shores. v + 84 pp. + 7 maps + appendices (124 pp.).

GEI Consultants. (2025, March). Town of Saugeen Shores screening report: Citing of potential alternate landfill locations & assessments of landfill alternatives (Version 3).

GEI Consultants. (2024). Southampton landfill site: Annual monitoring report 2024.

GM BluePlan. (n.d.). Town of Saugeen Shores waste management plan – Southampton landfill expansion site plan figure No. 8-6 (Project No. 219181).

Additional Review/Research:

eBird. (n.d.). eBird.org [Database of bird species observations]. Cornell Lab of Ornithology. Retrieved August 2025, from https://www.ebird.org

Owen Sound Field Naturalists. (2023). Vascular plant list – Bruce & Grey: Compendium (86 pp.).

Google Earth. (2025, July–August). Google Earth Pro [Satellite imagery]. https://www.google.com/earth

Ontario Ministry of the Environment, Conservation and Parks. (n.d.). Provincial water well database.

Ontario Ministry of Natural Resources and Forestry. (n.d.). Ontario pits and quarries database.

Summarized below are the findings of these reviews:

Natural Heritage Peer Review Summary and Natural Heritage Peer Review Recommendations

Review conducted by Jarmo Jalava, Terrestrial Ecologist Advisor, SON Environment Office

Comments on the draft Terms of Reference (ToR)

- While the ToR does recognize that the land within which the Town of Saugeen Shores "operates" is "part of the traditional territory and treaty lands of Saugeen Ojibway Nation" (i.e., Chippewas of Nawash Unceded First Nation and Saugeen First Nation), SON is generally lumped throughout the ToR into the catch-all term "Indigenous communities" along with Métis communities (Historic Saugeen Métis and the Métis Nation of Ontario), with whom formal consultation is not a constitutional requirement. The ToR needs to explicitly recognize SON as the sole Indigenous rights-holders in SON Territory with whom formal consultation may be a requirement according to the laws of Canada. In this context, it would be helpful to re-word Section 13.4 of the draft ToR to make this point clear, and to insert this section at the beginning of the ToR (with reference to this in the Executive Summary).

- In almost every instance where groups or agencies needing engagement or consultation are listed in the ToR, "Indigenous communities" are listed last. A valid argument could be made that the rights-holding First peoples of SON Territory should generally be listed first. The consistent listing of Indigenous communities last gives the impression of it being a perfunctory exercise.

- The landfill capacity expansion requirements are, in part, predicated on an assumption of a doubling of the population of the Town of Saugeen Shores to up to 45,000 people by 2070. There is no consideration in the ToR of the capacity of the finite lands and waters of the area to support an ever-increasing human population, nor of the effects (both direct and cumulative) on the quality of human life and the health of natural environments that a doubling of the population would impart. Assumptions of perpetual population growth on a finite landscape are not consistent with the "seven generation" thinking that SON and many other Indigenous peoples apply to decision-making. More thoughtful, conservative, environmentally-sensitive population projections could significantly affect the design and extent of landfill expansion plans in a positive, cost-effective way.

- In the context of the comment above, the ToR should include the need for a thorough and balanced assessment of cumulative effects (past, present and future) of the landfill operation and its potential expansion, linking these considerations to population growth projections. Any cumulative effects assessment should have the flexibility to account for reduced population growth rates as well as a goal of maintaining a stable human population in the area. Many non-Indigenous taxpayers of Saugeen Shores might also support curbing population growth in order to maintain quality of life and health of the natural and aesthetic environment of this beautiful area. Landfill capacity projections

should thus consider limits to population growth and the benefits of maintaining a stable population vs. perpetual growth.

- The southern edge of Saugeen First Nation (SFN) reserve is situated less than 2.5 km from the proposed landfill expansion area. The residential neighbourhoods of Saugeen First Nation are, on average, much closer to the proposed landfill site than the majority of the Town of Saugeen Shores. Despite these facts, the only mentions of Saugeen First Nation in the ToR are on page 32 (Location and Demographics) and page 91, where the Saugeen First Nation is only mentioned in the context of being one of the two "Indigenous communities" that constitute Saugeen Ojibway Nation (SON) (in reference to the requisite engagement and legal consultation requirements). Given the proximity of the landfill site (and proposed expansion area) to Saugeen First Nation, not to mention the well-known deep spiritual, ancestral and cultural connection the people of Saugeen FN have to the lands and waters of SON Territory, the ToR should explicitly recognize, if not give special consideration to, the fact that Saugeen First Nation lands are so near to (and immediately downriver from) the location selected decades ago by the Town to dispose of its solid waste, and which the Town is now considering expanding.

- Given the centrality of fishing, hunting and harvesting of plants and animals to SON culture, the limit of 500 m area surrounding the footprint of the proposed landfill expansion as being the area potentially impacted may not be satisfactory to SON, particularly the residents of Saugeen First Nation, which is so close by. Landfill operations may affect ecological functions and processes as well as the health and behaviour of many organisms of importance to the SON way of life well beyond the 500 m zone, given that landfills attract various scavenging species to the area (which may have effects throughout local food webs). Landfill operations (including increased vehicle travel to and from the site) may deter or otherwise impact various species (e.g., via road mortality, alteration of traditional wildlife movement routes). For example, Black Bears (an Anishinaabe clan animal), which are attracted to landfill sites, typically have home ranges that extend across many 10s of km^2. Snapping Turtles (also an Anishinaabe clan animal) will sometimes travel over 5 km to their preferred egg-laying sites. The several species of gulls that feed at the existing landfill site travel several kilometres between Lake Huron and the site daily. Changes to habitat and human activities can significantly affect the life cycles of such wide-ranging species and have impacts on more localized taxa beyond the 500 m zone. Such effects need to be considered in an EA.

- The ToR should include the need for a specific assessment of the potential impacts of landfill expansion on Black Bear, a SON clan animal, as well as impacts on SON medicines (plants), other species of cultural importance, as well as the effects landfill expansion may have SON members' right to harvest, perform ceremony, etc., in the area. Such studies may be better refined or prioritized through consultation with SON members (e.g., through community engagement). It is notable that the sandy soils of the study area may support relatively high concentrations of certain plants and fungi that are culturally important to SON.

- There is no mention in the ToR of a relationship between the Town of Saugeen Shores and neighbouring Saugeen First Nation (just 2.5 km north of the landfill site), and any special relevance such a relationship may have to planning and decision-making regarding the Town's waste disposal options.

- Given that the proposed landfill optimization is to occur on SON treaty lands, consideration should be given (by both SON and the Town of Saugeen Shores) to include SON in the Government Review Team (GRT).

Comments on the NRSI Natural Environment Assessment (2024)

- The NRSI NEA background information review is thorough. However, the NEA's examination of eBird data for recent records of SAR and other significant species appears to have missed some species that may occur within the study area. For example, there are several eBird records of the Endangered Red-headed Woodpecker within 5 km of (and there is suitable breeding habitat for the species within) the study area.

- Field effort appeared to be satisfactory for a high-level assessment of the natural environment of the study area. However, anuran calling surveys started too late (April 27) to verify whether the federally Threatened Western Chorus Frog breeds in the study area, as this species may start calling by mid to late March and may have stopped calling by the end of April depending on weather conditions in a given spring. Similarly, one evening of Eastern Whip-poor-will surveys is not enough to conclude that the species is not present as a breeding species in a study area. Environmental studies for another major project in SON Territory did not document Eastern Whip-poor-will during two field seasons (which included targeted surveys for the species). At SON's recommendation, additional surveys were conducted during a third field season and the species' presence at the site was confirmed.

- Where "regulatory agencies" are mentioned in the NEA (e.g., p. 66), there should be a recognition also of the requirement for meaningful consultation with SON.

- The observation of bear tracks within the study area by the NEA researchers is notable. Black Bear ("makwa") is an important clan animal of Anishinaabe people and a large percentage of SON members are Bear clan. The Saugeen (Bruce) Peninsula Black Bear population is genetically isolated from other populations of the species in Ontario. In fact, the population may meet international (i.e., IUCN) criteria for "critically endangered" according to the respected bear research scientist, Dr. Martyn Obbard. For these reasons, SON does not accept the provincial Ecodistrict 6E-14 (the Peninsula north of Ferndale) as the limit of "significant bear habitat" in SON Territory. Bears historically ranged across all of SON Territory and their local distribution has contracted greatly due to human encroachment since European settlement. Bears and their habitat south and east of the Peninsula are as important to the survival of the Saugeen bear population as those found on the Peninsula north of Ferndale.

- The NEA's "precautionary approach" to consideration of area sensitive forest interior bird species is supported.

- The NEA's preliminary evaluation that emphasizes the lower environmental impacts of expansion Option 1 (e.g., on p. 54) combined with the potential ecological benefits of the NEA's recommended compensation of restoration of the northern half of the western agricultural field (and some additional lands elsewhere) are strongly supported by this reviewer.

- Overall, in my opinion, the NRSI NEA is a well-researched, adequately ground-truthed, excellent report that provides highly useful information to assist with decision-making regarding landfill expansion or optimization options. The NEA's "restoration and enhancement" recommendations (p. 76-77), which tend to support expansion Option 1 with compensation restorations, are exemplary and particularly well-considered.

Detailed Review Comments – draft Terms of Reference

Page #	Draft ToR Text	SON comment / question	Proponent response
9	The proposed ToR was developed with extensive community engagement and consultation with the Government Review Team (GRT) and Indigenous communities… The Preliminary Draft Proposed ToR and associated supporting documentation were made available for review by members of the public, the government review team (GRT), and Indigenous Communities…	To this reviewer's knowledge there had been no formal engagement with SON (or Saugeen First Nation) at the time of the preparation of the draft ToR. Making documentation "available" does not constitute "extensive" consultation. It is acknowledged that SON monitors participated in archaeological studies for the EA prep and that communications with SON have taken place, but this is not Indigenous consultation in the legal sense.	
10	indigenous	This term is not consistently capitalized in the draft ToR	
13	The Southampton Landfill Site is not located in whole or in part on federal lands. Further, the scope of the project is not described in the Regulations. Therefore, based on our review, there are no requirements under the IAA and consultation with Impact Assessment Agency of Canada is not required.	Given the presence of navigable waters (Saugeen River) and fish habitat within 1 km and First Nation lands within 2.5 km, both of which fall under federal jurisdiction, it would be beneficial in the ToR to refer to the presence of these potential IAA triggers in the vicinity of the project specifically, followed by a clear explanation as to why the IAA nevertheless does not apply to this project.	

Page #	Draft ToR Text	SON comment / question	Proponent response
19	indigenous	This term is not consistently capitalized in the draft ToR	
22	Table 5-1	It would be beneficial to include a column indicating “Distance from Site” for each “Municipality/Territory”. It would also be logical to arrange the list in order of the closest community to the furthest community from the site, given that those communities closest to the site are most likely to be impacted by any expansion of footprint and operations.	
23	Cultural Heritage	There is no mention of SON or Anishinaabe (just “Indigenous people”) in this section, despite their cultural heritage that has been integrally connected to the lands upon which the landfill operates since time immemorial (i.e., millennia).	
36	…consultation with Indigenous communities…	Information sharing, dialogue, engagement, etc., needs to be distinguished in the ToR from formal (legal) Indigenous consultation, and SON needs to be distinguished from all other groups as the sole Indigenous rights-holders with whom such consultation can take place.	
36	citing	Should this be spelled “siting”?	
37	citing	Should this be spelled “siting”?	
38	citing	Should this be spelled “siting”?	
47	Indigenous communities	Please name the “Indigenous communities”	

Page #	Draft ToR Text	SON comment / question	Proponent response
50	Location and Demographics	There is no mention in this section of the presence of residential areas, band office, businesses and services at the Saugeen First Nation, all within 2.5 to 3.5 km of the landfill site. There is no mention of a SON commercial fishery, other economic activities and employment, as well as traditional harvesting of the SON in the general vicinity of the landfill site.	
50	In conjunction with the archaeological investigations, consultation with the Saugeen Ojibway Nation (SON) and the Historic Saugeen Métis (HSM) was initiated in 2021.	What was the nature of the "consultation" with SON? Is there a written record of consultation? HSM is not a treaty / rights-holding organisation, and engagement with HSM should not be considered equivalently with consultation with SON.	
52	8.3.1. Land Use …Surrounding the site, land designations include…	There is no mention in this section of the residential and other land uses at Saugeen First Nation, which is just 2.5 km north of the landfill site.	

Page #	Draft ToR Text	SON comment / question	Proponent response
57-59	Table 9-1. Preliminary Evaluation Criteria, Indicators, and Potential Data Sources for 'Alternative' Methods	"Consultation with SON" should be added the "Potential Data Sources" column for *each* category in Natural Environment, Social Environment and Cultural Environment (as well as potentially to Atmospheric Environment and Technical Environment) sections.	
61	Table 9-2: Recommended Technical Studies… The Natural Heritage Assessment (NRSI, 2023) identified widespread… The Natural Environment Report is not included with the Terms of Reference…	The NRSI report that was provided to SON is dated May 2024 and is titled: **Southampton Landfill Expansion** **Natural Environment Assessment** Is the draft ToR referring to this document? If so the title reference in Table 9-2 needs to be corrected.	
61	indigenous	This term is not consistently capitalized in the draft ToR	
64	indigenous	This term is not consistently capitalized in the draft ToR	
72	indigenous	This term is not consistently capitalized in the draft ToR	
80	indigenous	This term is not consistently capitalized in the draft ToR	
81	indigenous	This term is not consistently capitalized in the draft ToR	
82	indigenous	This term is not consistently capitalized in the draft ToR	

Page #	Draft ToR Text	SON comment / question	Proponent response
86	References	The NRSI (2024) Natural Environment Assessment report is missing from the References	

Detailed Review Comments – Natural Environment Assessment (NRSI 2024)

Page #	NRSI NEA Text	SON comment / question	Proponent response
24-25	Overall, the inventoried plant species in the study area have an average CC value of 3.3, which is moderately low but includes species within culturally influenced and disturbed features associated with the operational landfill lands.	Coefficient of conservatism (CC) values would ideally be calculated and assessed per each ELC polygon, as this would contribute significantly to evaluation of habitat quality and potential sensitivity in each part of the study area, including the different landfill expansion options.	
42	The area-sensitive species Yellow-bellied Sapsucker (*Sphyrapicus varius*) and Scarlet Tanager (*Piranga olivacea*) were also documented within the study area but were only observed outside of the core breeding period	Yellow-bellied Sapsucker probably does breed in the study area; the species arrives in mid- to late April and generally becomes relatively quiet and secretive during the standard breeding bird survey period (late May through early July). Habitat in the northern part of the study area would also appear to be highly suitable for Scarlet Tanager nesting.	

Page #	NRSI NEA Text	SON comment / question	Proponent response
44-45	Reptile Hibernaculum SWH is therefore considered absent within the area that was investigated during spring 2023 (i.e., the area of proposed landfill expansion plus an adjacent 50m area). Nonetheless, the confirmed presence of snake hibernaculum habitat within the landfill expansion zone should be carried forward for consideration in mitigation planning for the landfill expansion activities. Portions of the study area that are located outside of the landfill expansion zone (plus adjacent 50m) are still considered Reptile Hibernaculum Candidate SWH since these areas were not searched during early spring.	One late April site visit is not sufficient field effort to conclude that reptile hibernaculum SWH "absent" at the site.	
62	…ecological connectivity between the study area and forested lands to the west will be markedly enhanced through the recommended woodland compensation plantings within the north end of the study area agricultural field."	This statement is strongly supported.	

Preliminary Working List of Vascular Plants of Cultural Importance to Saugeen Ojibway Nation

DRAFT[1]

January 20, 206

This list of plants of cultural importance to the Saugeen Ojibway Nation is intended to support land-use planning and decision-making. Its primary purpose is to help ensure that these species, and their associated habitats, are appropriately stewarded and protected from potential harm arising from development activities or overharvesting.

This list is not comprehensive and has not been formally endorsed by SON Membership or Leadership. It is a living document that will be reviewed and updated on an ongoing basis as knowledge is shared, refined, and expanded.

This list was developed over a number of years through in-person research and a variety of published and unpublished sources, including:

Erichsen-Brown, C. 1989. Medicinal and Other Uses of North American Plants: a historical survey with special reference to the Eastern Indian tribes. Dover Publications, New York. 512 pp.

Jalava, J.V. 2023. Ecological Considerations for Planning and Development in the Saugeen Ojibway Nation Traditional Territory [WORKING DOCUMENT], prepared by Jarmo Jalava, Advisor (Ecology) to the Saugeen Ojibway Nation Environment Office (Original draft: January 2021, updated April 2023)

Neyaashiinigmiing. Formal and informal interviews with Neyaashiinigmiing elders and other community members by Miptoon (Anthony Chegahno) and Jarmo Jalava as part of the Chippewas of Nawash Unceded First Nation Species at Risk Program between 2007 and 2019.

Nishinabe Plant Uses. No date. Pp. 23-100. Saugeen Ojibway Nation Environment Office, Neyaashiinigmiing.

Smith, H. 1932. Ethnobotany of the Ojibwe Indians. Bull. Pub. Mus. Milwaukee 4;348-433. Available: http://blogs.nwic.edu/briansblog/files/2013/02/Ethnobotany-of-the-Ojibwe-Indians.pdf

Vascular plant list, Bruce & Grey: compendium / Owen Sound Field Naturalists, 5th Edition V2 2025, compiled by Tyler Miller, field ecologist, Owen Sound Field Naturalists. 82 pp.

Wikwemkoong DLNR (Department of Lands and Natural Resources). n.d. Interesting and Useful Plants of Wikwemkoong – species at risk and more. 52 pp.

[1] Prepared by Jarmo Jalava, Advisor, Terrestrial Ecology, Saugeen Ojibway Nation Environment Office (November 2025)

Key to Abbreviations

SON – Saugeen Ojibway Nation
CC – Coefficient of conservatism (1-10, with higher values indicating stronger affinity to specialized habitats, thus often higher sensitivity to impacts)
CW – Coefficient of wetness (5 to -5, with negative values indicating stronger affinity to wet habitats)
G-rank – Global conservation rank (G1 = extremely rare…G5 = common)
S-rank – Subnational conservation rank (S1 = extremely rare in Ontario…S5 = common in Ontario)
SAR – Species At Risk (federal or provincial)

Local status is based on *Vascular plant list, Bruce & Grey: compendium / Owen Sound Field Naturalists, 5th Edition V2 . 2025*, as follows:
P – status on the Saugeen (Bruce) Peninsula (north of Highway 21 / Southampton)
B – status in southern Bruce County (south of Highway 21 / Southampton)
G – status in Grey County
^ Introduced Native - taxa native from North America/regions of Ontario but presumably recently (e.g. the last few hundred years) introduced (e.g. intentionally or unintentionally/naturally) to Bruce-Grey Counties and not expected to have occured historically within the region.
(^) Likely Introduced Native – taxa presumed to be an introduced native (as described above) but not confirmed. This includes natural dispersal (e.g. wildlife, wind, water).
C Common - native; in P: following Johnson (2016) or ≥15 occurrences; or in B&G: ≥7 occurrences.
U Uncommon - native; in P: following Johnson (2016) or 7-14 occurrences; or in B&G: 3-6 occurrences.
R Rare - native; in P: following Johnson (2016) or ≤6 occurrences; or in B&G: ≤2 occurrences.
X No local status - a native taxon (including infraspecific taxa) or hybrid with native parents that is present but lacking information to determine the status (e.g. insufficient records, unconfirmed records, taxon often overlooked, challenging taxon to identify) or has not been recognised in authoritative sources for the region.
E Excluded - a taxon excluded from Johnson (2016; i.e. P) or B and G (e.g. incorrectly identified herbarium collections or records that were confirmed as having been planted and not reproducing naturally).

Species # - this column allows for alternating between phylogenetic and alphabetic sorting

In the SON column[2] – C = ceremonial; F = food; M = medicine; P = other products and uses (e.g., tools, building materials, artistic, etc.)

[2] In some cases, information on SON uses was available only at the genus-level (e.g., “goldenrod”). In such cases, all taxa in the genus have been indicated as culturally important.

Scientific Name	Infra. Taxon	*Synonyms*	Common Name	SON	CC	CW	G-Rank	S-Rank	SAR	P	B	G	Family	Species #
Dendrolycopodium obscurum		*Lycopodium obscurum*	Flat-branched Tree-clubmoss	M	6	3	G5	S4		U	X	X	Lycopodiaceae - Clubmoss Family	3
Lycopodium clavatum			Running Clubmoss	M	6	0	G5	S5		U	C	C	Lycopodiaceae - Clubmoss Family	8
Equisetum arvense			Field Horsetail	M	0	0	G5	S5		C	C	C	Equisetaceae - Horsetail Family	12
Equisetum hyemale			Common Scouring-rush	M	2	0	G5	S5		U	C	C	Equisetaceae - Horsetail Family	14
Equisetum palustre			Marsh Horsetail	M	10	-3	G5	S5		R/U	R	R	Equisetaceae - Horsetail Family	16
Botrypus virginianus		*Botrychium virginianum*	Rattlesnake Fern	M	5	3	G5	S5		C	C	C	Ophioglossaceae - Adder's Tongue Family	26
Pteridium aquilinum			Bracken Fern	FM	2	3	G5	S5		C	C	C	Dennstaedtiaceae - Bracken Family	39
Dryopteris cristata			Crested Wood Fern	M	7	-5	G5	S5		C	C	C	Dryopteridaceae - Wood Fern Family	42
Adiantum pedatum			Northern Maidenhair Fern	MP	7	3	G5	S5		C	C	C	Pteridaceae - Maidenhair Fern Family	61
Athyrium filix-femina	var. angustum	*Athyrium angustum*	Northeastern Lady Fern	M	4	0	G5 T5	S5		C	C	C	Athyriaceae - Ladyfern Family	69
Matteuccia struthiopteris		*Onoclea struthiopteris*	Ostrich Fern	F	5	0	G5	S5		C	C	C	Onocleaceae - Sensitive Fern Family	79
Onoclea sensibilis			Sensitive Fern	M	4	-3	G5	S5		C	C	C	Onocleaceae - Sensitive Fern Family	80
Taxus canadensis			Canada Yew	M	7	3	G5	S4		C	C	C	Taxaceae - Yew Family	82
Abies balsamea			Balsam Fir	MP	5	-3	G5	S5		C	C	C	Pinaceae - Pine Family	83
Larix laricina		*Larix alaskensis, Larix laricina var. alaskensis*	Tamarack	FMP	7	-3	G5	S5		C	C	C	Pinaceae - Pine Family	85
Picea glauca		*Picea laxa*	White Spruce	FMP	6	3	G5	S5		C	C	C	Pinaceae - Pine Family	87
Pinus resinosa			Red Pine	MP	8	3	G5	S5		C	C		Pinaceae - Pine Family	90
Pinus strobus			Eastern White Pine	FMP	4	3	G5	S5		C	C	C	Pinaceae - Pine Family	91
Tsuga canadensis			Eastern Hemlock	MP	7	3	G4 G5	S5		C	C	C	Pinaceae - Pine Family	93
Juniperus communis	var. depressa		Depressed Juniper	CFMP	4	3	G5 T5	S5		C	C	U	Cupressaceae - Cypress Family	94

Scientific Name	Infra. Taxon	*Synonyms*	Common Name	SON	CC	CW	G-Rank	S-Rank	SAR	P	B	G	Family	Species #
Juniperus horizontalis			Creeping Juniper	F	10	3	G5	S5		C	C	R	Cupressaceae - Cypress Family	95
Typha latifolia			Broad-leaved Cattail	FMP	1	-5	G5	S5		C	C	C	Typhaceae - Cat Tail Family	99
Sagittaria latifolia			Broad-leaved Arrowhead	FMP	4	-5	G5	S5		C	C	C	Alismataceae - Water Plantain Family	137
Andropogon gerardi			Big Bluestem	M	7	3	G5	S4		U	R	**R**	Poaceae - Grass Family	150
Anthoxanthum hirtum		*Hierochloe hirta, Hierochloe odorata ssp. Hirta*	Hairy Sweetgrass	CM	5	-3	G5	S4		U	**R**		Poaceae - Grass Family	151
Phragmites australis ssp. Americanus		*Phragmites americanus*	American Reed	P	5	-3	G5 T5	SU		C	R	R	Poaceae - Grass Family	246
Zizania palustris	var. palustris		Northern Wildrice	F	9	-5	G5 T4 T5	S5?		U	R	R	Poaceae - Grass Family	282
Schoenoplectus tabernaemontani		*Scirpus validus, Schoenoplectus lacustris ssp. validus, Schoenoplectus validus, Scirpus tabernaemontani, Scirpus tabernaemontanii*	Soft-stemmed Bulrush	FMP	5	-5	G5	S5		C	C	C	Cyperaceae - Sedge Family	422
Scirpus atrocinctus		*Scirpus cyperinus var. brachypodus*	Black-girdled Bulrush	P?	5	-5	G5	S5		X		X	Cyperaceae - Sedge Family	423
Scirpus atrovirens			Dark-green Bulrush	P?	3	-5	G5	S5		C	C	C	Cyperaceae - Sedge Family	424
Scirpus cyperinus			Common Woolly Bulrush	P	4	-5	G5	S5		C	C	C	Cyperaceae - Sedge Family	425
Scirpus hattorianus			Mosquito Bulrush	P?	6	-3	G5	S4		C/X	X	X	Cyperaceae - Sedge Family	426
Acorus americanus			American Sweetflag	MP	8	-5	G5	S4		U	R	R	Acoraceae - Sweet Flag Family	433
Arisaema triphyllum			Jack-in-the-pulpit	M	5	-3	G5	S5		C	C	C	Araceae - Arum Family	434
Juncus effusus	ssp. solutus		Soft Rush	P	4	-5	G5 T5	S5?		C	C	C	Juncaceae - Rush Family	454

Scientific Name	Infra. Taxon	*Synonyms*	Common Name	SON	C C	C W	G-Rank	S-Rank	SAR	P	B	G	Family	Species #
Allium canadense			Canada Garlic	FM?	8	3	G5	S5			R		Amaryllidaceae - Amaryllis & Onions Family	464
Allium schoenoprasum var. sibiricum			Wild Chives	FM?	9	0	G5 TNR	S4		R	E		Amaryllidaceae - Amaryllis & Onions Family	467
Allium tricoccum	var. tricoccum		Wild Leek	FM	7	3	G5	S4		C	C	C	Amaryllidaceae - Amaryllis & Onions Family	468
Maianthemum canadense			Wild Lily-of-the-valley	M	5	3	G5	S5		C	C	C	Asparagaceae - Asparagus Family	475
Maianthemum racemosum		*Maianthemum racemosum ssp. racemosum, Smilacina racemosa var. racemosa*	Large False Solomon's Seal	FM	4	3	G5	S5		C	C	C	Asparagaceae - Asparagus Family	476
Uvularia grandiflora			Large-flowered Bellwort	M	6	5	G5	S5		C	C	C	Colchicaceae - Bellwort Family	490
Iris versicolor			Harlequin Blue Flag	MP	5	-5	G5	S5		C	C	C	Iridaceae - Iris Family	495
Sisyrinchium angustifolium		*Sisyrinchium graminoides*	Narrow-leaved Blue-eyed-grass	M	6	0	G5	S4		E	**R**	R	Iridaceae - Iris Family	498
Sisyrinchium montanum			Strict Blue-eyed-grass	M	4	0	G5	S5		C	C	C	Iridaceae - Iris Family	499
Sisyrinchium mucronatum			Mucronate Blue-eyed-grass	M	10	0	G5	S4		C	C	R	Iridaceae - Iris Family	500
Lilium philadelphicum			Wood Lily	CF	8	0	G5	S5		C	C	**C**	Liliaceae - Lily Family	505
Medeola virginiana			Indian Cucumber-root	FM?	8	3	G5	S5		U	C	C	Liliaceae - Lily Family	506
Streptopus lanceolatus		*Streptopus roseus*	Rose Twisted-stalk	M	7	3	G5	S5		C	C	C	Liliaceae - Lily Family	507
Trillium grandiflorum			White Trillium	M	5	3	G5	S5		C	C	C	Melanthiaceae - Bunchflower Family	513
Smilax ecirrata		*Smilax ecirrhata, Smilax ecirrhata*	Upright Carrionflower	M?	6	5	G5	S3?				R	Smilacaceae - Greenbriers Family	514
Smilax lasioneura		*Smilax herbacea var. lasioneura,*	Hairy-nerved Carrionflower	M	5	5	G5	S4S5		R	C	C	Smilacaceae - Greenbriers Family	515

Scientific Name	Infra. Taxon	*Synonyms*	Common Name	SON	C C	C W	G-Rank	S-Rank	SAR	P	B	G	Family	Species #
		Smilax lasioneuron												
Smilax tamnoides		*Smilax hispida*	Bristly Greenbriar	M?	6	0	G5	S5		U	C	C	Smilacaceae - Greenbriers Family	516
Coeloglossum viride		*Dactylorhiza viridis, Habenaria viridis*	Frog Orchid	M	8	0	G5	S4		U	R	C	Orchidaceae - Orchid Family	521
Cypripedium parviflorum var. makasin		*Cypripedium pubescens var. makasin*	Northern Yellow Lady's-slipper	M	5	0	G5 T4 T5	S4S5		R/U/X	U/X	U/X	Orchidaceae - Orchid Family	530
Cypripedium parviflorum var. pubescens		*Cypripedium calceolus var. pubescens, Cypripedium pubescens*	Large Yellow Lady's-slipper	M	5	0	G5 T5	S5		C	C	C	Orchidaceae - Orchid Family	531
Goodyera repens			Dwarf Rattlesnake-plantain	M	8	0	G5	S5		U	R	R	Orchidaceae - Orchid Family	538
Myrica gale		*Gale palustris*	Sweet Gale	P	6	-5	G5	S5		C	C	C	Myricaceae - Bayberry Family	568
Populus balsamifera		*Populus candicans*	Balsam Poplar	M	4	-3	G5	S5		C	C	C	Salicaceae - Willow Family	570
Populus grandidentata			Large-toothed Aspen	FM	5	5	G5	S5		C	C	C	Salicaceae - Willow Family	572
Populus tremuloides			Trembling Aspen	MP	2	0	G5	S5		C	C	C	Salicaceae - Willow Family	574
Salix amygdaloides			Peach-leaved Willow	CMP	6	-3	G5	S5		C	C	C	Salicaceae - Willow Family	578
Salix bebbiana			Bebb's Willow	CMP	4	-3	G5	S5		C	C	C	Salicaceae - Willow Family	579
Salix candida			Sage Willow	CMP	10	-5	G5	S5		C	C	C	Salicaceae - Willow Family	580
Salix cordata			Heart-leaved Willow	CMP	9	0	G4	S4		R	R	R	Salicaceae - Willow Family	581
Salix discolor			Pussy Willow	CMP	3	-3	G5	S5		C	C	C	Salicaceae - Willow Family	583
Salix eriocephala		*Salix cordata var. abrasa, Salix rigida*	Cottony Willow	CMP	4	-3	G5	S5		C	C	C	Salicaceae - Willow Family	584
Salix humilis			Prairie Willow	CMP	7	3	G5	S5		U	C		Salicaceae - Willow Family	586
Salix interior		*Salix exigua ssp. interior, Salix exigua var. sericans*	Sandbar Willow	CMP	1	-3	G5	S5		C	C	C	Salicaceae - Willow Family	587
Salix lucida			Shining Willow	CMP	5	-3	G5	S5		C	C	C	Salicaceae - Willow Family	588
Salix myricoides			Bayberry Willow	CMP	10	-3	G4	S4		R	R		Salicaceae - Willow Family	589

Scientific Name	Infra. Taxon	*Synonyms*	Common Name	SON	CC	CW	G-Rank	S-Rank	SAR	P	B	G	Family	Species #
Salix nigra			Black Willow	CMP	6	-5	G5	S4		R	C	R	Salicaceae - Willow Family	590
Salix pedicellaris			Bog Willow	CMP	9	-5	G5	S5		R	R	R	Salicaceae - Willow Family	591
Salix petiolaris		*Salix gracilis*	Meadow Willow	CMP	3	-3	G5	S5		C	C	C	Salicaceae - Willow Family	593
Salix pyrifolia			Balsam Willow	CMP	10	-3	G5	S5		R			Salicaceae - Willow Family	595
Salix serissima			Autumn Willow	CMP	6	-5	G5	S5		U	R	C	Salicaceae - Willow Family	596
Juglans cinerea			Butternut	FMP	6	3	G3	S2?	END	U	C	C	Juglandaceae - Walnut Family	600
Alnus incana		*Alnus incana var. americana, Alnus rugosa, Alnus rugosa var. americana*	Speckled Alder	MP	6	-3	G5 T5	S5		C	C	C	Betulaceae - Birch Family	603
Betula alleghaniensis		*Betula lutea*	Yellow Birch	FP	6	0	G5	S5		C	C	C	Betulaceae - Birch Family	604
Betula papyrifera			Paper Birch	MP	2	3	G5	S5		C	C	C	Betulaceae - Birch Family	605
Carpinus caroliniana			Blue-beech	P	6	0	G5	S5		R	C	C	Betulaceae - Birch Family	611
Corylus cornuta			Beaked Hazelnut	FM	5	3	G5	S5		C	C	C	Betulaceae - Birch Family	613
Ostrya virginiana			Eastern Hop-hornbeam	MP	4	3	G5	S5		C	C	C	Betulaceae - Birch Family	614
Fagus grandifolia			American Beech	FMP	6	3	G5	S4		C	C	C	Fagaceae - Beech Family	615
Quercus macrocarpa			Bur Oak	FMP	5	3	G5	S5		U	C	C	Fagaceae - Beech Family	616
Quercus rubra			Northern Red Oak	FMP	6	3	G5	S5		C	C	C	Fagaceae - Beech Family	618
Ulmus americana			White Elm	M	3	-3	G4	S5		C	C	C	Ulmaceae - Elm Family	622
Ulmus rubra		*Ulmus fulva*	Slippery Elm	MP	6	0	G5	S5		U	R	C	Ulmaceae - Elm Family	625
Laportea canadensis			Canada Wood Nettle	MP	6	-3	G5	S5		U	C	C	Urticaceae - Nettle Family	628
Urtica gracilis		*Urtica dioica var. gracilis*	Slender Stinging Nettle	FMP	2	0	G5	S5		U	C	C	Urticaceae - Nettle Family	633
Asarum canadense			Canada Wild-ginger	FMP	6	5	G5	S5		C	C	C	Aristolochiaceae - Birthwort Family	637
Persicaria amphibia var. emersa		*Polygonum amphibium var. emersum, Polygonum coccineum*	Long-root Smartweed	M	5	-5	G5 T5	S5?		C			Polygonaceae - Buckwheat or Smartweed Family	643

Scientific Name	Infra. Taxon	*Synonyms*	Common Name	SON	CC	CW	G-Rank	S-Rank	SAR	P	B	G	Family	Species #
Persicaria amphibia var. stipulacea		*Polygonum amphibium var. stipulaceum*	Flanged Smartweed	M	5	-5	G5 T5	S5?		C			Polygonaceae - Buckwheat or Smartweed Family	644
Persicaria punctata		*Polygonum punctatum*	Dotted Smartweed	M	4	-5	G5	S5		C	C	C	Polygonaceae - Buckwheat or Smartweed Family	650
Nymphaea odorata	ssp. odorata		Fragrant Water-lily	FM	5	-5	G5 T5	S5?		C/X	C	C	Nymphaeaceae - Waterlily Family	729
Nymphaea odorata	ssp. tuberosa	*Nymphaea tuberosa*	Tuberous White Water-lily	FM	5	-5	G5 T5	SU		C/X	C	C	Nymphaeaceae - Waterlily Family	730
Actaea pachypoda		*Actaea alba*	White Baneberry	M	6	5	G5	S5		C	C	C	Ranunculaceae - Buttercup Family	732
Actaea rubra			Red Baneberry	M	6	3	G5	S5		C	C	C	Ranunculaceae - Buttercup Family	733
Actaea x ludovici			Louis's Baneberry	M	n/a	n/a	GNA	hyb		X			Ranunculaceae - Buttercup Family	734
Anemonastrum canadense		*Anemone canadensis*	Canada Anemone	M	3	-3	G5	S5		C	C	C	Ranunculaceae - Buttercup Family	735
Anemone cylindrica			Long-headed Anemone	M	7	5	G5	S4		C	C	C	Ranunculaceae - Buttercup Family	737
Anemone multifida			Cut-leaved Anemone	M?	10	5	G5	S5		U	R		Ranunculaceae - Buttercup Family	738
Anemone quinquefolia		*Anemonoides quinquefolia*	Wood Anemone	M?	7	0	G5	S5		R	C	R	Ranunculaceae - Buttercup Family	739
Anemone virginiana			Tall Anemone	M?	4	3	G5	S5		C	C	C	Ranunculaceae - Buttercup Family	740
Aquilegia canadensis			Red Columbine	M	5	3	G5	S5		C	C	C	Ranunculaceae - Buttercup Family	741
Caltha palustris			Yellow Marsh Marigold	FM	5	-5	G5	S5		C	C	C	Ranunculaceae - Buttercup Family	743
Coptis trifolia			Goldthread	MP	7	-3	G5	S5		C	C	C	Ranunculaceae - Buttercup Family	746
Hepatica acutiloba		*Anemone acutiloba, Hepatica nobilis var. acuta*	Sharp-lobed Hepatica	M?	8	5	G5 T5	S5		C	C	C	Ranunculaceae - Buttercup Family	747
Hepatica americana		*Anemone americana, Hepatica nobilis var. obtusa*	Round-lobed Hepatica	M	6	5	G5 T5	S5		U	C	R	Ranunculaceae - Buttercup Family	748

Scientific Name	Infra. Taxon	*Synonyms*	Common Name	SON	CC	CW	G-Rank	S-Rank	SAR	P	B	G	Family	Species #
Hydrastis canadensis			Goldenseal	M*	10	3	G3 G4	S2	SC	^		^	Ranunculaceae - Buttercup Family	749
Ranunculus pensylvanicus			Pennsylvania Buttercup	MP	3	-5	G5	S5		R	R	R	Ranunculaceae - Buttercup Family	757
Thalictrum dasycarpum			Purple Meadow-rue	M	5	-3	G5	S4?		X			Ranunculaceae - Buttercup Family	761
Thalictrum pubescens		*Thalictrum polygamum*	Tall Meadow-rue	M	5	-3	G5	S5		C	C	C	Ranunculaceae - Buttercup Family	763
Caulophyllum giganteum		*Caulophyllum thalictroides var. giganteum*	Giant Blue Cohosh	M	5	5	G4 G5	S5		C	C	C	Berberidaceae - Barberry Family	767
Caulophyllum thalictroides			Blue Cohosh	M	5	5	G5	S5			X	X	Berberidaceae - Barberry Family	768
Lindera benzoin			Northern Spicebush	F	6	-3	G5	S4		U	C	R	Lauraceae - Laurel Family	773
Sanguinaria canadensis			Bloodroot	MP	5	3	G5	S5		U	C	C	Papaveraceae - Poppy Family	787
Cardamine diphylla		*Dentaria diphylla, Dentaria incisa*	Two-leaved Toothwort	F	7	3	G5	S5		C	C	C	Brassicaceae - Mustard Family	810
Sarracenia purpurea			Northern Pitcher Plant	MP	10	-5	G5	S5		C	C	C	Sarraceniaceae - Pitcher Plant Family	846
Ribes americanum			American Black Currant	F	4	-3	G5	S5		C	C	C	Grossulariaceae - Currant Family	872
Ribes cynosbati			Eastern Prickly Gooseberry	FM	4	3	G5	S5		C	C	C	Grossulariaceae - Currant Family	874
Ribes glandulosum			Skunk Currant	FM	6	-3	G5	S5		R	C	C	Grossulariaceae - Currant Family	875
Ribes hirtellum			Swamp Gooseberry	FM	6	-3	G5	S5		C	C	C	Grossulariaceae - Currant Family	876
Ribes hudsonianum			Northern Black Currant	FM	8	-5	G5	S5		E		R	Grossulariaceae - Currant Family	877
Ribes lacustre			Bristly Black Currant	FM	7	-3	G5	S5		C	C	C	Grossulariaceae - Currant Family	878
Agrimonia gryposepala			Hooked Agrimony	M	2	3	G5	S5		C	C	C	Rosaceae - Rose Family	882
Agrimonia striata			Woodland Agrimony	M	3	3	G5	S4				R	Rosaceae - Rose Family	883
Amelanchier alnifolia			Saskatoon	FMP	8	3	G5	S4?		C	R		Rosaceae - Rose Family	885
Amelanchier arborea			Downy Serviceberry	FMP	5	3	G5	S5		R	R		Rosaceae - Rose Family	886

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Amelanchier laevis		*Amelanchier laevis var. nitida*	Smooth Serviceberry	FMP	5	5	G5	S5		C	C	C	Rosaceae - Rose Family	887
Amelanchier sanguinea		*Amelanchier huronensis*	Round-leaved Serviceberry	FMP	7	5	G5	S5		U	R	**X**	Rosaceae - Rose Family	888
Amelanchier spicata			Running Serviceberry	FMP	4	3	G5	S4		C	C	C	Rosaceae - Rose Family	889
Aronia melanocarpa		*Photinia melanocarpa, Pyrus melanocarpa*	Black Chokeberry	F	7	-3	G5	S5		U	C	C	Rosaceae - Rose Family	890
Comarum palustre		*Comarum palustris, Potentilla palustris*	Marsh Cinquefoil	M	7	-5	G5	S5		C	C	C	Rosaceae - Rose Family	892
Crataegus brainerdii			Brainerd's Hawthorn	FM	4	5	G5	S2		R			Rosaceae - Rose Family	893
Crataegus chrysocarpa			Fireberry Hawthorn	FM	4	5	G5	S5		R	X	X	Rosaceae - Rose Family	894
Crataegus coccinea	var. pringlei	*Crataegus pringlei*	Pringle's Hawthorn	FM	4	5	G5	S5		C	**X**	X	Rosaceae - Rose Family	895
Crataegus dodgei		*Crataegus dodgei var. flavida, Crataegus flavida*	Dodge's Hawthorn	FM	4	5	G4	S4		R		X	Rosaceae - Rose Family	896
Crataegus douglasii			Douglas' Hawthorn	FM	7	0	G5	S4?		U		R	Rosaceae - Rose Family	897
Crataegus flabellata			Fan-leaved Hawthorn	FM	4	5	G4 G5	S4		R	**R**	**R**	Rosaceae - Rose Family	898
Crataegus fluviatilis		*Crataegus apiomorpha*	Fort Sheridan Hawthorn	FM	4	5	G3 G4 Q	S2		X	X	X	Rosaceae - Rose Family	899
Crataegus holmesiana			Holmes' Hawthorn	FM	4	5	G5	S4S5		R	**U**		Rosaceae - Rose Family	900
Crataegus macracantha		*Crataegus succulenta var. macracantha*	Large-thorned Hawthorn	FM	4	5	G5	S5		U	X	X	Rosaceae - Rose Family	902
Crataegus macrosperma		*Crataegus macrosperma var. acutiloba*	Big-fruited Hawthorn	FM	4	5	G5	S5		U	X	X	Rosaceae - Rose Family	903

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Crataegus magniflora		*Crataegus corusca, Crataegus hillii*	Shining-branch Hawthorn	FM	4	5	G3 G5	S3		U		R	Rosaceae - Rose Family	904
Crataegus punctata			Dotted Hawthorn	FM	4	5	G5	S5		C	C	C	Rosaceae - Rose Family	906
Crataegus submollis			Quebec Hawthorn	FM	4	5	G5	S5		C	C	C	Rosaceae - Rose Family	907
Crataegus suborbiculata			Caughnawaga hawthorn	FM	4	5	G3 ?	S2		R	R		Rosaceae - Rose Family	908
Fragaria vesca	ssp. americana		American Woodland Strawberry	FM	4	3	G5 T5	S5		C	C	C	Rosaceae - Rose Family	911
Fragaria virginiana	ssp. virginiana		Wild Strawberry	FM	2	3	G5 T5	S5		C	C	C	Rosaceae - Rose Family	912
Geum canadense			Canada Avens	M	3	0	G5	S5		C	C	C	Rosaceae - Rose Family	914
Prunus pensylvanica			Pin Cherry	FM	3	3	G5	S5		C	C	C	Rosaceae - Rose Family	937
Prunus serotina			Black Cherry	FM	3	3	G5	S5		C	C	C	Rosaceae - Rose Family	940
Prunus virginiana			Chokecherry	FM	2	3	G5	S5		C	C	C	Rosaceae - Rose Family	941
Rosa acicularis			Prickly Rose	FMP	5	3	G5	S5		C	C	R	Rosaceae - Rose Family	943
Rosa blanda			Smooth Rose	FMP	3	3	G5	S5		C	C	R	Rosaceae - Rose Family	944
Rosa palustris			Swamp Rose	FMP	7	-5	G5	S5		C	C	C	Rosaceae - Rose Family	949
Rubus allegheniensis	var. alleghenicensis		Allegheny Blackberry	FM	2	3	G5 TNR	SU		C	C	C	Rosaceae - Rose Family	953
Rubus canadensis			Canada Blackberry	FM	2	5	G5	S5		C/X	X		Rosaceae - Rose Family	955
Rubus flagellaris			Northern Dewberry	FM?	4	3	G5	S4		R	R		Rosaceae - Rose Family	956
Rubus hispidus			Bristly Dewberry	FM?	6	-3	G5	S4		R	R	**R**	Rosaceae - Rose Family	957
Rubus idaeus	ssp. strigosus		North American Red Raspberry	FM	2	3	G5 T5	S5		C	C	C	Rosaceae - Rose Family	958
Rubus occidentalis			Black Raspberry	FM	2	5	G5	S5		C	C	C	Rosaceae - Rose Family	961
Rubus odoratus			Purple-flowering Raspberry	FM	3	5	G5	S5		**R**	R	R	Rosaceae - Rose Family	962
Rubus pubescens			Dwarf Raspberry	FM	4	-3	G5	S5		C	C	C	Rosaceae - Rose Family	963
Rubus repens		*Dalibarda repens,*	Dewdrop	FM?	8	0	G5	S4?		R	R	C	Rosaceae - Rose Family	964

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		Rubus dalibarda												
Sorbus americana		*Pyrus americana*	American Mountain-ash	FMP	8	0	G5	S5		R		R	Rosaceae - Rose Family	966
Sorbus decora			Showy Mountain-ash	FMP	8	3	G5	S5		C	R	R	Rosaceae - Rose Family	968
Amphicarpaea bracteata			American Hog-peanut	F	4	0	G5	S5		R	C	C	Fabaceae - Legumes Family	972
Apios americana			American Groundnut	F	6	-3	G5	S5			R	R	Fabaceae - Legumes Family	973
Lathyrus palustris			Marsh Vetchling	F	6	-3	G5	S5		C	C	R	Fabaceae - Legumes Family	981
Geranium maculatum			Spotted Geranium	M	6	3	G5	S5		R		R	Geraniaceae - Geranium Family	1012
Polygala senega			Seneca Snakeroot	M	7	3	G4 G5	S4		C	C	R	Polygalaceae - Milkwort Family	1021
Rhus aromatica			Fragrant Sumac	FMP	8	5	G5	S4		U		R	Anacardiaceae - Sumac Family	1038
Rhus typhina		*Rhus hirta*	Staghorn Sumac	FMP	1	3	G5	S5		C	C	C	Anacardiaceae - Sumac Family	1039
Celastrus scandens			Climbing Bittersweet	M	3	3	G5	S5		C	C	C	Celastraceae - Bittersweet Family	1046
Acer pensylvanicum			Striped Maple	P	7	3	G5	S4		U		R	Sapindaceae - Soapberry Family	1051
Acer rubrum			Red Maple	MP	4	0	G5	S5		C	C	C	Sapindaceae - Soapberry Family	1053
Acer saccharinum			Silver Maple	M	5	-3	G5	S5		C	C	C	Sapindaceae - Soapberry Family	1054
Acer saccharum			Sugar Maple	FP	4	3	G5	S5		C	C	C	Sapindaceae - Soapberry Family	1055
Acer spicatum			Mountain Maple	MP	6	3	G5	S5		C	C	C	Sapindaceae - Soapberry Family	1056
Impatiens capensis		*Impatiens biflora*	Spotted Jewelweed	M	4	-3	G5	S5		C	C	C	Balsaminaceae - Touch-Me-Not Family	1058
Impatiens pallida			Pale Jewelweed	M?	7	-3	G5	S4		U	C	C	Balsaminaceae - Touch-Me-Not Family	1060
Parthenocissus vitacea		*Parthenocissus inserta*	Thicket Creeper	F	4	3	G5	S5		C	C	C	Vitaceae - Grape Family	1066
Vitis riparia			Riverbank Grape	FMP	0	0	G5	S5		C	C	C	Vitaceae - Grape Family	1068
Tilia americana			Basswood	FMP	4	3	G5	S5		C	C	C	Malvaceae - Mallow Family	1070
Viola labradorica		*Viola adunca var. minor. Viola conspersa*	Labrador Violet	M	3	0	G5	S5		C	C	C	Violaceae - Violet Family	1092

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Viola pubescens	var. pubescens	*Viola pensylvanica, Viola pubescens var. eriocarpa*	Downy Yellow Violet	M	5	3	G5 T5	S5		C	C	C	Violaceae - Violet Family	1096
Dirca palustris			Eastern Leatherwood	MP	7	0	G4	S4		C	C	C	Thymelaceae - Mezereum Family	1103
Shepherdia canadensis			Soapberry	FMP	7	5	G5	S5		C	C	C	Elaeagnaceae - Oleaster Family	1106
Chamaenerion angustifolium	ssp. circumvagum	*Chamerion angustifolium ssp. circumvagum, Epilobium angustifolium ssp. circumvagum*	Wandering Fireweed	M	3	0	G5 T5	S5		U	C	C	Onagraceae - Evening Primrose Family	1109
Aralia hispida			Bristly Sarsaparilla	M?	8	5	G5	S5		R		R	Araliaceae - Sarsaparilla Family	1131
Aralia nudicaulis			Wild Sarsaparilla	MP	4	3	G5	S5		C	C	C	Araliaceae - Sarsaparilla Family	1132
Aralia racemosa			American Spikenard	FM	7	5	G5	S5		C	C	C	Araliaceae - Sarsaparilla Family	1133
Panax quinquefolius		*Panax quinquefolium*	American Ginseng	CM	9	5	G3 G4	S2	END	U	R	C	Araliaceae - Sarsaparilla Family	1135
Cicuta maculata	var. maculata		Spotted Water-hemlock	M	6	-5	G5 T5	S5		C	C	C	Apiaceae - Carrot Family	1143
Heracleum maximum		*Heracleum lanatum*	American Cow Parsnip	FMP	3	-3	G5	S5		U	R	R	Apiaceae - Carrot Family	1148
Osmorhiza berteroi		*Osmorhiza berterii, Osmorhiza chilensis*	Mountain Sweet Cicely	M	5	3	G5	S4		U	R	R	Apiaceae - Carrot Family	1152
Osmorhiza claytonii			Hairy Sweet Cicely	M	5	0	G5	S5		C	C	C	Apiaceae - Carrot Family	1153
Osmorhiza longistylis			Smooth Sweet Cicely	M	6	3	G5	S5		U		R	Apiaceae - Carrot Family	1154
Sanicula marilandica			Maryland Sanicle	M	5	3	G5	S5		C	C	C	Apiaceae - Carrot Family	1157
Sanicula odorata			Clustered Sanicle	M?	6	0	G5	S5		R	C	R	Apiaceae - Carrot Family	1158
Sanicula trifoliata			Large-fruited Sanicle	M?	7	5	G4	S4		R			Apiaceae - Carrot Family	1159

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Sium suave			Common Water-parsnip	M	4	-5	G5	S5		C	C	C	Apiaceae - Carrot Family	1160
Cornus alternifolia		*Swida alternifolia*	Alternate-leaved Dogwood	MP	6	3	G5	S5		C	C	C	Cornaceae - Dogwood Family	1163
Cornus canadensis		*Chamaepericlymenum canadensis*	Bunchberry	FM	7	0	G5	S5		C	C	C	Cornaceae - Dogwood Family	1164
Cornus obliqua		*Cornus amomum ssp. obliqua, Cornus amomum var. schuetzeana, Swida obliqua, Cornus amomum*	Silky Dogwood	MP?	2	-3	G5	S5		C	C	C	Cornaceae - Dogwood Family	1165
Cornus racemosa		*Cornus foemina ssp. racemosa, Swida racemosa, Cornus foemina*	Grey Dogwood	MP?	2	0	G5	S5		R	C	R	Cornaceae - Dogwood Family	1166
Cornus rugosa		*Swida rugosa*	Round-leaved Dogwood	MP?	6	5	G5	S5		C	C	C	Cornaceae - Dogwood Family	1167
Cornus sericea		*Cornus stolonifera*	Red-osier Dogwood	MP	2	-3	G5	S5		C	C	C	Cornaceae - Dogwood Family	1168
Andromeda polifolia	var. latifolia	*Andromeda glaucophylla, Andromeda polifolia var. glaucophylla*	Glaucous-leaved Bog Rosemary	F	10	-5	G5T5	S5		U	C	C	Ericaceae - Heath Family	1169
Arctostaphylos uva-ursi			Common Bearberry	FM	8	5	G5	S5		C	C	R	Ericaceae - Heath Family	1170
Chamaedaphne calyculata		*Cassandra calyculata*	Leatherleaf	FM	9	-5	G5	S5		U	C	C	Ericaceae - Heath Family	1171
Chimaphila umbellata			Common Pipsissewa	M	8	5	G5	S5		U	R	R	Ericaceae - Heath Family	1172
Gaultheria hispidula			Creeping Snowberry	F	8	-3	G5	S5		C	C	C	Ericaceae - Heath Family	1174
Gaultheria procumbens			Eastern Teaberry	FM	6	3	G5	S5		U	C	C	Ericaceae - Heath Family	1175

Scientific Name	Infra. Taxon	*Synonyms*	Common Name	SON	CC	CW	G-Rank	S-Rank	SAR	P	B	G	Family	Species #
Monotropa uniflora		*Monotropa brittonii*	Indian-pipe	M	6	3	G5	S5		C	C	C	Ericaceae - Heath Family	1181
Rhododendron groenlandicum		*Ledum groenlandicum*	Common Labrador Tea	FMP	9	-5	G5	S5		U	C	C	Ericaceae - Heath Family	1188
Vaccinium angustifolium			Early Lowbush Blueberry	FM	6	3	G5	S5		U	R	R	Ericaceae - Heath Family	1189
Vaccinium macrocarpon		*Oxycoccus macrocarpus*	Large Cranberry	F	10	-5	G5	S4		R	C	R	Ericaceae - Heath Family	1190
Vaccinium myrtilloides			Velvet-leaved Blueberry	F	7	-3	G5	S5		U	C	C	Ericaceae - Heath Family	1191
Vaccinium oxycoccos		*Oxycoccus oxycoccos, Oxycoccus palustris*	Small Cranberry	FM	10	-5	G5	S5		C	C	C	Ericaceae - Heath Family	1192
Lysimachia borealis		*Trientalis borealis*	Northern Starflower	P	6	0	G5	S5		C	C	C	Primulaceae - Primrose Family	1194
Fraxinus americana			White Ash	FMP	4	3	G4	S4		C	C	C	Oleaceae - Olive Family	1206
Fraxinus nigra			Black Ash	FMP	7	-3	G5	S4	THR/END	C	C	C	Oleaceae - Olive Family	1208
Fraxinus pennsylvanica			Red Ash	FMP	3	-3	G4	S4		C	C	C	Oleaceae - Olive Family	1209
Apocynum androsaemifolium			Spreading Dogbane	M	3	5	G5	S5		C	C	C	Apocynaceae - Dogbane Family	1220
Apocynum cannabinum	var. cannabinum		Hemp Dogbane	P	3	0	G5	S5		U	C	R	Apocynaceae - Dogbane Family	1221
Asclepias incarnata			Swamp Milkweed	MP	6	-5	G5T5	S5		C	C	C	Apocynaceae - Dogbane Family	1223
Asclepias syriaca			Common Milkweed	FM	0	5	G5	S5		C	C	C	Apocynaceae - Dogbane Family	1224
Phryma leptostachya			Lopseed	M	6	3	G5	S4S5		R	C	C	Phrymaceae - Lopseed Family	1261
Verbena hastata			Blue Vervain	M	4	-3	G5	S5		U	C	C	Verbenaceae - Vervain Family	1262
Clinopodium arkansanum		*Calamintha arkansana, Satureja arkansana, Satureja glabella var. angustifolia*	Low Calamint	M	10	-3	G5	S4		C	C		Lamiaceae - Mint Family	1270

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Mentha canadensis		*Mentha arvensis*	Canada Mint	FM	3	-3	G5	S5		C	C	C	Lamiaceae - Mint Family	1289
Monarda fistulosa			Wild Bergamot	M	6	3	G5	S5		U	R	R	Lamiaceae - Mint Family	1294
Prunella vulgaris	ssp. lanceolata	*Prunella vulgaris var. elongata*	Lance-leaved Self-heal	M	0	0	G5T5	S5		C	C	C	Lamiaceae - Mint Family	1299
Trichostema brachiatum		*Isanthus brachiatus*	Fluxweed	M	9	5	G5	S4		U		X	Lamiaceae - Mint Family	1313
Castilleja coccinea			Scarlet Paintbrush	M	9	0	G5	S4S5		C	C	R	Orobanchaceae - Broomrape Family	1337
Melampyrum lineare			American Cow-wheat	M	6	3	G5	S5		C	C	R	Orobanchaceae - Broomrape Family	1341
Pedicularis canadensis			Canada Lousewort	M	7	3	G5	S5		C	C	C	Orobanchaceae - Broomrape Family	1343
Plantago rugelii			Rugel's Plantain	M	1	0	G5	S5		C	C	C	Plantaginaceae - Plantain Family	1362
Galium aparine			Common Bedstraw	M	4	3	G5	S5		C	C	C	Rubiaceae - Bedstraw Family	1379
Galium tinctorium			Dyer's Bedstraw	M	5	-5	G5	S5		U			Rubiaceae - Bedstraw Family	1389
Galium trifidum	ssp. trifidum		Three-petalled Bedstraw	M	5	-3	G5T5	S5		C	C	C	Rubiaceae - Bedstraw Family	1390
Diervilla lonicera			Northern Bush-honeysuckle	M	5	5	G5	S5		C	C	C	Caprifoliaceae - Honeysuckle Family	1397
Linnaea borealis			Twinflower	M	7	0	G5	S5		C	C	C	Caprifoliaceae - Honeysuckle Family	1399
Lonicera canadensis			Canada Fly Honeysuckle	M	6	3	G5	S5		C	C	C	Caprifoliaceae - Honeysuckle Family	1400
Lonicera dioica			Limber Honeysuckle	M	5	3	G5	S5		C	C	C	Caprifoliaceae - Honeysuckle Family	1401
Lonicera hirsuta			Hairy Honeysuckle	M	7	0	G5	S5		C	C	C	Caprifoliaceae - Honeysuckle Family	1402
Lonicera oblongifolia			Swamp Fly-honeysuckle	M	8	-5	G5	S5		C	C	C	Caprifoliaceae - Honeysuckle Family	1404
Lonicera villosa		*Lonicera caerulea var. villosa*	Mountain Fly-honeysuckle	M	10	-3	G5	S5		R	C	C	Caprifoliaceae - Honeysuckle Family	1406
Sambucus canadensis		*Sambucus nigra ssp. canadensis*	Common Elderberry	FM	5	-3	G5T5	S5		U	C	C	Viburnaceae - Elder Family	1415
Sambucus racemosa	ssp. pubens		Red Elderberry	FM	5	3	G5	S5		C	C	C	Viburnaceae - Elder Family	1416
Viburnum acerifolium			Maple-leaved Viburnum	M	6	5	G5	S5			R	R	Viburnaceae - Elder Family	1417

Scientific Name	Infra. Taxon	*Synonyms*	Common Name	SON	CC	CW	G-Rank	S-Rank	SAR	P	B	G	Family	Species #
Viburnum lentago			Nannyberry	FM	4	0	G5	S5		C	C	C	Viburnaceae - Elder Family	1422
Viburnum opulus var. americanum		*Viburnum trilobum*	Highbush Cranberry	F	5	-3	G5T5	S5		C	C	C	Viburnaceae - Elder Family	1423
Echinocystis lobata			Wild Cucumber	M	3	-3	G5	S5		R	**C**	**C**	Cucurbitaceae - Cucumber or Gourd Family	1429
Lobelia siphilitica			Great Blue Lobelia	M	6	-3	G5	S5		R	R	C	Campanulaceae - Bellflower Family	1438
Achillea borealis		*Achillea lanulosa, Achillea millefolium*	Woolly Yarrow	CMP	0	3	G5	S5		C	C	C	Asteraceae - Aster Family	1441
Ageratina altissima		*Eupatorium rugosum*	White Snakeroot	M?	5	3	G5	S5		C	C	C	Asteraceae - Aster Family	1445
Anaphalis margaritacea			Pearly Everlasting	CM	3	3	G5	S5		C	C	C	Asteraceae - Aster Family	1448
Antennaria howellii ssp. canadensis		*Antennaria neglecta var. canadensis, Antennaria neodioica ssp. canadensis*	Canada Pussytoes	M	2	5	G5T5?	S4S5		X	X	X	Asteraceae - Aster Family	1449
Antennaria howellii ssp. neodioica		*Antennaria neglecta var. attenuata, Antennaria neglecta var. neodioica, Antennaria russellii*	Northern Pussytoes	M	2	5	G5T5	S5?				X	Asteraceae - Aster Family	1450
Antennaria howellii ssp. petaloidea		*Antennaria neglecta var. petaloidea, Antennaria neodioica ssp. petaloidea*	Petaloid Pussytoes	M	2	5	G5T4T5	S5?		X			Asteraceae - Aster Family	1451
Antennaria neglecta			Field Pussytoes	M	3	5	G5	S5				R	Asteraceae - Aster Family	1452
Antennaria parlinii	ssp. fallax	*Antennaria plantaginifolia var. ambigens*	Deceitful Pussytoes	M	2	5	G5T5	S5		U	R	C	Asteraceae - Aster Family	1453
Arnoglossum plantagineum		*Cacalia plantaginea,*	Tuberous Indian-plantain	M	10	0	G4G5	S2	SC	U	R/X	R	Asteraceae - Aster Family	1457

Scientific Name	Infra. Taxon	*Synonyms*	Common Name	SON	CC	CW	G-Rank	S-Rank	SAR	P	B	G	Family	Species #
		Cacalia tuberosa												
Artemisia campestris	ssp. caudata	*Artemisia caudata*	Tall Wormwood	M	8	5	G5 T5	S4S5		C	C		Asteraceae - Aster Family	1461
Cirsium muticum			Swamp Thistle	M	8	-5	G5	S5		R	C	C	Asteraceae - Aster Family	1485
Cirsium pitcheri			Pitcher's Thistle	M?	10	5	G3	S2	SC/THR	R	R		Asteraceae - Aster Family	1486
Cirsium pumilum	var. hillii	*Cirsium hillii*	Hill's Thistle	M?	10	5	G3	S3	THR	U			Asteraceae - Aster Family	1487
Erigeron philadelphicus var. philadelphicus			Philadelphia Fleabane	M	1	-3	G5 T5	S5		C	C	C	Asteraceae - Aster Family	1500
Eupatorium perfoliatum			Common Boneset	M	2	-3	G5	S5		C	C	C	Asteraceae - Aster Family	1503
Eurybia macrophylla		*Aster macrophyllus*	Large-leaved Aster	FM	5	5	G5	S5		C	C	C	Asteraceae - Aster Family	1504
Euthamia graminifolia		*Solidago graminifolia*	Grass-leaved Goldenrod	M	2	0	G5	S5		C	C	C	Asteraceae - Aster Family	1505
Eutrochium maculatum	var. maculatum	*Eupatorium maculatum var. maculatum*	Spotted Joe Pye Weed	M?	3	-5	G5 T5	S5		C	C	C	Asteraceae - Aster Family	1506
Lactuca biennis		*Lactuca terrae-novae*	Tall Blue Lettuce	M	6	0	G5	S5		C	C	C	Asteraceae - Aster Family	1524
Nabalus albus		*Prenanthes alba*	White Rattlesnakeroot	M	6	3	G5	S5		U	C	C	Asteraceae - Aster Family	1535
Rudbeckia hirta	*var. pulcherrima*	*Rudbeckia serotina*	Black-eyed Susan	P	0	3	G5 T5	S5		(^)/C	C/X	C/X	Asteraceae - Aster Family	1553
Solidago altissima	var. altissima		Eastern Tall Goldenrod	M	1	3	G5	S5		C	C	C	Asteraceae - Aster Family	1561
Solidago arguta			Cut-leaved Goldenrod	M	8	3	G5	S4				R	Asteraceae - Aster Family	1562
Solidago caesia			Blue-stemmed Goldenrod	M	5	3	G5	S5		R	R	R	Asteraceae - Aster Family	1563
Solidago canadensis	var. canadensis		Canada Goldenrod	M	1	3	G5 T5	S5		C	C	C	Asteraceae - Aster Family	1564
Solidago flexicaulis			Zigzag Goldenrod	M	6	3	G5	S5		C	C	C	Asteraceae - Aster Family	1565
Solidago gigantea	var. gigantea		Giant Goldenrod	M	4	-3	G5 T5	S5		U	C	C	Asteraceae - Aster Family	1566
Solidago hispida var. hispida			Hairy Goldenrod	M	7	5	G5 T5	S5		C	C	R	Asteraceae - Aster Family	1567

Scientific Name	Infra. Taxon	*Synonyms*	Common Name	SON	C C	C W	G-Rank	S-Rank	SAR	P	B	G	Family	Species #
Solidago hispida var. huronensis		*Solidago hispida var. tonsa*	Lake Huron Hairy Goldenrod	M	5	5	G5 T3 ?	S2?		R			Asteraceae - Aster Family	1568
Solidago houghtonii		*Oligoneuron houghtonii*	Houghton's Goldenrod	M	10	-5	G3	S2?	SC/THR	R			Asteraceae - Aster Family	1569
Solidago juncea			Early Goldenrod	M	3	5	G5	S5		U	R	R	Asteraceae - Aster Family	1570
Solidago nemoralis	ssp. nemoralis		Grey-stemmed Goldenrod	M	2	5	G5 T5	S5		C	C	C	Asteraceae - Aster Family	1571
Solidago ohioensis		*Oligoneuron ohioense*	Ohio Goldenrod	M	10	-5	G4	S4		C	C	R	Asteraceae - Aster Family	1572
Solidago ontarioensis		*Solidago glutinosa var. ontarioensis, Solidago simplex var. ontarioensis, Solidago simplex ssp. randii*	Ontario Goldenrod	M	10	3	G3	S3		U			Asteraceae - Aster Family	1573
Solidago ptarmicoides		*Aster ptarmicoides, Oligoneuron album, Unamia alba*	Upland White Goldenrod	M	9	3	G5	S5		C	C		Asteraceae - Aster Family	1574
Solidago rugosa	ssp. rugosa		Northern Rough-stemmed Goldenrod	M	4	0	G5 T5	S5		U	C	C	Asteraceae - Aster Family	1576
Solidago uliginosa			Bog Goldenrod	M	9	-5	G5	S5		C	C	C	Asteraceae - Aster Family	1577
Solidago x krotkovii			Krotkov's Goldenrod	M	n/a	n/a	GNA	hyb		X	X		Asteraceae - Aster Family	1578
Symphyotrichum cordifolium		*Aster cordifolius*	Heart-leaved Aster	P	5	5	G5	S5		C	C	C	Asteraceae - Aster Family	1586
Symphyotrichum novae-angliae		*Aster novae-angliae , Virgulus novae-angliae*	New England Aster	MP	2	-3	G5	S5		C	C	C	Asteraceae - Aster Family	1595
Symphyotrichum puniceum		*Aster puniceus*	Purple-stemmed Aster	P	6	-5	G5	S5		C	C	C	Asteraceae - Aster Family	1599

Appendix III
SVCA Pre-Consultation Comments

1078 Bruce Road 12, P.O. Box 150, Formosa ON Canada N0G 1W0
Tel 519-367-3040, Fax 519-367-3041, publicinfo@svca.on.ca, www.svca.on.ca

SENT ELECTRONICALLY (*rarcher@nrsi.on.ca*)

September 28, 2021

Natural Resource Solutions Inc. for Town of Saugeen Shores
c/o Ryan Archer
415 Phillip Street, Unit C
Waterloo, ON
N2L 3X2

ATTENTION: Ryan Archer, Senior Terrestrial and Wetland Biologist

Dear Ryan Archer,

RE: Class EA to Address Proposed Southampton Landfill Expansion
126 Concession 14
CON 15 N PT LOT 12 RW OVER; PT LOT 11
Roll Number: 411044000206500 and 411044000206400
Geographic Town of Saugeen
Town of Saugeen Shores

It is Saugeen Valley Conservation Authority (SVCA) staff's understanding the Town of Saugeen Shores will be initiating a Class Environmental Assessment (Class EA) process to consider the proposed Southampton landfill expansion on the above-noted property.

As requested, Saugeen Valley Conservation Authority (SVCA) staff has reviewed the above-noted project as per our delegated responsibility from the Province to represent provincial interests regarding natural hazards identified in Section 3.1 of the Provincial Policy Statement (PPS, 2020) and as a regulatory authority under Ontario Regulation 169/06 (SVCA's Development, Interference with Wetlands, and Alterations to Shorelines and Watercourses Regulation). SVCA staff has also provided comments as per our Memorandum of Agreement (MOA) with the County of Bruce representing natural hazards, natural heritage, and water resources; and the proposed has also been reviewed through our role as a public body under as per our CA Member approved 'Environmental Planning and Regulations Policies' manual, amended October 16, 2018.

The purpose of the review is to provide preliminary comments regarding the revised natural hazard mapping on the subject property associated with wetland features. NRSI is undergoing a natural environment characterization and constraints assessment prior to initiating the Class Environmental Assessment (Class EA) process.

Site Characteristics

Based on the review of available mapping, aerial imagery and the site inspection completed September 15th, 2021 with NRSI staff member Brett Woodman, SVCA staff confirmed that the property is located on the north

side of Concession 14. The property is generally undulating in topography. The southeast corner of the lot features the existing landfill, it is largely disturbed. The northeast corner of the property features upland species and is entirely forest covered. No wetland was identified in the northeast corner of the property through NRSI onsite reviews. The southwest corner of the property features existing disturbance associated with the landfill and compost area, however, during the site inspection SVCA staff reviewed the area northeast of the compost area. Fill has been placed throughout the area resulting in drainage being directed to the existing conifer plantation consisting of primarily red cedar. The understory of the conifer plantation is generally populated by dogwood. The northwest corner of the property features undulating mixed forest cover with pockets of low-lying wetland features. An ephemeral watercourse feature extends through the north property line, connected to the wetland features. Agricultural field extends throughout the west portion of the property.

PLANNING ACT **APPLICATION PRE-SUBMISSION CONSULTATION**

Should the project require a *Planning Act* application for the project, the following pre-submission comments are offered by SVCA staff in advance of any submission of a formal application (i.e. official plan amendment, zoning by-law amendment) to the County of Bruce/Town of Saugeen Shores. Please note, SVCA staff provide advice and recommendations to the County/Town regarding natural hazard and natural heritage matters; however, the SVCA is not the Approval Authority for *Planning Act* Applications. We recommend you contact the Town and/or County for information pertaining to the *Planning Act* process.

ZONING AND OFFICIAL PLAN

Administration and final interpretation of the Zoning By-law and Official Plan are the responsibility of the Town and/or County. We recommend you contact the County / Town to confirm the zoning status and/or designation of the property, and for all other items relating to the Zoning By-law and Official Plan.

DELEGATED RESPONSIBILITY AND ADVISORY COMMENTS

SVCA staff has reviewed the application through our delegated responsibility from the Province to represent provincial interests regarding natural hazards identified in Section 3.1 of the Provincial Policy Statement (PPS, 2020). We have also reviewed the application through our responsibilities as a service provider to the County of Bruce in that we provide expert advice and technical clearance on *Planning Act* applications with regards to natural hazards, natural heritage, and water resources as set out in the PPS 2020, County Official Plan and/or local official plans. Comments below only include features/technical requirements affecting the property.

Natural Hazards:

Portions of the subject property have been identified as Hazard associated with low-lying wetland features and a watercourse. It is SVCA staff's interpretation that the current SVCA hazard mapping is consistent with the Town of Saugeen Shores Zoning By-Law 75-2006 Environmental Protection (EP) zone and designated Environmental Hazard in the Saugeen Shores Official Plan (OP).

Wetland hazard mapping was reviewed and refined by onsite assessments completed by NRSI staff. SVCA staff defer to NRSI regarding the refined hazard mapping. In general, it is SVCA staff's interpretation that no new buildings or structures are permitted within the Environmental Hazard Designations as per the Saugeen Shores Local OP Section 2.8 and within the EP zone as per Section 22.3 of the Saugeen Shores Zoning By-law 75-2006.

SVCA staff will recommend to the County at the next Official Plan update and to the Town at the next zoning by-law amendment to include the revised hazard lands. The following is a summary of Provincial, County and Municipal natural hazard policies that affect the subject property.

Provincial Policy Statement – Section 3.1

Section 3.1.1 of the PPS, 2020 states, in general, that development shall be directed to areas outside of hazardous lands (flooding hazards, erosion hazards, dynamic beach hazards), and hazardous sites (organic soils, leda clay, unstable bedrock.).

Bruce County Official Plan Policies

It is SVCA staff's interpretation that flood and erosion susceptible areas are considered a Hazard Land Area per Section 5.8.1 of the Bruce County Official Plan. Further, these policies state that buildings and structures are generally not permitted within these lands.

Town of Saugeen Shores Official Plan Policies

It is SVCA staff's interpretation, Section 2.8 of the Town of Saugeen Shores Official Plan prohibits, in general, development and site alteration within hazardous lands.

At this time, no final site plan of the proposed landfill expansion has been submitted to SVCA staff for review. It is staff's understanding that the configuration of the expanded landfill site is still underway subject to discussion between the Town of Saugeen Shores and NRSI. SVCA staff recommends that the landfill expansion area be directed outside of the identified wetland areas. Further, SVCA staff defer to NRSI regarding their recommended development setback from the delineated wetland features.

Natural Heritage:

In the opinion of SVCA staff, the subject property features Significant Woodlands, potential Significant Wildlife Habitat, adjacent lands to Fish Habitat, and potential Habitat of Threatened and Endangered Species.

Significant Woodlands

Significant Woodlands are identified in the Town of Saugeen Shores Official Plan (OP) as those which are greater than or equal to 4 hectares in size, or as determined by the Significant Woodlands study, or as identified by Special Policy Area #4, as per section 2.6.8.2 of the Saugeen Shores OP. In this case, the woodlands on and within the vicinity of the property are considered significant as they are greater than or equal to 4 hectares in size.

The following is a summary of Provincial, County and Municipal natural hazard policies that affect the subject property.

Provincial Policy Statement

Section 2.1.5 (b) of the Provincial Policy Statement dictates that development and site alteration shall not be permitted within significant woodlands nor shall it be permitted on adjacent lands (Section 2.1.8) to significant woodlands unless it has been evaluated and demonstrated that there will be no negative impacts.

Bruce County Official Plan Policies

It is SVCA staff's interpretation Section 4.3.2.6 of the Bruce County Official Plan states that development within significant woodlands will require an Environmental Impact Study (EIS).

Saugeen Shore Official Plan Policies

Section 2.6.8.5 (c) of the Saugeen Shores OP states, in the opinion of SVCA staff, that development or site alteration shall not be permitted within these woodlands, and that development may be permitted on adjacent lands in accordance with Section 2.6.11.

At this time, no final site plan of the proposed landfill expansion has been submitted to SVCA staff for review. It is staff's understanding that the configuration of the expanded landfill site is still underway subject to discussion between the Town of Saugeen Shores and NRSI. SVCA staff recommends that the landfill expansion area be directed to the south and southwest portion of the property where previous disturbance has already occurred. This portion of the property has historically experienced forest cover removal, as such, SVCA staff are of the opinion that further negative impact to the significant woodland feature could be minimized by restricting encroachment to the forest fringe. SVCA staff recommend that tree removal be restricted to only what is necessary to accommodate the proposed new laneway. Further, our office recommends any tree removal avoid the active woodland bird nesting/rearing season from May 1st to August 15th, in accordance with the Federal Migratory Birds Act. Through application of these proposed measures, it is the SVCA's opinion that the potential negative impacts to the significant woodland feature and/or the adjacent lands would be minimized. The Town has retained the services of NRSI to undertake and EA in accordance with the above policies. SVCA staff asks for the opportunity to review a copy of the draft EA.

Significant Wildlife Habitat

While mapping showing significant wildlife habitat is not included in the Bruce County Official Plan, it has come to the attention of SVCA staff that significant wildlife habitat may be located on and/or within the vicinity of the subject property. Based on Natural Heritage Information Centre (NHIC) historical records Tuberous Indian Plantain has been identified on or within the vicinity of the subject property. Tuberous Indian Plantain is considered a species of special concern by the Province, as such, its habitat is considered significant wildlife habitat. Tuberous Indian Plantain typically grows in open sunny areas in wet, calcium-rich meadows or shoreline fens. In Ontario, it grows along riverbanks and in wetlands near Lake Huron. Portions of the subject property may feature this significant wildlife habitat.

The following is a summary of Provincial, County and Municipal natural hazard policies that affect the subject property.

Provincial Policy Statement – Section 2.1

Section 2.1.5 (d) of the Provincial Policy Statement dictates that development and site alteration shall not be permitted in significant wildlife habitat nor shall it be permitted on adjacent lands (Section 2.1.8) to significant wildlife habitat unless it has been evaluated and demonstrated that there will be no negative impacts.

Bruce County Official Plan Policies

Section 4.3.2.10 of the Bruce County OP states, in part, that development proposed within significant wildlife habitat requires an EIS that states there will be no negative impact on the feature.

Town of Saugeen Shores Official Plan Policies

Section 2.6.4 of the Saugeen Shores OP states, in part, that development proposed within significant wildlife habitat will require an Environmental Impact Statement (EIS) to determine whether the development is acceptable.

At this time, no final site plan of the proposed landfill expansion has been submitted to SVCA staff for review. It is staff's understanding that the configuration of the expanded landfill site is still underway subject to discussion between the Town of Saugeen Shores and NRSI. SVCA staff recommends that the landfill expansion area be directed to the south and southwest portion of the property where previous disturbance has already occurred. This portion of the property features previous and ongoing disturbance, as such, SVCA staff are of the opinion that development restricted to this portion of the property will minimize further potential negative impact to this natural heritage feature. Through application of these proposed measures, it is SVCA staff's opinion that the potential negative impacts to the potential significant wildlife habitat and/or the adjacent lands would be minimized. The Town has retained the services of NRSI to undertake and EA in accordance with the above policies. SVCA staff asks for the opportunity to review a copy of the draft EA.

Fish Habitat:

SVCA staff consider the Saugeen River and the intermittent watercourse to be fish habitat. The proposed development is located on adjacent lands to the fish habitat. SVCA staff's review of fish habitat is provided in consideration of the PPS and local policies but does not provide clearance on the required statutes or legislation from either the Ministry of Natural Resources and Forestry (MNRF) or the Department of Fisheries and Oceans (DFO).

The following is a summary of Provincial, County and Municipal natural hazard policies that affect the subject property.

Provincial Policy Statement (PPS, 2020) – Natural Heritage Policies – Section 2.1

Section 2.1.6 of the PPS states that development and site alteration shall not be permitted in fish habitat except in accordance with provincial and federal requirements; and further, Section 2.1.8 states that development and site alteration shall not be permitted on adjacent lands to fish habitat unless the ecological function of the adjacent lands has been evaluated and it has been demonstrated that there will be no negative impacts on the natural features or on their ecological functions.

County of Bruce Official Plan Policies

It is SVCA's interpretation that Section 4.3.3.1 (v) of the Bruce County OP, in SVCA staff's opinion, states that development proposed within lands adjacent to fish habitat requires an EIS that demonstrates there will be no negative impact on the feature.

Town of Saugeen Shores Official Plan Policies

It is SVCA staff's interpretation, Section 2.6.5 of the Saugeen Shores Official Plan states, in part, that development proposed adjacent to a water feature that potentially contains fish habitat, will require an EIS to determine whether the development is acceptable.

At this time, no final site plan of the proposed landfill expansion has been submitted to SVCA staff for review. It is staff's understanding that the configuration of the expanded landfill site is still underway subject to discussion between the Town of Saugeen Shores and NRSI. SVCA staff recommends that the landfill expansion area be directed to the south and southwest portion of the property where previous disturbance has already occurred. SVCA staff recommend that the appropriate sediment and erosion measures are applied throughout the landfill expansion process and throughout its use to ensure that no deleterious materials enter the Saugeen River or the identified intermittent tributary. Through implementation of the proposed measures, SVCA staff are of the opinion that the potential significant negative impacts to the fish habitat could be minimized. The Town has retained the services of NRSI to undertake and EA in accordance with the above policies. SVCA staff asks for the opportunity to review a copy of the draft EA.

Threatened and Endangered Species

It has come to the attention of SVCA staff that habitat of Endangered Species and Threatened Species may be located on or adjacent to the property. SVCA's role is to identify endangered/threatened species habitat via screening process in consideration of the PPS and local policies but we must direct applicants to Ministry of Environment, Conservation and Parks (MECP) for follow-up. It is the responsibility of the applicant to ensure the endangered species and threatened species policy referred to in the PPS has been appropriately addressed.

The following is a summary of Provincial, County and Municipal natural hazard policies that affect the subject property.

Provincial Policy Statement (PPS, 2020) –Section 2.1

Section 2.1.7 of the PPS states that development and site alteration shall not be permitted in habitat of endangered species and threatened species, except in accordance with provincial and federal requirements. It is the responsibility of the applicant to ensure the endangered species and threatened species policy referred to in the PPS is appropriately addressed.

County of Bruce Official Plan Policies

It is the interpretation of SVCA staff that Section 4.3.2.7.3 of the County OP does not support development within the habitat of endangered/threatened species except for infrastructure permitted by the Provincial Policy Statement within significant portions of the habitat of threatened and endangered species.

Town of Saugeen Shores (OP)

It is SVCA staff's interpretation that Section 2.6.3.2 of the Town's OP does not permit development or site alteration in habitat of endangered or threatened species or species.

Please contact the Ministry of Environment, Conservation and Parks (MECP) for information on how to address this policy. MECP inquiries can be sent via email to: SAROntario@ontario.ca

Water Resources

SVCA staff recommends a hydrologic/hydrogeologic assessment be undertaken to demonstrate the proposed landfill expansion will not have an impact on the source water quality and quantity to the adjacent wetland sand watercourse features; and that, SVCA staff should have an opportunity to review these studies in accordance with our MOA with the County of Bruce and as a public review agency.

STATUTORY COMMENTS

SVCA staff has reviewed the application as per our responsibilities as a regulatory authority under Ontario Regulation 169/06 (SVCA's Development, Interference with Wetlands, and Alterations to Shorelines and Watercourses Regulation). This regulation, made under Section 28 of the *Conservation Authorities Act,* enables SVCA to regulate development in or adjacent to river or stream valleys, Great Lakes and inland lake shorelines, watercourses, hazardous lands and wetlands. Subject to the CA Act, development taking place on or adjacent to these lands may require permission from SVCA to confirm that the control of flooding, erosion, dynamic beaches, pollution or the conservation of land are not affected. SVCA also regulates the alteration to or interference in any way with a watercourse or wetland.

Portions of the property are within the SVCA 'Regulated Area' associated with Ontario Regulation 169/06. Within the regulated area is the intermittent watercourse plus 30 metres, the wetlands identified by NRSI plus 30 metres and the floodplain of the Saugeen River, plus 30 metres and their delineated "hazardous lands", which are lands that could be unsafe for development because of naturally occurring processes associated with flooding, erosion or unstable soils. In accordance with O. Reg. 169 /06 development and/or site alteration within these areas and their adjacent lands require the permission from SVCA, prior to carrying out the work.

"Development" as defined under the *Conservation Authorities Act means:*

a) *the construction, reconstruction, erection or placing of a building or structure of any kind;*
b) *any change to a building or structure that would have the effect of altering the use or potential use of the building or structure, increasing the size of the building or structure or increasing the number of dwelling units in the building or structure;*
c) *site grading; or,*
d) *the temporary or permanent placing, dumping or removal of any material, originating on the site or elsewhere*.

And;

"Alteration" as per Section 5 of Ontario Regulation 169/06 generally includes the straightening, diverting or interference in any way with a rive, creek, stream or watercourse, or the changing or interfering in any way with a wetland.

To determine the SVCA Regulated Area on the property, please refer to the attached map.

SVCA PERMISSION FOR DEVELOPMENT OR ALTERATION

In general, SVCA's policies do not support development within the aforementioned hazard lands/regulated areas. SVCA's policies generally encourage development outside these areas, where feasible. However, development

within the adjacent lands to the above-noted features may be acceptable, subject to conditions to control the impact of flooding, erosion, pollution, and conservation of land. If development is proposed within the 'SVCA Regulated Area', an SVCA permit may be required for the development. Furthermore, any development proposed within SVCA's regulated area may require a hydrogeologic assessment to evaluate the hydrologic impacts (quantity and quality) of the proposed on the watercourse and wetland features.

Right to Hearing

Please be advised that the owner(s) of a property may submit an Application for a development or alteration proposal to the SVCA at any time. An Application must be complete as determined by the SVCA for it to be considered. The completeness of an Application is determined by SVCA staff, or an administrative review can be requested by the applicant to the SVCA's General Manager/Secretary Treasurer. In the event that the administrative review by the SVCA's General Manager/Secretary Treasurer determines an Application is not complete, the applicant can request an administrative review by the Authority.

In accordance with Section 28 (12) of the *Conservation Authorities Act*, permission required under Ontario Regulation 169/06, as amended, shall not be refused or granted subject to conditions unless the person requesting the permission has been given the opportunity for a hearing (by request) before the Authority or, in the case of the SVCA, before the Authority's Executive Committee. Should you receive an SVCA permit, approved by staff, with conditions of approval and object to one or more of the conditions, you will have the option to attend a hearing before the SVCA Executive Committee. Should you submit a complete Application for which staff is not prepared to issue a permit, you will have the option to attend a hearing scheduled before the SVCA Executive Committee.
After holding a hearing under Section 28 (12), the SVCA Executive Committee shall,

(a) refuse the permission; or
(b) grant the permission, with or without conditions

After the hearing, if the Executive Committee refuses permission, or grants permission subject to conditions, the person who requested permission shall be given written reasons for the decision. If the person is refused permission or objects to conditions imposed on the permission, the person may appeal to the Minister of Natural Resources and Forestry within 30 days of receiving the reasons for the refusal.

SUMMARY

SVCA staff has reviewed the proposed in accordance with our Memorandum of Agreement (MOA) with Bruce County (should a Planning Act application be required) and as per our mandated responsibilities for natural hazard management, including our regulatory role under the *Conservation Authorities Act*. We have also commented as a public body in accordance with our 'Environmental Planning and Regulation Policies' manual.

Preliminary SVCA comments regarding Zoning and Official Plan matters have been included within this correspondence but should not be considered all-encompassing for formal SVCA *Planning Act* application comments and you should contact Bruce County and the Town of Saugeen Shores confirm the Official Plan and Zoning status of the property.

SVCA staff recommends the aforementioned natural heritage and natural hazard features be addressed, as per comments above, in the Class EA review. We further recommend that should development and site alteration proceed on the property that SVCA staff be afforded an opportunity to review the draft EA and finalized site

plans. Further, if development is proposed within the 'SVCA Regulated Area', an SVCA permit may be required for the development. Additionally, should any off-site construction/site alteration be proposed as part of this project, we ask to be contacted to determine if there are any areas of interest to the SVCA.

SVCA staff has provided comments for the proposed based on the available aerial imagery and mapping, including the updated wetland mapping provided by NSRI, and the site inspection completed September 15th, 2021. There is no guarantee these comments will remain unchanged indefinitely.

We trust this information is satisfactory, thank you for the opportunity to comment. Should you have any questions, please contact the SVCA Planning Department.

Sincerely,



Lauren McGregor
Environmental Planning Technician
Saugeen Conservation

LM/

cc: Cheryl Grace, Authority Member, SVCA (via email)
Mike Myatt, Authority Member, SVCA (via email)



The included mapping has been compiled from various sources and is for information purposes only. Saugeen Valley Conservation Authority (SVCA) is not responsible for, and cannot guarantee, the accuracy of all the information contained within the map.

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This mapping contains products of the South Western Ontario Orthophotography Project 2015 (SWOOP2015). These images were taken in 2015 at 20cm resolution by Fugro GeoServices. They are the property of Saugeen Valley Conservation Authority ©2021.

N

UTM Zone 17N, NAD 83

0 200 m

1:7500

Legend

- Subject Property
- Ontario Parcel
- SVCA Hazard Area
- SVCA Approx. Screening Area
- Watercourse
- Intermittent Watercourse

Natural Resource Solutions Inc.

126 Concession 14
Roll #s: 411044000206500
and 411044000206400
Town of Saugeen Shores (Saugeen)

SAUGEEN CONSERVATION

Map Document: (W:\Projects\Planning\UserProjects\Planning_LM.map) -- view (1); 2021-09-28 -- 3:21:06 PM

Appendix IV
Species at Risk/Species of Conservation Concern Habitat Screening

Scientific Name	Common Name	S-RANK[1]	ESA/ COSSARO[3]	COSEWIC[2]	SARA	Background Source	Habitat Preference[4,5]	Suitable Habitats within Study Area	Carried Forward to NEA?	Rationale
Birds										
Cardellina canadensis	Canada Warbler	S4B	SC	T	Schedule 1	eBird 2025	Interior forest habitats with a dense, well-developed shrub and vegetation understory; along riparian zones or wet bottomland habitat. require tracts of land which are >30ha.	Yes	Yes	Suitable interior forest and bottomland habitat exists within the study area
Aquila chrysaetos	Golden Eagle	S1B,S4N	END	NAR	No schedule	eBird 2025	Wild, arid plateaus deeply cut by streams and canyons or sparsely treed slopes and rock crags	No	No.	The species record was of a migrating individual. Suitable habitat is absent within the study area.
Ardea alba	Great Egret	S2B,S3M				eBird 2025	Open swamp woods or willow thickets, offshore islands, mudflats for feeding; nests in standing trees in open water, thickets, sometimes on low vegetation on islands	No	No	This species is more associated with lakeshore and open water habitats within the study area vicinity based on habitat preferences and occurrence records.
Chaetura pelagica	Chimney Swift	S4B, S4N	THR	T	Schedule 1	BSC et al. 2006; eBird 2025	Commonly found in urban areas near buildings; nests in hollow trees, crevices of rock cliffs, chimneys; highly gregarious; feeds over open water.	No	No	Limited buildings, rock cliffs, or chimneys.
Chlidonias niger	Black Tern	S3B,S4M	SC	NAR	No schedule	eBird 2025	Wetlands, coastal or inland marshes; large cattail marshes, marshy edges of rivers, lakes or ponds, wet open fens, wet meadows; requires marshes >20ha in size.	No	No	Suitable habitat is absent within the study area
Chordeiles minor	Common Nighthawk	S4B	SC	T	Schedule 1	NRSI staff experience; eBird 2025	Open ground; clearings in dense forests; ploughed fields; gravel beaches or barren areas with rocky soils; open woodlands; flat gravel roofs.	Yes	Yes	Field may be ploughed on the subject property. Suitable open habitats within wooded features may occur
Caprimulgus vociferus	Eastern Whip-poor-will	S4B	SC	SC	Schedule 1 (Threatened)	NRSI staff experience	Dry, open, deciduous woodlands of small to medium trees; oak or beech with lots of clearings and shaded leaflitter; wooded edges, forest clearings with little herbaceous growth; pine plantations; associated with >100 ha forests; may require 500 to 1000 ha to maintain population.	Yes	Yes	Open woodlands present in the study area.
Melanerpes erythrocephalus	Red-headed Woodpecker	S4B	END	E	Schedule 1	BSC et al. 2006	Open, deciduous forest with little understory; fields or pasture lands with scattered large trees; wooded swamps; orchards, small woodlots or forest edges; groves of dead or dying trees; feeds on insects and stores nuts or acorns for winter; loss of habitat is limiting factor; requires cavity trees with at least 40 cm dbh; require about 4 ha for a territory.	Yes	Yes	Suitable woodland and forest habitat is present within the study area
Cygnus columbianus	Tundra Swan	S2B,S4N, S3M				eBird 2025	Arctic tundra lakes, ponds and pools, primarily in coastal delta areas.	No	No	Local records of this species are of migrating individuals.
Falco peregrinus	Peregrine Falcon	S4	SC	NAR	No schedule	eBird 2025	Rock cliifs, crags, especially situated near water; tall buildings in urban centres.	No	No	Suitable breeding habitat is absent within the study area.
Fulica americana	American Coot	S3B,S4N	NAR	NAR	No schedule	eBird 2025	Reed marshes with permanent water and tall emergent vegetation; needs deep open water; cattail marshes; near lakes and ponds	No	No	Suitable habitat is absent within the study area

Scientific Name	Common Name	S-RANK[1]	ESA/ COSSARO[3]	COSEWIC[2]	SARA	Background Source	Habitat Preference[4,5]	Suitable Habitats within Study Area	Carried Forward to NEA?	Rationale
Progne subis	Purple Martin	S3B				eBird 2025	Open treed areas such as farmland, parks, yards, marshes; usually near large bodies of water; most commonly nests in nest boxes	No	No	Unlikely to occur within the study area; more likely to occur closer to the Lake Huron shoreline, especially where Purple Martin houses (nest structures) are provided
Riparia riparia	Bank Swallow	S4B	THR	T		BSC et al. 2006; NHIC 2021; eBird 2025	Sand, clay or gravel river banks or steep riverbank cliffs;lakeshore bluffs of easily crumbled sand or gravel; gravel pits, road-cuts, grassland or cultivated fields that are close to water; nesting sites are limiting factor for species presence.	Yes	Yes	Riverbank bluff at the northeast corner of the study area may contain suitable Bank Swallow nesting habitat. Foraging habitat may occur within the study area.
Tringa semipalmata	Willet	S2M				eBird 2025	Salt marshes, barrier islands and barrier beaches	No	No	The local record of this species was a migrant or vagrant
Hirundo rustica	Barn Swallow	S4B	SC	SC	Schedule 1	BSC et al. 2006; eBird 2025	Farmlands or rural areas; cliffs, caves, rock niches; buildings or other man-made structures for nesting; open country near body of water.	Yes	Yes - Breeding bird surveys to confirm presence	Nesting habitat may occur in/on structures within the study area. Also near farmland and rural areas, and near body of water that may provide foraging habitat.
Hylocichla mustelina	Wood Thrush	S4B	SC	T		BSC et al. 2006; eBird 2025	Carolinian and Great Lakes-St. Lawrence forest zones; undisturbed moist mature deciduous or mixed forest with deciduous sapling growth; near pond or swamp; hardwood forest edges; must have some trees higher than 12 m.	Yes	Yes	Large mixed forest within the study area
Nycticorax nycticorax	Black-crowned Night Heron	S3B,S2N, S4M				eBird 2025	Deciduous woodland swamps, cattail marshes, islands, wooded river and lake banks, coastal wetlands	No	No	Swamp habitat within the study area is relatively small and not typical of this species' habitat requirements
Ammodramus savannarum	Grasshopper Sparrow	S4B	SC	SC	Schedule 1	BSC et al. 2006; eBird 2025	Well-drained grassland or prairie with low cover of grasses, taller weeds on sandy soil; hayfields or weedy fallow fields; uplands with ground vegetation of various densities; perches for singing; requires tracts of grassland > 10ha.	Yes	Yes	Suitable habitat may be found within the large agricultural field at the east end of the study area, depending on field cover type.
Contopus virens	Eastern Wood-Pewee	S4B	SC	SC	Schedule 1	BSC et al. 2006; eBird 2025	Open, deciduous, mixed or coniferous forest; predominated by oak with little understorey; forest clearings, edges; farm woodlots; parks.	Yes	Yes	Mixed forest present.
Sturnella magna	Eastern Meadowlark	S4B	THR	T	Schedule 1	BSC et al. 2006; NHIC 2021; eBird 2025	Open, grassy meadows, farmland, pastures, hayfields or grasslands with elevated singing perches; cultivated land and weedy areas with trees; old orchards with adjacent, open grassy areas >10 ha in size.	Yes	Yes	Farmland and pastures present within the study area.
Dolichonyx oryzivorus	Bobolink	S4B	THR	T	No Schedule	BSC et al. 2006; NHIC 2021; eBird 2025	Large, open expansive grasslands with dense ground cover; hayfields, meadows or fallow fields; marshes; requires tracts of grassland >50 ha.	Yes	Yes	Farmland and pastures present within the study area.

Scientific Name	Common Name	S-RANK[1]	ESA/ COSSARO[3]	COSEWIC[2]	SARA	Background Source	Habitat Preference[4,5]	Suitable Habitats within Study Area	Carried Forward to NEA?	Rationale
Icteria virens	Yellow-breasted Chat	S2B	END	E	Schedule 1	MECP 2021b	Thickets, tall tangles of shrubbery beside streams, ponds; overgrown bushy clearings with deciduous thickets; nests above ground in bush, vines etc.	Yes	Yes	Suitable habitat may exist within early successional regenerating portions of the study area
Herpetofauna										
Graptemys geographica	Northern Map Turtle	S3	SC	SC	Schedule 1	Ontario Nature 2019; NHIC 2021	Large bodies of water with soft bottoms, and aquatic vegetation; basks on logs or rocks or on beaches and grassy edges, will bask in groups; uses soft soil or clean dry sand for nest sites; may nest at some distance from water.	Yes	Yes	The Saugeen River occurs immediately adjacent to the study area and may provide suitable open water habitat.
Chelydra serpentina serpentina	Common Snapping Turtle	S3	SC	SC	Schedule 1	Ontario Nature 2019; NHIC 2021	Permanent or semi-permanent fresh water; marshes, swamps or bogs; rivers and streams with soft muddybanks or bottoms. The species often uses soft soil or clean dry sand on south-facing slopes for nest sites and may nest at some distance from water.	Yes	Yes	Swamp and small pond features that provide suitable habitat may occur within the study area
Sistrurus catenatus catenatus	Massasauga *(Great Lakes-St. Lawrence population*)	S3	THR	T	Schedule 1	Ontario Nature 2019	Massasaugas live in different types of habitats throughout Ontario, including tall grass prairie, bogs, marshes, shorelines, forests and alvars. Within all of these habitats, Massasaugas require open areas to warm themselves in the sun. Pregnant females are most often found in open, dry habitats such as rock barrens or forest clearings where they can more easily maintain the body temperature required for the development of their offspring. Non-pregnant females and males forage and mate in lowland habitats such as grasslands, wetlands, bogs and the shorelines of lakes and rivers. Massasaugas hibernate underground in crevices in bedrock, sphagnum swamps, tree root cavities and animal burrows where they can get below the frost line but stay above the water table.	Yes	Yes	As a habitat generalist, suitable habitat for Massasauga may be present in the study area. Suitable habitat will be mapped/identified as part of site investigations. However, this species is not known to have records in the immediate vicinity of the site or Southampton.
Mammals										
Lasionycteris noctivagans	Silver-haired Bat	S4	END	E	No Schedule	COSEWIC 2023	Woodlands with large-diameter decaying trees	Yes	Yes	Suitable forest roosting habitat exists within the study area
Lasiurus borealis	Eastern Red Bat	S4	END	E	No Schedule	COSEWIC 2023	Deciduous and coniferous forests with open understories, containing large-diameter and some tall trees	Yes	Yes	Suitable forest roosting habitat exists within the study area
Lasiurus cinereus	Hoary Bat	S4	END	E	No Schedule	COSEWIC 2023	Deciduous and coniferous forests with open understories, containing large-diameter and some tall trees	Yes	Yes	Suitable forest roosting habitat exists within the study area
Myotis lucifungus	Little Brown Myotis	S5	END	E	Schedule 1	Dobbyn 1994	Uses caves, quarries, tunnels, hollow trees or buildings for roosting; winters in humid caves; maternity sites in dark warm areas such as attics and barns; feeds primarily in wetlands, forest edges	Yes	Yes	Woodland present within the study area.
Myotis septentrionalis	Northern Myotis	S3?	END	E	Schedule 1	ECCC 2018	Hibernates during winter in mines or caves; during summer males roost alone and females form maternity colonies of up to 60 adults; roosts in houses, man-made structures but prefers hollow trees or under loose bark; hunts within forest, below canopy	Yes	Yes	Woodland present within the study area.

Scientific Name	Common Name	S-RANK[1]	ESA/ COSSARO[3]	COSEWIC[2]	SARA	Background Source	Habitat Preference[4,5]	Suitable Habitats within Study Area	Carried Forward to NEA?	Rationale
Perimyotis subflavus	Tri-colored Bat	S3?	END	E	Schedule 1	ECCC 2018	During the summer, the Tri-colored Bat is found in a variety of forested habitats. It forms day roosts and maternity colonies in older forest and occasionally in barns or other structures. They forage over water and along streams in the forest. Tri-colored Bats eat flying insects and spiders gleaned from webs. At the end of the summer they travel to a location where they swarm; it is generally near the cave or underground location where they will overwinter. They overwinter in caves where they typically roost by themselves rather than part of a group.	Yes	Yes	Woodland present within the study area.
Taxidea taxus jacksoni	American Badger	S2	END	E	Schedule 1	MECP 2021b	In Ontario, badgers are found in a variety of habitats, such as tall grass prairie, sand barrens and farmland. These habitats provide badgers with small prey, including groundhogs, rabbits and small rodents. Since badgers are primarily nocturnal and quite wary of people, not many people are fortunate enough to spot one in the wild.	Yes	Yes	Agricultural field present within the study area
Insects										
Danaus plexippus	Monarch	S4	SC	SC		MacNaughton et al. 2021	Open areas with milkweed species (*Asclepias spp.*).	Yes	Yes	Meadows potentially present on site.

Scientific Name	Common Name	S-RANK[1]	ESA/ COSSARO[3]	COSEWIC[2]	SARA	Background Source	Habitat Preference[4,5]	Suitable Habitats within Study Area	Carried Forward to NEA?	Rationale
Fish										
Acipenser fulvescens	Lake Sturgeon (NWO Pop.)	S2	THR	T	NONE	MECP 2021b	Lake Sturgeon are bottom-dwelling fish found in large rivers and lakes, at depths generally between 5 and 10 m, sometimes greater. Spawning occurs in the spring in fast-flowing water at depths between 0.6 and 5 m over hard-pan clay, sand, gravel and boulders.	Yes	Yes	Suitable habitat may exist within the Saugeen River
Anguilla rostrata	American Eel	S1?	END	THR (May 2012)	NONE	MECP 2021b	In Canada, it is found in all fresh water, estuaries and coastal marine waters that are accessible to the Atlantic Ocean, from Niagara Falls in the Great Lakes up to the mid- Labrador coast. American eel is declining in some locations and is stable in other locations.	Yes	Yes	Suitable habitat may exist within the Saugeen River
Notropis photogenis	Silver Shiner	S2S3	THR	T (May 2011)	Schedule 3	MECP 2021b	Silver shiners prefer moderate to large size streams with swift currents that are free of weeds and have clean gravel or boulder bottoms. They live in schools and feed on crustaceans and adult flies that fall in the water or fly just above the surface. In June or July, they spawn by scattering their eggs over gravel riffles.	Yes	Yes	Suitable habitat may exist within the Saugeen River
Moxostoma duquesnei	Black Redhorse	S2	THR	T (May 2005)		MECP 2021b	In Ontario, the Black Redhorse lives in pools and riffle areas of medium-sized rivers and streams that are usually less than two metres deep. These rivers usually have few aquatic plants, a moderate to fast current, and a sandy or gravel bottom. In the spring, it migrates to breeding habitat where eggs are laid on gravel in fast water. The winter is spent in deeper pools. Adults feed on crustaceans and aquatic insects, while the young fish feed on plankton.	Yes	Yes	Suitable habitat may exist within the Saugeen River
Coregonus reighardi	Shortnose Cisco	SH	END	E (May 2005)	Schedule 1	MECP 2021b	Very little is known about the habitat preferences and life history of the Shortnose Cisco. It was a deepwater fish, considered one of the 'chub' species, which lived in clear, cold-water environments all year long. It has been collected in water depths ranging from 22 to 110 m.	No	No	Suitable aquatic habitat absent within the study area
Freshwater Mussels										
Villosa iris	Rainbow	S2S3	SC	SC	Schedule 1	DFO 2021	The Rainbow mussel prefers small to medium-sized rivers with a moderate to strong current and sand, rocky, or gravel bottoms. It is found in or near riffle areas and along the edges of vegetation in water less than one metre deep. The Rainbow mussel uses a variety of fish hosts in Ontario, including Striped shiner, Smallmouth bass, Largemouth bass, Green sunfish, Greenside darter, Rainbow darter, and Yellow perch.	Yes	Yes	Saugeen River is mapped as potential habitat for this species.
Plants										
Arnoglossum plantagineum	Tuberous Indian-plantain	S2	SC	SC	Schedule 1	MNRF 2021	This species prefers open sunny areas in wet, calcium-rich meadows or shoreline fens. In Ontario, it grows along river banks and in wetlands near Lake Huron.	No	No	No wet calcium rich meadows or fens.
Fraxinus nigra	Black Ash	S4	END	T	No Schedule	MNRF 2023	Black Ash is predominantly a wetland species found in swamps, floodplains and fens.	Yes	Yes	Swamp present within the study area.

Appendix V
Significant Wildlife Habitat Screening

Appendix II. Significant Wildlife Habitat Assessment Tables

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 6E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Waterfowl Stopover and Staging Areas (Terrestrial)					
Rationale: Habitat important to migrating waterfowl.	American Black Duck Wood Duck Green-winged Teal Blue-winged Teal Mallard Northern Pintail Northern Shoveler American Wigeon Gadwall	CUM1 CUT1 - Plus evidence of annual spring flooding from melt water or run-off within these Ecosites.	Fields with sheet water during Spring (mid March to May). • Fields flooding during spring melt and run-off provide important invertebrate foraging habitat for migrating waterfowl. • Agricultural fields with waste grains are commonly used by waterfowl, these are not considered SWH unless they have spring sheet water available[cxlviii]. Information Sources • Anecdotal information from the landowner, adjacent landowners or local naturalist clubs may be good information in determining occurrence. • Reports and other information available from Conservation Authorities (CAs) • Sites documented through waterfowl planning processes (eg. EHJV implementation plan) • Field Naturalist Clubs • Ducks Unlimited Canada • Natural Heritage Information Centre (NHIC) Waterfowl Concentration Area	Studies carried out and verified presence of an annual concentration of any listed species, evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • Any mixed species aggregations of 100 or more individuals required. • The area of the flooded field ecosite habitat plus a 100-300m radius buffer dependent on local site conditions and adjacent land use is the significant wildlife habitat[cxlviii]. • Annual use of habitat is documented from information sources or field studies (annual use can be based on studies or determined by past surveys with species numbers and dates). • SWHMiST[cxlix] Index #7 provides development effects and mitigation measures.	One large agricultural field or meadow on the subject property. Unlikely that it provides suitable habitat. **Not SWH.**
Wildlife Habitat: Waterfowl Stopover and Staging Areas (Aquatic)					
Rationale: Important for local and migrant waterfowl populations during the spring or fall migration or both periods combined. Sites identified are usually only one of a few in the eco-district.	Canada Goose Cackling Goose Snow Goose American Black Duck Northern Pintail Northern Shoveler American Wigeon Gadwall Green-winged Teal Blue-winged Teal Hooded Merganser Common Merganser Lesser Scaup Greater Scaup Long-tailed Duck Surf Scoter White-winged Scoter Black Scoter Ring-necked Duck Common Goldeneye Bufflehead Redhead Ruddy Duck Red-breasted Merganser Brant Canvasback	MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 SWD1 SWD2 SWD3 SWD4 SWD5 SWD6 SWD7	• Ponds, marshes, lakes, bays, coastal inlets, and watercourses used during migration. Sewage treatment ponds and storm water ponds do not qualify as a SWH, however a reservoir managed as a large wetland or pond/lake does qualify. • These habitats have an abundant food supply (mostly aquatic invertebrates and vegetation in shallow water). Information Sources • Environment Canada • Naturalist clubs often are aware of staging/stopover areas. • OMNRF Wetland Evaluations indicate presence of locally and regionally significant waterfowl staging. • Sites documented through waterfowl planning processes (eg. EHJV implementation plan) • Ducks Unlimited projects • Element occurrence specification by Nature Serve: http://www.natureserve.org • Natural Heritage Information Centre (NHIC) Waterfowl Concentration Area	Studies carried out and verified presence of: • Aggregations of 100[i] or more of listed species for 7 days[i], results in > 700 waterfowl use days. • Areas with annual staging of ruddy ducks, canvasbacks, and redheads are SWH[cxlix] • The combined area of the ELC ecosites and a 100m radius area is the SWH[cxlviii] • Wetland area and shorelines associated with sites identified within the SWHTG[cxlviii] Appendix K[cxlix] are significant wildlife habitat. • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • Annual Use of Habitat is Documented from Information Sources or Field Studies (Annual can be based on completed studies or determined from past surveys with species numbers and dates recorded). • SWHMiST[cxlix] Index #7 provides development effects and mitigation measures.	Some indicator species have been documented in the vicinity of the study area. Ponds, marshes, lakes, bays, coastal inlets, and watercourses used during migration are not present in the study area. **Not SWH.**

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 6E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Shorebird Migratory Stopover Area					
Rationale: High quality shorebird stopover habitat is extremely rare and typically has a long history of use.	Greater Yellowlegs Lesser Yellowlegs Marbled Godwit Hudsonian Godwit Black-bellied Plover American Golden-Plover Semipalmated Plover Solitary Sandpiper Spotted Sandpiper Semipalmated Sandpiper Pectoral Sandpiper White-rumped Sandpiper Baird's Sandpiper Least Sandpiper Purple Sandpiper Stilt Sandpiper Short-billed Dowitcher Red-necked Phalarope Whimbrel Ruddy Turnstone Sanderling Dunlin Whimbrel	BBO1 BBO2 BBS1 BBS2 BBT1 BBT2 SDO1 SDS2 SDT1 MAM1 MAM2 MAM3 MAM4 MAM5	Shorelines of lakes, rivers and wetlands, including beach areas, bars and seasonally flooded, muddy and un-vegetated shoreline habitats. Great Lakes coastal shorelines, including groynes and other forms of armour rock lakeshores, are extremely important for migratory shorebirds in May to mid-June and early July to October. Sewage treatment ponds and storm water ponds do not qualify as a SWH. Information Sources • Western hemisphere shorebird reserve network. • Canadian Wildlife Service (CWS) Ontario Shorebird Survey. • Bird Studies Canada • Ontario Nature • Local birders and naturalist clubs • Natural Heritage Information Center (NHIC) Shorebird Migratory Concentration Area	Studies confirming: • Presence of 3 or more of listed species and > 1000 shorebird use days during spring or fall migration period. (shorebird use days are the accumulated number of shorebirds counted per day over the course of the fall or spring migration period) • Whimbrel stop briefly (<24hrs) during spring migration, any site with >100 Whimbrel used for 3 years or more is significant. • The area of significant shorebird habitat includes the mapped ELC shoreline ecosites plus a 100m radius area[cxlviii] • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • SWHMiST[cxlix] Index #8 provides development effects and mitigation measures.	Some listed species have been documented in the vicinity of the study area. Shorelines of lakes, wetlands, and beach areas are located outside of the study area. **Not SWH.**
Wildlife Habitat: Raptor Wintering Area					
Rationale: Sites used by multiple species, a high number of individuals and used annually are most significant	Rough-legged Hawk Red-tailed Hawk Northern Harrier American Kestrel Snowy Owl 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	The habitat provides a combination of fields and woodlands that provide roosting, foraging and resting habitats for wintering raptors. Raptor wintering 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, large trees and snags available for roosting Information Sources • OMNRF Ecologist or Biologist • Field Natural Clubs • Natural Heritage Information Center (NHIC) Raptor Winter Concentration Area • Data from Bird Studies Canada • Reports and other information available from Conservation Authorities CAs.	Studies confirm the use of these habitats by: • One or more Short-eared Owls or; One or more Bald Eagles or; At least 10 individuals and two listed hawk/owl species • To be significant a site must be used regularly (3 in 5 years)[cxlix] for a minimum of 20 days by the above number of birds • The habitat area for an Eagle winter site is the shoreline forest ecosites directly adjacent to the prime hunting area • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • SWHMiST[cxlix] Index #10 and #11 provides development effects and mitigation measures.	Combination of forest and upland vegetation communities not present within the subject property. **Not SWH.**

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 6E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Bat Hibernacula					
Rationale Bat hibernacula are rare habitats in Ontario landscapes.	Big Brown Bat Tri-coloured Bat	Bat Hibernacula may be found in these ecosites: CCR1 CCR2 CCA1 CCA2 (Note: buildings are not considered to be SWH)	• Hibernacula may be found in caves, mine shafts, underground foundations and Karsts. • Active mine sites should not be considered as SWH • The locations of bat hibernacula are relatively poorly known. Information Sources • OMNRF for possible locations and contact for local experts • Natural Heritage Information Center (NHIC) Bat Hibernaculum • Ministry of Northern Development and Mines for location of mine shafts. • Clubs that explore caves (eg. Sierra Club) • University Biology Departments with bat experts.	• All sites with confirmed hibernating bats are SWH. • The habitat area includes a 200m radius around the entrance of the hibernaculum[cxlviii, ccvii] for most. • Studies are to be conducted during the peak swarming period (Aug. – Sept.). Surveys should be conducted following methods outlined in the "Bats and Bat Habitats: Guidelines for Wind Power Projects"[ccv] • SWHMiST[cxlix] Index #1 provides development effects and mitigation measures.	No known hibernacula are present within 200 m of the study area. **Not SWH.**
Wildlife Habitat: Bat Maternity Colonies					
Rationale: Known locations of forested bat maternity colonies is extremely rare in all Ontario landscapes.	Big Brown Bat Silver-haired Bat	Maternity colonies considered SWH are found in forested Ecosites. All ELC Ecosites in ELC Community Series: FOD FOM SWD SWM	Maternity colonies can be found in tree cavities, vegetation and often in buildings[xxii, xxv, xxvi, xxvii, xxxi] (buildings are not considered to be SWH). • Maternity roosts are not found in caves and mines in Ontario[xxii] • Maternity colonies located in Mature deciduous or mixed forest stands[ccix, ccx] with >10/ha large diameter (>25cm dbh) wildlife trees[ccvii] • Female Bats prefer wildlife tree (snags) in early stages of decay, class 1-3[ccxiv] or class 1 or 2[ccxii] • Silver-haired Bats prefer older mixed or deciduous forest and form maternity colonies in tree cavities and small hollows. Older forest areas with at least 21 snags/ha are preferred[ccx] Information Sources • 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 Ecoelement 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] • SWHMiS T[cxlix] Index #12 provides development effects and mitigation measures.	Large woodland area with potential to provide habitat. **Candidate SWH**

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 6E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Turtle Wintering Area					
Rationale: Generally sites are the only known sites in the area. Sites with the highest number of individuals are most significant	Midland Painted Turtle Special Concern: Northern Map Turtle Snapping Turtle	Snapping and Midland Painted Turtles - ELC Community Classes: SW, MA, OA and SA; ELC Community Series: FEO and BOO Northern Map Turtle - Open Water areas such as deeper rivers or streams and lakes with current can also be used as over-wintering habitat.	For most turtles, wintering areas are in the same general area as their core habitat. Water has to be deep enough not to freeze and have soft mud substrates. • Over-wintering sites are permanent water bodies, large wetlands, and bogs or fens with adequate Dissolved Oxygen[cix, cx, cxi, cxviii]. • Man-made ponds such as sewage lagoons or storm water ponds should not be considered SWH. Information Sources • EIS studies carried out by Conservation Authorities. • Local field naturalists and experts, as well as university herpetologists may also know where to find some of these sites. • OMNRF ecologist or biologist • Natural Heritage Information Center (NHIC)	• Presence of 5 over-wintering Midland Painted Turtles is significant. • One or more Northern Map Turtle or Snapping Turtle over-wintering within a wetland is significant. • The mapped ELC ecosite area with the over wintering turtles is the SWH. If the hibernation site is within a stream or river, the deep-water pool where the turtles are over wintering is the SWH. • Over wintering areas may be identified by searching for congregations (Basking Areas) of turtles on warm, sunny days during the fall (Sept. – Oct.) or spring (Mar. – May)[cvii] • Congregation of turtles is more common where wintering areas are limited and therefore significant[cix, cx, cxi, cxii]. • SWHMiST[cxlix] Index #28 provides development effects and mitigation measures for turtle wintering habitat.	Snapping Turtle has been documented witin the vicinity of the study area. The Saugeen River immediately adjacent to the study area may provide suitable turtle overwintering habitat **Candidate SWH.**
Wildlife Habitat: Snake 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 Lizard: Special Concern (Southern Shield population): Five-lined Skink	For all snakes, habitat may be found in any ecosite other than very wet ones. Talus, Rock Barren, Crevice and Cave, and Alvar sites may be directly related to these habitats. Observations of congregations of snakes on sunny warm days in the spring or fall is a good indicator. For Five-lined Skink, ELC Community Series of FOD and FOM and Ecosites: FOC1 FOC3	• For snakes, hibernation takes place in sites located below frost lines in burrows, rock crevices and other natural locations. The existence of features that go below the 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, liii, 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. • Five-lined skink prefer mixed forests with rock outcrop openings providing cover rock overlaying granite bedrock with fissures cciii. 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 from CAs. • Local Field naturalists and experts, as well as university herpetologists may also know where to find some of these sites. clubs • Natural Heritage Information Center (NHIC) • OMNRF ecologist or biologist may be aware of locations of wintering skinks	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 30m buffer is the SWH[l] • SWHMiST[cxlix] Index #13 provides development effects and mitigation measures for snake hibernacula. • Presence of any active hibernaculum for skink is significant. • SWHMiST[cxlix] Index #37 provides development effects and mitigation measures for five-lined skink wintering habitat.	Potential for snake hibernaculum habitat on site. Reptile surveys and snake boards will be placed to confirm habitat type. **Candidate SWH.**

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 6E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Colonially - Nesting Bird Breeding Habitat (Bank and Cliff)					
Rationale: Historical use and number of nests in a colony make this habitat significant. An identified colony can be very important to local populations. All swallow populations are declining in Ontario.	Cliff Swallow Northern Rough-winged Swallow (this species is not colonial but can be found in Cliff Swallow colonies)	Eroding banks, sandy hills, borrow pits, steep slopes, and sand piles Cliff faces, bridge abutments, silos, barns Habitat found in the following ecosites: CUM1 CUT1 CUS1 BLO1 BLS1 BLT1 CLO1 CLS1 CLT1	• Any site or areas with exposed soil banks, undisturbed or naturally eroding that is not a licensed/permitted aggregate area. • Does not include man-made structures (bridges or buildings) or recently (2 years) disturbed soil areas, such as berms, embankments, soil or aggregate stockpiles. • Does not include a licensed/permitted Mineral Aggregate Operation. Information Sources • Reports and other information available from CAs • Ontario Breeding Bird Atlas [ccv] • Bird Studies Canada; *NatureCounts* http://www.birdscanada.org/birdmon/ • Field Naturalist clubs	Studies confirming: • Presence of 1 or more nesting sites with 8[cxlvix] or more cliff swallow pairs and/or rough-winged swallow pairs during the breeding season. • A colony identified as SWH will include a 50m radius habitat area from the peripheral nests[ccvii] • Field surveys to observe and count swallow nests are to be completed during the breeding season Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • SWHMiST[cxlix] Index #4 provides development effects and mitigation measures	Suitable bank habitat may occur along the Saugeen River bluffs at the northeast corner of the study area. **Candidate SWH**
Wildlife Habitat: Colonially - Nesting Bird Breeding Habitat (Tree/Shrubs)					
Rationale: Large Colonies are important to local bird population, typically sites are only known colony in area and are used annually.	Great Blue Heron Black-crowned Night-heron Great Egret Green Heron	SWM2 SWM3 SWM5 SWM6 SWD1 SWD2 SWD3 SWD4 SWD5 SWD6 SWD7 FET1	• 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 15m 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 (OMNR). • NHIC Mixed Wader Nesting Colony • Aerial photographs can help identify large heronries • Reports and other information available from CAs • MNRF District Offices • Local naturalist clubs	Studies confirming: • Presence of 5[l] 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 • SWHMiST[cxlix] Index #5 provides development effects and mitigation measures.	Suitable swamp habitat may occur within the study area. **Candidate SWH.**

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 6E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Colonially - Nesting Bird Breeding Habitat (Ground)					
Rationale: Colonies are important to local bird populations, typically sites are only known colony in area and are used annually.	Herring Gull Great Black-backed Gull Little Gull Ring-billed Gull Common Tern Caspian Tern Brewer's Blackbird	Any rocky island or peninsula (natural or artificial) within a lake or large river (two-lined on a 1:50,000 NTS map). Close proximity to watercourses in open fields or pastures with scattered trees or shrubs (Brewer's Blackbird) MAM1 – 6 MAS1 – 3 CUM CUT CUS	• Nesting colonies of gulls and terns are on islands or peninsulas associated with open water or in marshy areas. • Brewers Blackbird colonies are found loosely on the ground in or in low bushes in close proximity to streams and irrigation ditches within farmlands. Information Sources • Ontario Breeding Bird Atlas[ccv], rare/colonial species records. • Canadian Wildlife Service • Reports and other information available from CAs • Natural Heritage Information Center (NHIC) Colonial Waterbird Nesting Area • MNRF District Offices • Field naturalist clubs	Studies confirming: • Presence of >25 active nests for Herring Gulls or Ring-billed Gulls, >5 active nests for Common Tern or >2 active nests for Caspian Tern[í]. • Presence of 5 or more pairs for Brewer's Blackbird. • Any active nesting colony of one or more Little Gull, and Great Black-backed Gull is significant. • The edge of the colony and a minimum 150m area of habitat, or the extent of the ELC ecosites containing the colony or any island <3.0ha with a colony is the SWH[cc, ccvii] • Studies would be done during May/June when actively nesting. Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • SWHMiST[cxlix] Index #6 provides development effects and mitigation measures.	Islands or peninsula not present within the study area. **Not SWH.**
Wildlife Habitat: Migratory Butterfly Stopover Areas					
Rationale: Butterfly stopovers areas are extremely rare habitats and are biologically important for butterfly species that migrate south for the winter.	Painted Lady Red Admiral Special Concern: Monarch	Combination of ELC Community Series: Need to have present one Community Series from each landclass: Field: CUM CUS CUT Forest: FOC FOM FOD CUP Anecdotally, a candidate sight for butterfly stopover will have a history of butterflies being observed.	A butterfly stopover area will be a minimum of 10 ha in size with a combination of field and forest habitat present, and will be located within 5 km of Lake Ontario[cxlix]. • The habitat is typically a combination of field and forest, and provides the butterflies with a location to rest prior to their long migration south[xxxii, xxxiii, xxxiv, xxxv, xxxvi]. • The habitat should not be disturbed, fields/meadows with an abundance of preferred nectar plants and woodland edge providing shelter are requirements for this habitat cxlviii, cxlix. • Staging areas usually provide protection from the elements and are often spits of land or areas with the shortest distance to cross the Great Lakes[xxxvii, xxxviii, xxxix, xl, xli]. Information Sources • OMNRF (NHIC) • Agriculture Canada in Ottawa may have list of butterfly experts. • Field Naturalist Clubs • Toronto Entomologists Association • Conservation Authorities	Studies confirm: • The presence of Monarch Use Days (MUD) during fall migration (Aug/Oct)[xliii]. MUD is based on the number of days a site is used by Monarchs, multiplied by the number of individuals using the site. Numbers of butterflies can range from 100-500/day[xxxvii], significant variation can occur between years and multiple years of sampling should occur [xl, xlii]. • Observational studies are to be completed and need to be done frequently during the migration period to estimate MUD • MUD of >5000 or >3000 with the presence of Painted Ladies or Red Admiral's is to be considered significant. • SWHMiST[cxlix] Index #16 provides development effects and mitigation measures.	Subject property not within 5 km of Lake Ontario. **Not SWH.**

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 6E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Landbird Migratory Stopover Areas					
Rationale: Sites with a high diversity of species as well as high number are most significant	All migratory songbirds. Canadian Wildlife Service Ontario website: http://www.on.ec.gc.ca/wildlife_e.html All migrant raptors species: Ontario Ministry of Natural Resources: Fish and Wildlife Conservation Act, 1997. Schedule 7: Specially Protected Birds (Raptors)	All Ecosites associated with these ELC Community Series: FOC FOM FOD SWC SWM SWD	Woodlots need to be >10 ha[i] in size and within 5km [iv, v, vi, vii, viii, ix, x, xi, xii, xiii, xiv, xv] of Lake Ontario. • If multiple woodlands are located along the shoreline, those woodlands <2km from Lake Ontario are more significant[cxlix] • Sites have a variety of habitats; forest, grassland and wetland complexes[cxlix]. • The largest sites are more significant[cxlix] • Woodlots and forest fragments are important habitats to migrating birds[ccxviii], these features located along the shore and located within 5km of Lake Ontario are Candidate SWH[cxlviii]. Information Sources • Bird Studies Canada • Ontario Nature • Local birders and naturalist club • Ontario Important Bird Areas (IBA) Program	Studies confirm: • Use of the woodlot by >200 birds/day and with >35 spp. with at least 10 bird spp. recorded on at least 5 different survey dates. This abundance and diversity of migrant bird species is considered above average and significant. • Studies should be completed during spring (Apr/May) and fall (Aug/Oct) migration using standardized assessment techniques. Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • SWHMiST[cxlix] Index #9 provides development effects and mitigation measures.	Subject property not within 5 km of Lake Ontario. **Not SWH.**
Wildlife Habitat: Deer Yarding Areas					
Rationale: Winter habitat for deer is considered to be the main factor for northern deer populations. In winter, deer congregate in "yards" to survive severe winter conditions. Deer yards typically have a long history of annual use by deer, yards typically represent 10-15% of an areas summer range.	White-tailed Deer	Note: OMNRF to determine this habitat. ELC Community Series providing a thermal cover component for a deer yard would include: FOM, FOC, SWM and SWC. Or these ELC Ecosites: CUP2 CUP3 FOD3 CUT	• Deer yarding areas or winter concentration areas (yards) are areas deer move to in response to the onset of winter snow and cold. This is a behavioural response and deer will establish traditional use areas. The yard is composed of two areas referred to as Stratum I and Stratum II. Stratum II covers the entire winter yard area and is usually a mixed or deciduous forest with plenty of browse available for food. Agricultural lands can also be included in this area. Deer move to these areas in early winter and generally, when snow depths reach 20cm, most of the deer will have moved here. If the snow is light and fluffy, deer may continue to use this area until 30cm snow depth. In mild winters, deer may remain in the Stratum II area the entire winter. • The Core of a deer yard (Stratum I) is located within the Stratum II area and is critical for deer survival in areas where winters become severe. It is primarily composed of coniferous trees (pine, hemlock, cedar, spruce) with a canopy cover of more than 60%[cxciv]. • OMNRF determines deer yards following methods outlined in "Selected Wildlife and Habitat Features: Inventory Manual"[cxcv] • Woodlots with high densities of deer due to artificial feeding are not significant.	No Studies Required: • Snow depth and temperature are the greatest influence on deer use of winter yards. Snow depths > 40cm for more than 60 days in a typically winter are minimum criteria for a deer yard to be considered as SWH[lvi, lvii, lviii, lix, lx, I]. • Deer Yards are mapped by OMNRF District offices. Locations of Core or Stratum 1 and Stratum 2 Deer yards considered significant by OMNRF will be available at local MNRF offices or via Land Information Ontario (LIO). • Field investigations that record deer tracks in winter are done to confirm use (best done from an aircraft). Preferably, this is done over a series of winters to establish the boundary of the Stratum I and Stratum II yard in an "average" winter. MNRF will complete these field investigations[cxcv]. • If a SWH is determined for Deer Wintering Area or if a proposed development is within Stratum II yarding area then Movement Corridors are to be considered as outlined in Table 1.4.1 of this Schedule. • SWHMiST[cxlix] Index #2 provides development effects and mitigation measures.	White-tailed Deer have been documented (background info) within the vicinity of the study area. Deer yarding habitat not identified within or adjacent to the subject property. **Not SWH.**

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 6E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Deer Winter Congregation Areas					
Rationale: Deer movement during winter in the southern areas of Ecoregion 6E are not constrained by snow depth, however deer will annually congregate in large numbers in suitable woodlands to reduce or avoid the impacts of winter conditions[cxlviii]	White-tailed Deer	All Forested Ecosites with these ELC Community Series: FOC FOM FOD SWC SWM SWD Conifer plantations much smaller than 50ha may also be used.	• Woodlots will typically be >100 ha in size. Woodlots <100ha may be considered as significant based on MNRF studies or assessment. • Deer movement during winter in the southern areas of Eco-region 6E are not constrained by snow depth, however deer will annually congregate in large numbers in suitable woodlands[cxlviii]. • If deer are constrained by snow depth refer to the Deer Yarding Area habitat within Table 1.1 of this Schedule. • 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. 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 white-tailed deer will be determined by MNRF, all woodlots exceeding the area criteria are significant, unless determined not to be significant by MNR[i]. • Studies should be completed during winter (Jan/Feb) when >20cm of snow is on the ground using aerial survey techniques[ccxxiv], ground or road surveys, or a pellet count deer density survey[ccxxv]. • If a SWH is determined for Deer Wintering Area of if a proposed development is within Stratum II yarding area then Movement Corridors are to be considered as outlined in Table 1.4.1 of this Schedule. • SWHMiST[cxlix] Index #2 provides development effects and mitigation measures.	White-tailed Deer have been documented within the vicinity of the study area. Deer overwintering habitat not identified within or adjacent to the study area by the MNRF. **Not SWH.**

Appendix II. Significant Wildlife Habitat Assessment Tables

Table 2. Characteristics of Rare Vegetation Communities for Ecoregion 6E.

Rare Vegetation Community[1]	Candidate SWH			Confirmed SWH	Study Area
	ELC Ecosite Codes[1]	Habitat Description[1]	Detailed Information and Sources[1]	Defining Criteria[1]	Assessment Details
Cliff and Talus Slopes					
Rationale: Cliffs and Talus Slopes are extremely rare habitats in Ontario.	Any ELC Ecosite within Community Series: TAO CLO TAS CLS TAT CLT	A Cliff is vertical to near vertical bedrock >3m in height. A Talus Slope is rock rubble at the base of a cliff made up of coarse rocky debris.	Most cliff and talus slopes occur along the Niagara Escarpment. Information Sources • The Niagara Escarpment Commission has detailed information on location of these habitats. • OMNRF District • Natural Heritage Information Center (NHIC) has location information on their website • Local naturalist clubs • Conservation Authorities	• Confirm any ELC Vegetation Type for Cliffs or Talus Slopes[lxxviii] • SWHMiST[cxlix] Index #21 provides development effects and mitigation measures.	Vegetation community not expected to be present within subject property. **Not SWH.**
Sand Barrens					
Rationale: Sand barrens are rare in Ontario and support rare species. Most Sand Barrens have been lost due to cottage development and forestry.	ELC Ecosites: SBO1 SBS1 SBT1 Vegetation cover varies from patchy and barren to continuous meadow (SBO1), thicket-like (SBS1), or more closed and treed (SBT1). Tree cover always <60%.	Sand Barrens typically are exposed sand, generally sparsely vegetated and caused by lack of moisture, periodic fires and erosion. They have little or no soil and the underlying rock protrudes through the surface. Usually located within other types of natural habitat such as forest or savannah. Vegetation can vary from patchy and barren to tree covered but less than 60%.	Any sand barren area, >0.5ha in size. Information Sources • OMNRF Districts. • Natural Heritage Information Center (NHIC) has location information on their website • Field naturalist clubs • Conservation Authorities	• Confirm any ELC Vegetation Type for Sand Barrens[lxxviii] • Site must not be dominated by exotic or introduced species (<50% vegetative cover exotics)[l]. • SWHMiST[cxlix] Index #20 provides development effects and mitigation measures.	Vegetation community not present within subject property. **Not SWH.**

Table 2. Characteristics of Rare Vegetation Communities for Ecoregion 6E.

Rare Vegetation Community[1]	Candidate SWH			Confirmed SWH	Study Area
	ELC Ecosite Codes[1]	Habitat Description[1]	Detailed Information and Sources[1]	Defining Criteria[1]	Assessment Details
Alvar					
Rationale: Alvars are extremely rare habitats in Ecoregion 6E. Most alvars in Ontario are in Ecoregion 6E and 7E. Alvars in 6E are small and highly localized just north of the Palaeozoic-Precambrian contact.	ALO1 ALS1 ALT1 FOC1 FOC2 CUM2 CUS2 CUT2-1 CUW2 Five Alvar Indicator Species: 1) Carex crawei 2) Panicum philadelphicum 3) Eleochairs compressa 4) Scutellaria parvula 5) Trichostema branchiatum These indicator species are very specific to Alvars within Ecoregion 6E	An alvar is typically a level, mostly unfractured calcareous bedrock feature with a mosaic of rock pavements and bedrock overlain by a thin veneer of soil. The hydrology of alvars is complex, with alternating periods of inundation and drought. Vegetation cover varies from sparse lichen-moss associations to grasslands and shrublands and comprising a number of characteristic or indicator plant. Undisturbed alvars can be phyto- and zoo geographically diverse, supporting many uncommon or are relict plant and animals species. Vegetation cover varies from patchy to barren with a less than 60% tree cover[lxxviii].	An Alvar site > 0.5 ha in size[lxxv]. Information Sources • Alvars of Ontario (2000), Federation of Ontario Naturalists[lxxvi]. • Ontario Nature – Conserving Great Lakes Alvars[ccviii]. • Natural Heritage Information Center (NHIC) has location information on their website • Field Naturalist clubs • Conservation Authorities	Field studies identify four of the five Alvar indicator species[lxxv, cxlix] at a Candidate Alvar site is Significant. • Site must not be dominated by exotic or introduced species (<50% vegetative cover are exotics sp.). • The alvar must be in excellent condition and fit in with surrounding landscape with few conflicting land uses[lxxv]. • SWHMiST[cxlix] Index #17 provides development effects and mitigation measures.	Vegetation community not expected to be present within subject property. **Not SWH.**
Old Growth Forest					
Rationale: Due to historic logging practices, extensive old growth forest is rare in the Ecoregion. Interior habitat provided by old growth forests is required by many wildlife species.	Forest Community Series: FOD FOC FOM SWD SWC SWM	Old Growth forests are characterized by heavy mortality or turnover of over-storey trees resulting in a mosaic of gaps that encourage development of a multi-layered canopy and an abundance of snags and downed woody debris.	Woodland Stands areas 30ha or greater in size or with at least 10 ha interior habitat assuming 100m buffer at edge of forest Í. Information Sources • OMNRF Forest Resource Inventory mapping • OMNRF Forester, Ecologist or Biologist • Field Local naturalist clubs • Conservation Authorities • Sustainable Forestry License (SFL) companies will possibly know locations through field operations. • Municipal forestry departments	Field Studies will determine: • If dominant trees species of the ecosite are >140 years old, then stand is Significant Wildlife Habitat[cxlviii] • The stand will have experienced no recognizable forestry activities[cxlviii] • The area of Forest Ecosites combined to make up the stand is the SWH. • Determine ELC Vegetation Type for forest stand[lxxviii] • SWHDSS[cxlix] Index #23 provides development effects and mitigation measures.	Old Growth Forest possibly present within subject property. Large woodland within study area and extending beyond. ELC and vegetation surveys to be conducted in 2021. **Candidate SWH.**

Table 2. Characteristics of Rare Vegetation Communities for Ecoregion 6E.

Rare Vegetation Community[1]	Candidate SWH			Confirmed SWH	Study Area
	ELC Ecosite Codes[1]	Habitat Description[1]	Detailed Information and Sources[1]	Defining Criteria[1]	Assessment Details
Savannah					
Rationale: Savannahs are extremely rare habitats in Ontario.	TPS1 TPS2 TPW1 TPW2 CUS2	A Savannah is a tallgrass prairie habitat that has tree cover between 25 – 60%.	• No minimum size to site Site must be restored or a natural site. Remnant sites such as railway right of ways are not considered to be SWH. Information Sources • Natural Heritage Information Center (NHIC) has location information on their website • OMNRF Ecologists • Field naturalists clubs • Conservation Authorities	Field studies confirm one or more of the Savannah indicator species listed in[lxxv] Appendix N should be present. Note: Savannah plant spp. list from Ecoregion 6E should be used[cxlviii]. • Area of the ELC Ecosite is the SWH. • Site must not be dominated by exotic or introduced species (<50% vegetative cover exotics sp.). • SWHMiST[cxlix] Index #18 provides development effects and mitigation measures.	Vegetation community not expected to be present within subject property. **Not SWH.**
Tallgrass Prairie					
Rationale: Tallgrass Prairies are extremely rare habitats in Ontario.	TPO1 TPO2	A Tallgrass Prairie has ground cover dominated by prairie grasses. An open Tallgrass Prairie habitat has < 25% tree cover.	• No minimum size to site Site must be restored or a natural site. Remnant sites such as railway right of ways are not considered to be SWH. Information Sources • OMNR Districts • Natural Heritage Information Center (NHIC) has location information available on their website • Field naturalists clubs • Conservation Authorities	Field studies confirm one or more of the Prairie indicator species listed in[lxxv] Appendix N should be present. Note: Prairie plant spp. list from Ecoregion 6E should be used[cxlviii]. • Area of the ELC Ecosite is the SWH • Site must not be dominated by exotic or introduced species (<50% vegetative cover exotics). • SWHMiST[cxlix] Index #19 provides development effects and mitigation measures.	Vegetation community not present within subject property. **Not SWH.**
Other Rare Vegetation Communities					

Table 2. Characteristics of Rare Vegetation Communities for Ecoregion 6E.

Rare Vegetation Community[1]	Candidate SWH			Confirmed SWH	Study Area
	ELC Ecosite Codes[1]	Habitat Description[1]	Detailed Information and Sources[1]	Defining Criteria[1]	Assessment Details
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 SWHTG[cxlviii]. 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 OMNR/NHIC will have up to date listing for rare vegetation communities. Information Sources • Natural Heritage Information Center (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 SWHTG[cxlviii]. • Area of the ELC Vegetation Type polygon is the SWH. • SWHMiST[cxlix] Index #37 provides development effects and mitigation measures.	Rare vegetation communities are potentially present within the subject property. ELC survey and vegetation surveys to be completed. **Candidate SWH.**

Appendix II. Significant Wildlife Habitat Assessment Tables

Table 3. Characteristics of Specialized Wildlife Habitat for Ecoregion 6E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Waterfowl Nesting Area					
Rationale: Important to local waterfowl populations, sites with greatest number of species and highest number of individuals are significant.	American Black Duck Northern Pintail Northern Shoveler Gadwall Blue-winged Teal Green-winged Teal Wood Duck Hooded Merganser Mallard	All upland habitats located adjacent to these wetland ELC Ecosites are Candidate SWH: MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 SWT1 SWT2 SWD1 SWD2 SWD3 SWD4 Note: includes adjacency to Provincially Significant Wetlands	A waterfowl nesting area extends 120m[cxlix] from a wetland (> 0.5 ha) or a wetland (>0.5ha) and any small wetlands (0.5ha) within 120m or a cluster of 3 or more small (<0.5 ha) wetlands within 120m of each individual wetland where waterfowl nesting is known to occur[cxlix]. • Upland areas should be at least 120m wide so that predators such as raccoons, skunks, and foxes have difficulty finding nests. • Wood Ducks and Hooded Mergansers utilize large diameter trees (>40cm dbh) in woodlands for cavity nest sites. Information Sources • Ducks Unlimited staff may know the locations of particularly productive nesting sites. • OMNRF Wetland Evaluations for indication of significant waterfowl nesting habitat. • Reports and other information available from CAs	Studies confirmed: • Presence of 3 or more nesting pairs for listed species excluding Mallards, or • Presence of 10 or more nesting pairs for listed species including Mallards. • Any active nesting site of an American Black Duck is considered significant. • Nesting studies should be completed during the spring breeding season (April - June). Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • A field study confirming waterfowl nesting habitat will determine the boundary of the waterfowl nesting habitat for the SWH, this may be greater or less than 120m[cxlviii] from the wetland and will provide enough habitat for waterfowl to successfully nest. • SWHMiST[cxlix] Index #25 provides development effects and mitigation measures.	The study area contains a mix of wetland and upland habitats that may provide suitable habitat. **Candidate SWH.**

Table 3. Characteristics of Specialized Wildlife Habitat for Ecoregion 6E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Bald Eagle and Osprey Nesting, Foraging and Perching Habitat					
Rationale: Nest sites are fairly uncommon in Eco-region 6E are used annually by these species. Many suitable nesting locations may be lost due to increasing shoreline development pressures and scarcity of habitat.	Osprey Special Concern: Bald Eagle	ELC Forest Community Series: FOD, FOM, FOC, SWD, SWM and SWC directly adjacent to riparian areas – rivers, lakes, ponds and wetlands	• Nests are associated with lakes, ponds, rivers or wetlands along forested shorelines, islands, or on structures over water. • Osprey nests are usually at the top a tree whereas Bald Eagle nests are typically in super canopy trees in a notch within the tree's canopy. • Nests located on man-made objects are not to be included as SWH (e.g. telephone poles and constructed nesting platforms). Information Sources • Natural Heritage Information Center (NHIC) compiles all known nesting sites for Bald Eagles in Ontario. • MNRF values information (LIO/NRVIS) will list known nesting locations. Note: data from NRVIS is provided as a point and does not represent all the habitat. • Nature Counts, Ontario Nest Records Scheme data. • OMNRF Districts • Sustainable Forestry License (SFL) companies will identify additional nesting locations through field operations. • Check the Ontario Breeding Bird Atlas[ccv] or Rare Breeding Birds in Ontario for species documented • Reports and other information available from CAs. • Field naturalists clubs	Studies confirm the use of these nests by: • One or more active Osprey or Bald Eagle nests in an area[cxlviii]. • Some species have more than one nest in a given area and priority is given to the primary nest with alternate nests included within the area of the SWH. • For an Osprey, the active nest and a 300m radius around the nest or the contiguous woodland stand is the SWHccvii, maintaining undisturbed shorelines with large trees within this area is important[cxlviii]. • For a Bald Eagle the active nest and a 400-800m radius around the nest is the SWH[cvi], ccvii. Area of the habitat from 400-800m is dependent on site lines from the nest to the development and inclusion of perching and foraging habitat[cvi]. • To be significant a site must be used annually. When found inactive, the site must be known to be inactive for >3 years or suspected of not being used for >5 years before being considered not significant[ccvii] • Observational studies to determine nest site use, perching sites and foraging areas need to be done from mid March to mid August. • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • SWHMiST[cxlix] Index #26 provides development effects and mitigation measures	Bald Eagle and Osprey have not been documented in the vicinity of the study area. **Not SWH.**
Wildlife Habitat: Woodland Raptor Nesting Habitat					
Rationale: Nests sites for these species are rarely identified; these area sensitive habitats and are often used annually by these species.	Northern Goshawk Cooper's Hawk Sharp-shinned Hawk Red-shouldered Hawk Barred Owl Broad-winged Hawk	May be found in all forested ELC Ecosites. May also be found in SWC, SWM, SWD and CUP3.	All natural or conifer plantation woodland/forest stands >30ha with >10ha of interior habitat[lxxxviii, lxxxix, xc, xci, xciii, xciv, xcv, xcvi, cxxxiii]. Interior habitat determined with a 200m buffer[cxlviii]. • Stick nests found in a variety of intermediate-aged to mature conifer, deciduous or mixed forests within tops or crotches of trees. Species such as Cooper's hawk nest along forest edges sometimes on peninsulas or small off-shore islands. • In disturbed sites, nests may be used again, or a new nest will be in close proximity to old nest. Information Sources • OMNRF • Check the Ontario Breeding Bird Atlas[ccv] or Rare Breeding Birds in Ontario for species documented. • Check data from Bird Studies Canada • Reports and other information available from CAs	Studies confirm: • Presence of 1 or more active nests from species list is considered significant[cxlviii]. • Red-shouldered Hawk and Northern Goshawk – a 400m radius around the nest or 28ha area of habitat is the SWH[ccvii]. • Barred Owl – a 200m radius around the nest is the SWH[ccvii]. • Broad-winged Hawk and Coopers Hawk – a 100m radius around the nest is the SWH[ccvii]. • Sharp-shinned Hawk – a 50m radius around the nest is the SWH[ccvii]. • Conduct field investigations from mid-March to end of May. The use of call broadcasts can help in locating territorial (courting/nesting) raptors and facilitate the discovery of nests by narrowing down the search area. • SWHMiST[cxlix] Index #27 provides development effects and mitigation measures.	Woodland within the study area may contain suitable areas of interior forest habitat. **Candidate SWH.**

Table 3. Characteristics of Specialized Wildlife Habitat for Ecoregion 6E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Turtle Nesting Area					
Rationale: These habitats are rare and when identified will often be the only breeding site for local populations of turtles	Midland Painted Turtle Special Concern: Northern Map Turtle Snapping Turtle	Exposed mineral soil (sand or gravel) areas adjacent (<100m)[cxlviii] or within the following ELC Ecosites: MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 BOO1 FEO1	• Best nesting habitat for turtles are close to water and away from roads and sites less prone to loss of eggs by predation from skunks, raccoons or other animals. • For an area to function as a turtle-nesting area, it must provide sand and gravel that turtles are able to dig in and are located in open, sunny areas. Nesting areas on the sides of municipal or provincial road embankments and shoulders are not SWH. • Sand and gravel beaches adjacent to undisturbed shallow weedy areas of marshes, lakes, and rivers are most frequently used. Information Sources • Use Ontario Soil Survey reports and maps to help find suitable substrate for nesting turtles (well-drained sands and fine gravels). • Check the Ontario Herpetofaunal Summary Atlas records or other similar atlases for uncommon turtles; location information may help to find potential nesting habitat for them. • Natural Heritage Information Center (NHIC) • Field Naturalist clubs and landowners	Studies confirm: • Presence of 5 or more nesting Midland Painted Turtles • One or more Northern Map Turtle or Snapping Turtle nesting is a SWH[i] • The area or collection of sites within an area of exposed mineral soils where the turtles nest, plus a radius of 30-100m around the nesting area dependent on slope, riparian vegetation and adjacent land use is the SWH[cxlviii]. • Travel routes from wetland to nesting area are to be considered within the SWH[cxlix]. • Field investigations should be conducted in prime nesting season typically late spring to early summer. Observational studies observing the turtles nesting is a recommended method. • SWHMiST[cxlix] Index #28 provides development effects and mitigation measures for turtle nesting habitat.	Suitable habitat not present within the study area. **Not SWH.**
Wildlife Habitat: Seeps and Springs					
Rationale: Seeps/Springs are typical of headwater areas and are often at the source of coldwater streams.	Wild Turkey Ruffed Grouse Spruce Grouse White-tailed Deer Salamander spp.	Seeps/Springs are areas where ground water comes to the surface. Often they are found within headwater areas within forested habitats. Any forested Ecosite within the headwater areas of a stream could have seeps/springs.	Any forested area (with <25% meadow/field/pasture) within the headwaters of a stream or river system[cxvii, cxlix]. • Seeps and springs are important feeding and drinking areas especially in the winter will typically support a variety of plant and animal species[cxix, cxx, cxxi, cxxii, cxiii, cxiv] Information Sources • Topographical Map • Thermography • Hydrological surveys conducted by CAs and MOE • Field naturalists clubs and landowners • Municipalities and Conservation Authorities may have drainage maps and headwater areas mapped.	Field Studies confirm: • Presence of a site with 2 or more seeps/springs should be considered SWH. • The area of a ELC forest ecosite containing the seeps/springs is the SWH. The protection of the recharge area considering the slope, vegetation, height of trees and groundwater condition need to be considered in delineation the habitat[cxlviii] • SWHMiST[cxlix] Index #30 provides development effects and mitigation measures	The study area may provide headwater drainage features tributary to the Saugeen River. Seeps and springs may occur **Candidate SWH.**

Table 3. Characteristics of Specialized Wildlife Habitat for Ecoregion 6E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Amphibian Breeding Habitat (Woodland)					
Rationale: These habitats are extremely important to amphibian biodiversity within a landscape and often represent the only breeding habitat for local amphibian populations.	Eastern Newt Blue-spotted Salamander Spotted Salamander Gray Treefrog Spring Peeper Western Chorus Frog Wood Frog	All Ecosites associated with these ELC Community Series: FOC FOM FOD SWC SWM SWD Breeding pools within the woodland or the shortest distance from forest habitat are more significant because they are more likely to be used due to reduced risk to migrating amphibians.	• Presence of a wetland, pond or woodland pool (including vernal pools) >500m^2 (about 25m diameter) [ccvii] within or adjacent (within 120m) to a woodland (no minimum size)[clxxxii, lxiii, lxv, lxvi, lxvii, lxviii, lxix, lxx] Some small wetlands may not be mapped and may be important breeding pools for amphibians. • Woodlands with permanent ponds or those containing water in most years until mid-July are more likely to be used as breeding habitat[cxlviii] Information Sources • Ontario Herpetofaunal Summary Atlas (or other similar atlases) for records • Local landowners may also provide assistance as they may hear spring-time choruses of amphibians on their property. • OMNRF District • OMNRF wetland evaluations • Field naturalist clubs • Canadian Wildlife Service Amphibian Road Call Survey • Ontario Vernal Pool Association: http://www.ontariovernalpools.org	Studies confirm: • Presence of breeding population of 1 or more of the listed newt/salamander species or 2 or more of the listed frog species with at least 20 individuals (adults or eggs masses)[lxxi] or 2 or more of the listed frog species with Call Level Codes of 3. • A combination of observational study and call count surveys[cviii] -will be required during the spring March-June when amphibians are concentrated around suitable breeding habitat within or near the woodland/wetlands. • The habitat is the woodland area plus a 230m radius of woodland area[lxiii,lxv, lxvi, lxvii, lxviii, lxix, lxx, lxxi] if a wetland area is adjacent to a woodland, a travel corridor connecting the wetland to the woodland is the be included in the habitat. • SWHMiST[cxlix] Index #14 provides development effects and mitigation measures.	Indicator species have been documented in the vicinity of the study area. Wetlands within the study area may provide suitable habitat. Anuran surveys to be completed to confirm habitat presence/species presence. **Candidate SWH.**
Wildlife Habitat: Amphibian Breeding Habitat (Wetland)					
Rationale: These habitats are extremely important to amphibian biodiversity within a landscape and often represent the only breeding habitat for local amphibian populations	Eastern Newt American Toad Spotted Salamander Four-toed Salamander Blue-spotted Salamander Gray Tree frog Western Chorus Frog Northern Leopard Frog Pickerel Frog Green Frog Mink Frog Bullfrog	ELC Community Classes SW, MA, FE, BO, OA and SA. Typically these wetland ecosites will be isolated (>120m) from woodland ecosites, however larger wetlands containing predominantly aquatic species (e.g. Bull Frog) may be adjacent to woodlands.	• Wetlands >500m2 (about 25m diameter)[ccvii] supporting high species diversity are significant; some small or ephemeral habitats may not be identified on MNRF mapping and could be important amphibian breeding habitats[clxxxiv]. • Presence of shrubs and logs increase significance of pond for some amphibian species because of available structure for calling, foraging, escape and concealment from predators. • Bullfrogs require permanent water bodies with abundant emergent vegetation. Information Sources • Ontario Herpetofaunal Summary Atlas (or other similar atlases) • Canadian Wildlife Service Amphibian Road Surveys and Backyard Amphibian Call Count. • OMNRF Districts and wetland evaluations • Reports and other information available from CAs.	Studies confirm: • Presence of breeding population of 1 or more of the listed newt/salamander species or 2 or more of the listed frog/toad species and with at least 20 individuals (adults or eggs masses)[lxxi, lxxiii], or 2 or more of the listed frog/toad species with Call Level Codes of 3. or; Wetland with confirmed breeding Bullfrogs are significant. • The ELC ecosite wetland area and the shoreline are the SWH. • A combination of observational study and call count surveys[cviii] will be required during spring March to June) when amphibians are concentrated around suitable breeding habitat within or near the wetlands. • If a SWH is determined for Amphibian Breeding Habitat (Wetlands) then Movement Corridors are to be considered as outlined in Table 1.4.1 of this Schedule. • SWHMiST[cxlix] Index #15 provides development effects and mitigation measures.	Suitable habitat not present within the study area **Not SWH.**

Table 3. Characteristics of Specialized Wildlife Habitat for Ecoregion 6E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Woodland Area-Sensitive Bird Breeding Habitat					
Rationale: Large, natural blocks of mature woodland habitat within the settled areas of Southern Ontario are important habitats for area sensitive interior forest song birds.	Yellow-Bellied Sapsucker Red-breasted Nuthatch Veery Blue-headed Vireo Northern Parula Black-throated Green Warbler Blackburnian Warbler Black-throated Blue Warbler Ovenbird Scarlet Tanager Winter Wren Special Concern: Cerulean Warbler Canada Warbler	All Ecosites associated with these ELC Community Series: FOC FOM FOD SWC SWM SWD	• Habitats where interior forest breeding birds are breeding, typically large mature (>60 yrs old) forest stands or woodlots >30 ha.[cv, cxxxi, cxxxii, cxxxiii, cxxxiv, cxxv, cxxvi, cxxxvii, cxxxviii, cxxxix, cxl, cxli, cxlii, cxliii, cxliv, cxlv, cxlvi, cl, cli, clii, cliii, cliv, clv, clvii, clviii, clix] • Interior forest habitats are at least 200m from forest edge habitat. Information Sources • Local bird clubs • Canadian Wildlife Service (CWS) for the location of forest bird monitoring. • Bird studies Canada conducted a 3-year study of 287 woodlands to determine the effects of forest fragmentation on forest birds and to greatest value to interior species • Reports and other information available from CAs.	• Presence of nesting or breeding pairs of 3 or more of the listed wildlife species. • Note: any site with breeding Cerulean Warblers or Canada Warblers is to be considered SWH. • Conduct field investigations in spring and early summer when birds are singing and defending their territories. • Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”[ccxi] • SWHMiST[cxlix] Index #34 provides development effects and mitigation measures.	Forest with interior habitat of suitable size present within the subject property. Woodland is large and is likely to have mature trees. Breeding bird surveys to be completed to document species. **Candidate SWH**.

Appendix II. Significant Wildlife Habitat Assessment Tables

Table 4. Characteristics of Habitat for Species of Conservation Concern for Ecoregion 6E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Marsh Bird Breeding Habitat					
Rationale: Wetlands for these bird species are typically productive and fairly rare in Southern Ontario landscapes.	American Bittern Virginia Rail Sora Common Gallinule American Coot Pied-billed Grebe Marsh Wren Sedge Wren Common Loon Sandhill Crane Green Heron Trumpeter Swan Special Concern: Black Tern Yellow Rail	MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 SAS1 SAM1 SAF1 FEO1 BOO1 For Green Heron: All SW, MA and CUM1 sites.	• Nesting occurs in wetlands • All wetland habitat is to be considered as long as there is shallow water with emergent aquatic vegetation present[cxxiv]. • For Green Heron, habitat is at the edge of water such as sluggish streams, ponds and marshes sheltered by shrubs and trees. Less frequently, it may be found in upland shrubs or forest a considerable distance from water. Information Sources • Contact OMNRF, wetland evaluations are a good source of information. • Field naturalist clubs • Natural Heritage Information Center (NHIC) Records • Reports and other information available from CAs. • Ontario Breeding Bird Atlas[ccv]	Studies confirm: • Presence of 5 or more nesting pairs of Sedge Wren or Marsh Wren or 1 pair of Sandhill Cranes; or breeding by any combination of 5 or more of the listed species[i]. • Note: any wetland with breeding of 1 or more Black Terns, Trumpeter Swan, Green Heron or Yellow Rail is SWH[i]. • Area of the ELC ecosite is the SWH • Breeding surveys should be done in May/June when these species are actively nesting in wetland habitats. • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi]. • SWHMiST[cxlix] Index #35 provides development effects and mitigation measures	Suitable habitat not present within the study area **Not SWH.**
Wildlife Habitat: Open Country Bird Breeding Habitat					
Rationale: This wildlife habitat is declining throughout Ontario and North America. Species such as the Upland Sandpiper have declined significantly the past 40 years based on CWS (2004) trend records.	Upland Sandpiper Grasshopper Sparrow Vesper Sparrow Northern Harrier Savannah Sparrow Special Concern: Short-eared Owl	CUM1 CUM2	Large grassland areas (includes natural and cultural fields and meadows) >30 ha [clx, clxi, clxii, clxiii, clxiv, clxv, clxvi, clxvii, clxviii, clxix]. Grasslands not Class 1 or 2 agricultural lands, and not being actively used for farming (i.e. no row cropping or intensive hay or livestock pasturing in the last 5 years)[i]. Grassland sites considered significant should have a history of longevity, either abandoned fields, mature hayfields and pasturelands that are at least 5 years or older. The Indicator bird species are area sensitive requiring larger grassland areas than the common grassland species. Information Sources • Agricultural land classification maps, Ministry of Agriculture. • Ask local birders • Ontario Breeding Bird Atlas[ccv] • Reports and other information available from CAs.	Field Studies confirm: • Presence of nesting or breeding of 2 or more of the listed species. • A field with 1 or more breeding Short-eared Owl is to be considered SWH. • The area of SWH is the contiguous ELC ecosite field areas. • Conduct field investigations of the most likely areas in spring and early summer when birds are singing and defending their territories. • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi]. • SWHMiST[cxlix] Index #32 provides development effects and mitigation measures.	Large grassland areas >30 ha not present within the subject property. **Not SWH**.

Table 4. Characteristics of Habitat for Species of Conservation Concern for Ecoregion 6E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Shrub/Early Successional Bird Breeding Habitat					
Rationale: This wildlife habitat is declining throughout Ontario and North America. The Brown Thrasher has declined significantly over the past 40 years based on CWS (2004) trend records cxcix.	Indicator spp.: Brown Thrasher Clay-coloured Sparrow Common spp.: Field Sparrow Black-billed Cuckoo Eastern Towhee Willow Flycatcher Special Concern: Yellow-breasted Chat Golden-winged Warbler	CUT1 CUT2 CUS1 CUS2 CUW1 CUW2 Patches of shrub ecosites can be complexed into a larger habitat for some bird species.	Large field areas succeeding to shrub and thicket habitats>10ha[clxiv] in size. • Shrub land or early successional fields, not class 1 or 2 agricultural lands, not being actively used for farming (i.e. no row-cropping, haying or live-stock pasturing in the last 5 years)[i]. Shrub thicket habitats (>10 ha) are most likely to support and sustain a diversity of these species [clxxiii]. Shrub and thicket habitat sites considered significant should have a history of longevity, either abandoned fields or pasturelands. Information Sources • Agricultural land classification maps Ministry of Agriculture Local bird clubs • Ontario Breeding Bird Atlas[ccv] • Reports and other information available from CAs	Field Studies confirm: • Presence of nesting or breeding of 1 of the indicator species and at least 2 of the common species[i]. • A field with breeding Yellow-breasted Chat or Golden-winged Warbler is to be considered as Significant Wildlife Habitat. • The area of the SWH is the contiguous ELC ecosite field/thicket area. • Conduct field investigations of the most likely areas in spring and early summer when birds are singing and defending their territories • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • SWHMiST[cxlix] Index #33 provides development effects and mitigation measures.	Vegetation community has potential to be present within the subject property. Large field area. To be further assessed through ELC and vegetation surveys. **Candidate SWH.**
Wildlife Habitat: 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 Crawfish or Meadow Crayfish: (*Cambarus Diogenes*)	MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 MAS1 MAS2 MAS3 SWD SWT SWM	Wet meadow and edges of shallow marshes (no minimum size) identified 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 semi-terrestrial burrower which spends most of its life within burrows consisting of a network of tunnels. Usually the soil is not too moist so that the tunnel is well formed. 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 marsh meadow or 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 during in temporary or permanent water Note the presence of burrows or chemistry are often the only indicator of presence, observance or collection of individuals is very difficult[cci] • SWHMiST[cxlix] Index #36 provides development effects and mitigation measures.	Suitable habitat not expected to be present within the study area. Incidental observations will be conducted during all surveys. **Not SWH.**

Table 4. Characteristics of Habitat for Species of Conservation Concern for Ecoregion 6E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Special Concern and Rare Wildlife Species					
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 the 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[ccv] • 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 to 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.	Background information has has shown that there is potential for Special Concern and Rare Species to occur within the subject property. A suite of surveys are being conducted to assess/inventory the site during the appropriate time of the year. **Candidate SWH**

Appendix II. Significant Wildlife Habitat Assessment Tables

Table 5. Characteristics of Animal Movement Corridors for Ecoregion 6E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Amphibian Movement Corridors					
Rationale: Movement corridors for amphibians moving from their terrestrial habitat to breeding habitat can be extremely important for local populations.	Eastern Newt Blue-spotted Salamander Spotted Salamander Gray Treefrog Spring Peeper Western Chorus Frog Northern Leopard Frog Pickerel Frog Green Frog Mink Frog Bullfrog	Corridors may be found in all ecosites associated with water. • Corridors will be determined based on identifying the significant breeding habitat for these species in Table 1.1.	Movement corridors between breeding habitat and summer habitat [clxxiv, clxxv, clxxvi, clxxvii, clxxviii, clxxix, clxxx, clxxxi]. Movement corridors must be determined when Amphibian breeding habitat is confirmed as SWH from Table 1.2.2 (Amphibian Breeding Habitat – Wetland) of this Schedule[j]. Information Sources • MNRF District Office • Natural Heritage Information Center NHIC • Reports and other information available from CAs • Field Naturalist Clubs	• Field Studies must be conducted at the time of year when species are expected to be migrating or entering breeding sites. • Corridors should consist of native vegetation, with several layers of vegetation. Cooridors unbroken by roads, waterways or bodies, and undeveloped areas are most significant[cxlix]. • Corridors should have at least 15m of vegetation on both sides of waterway [cxlix] or be up to 200m wide[cxlix] of woodland habitat and with gaps <20m [cxlix]. • Shorter corridors are more significant than longer corridors, however amphibians must be able to get to and from their summer and breeding habitat[cxlix]. • SWHMiST[cxlix] Index #40 provides development effects and mitigation measures.	Amphibian Breeding Habitat (Wetland) SWH not present. **Not SWH**
Wildlife Habitat: Deer Movement Corridors					
Rationale: Corridors important for all species to be able to access seasonally important life-cycle habitats or to access new habitat for dispersing individuals by minimizing their vulnerability while travelling.	White-tailed Deer	Corridors may be found in all forested ecosites. A Project Proposal in Stratum II Deer Wintering Area has potential to contain corridors.	Movement corridor must be determined when Deer Wintering Habitat is confirmed as SWH from Table 1.1 of this schedule[l]. • A deer wintering habitat identified by the OMNRF as SWH in Table 1.1 of this Schedule will have corridors that the deer use during fall migration and spring dispersion [clxxxii, clxxxiii, cxlix, cxciv]. • Corridors typically follow riparian areas, woodlots, areas of physical geography (ravines, or ridges). Information Sources • MNRF District Office • Natural Heritage Information Center (NHIC) • Reports and other information available from CAs • Field Naturalist Clubs	• Studies must be conducted at the time of year when deer are migrating or moving to and from winter concentration areas. • Corridors that lead to a deer wintering yard should be unbroken by roads and residential areas. • Corridors should be at least 200m wide[cxlix] with gaps <20m[cxlix] and if following riparian area with at least 15m of vegetation on both sides of waterway[cxlix]. Shorter corridors are more significant than longer corridors[cxlix] • SWHMiST[cxlix] Index #39 provides development effects and mitigation measures.	Deer Wintering Habitat not present. **Not SWH**

Appendix II. Significant Wildlife Habitat Assessment Tables

Table 6. Exceptions for Ecodistricts within Ecoregion 6E.

	Wildlife Habitat and Species	Candidate SWH			Confirmed SWH	Study Area
		Ecosites	Habitat Description	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
EcoDistrict: 6E-14						
Rationale: The Bruce Peninsula has an isolated and distinct population of black bears. Maintenance of large woodland tracks with mast producing tree species is important for bears. clxxxvi, ccxvii	**Mast Producing Areas** Black Bear	All Forested habitat represented by ELC Community Series: FOM FOD	• Black bears require forested habitat that provides cover, winter hibernation sites, and mast producing tree species. clxxxv, clxxxvii, clxxxviii, clxxxix, cxc, cxci, cxcii, cxciii, ccxvii • Forested habitats need to be large enough to provide cover and protection for black bears ccxvii.	Woodland ecosites >30ha with mast-producing tree species, either soft (cherry) or hard (oak and beech), Information Sources Important forest habitat for black bears may be identified by OMNRF.	• All woodlands > 30 ha with a 50% composition of these ELC Vegetation Types are considered significant: FOM1-1 FOM2-1 FOM3-1 FOD1-1 FOD1-2 FOD2-1 FOD2-2 FOD2-3 FOD2-4 FOD4-1 FOD5-2 FOD5-3 FOD5-7 FOD6-5 • SWHMiST cxlix Index #3 provides development effects and mitigation measures.	Not in ECO District 6E-14
EcoDistrict: 6E-17						
Rationale: Sharp-tailed grouse only occur on Manitoulin Island in Ecoregion 6E, Leks are an important habitat to maintain their population	**Lek** Sharp-tailed Grouse	CUM CUS CUT	• The lek or dancing ground consists of bare, grassy or sparse shrubland. There is often a hill or rise in topographyccxix. • Leks are typically a grassy field/meadow >15h with adjacent shrublands and >30ha with adjacent deciduous woodland. Conifer trees within 500m are not tolerated. ccxix	Grasslands (field/meadow) are to be >15ha when adjacent to shrubland and >30ha when adjacent to deciduous woodland[ccxix]. • Grasslands are to be undisturbed with low intensities of agriculture (light grazing or late haying) • Leks will be used annually if not destroyed by cultivation or invasion by woody plants or tree planting[ccxix] Information Sources • OMNRF district office • Bird watching clubs • Local landowners • Ontario Breeding Bird Atlas	Studies confirming lek habitat are to be completed from late March to June. • Any site confirmed with sharp-tailed grouse courtship activities is considered significant • The field/meadow ELC ecosites plus a 200 m radius area with shrub or deciduous woodland is the lek habitat • SWHMiST cxlix Index #32 provides development effects and mitigation measures	Not in ECO District 6E-14

Appendix VI
Species at Risk Screening Memo and MECP Correspondence

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Memo

Project 2559

To:	**Ministry of Environment, Conservation and Parks (MECP)**
From:	**Ryan Archer**
Date:	**May 5, 2021**
Re:	**Southampton Landfill Expansion Environmental Assessment Species at Risk Screening**

Introduction

Natural Resource Solutions Inc. (NRSI) was retained by GM BluePlan Engineering, on behalf of the Town of Saugeen Shores, to complete a Natural Environment Assessment (NEA) to inform an upcoming Environmental Assessment (EA) associated with the planned expansion of the Southampton Landfill. The landfill property is located at 126 Concession 14 east of Southampton. See Appendix I for the subject property location. For the purposes of the upcoming EA, a study area has been identified that includes a potential landfill expansion area as well as adjacent lands owned by the Town (Appendix I).

As part of the EIS, NRSI has undertaken a screening exercise for Species at Risk (SAR) and Species of Conservation Concern (SCC) habitats within this study area. For the purposes of this study, SAR are defined as provincially Endangered and Threatened Species protected under the *Endangered Species Act* (ESA), while SCC comprise provincial species of Special Concern, as well as other provincially rare species (e.g., Natural Heritage Information Centre S-ranks of S1-S3) whose habitat is considered Significant Wildlife Habitat (SWH) in accordance with the provincial Natural Heritage Reference Manual (OMNR 2010). The primary focus of this memo is SAR regulated under the ESA. SCC will be addressed under SWH considerations within the NEA.

Background information review and initial site visits for the NEA have been undertaken during spring 2021 to characterize the existing natural features. Additional field surveys will be completed during spring and summer 2021 to assess the significance and sensitivity of the existing natural features, and to investigate the presence of any SAR habitat within the EA study area. This memo summarizes the results of the background review and the SAR screening for your review and approval. The purpose of this screening is to determine any further actions that may be required in accordance with the ESA to address SAR that may be impacted by the proposed development.

Background Data

Background information sources were reviewed to identify records of SAR known from the study area and surrounding lands. These information sources included the following:

- Natural Heritage Information Centre (NHIC) significant species database (MNRF 2021);
- Ontario Breeding Bird Atlas (Bird Studies Canada et at. 2008);
- Ontario Reptile and Amphibian Atlas data (Ontario Nature 2019);

- Ontario Butterfly Atlas (MacNaughton et al. 2020);
- Atlas of the Mammals of Ontario (Dobbyn 1994);
- Ontario Odonate Atlas (OOAD 2021);
- First-hand NRSI staff experience with the site;
- eBird online records; and,
- iNaturalist online records.

Existing Conditions

The majority of the study area comprises a complex of Cultural Plantation and birch/poplar-dominated forest. Ecological Land Classification mapping of the study area is not yet available, but will be prepared for the NEA. Poplar and birch-dominated woodlands in the study area are young-regenerating to mid-aged. There is some natural pine recruitment within the mixed plantation/woodland areas. Pockets of unevaluated wetland occur within the study area woodland features. These wetlands primarily comprise deciduous swamp and swamp thicket. Western portions of the study area woodlands are relatively younger than the more mature woodland to the north of the active landfill operation site. The far northeast corner of the study area abuts the Saugeen River, while a small tributary to the river originates and flows north out of the study area. The study area includes a Town-owned active agricultural field on the far west side.

SAR Screening

NHIC results obtained for the study area vicinity (within the 1x1km square) included the following SAR:

- Bank Swallow (*Riparia riparia*);
- Bobolink (*Dolichonyx oryzivorus*); and,
- Eastern Meadowlark (*Sturnella magna*).

Records for the Ontario Nature 10x10km Reptile and Amphibian Atlas (Ontario Nature 2019) square that includes the study area (17MK72) also identified a single record for Massasauga (*Sistrurus catenatus catenatus*) from 2013. Coarse-level (i.e. 10x10km scale) background information gathered from wildlife atlases identified other SAR records within 10km of the subject property. Based on NRSI staff experience with the study area, it is known that Eastern Whip-poor-will (*Caprimulgus vociferus*) is or has occurred within the area.

A preliminary screening was completed by comparing the habitats present in the study area to the preferred habitats of the SAR reported from the background information. The results of this screening indicate that the study area may potentially contain suitable habitat for multiple SAR. The screening was further refined by considering the proposed expansion area and the potential impacts of the proposed undertaking to determine whether the proposal has the potential to affect SAR or their habitats. Details of the screening are included in a table appended to this memo (Appendix II).

Based on the analysis, the following SAR may have the potential to be present on site and to be affected by the proposed development:

- Barn Swallow (*Hirundo rustica*) (through removal of potential nesting habitat structures);
- Bobolink;
- Eastern Meadowlark;
- Eastern Whip-poor-will;

- Little Brown Myotis (*Myotis lucifigus*);
- Massasauga (however, see below);
- Northern Myotis (*Myotis septentrionalis*); and,
- Tri-colored Bat (*Perimyotis subflavus*).

See the screening table appended to this memo (Appendix II) for SAR that were ruled out as having suitable habitat within the study area.

As stated above, Massasauga was identified in the screening due to the single record of the species identified in the 10x10km Ontario Reptile and Amphibian Atlas square that contains the study area (Ontario Nature 2019). Massasauga is a habitat generalist, utilizing a wide variety of habitat conditions but typically preferring open woodlands with dense ground cover (Parks Canada 2015). Based on a preliminary investigation of the study area by NRSI biologists, the western portion of the study area, which comprises more open and younger regenerating woodland may provide suitable habitat conditions for the species. However, it is the understanding of NRSI herpetofauna experts that Massasauga is not known to occur in or immediately around Southampton in recent years. It is therefore NRSI's opinion that the potential for Massasauga occurrence within the study area, and therefore for negative impacts to Massasauga and its habitat, is low. We request MECP comment on the potential for Massasauga occurrence, and impact potential associated with landfill expansion, based on where the species is known to occur and whether or not it may feasibly access the study area lands.

Field Work

Seasonal field work has been and will continue to be carried out to characterize the natural features and wildlife habitats within the study area in completion of the NEA. The field work components that have or will be conducted to address SAR that were screened as having suitable habitat in the study area are described in Table 1.

Table 1. NEA Field Surveys Addressing SAR

Survey Type	Completion Status	Protocol	Target SAR
Breeding Bird Surveys/Bobolink and Eastern Meadowlark Surveys	To be completed	Surveys as per Ontario Breeding Bird Atlas methodology (BSC 2001). If suitable habitat for Bobolink or Eastern Meadowlark occurs within the study area (i.e., within the eastern agricultural field), the MNRF survey protocol for Bobolink and Eastern Meadowlark (MNRF 2015) will also be utilized in conjunction with standard breeding bird survey work. Potential nesting structures will be inspected for the presence of Barn Swallows.	Barn Swallow Bobolink Eastern Meadowlark
Reptile Habitat Assessment	Completed	A general site investigation and habitat assessment was completed, with a focus on areas of habitat suitability for Massasauga.	Massasauga

Survey Type	Completion Status	Protocol	Target SAR
Crepuscular Bird Survey	To be completed	A single survey will be completed to identify the presence of Eastern Whip-poor-will within the study area. The survey methodology will follow the MNRF protocol for Eastern Whip-poor-will (MNRF 2014)	Eastern Whip-poor-will

SAR bat habitat may occur anywhere within the wooded features of the study area. Due to the large expanse of potential bat SAR habitat, particularly within the area of potential landfill expansion, targeted bat cavity tree assessments are not proposed due to the impracticality of searching this area and identifying habitat trees with suitable accuracy. While this area could be subsampled using a plot-based approach, it is NRSI's understanding from prior MNRF consultation that it is preferred that large wooded areas such as this be assumed to represent SAR bat habitat rather than attempting to complete targeted habitat assessments. Based on this approach, we request MECP comment on the necessary next steps to address SAR bats and their habitat in the context of the proposed landfill expansion.

No other SAR that were not initially screened for the study area have been observed during field surveys completed to date.

Landfill Expansion Plan

The Town of Saugeen Shores proposes to expand the operational footprint of the existing Southampton Landfill within the Town-owned lands. See Appendix I for the portion of the lands that are being considered for landfill expansion. The actual areas of landfill expansion will be determined as an outcome of the upcoming EA and the results of its various technical studies, including but not limited to the NEA. An objective of the NEA is to identify any natural environment constraints and/or sensitive wildlife habitat areas such that these areas may be avoided in designing the expansion area. Potential impacts to SAR and their habitats are to be discussed with MECP. To date, detailed designs for landfill expansion areas have not been provided. However, for the purposes of the NEA it is assumed that natural features will be fully removed within the proposed footprint of the expansion area to accommodate landfill operation activities.

Potential Species at Risk Implications

Barn Swallow

It is currently unknown whether or not Barn Swallows nest within the study area. If landfill expansion activities require the removal of existing structures, then there is potential for negative impacts to Barn Swallows and their nesting habitat. NRSI will assess if/which structures contain Barn Swallow nests through targeted survey work. If it is determined that structures containing Barn Swallow nests will require removal, the client will be advised to undertake the necessary activities identified in Ontario Regulation 242/08 prior to any activities that would impact the species.

The majority of suitable Barn Swallow foraging habitat within the study area likely occurs over the existing agricultural field in the west end. The majority of this field is expected to be retained as part of future landfill expansion plans (Appendix I). The majority of the proposed expansion area is wooded and does not represent typical Barn Swallow foraging habitat, with the exception

of localized clearings. Therefore, negative impacts to Barn Swallow foraging habitat are considered unlikely.

Bobolink and Eastern Meadowlark

Potentially suitable habitat for these species is associated with the agricultural field at the west end of the study area. Targeted surveys will be completed for these species if suitable habitat exists (e.g., fallow field, hayfield). The conceptual landfill expansion plan includes the potential removal of a portion of this agricultural field that may contain suitable breeding habitat for Bobolink or Eastern Meadowlark. If it is determined that suitable breeding habitat for Bobolink or Eastern Meadowlark will be impacted, the client will be advised to undertake the necessary activities identified in Ontario Regulation 242/08 prior to any activities that would impact the species.

Eastern Whip-poor-will

NRSI will complete a survey to identify the presence of this species in accordance with MNRF survey methodology and under appropriate conditions (weather, temperature, visible moon phase). If this species is confirmed to be present, it is likely that a portion of its suitable habitat could be impacted by the proposed development (i.e., removal of open/younger woodland within the western portion of the study area). If potential for impact is identified, NRSI will consult with the MECP to discuss the need for any additional survey requirements or other measures that are necessary to address Eastern Whip-poor-will in accordance with ESA requirements.

Species at Risk Bats

As stated above, NRSI has taken the approach of assuming that the wooded portions of the study area that fall within the potential landfill expansion area represent potential SAR bat habitat. Therefore, removal of portions of this wooded area would be assumed to represent a negative impact to bat SAR habitat. The degree of potential impact would depend on factors such as the spatial extent of woodland to be removed. We request MECP comment on whether an alternative approach should be taken to addressing SAR bat habitat and/or what next steps may be required to meet the requirements of the ESA.

Summary

The study area is largely forested, containing a mix of cultural plantation and natural birch/poplar-dominated woodland. The western portion of the study area comprises younger, mid-aged and more open canopy woodland areas interspersed with openings associated with existing land use activities. The study area contains an active agricultural field on the west end. Certain SAR were identified as having suitable habitat within the study area. Targeted survey work will be completed to assess the presence of these species and their habitats. However, due to the large expanse of woodland within the study area, including within the area of potential landfill expansion, bat habitat assessment work is not proposed in lieu of assuming that these woodland areas represent suitable habitat. We request MECP comment on this approach and any necessary next steps to address SAR bats in completion of the NEA.

NRSI has also identified that a 2013 record of Massasauga occurs within 10km of the study area, and that suitable habitat for the species exists within the study area. However, based on NRSI expert opinion, it is considered unlikely that Massasauga would occur within the study area due to the species not being known from the Southampton area in recent years. We request MECP comment on the location of Massasauga records in the vicinity and if there is any likelihood that the species may access and occupy the study area lands.

We look forward to your comments on these matters. If you have any questions or require more information or clarification, please contact the undersigned.

Sincerely,
Natural Resource Solutions Inc.



Ryan Archer, M.Sc.
Terrestrial and Wetland Biologist

Cc.: Andrea Nelson; GM BluePlan Engineering
Colin Saunders; Town of Saugeen Shores

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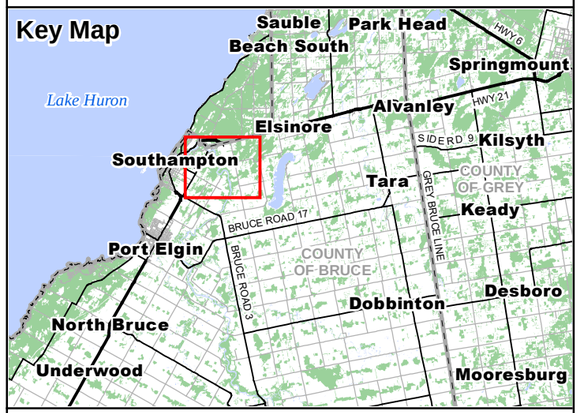
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MAPS

Map 1

Southampton Landfill NEA

Study Area and Natural Features



Legend

- Study Area (Boundary Approximate)
- Utility Line
- Highway
- Primary Road
- Secondary Road
- Permanent Watercourse
- Intermittent Watercourse
- Water Body
- Provincially Significant Wetland (PSW)
- Unevaluated Wetland
- Wooded Area

Aquatic Resource Area (ARA)

- ARA Point
- ARA Line Segment
- ARA Polygon

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Map Produced by Natural Resource Solutions Inc. This map is proprietary and confidential and must not be duplicated or distributed by any means without express written permission of NRSI. Data provided by MNRF© Copyright: Queen's Printer Ontario. Imagery:ESRI (2014).

Project: 2559
Date: April 7, 2021

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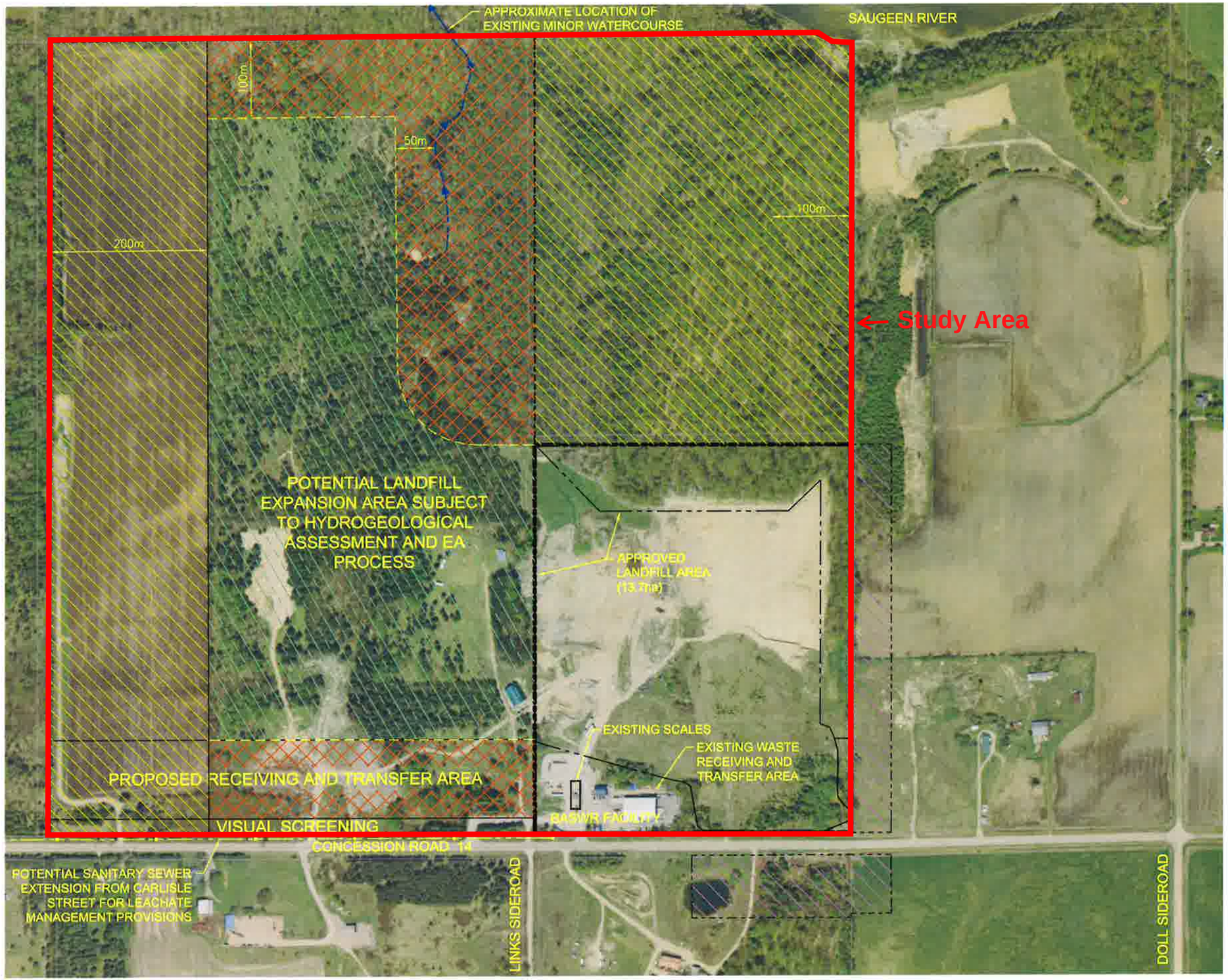
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APPENDIX I

Southampton Landfill Expansion Site Plan (GM BluePlan)



219181
Town of Saugeen Shores Waste Management Plan

LEGEND

- CONTAMINATION ATTENUATION ZONE (CAZ) LANDS
- BUFFER LANDS
- ADDITIONAL LANDS OWNED BY THE TOWN
- POTENTIAL LANDFILL EXPANSION AREA
- POTENTIAL SANITARY SEWER EXTENSION

NOTE:
AIR PHOTO BACKGROUND WAS TAKEN IN 2015.

SCALE : 1:5,000
DECEMBER 2019

SOUTHAMPTON LANDFILL EXPANSION SITE PLAN

Town of Saugeen Shores
County of Bruce

Figure No. 8-6

BluePlan ENGINEERING

FILE:C:\Civil 3D Projects\219181 Figures-K.dwg LAYOUT:Fig. 8-6-Overall Site Plan
LAST SAVED BY:Kboers, 12/10/2019 4:15:48 PM PLOTTED BY:Ken Boers - GM BluePlan 12/11/2019 3:55:00 PM

APPENDIX II

Species at Risk Screening Table

Scientific Name	Common Name	S-RANK[1]	ESA/ COSSARO[3]	COSEWIC[2]	SARA	Background Source	Habitat Preference[4,5]	Suitable Habitats within Study Area	Carried Forward to NEA?	Rationale
Birds										
Chaetura pelagica	Chimney Swift	S4B, S4N	THR	T	Schedule 1	BSC et al. 2006	Commonly found in urban areas near buildings; nests in hollow trees, crevices of rock cliffs, chimneys; highly gregarious; feeds over open water.	No	No	Limited buildings, rock cliffs, or chimneys.
Chordeiles minor	Common Nighthawk	S4B	SC	T	Schedule 1	NRSI staff experience	Open ground; clearings in dense forests; ploughed fields; gravel beaches or barren areas with rocky soils; open woodlands; flat gravel roofs.	Yes	Yes - crepuscular bird survey to confirm presence	Field may be ploughed on the subject property. Suitable open habitats within wooded features may occur
Caprimulgus vociferus	Eastern Whip-poor-will	S4B	THR	T	Schedule 1	NRSI staff experience	Dry, open, deciduous woodlands of small to medium trees; oak or beech with lots of clearings and shaded leaflitter; wooded edges, forest clearings with little herbaceous growth; pine plantations; associated with >100 ha forests; may require 500 to 1000 ha to maintain population.	Yes	Yes - crepuscular bird survey to confirm presence	Open woodlands present in the study area.
Riparia riparia	Bank Swallow	S4B	THR	T		BSC et al. 2006; NHIC 2021	Sand, clay or gravel river banks or steep riverbank cliffs;lakeshore bluffs of easily crumbled sand or gravel; gravel pits, road-cuts, grassland or cultivated fields that are close to water; nesting sites are limiting factor for species presence.	Yes	Yes - Breeding bird surveys to confirm presence	Riverbank bluff at the northeast corner of the study area may contain suitable Bank Swallow nesting habitat. Foraging habitat may occur within the study area.
Hirundo rustica	Barn Swallow	S4B	THR	T		BSC et al. 2006	Farmlands or rural areas; cliffs, caves, rock niches; buildings or other man-made structures for nesting; open country near body of water.	Yes	Yes - Breeding bird surveys to confirm presence	Nesting habitat may occur in/on structures within the study area. Also near farmland and rural areas, and near body of water that may provide foraging habitat.
Hylocichla mustelina	Wood Thrush	S4B	SC	T		BSC et al. 2006	Carolinian and Great Lakes-St. Lawrence forest zones; undisturbed moist mature deciduous or mixed forest with deciduous sapling growth; near pond or swamp; hardwood forest edges; must have some trees higher than 12 m.	Yes	Yes - Breeding bird surveys to confirm presence	Large mixed forest within the study area
Ammodramus savannarum	Grasshopper Sparrow	S4B	SC	SC	Schedule 1	BSC et al. 2006	Well-drained grassland or prairie with low cover of grasses, taller weeds on sandy soil; hayfields or weedy fallow fields; uplands with ground vegetation of various densities; perches for singing; requires tracts of grassland > 10ha.	Yes	No	Suitable habitat may be found within the large agricultural field at the east end of the study area, depending on field cover type.
Contopus virens	Eastern Wood-Pewee	S4B	SC	SC	Schedule 1	BSC et al. 2006	Open, deciduous, mixed or coniferous forest; predominated by oak with little understorey; forest clearings, edges; farm woodlots; parks.	Yes	Yes - Breeding bird surveys to confirm presence.	Mixed forest present.
Sturnella magna	Eastern Meadowlark	S4B	THR	T	Schedule 1	BSC et al. 2006; NHIC 2021	Open, grassy meadows, farmland, pastures, hayfields or grasslands with elevated singing perches; cultivated land and weedy areas with trees; old orchards with adjacent, open grassy areas >10 ha in size.	Yes	Yes - Breeding bird surveys to confirm presence.	Farmland and pastures present within the study area.
Dolichonyx oryzivorus	Bobolink	S4B	THR	T	No Schedule	BSC et al. 2006; NHIC 2021	Large, open expansive grasslands with dense ground cover; hayfields, meadows or fallow fields; marshes; requires tracts of grassland >50 ha.	Yes	Yes - Breeding bird surveys to confirm presence.	Farmland and pastures present within the study area.

Scientific Name	Common Name	S-RANK[1]	ESA/ COSSARO[3]	COSEWIC[2]	SARA	Background Source	Habitat Preference[4,5]	Suitable Habitats within Study Area	Carried Forward to NEA?	Rationale
Herpetofauna										
Graptemys geographica	Northern Map Turtle	S3	SC	SC	Schedule 1	Ontario Nature 2019; NHIC 2021	Large bodies of water with soft bottoms, and aquatic vegetation; basks on logs or rocks or on beaches and grassy edges, will bask in groups; uses soft soil or clean dry sand for nest sites; may nest at some distance from water.	Yes	Yes - Visual turtle surveys to be completed within the Saugeen to confirm habitat useage.	The Saugeen River occurs immediately adjacent to the study area and may provide suitable open water habitat.
Chelydra serpentina serpentina	Common Snapping Turtle	S3	SC	SC	Schedule 1	Ontario Nature 2019; NHIC 2021	Permanent or semi-permanent fresh water; marshes, swamps or bogs; rivers and streams with soft muddybanks or bottoms. The species often uses soft soil or clean dry sand on south-facing slopes for nest sites and may nest at some distance from water.	Yes	Yes - Visual turtle surveys to be completed as part of site investigations.	Swamp and small pond features that provide suitable habitat may occur within the study area
Sistrurus catenatus catenatus	Massasauga *(Carolinian population*)	S1	END	E		Ontario Nature 2019	Massasaugas live in different types of habitats throughout Ontario, including tall grass prairie, bogs, marshes, shorelines, forests and alvars. Within all of these habitats, Massasaugas require open areas to warm themselves in the sun. Pregnant females are most often found in open, dry habitats such as rock barrens or forest clearings where they can more easily maintain the body temperature required for the development of their offspring. Non-pregnant females and males forage and mate in lowland habitats such as grasslands, wetlands, bogs and the shorelines of lakes and rivers. Massasaugas hibernate underground in crevices in bedrock, sphagnum swamps, tree root cavities and animal burrows where they can get below the frost line but stay above the water table.	Yes	Yes	As a habitat generalist, suitable habitat for Massasauga may be present in the study area. Suitable habitat will be mapped/identified as part of site investigations. However, this species is not known to have records in the immediate vicinity of the site or Southampton.
Mammals										
Myotis lucifungus	Little Brown Myotis	S5	END	E	Schedule 1	Dobbyn 1994	Uses caves, quarries, tunnels, hollow trees or buildings for roosting; winters in humid caves; maternity sites in dark warm areas such as attics and barns; feeds primarily in wetlands, forest edges	Yes	Yes	Woodland present within the study area.
Myotis septentrionalis	Northern Myotis	S3?	END	E	Schedule 1	ECCC 2018	Hibernates during winter in mines or caves; during summer males roost alone and females form maternity colonies of up to 60 adults; roosts in houses, man-made structures but prefers hollow trees or under loose bark; hunts within forest, below canopy	Yes	Yes	Woodland present within the study area.
Perimyotis subflavus	Tri-colored Bat	S3?	END	E	Schedule 1	ECCC 2018	During the summer, the Tri-colored Bat is found in a variety of forested habitats. It forms day roosts and maternity colonies in older forest and occasionally in barns or other structures. They forage over water and along streams in the forest. Tri-colored Bats eat flying insects and spiders gleaned from webs. At the end of the summer they travel to a location where they swarm; it is generally near the cave or underground location where they will overwinter. They overwinter in caves where they typically roost by themselves rather than part of a group.	Yes	Yes	Woodland present within the study area.
Insects										
Danaus plexippus	Monarch	S4	SC	SC		TEA 2020	Open areas with milkweed species (*Asclepias spp.*).	Yes	Yes - Incidental observations to be taken during field surveys.	Meadows potentially present on site.

Scientific Name	Common Name	S-RANK[1]	ESA/ COSSARO[3]	COSEWIC[2]	SARA	Background Source	Habitat Preference[4,5]	Suitable Habitats within Study Area	Carried Forward to NEA?	Rationale
Freshwater Mussels										
Villosa iris	Rainbow	S2S3	SC	SC	Schedule 1	DFO 2021	The Rainbow mussel prefers small to medium-sized rivers with a moderate to strong current and sand, rocky, or gravel bottoms. It is found in or near riffle areas and along the edges of vegetation in water less than one metre deep. The Rainbow mussel uses a variety of fish hosts in Ontario, including Striped shiner, Smallmouth bass, Largemouth bass, Green sunfish, Greenside darter, Rainbow darter, and Yellow perch.	Yes	Yes- Aquatic habitat assessment to be completed on tributary and Saugeen River.	Saugeen River is mapped as potential habitat for this species.
Plants										
Arnoglossum plantagineum	Tuberous Indian-plantain	S2	SC	SC	Schedule 1	NHIC 2021	This species prefers open sunny areas in wet, calcium-rich meadows or shoreline fens. In Ontario, it grows along river banks and in wetlands near Lake Huron.	No	No	No wet calcium rich meadows or fens.

Subject: RE: Southampton Landfill, Town of Saugeen Shores - SAR Screening
From: "McShane, Lisa (MECP)" <lisa.mcshane@ontario.ca>
Date: 25/05/2021, 1:39 p.m.
To: Ryan Archer <rarcher@nrsi.on.ca>

Hi Ryan,
I believe the Massasauga record you are referencing was confirmed within 4km of this site and is from 2013 and it included in the NHIC data that I have access to. I would advise that if as you suggest, suitable habitat is present for this species at this site, that surveys be undertaken to determine presence/absence following the Survey protocol for Ontario's species at risk snakes | Ontario.ca

I would also advise you to undertake surveys for bats and their habitat rather than assuming presence. However if you choose to assume presence, I would recommend moving forward into the permitting process as the damage or destruction of species at risk habitat without authorization would contravene the ESA.

Lisa

Lisa McShane
Management Biologist | Permissions and Compliance Section, Species at Risk Branch|Land and Water Division | Ministry of the Environment, Conservation and Parks | lisa.mcshane@ontario.ca | (226) 668-0527

From: Ryan Archer <rarcher@nrsi.on.ca>
Sent: Friday, May 21, 2021 4:41 PM
To: McShane, Lisa (MECP) <lisa.mcshane@ontario.ca>
Cc: Species at Risk (MECP) <SAROntario@ontario.ca>
Subject: Re: Southampton Landfill, Town of Saugeen Shores - SAR Screening

CAUTION -- EXTERNAL E-MAIL - Do not click links or open attachments unless you recognize the sender.

Hi Lisa,

Thank you for the information provided to supplement our list of Species at Risk records to incorporate into our screening.

I am hoping to receive MECP comment on a couple of key questions/requests that were posed in the SAR screening document that I submitted (re-attached here for reference), those being the following:

- NRSI has taken the approach of assuming the large expanse of woodland in the project study area represents SAR bat habitat. Please advise if MECP agrees with this approach, and if so what next steps should be followed in completion of the Natural Environment Assessment to ensure the landfill expansion planning proceeds in accordance with ESA requirements.
- NRSI determined that a record of Massasauga exists for the 10x10 km Reptile and Amphibian Atlas square that contains the study area (but Massasauga was not identified in the immediate study area vicinity based on NHIC records). We request MECP comment on whether Massasauga needs to be considered for this site, based on known observation records of the species and whether there is any likelihood for the species to occupy the study area lands. Based on NRSI biologist experience, we do not believe that there is much likelihood of Massasauga occurring within the study area.

Regards,

Ryan Archer M.Sc.
Terrestrial and Wetland Biologist
Natural Resource Solutions Inc.
415 Phillip Street, Unit C
Waterloo, ON N2L 3X2
(p) 519-725-2227 Ext. 414 (f) 519-725-2575
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(w) www.nrsi.on.ca (e) rarcher@nrsi.on.ca
@nrsinews Natural Resource Solutions Inc.
Over 20 years of environmental consulting excellence

On 21/05/2021 3:17 p.m., Species at Risk (MECP) wrote:

Hi Ryan,
In addition to the species at risk occurrences that you have listed for this site we have the additional species at risk occurrence information in the area:

1. American badger
2. American eel
3. Black redhorse
4. Lake sturgeon
5. Shortnose cisco
6. Silver shiner
7. Yellow breasted chat
8. Piping plover

\A0
It is important to note that a lack of information does not mean that species at risk or their habitat are not present. There are many areas where the Government of Ontario does not currently have information, especially in more remote parts of the province. On\2010 site assessments can better verify site conditions, identify and confirm presence of species at risk and/or their habitats. It is the responsibility of the proponent to ensure that species at risk are not killed, harmed, or harassed, and that their habitat is not damaged or destroyed through the activities carried out on the site.
\A0
Please note it remains the clients responsibility to:

1. Carry out preliminary screening for their project,
2. Obtain the best available information for all applicable information sources,
3. Conduct necessary field studies or inventories to identify and confirm the presence of absence of species at risk or their habitat,
4. Consider any potential impacts to species at risk that a proposed activity might cause, and
5. Comply with the Endangered Species Act (ESA).

\A0
The Ministry of Environment, Conservation and Parks is only responsible for species at risk and the Endangered Species Act. If you would like confirmation of fisheries or other natural heritage features outside of species at risk please contact the Ministry of Natural Resources and Forestry office.
\A0
Lisa
\A0
\A0

Lisa McShane
Management Biologist | Permissions and Compliance Section, Species at Risk Branch|Land and Water Division | Ministry of the Environment, Conservation and Parks | lisa.mcshane@ontario.ca | (226)

668-0527
\A0

From: Ryan Archer <rarcher@nrsi.on.ca>
Sent: Wednesday, May 5, 2021 9:18 AM
To: Species at Risk (MECP) <SAROntario@ontario.ca>
Cc: Drea Nelson - GM BluePlan <Drea.Nelson@gmblueplan.ca>; Colin Saunders <colin.saunders@saugeenshores.ca>
Subject: Southampton Landfill, Town of Saugeen Shores - SAR Screening
\A0

CAUTION -- EXTERNAL E-MAIL - Do not click links or open attachments unless you recognize the sender.

Hello,

NRSI is working with GM BluePlan Engineering, on behalf of the Town of Saugeen Shores, to complete a Natural Environment Assessment to identify natural environment sensitivities and constraints on Town-owned lands on and adjacent to the Southampton Landfill. This work is being completed ahead of a planned EA for future expansion of the landfill operations. As part of this work, we have identified certain Species at Risk that may occur within the study area, and if present have the potential to be impacted unless properly accounted for.

I have attached the results of our SAR screening, highlighting a few SAR of most relevance. In particular, we are looking for MECP comment and guidance on the subject of SAR bats, and in regards to the potential for occurrence of Massasauga within this project study area.

We look forward to your input. Let me know if you have any questions or require clarification about anything.

Regards,

--\A0

Ryan Archer\A0 \A0 M.Sc.
Terrestrial and Wetland Biologist
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(w) www.nrsi.on.ca\A0 \A0 (e)\A0 rarcher@nrsi.on.ca
@nrsinews Natural Resource Solutions Inc.
Over 20 years of environmental consulting excellence

\A0

Subject: RE: Southampton Landfill, Saugeen Shores - Massasauga surveys
From: "Species at Risk (MECP)" <SAROntario@ontario.ca>
Date: 22/04/2022, 10:01 a.m.
To: Ryan Archer <rarcher@nrsi.on.ca>

Hi Ryan,
Given the lack of observations in the vicinity, the distance to the 1 observation (located on the shoreline of Lake Huron) and the survey work that you have done in the field I would concur that there is likely not sufficient evidence to suggest that Massasauga are present at this site and a second year of surveys may not be warranted. I will trust your professional judgement and expertise related to this area.
Lisa

Lisa McShane she/her

Management Biologist – Species at Risk | Landscape Species Recovery Section, Species at Risk Branch | Ministry of Environment, Conservation and Parks | lisa.mcshane@ontario.ca | (226) 668-0527



I pledge to be anti-racist, to have the courage to speak up and treat everyone with respect and honour

---

From: Ryan Archer <rarcher@nrsi.on.ca>
Sent: Friday, March 25, 2022 9:28 AM
To: McShane, Lisa (MECP) <lisa.mcshane@ontario.ca>; Species at Risk (MECP) <SAROntario@ontario.ca>
Subject: Southampton Landfill, Saugeen Shores - Massasauga surveys

CAUTION -- EXTERNAL E-MAIL - Do not click links or open attachments unless you recognize the sender.

Hi Lisa,

Please see attached a brief letter speaking to the results of Year 1 of Massasauga surveys completed as part of studies for the planned Southampton Landfill expansion, and in regards to the need for Year 2 of those surveys according to the 2-year survey protocol for the species. We are suggesting that there may not be strong rationale to continue these surveys but we would like to request MECP comment on this.

Let me know if you would like to discuss this further.

Regards,

--

Ryan Archer M.Sc.
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Over 20 years of environmental consulting excellence

Appendix VII
Bat Acoustic Monitoring Summary Report

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

January 23, 2026 Project No. 2559

Andrea Nelson
GEI Consultants Canada
1260 2nd Avenue East
Owen Sound, Ontario
N4K 2J3

RE: Southampton Landfill Expansion Natural Environment Assessment
Bat Acoustic Monitoring Results

1.0 Introduction

Natural Resource Solutions Inc. (NRSI) was retained by GEI Consultants Canada to complete a Natural Environment Assessment (NEA) in association with the proposed expansion of the Southampton Landfill in Southampton, Ontario.

The Town of Saugeen Shores intends to expand the Southampton Landfill to address future capacity needs. In order to inform the landfill expansion planning, a NEA of the proposed expansion lands is required to identify natural environment constraints. In response to a Species at Risk (SAR) screening summary submitted by NRSI, the Ministry of Environment, Conservation and Parks (MECP) advised that acoustic surveys for bat SAR be undertaken. As part of the NEA, NRSI conducted acoustic surveys to assess the potential presence of bat habitat and species composition, with a specific focus on bat SAR. This letter provides a summary of the methods and results of the bat acoustic monitoring.

The majority of the study area consists of deciduous forest and cultural plantation vegetation communities, with several cultural meadow communities and unevaluated wetland features dispersed throughout. An existing trail system is present throughout the study area. The study area is surrounded by forested vegetation communities, active agricultural fields and the Saugeen River to the northeast.

2.0 Methods

Acoustic monitoring for bats was completed in all treed communities within the study area that fall within identified potential landfill expansion areas (Map 1). Acoustic monitoring was not completed in the northeast portion of the study area as no development is proposed in this area.

Bat acoustic monitoring methodology followed the guidelines outlined within the Ministry of Natural Resources and Forestry's (MNRF) *Survey Protocol for Species at Risk* (SAR) *Bats within Treed Habitats for Little Brown Myotis, Northern Myotis & Tri-Colored Bats* (MNRF 2017) and the Ministry of Environment, Conservation and Parks' (MECP) *Survey Protocol for Maternity Roost Surveys (Forests/Woodlands)* (MECP 2020) and are described in detail below.

Since the completion of the passive acoustic monitoring, updated guidelines have been released by the MECP, including the *Survey Protocol for Maternity Roost Surveys (Forests/Woodlands)* (MECP 2022a), and the *2022 Bat Survey Standards Note* (MECP 2022b).

Although not designed based on the 2022 guidelines, the methods utilized as part of this study still adhere to the 2022 guidelines.

2.1 Acoustic Monitoring Station Locations

NRSI placed 24 acoustic monitoring stations in areas with suitable bat SAR habitat, including candidate roosting habitat, foraging habitat and travel corridors/flyways within the study area (Map 1). Candidate foraging and travel corridors were surveyed by placing the acoustic monitoring station along the edge of the habitat to conceal the microphone from any foraging bats and avoid recording inspection calls.

A total of 24 acoustic recorders were utilized, one per monitoring station. Monitoring stations BAT-005 and BAT-024 did not record any bat pass sequences during the monitoring period due to equipment error. Therefore, this data has been removed from the analysis. A summary of the location and set-up details for each acoustic monitoring station is provided in Appendix I.

2.2 Acoustic Detector Settings

Bat activity was monitored with the use of an omnidirectional SMM-U1 microphone and Song Meter SM4 acoustic recorder (Wildlife Acoustics Inc., Massachusetts, USA). Table 1 summarizes the unit settings used for this project.

Table 1. SM4 acoustic recorder settings used for bat acoustic monitoring.

Parameter	Setting Used
Detector Type	Wildlife Acoustics Song Meter SM4BAT-FS [Full-spectrum]
Microphone Type	Wildlife Acoustics SMM-U1 [omnidirectional]
Microphone Attachments	Windscreen [no horn or other weather proofing]
Gain	12dB
16 kHz High Pass Filter	Off
Sample Rate	384kHz
Min Duration	1.5ms
Max Duration	Off
Minimum Trigger Frequency	16kHz
Trigger Level	12dB
Trigger Window	3 sec
Maximum Length	00:15 min
Sunrise/Sunset Type	Solar
Timezone	UTC -04:00
Latitude	44.48235 N
Longitude	-81.33412 W
Delay Start	Off
Schedule Start	Sunset + 00:00hrs
Schedule End	Sunset + 05:00hrs

2.3 Acoustic Monitoring Frequency and Timing

Passive acoustic monitoring was conducted between June 17 and July 6, 2021, for a total of 20 nights at all monitoring stations, with 14 nights in June. Acoustic detectors were set to record bat passes for a total of 5 hours each night during the monitoring period, commencing at sunset.

Upon review of weather conditions during the monitoring period, bat echolocation calls recorded on the 10 evenings with the most ideal weather conditions for bat activity (ambient air temperature >15°C, wind <12km/hr, and no precipitation) were selected for further analyses (Appendix II). As per MECP (2022a), the analysis of acoustic data from at least 10 monitoring nights that align with the above weather conditions where no SAR bat activity is detected is required to confirm the absence of SAR bats from a given habitat.

2.4 Acoustic Data Analysis

The acoustic recorders used for this study employ direct digital recording technology and are designed to collect records from the full spectrum of bat calls (15-120kHz) for the entire duration of the monitoring period. This allows for a full analysis of activity in the vicinity of each acoustic monitoring station. Identification of call sequences to species level are typically possible with a quality ultrasound microphone (as used in this study) when recordings of bat echolocation calls are made in the open, the bat approaches close to the microphone, the bat produces echolocation calls typical for that species, and there is little interference (wind, proximity to the ground, type and abundance of vegetation, etc.) with the passage of ultrasound from the bat to the microphone. However, this perfect scenario rarely exists. All of the above factors can influence the ability to identify a call sequence to the species level. In addition to these conditional factors, many of the sounds produced by a particular species of bat are also produced by other species (i.e., they have overlapping ranges of call characteristics). The degree of overlap in call characteristics varies by species. These factors must all be taken into consideration when acoustic bat monitoring is undertaken.

Bat echolocation calls recorded during passive acoustic surveys were reviewed with the software program SonoBat 4.2.2 for the North/Northeastern US, Southern Ontario Region and initially identified to species with the SonoBat Auto-classifier. Settings for the auto-classification of the acoustic data included the following:

- Autofilter: 5 kHz;
- Acceptable call quality: 0.70;
- Decision threshold: 0.90; and
- Maximum number of calls to consider per file: 16.

All bat call sequences with one or more of the following auto-classification results were manually vetted by NRSI biologists to bat species or species grouping (Table 2):

- Classified as a high frequency call sequence (potential high frequency SAR including, Little Brown Myotis (*Myotis lucifugus*), Eastern Small-footed Myotis (*Myotis leibii*), Northern Myotis (*Myotis septentrionalis*), or Tri-colored Bat (*Perimyotis subflavus*)) and not confidently classified to species level;
- Classified as a high frequency SAR (Little Brown Myotis, Eastern Small-footed Myotis, Northern Myotis, or Tri-colored Bat);

- A high frequency SAR was identified as one of the second or third suggested species identifications; and/or
- Not assigned a classification by the auto-classifier or classified as “No ID”.

Note, at the time the acoustic data was analyzed in 2021, only four bat species were listed as SAR, including Little Brown Myotis, Northern Myotis, Eastern Small-footed Myotis, and Tri-colored Bat. Three additional bat species were listed as SAR under the *Endangered Species Act*, 2007 (ESA) in January 2025. The data has been reviewed, and the analysis updated to include the bat SAR Hoary Bat (*Lasiurus cinereus*), Silver-haired Bat (*Lasionycteris noctivagans*), and Eastern Red Bat (*Lasiurus borealis*). Call sequences auto-classified as a low frequency bat species (i.e., Silver-haired Bat, Hoary Bat, and Big Brown Bat (*Eptesicus fuscus*)), or as an Eastern Red Bat were not manually vetted.

Table 2. Call classifications for Ontario bat species. Species at Risk (O. Reg. 230/08) are highlighted in blue.

<table>
<tr><th>Species</th><th>Characteristic Frequency</th><th colspan="4">NRSI Call Sequence Classification</th></tr>
<tr><td>Hoary Bat (Lasiurus cinereus)</td><td>20 kHz (~to 30kHz)</td><td rowspan="3">Low Frequency</td><td></td><td rowspan="5"></td><td>Hoary Bat</td></tr>
<tr><td>Big Brown Bat (Eptesicus fuscus)</td><td rowspan="2">~30 kHz</td><td rowspan="2">30 kHz</td><td>Big Brown Bat</td></tr>
<tr><td>Silver-haired Bat (Lasionycteris noctivagans)</td><td>Silver-haired Bat</td></tr>
<tr><td>Eastern Red Bat (Lasiurus borealis)</td><td rowspan="5">~40 kHz</td><td rowspan="5">High Frequency</td><td rowspan="5">40 kHz</td><td>Eastern Red Bat</td></tr>
<tr><td>Tri-colored Bat (Perimyotis subflavus)</td><td>Tri-colored Bat</td></tr>
<tr><td>Little Brown Myotis (Myotis lucifugus)</td><td rowspan="3">Myotis spp.</td><td>Little Brown Myotis</td></tr>
<tr><td>Northern Myotis (Myotis septentrionalis)</td><td>Northern Myotis</td></tr>
<tr><td>Eastern Small-footed Myotis (Myotis leibii)</td><td>Eastern Small-footed Myotis</td></tr>
</table>

Once the required files were manually vetted, the auto-classification program provided an estimated likelihood of presence for each species, also known as a maximum likelihood estimate (MLE). An MLE value provides an indication of the strength of evidence for the presence of a species. An MLE value of zero suggests that the data presents stronger evidence of species presence and a value of one suggests that the data presents weaker evidence of species presence. These values are discussed in the results below at the site-level and presented in Appendix III at the station-level. It is important to note that the likelihood estimate provides a probabilistic estimate and does not convey certainty.

3.0 Results

Six bat species were documented as present during passive acoustic monitoring conducted within the study area. Five of these species, Eastern Red Bat, Hoary Bat, Little Brown Myotis, Silver-haired Bat, and Tri-colored Bat, are listed as SAR in Ontario (O. Reg. 230/08,

https://www.ontario.ca/laws/regulation/080230). A summary of the acoustic monitoring results is provided in Appendix III and Figure 1.

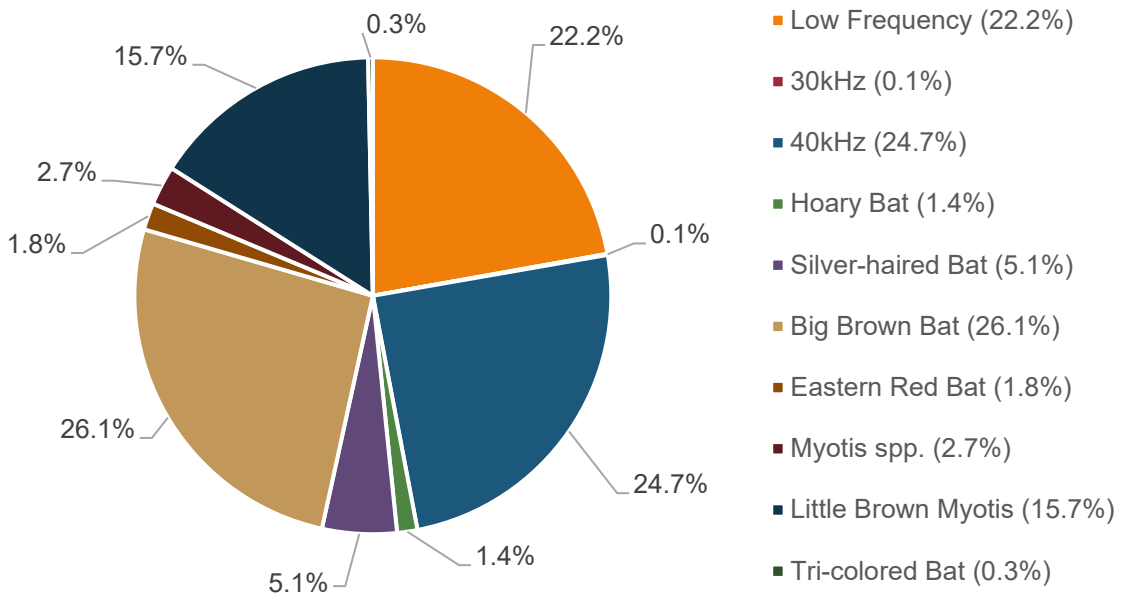


Figure 1. Bat species and species grouping classification results (all stations).

A total of 22,947 bat pass sequences were recorded throughout the acoustic monitoring period that were of high enough quality that they could be classified to either the species level or a species grouping. The majority of these bat pass sequences that were classified to the species level were identified as Big Brown Bat (*Eptesicus fuscus*) (26.1%) and Little Brown Myotis (15.7%). Several sequences were classified to Silver-haired Bat (*Lasionycteris noctivagans)* (5.1%), Eastern Red Bat (*Lasiurus borealis*) (1.8%) and Hoary Bat (*Lasiurus cinereus*) (1.4%). A small proportion of calls were classified to Tri-colored Bat (0.3%).

Consistent with these findings, the site-level MLE values (across all monitoring stations throughout the entire monitoring period) for each species suggest that there is strong evidence for the presence of Big Brown Bat (MLE=0), Hoary Bat (MLE=0), Silver-haired Bat (MLE=0), Eastern Red Bat (MLE=0) and Little Brown Myotis (MLE=0) within the study area. The data suggests that there is slightly weaker evidence for the presence of Tri-colored Bat (MLE=0.2). Station-level MLE values (per monitoring station) for each species is provided in Appendix III.

Of those bat pass sequences that were classified to species groupings, 5,090 (22.9%) were identified to the Low Frequency species grouping, 17 (0.1%) to the 30kHz species grouping, 5,678 (24.7%) to the 40kHz species grouping, and 613 (2.7%) to the Myotis species (*Myotis* spp.) grouping. The 40kHz species grouping includes the Myotis species, Tri-colored Bat and Eastern Red Bat. All Myotis species which occur in Ontario, as well as the Tri-colored Bat and Eastern Red Bat are listed as SAR. The Low Frequency and 30kHz species groupings, however, both include the non-SAR, Big Brown Bat, and should not independently be considered probable evidence of the presence of SAR.

Bat pass sequences were recorded on all monitoring nights. Bat activity peaked on the evening of July 1, 2021, when the highest number of bat pass sequences were recorded (4,160). The evening of June 19, 2021, had the lowest number of recorded bat pass sequences (926).

Figure 2 provides a summary of the number of recorded bat pass sequences per monitoring night.

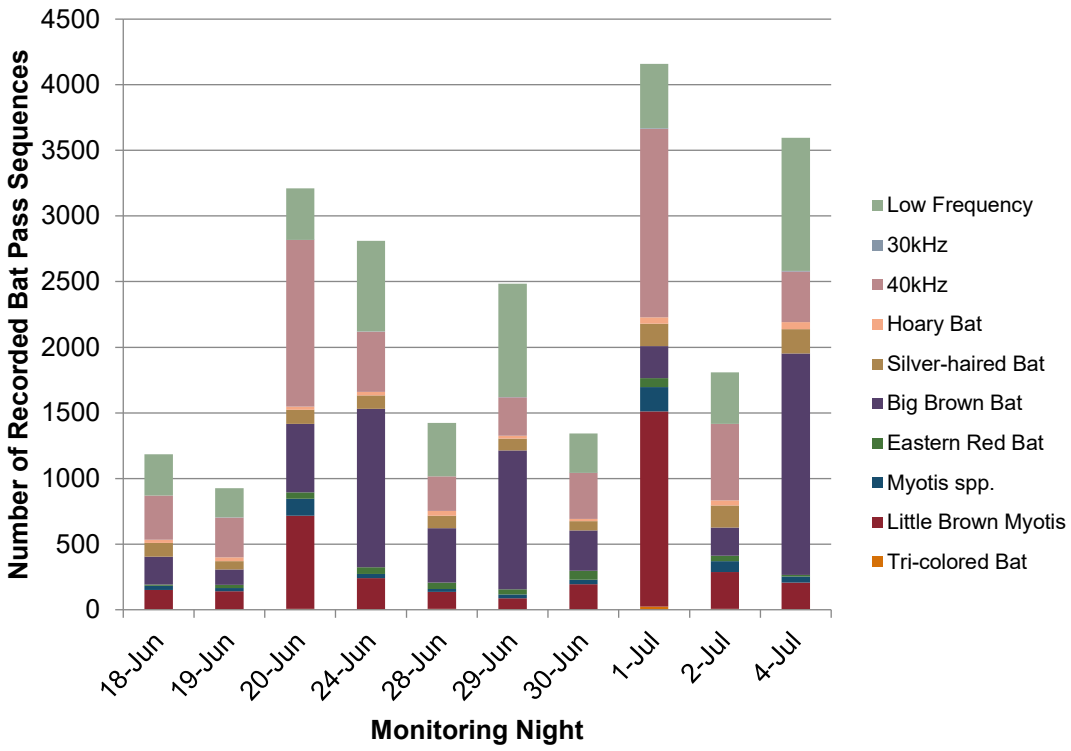


Figure 2. Number of recorded bat pass sequences per monitoring night (all stations).

Variation in the number of bat pass sequences recorded per monitoring night may be due to several factors, including weather, presence of predators, and abundance of prey items (e.g., insects). Bats are more likely to leave the roost to drink, forage, and socialize on warm or mild nights (i.e., ambient temperature >10°C) with low wind speed and no precipitation (MECP 2022a). Figure 3 presents the number of bat pass sequences recorded each monitoring night between sunset (21:13 hrs), and one hour after sunset in relation to ambient temperature and wind speed at approximately sunset (21:00 hrs). In general, relatively higher numbers of bat pass sequences were recorded on warmer evenings with low wind. Although it appears as though bat activity increased on some evenings with higher wind (Figure 3), wind speeds were still generally low (<15km/h). Appendix II summarizes the weather conditions for each recording interval throughout the monitoring period.

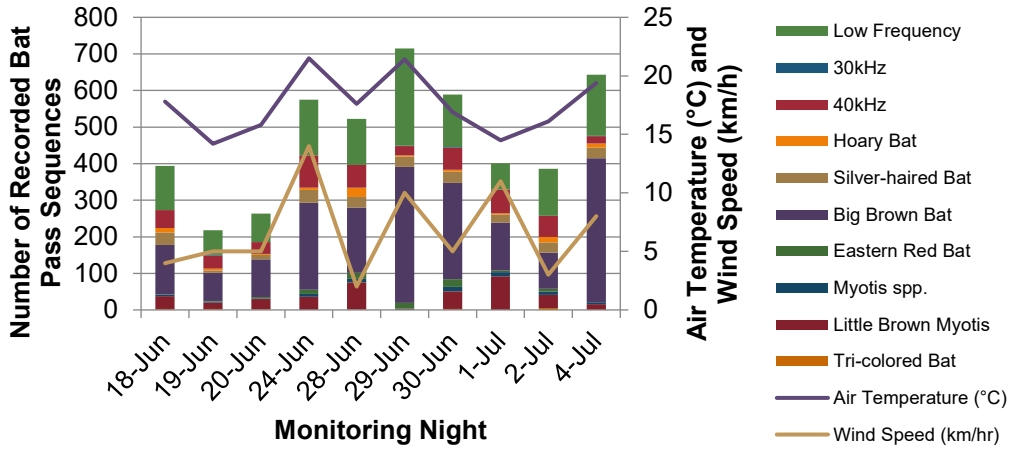


Figure 3. Relationship between weather conditions at sunset (21:00hrs) and the number of recorded bat pass sequences per monitoring night between 21:00 and 22:00hrs (all stations).

All species recorded throughout the monitoring period, including Little Brown Myotis, Tri-colored Bat, Eastern Red Bat, Big Brown Bat, Silver-haired Bat, and Hoary Bat, were detected on all 10 analyzed monitoring nights. Recordings classified to the Myotis, 40 kHz, and Low Frequency species groupings were also detected on all 10 analyzed monitoring nights. Recordings classified to the 30 kHz species grouping were detected on seven of the 10 analyzed monitoring nights.

Acoustic monitoring station BAT-022 had the highest total number of bat pass sequences recorded with 2,359 records, while station BAT-025 had the lowest, with a total of 55 recorded bat pass sequences. Figure 4 provides a summary of bat species and relative species abundances documented at each station throughout the monitoring period. Slight differences in species detected and the number of call sequences recorded was noted among all monitoring stations, as illustrated in Figure 4.

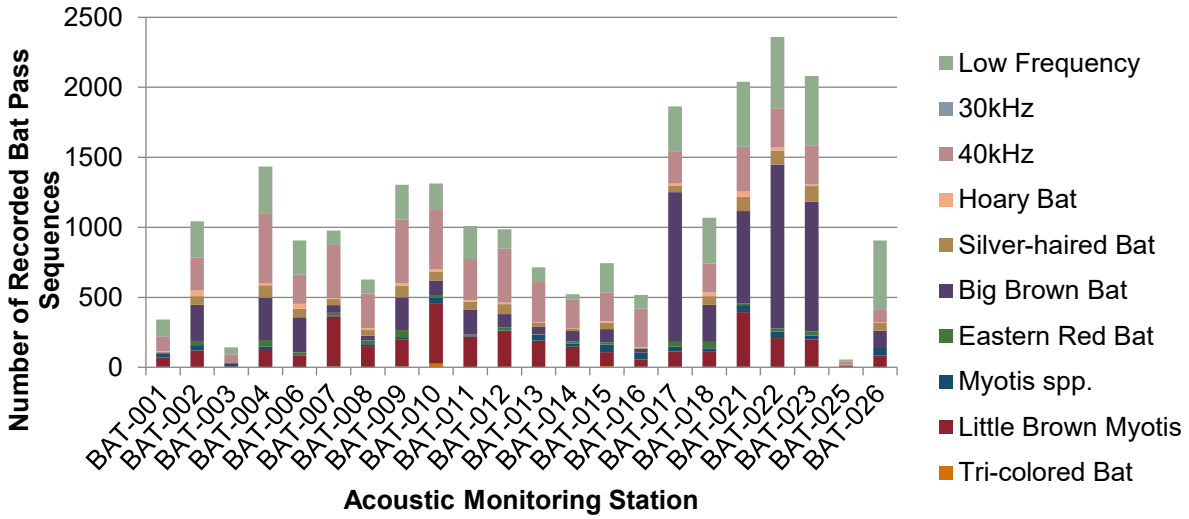


Figure 4. Number of recorded bat pass sequences per acoustic monitoring station (all stations).

Bat pass sequences classified to Little Brown Myotis, the Myotis species grouping and the 40kHz species grouping were recorded at all monitoring stations. Bat pass sequences classified to Tri-colored Bat were recorded at 18 of the 22 monitoring stations. Bat pass sequences classified to Eastern Red Bat were recorded at 17 of the 22 monitoring stations.

Low Frequency bat pass sequences were also recorded at all monitoring stations. Bat pass sequences classified to Silver-haired Bat and Hoary Bat were recorded at 21 of the 22 monitoring stations.

Bat activity also varied throughout each monitoring night. At the site-level (across all monitoring stations throughout the entire monitoring period), overall bat activity was highest during the 22:00 monitoring hour, and gradually declined throughout the evening. It should be noted that sunset occurred at 21:13 or 21:14 hrs during the monitoring period. Figure 5 provides a summary of bat species and relative species abundance per hour during the recording period each evening.

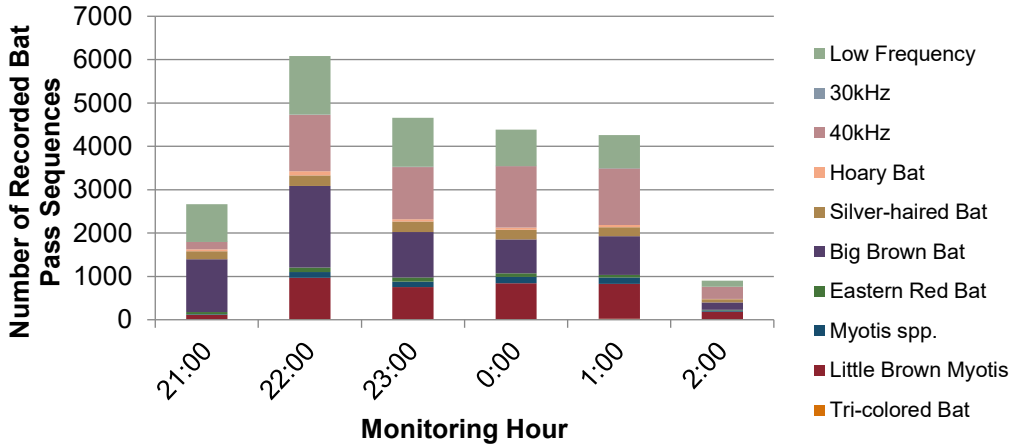


Figure 5. Number of recorded bat pass sequences per monitoring hour (all stations).

The timing of bat pass sequence recordings can provide information on how bats are using available habitats within the study area. Bat pass sequences recorded early in the evening can indicate the presence of roosting, including maternity roosting habitat. Sequences recorded later in the evening can indicate the presence of foraging habitat and movement or travel corridors (i.e., flyways).

Figures 6 and 7 further illustrate the timing of bat pass sequence recordings in relation to the trends in bat activity associated with a maternity roost as documented by Henry et al. (2002). That is, the number of bat call sequences recorded within each of the following bat activity periods are presented: 1) 0 – 60 minutes after sunset, 2) 61 – 100 minutes after sunset, and 3) >100 minutes after sunset. Results presented by Henry et al. (2002) suggest that at building maternity colonies where Little Brown Myotis have already given birth, bats are likely to emerge from the roost between sunset and 100 minutes after sunset, with peak emergence occurring between 20-60 minutes after sunset. The study also suggests that this initial phase of activity at emergence is followed by a decrease in activity while bats are away from the roost foraging and drinking, and then an increase in activity when females are returning to the roost after their initial bouts of foraging and drinking between 100-280 minutes after sunset (Henry et al. 2002). Eastern Red Bat and Hoary Bat activity patterns were not examined in relation to the pattern outlined by Henry et al. (2002) as they are not known to roost in colonies, but Figure 8 illustrates the timing of recorded bat pass sequences for these two species to inform an analysis of the potential for these two species to be using the study area for roosting based on activity at the time of expected emergence from a roost (i.e., near sunset).

Assessing high frequency colony-roosting species, this pattern outlined by Henry et al. (2002) was observed for Tri-colored Bat (Figure 6). With regards to low frequency colony-roosting species, this pattern was also observed for Big Brown Bat, Silver-haired Bat, the 30 kHz species grouping, and the Low Frequency species grouping (Figure 7).

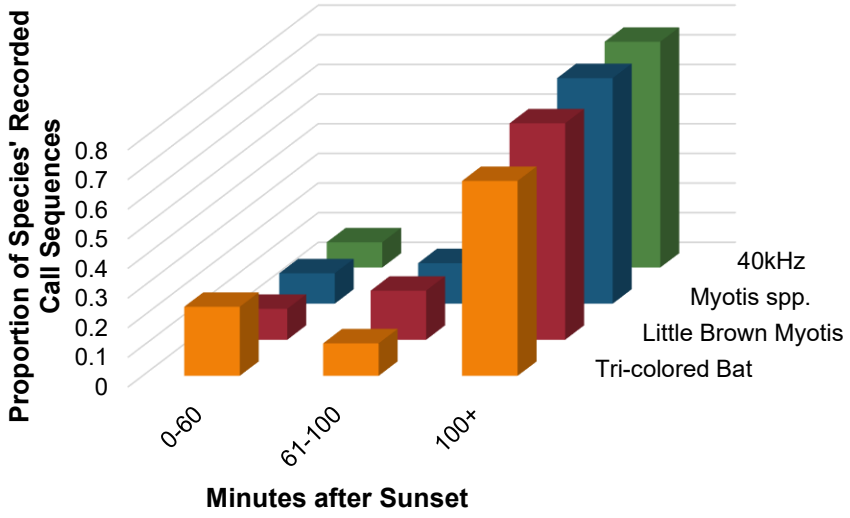


Figure 6. Within-species proportion of high frequency colony-forming bat call sequences per time period after sunset

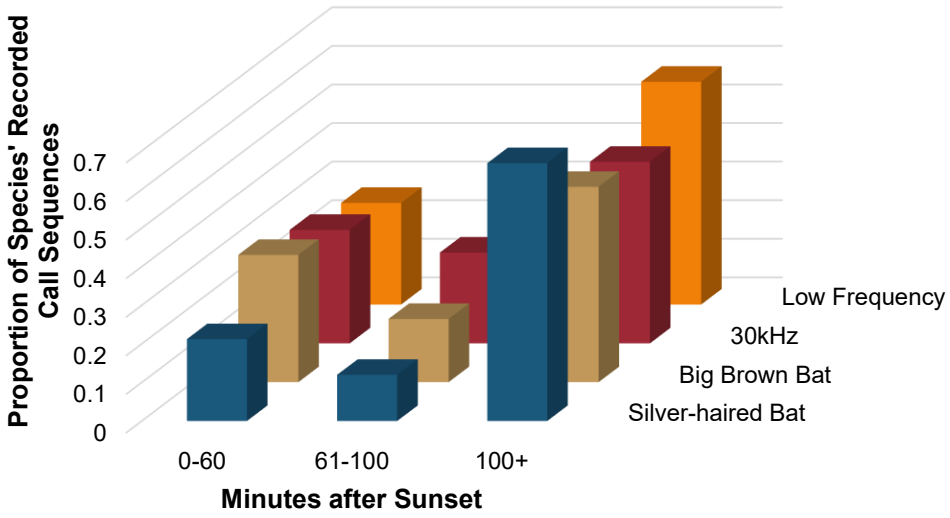


Figure 7. Within-species proportion of low frequency colony-forming bat call sequences per time period after sunset

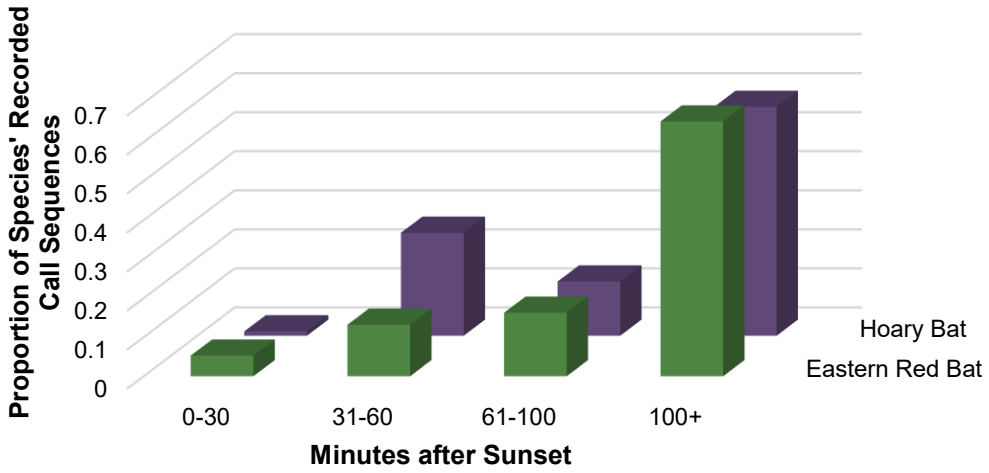


Figure 8. Within species proportion of solitary roosting bat call sequences per time period after sunset

3.1 East Study Area

3.1.1 Dry - Fresh Sugar Maple - Beech Deciduous Forest (FOD5-2) (#1)

Monitoring stations BAT-024, BAT-025 and BAT-026 were located within the Dry - Fresh Sugar Maple - Beech Deciduous Forest (FOD5-2) (#1) community in the east portion of the study area. Monitoring station BAT-024 did not record any bat pass sequences during the monitoring period due to equipment error. Bat pass sequences classified to Little Brown Myotis, Silver-haired Bat, Hoary Bat, as well as the Myotis species, 40kHz, and Low Frequency species groupings, were recorded at all monitoring stations within this community.

Bat activity in this community was highest in the 21:00 monitoring hour and gradually declined throughout the evening. Bat activity began at 21:27hrs. Table 3 provides a summary of the timing of bat pass sequence recordings per species in this community. Call sequences classified to Big Brown Bat, and the Low Frequency, 40 kHz, and Myotis, species groupings were detected on most of the 10 analyzed monitoring nights within the first hour after sunset (Table 3). Hoary Bat was only detected on two of the 10 analyzed monitoring nights within the first hour after sunset.

Table 3. Summary of timing and consistency of recorded bat call sequences during the monitoring period (FOD5-2 (#1))

Species or Species Grouping		Number of Call Sequences per Time Period after Sunset				Number of Monitoring Nights with Recorded Call Sequences per Time Period after Sunset[4]	
Common Name	**Scientific Name**	**0 – 30 min**	**31 – 60 min**	**61 – 100 min**	**>100 min**	**0 – 30 min**	**31 – 60 min**
Little Brown Myotis	*Myotis lucifugus*	0	13	16	60	0	6
Myotis spp.[1]	*Myotis* spp.	0	19	9	34	0	9
40 kHz[2]	-	0	22	22	62	0	7
Big Brown Bat	*Eptesicus fuscus*	10	97	7	11	6	10
Silver-haired Bat	*Lasionycteris noctivagans*	14	24	5	16	5	6
Hoary Bat	*Lasiurus cinereus*	0	4	0	4	0	2
Low Frequency[3]	-	44	81	87	199	5	8

[1]Myotis spp. grouping includes: Little Brown Myotis, Eastern Small-footed Myotis (*Myotis leibii*) and Northern Myotis (*Myotis septentrionalis*).
[2]40 kHz grouping includes: Eastern Red Bat (*Lasiurus borealis*), Little Brown Myotis, Eastern Small-footed Myotis, Northern Myotis and Tri-colored Bat (*Perimyotis subflavus*).
[3]Low Frequency grouping includes: Hoary Bat, Big Brown Bat and Silver-haired Bat.
[4]Total number of analyzed monitoring nights = 10

3.1.2 Cultural Meadow (CUM) (#3)

Monitoring stations BAT-021, BAT-022 and BAT-023 were located within the Cultural Meadow (CUM) (#3) community in the east portion of the study area. Bat pass sequences classified to Little Brown Myotis, Tri-colored Bat, Eastern Red Bat, Hoary Bat, Silver-haired Bat, Big Brown Bat, as well as the Low Frequency, 30kHz, 40kHz, and Myotis species groupings were recorded at all of these monitoring stations.

Bat activity in this community was highest in the 22:00 monitoring hour and gradually declined throughout the evening. Bat activity began at 21:14hrs. Table 4 provides a summary of the timing of bat pass sequence recordings in this community. Call sequences classified to Little Brown Myotis, Big Brown Bat, Silver-haired Bat, Hoary Bat, and the 40kHz and Low Frequency species groupings were detected on most of the 10 analyzed monitoring nights within the first hour after sunset (Table 4). Tri-colored Bat was only detected on two of the 10 analyzed monitoring nights within the first hour after sunset.

Table 4. Summary of timing and consistency of recorded bat call sequences during the monitoring period (CUM (#3))

Species or Species Grouping		Number of Call Sequences per Time Period after Sunset				Number of Monitoring Nights with Recorded Call Sequences per Time Period after Sunset[4]	
Common Name	**Scientific Name**	**0 – 30 min**	**31 – 60 min**	**61 – 100 min**	**>100 min**	**0 – 30 min**	**31 – 60 min**
Little Brown Myotis	*Myotis lucifugus*	0	121	155	519	0	9
Myotis spp.[1]	*Myotis* spp.	0	18	22	83	0	5
Tri-colored Bat	*Perimyotis subflavus*	0	4	1	2	0	2
Eastern Red Bat	*Lasiurus borealis*	4	11	11	40	2	5
40 kHz[2]	-	1	96	184	590	1	9
Big Brown Bat	*Eptesicus fuscus*	34	649	449	1624	8	10
Silver-haired Bat	*Lasionycteris noctivagans*	3	34	40	235	3	9
Hoary Bat	*Lasiurus cinereus*	0	12	17	49	0	7
Low Frequency[3]	-	31	227	191	1023	5	10

[1]Myotis spp. grouping includes: Little Brown Myotis, Eastern Small-footed Myotis (*Myotis leibii*) and Northern Myotis (*Myotis septentrionalis*).
[2]40 kHz grouping includes: Eastern Red Bat, Little Brown Myotis, Eastern Small-footed Myotis, Northern Myotis and Tri-colored Bat.
[3]Low Frequency grouping includes: Hoary Bat, Big Brown Bat and Silver-haired Bat.
[4]Total number of analyzed monitoring nights = 10

3.2 West Study Area

3.2.1 Mineral Cultural Meadow (CUM1) (#2)

Monitoring station BAT-018 was located within the Cultural Meadow (CUM) (#2) community in the central west portion of the study area. Bat pass sequences classified to Little Brown Myotis, Tri-colored Bat, Eastern Red Bat, Hoary Bat, Silver-haired Bat, Big Brown Bat, as well as the Myotis species, 40kHz, and Low Frequency species groupings, were recorded at this monitoring station.

Bat activity in this community was highest in the 22:00 monitoring hour and gradually declined throughout the evening. Bat activity began at 21:31hrs. Table 6 provides a summary of the timing of bat pass sequence recordings in this community. Call sequences classified to Little Brown Myotis, Big Brown Bat, and the Low Frequency species grouping were detected on most of the 10 analyzed monitoring nights within the first hour after sunset (Table 6). Tri-colored Bat was only detected on one of the 10 analyzed monitoring nights within the first hour after sunset. Hoary Bat and Eastern Red Bat were also detected on relatively few nights (n=4) within the first hour after sunset during passive acoustic monitoring in the CUM1 (#2) vegetation community.

Table 5. Summary of timing and consistency of recorded bat call sequences during the monitoring period (CUM1 (#2))

Species or Species Grouping		Number of Call Sequences per Time Period after Sunset				Number of Monitoring Nights with Recorded Call Sequences per Time Period after Sunset[4]	
Common Name	**Scientific Name**	**0 – 30 min**	**31 – 60 min**	**61 – 100 min**	**>100 min**	**0 – 30 min**	**31 – 60 min**
Little Brown Myotis	*Myotis lucifugus*	0	17	21	70	0	7
Myotis spp.[1]	*Myotis* spp.	0	5	4	16	0	5
Tri-colored Bat	*Perimyotis subflavus*	0	3	0	0	0	1
Eastern Red Bat	*Lasiurus borealis*	4	6	13	23	2	4
40 kHz[2]	-	0	18	48	139	0	6
Big Brown Bat	*Eptesicus fuscus*	5	110	58	91	3	10
Silver-haired Bat	*Lasionycteris noctivagans*	1	8	10	42	1	5
Hoary Bat	*Lasiurus cinereus*	0	9	5	15	0	4
Low Frequency[3]	-	7	77	74	170	4	9

[1]Myotis spp. grouping includes: Little Brown Myotis, Eastern Small-footed Myotis (*Myotis leibii*) and Northern Myotis (*Myotis septentrionalis*).
[2]40 kHz grouping includes: Eastern Red Bat, Little Brown Myotis, Eastern Small-footed Myotis, Northern Myotis and Tri-colored Bat.
[3]Low Frequency grouping includes: Hoary Bat, Big Brown Bat and Silver-haired Bat.
[4]Total number of analyzed monitoring nights = 10

3.2.2 Mineral Thicket Swamp (SWT2) (#2)

Monitoring station BAT-001 was located within the Mineral Thicket Swamp (SWT2) (#2) community in the west portion of the study area. Bat pass sequences classified to Little Brown Myotis, Tri-colored Bat, Hoary Bat, Silver-haired Bat, as well as the Myotis, 40kHz, 30kHz, and Low Frequency species groupings, were recorded at this monitoring station.

Bat activity in this community was highest in the 20:00 monitoring hour and gradually declined throughout the evening. Bat activity began at 21:43hrs. Table 7 provides a summary of the timing of bat pass sequence recordings in this community. Call sequences classified to the Low Frequency species grouping were detected on most of the 10 analyzed monitoring nights within the first hour after sunset (Table 7). No calls classified to Tri-colored Bat, Hoary Bat, and the Myotis species grouping were detected within the first hour after sunset at this monitoring station. Little Brown Myotis, Big Brown Bat, Silver-haired Bat, and the 30kHz and 40kHz species groupings were detected on very few of the 10 analyzed monitoring nights within the first hour after sunset.

Table 6. Summary of timing and consistency of recorded bat call sequences during the monitoring period (SWT2 (#2))

Species or Species Grouping		Number of Call Sequences per Time Period after Sunset				Number of Monitoring Nights with Recorded Call Sequences per Time Period after Sunset[5]	
Common Name	Scientific Name	0 – 30 min	31 – 60 min	61 – 100 min	>100 min	0 – 30 min	31 – 60 min
Little Brown Myotis	*Myotis lucifugus*	0	2	6	59	0	2
Myotis spp.[1]	*Myotis* spp.	0	0	2	26	0	0
Tri-colored Bat	*Perimyotis subflavus*	0	0	0	2	0	0
40 kHz[2]	-	0	5	2	97	0	3
Big Brown Bat	*Eptesicus fuscus*	0	5	2	1	0	2
Silver-haired Bat	*Lasionycteris noctivagans*	0	2	1	3	0	1
Hoary Bat	*Lasiurus cinereus*	0	0	0	4	0	0
30 kHz[3]	-	0	4	3	4	0	3
Low Frequency[4]	-	1	25	17	69	1	8

[1]Myotis spp. grouping includes: Little Brown Myotis, Eastern Small-footed Myotis (*Myotis leibii*) and Northern Myotis (*Myotis septentrionalis*).
[2]40 kHz grouping includes: Eastern Red Bat (*Lasiurus borealis*), Little Brown Myotis, Eastern Small-footed Myotis, Northern Myotis and Tri-colored Bat.
[3]30 kHz grouping includes: Big Brown Bat and Silver-haired Bat.
[4]Low Frequency grouping includes: Hoary Bat, Big Brown Bat and Silver-haired Bat.
[5]Total number of analyzed monitoring nights = 10

3.2.3 Cultural Meadow (CUM)

Monitoring stations BAT-005, BAT-009, BAT-010 and BAT-014 were located within the north Cultural Meadow (CUM) community in the west portion of the study area. Monitoring station BAT-005 did not record any bat pass sequences during the monitoring period due to equipment error. Bat pass sequences classified to Little Brown Myotis, Tri-colored Bat, Eastern Red Bat, Hoary Bat, Silver-haired Bat, Big Brown Bat, as well as the Myotis, 40kHz, and Low Frequency species groupings, were recorded at all other monitoring stations in this vegetation community.

Bat activity in this community was relatively consistent between the 22:00 and 01:00 monitoring hours, and was first recorded at 21:21hrs. Table 8 provides a summary of the timing of bat pass sequence recordings in this community. Call sequences classified to Little Brown Myotis, Silver-haired Bat, Big Brown Bat, and the 40kHz and Low Frequency species groupings were detected on most of the 10 analyzed monitoring nights within the first hour after sunset (Table 8). Tri-colored Bat and Eastern Red Bat were detected on very few of the 10 analyzed monitoring nights within the first hour after sunset.

Table 7. Summary of timing and consistency of recorded bat call sequences during the monitoring period (CUM)

Species or Species Grouping		Number of Call Sequences per Time Period after Sunset				Number of Monitoring Nights with Recorded Call Sequences per Time Period after Sunset[4]	
Common Name	Scientific Name	0 – 30 min	31 – 60 min	61 – 100 min	>100 min	0 – 30 min	31 – 60 min
Little Brown Myotis	*Myotis lucifugus*	0	26	109	630	0	7
Myotis spp.[1]	*Myotis* spp.	0	2	9	71	0	2
Tri-colored Bat	*Perimyotis subflavus*	1	2	1	30	1	1
Eastern Red Bat	*Lasiurus borealis*	5	12	7	55	1	3
40 kHz[2]	-	0	51	109	927	0	10
Big Brown Bat	*Eptesicus fuscus*	9	225	57	125	4	10
Silver-haired Bat	*Lasionycteris noctivagans*	10	48	18	91	3	8
Hoary Bat	*Lasiurus cinereus*	0	8	3	22	0	5
Low Frequency[3]	-	11	107	56	299	5	10

[1]Myotis spp. grouping includes: Little Brown Myotis, Eastern Small-footed Myotis (*Myotis leibii*) and Northern Myotis (*Myotis septentrionalis*).
[2]40 kHz grouping includes: Eastern Red Bat, Little Brown Myotis, Eastern Small-footed Myotis, Northern Myotis and Tri-colored Bat.
[3]Low Frequency grouping includes: Hoary Bat, Big Brown Bat and Silver-haired Bat.
[4]Total number of analyzed monitoring nights = 10

3.2.4 North Fresh - Moist Poplar Deciduous Forest/Coniferous Plantation (FOD8-1/CUP3)

Monitoring stations BAT-002, BAT-003, BAT-004, BAT-006, BAT-007, BAT-008, BAT-011, BAT-012, BAT-013, BAT-015 and BAT-016 were located within the north Fresh - Moist Poplar Deciduous Forest/Coniferous Plantation (FOD8-1/CUP3) community in the west portion of the study area. Bat pass sequences classified to Little Brown Myotis, and Tri-colored Bat, as well as the Myotis species and 40kHz species groupings, were recorded at these monitoring stations.

Bat activity in this community peaked in the 22:00 monitoring hour and gradually declined throughout the evening. Bat activity began at 21:13hrs. Table 9 provides a summary of the timing of bat pass sequence recordings in this community. Call sequences classified to Little Brown Myotis, Eastern Red Bat, Silver-haired Bat, Hoary Bat, Big Brown Bat, and the 40 kHz and Low Frequency species groupings were detected on most of the 10 analyzed monitoring nights within the first hour after sunset (Table 9). Tri-colored Bat was only detected on four of the 10 analyzed monitoring nights within the first hour after sunset.

Table 8. Summary of timing and consistency of recorded bat call sequences during the monitoring period (North FOD8-1/CUP3)

Species or Species Grouping		Number of Call Sequences per Time Period after Sunset				Number of Monitoring Nights with Recorded Call Sequences per Time Period after Sunset[5]	
Common Name	**Scientific Name**	**0 – 30 min**	**31 – 60 min**	**61 – 100 min**	**>100 min**	**0 – 30 min**	**31 – 60 min**
Little Brown Myotis	*Myotis lucifugus*	41	152	265	1208	8	10
Myotis spp.[1]	*Myotis* spp.	4	12	30	213	4	6
Tri-colored Bat	*Perimyotis subflavus*	2	4	5	14	1	3
Eastern Red Bat	*Lasiurus borealis*	11	26	29	125	6	9
40 kHz[2]	-	49	241	459	2325	9	10
Big Brown Bat	*Eptesicus fuscus*	103	626	205	410	10	10
Silver-haired Bat	*Lasionycteris noctivagans*	17	85	57	348	9	10
Hoary Bat	*Lasiurus cinereus*	4	49	16	81	4	9
30 kHz[3]	-	1	0	1	4	1	0
Low Frequency[4]	-	70	497	324	984	10	10

[1]Myotis spp. grouping includes: Little Brown Myotis, Eastern Small-footed Myotis (*Myotis leibii*) and Northern Myotis (*Myotis septentrionalis*).
[2]40 kHz grouping includes: Eastern Red Bat, Little Brown Myotis, Eastern Small-footed Myotis, Northern Myotis and Tri-colored Bat.
[3]30 kHz grouping includes: Big Brown Bat and Silver-haired Bat.
[4]Low Frequency grouping includes: Hoary Bat, Big Brown Bat and Silver-haired Bat.
[5]Total number of analyzed monitoring nights = 10

3.2.5 South Fresh - Moist Poplar Deciduous Forest/Coniferous Plantation (FOD8-1/CUP3)

Monitoring station BAT-017 was located within the south Fresh - Moist Poplar Deciduous Forest/Coniferous Plantation (FOD8-1/CUP3) community in the west portion of the study area. Bat pass sequences classified to Little Brown Myotis, and Tri-colored Bat, as well as the Myotis species and 40kHz species groupings, were recorded at this monitoring station.

Bat activity in this community peaked in the 22:00 monitoring hour and gradually declined throughout the evening. Bat activity began at 21:19hrs. Table 10 provides a summary of the timing of bat pass sequence recordings in this community. Call sequences classified to Big Brown Bat, and the 40 kHz and Low Frequency species groupings were detected on most of the 10 analyzed monitoring nights within the first hour after sunset (Table 10). Tri-colored Bat, Silver-haired Bat and Hoary Bat were detected on very few of the 10 analyzed monitoring nights within the first hour after sunset.

Table 9. Summary of timing and consistency of recorded bat call sequences within the monitoring period (South FOD8-1/CUP3)

Species or Species Grouping		Number of Call Sequences per Time Period after Sunset				Number of Monitoring Nights with Recorded Call Sequences per Time Period after Sunset[4]	
Common Name	Scientific Name	0 – 30 min	31 – 60 min	61 – 100 min	>100 min	0 – 30 min	31 – 60 min
Little Brown Myotis	*Myotis lucifugus*	0	13	30	68	0	4
Myotis spp.[1]	*Myotis* spp.	0	4	11	19	0	4
Tri-colored Bat	*Perimyotis subflavus*	0	1	1	0	0	1
Eastern Red Bat	*Lasiurus borealis*	0	4	8	23	0	4
40 kHz[2]	-	0	14	48	169	0	8
Big Brown Bat	*Eptesicus fuscus*	1	117	208	743	1	7
Silver-haired Bat	*Lasionycteris noctivagans*	1	8	9	30	1	3
Hoary Bat	*Lasiurus cinereus*	0	2	2	10	0	2
Low Frequency[3]	-	2	41	51	225	2	9

[1]Myotis spp. grouping includes: Little Brown Myotis, Eastern Small-footed Myotis (*Myotis leibii*) and Northern Myotis (*Myotis septentrionalis*).
[2]40 kHz grouping includes: Eastern Red Bat, Little Brown Myotis, Eastern Small-footed Myotis, Northern Myotis and Tri-colored Bat.
[3]Low Frequency grouping includes: Hoary Bat, Big Brown Bat and Silver-haired Bat.
[4]Total number of analyzed monitoring nights = 10

4.0 Discussion

Six bat species were documented as present during passive acoustic monitoring conducted within the study area. Five of these species, Eastern Red Bat, Hoary Bat, Little Brown Myotis, Silver-haired Bat, and Tri-colored Bat, are listed as SAR in Ontario (O. Reg. 230/08), and are discussed further in the following sections.

4.1 Little Brown Myotis

Little Brown Myotis was detected in all monitored vegetation communities during the monitoring period. Summer habitats used by this species include roosting habitat for maternity colonies and day roosts, as well as foraging habitats and travel corridors/flyways. Little Brown Myotis primarily use buildings and other anthropogenic structures to roost, but will also roost in natural roost sites such as rock crevices, tree cavities and crevices, and exfoliating tree bark (ECCC 2018, Humphrey and Fotherby 2019). Maternity colonies are large and consist mainly of females and pups, while males roost individually or in small groups (ECCC 2018). They most often forage in open habitats and within forests (ECCC 2018). Wetlands and waterbodies are also important foraging habitats for Little Brown Myotis (ECCC 2018, MNRF 2017).

Several bat pass sequences classified as Little Brown Myotis were recorded fairly early in the evening, within one hour after sunset (i.e., between 21:13hrs and 22:13hrs), in all monitored

vegetation communities (Table 11). Bat pass sequences recorded before 22:13hrs are considered an indication of the presence of roosting habitat based on the results of studies suggesting that the majority of emergence from a roost by bats occurs within the first hour after sunset (e.g., Fidiam and Ludica 2011). Due to the timing of recorded bat pass sequences, there is therefore potential that Little Brown Myotis is using habitats in all treed communities within the study area for roosting.

The consistency of recorded bat pass sequences throughout a monitoring period can further suggest whether the habitat is being used for maternity colony roosting or male/day roosting. It can be expected to detect bat pass sequences within one hour after sunset on close to all monitored evenings with suitable weather conditions within the vicinity of a maternity colony roost. The number of evenings during which bat pass sequences classified to Little Brown Myotis were recorded within one hour after sunset ranged from one to nine of the 10 analyzed evenings in each of the monitored vegetation communities (Table 11). Within those communities with a high number of evenings during which the species was detected within one hour after sunset, the data suggests the potential for Little Brown Myotis to be using these vegetation communities, or if detected within an open habitat (e.g., meadow), the adjacent treed vegetation communities, for maternity colony roosting. Where there is a lack of consistent recordings within one hour after sunset throughout the monitoring period, the data suggests the potential for this species to be using these communities for male/day roosting.

Given maternity colonies formed by this species are known to consist of a large number of females and their pups, the number of recorded bat pass sequences within one hour of sunset could also potentially suggest the importance of a habitat feature, such as the presence of a maternity colony roost in the vicinity of a monitoring station. Relatively low numbers of sequences identified to the species were recorded at approximately half of the stations (Table 3), suggesting the lack of a maternity colony roost, but the potential presence of male/day roost sites in the vicinity of these stations. A higher number of bat pass sequences identified to Little Brown Myotis were recorded at the remainder of the monitoring stations within one hour of sunset (Table 3). The higher number of recordings suggest the potential presence of a maternity colony roost in the vicinity of each of these stations. However, it is important to note that the number of bat pass sequences recorded does not accurately reflect the number of individuals present as each individual may be recorded several times throughout the monitoring period.

The acoustic results further support the potential for this species to be using open meadow communities and wetlands, including Mineral Swamp Thicket (SWT2) communities, for foraging, as well as forest edge habitats and the existing trail system as travel corridors/flyways between habitat features.

Table 10. Total number of recorded bat pass sequences, and monitoring nights with recorded call sequences identified to high frequency maternity colony-forming bat species within one hour after sunset during the monitoring period.

Vegetation Community	Monitoring Station	Number of Bat Pass Sequences Recorded				Number of Monitoring Nights with Recorded Call Sequences[1]			
		Little Brown Myotis	Myotis spp.[2]	Tri-colored Bat	40 kHz[3]	Little Brown Myotis	Myotis spp.[2]	Tri-colored Bat	40 kHz[3]
SWT2 (#2)	BAT-001	2	0	0	5	2	0	0	3
North FOD8-1/CUP3	BAT-002	5	1	0	5	4	1	0	4
	BAT-003	0	0	0	2	0	0	0	2
	BAT-004	12	2	0	47	4	2	0	10
	BAT-006	16	0	0	15	5	0	0	8
	BAT-007	59	0	2	74	7	0	1	10
	BAT-008	32	4	0	60	7	3	0	10
	BAT-011	22	1	0	22	8	1	0	8
	BAT-012	27	0	0	18	8	0	0	5
	BAT-013	6	2	0	17	2	1	0	5
	BAT-015	10	2	4	15	6	3	3	8
	BAT-016	1	3	0	15	1	3	0	7
South FOD8-1/CUP3	BAT-017	12	3	1	14	1	3	0	7
CUM	BAT-009	6	1	2	23	5	1	1	7
	BAT-010	16	0	1	19	6	1	1	8
	BAT-014	3	0	0	9	2	0	0	4
CUM1 (#2)	BAT-018	17	5	3	18	7	5	1	6
CUM1 (#3)	BAT-021	58	9	3	48	9	5	2	7
	BAT-022	44	7	1	25	8	4	1	7
	BAT-023	13	2	0	24	3	2	0	8
FOD5-2 (#1)	BAT-025	2	1	0	6	1	1	0	2
	BAT-026	11	17	0	16	6	9	0	7

[1]Total number of analyzed monitoring nights = 10
[2]Myotis spp. grouping includes: Little Brown Myotis, Eastern Small-footed Myotis (*Myotis leibii*) and Northern Myotis (*Myotis septentrionalis*).
[3]40 kHz grouping includes: Eastern Red Bat, Little Brown Myotis, Eastern Small-footed Myotis, Northern Myotis and Tri-colored Bat.

4.2 Tri-colored Bat

Tri-colored Bat was detected in all monitored vegetation communities, with the exception of the Dry - Fresh Sugar Maple - Beech Deciduous Forest (FOD5-2) (#1) communities. Summer habitats used by this species include roosting habitat for maternity colonies and day roosts, as well as foraging habitats and travel corridors/flyways (ECCC 2018). Less information is available on the characteristics of the preferred roosting habitats of Tri-colored Bat, but studies completed in eastern Canada and in the United States suggest a preference by the species for dead/dying foliage and lichens in forested habitats (ECCC 2018). Females roost individually or in small maternity colonies, while males roost individually (ECCC 2018). They most often forage in forested riparian areas, over water and in relatively open areas (ECCC 2018).

A small number of bat pass sequences classified as Tri-colored Bat were recorded within one hour after sunset (i.e., between 21:13hrs and 22:13hrs), in the following vegetation communities: CUM1 (#3), CUM1 (#2), CUM, north Fresh - Moist Poplar Deciduous Forest/Coniferous Plantation (FOD8-1/CUP3), and south Fresh - Moist Poplar Deciduous Forest/Coniferous Plantation (FOD8-1/CUP3) (Table 11). The number of evenings during which bat pass sequences classified to Tri-colored Bat were recorded within one hour after sunset ranged from one to three of the 10 monitored evenings in each of these vegetation communities. Due to the lack of consistent recordings throughout the monitoring period, as well as the timing and relatively low number of recorded bat pass sequences, the data suggests the potential that this species is using habitats within these treed communities, or treed communities that are immediately adjacent to the monitored meadow communities, as roosting habitat for male/day roosting, but does not indicate maternity colony roosting. Note, due to the general lack of information available on the timing of emergence for this species, bat pass sequences recorded within one hour of sunset are considered a potential indication of roosting habitat based on the results of Little Brown Myotis studies (e.g., Fidiam and Ludica 2011).

This species is also likely using open meadow communities, wetlands, and forest edge habitats for foraging, as well as the existing trail system as travel corridors/flyways between habitat features.

4.3 Silver-haired Bat

Silver-haired Bat was detected in all monitored vegetation communities during the monitoring period. Summer habitats used by this species include roosting habitat for maternity colonies and day roosts, as well as foraging habitats and travel corridors/flyways. Silver-haired Bat roosts under bark and in the cavities of large diameter coniferous and deciduous trees (COSEWIC 2023). Maternity roosts consist of small groups of individuals and occur in tree cavities or under bark. Frequent roost switching is common for this species, including for maternity roosts. Silver-haired Bats forage in forests, forest openings and along forest edges (COSEWIC 2023).

Several bat pass sequences classified as Silver-haired Bat were recorded within one hour after sunset in all monitored treed vegetation communities (Table 12). The number of evenings during which bat pass sequences classified to the species were recorded within one hour after sunset ranged from one to nine of the 10 monitored evenings in each of these vegetation communities (Table 12). Within those communities with a high number of evenings during which the species was detected within one hour after sunset, the data suggests the potential for Silver-haired Bat to be using these vegetation communities, or if detected within an open habitat (e.g., meadow), the adjacent treed vegetation communities, for maternity colony roosting. Where there is a lack of consistent recordings within one hour after sunset throughout the

monitoring period, the data suggests the potential for this species to be using these communities for male/day roosting. Note, due to the general lack of information available on the timing of emergence for this species, bat pass sequences recorded within one hour of sunset are considered a potential indication of roosting habitat based on the results of Little Brown Myotis studies (e.g., Fidiam and Ludica 2011).

This species is also likely using open meadow communities, wetlands, and forest edge habitats for foraging, as well as the existing trail system as travel corridors/flyways between habitat features.

4.4 Eastern Red Bat

Eastern Red Bat was detected in all monitored vegetation communities during the monitoring period, with the exception of the SWT2 and FOD5-2 (#1) communities. Eastern Red Bat roosts in the foliage of trees, including in the upper foliage of typically large-diameter, super-canopy trees in deciduous and coniferous forests of any age (COSEWIC 2023). The species typically roosts alone with its pups, and tends to switch roosts (i.e., trees) frequently during the maternity period. This species forages in both forested and non-forested habitats, in open and semi-cluttered habitats, and above and below forest canopies (COSEWIC 2023).

A small number of bat pass sequences classified as Eastern Red Bat were recorded within one hour after sunset (i.e., between 21:13hrs and 22:13hrs) in all vegetation communities within which the species was detected (Table 13). The number of evenings during which bat pass sequences classified to Eastern Red Bat were recorded within one hour after sunset ranged from zero to five of the 10 monitored evenings in each of these vegetation communities (Table 13). Due to the lack of consistent recordings throughout the monitoring period, as well as the timing and relatively low number of recorded bat pass sequences, the data suggests the potential that this species is using habitats within these treed communities, or treed communities that are immediately adjacent to the monitored meadow communities, as roosting habitat for male/day roosting, but does not indicate maternity colony roosting. Note, due to the general lack of information available on the timing of emergence for this species, bat pass sequences recorded within one hour of sunset are considered a potential indication of roosting habitat based on the results of Little Brown Myotis studies (e.g., Fidiam and Ludica 2011).

This species is also likely using open meadow communities, wetlands, and forest edge habitats for foraging, as well as the existing trail system as travel corridors/flyways between habitat features.

4.5 Hoary Bat

Hoary Bat was detected in all monitored vegetation communities during the monitoring period, with the exception of the SWT2 community. Similar to Eastern Red Bats, Hoary Bats roost in the foliage of trees, including in the upper foliage of typically large-diameter, super-canopy trees in deciduous and coniferous forests of any age (COSEWIC 2023). The species typically roosts alone with their pups. There is little information available on roost switching for Hoary Bats, but the species typically uses several trees during the maternity period. Hoary Bats forage in open habitats including wetlands, grasslands and open fields interspersed with trees (COSEWIC 2023).

Table 11. Total number of recorded bat pass sequences, and monitoring nights with recorded call sequences identified to low frequency maternity colony-forming bat species within one hour after sunset during the monitoring period.

Vegetation Community	Monitoring Station	Number of Bat Pass Sequences Recorded				Number of Monitoring Nights with Recorded Call Sequences[1]			
		Silver-haired Bat	Big Brown Bat	30 kHz[2]	Low Frequency[3]	Silver-haired Bat	Big Brown Bat	30 kHz[2]	Low Frequency[3]
SWT2 (#2)	BAT-001	2	5	4	26	1	2	3	8
North FOD8-1/CUP3	BAT-002	13	163	0	112	7	10	0	10
	BAT-003	0	1	0	6	0	1	0	3
	BAT-004	13	171	1	107	8	10	1	10
	BAT-006	11	175	0	91	7	10	0	10
	BAT-007	9	22	0	33	5	7	0	9
	BAT-008	9	14	0	21	5	3	0	7
	BAT-011	13	77	0	90	6	9	0	10
	BAT-012	14	35	0	21	6	6	0	8
	BAT-013	6	21	0	18	4	7	0	8
	BAT-015	13	43	0	51	9	8	0	9
	BAT-016	1	7	0	17	1	4	0	7
South FOD8-1/CUP3	BAT-017	9	118	0	43	3	7	0	10
CUM	BAT-009	39	142	0	77	7	10	0	9
	BAT-010	18	48	0	30	7	10	0	10
	BAT-014	1	44	0	11	1	5	0	5
CUM1 (#2)	BAT-018	9	115	0	84	5	10	0	10
CUM1 (#3)	BAT-021	7	338	0	162	6	10	0	10
	BAT-022	15	177	0	47	8	9	0	9
	BAT-023	15	168	0	49	7	9	0	10
FOD5-2 (#1)	BAT-025	1	2	0	3	1	1	0	1
	BAT-026	37	105	0	222	6	10	0	8

[1]Total number of analyzed monitoring nights = 10
[2]30 kHz grouping includes: Big Brown Bat and Silver-haired Bat.
[3]Low Frequency grouping includes: Hoary Bat, Big Brown Bat and Silver-haired Bat.

Table 12. Total number of recorded bat pass sequences, and monitoring nights with recorded call sequences identified to solitary roosting bat species within one hour of sunset during the monitoring period.

Vegetation Community	Monitoring Station	Number of Bat Pass Sequences Recorded				Number of Monitoring Nights with Recorded Call Sequences[1]			
		Eastern Red Bat	40 kHz[2]	Hoary Bat	Low Frequency[3]	Eastern Red Bat	40 kHz[2]	Hoary Bat	Low Frequency[3]
SWT2 (#2)	BAT-001	0	5	0	26	0	3	0	8
North FOD8-1/CUP3	BAT-002	5	5	23	112	1	4	5	10
	BAT-003	0	2	0	6	0	2	0	3
	BAT-004	12	47	2	107	4	10	2	10
	BAT-006	3	15	12	91	3	8	5	10
	BAT-007	4	74	2	33	3	10	1	9
	BAT-008	7	60	1	21	3	10	1	7
	BAT-011	2	22	8	90	2	8	3	10
	BAT-012	1	18	3	21	1	5	2	8
	BAT-013	1	17	1	18	1	5	1	8
	BAT-015	2	15	0	51	2	8	0	9
	BAT-016	0	15	1	17	0	7	1	7
South FOD8-1/CUP3	BAT-017	4	14	2	43	4	7	2	10
CUM	BAT-009	15	23	5	77	2	7	3	9
	BAT-010	2	19	2	30	1	8	2	10
	BAT-014	0	9	1	11	0	4	1	5
CUM1 (#2)	BAT-018	10	18	9	84	5	6	4	10
CUM1 (#3)	BAT-021	5	48	6	162	3	7	4	10
	BAT-022	5	25	4	47	2	7	4	9
	BAT-023	5	24	2	49	2	8	2	10
FOD5-2 (#1)	BAT-025	0	6	0	3	0	2	0	1
	BAT-026	0	16	4	222	0	7	1	8

[1]Total number of analyzed monitoring nights = 10
[3]40 kHz grouping includes: Eastern Red Bat, Little Brown Myotis, Eastern Small-footed Myotis, Northern Myotis and Tri-colored Bat.
[3]Low Frequency grouping includes: Hoary Bat, Big Brown Bat and Silver-haired Bat.

A small number of bat pass sequences classified as Hoary Bat were recorded within one hour after sunset (i.e., between 21:13hrs and 22:13hrs) in all vegetation communities within which the species was detected (Table 13). The number of evenings during which bat pass sequences classified to Hoary Bat were recorded within one hour after sunset ranged from zero to five of the 10 monitored evenings in each of these vegetation communities (Table 13). Due to the lack of consistent recordings throughout the monitoring period, as well as the timing and relatively low number of recorded bat pass sequences, the data suggests the potential that this species is using habitats within these treed communities, or treed communities that are immediately adjacent to the monitored meadow communities, as roosting habitat for male/day roosting, but does not indicate maternity colony roosting. Note, due to the general lack of information available on the timing of emergence for this species, bat pass sequences recorded within one hour of sunset are considered a potential indication of roosting habitat based on the results of Little Brown Myotis studies (e.g., Fidiam and Ludica 2011).

This species is also likely using open meadow communities, wetlands, and forest edge habitats for foraging, as well as the existing trail system as travel corridors/flyways between habitat features.

5.0 Summary and Conclusions

The results of passive acoustic monitoring indicate that all treed communities within the study area have the potential to provide roosting habitat, including maternity colony roosting habitat for the SAR, Little Brown Myotis and Silver-haired Bat. The results further indicate that treed communities within the study area have the potential to provide male/day roosting for the SAR, Tri-colored Bat, Eastern Red Bat, and Hoary Bat. Note, due to the lack of acoustic monitoring stations within the northeast treed vegetation communities, it is possible that all detected SAR within the study area may be using the treed vegetation communities in the northeast portion of the study area for maternity colony roosting.

All open meadow and wetland communities provide foraging habitat for bat SAR. The trail network and all forest edges within the study area also have the potential to provide travel corridors/flyways for bat SAR.

Due to the presence of bat SAR within the study area, the impacts of the proposed development on bat SAR must be considered during detailed design. Little Brown Myotis and Tri-colored Bat are listed as Endangered both provincially and federally, and receive general habitat protection under the ESA (O. Reg. 230/08, Government of Canada 2025). Eastern Red Bat, Hoary Bat, and Silver-haired Bat are also listed as Endangered provincially, and receive general habitat protection under the ESA (O. Reg. 230/08). Under the ESA, habitat for animal species is defined as a dwelling place, such as a den, nest, or similar place, occupied or habitually occupied by one or more members of a species for the purposes of breeding, rearing, staging, wintering, or hibernating, and the area immediately surrounding a dwelling place that is essential for the purposes mentioned. For bat SAR, this includes hibernating/overwintering, swarming, maternity roosting, and migratory stopover habitats. No hibernating or swarming habitat for Little Brown Myotis or Tri-colored Bat (e.g., cave, crevice, mine, tunnel, etc.) is present in the subject property, and no migratory stopover or overwintering habitat for Eastern Red Bat, Hoary Bat or Silver-haired Bat is present. Based on the results of the current study, maternity roosting habitats for Little Brown Myotis and Silver-haired Bat likely occur within the study area, and maternity roosting habitats for Tri-colored Bat, Eastern Red Bat, and Hoary Bat may also occur in the study area. Natural maternity roost sites (e.g., tree) occupied for breeding and rearing pups, and the area up to 1000m with suitable habitat is protected under the ESA.

The ESA prohibits killing, harming, or capturing SAR and protects their habitats from damage and destruction. A permit or authorization under the ESA may be required for proposed developments or site alterations with the potential to result in negative impacts to SAR and their habitats. Note, Bill 5, the *Protect Ontario by Unleashing our Economy Act,* 2025 makes immediate amendments to the ESA and will later repeal the ESA and enact the new *Species Conservation Act,* 2025 (SCA). It is recommended that the MECP be consulted to discuss the potential need for any further field surveys or permitting that may be required to ensure the proposed development is in compliance with the ESA.

To minimize impacts to bat SAR and associated habitats as a result of the proposed development, the following mitigation measures are recommended. Confirmation of these recommendations is subject to MECP review.

- All removals of trees and shrub >1 m in height must occur outside of the bat active period (April 1 – November 30) to avoid direct impacts to bats;
- All maternity roosting habitats are recommended to be retained, where possible. A buffer of at least 10m should be applied to maternity roosting habitats to protect the form and function of the habitat;
- Restrict all construction activities to daylight hours, when possible. Any artificial lighting used for construction purposes should be turned off or directed away from adjacent natural features following the completion of daily construction activities;
- The limit of all construction activities should be clearly delineated to avoid unnecessary encroachment into natural features and habitats;
- To promote the continued use of the natural area by bats as potential maternity, roosting and foraging habitat and movement corridors, the following is recommended for any new treed edges created as a result of vegetation removal (JNCC 2001, Vermont Fish and Wildlife 2014):
    - Avoid the use of artificial lighting in locations that would cause light wash effects on the new woodland edge;
        - Eliminate the use of decorative lighting;
        - Use covered bulbs that light facing downward. Ensure that the cone of light does not extend beyond the development footprint to adjacent natural areas;
        - Use “warm” or filtered LEDs (CCT < 3,000 K; S/P ratio < 1.2) to minimize blue emission;
        - Use motion sensors and timers to minimize unnecessary lighting; and
        - Use International Dark-sky Association (IDA) approved fixtures.
    - Promote vegetation structural diversity along the new woodland edge. A variety of vegetation types from trees to shrubs to herbaceous vegetation promotes greater insect diversity and cover for bats; and
    - Avoid the use of pesticides, or other products that adversely impact insect populations.

6.0 References

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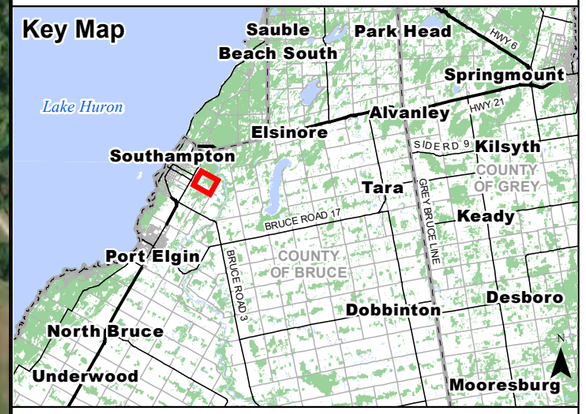
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Maps

Map 1

Southampton Landfill NEA

Monitoring Stations and Vegetation Communities



Legend

- Study Area (Boundary Approximate)
- Bat Passive Acoustic Monitoring Stations (BAT)
- Ecological Land Classification (ELC)
- (CUM) Cultural Meadow
- (CUM1) Mineral Cultural Meadow Ecosite
- (CUP3) Coniferous Plantations
- (FOD) Deciduous Forest
- (FOD3-2) Dry - Fresh White Birch Deciduous Forest Type
- (FOD5-2) Dry - Fresh Sugar Maple - Beech Deciduous Forest Type
- (FOD6-3) Fresh - Moist Sugar Maple - Yellow Birch Deciduous Forest Type
- (FOD8-1) Fresh - Moist Poplar Deciduous Forest Type
- (MAM2) Mineral Meadow Marsh Ecosite
- (SWD3-1) Red Maple Mineral Deciduous Swamp Type
- (SWD4) Mineral Deciduous Swamp Ecosite
- (SWT2) Mineral Thicket Swamp Ecosite

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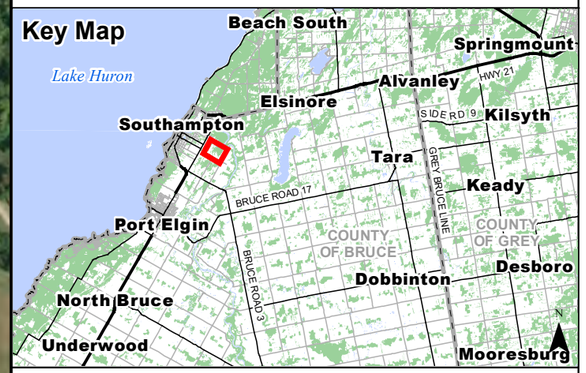
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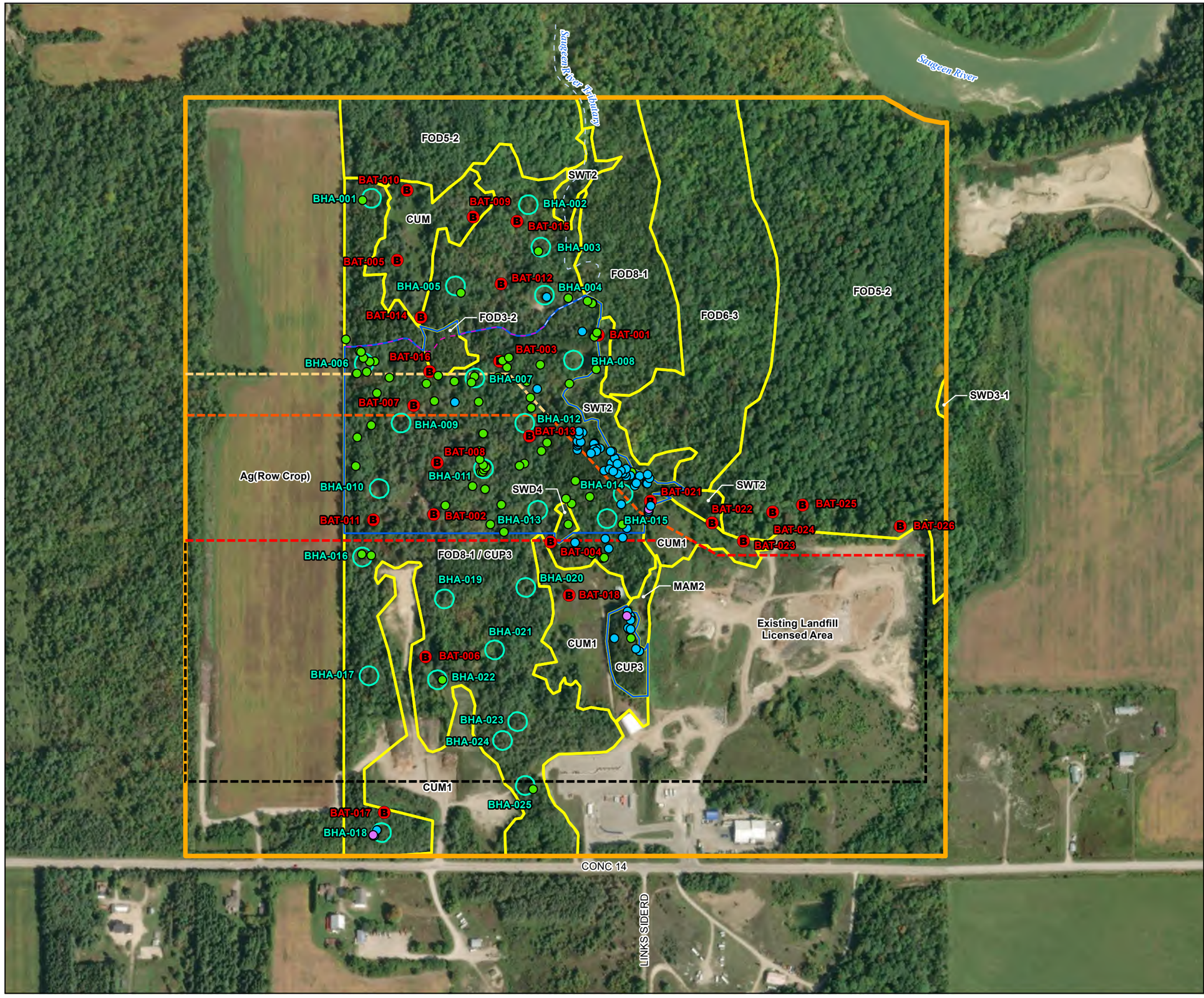
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Map 2

Southampton Landfill NEA

Bat Habitat Assessment Analysis





Legend

- Study Area (Boundary
- North Landfill Expansion Limit - Option 1
- North Landfill Expansion Limit - Option 2
- North Landfill Expansion Limit - Option 3
- Other Future Landfill Limits
- Bat Habitat Assessment Search Area
- Bat Habitat Assessment Plot (BHA)
- Bat Passive Acoustic Monitoring Station (BAT)
- Candidate Little Brown Myotis, Northern Myotis and Silver-haired Bat Roost Tree
- Candidate Little Brown Myotis, Northern Myotis, Silver-haired Bat and Tri-colored Bat Roost Tree
- Candidate Tri-colored Bat Roost Tree
- Ephemeral Drainage Features
- Ephemeral Watercourse
- Ecological Land Classification (ELC)

N

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Project: 2559 Date: December 30, 2025	NAD83 - UTM Zone 17 Size: 11x17" **1:5,000**

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Appendix I
Location and Set-up Details of Bat Acoustic Monitoring Stations

Acoustic Monitoring Station	Location UTM Zone: 17T		Microphone Height (m)	Microphone Direction	Habitat Type	Clutter[1]
	Easting	Northing				
BAT-001	473539	4925979	5.2	73	Woodland clearing near candidate roost tree	MED/HIGH
BAT-002	473228	4925876	5.2	340	Woodland clearing	MED/HIGH
BAT-003	473406	4926013	5.2	77	Woodland near candidate roost trees	HIGH
BAT-004	473347	4925768	5.2	77	ATV trail in cultural plantation	LOW/MED
BAT-005	473351	4926198	5.2	105	Woodland/meadow edge	LOW/MED
BAT-006	473125	4925714	5.2	70	Woodland clearing	MED
BAT-007	473276	4926017	5.2	190	Woodland clearing	LOW/MED
BAT-008	473266	4925935	5.2	267	Woodland clearing	MED
BAT-009	473468	4926199	5.2	249	Woodland/meadow edge	LOW
BAT-010	473409	4926274	5.2	142	Woodland/meadow edge	LOW
BAT-011	473154	4925910	5.2	110	Woodland clearing	MED
BAT-012	473458	4926102	5.2	77	Woodland clearing	LOW/MED
BAT-013	473392	4925905	5.2	71	ATV trail in woodland clearing	LOW/MED
BAT-014	473342	4926116	5.2	64	Woodland/meadow edge	LOW/MED
BAT-015	473517	4926166	5.2	244	Woodland/meadow edge	LOW/MED
BAT-016	473317	4926046	5.2	159	ATV trail in woodland clearing	MED/HIGH
BAT-017	472975	4925559	5.2	95	Woodland/meadow edge	EDGE
BAT-018	473334	4925693	5.2	185	Woodland/meadow edge	EDGE
BAT-021	473491	4925750	5.2	130	Woodland/meadow edge	EDGE
BAT-022	473549	4925684	5.2	178	Woodland/meadow edge	EDGE
BAT-023	473574	4925642	5.2	210	Woodland/meadow edge	EDGE
BAT-024	473627	4925657	5.2	254	Woodland near candidate roost trees	HIGH
BAT-025	473667	4925646	5.2	234	Woodland near candidate roost trees	HIGH
BAT-026	473768	4925557	5.2	352	Woodland clearing near candidate roost trees	HIGH

[1]NO = stadium sized open meadow without vegetation or topography interfering with the airspace; LOW = large fields or other open areas bordered by hedgerows or tree lines; EDGE = significant vegetation, topography, or anthropogenic structures bordering a NO or LOW clutter open area; MED = large area with widely spaced trees and other topographic or anthropogenic structures; HIGH = understory travel corridors either along tree covered roads or within a forested clearing

Appendix II
Weather Conditions

Monitoring Night	Survey Start (hrs)	Survey End (hrs)	Survey Start		Survey End		Weather Conditions[1]
			Temperature (°C)[1]	Wind Speed (km/hr)[1]	Temperature (°C)[1]	Wind Speed (km/hr)[1]	
17-Jun-21	21:00	2:00	15.8	6	20.0	23	
18-Jun-21	21:00	2:00	17.8	4	13.7	4	
19-Jun-21	21:00	2:00	14.2	5	10.7	5	
20-Jun-21	21:00	2:00	15.8	5	17.7	5	
21-Jun-21	21:00	2:00	10.3	19	8.8	4	
22-Jun-21	21:00	2:00	8.8	4	9.4	9	
23-Jun-21	21:00	2:00	20.0	28	18.7	25	
24-Jun-21	21:00	2:00	21.5	14	21.0	14	
25-Jun-21	21:00	2:00	20.2	16	17.1	4	Moderate Rain
26-Jun-21	21:00	2:00	23.0	17	23.7	32	
27-Jun-21	21:00	2:00	20.4	12	17.7	7	Light Rain
28-Jun-21	21:00	2:00	17.6	2	17.4	7	
29-Jun-21	21:00	2:00	21.4	10	19.8	12	
30-Jun-21	21:00	2:00	16.9	5	15.3	2	
1-Jul-21	21:00	2:00	14.5	11	14.1	9	
2-Jul-21	21:00	2:00	16.1	3	14.2	6	
3-Jul-21	21:00	2:00	14.8	8	13.1	8	
4-Jul-21	21:00	2:00	19.4	8	21.1	23	
5-Jul-21	21:00	2:00	22.8	17	19.1	10	
6-Jul-21	21:00	2:00	20.5	6	16.7	16	

[1]Government of Canada 2021

Shading indicates monitoring dates included in data analysis

Appendix III
Acoustic Monitoring Results

Bat ID Software Program Used	Software Version	Type of Data Analyzed (FS or ZC)	Acoustic Monitoring Station	Species or Species Grouping Classification	No. of Bat Pass Sequences	Maximum Likelihood Estimate (p-value)[1]
SonoBat	4.2.2 North Northeast	Full Spectrum	BAT-001	30kHz	11	-
				40kHz	104	-
				Big Brown Bat	8	0.04
				Hoary Bat	4	0.20
				Little Brown Myotis	67	0
				Low Frequency	112	-
				Myotis spp.	28	-
				Silver-haired Bat	6	0.23
				Tri-colored Bat	2	0.77
SonoBat	4.2.2 North Northeast	Full Spectrum	BAT-002	40kHz	235	-
				Big Brown Bat	257	0
				Eastern Red Bat	31	0
				Hoary Bat	43	0
				Little Brown Myotis	118	0
				Low Frequency	259	-
				Myotis spp.	39	-
				Silver-haired Bat	61	0
				Tri-colored Bat	1	0.96
SonoBat	4.2.2 North Northeast	Full Spectrum	BAT-003	40kHz	61	-
				Big Brown Bat	1	0.63
				Little Brown Myotis	8	0.05
				Low Frequency	52	-
				Myotis spp.	21	-
SonoBat	4.2.2 North Northeast	Full Spectrum	BAT-004	30kHz	1	-
				40kHz	498	-
				Big Brown Bat	302	0
				Eastern Red Bat	45	0
				Hoary Bat	17	0.26
				Little Brown Myotis	130	0
				Low Frequency	332	-
				Myotis spp.	19	-
				Silver-haired Bat	88	0
				Tri-colored Bat	1	0.96
SonoBat	4.2.2 North Northeast	Full Spectrum	BAT-006	30kHz	5	-
				40kHz	204	-
				Big Brown Bat	252	0
				Eastern Red Bat	18	0
				Hoary Bat	36	0
				Little Brown Myotis	84	0
				Low Frequency	242	-
				Myotis spp.	2	-
				Silver-haired Bat	61	0
				Tri-colored Bat	1	0.96
SonoBat	4.2.2 North Northeast	Full Spectrum	BAT-007	40kHz	377	-
				Big Brown Bat	54	0
				Eastern Red Bat	18	0.17
				Hoary Bat	9	0.15
				Little Brown Myotis	360	0
				Low Frequency	104	-
				Myotis spp.	6	-
				Silver-haired Bat	44	0
				Tri-colored Bat	5	1
SonoBat	4.2.2 North Northeast	Full Spectrum	BAT-008	40kHz	247	-
				Big Brown Bat	36	0
				Eastern Red Bat	26	0
				Hoary Bat	8	0.16
				Little Brown Myotis	150	0
				Low Frequency	100	-
				Myotis spp.	15	-
				Silver-haired Bat	43	0
				Tri-colored Bat	1	0.96

Bat ID Software Program Used	Software Version	Type of Data Analyzed (FS or ZC)	Acoustic Monitoring Station	Species or Species Grouping Classification	No. of Bat Pass Sequences	Maximum Likelihood Estimate (p-value)[1]
SonoBat	4.2.2 North Northeast	Full Spectrum	BAT-009	40kHz	456	-
				Big Brown Bat	232	0
				Eastern Red Bat	51	0
				Hoary Bat	15	0.25
				Little Brown Myotis	193	0
				Low Frequency	248	-
				Myotis spp.	17	-
				Silver-haired Bat	86	0
				Tri-colored Bat	5	0.82
SonoBat	4.2.2 North Northeast	Full Spectrum	BAT-010	40kHz	423	-
				Big Brown Bat	108	0
				Eastern Red Bat	15	0.67
				Hoary Bat	16	0.03
				Little Brown Myotis	429	0
				Low Frequency	189	-
				Myotis spp.	42	-
				Silver-haired Bat	65	0
				Tri-colored Bat	25	0
SonoBat	4.2.2 North Northeast	Full Spectrum	BAT-011	40kHz	295	-
				Big Brown Bat	176	0
				Eastern Red Bat	10	0.42
				Hoary Bat	13	0.21
				Little Brown Myotis	218	0
				Low Frequency	235	-
				Myotis spp.	5	-
				Silver-haired Bat	56	0
				Tri-colored Bat	1	0.96
SonoBat	4.2.2 North Northeast	Full Spectrum	BAT-012	40kHz	385	-
				Big Brown Bat	93	0
				Eastern Red Bat	23	0.01
				Hoary Bat	10	0.26
				Little Brown Myotis	255	0
				Low Frequency	140	-
				Myotis spp.	5	-
				Silver-haired Bat	73	0
				Tri-colored Bat	3	0.99
SonoBat	4.2.2 North Northeast	Full Spectrum	BAT-013	40kHz	287	-
				Big Brown Bat	52	0
				Eastern Red Bat	3	0.98
				Hoary Bat	2	0.99
				Little Brown Myotis	191	0
				Low Frequency	105	-
				Myotis spp.	42	-
				Silver-haired Bat	31	0
SonoBat	4.2.2 North Northeast	Full Spectrum	BAT-014	40kHz	208	-
				Big Brown Bat	76	0
				Eastern Red Bat	13	0.07
				Hoary Bat	2	1
				Little Brown Myotis	143	0
				Low Frequency	36	-
				Myotis spp.	23	-
				Silver-haired Bat	16	0.12
				Tri-colored Bat	4	0.70
SonoBat	4.2.2 North Northeast	Full Spectrum	BAT-015	40kHz	209	-
				Big Brown Bat	93	0
				Eastern Red Bat	17	0.01
				Hoary Bat	8	0.36
				Little Brown Myotis	101	0
				Low Frequency	207	-
				Myotis spp.	54	-
				Silver-haired Bat	46	0
				Tri-colored Bat	8	0.13

Bat ID Software Program Used	Software Version	Type of Data Analyzed (FS or ZC)	Acoustic Monitoring Station	Species or Species Grouping Classification	No. of Bat Pass Sequences	Maximum Likelihood Estimate (p-value)[1]
SonoBat	4.2.2 North Northeast	Full Spectrum	BAT-016	40kHz	276	-
				Big Brown Bat	28	0
				Hoary Bat	4	0.34
				Little Brown Myotis	51	0
				Low Frequency	99	-
				Myotis spp.	51	-
				Silver-haired Bat	4	0.74
				Tri-colored Bat	4	0.29
SonoBat	4.2.2 North Northeast	Full Spectrum	BAT-017	40kHz	231	-
				Big Brown Bat	1069	0
				Eastern Red Bat	35	0
				Hoary Bat	14	1
				Little Brown Myotis	111	0
				Low Frequency	319	-
				Myotis spp.	34	-
				Silver-haired Bat	48	1
				Tri-colored Bat	2	1
SonoBat	4.2.2 North Northeast	Full Spectrum	BAT-018	40kHz	205	-
				Big Brown Bat	264	0
				Eastern Red Bat	46	0
				Hoary Bat	29	0
				Little Brown Myotis	108	0
				Low Frequency	328	-
				Myotis spp.	25	-
				Silver-haired Bat	61	0
				Tri-colored Bat	3	0.93
SonoBat	4.2.2 North Northeast	Full Spectrum	BAT-021	40kHz	319	-
				Big Brown Bat	659	0
				Eastern Red Bat	14	0.51
				Hoary Bat	39	0.02
				Little Brown Myotis	389	0
				Low Frequency	465	-
				Myotis spp.	51	-
				Silver-haired Bat	100	0
				Tri-colored Bat	4	0.99
SonoBat	4.2.2 North Northeast	Full Spectrum	BAT-022	40kHz	277	-
				Big Brown Bat	1170	0
				Eastern Red Bat	23	0
				Hoary Bat	26	1
				Little Brown Myotis	208	0
				Low Frequency	508	-
				Myotis spp.	45	-
				Silver-haired Bat	101	0.06
				Tri-colored Bat	1	0.96

Bat ID Software Program Used	Software Version	Type of Data Analyzed (FS or ZC)	Acoustic Monitoring Station	Species or Species Grouping Classification	No. of Bat Pass Sequences	Maximum Likelihood Estimate (*p* -value)[1]
SonoBat	4.2.2 North Northeast	Full Spectrum	BAT-023	40kHz	275	-
				Big Brown Bat	927	0
				Eastern Red Bat	29	0
				Hoary Bat	13	1
				Little Brown Myotis	198	0
				Low Frequency	499	-
				Myotis spp.	27	-
				Silver-haired Bat	111	0
				Tri-colored Bat	2	1
SonoBat	4.2.2 North Northeast	Full Spectrum	BAT-025	40kHz	20	-
				Big Brown Bat	2	0.50
				Hoary Bat	1	0.71
				Little Brown Myotis	7	0.07
				Low Frequency	16	-
				Myotis spp.	6	-
				Silver-haired Bat	3	0.41
SonoBat	4.2.2 North Northeast	Full Spectrum	BAT-026	40kHz	86	-
				Big Brown Bat	123	0
				Hoary Bat	7	0.65
				Little Brown Myotis	82	0
				Low Frequency	495	-
				Myotis spp.	56	-
				Silver-haired Bat	56	0

[1]Calculated by SonoBat 4.2.2 Auto-classifier

Appendix VIII
Plant Species Inventoried within the Study Area

Plant Species Reported from the Study Area - Southampton Landfill (Project #2559)

Scientific Name	Common Name	SON Culturally Significant Species	CC	SRANK	SARO	COSEWIC	SARA	SARA Schedule	Bruce County South	NRSI Observed	FOD5-2	CUP3	FOD8-1	FOD6-3	FOD3-2	SWD3-1	CUM	SWD4
		SON 2026	Oldham et al. 1995	MNRF 2023a	MECP 2023	Government of Canada 2023	Government of Canada 2023	Government of Canada 2023	OSFN 2010	NRSI Results From 2021 - 2023								
Pteridophytes	**Ferns & Allies**																	
Dennstaedtiaceae	**Bracken Fern Family**																	
Pteridium aquilinum ssp. latiusculum	Eastern Bracken Fern	FM	2	S5					X	X			X					
Dryopteridaceae	**Wood Fern Family**																	
Athyrium filix-femina	Common Lady Fern	M	4	S5						X						X		
Dryopteris carthusiana	Spinulose Wood Fern		5	S5					X	X						X		
Homalosorus pycnocarpos	Narrow-leaved Glade Fern		10	S4					R	X			X					
Matteuccia struthiopteris	Ostrich Fern		5	S5						X						X		
Onoclea sensibilis	Sensitive Fern	M	4	S5					X	X						X		
Equisetaceae	**Horsetail Family**																	
Equisetum arvense	Field Horsetail	M	0	S5					X	X			X		X	X		
Equisetum hyemale	Common Scouring-rush	M	2	S5						X			X					
Equisetum scirpoides	Dwarf Scouring-rush		7	S5					X	X						X		
Equisetum variegatum	Variegated Horsetail		5	S5						X								
Osmundaceae	**Royal Fern Family**																	
Osmunda regalis	Royal Fern		7	S5						X						X		
Osmundastrum cinnamomeum	Cinnamon Fern		7	S5					X	X						X		
Pteridaceae	**Maidenhair Fern Family**																	
Adiantum pedatum	Northern Maidenhair Fern	MP	7	S5					X	X	X							
Thelypteridaceae	**Beech Fern Family**																	
Thelypteris palustris	Marsh Fern		5	S5						X						X		
Gymnosperms	**Conifers**																	
Cupressaceae	**Cypress Family**																	
Juniperus communis	Common Juniper	CFMP	4	S5					X	X			X					
Thuja occidentalis	Eastern White Cedar		4	S5					X	X			X	X		X		
Pinaceae	**Pine Family**																	
Picea glauca	White Spruce	FMP	6	S5					X	X		X						
Pinus banksiana	Jack Pine		5	S5						X		X						
Pinus resinosa	Red Pine	MP	8	S5					X	X		X						
Pinus strobus	Eastern White Pine	FMP	4	S5					X	x								
Pinus sylvestris	Scots Pine		0	SE5						X		X						
Tsuga canadensis	Eastern Hemlock	MP	7	S5					X	X				X		X		
Dicotyledons	**Dicots**																	
Aceraceae	**Maple Family**																	
Acer negundo	Manitoba Maple		0	S5					X	X								
Acer rubrum	Red Maple	MP	4	S5					X	X			X			X		
Acer saccharum	Sugar Maple	FP	4	S5					X	X	X			X	X	X		
Anacardiaceae	**Sumac or Cashew Family**																	
Rhus typhina	Staghorn Sumac	FMP	1	S5					X	X								
Toxicodendron radicans	Poison Ivy		2	S5						X		X			X			
Toxicodendron radicans var. rydbergii	Western Poison Ivy		2	S5						X								
Apiaceae	**Carrot or Parsley Family**																	
Daucus carota	Wild Carrot		0	SE5						X								
Aquifoliaceae	**Holly Family**																	
Ilex verticillata	Common Winterberry		5	S5					X	X						X		
Araliaceae	**Ginseng Family**																	
Aralia nudicaulis	Wild Sarsaparilla	MP	4	S5					X	X	X							
Asclepiadaceae	**Milkweed Family**																	
Asclepias syriaca	Common Milkweed	FM	0	S5					X	X								
Asclepias verticillata	Whorled Milkweed		6	S4						X								
Asteraceae	**Composite or Aster Family**																	
Achillea millefolium	Common Yarrow	CMP	0	SE5?					X	X								
Ageratina altissima	Common White Snakeroot	M?	5	S5					X	X				X				
Centaurea stoebe	Spotted Knapweed		0	SE5						X								
Eurybia macrophylla	Large-leaved Aster	FM	5	S5					X	X								
Euthamia graminifolia	Grass-leaved Goldenrod	M	2	S5					X	X								
Nabalus albus	White Rattlesnakeroot	M	6	S5					X	X								
Rudbeckia hirta	Black-eyed Susan	P	0	S5					X	X		X						
Solidago altissima	Tall Goldenrod	M	1	S5						X			X					
Solidago caesia	Blue-stemmed Goldenrod	M	5	S5					R	X	X							
Solidago canadensis	Canada Goldenrod	M	1	S5					X	X								
Solidago flexicaulis	Zigzag Goldenrod	M	6	S5					X	X								
Solidago gigantea	Giant Goldenrod	M	4	S5					X	X								
Solidago juncea	Early Goldenrod	M	3	S5					R	X								
Solidago nemoralis	Gray-stemmed Goldenrod	M	2	S5						X								
Symphyotrichum lateriflorum	Calico Aster		3	S5						X			X			X		
Symphyotrichum novae-angliae	New England Aster	MP	2	S5					X	X								
Symphyotrichum pilosum	Old Field Aster		0	S5						X								
Symphyotrichum puniceum	Swamp Aster	P	6	S5						X						X		
Taraxacum officinale	Common Dandelion		0	SE5						X					X			
Tussilago farfara	Colt's-foot		0	SE5						X						X		
Balsaminaceae	**Touch-me-not Family**																	
Impatiens capensis	Spotted Jewelweed	M	4	S5					X	X						X		
Berberidaceae	**Barberry Family**																	
Berberis thunbergii	Japanese Barberry		0	SE5						X								

Caulophyllum thalictroides	Blue Cohosh	M	5	S5					X	X								
Betulaceae	**Birch Family**																	
Betula alleghaniensis	Yellow Birch	FP	6	S5					X	X				X		X		
Betula papyrifera	Paper Birch	MP	2	S5					X	X		X	X		X	X	X	
Ostrya virginiana	Eastern Hop-hornbeam	MP	4	S5					X	X	X	X						
Boraginaceae	**Borage Family**																	
Symphytum officinale	Common Comfrey		0	SE5						X								
Brassicaceae	**Mustard Family**																	
Cardamine diphylla	Two-leaved Toothwort	F	7	S5					X	X	X							
Nasturtium officinale	Watercress		0	SE						X						X		
Campanulaceae	**Bellflower Family**																	
Lobelia inflata	Indian-tobacco		3	S5					X	X	X							
Caprifoliaceae	**Honeysuckle Family**																	
Diervilla lonicera	Northern Bush-honeysuckle	M	5	S5					X	X	X							
Lonicera tatarica	Tatarian Honeysuckle		0	SE5						X								
Viburnum lentago	Nannyberry	FM	4	S5					X	X								
Viburnum opulus	Cranberry Viburnum		5	S5						X								
Caryophyllaceae	**Pink Family**																	
Dianthus armeria	Deptford Pink		0	SE5						X								
Silene vulgaris	Bladder Campion		0	SE5						X								
Clusiaceae	**St. John's-wort Family**																	
Hypericum perforatum	Common St. John's-wort		0	SE5						X								
Cornaceae	**Dogwood Family**																	
Cornus alternifolia	Alternate-leaved Dogwood	MP	6	S5					X	X			X		X			
Cornus obliqua	Pale Dogwood	MP?	2	S5					X	X								
Cornus rugosa	Round-leaved Dogwood	MP?	6	S5					X	X		X						
Cornus sericea	Red-osier Dogwood	MP	2	S5					X	X	X					X		
Elaeagnaceae	**Oleaster Family**																	
Shepherdia canadensis	Soapberry	FMP	7	S5					X	X								
Fabaceae	**Pea Family**																	
Trifolium pratense	Red Clover		0	SE5						X								
Fagaceae	**Beech Family**																	
Fagus grandifolia	American Beech	FMP	6	S4					X	X	X	X	X					
Gentianaceae	**Gentian Family**																	
Centaurium erythraea	Common Centaury		0	SE3						X								
Grossulariaceae	**Currant Family**																	
Ribes americanum	Wild Black Currant	F	4	S5					X	X								
Ribes cynosbati	Prickly Gooseberry	FM	4	S5					X	X					X			
Juglandaceae	**Walnut Family**																	
Juglans nigra	Black Walnut		5	S4?					X	X	X							
Lamiaceae	**Mint Family**																	
Clinopodium vulgare	Field Basil		4	S5					X	X	X							
Leonurus cardiaca	Common Motherwort		0	SE5						X								
Lycopus americanus	American Water-horehound		4	S5					X	X								
Lycopus uniflorus	Northern Water-horehound		5	S5					X	X						X		
Prunella vulgaris	Self-heal	M	0	S5						X		X	X			X		
Scutellaria lateriflora	Mad Dog Skullcap		5	S5					X	X						X		
Monotropaceae	**Indian Pipe Family**																	
Hypopitys monotropa	Pinesap		6	S4						X								
Monotropa uniflora	Indian-pipe	M	6	S5					X	X								
Oleaceae	**Olive Family**																	
Fraxinus americana	White Ash	FMP	4	S4					X	X	X	X	X					
Fraxinus nigra	Black Ash	FMP	7	S4	END	T	NS	No schedule	X	X								
Fraxinus pennsylvanica	Green Ash	FMP	3	S4					X	X			X			X		
Onagraceae	**Evening-primrose Family**																	
Circaea canadensis	Broad-leaved Enchanter's Nightshade		2	S5					X	X						X		
Epilobium parviflorum	Small-flowered Willowherb		0	SE4						X								
Ludwigia palustris	Marsh Seedbox		5	S5					X	X						X		
Oenothera biennis	Common Evening-primrose		0	S5					X	X								
Orobanchaceae	**Broom-rape Family**																	
Epifagus virginiana	Beechdrops		6	S5					X	X								
Plantaginaceae	**Plantain Family**																	
Plantago lanceolata	English Plantain		0	SE5						X								
Polygonaceae	**Smartweed Family**																	
Rumex acetosella	Sheep Sorrel		0	SE5						X								
Pyrolaceae	**Wintergreen Family**																	
Pyrola asarifolia	Pink Pyrola		7	S5					X	X								
Pyrola elliptica	Shinleaf		5	S5					X	X					X			
Ranunculaceae	**Buttercup Family**																	
Anemone cylindrica	Long-headed Anemone	M	7	S4					X	X							X	
Anemone virginiana	Tall Anemone	M?	4	S5						X								
Ranunculus acris	Tall Buttercup		0	SE5						X								
Rhamnaceae	**Buckthorn Family**																	
Rhamnus cathartica	Common Buckthorn		0	SE5						X								
Rosaceae	**Rose Family**																	
Agrimonia gryposepala	Hooked Agrimony	M	2	S5					X	X								
Amelanchier arborea	Downy Serviceberry	FMP	5	S5					R	X	X	X	X		X			
Fragaria virginiana	Wild Strawberry	FM	2	S5						X					X		X	
Malus pumila	Common Apple		0	SE4						X			X					
Potentilla anserina	Silverweed		5	S5						X			X					
Potentilla recta	Sulphur Cinquefoil		0	SE5						X								
Prunus pensylvanica	Pin Cherry	FM	3	S5						X								

Prunus serotina	Black Cherry	FM	3	S5						X	X		X					
Prunus virginiana	Choke Cherry	FM	2	S5						X		X			X			
Rosa multiflora	Multiflora Rose		0	SE5						X								
Rubus allegheniensis	Allegheny Blackberry	FM	2	S5						X	X				X			
Rubus idaeus	Common Red Raspberry	FM	2	S5						X		X	X		X		X	
Rubus occidentalis	Black Raspberry	FM	2	S5					R	X								
Rubus pubescens	Dewberry	FM	4	S5						X			X					
Sorbus aucuparia	European Mountain-ash		0	SE4						X		X						
Rubiaceae	**Madder Family**																	
Mitchella repens	Partridge-berry		6	S5					X	X			X					X
Salicaceae	**Willow Family**																	
Populus balsamifera	Balsam Poplar	M	4	S5					X	X			X					
Populus grandidentata	Large-toothed Aspen	FM	5	S5					X	X			X					
Populus tremuloides	Trembling Aspen	MP	2	S5					X	X		X	X					
Salix discolor	Pussy Willow	CMP	3	S5					X	X								
Salix eriocephala	Heart-leaved Willow	CMP	4	S5					X	X								
Salix interior	Sandbar Willow	CMP	1	S5					X	X								
Salix purpurea	Purple Willow		0	SE4						X								
Saxifragaceae	**Saxifrage Family**																	
Tiarella cordifolia	Heart-leaved Foam-flower		6	S5					X	X			X					
Scrophulariaceae	**Figwort Family**																	
Verbascum thapsus ssp. thapsus	Common Mullein		0	SE5						X		X						
Veronica anagallis-aquatica	Water Speedwell		0	SE						X						X		
Veronica officinalis	Common Speedwell		0	SE5						X								
Thymelaeaceae	**Mezereum Family**																	
Daphne mezereum	February Daphne		0	SE2						X		X				X		
Ulmaceae	**Elm Family**																	
Ulmus americana	American Elm	M	3	S5					X	X			X			X		
Urticaceae	**Nettle Family**																	
Boehmeria cylindrica	False Nettle		4	S5					X	X						X		
Laportea canadensis	Wood Nettle	MP	6	S5					X	X						X		
Violaceae	**Violet Family**																	
Viola cucullata	Marsh Blue Violet		5	S5					X	X								
Viola labradorica	Labrador Violet	M	3	S5					X	X								X
Viola pubescens var. pubescens	Downy Yellow Violet	M	5	S5						X								
Viola rostrata	Long-spurred Violet		6	S5					X	X	X							
Vitaceae	**Grape Family**																	
Parthenocissus vitacea	Thicket Creeper	F	4	S5						X								
Vitis riparia	Riverbank Grape	FMP	0	S5					X	X								
Monocotyledons	**Monocots**																	
Araceae	**Arum Family**																	
Arisaema triphyllum	Jack-in-the-pulpit	M	5	S5					X	X						X		
Cyperaceae	**Sedge Family**																	
Carex albursina	White Bear Sedge		7	S5					R	X				X				
Carex arctata	Drooping Woodland Sedge		5	S5					X	X								
Carex communis	Fibrous-root Sedge		6	S5					X	X	X							
Carex eburnea	Bristle-leaved Sedge		6	S5					X	X								
Carex lupulina	Hop Sedge		6	S5					X	X						X		
Carex pedunculata	Long-stalked Sedge		5	S5					X	X				X				
Carex prasina	Drooping Sedge		10	S4					X	X						X		
Carex vulpinoidea	Fox Sedge		3	S5					X	x								
Scirpus cyperinus	Cottongrass Bulrush	P	4	S5					X	X						X		
Juncaceae	**Rush Family**																	
Juncus nodosus	Knotted Rush		5	S5					X	X								
Juncus tenuis	Path Rush		0	S5					X	X								
Juncus torreyi	Torrey's Rush		3	S5						X								
Liliaceae	**Lily Family**																	
Allium tricoccum	Wild Leek	FM	7	S4					X	X								
Erythronium americanum	Yellow Trout-lily		5	S5						X								
Maianthemum canadense	Wild Lily-of-the-valley	M	5	S5					X	X		X						
Maianthemum racemosum	Large False Solomon's Seal	FM	4	S5					X	X								
Polygonatum pubescens	Hairy Solomon's Seal		5	S5					X	X	X							
Trillium grandiflorum	White Trillium	M	5	S5					X	X		X						
Uvularia grandiflora	Large-flowered Bellwort	M	6	S5					X	X								
Uvularia sessilifolia	Sessile-leaved Bellwort		7	S4						X			X					
Orchidaceae	**Orchid Family**																	
Cypripedium parviflorum	Yellow Lady's-slipper	M	5	S5						X								
Epipactis helleborine	Eastern Helleborine		0	SE5						X						X		
Poaceae	**Grass Family**																	
Agrostis gigantea	Redtop		0	SE5						X								
Dactylis glomerata	Orchard Grass		0	SE5						X	X				X			
Glyceria striata	Fowl Mannagrass		3	S5					X	X						X		
Oryzopsis asperifolia	White-grained Mountain-ricegrass		6	S5					X	X	X							
Phalaris arundinacea	Reed Canary Grass		0	S5					X	X								
Phragmites australis ssp. australis	European Reed		0	SE5						X							X	
Poa compressa	Canada Bluegrass		0	SE5					X	X								
Sporobolus cryptandrus	Sand Dropseed		2	S4						X								
TOTAL										**173**	**21**	**21**	**29**	**7**	**14**	**39**	**5**	**2**

SON Species Code Legend

C - Ceremonial

F - Food

M - Medicine
P - Other Products and Uses (e.g., Tools, Building Materials, Artistic, etc.)

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Appendix IX
Bird Species Reported from the Study Area and Vicinity

Bird Species Reported from the Study Area - Southampton Landfill (Project #2559)

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	OBBA*	NRSI Observed: Highest Level of Breeding Evidence	Forest	Landfill	Cultural Meadow	River	Undefined/Study Area-wide	Other Observations
		MNRF 2023a	MECP 2023	Government of Canada 2023	Government of Canada 2023	Government of Canada 2023	BSC et al. 2006	NRSI Results from 2021 - 2023						
Anatidae	**Ducks, Geese & Swans**													
Anas platyrhynchos	Mallard	S5					PR							
Branta canadensis	Canada Goose	S5					CO	**X**						
Mergus serrator	Red-breasted Merganser	S5					PR							
Spatula discors	Blue-winged Teal	S3B, S4M					CO							
Phasianidae	**Partridges, Grouse & Turkeys**													
Bonasa umbellus	Ruffed Grouse	S5					PR	**CO**	PO				PO	CO
Meleagris gallopavo	Wild Turkey	S5					CO	**PO**						PO
Columbidae	**Pigeons & Doves**													
Columba livia	Rock Pigeon	SNA					PR	**PO**						PO
Zenaida macroura	Mourning Dove	S5					CO	**PR**		PO			PO	
Cuculiformes	**Cuckoos & Anis**													
Coccyzus americanus	Yellow-billed Cuckoo	S4B						**PO**	PO					
Apodidae	**Swifts**													
Chaetura pelagica	Chimney Swift	S3B	THR	T	T	Schedule 1	PR							
Trochilidae	**Hummingbirds**													
Archilochus colubris	Ruby-throated Hummingbird	S5B					CO	**PO**					PO	
Rallidae	**Rails, Gallinules & Coots**													
Porzana carolina	Sora	S5B					PO							
Rallus limicola	Virginia Rail	S4S5B					PR							
Gruidae	**Cranes**													
Antigone canadensis	Sandhill Crane	S5B, S3N		NAR	NS	No schedule	CO							X
Charadriidae	**Plovers & Lapwings**													
Charadrius vociferus	Killdeer	S4B					CO	**PO**						PO
Scolopacidae	**Sandpipers & Allies**													
Actitis macularia	Spotted Sandpiper	S5B					PR							
Bartramia longicauda	Upland Sandpiper	S2B					PO							
Gallinago delicata	Wilson's Snipe	S5B					PR							
Scolopax minor	American Woodcock	S4B					CO	**X**						X
Laridae	**Gulls, Terns & Skimmers**													
Larus argentatus	Herring Gull	S4B, S5N					0	**X**						X
Larus delawarensis	Ring-billed Gull	S5					0	**PO**				PO		X
Graviidae	**Loons**													
Gavia immer	Common Loon	S5	NAR	NAR	NS	No schedule	CO	**X**						
Ardeidae	**Herons & Bitterns**													
Botaurus lentiginosus	American Bittern	S5B					PO							
Butorides virescens	Green Heron	S4B					PR							
Cathartidae	**Vultures**													
Cathartes aura	Turkey Vulture	S5B, S3N					PR	**PO**					PO	X
Accipitridae	**Hawks, Kites, Eagles & Allies**													
Accipiter striatus	Sharp-shinned Hawk	S5	NAR	NAR	NS	No schedule	PO							
Buteo jamaicensis	Red-tailed Hawk	S5	NAR	NAR	NS	No schedule	CO	**PO**					PO	X
Buteo platypterus	Broad-winged Hawk	S5B						**PO**	PO					
Circus hudsonius	Northern Harrier	S5B, S4N	NAR	NAR	NS	No schedule	PR							
Haliaeetus leucocephalus	Bald Eagle	S4	SC	NAR	NS	No schedule		**0**						X
Strigidae	**Typical Owls**													
Aegolius acadicus	Northern Saw-whet Owl	S5						**X**						X
Bubo virginianus	Great Horned Owl	S4					CO							
Megascops asio	Eastern Screech-Owl	S4	NAR	NAR	NS	No schedule	PR	**X**						X
Alcedinidae	**Kingfishers**													
Megaceryle alcyon	Belted Kingfisher	S5B, S4N					PO	**PO**				PO		X
Picidae	**Woodpeckers**													
Colaptes auratus	Northern Flicker	S5					CO	**PR**	PO				PO	X
Dryobates pubescens	Downy Woodpecker	S5					CO	**PO**					PO	X
Dryobates villosus	Hairy Woodpecker	S5					CO	**PR**	PO				PO	X

Bird Species Reported from the Study Area - Southampton Landfill (Project #2559)

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	OBBA*	NRSI Observed: Highest Level of Breeding Evidence	Forest	Landfill	Cultural Meadow	River	Undefined/Study Area-wide	Other Observations
		MNRF 2023a	MECP 2023	Government of Canada 2023	Government of Canada 2023	Government of Canada 2023	BSC et al. 2006	NRSI Results from 2021 - 2023						
Dryocopus pileatus	Pileated Woodpecker	S5					PR							
Melanerpes carolinus	Red-bellied Woodpecker	S5					PR							
Sphyrapicus varius	Yellow-bellied Sapsucker	S5B, S3N					PR	**X**						X
Falconidae	**Caracaras & Falcons**													
Falco sparverius	American Kestrel	S4					PR							
Tyrannidae	**Tyrant Flycatchers**													
Contopus virens	Eastern Wood-Pewee	S4B	SC	SC	SC	Schedule 1	PR	**PR**	PO				PO	PO
Empidonax alnorum	Alder Flycatcher	S5B					PR							
Empidonax minimus	Least Flycatcher	S5B					PR							
Empidonax traillii	Willow Flycatcher	S4B					PO							
Myiarchus crinitus	Great Crested Flycatcher	S5B					PR	**PR**	PO				PO	
Sayornis phoebe	Eastern Phoebe	S5B					PR							X
Tyrannus tyrannus	Eastern Kingbird	S4B					CO							
Vireonidae	**Vireos**													
Vireo gilvus	Warbling Vireo	S5B					PR	**PR**					PO	PO
Vireo olivaceus	Red-eyed Vireo	S5B					CO	**PR**	PO				PO	PO
Vireo solitarius	Blue-headed Vireo	S5B					PO	**PO**						PO
Corvidae	**Crows & Jays**													
Corvus brachyrhynchos	American Crow	S5					PR	**PR**	PO				PO	X
Corvus corax	Common Raven	S5					PR	**PO**	PO					
Cyanocitta cristata	Blue Jay	S5					CO	**PR**	PO				PO	PO
Alaudidae	**Larks**													
Eremophila alpestris	Horned Lark	S4					PR							
Hirundinidae	**Swallows**													
Hirundo rustica	Barn Swallow	S4B	SC	SC	T	Schedule 1	CO							
Petrochelidon pyrrhonota	Cliff Swallow	S4S5B					CO							
Riparia riparia	Bank Swallow	S4B	THR	T	T	Schedule 1	CO	**CO**				CO		
Stelgidopteryx serripennis	Northern Rough-winged Swallow	S4B					PO							
Tachycineta bicolor	Tree Swallow	S4S5B					CO							
Paridae	**Chickadees & Titmice**													
Poecile atricapillus	Black-capped Chickadee	S5					PO	**PR**	PO				PO	PO
Sittidae	**Nuthatches**													
Sitta canadensis	Red-breasted Nuthatch	S5						**PO**						PO
Sitta carolinensis	White-breasted Nuthatch	S5					PO	**X**						X
Certhiidae	**Creepers**													
Certhia americana	Brown Creeper	S5					PO							X
Troglodytidae	**Wrens**													
Cistothorus palustris	Marsh Wren	S4B, S3N					PR							
Troglodytes aedon	House Wren	S5B					CO	**PR**	PO		PO		PO	PO
Troglodytes hiemalis	Winter Wren	S5B, S4N					PO							X
Regulidae	**Kinglets**													
Regulus satrapa	Golden-crowned Kinglet	S5						**X**						X
Turdidae	**Thrushes**													
Catharus fuscescens	Veery	S5B					PR							
Catharus guttatus	Hermit Thrush	S5B, S4N						**PO**	PO					X
Hylocichla mustelina	Wood Thrush	S4B	SC	T	T	Schedule 1	PO	**PO**						PO
Sialia sialis	Eastern Bluebird	S5B, S4N	NAR	NAR	NS	No schedule	CO							
Turdus migratorius	American Robin	S5					CO	**PR**	PO		PO		PO	PO
Mimidae	**Mockingbirds, Thrashers & Allies**													
Dumetella carolinensis	Gray Catbird	S5B, S3N					PR	**PR**	PO				PR	X
Mimus polyglottos	Northern Mockingbird	S4					PO							
Toxostoma rufum	Brown Thrasher	S4B					CO	**PO**	PO					
Sturnidae	**Starlings**													
Sturnus vulgaris	European Starling	SNA					CO	**CO**			CO			X
Bombycillidae	**Waxwings**													
Bombycilla cedrorum	Cedar Waxwing	S5					PR	**PR**	PO				PO	

Bird Species Reported from the Study Area - Southampton Landfill (Project #2559)

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	OBBA*	NRSI Observed: Highest Level of Breeding Evidence	Forest	Landfill	Cultural Meadow	River	Undefined/Study Area-wide	Other Observations
		MNRF 2023a	MECP 2023	Government of Canada 2023	Government of Canada 2023	Government of Canada 2023	BSC et al. 2006	NRSI Results from 2021 - 2023						
Passeridae	**Old World Sparrows**													
Passer domesticus	House Sparrow	SNA					CO							
Fringillidae	**Finches & Allies**													
Coccothraustes vespertinus	Evening Grosbeak	S4		SC	SC	Schedule 1	PR							
Haemorhous mexicanus	House Finch	SNA					PO							
Haemorhous purpureus	Purple Finch	S5					PR							
Spinus tristis	American Goldfinch	S5					PR	**PR**			PO		PO	PO
Emberizidae	**New World Sparrows & Allies**													
Ammodramus savannarum	Grasshopper Sparrow	S4B	SC	SC	SC	Schedule 1	PR							
Junco hyemalis	Dark-eyed Junco	S5						**X**						X
Melospiza georgiana	Swamp Sparrow	S5B, S4N					CO							
Melospiza melodia	Song Sparrow	S5					CO	**PR**			PO	PO	PO	PO
Passerculus sandwichensis	Savannah Sparrow	S5B, S3N					CO							
Passerella iliaca	Fox Sparrow	S5B, S3N						**X**						X
Pipilo erythrophthalmus	Eastern Towhee	S4B, S3N					PR	**PO**						PO
Pooecetes gramineus	Vesper Sparrow	S4B					PO							
Spizella pallida	Clay-colored Sparrow	S4B					PO							
Spizella passerina	Chipping Sparrow	S5B, S3N					CO	**PO**						PO
Spizella pusilla	Field Sparrow	S4B, S3N					PR	**X**						X
Zonotrichia albicollis	White-throated Sparrow	S5					PR	**PR**	PO		PO		PO	PO
Icteridae	**Troupials & Allies**													
Agelaius phoeniceus	Red-winged Blackbird	S5					CO	**PR**			PR		PR	PO
Dolichonyx oryzivorus	Bobolink	S4B	THR	T	T	Schedule 1	PR							
Icterus galbula	Baltimore Oriole	S4B					CO							
Molothrus ater	Brown-headed Cowbird	S5					PR							
Quiscalus quiscula	Common Grackle	S5					CO	**PO**						PO
Sturnella magna	Eastern Meadowlark	S4B, S3N	THR	T	T	Schedule 1	CO							
Parulidae	**Wood Warblers**													
Geothlypis philadelphia	Mourning Warbler	S5B					PR	**PR**						PR
Geothlypis trichas	Common Yellowthroat	S5B, S3N					PR	**PR**	PO				PO	
Leiothlypis ruficapilla	Nashville Warbler	S5B					PO	**PO**	PO					
Mniotilta varia	Black-and-white Warbler	S5B					PR	**PR**	PO				PO	
Parkesia noveboracensis	Northern Waterthrush	S5B					PO							
Seiurus aurocapilla	Ovenbird	S5B					PO	**PR**	PO					PO
Setophaga caerulescens	Black-throated Blue Warbler	S5B					PO	**PO**	PO					
Setophaga coronata	Yellow-rumped Warbler	S5B, S4N						**PO**	PO					
Setophaga fusca	Blackburnian Warbler	S5B					PO	**PO**	PO					
Setophaga magnolia	Magnolia Warbler	S5B					PR							
Setophaga pensylvanica	Chestnut-sided Warbler	S5B					PO	**PO**	PO					X
Setophaga petechia	Yellow Warbler	S5B					PR							
Setophaga pinus	Pine Warbler	S5B, S3N					PR	**PR**	PO				PO	
Setophaga ruticilla	American Redstart	S5B					CO	**PR**	PO		PO		PO	PO
Setophaga virens	Black-throated Green Warbler	S5B					PR	**PR**	PO				PO	X
Cardinalidae	**Cardinals, Grosbeaks & Allies**													
Cardinalis cardinalis	Northern Cardinal	S5					CO	**PO**					PO	X
Passerina cyanea	Indigo Bunting	S5B					PO	**PR**	PO		PO	PO	PO	PO
Pheucticus ludovicianus	Rose-breasted Grosbeak	S5B					CO							
Piranga olivacea	Scarlet Tanager	S5B					PR	**X**						X
Total							**106**	**66**	**31**	**1**	**9**	**5**	**30**	**55**

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Appendix X
Herpetofauna Species Reported from the Study Area and Vicinity

Reptile and Amphibian Species Reported from the Study Area - Southampton Landfill (Project #2559)

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	ORAA*	NRSI Observed	Anuran Call Survey	Snake Cover Board Survey	Visual Encounter Survey
		MNRF 2021a	MNRF 2021a	Government of Canada 2021	Government of Canada 2021	Government of Canada 2021	Ontario Nature 2019	NRSI Results from 2021 - 2023			
Turtles											
Chelydra serpentina	Snapping Turtle	S4	SC	SC	SC	Schedule 1	X				
Chrysemys picta marginata	Midland Painted Turtle	S4		SC	SC	Schedule 1	X				
Graptemys geographica	Northern Map Turtle	S3	SC	SC	SC	Schedule 1	X				
Trachemys scripta	Pond Slider	SNA					X				
Snakes											
Diadophis punctatus	Northern Ring-necked Snake	S4					X				
Lampropeltis triangulum	Milksnake	S4	NAR	SC	SC	Schedule 1	X	**X**		**X**	
Nerodia sipedon sipedon	Northern Watersnake	S5	NAR	NAR	NS	No schedule	X				
Sistrurus catenatus pop. 2	Massasauga (Carolinian population)	S1	END	E	E	Schedule 1	X				
Storeria dekayi	Dekay's Brownsnake	S5	NAR	NAR	NS	No schedule	X	**X**		**X**	**X**
Storeria occipitomaculata	Red-bellied Snake	S5					X	**X**		**X**	
Thamnophis sirtalis sirtalis	Eastern Gartersnake	S5					X	**X**		**X**	**X**
Salamanders											
Ambystoma maculatum	Spotted Salamander	S4					X				
Necturus maculosus	Mudpuppy	S4	NAR	NAR	NS	No schedule	X				
Notophthalmus viridescens viridescens	Red-spotted Newt	S5					X				
Plethodon cinereus	Eastern Red-backed Salamander	S5					X				
Frogs and Toads											
Anaxyrus americanus	American Toad	S5					X	**X**	**X**		
Hyla versicolor	Gray Treefrog	S5					X	**X**	**X**		
Pseudacris crucifer	Spring Peeper	S5					X	**X**	**X**		
Lithobates catesbeianus	American Bullfrog	S4					X				
Lithobates clamitans	Green Frog	S5					X	**X**	**X**		
Lithobates pipiens	Northern Leopard Frog	S5	NAR	NAR	NS	No schedule	X	**X**	**X**		
Lithobates sylvaticus	Wood Frog	S5					X	**X**			
Total							**22**	**10**	**5**	**4**	**2**

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Appendix XI
Mammal Species Reported from the Study Area and Vicinity

Mammal Species Reported from the Study Area - Southampton Landfill (Project #2559)

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	Ontario Mammal Atlas	NRSI Observed
		MNRF 2021a	MNRF 2021a	Government of Canada 2021	Government of Canada 2021	Government of Canada 2021	Dobbyn 1994	NRSI Results from 2021 - 2023
Didelphimorphia	**Opossums**							
Didelphis virginiana	Virginia Opossum	S4					X	
Eulipotyphla	**Shrews, Moles, Hedgehogs, and Allies**							
Blarina brevicauda	Northern Short-tailed Shrew	S5					X	
Sorex fumeus	Smoky Shrew	S5					X	
Sorex palustris	Water Shrew	S5					X	
Chiroptera	**Bats**							
Eptesicus fuscus	Big Brown Bat	S4					X	X
Lasionycteris noctivagans	Silver-haired Bat	S4						X
Lasiurus borealis	Eastern Red Bat	S4						X
Lasiurus cinereus	Hoary Bat	S4					X	X
Myotis lucifugus	Little Brown Myotis	S3	END	E	E	Schedule 1	X	X
Perimyotis subflavus	Tri-colored Bat	S3?	END	E	E	Schedule 1		X
Lagomorpha	**Rabbits and Hares**							
Lepus americanus	Snowshoe Hare	S5					X	
Sylvilagus floridanus	Eastern Cottontail	S5					X	X
Rodentia	**Rodents**							
Castor canadensis	Beaver	S5					X	
Erethizon dorsatum	Porcupine	S5					X	X
Marmota monax	Woodchuck	S5					X	
Microtus pennsylvanicus	Meadow Vole	S5					X	X
Myodes gapperi	Southern Red-backed Vole	S5					X	
Napaeozapus insignis	Woodland Jumping Mouse	S5					X	
Ondatra zibethicus	Muskrat	S5					X	
Peromyscus leucopus	White-footed Mouse	S5					X	
Peromyscus maniculatus	Deer Mouse	S5					X	
Sciurus carolinensis	Eastern Gray Squirrel	S5					X	
Tamias striatus	Eastern Chipmunk	S5					X	X
Tamiasciurus hudsonicus	Red Squirrel	S5					X	X
Canidae	**Canines**							
Canis latrans	Coyote	S5					X	X
Vulpes vulpes	Red Fox	S5					X	
Felidae	**Felines**							
Lynx rufus	Bobcat	S4					X	
Mephitidae	**Skunks and Stink Badgers**							
Mephitis mephitis	Striped Skunk	S5					X	X
Mustelidae	**Weasels and Allies**							
Lontra canadensis	North American River Otter	S5					X	
Mustela erminea	Ermine	S5					X	
Neovison vison	American Mink	S4					X	
Procyonidae	**Raccoons and Allies**							
Procyon lotor	Northern Raccoon	S5					X	X
Ursidae	**Bears**							
Ursus americanus	American Black Bear	S5	NAR	NAR	NS	No schedule		X
Artiodactyla	**Deer and Bison**							

Mammal Species Reported from the Study Area - Southampton Landfill (Project #2559)

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	Ontario Mammal Atlas	NRSI Observed
		MNRF 2021a	MNRF 2021a	Government of Canada 2021	Government of Canada 2021	Government of Canada 2021	Dobbyn 1994	NRSI Results from 2021 - 2023
Odocoileus virginianus	White-tailed Deer	S5					X	X
Total							**30**	**16**

References

Dobbyn, J.S. 1994. Atlas of the Mammals of Ontario. Don Mills, Federation of Ontario Naturalists. 120p. Government of Canada. 2021. Species at Risk Public Registry: Species Search. COSEWIC Last Assessment Date: 2021-05-05. Available: https://species-registry.canada.ca/index-en.html#/species?sortBy=commonNameSort&sortDirection=asc&pageSize=10 Dobbyn, J.S. 1994. Atlas of the Mammals of Ontario. Don Mills, Federation of Ontario Naturalists. 120p.

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Appendix XII
Potential Bat Roosting Tree Habitat Inventory Summary

Tree ID	SPECIES		Location UTM Zone: 17T		Plot Reference	ELC Community	DBH[1] (cm)	Height Class[2]	Decay Class[2]	Candidate Little Brown Myotis and Northern Myotis Roost Trees	Candidate Tri-colored Bat Roost Trees
	Common Name	Scientific Name	Easting	Northing						Microhabitat Attributes	Tree Status[4]
RST-004	Trembling Aspen	*Populus tremuloides*	473165	4925488	BHA-025	FOD8-1/CUP3	43.2	2	2	Knothole cavity at 12m above the ground level and loose bark present	N/A
RST-005	Sugar Maple	*Acer saccharum*	472947	4925539	BHA-018	FOD8-1/CUP3	28.0	2	1	N/A	Live
RST-006	Sugar Maple	*Acer saccharum*	472948	4925538	BHA-018	FOD8-1/CUP3	28.5	2	1	N/A	Live
RST-007	Sugar Maple	*Acer saccharum*	472955	4925543	BHA-018	FOD8-1/CUP3	26.2	2	1	N/A	Live
RST-008	Sugar Maple	*Acer saccharum*	472947	4925540	BHA-018	FOD8-1/CUP3	14.5	3	2	Knothole cavity present at 4m above ground level, cracks and crevices present	Live
RST-009	White Ash	*Fraxinus americana*	473130	4925676	BHA-022	FOD8-1/CUP3	24	2	3	Knothole cavity at 3m above the ground level and loose bark present	N/A
RST-010	White Ash	*Fraxinus americana*	473128	4925869	BHA-016	FOD8-1/CUP3	26,28,33,34,36	2	3	Loose bark present between 4 to 6m above ground level	N/A
RST-011	White Ash	*Fraxinus americana*	473117	4925876	BHA-016	FOD8-1/CUP3	36,45	2	3	Cavities present at 4, 6, and 6m above ground level	N/A
RST-012	Trembling Aspen	*Populus tremuloides*	473523	4926116	BHA-003	FOD8-1/CUP3	13.8	3	2	Loose bark present between 0 to 5m above the ground level	N/A
RST-013	Sugar Maple	*Acer saccharum*	473503	4926057	BHA-004	FOD8-1/CUP3	42	1	1	N/A	Live
RST-014	Trembling Aspen	*Populus tremuloides*	473405	4926118	BHA-005	FOD8-1/CUP3	29	2	2	Loose bark present between 0 and 3m above the ground level	N/A
RST-015	Trembling Aspen	*Populus tremuloides*	473350	4926291	BHA-001	FOD8-1/CUP3	26.0	2	2	Cavity present at 12m and loose bark from 0 to 15 m above the ground level	N/A
RST-016	Sugar Maple	*Acer saccharum*	473376	4925750	N/A	FOD8-1/CUP3	31			N/A	Live
RST-017	Sugar Maple	*Acer saccharum*	473413	4925735	N/A	FOD8-1/CUP3	24.8			N/A	Live
RST-018	Sugar Maple	*Acer saccharum*	473435	4925725	N/A	FOD8-1/CUP3	26			N/A	Live
RST-019	Sugar Maple	*Acer saccharum*	473446	4925733	N/A	FOD8-1/CUP3	24.9			N/A	Live
RST-020	Jack Pine	*Pinus banksiana*	473387	4925726	N/A	FOD8-1/CUP3	32	4	5	Knothole cavity at 7m and multiple cavities from 0 to 2m and 6m above the ground level	N/A
RST-021	Black Cherry	*Prunus serotina*	473398	4925714	N/A	FOD8-1/CUP3	41	3	4	Knothole cavity at 4m and other cavity at 3m above the ground level	N/A
RST-022	White Ash	*Fraxinus americana*	473399	4925714	N/A	FOD8-1/CUP3	32	2	4	Knothole cavity present at 4.5m above the ground level	N/A
RST-023	Sugar Maple	*Acer saccharum*	473411	4925721	N/A	FOD8-1/CUP3	32			N/A	Live
RST-024	Sugar Maple	*Acer saccharum*	473481	4925737	N/A	CUM1				N/A	Live
RST-025	Sugar Maple	*Acer saccharum*	473482	4925739	N/A	CUM1	27			N/A	Live
RST-026	Sugar Maple	*Acer saccharum*	473484	4925741	N/A	FOD8-1/CUP3	22	3	2	Knothole cavity at 3m above the ground level	Declining Live
RST-027	Sugar Maple	*Acer saccharum*	473488	4925744	N/A	FOD8-1/CUP3	31+28			N/A	Live
RST-028	Sugar Maple	*Acer saccharum*	473498	4925774	N/A	FOD8-1/CUP3	46			N/A	Live
RST-029	Sugar Maple	*Acer saccharum*	473439	4925858	N/A	FOD8-1/CUP3	37			N/A	Live
RST-030	Sugar Maple	*Acer saccharum*	473442	4925863	N/A	FOD8-1/CUP3	25			N/A	Live
RST-031	Sugar Maple	*Acer saccharum*	473443	4925864	N/A	FOD8-1/CUP3	32			N/A	Live
RST-032	Sugar Maple	*Acer saccharum*	473444	4925866	N/A	FOD8-1/CUP3	30	2	1	Knothole cavity at 3m above the ground level	Live
RST-033	Sugar Maple	*Acer saccharum*	473444	4925868	N/A	FOD8-1/CUP3	44			N/A	Live
RST-034	Sugar Maple	*Acer saccharum*	473448	4925865	N/A	FOD8-1/CUP3	39			N/A	Live
RST-035	Sugar Maple	*Acer saccharum*	473463	4925854	N/A	FOD8-1/CUP3	47			N/A	Live
RST-036	Sugar Maple	*Acer saccharum*	473462	4925854	N/A	FOD8-1/CUP3	25			N/A	Live
RST-037	Sugar Maple	*Acer saccharum*	473467	4925845	N/A	FOD8-1/CUP3	31			N/A	Live
RST-038	Sugar Maple	*Acer saccharum*	473462	4925846	N/A	FOD8-1/CUP3	36			N/A	Live
RST-039	Sugar Maple	*Acer saccharum*	473462	4925846	N/A	FOD8-1/CUP3	42			N/A	Live
RST-040	Sugar Maple	*Acer saccharum*	473458	4925847	N/A	FOD8-1/CUP3	28			N/A	Live
RST-041	Sugar Maple	*Acer saccharum*	473460	4925843	N/A	FOD8-1/CUP3	28			N/A	Live
RST-042	Sugar Maple	*Acer saccharum*	473452	4925845	N/A	FOD8-1/CUP3	52			N/A	Live
RST-043	Sugar Maple	*Acer saccharum*	473456	4925875	N/A	FOD8-1/CUP3	45			N/A	Live
RST-044	Sugar Maple	*Acer saccharum*	473450	4925874	N/A	FOD8-1/CUP3	39			N/A	Live
RST-045	Trembling Aspen	*Populus tremuloides*	473396	4925880	N/A	FOD8-1/CUP3	32	2	5	Knothole cavity at 12m and multiple other cavities at 5, 6 and 8m above the ground level	N/A
RST-046	Trembling Aspen	*Populus tremuloides*	473305	4926034	N/A	FOD8-1/CUP3	34	2	4	Knothole cavity at 5m, a crack and crevice at 4m above ground level	N/A
RST-047	Trembling Aspen	*Populus tremuloides*	473266	4926065	N/A	FOD8-1/CUP3	39	3	5	Knothole cavity at 9m above the ground level	N/A
RST-048	Trembling Aspen	*Populus tremuloides*	473243	4926087	BHA-006	FOD8-1/CUP3	32	2	1	Knothole cavity at 10m and other cavity at 9m above the ground level	N/A

Tree ID	SPECIES		Location UTM Zone: 17T		Plot Reference	ELC Community	DBH[1] (cm)	Height Class[2]	Decay Class[2]	Candidate Little Brown Myotis and Northern Myotis Roost Trees	Candidate Tri-colored Bat Roost Trees
	Common Name	Scientific Name	Easting	Northing						Microhabitat Attributes	Tree Status[4]
RST-049	Trembling Aspen	*Populus tremuloides*	473230	4926092	N/A	FOD8-1/CUP3	72	1	2	Loose bark present at 6m, cracks and crevices found at 6m above the ground level	N/A
RST-050	Trembling Aspen	*Populus tremuloides*	473241	4926055	N/A	FOD8-1/CUP3	19	4	5	Knothole cavity at 7m above the ground level	N/A
RST-051	Scots Pine	*Pinus sylvestris*	473299	4925810	N/A	FOD8-1/CUP3	32	3	5	Knothole cavity at 13m above the ground level	N/A
RST-052	Trembling Aspen	*Populus tremuloides*	473168	4925984	N/A	FOD8-1/CUP3	19	4	5	Knothole at 5m above the ground level and leafcluster present	N/A
RST-053	Trembling Aspen	*Populus tremuloides*	473311	4925895	BHA-011	FOD8-1/CUP3	29	3	4	Crack and crevice at 7m above the ground level	N/A
RST-054	Trembling Aspen	*Populus tremuloides*	473368	4925877	N/A	FOD8-1/CUP3	25	4	5	Knothole cavity at 13m and other cavity at 17m above the ground level	N/A
RST-055	Trembling Aspen	*Populus tremuloides*	473360	4925877	N/A	FOD8-1/CUP3		2	2	Knothole cavity at 4m and loose bark found at 4, 6, 12, and 15 m above the ground level	N/A
RST-056	Trembling Aspen	*Populus tremuloides*	473339	4925938	N/A	FOD8-1/CUP3	38	2	2	Cracks and crevices between 6 to 7m and at 9 m above the ground level	N/A
RST-057	Freeman's Maple	*Acer freemanii*	473326	4925994	N/A	FOD8-1/CUP3	35			N/A	Live
RST-058	Sugar Maple	*Acer saccharum*	473431	4925955	N/A	FOD8-1/CUP3	31			N/A	Live
RST-059	Trembling Aspen	*Populus tremuloides*	473424	4925971	N/A	FOD8-1/CUP3	52	2	1	Knothole cavity at 17m above the ground level	N/A
RST-060	Trembling Aspen	*Populus tremuloides*	473393	4925995	N/A	FOD8-1/CUP3	3	3	5	Other cavities at 10 and 13m; loose bark present between 0 and 16 m above the ground level	N/A
RST-061	Trembling Aspen	*Populus tremuloides*	473366	4926011	BHA-007	FOD8-1/CUP3	23	2	2	Knothole cavity at 8m and multiple other cavities at 4, 6, and 12 m above the ground level	N/A
RST-062	Trembling Aspen	*Populus tremuloides*	473410	4926000	N/A	FOD8-1/CUP3	37	4	5	Knothole cavity at 6m above the ground level	N/A
RST-063	Sugar Maple	*Acer saccharum*	473359	4925613	N/A	CUP3	25			N/A	Live
RST-064	Sugar Maple	*Acer saccharum*	473380	4925581	N/A	CUP3	28			N/A	Live
RST-065	Trembling Aspen	*Populus tremuloides*	473379	4925601	N/A	CUP3	39			Knothole cavity at 8m, other cavity at 7m and presence of crack and crevice between 13 and 14m above ground level	N/A
RST-066	Sugar Maple	*Acer saccharum*	473382	4925614	N/A	CUP3	27,42			N/A	Live
RST-067	Sugar Maple	*Acer saccharum*	473381	4925616	N/A	CUP3	>35+>45			N/A	Live
RST-068	Sugar Maple	*Acer saccharum*	473391	4925626	N/A	CUP3	31			N/A	Live
RST-069	Sugar Maple	*Acer saccharum*	473392	4925626	N/A	CUP3	28			N/A	Live
RST-070	Sugar Maple	*Acer saccharum*	473392	4925628	N/A	CUP3	34			N/A	Live
RST-071	Silver Maple	*Acer saccharinum*	473392	4925635	N/A	CUP3	31			N/A	Live
RST-072	Trembling Aspen	*Populus tremuloides*	473379	4925776	N/A	SWD4	43	2	2	Knothole cavity between 3 and 4m above the ground level	N/A
RST-073	Green Ash	*Fraxinus pennsylvanica*	473443	4925741	N/A	FOD8-1/CUP3	38	2	2	Loose bark present at 5m above the ground level (crack in the bark)	N/A
RST-074	Sugar Maple	*Acer saccharum*	473495	4925786	N/A	FOD8-1/CUP3	38	2	1	N/A	Live
RST-075	Green Ash	*Fraxinus pennsylvanica*	473488	4925796	N/A	FOD8-1/CUP3	37	2	2	Loose bark present which extends the majority of the trunk above ground level	N/A
RST-076	Trembling Aspen	*Populus tremuloides*	473397	4925798	N/A	FOD8-1/CUP3	40	2	2	Crack and crevice between 0 and 6m above ground level	N/A
RST-077	Sugar Maple	*Acer saccharum*	473467	4925813	N/A	FOD8-1/CUP3	34	2	1	N/A	Live
RST-078	Sugar Maple	*Acer saccharum*	473470	4925816	N/A	FOD8-1/CUP3	26	2	1	N/A	Live
RST-079	Sugar Maple	*Acer saccharum*	473470	4925820	N/A	FOD8-1/CUP3	25	2	1	N/A	Live
RST-080	Sugar Maple	*Acer saccharum*	473477	4925823	N/A	FOD8-1/CUP3	38	2	1	N/A	Live
RST-081	Sugar Maple	*Acer saccharum*	473479	4925833	N/A	FOD8-1/CUP3	34	2	1	N/A	Live
RST-082	Trembling Aspen	*Populus tremuloides*	473408	4925886	N/A	FOD8-1/CUP3	35,28	2	2	Knothole cavity at 8m above the ground level	N/A
RST-083	Trembling Aspen	*Populus tremuloides*	473514	4925940	N/A	SWT2	38	3	5	Cracks and cravities throughout the trunk between 0 and 9m above the ground level	N/A
RST-084	Trembling Aspen	*Populus tremuloides*	473533	4925979	N/A	FOD8-1/CUP3	23	3	6	Multiple other cavities at 4 to 5m above the ground level	N/A
RST-085	Green Ash	*Fraxinus pennsylvanica*	473527	4926042	N/A	FOD8-1/CUP3	29	2	3	Loose bark throughout the trunk	N/A
RST-086	Trembling Aspen	*Populus tremuloides*	473259	4926094	N/A	FOD8-1/CUP3	40	2	2	Multiple cracks and crevices between 2 to 6m above ground level	N/A
RST-087	Trembling Aspen	*Populus tremuloides*	473253	4926097	BHA-006	FOD8-1/CUP3				Twisted crack between 2 and 9m above ground level, which is partially split fully through stem	N/A

Tree ID	SPECIES		Location UTM Zone: 17T		Plot Reference	ELC Community	DBH[1] (cm)	Height Class[2]	Decay Class[2]	Candidate Little Brown Myotis and Northern Myotis Roost Trees	Candidate Tri-colored Bat Roost Trees
	Common Name	Scientific Name	Easting	Northing						Microhabitat Attributes	Tree Status[4]
RST-088	Trembling Aspen	*Populus tremuloides*	473189	4926016	N/A	FOD8-1/CUP3	37	2	2	Multiple cracks and crevices between 1 and 7m above ground level on the trunk	N/A
RST-090	Trembling Aspen	*Populus tremuloides*	473316	4925896	BHA-011	FOD8-1/CUP3	23	2	2	Multiple cracks and crevices between 1 and 10m above the ground level on the trunk	N/A
RST-091	Trembling Aspen	*Populus tremuloides*	473320	4925897	BHA-011	FOD8-1/CUP3	30	3	3	Multiple cracks and crevices between 1 and 6m above ground level on the trunk	N/A
RST-092	Trembling Aspen	*Populus tremuloides*	473318	4925901	BHA-011	FOD8-1/CUP3	30	3	6	Multiple cracks and crevices between 1 and 7m above the ground level on the trunk	N/A
RST-093	Trembling Aspen	*Populus tremuloides*	473318	4925910	N/A	FOD8-1/CUP3	27	2	3	Multiple cracks and crevices between 1 and 5m above the ground level on the trunk	N/A
RST-094	Trembling Aspen	*Populus tremuloides*	473323	4925921	N/A	FOD8-1/CUP3	36	2	1	Other cavity at 12m above the ground level	N/A
RST-095	Trembling Aspen	*Populus tremuloides*	473303	4926009	N/A	FOD8-1/CUP3	28	2	2	Cavities at 6, 8, and 12m above ground level and loose bark present	N/A
RST-096	Austrian Pine	*Pinus nigra*	473354	4925978	N/A	FOD8-1/CUP3	43	3	5	Two cavities found at 8m, three cavities found at 12m above the ground level, loose bark along majority of the trunk,	N/A
RST-097	Trembling Aspen	*Populus tremuloides*	473412	4925937	N/A	FOD8-1/CUP3	25	3		Cavities at 4 and 8m above ground level	N/A
RST-098	Trembling Aspen	*Populus tremuloides*	473418	4925950	N/A	FOD8-1/CUP3	15	3	5	Four cavities between 8 and 9 m above ground level	N/A
RST-099	Trembling Aspen	*Populus tremuloides*	473359	4926006	BHA-006	FOD8-1/CUP3	55	2	2	Slender cavity present at 5m above ground level	N/A
RST-100	Trembling Aspen	*Populus tremuloides*	473339	4926018	N/A	FOD8-1/CUP3	40	3	5	Two cavities at 6m above ground level and loose bark present	N/A
RST-101	Trembling Aspen	*Populus tremuloides*	473324	4926036	N/A	FOD8-1/CUP3	25	3	5	Multiple cavities at 7m above ground level and loosebark throughout	N/A
RST-102	Trembling Aspen	*Populus tremuloides*	473409	4926011	N/A	FOD8-1/CUP3	33	3	5	Four cavities between 5 and 7m above ground level, cracks and crevices at 5m above ground level	N/A
RST-103	Trembling Aspen	*Populus tremuloides*	473419	4926011	N/A	FOD8-1/CUP3	56	3	5	Loose bark between 5 and 8m above the ground level	N/A
RST-104	Trembling Aspen	*Populus tremuloides*	473451	4925982	N/A	FOD8-1/CUP3	30	2	2	Loose bark throughout majority of trunk	N/A
RST-105	Sugar Maple	*Acer saccharum*	473377	4925586	N/A	CUP3	45, 55	2	1	N/A	Live
RST-106	Sugar Maple	*Acer saccharum*	473384	4925612	N/A	CUP3	29, 26, 14, 10	2	1	N/A	Live
RST-107	Sugar Maple	*Acer saccharum*	473390	4925623	N/A	CUP3	34, 38	2	1	N/A	Live
RST-108	Sugar Maple	*Acer saccharum*	473388	4925630	N/A	CUP3	37, 45, 25, 30	2	1	Knothole cavity at 2m above ground level	Live
RST-109	Sugar Maple	*Acer saccharum*	473455	4925765	N/A	FOD8-1/CUP3	33			N/A	Live
RST-110	Sugar Maple	*Acer saccharum*	473483	4925778	N/A	FOD8-1/CUP3	51			N/A	Live
RST-111	Sugar Maple	*Acer saccharum*	473486	4925780	N/A	FOD8-1/CUP3	46.5			N/A	Live
RST-112	Sugar Maple	*Acer saccharum*	473499	4925772	N/A	FOD8-1/CUP3	15,47			N/A	Live
RST-113	Sugar Maple	*Acer saccharum*	473505	4925777	N/A	FOD8-1/CUP3	47.2			N/A	Live
RST-114	Sugar Maple	*Acer saccharum*	473505	4925783	N/A	SWT2	31			N/A	Live
RST-115	Sugar Maple	*Acer saccharum*	473484	4925793	N/A	FOD8-1/CUP3	27.5			N/A	Live
RST-116	Sugar Maple	*Acer saccharum*	473479	4925795	N/A	FOD8-1/CUP3	31			N/A	Live
RST-117	Sugar Maple	*Acer saccharum*	473479	4925798	N/A	FOD8-1/CUP3	33.3			N/A	Live
RST-118	Sugar Maple	*Acer saccharum*	473477	4925801	N/A	FOD8-1/CUP3	46.4			N/A	Live
RST-119	Sugar Maple	*Acer saccharum*	473483	4925804	N/A	FOD8-1/CUP3	35.9			N/A	Live
RST-120	Sugar Maple	*Acer saccharum*	473476	4925805	N/A	FOD8-1/CUP3	31.7			N/A	Live
RST-121	Sugar Maple	*Acer saccharum*	473470	4925803	N/A	FOD8-1/CUP3	30.3			N/A	Live
RST-122	White Ash	*Fraxinus americana*	473423	4925794	N/A	FOD8-1/CUP3	23.7	2	3	Loose bark found at 7m above the ground level	N/A
RST-123	Trembling Aspen	*Populus tremuloides*	473394	4925808	N/A	FOD8-1/CUP3	32.1	4	5	Loose bark found at 7m, cracks and crevice between 0 and 6m above ground level	N/A
RST-124	Red Pine	*Pinus resinosa*	473416	4925822	N/A	FOD8-1/CUP3	20.5	4	5	Cavity found at 7m above ground level	N/A
RST-125	Sugar Maple	*Acer saccharum*	473457	4925816	N/A	FOD8-1/CUP3	72.1			N/A	Live
RST-126	Sugar Maple	*Acer saccharum*	473464	4925814	N/A	FOD8-1/CUP3	28.3			N/A	Live
RST-127	Sugar Maple	*Acer saccharum*	473467	4925809	N/A	FOD8-1/CUP3	39.6			N/A	Live
RST-128	Sugar Maple	*Acer saccharum*	473477	4925815	N/A	FOD8-1/CUP3	35.2			N/A	Live
RST-129	Sugar Maple	*Acer saccharum*	473477	4925834	N/A	FOD8-1/CUP3	37			N/A	Live
RST-130	Sugar Maple	*Acer saccharum*	473453	4925878	N/A	FOD8-1/CUP3	49			N/A	Live
RST-131	Trembling Aspen	*Populus tremuloides*	473473	4925940	N/A	FOD8-1/CUP3	37.1	2	5	Cracks and crevices between 0 and 12m above ground level	N/A
RST-132	Trembling Aspen	*Populus tremuloides*	473538	4925982	N/A	FOD8-1/CUP3	36	2	2	Knothole cavity between 1.5 and 3m above ground level	N/A
RST-133	Trembling Aspen	*Populus tremuloides*	473552	4926020	N/A	FOD8-1/CUP3	32.5	2	2	Cracks and crevices between 1 and 15m above ground level	N/A

Tree ID	SPECIES		Location UTM Zone: 17T		Plot Reference	ELC Community	DBH[1] (cm)	Height Class[2]	Decay Class[2]	Candidate Little Brown Myotis and Northern Myotis Roost Trees	Candidate Tri-colored Bat Roost Trees
	Common Name	Scientific Name	Easting	Northing						Microhabitat Attributes	Tree Status[4]
RST-134	Trembling Aspen	*Populus tremuloides*	473552	4926020	N/A	FOD8-1/CUP3	30	3	6	Knothole cavities at 6 and 8m, cracks and crevices between 0 and 9m above ground level	N/A
RST-135	Trembling Aspen	*Populus tremuloides*	473548	4926026	N/A	FOD8-1/CUP3	25	3	3	Cracks and crevices between 0 and 6m above the ground level	N/A
RST-136	Sugar Maple	*Acer saccharum*	473522	4925993	N/A	FOD8-1/CUP3	27			N/A	Live
RST-137	White Ash	*Fraxinus americana*	473239	4926139	N/A	FOD8-1/CUP3	71	1	3	Loose bark present between 0 and 14m above ground level	N/A
RST-138	Trembling Aspen	*Populus tremuloides*	473248	4926116	N/A	FOD8-1/CUP3	27	2	2	Cracks and crevices between 0 and 5m above ground level	N/A
RST-139	Trembling Aspen	*Populus tremuloides*	473248	4926106	BHA-006	FOD8-1/CUP3	32	2	2	Cracks and crevices between 0 and 8m above ground level	N/A
RST-140	Trembling Aspen	*Populus tremuloides*	473249	4926114	N/A	FOD8-1/CUP3	27	2	4	Loose bark present between 0 and 5m above ground level	N/A
RST-141	Poplar	*Populus*	473288	4925827	N/A	FOD8-1/CUP3	76	1	2	Three knothole cavities between 8 and 10 m and loose bark present at 6m above ground level	N/A
RST-142	Large-tooth Aspen	*Populus grandidentata*	473247	4925879	N/A	FOD8-1/CUP3	21	2	2	Two cavities at 7 and 8m above ground level	N/A
RST-143	Trembling Aspen	*Populus tremuloides*	473213	4926021	N/A	FOD8-1/CUP3	34	2	3	Cracks and crevices between 0 and 11m above ground level	N/A
RST-144	Eastern White Pine	*Pinus strobus*	473292	4925884	N/A	FOD8-1/CUP3	31	3	6	Two cavities at 10m above ground level	N/A
RST-145	Scots Pine	*Pinus sylvestris*	473305	4925872	N/A	FOD8-1/CUP3	33	4	5	Knothole cavity at 8m above ground level	N/A
RST-146	Scots Pine	*Pinus sylvestris*	473314	4925843	N/A	FOD8-1/CUP3	22	4	6	Cavity at 3m and loose bark present between 0 and 2m above the ground level	N/A

[1]Diameter-at-Breast Height

[2]Height Class: 1 = Dominant (above canopy); 2 = Co-dominant (canopy height); 3 = Intermediate (just below canopy); 4 = Suppressed (well below canopy)

[3]Decay Class: 1 = Healthy, live tree; 2 = Declining live tree, part of canopy lost; 3 = Very recently dead, bark intact, branches intact; 4 = Recently dead, bark peeling, only branches intact; 5 = Older dead tree, 90% of bark lost, few branch stubs, broken top; 6 = Very old dead tree, advanced decay, no branches, parts of stem have rotted away

[4]Dead/Live

Appendix XIII
Butterfly Species Reported from the Study Area and Vicinity

Butterfly Species Reported from the Study Area - Southampton Landfill (Project #2559)

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	Ontario Butterfly Atlas*	NRSI Observed
Vanessa atalanta	Red Admiral	S5B					X	
Vanessa cardui	Painted Lady	S5B					X	
Vanessa virginiensis	American Lady	S5					X	
Total							**38**	**20**

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Appendix XIV
Odonate Species Reported from the Study Area and Vicinity

Odonate Species Reported from the Study Area - Southampton Landfill (Project #2559)

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	Odonate Atlas*	NRSI Observed
		MNRF 2021a	MNRF 2021a	Government of Canada 2021	Government of Canada 2021	Government of Canada 2021	OOAD 2021	
Calopterygidae	**Broadwinged Damselflies**							
Hetaerina americana	American Rubyspot	S4					X	
Lestidae	**Spreadwings**							
Lestes forcipatus	Sweetflag Spreadwing	S4					X	
Lestes unguiculatus	Lyre-tipped Spreadwing	S5					X	
Coenagrionidae	**Narrow-winged Damselflies**							
Argia moesta	Powdered Dancer	S5					X	
Enallagma carunculatum	Tule Bluet	S5					X	
Enallagma civile	Familiar Bluet	S5					X	
Enallagma exsulans	Stream Bluet	S5					X	
Ischnura verticalis	Eastern Forktail	S5					X	
Aeshnidae	**Darners**							
Aeshna canadensis	Canada Darner	S5					X	
Aeshna constricta	Lance-tipped Darner	S5					X	
Aeshna umbrosa	Shadow Darner	S5					X	
Aeshna verticalis	Green-striped Darner	S4					X	
Boyeria grafiana	Ocellated Darner	S4					X	
Gomphidae	**Clubtails**							
Phanogomphus spicatus	Dusky Clubtail	S5					X	
Corduliidae	**Emeralds**							
Somatochlora walshii	Brush-tipped Emerald	S4					X	
Somatochlora williamsoni	Williamson's Emerald	S4					X	
Libellulidae	**Skimmers**							
Celithemis elisa	Calico Pennant	S5					X	
Libellula luctuosa	Widow Skimmer	S5						X
Libellula pulchella	Twelve-spotted Skimmer	S5					X	X
Plathemis lydia	Common Whitetail	S5						X
Sympetrum costiferum	Saffron-winged Meadowhawk	S4					X	
Sympetrum danae	Black Meadowhawk	S4					X	
Sympetrum internum	Cherry-faced Meadowhawk	S5					X	
Sympetrum obtrusum	White-faced Meadowhawk	S5					X	
Sympetrum vicinum	Autumn Meadowhawk	S5					X	
Tramea lacerata	Black Saddlebags	S4						X
Total							**23**	**4**

**Odonate Atlas Square Numbers: Square(s)*
***NHIC Atlas Squares: Square(s)*

References

Ministry of Natural Resources and Forestry (MNRF). 2021a. Natural Heritage Information Centre (NHIC): Species List for Ontario. Published: 2014-07-17. All Species List Updated: 2021-03-18. Available: https://www.ontario.ca/page/get-natural-heritage-information

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Ontario Odonata Atlas Database (OOAD). 2021. Natural Heritage Information Centre, Ontario Ministry of Natural Resources and Forestry. Species list from atlas square ##XX## queried on January 13, 2020.
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