Draft

1493 Sixth Line, Oakville

Environmental Impact Study Addendum

Prepared for:

Innovative SHS
117 George Street
Oakville, ON L6J 3B8

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NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

1493 Sixth Line, Oakville

Environmental Impact Study Addendum

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1.0 Introduction

Natural Resource Solutions Inc. (NRSI) was retained by Innovative SHS to complete an Environmental Impact Study (EIS) Addendum associated with proposed residential development located at 1493 Sixth Line, Oakville (hereafter referred to as the subject property; Map 1). In 2024, an EIS was completed on behalf of a previous landowner in support of refinements to the Halton Regional Natural Heritage (RNHS) where it has been mapped on the subject property in the Halton Regional Official Plan (OP) (NRSI 2024). For the purposes of this report, true southwest is referred to as 'west', true northwest is referred to as 'north', etc.

The subject property is approximately 0.87ha in size and contains a single residential dwelling home that was built in 1950, along with two accessory structures (i.e., pigeon shed and lawn shed). The residential dwelling is located within the western section of the property and is surrounded by Cultural Meadow (CUM1), landscaped trees, and a deciduous hedgerow along the northern boundary. A Common Buckthorn (*Rhamnus cathartica*)-dominated Cultural Thicket (CUT1) community is located within the eastern section of the property; a portion of this CUT1 was recently cleared by the landowner. The rear (easternmost) portion of the subject property contains a Cultural Woodland (CUW1) community, which represents a Significant Woodland (NRSI 2024) in the Town of Oakville and Halton Region. The Significant Woodland is also mapped by the Ministry of Natural Resource and Forestry (MNR), which is contiguous with a larger off-site MNR-mapped woodland feature (Map 1), although this connection is fragmented by public trails; the McCraney Valley Trail runs east and north of the subject property. The far east end of the property contains a Headwater Drainage Feature (HDF), which was identified as part the 2024 EIS (NRSI 2024).

The subject property is located within the College Park urban settlement of Oakville. The property is currently zoned as N-Natural Area per the Town of Oakville's Zoning By-law 2014-014 (2025). Prior to 2014, the subject property was zoned and designated as Low Density Residential.

For the purposes of this EIS Addendum, the "study area" is considered the subject property plus adjacent lands within 120m (Map 1). The size of the study area is based on the size of adjacent lands included in the Natural Heritage Reference Manual (OMNR 2010). Adjacent lands include Munn's Public School, commercial businesses, residential neighbourhoods, and recreational fields.

As part of the original EIS (dated May 6, 2024), NRSI carried out a review of background natural heritage information and prepared and submitted a Terms of Reference (TOR) (dated April 23, 2023) to the Region and Town for review and approval. On June 16, 2023, the Region commented that if/when future development is proposed, a new EIS or an EIS Addendum will be required. A new landowner is now proposing to construct a six-storey mixed-use residential building located on Sixth Line designed to provide 190 affordable rental housing units. The project features a mix of one-, two-, and three-bedroom independent living units, all of which will remain affordable for at least 25 years. Notably, 30% of these units are designed to be fully accessible, and 35 are designated as "deeply affordable" through a partnership with the Region of Halton. To ensure long-term stability, the developer intends to lease blocks of units to community partner organizations that will manage the housing for their clients. Beyond residential space, the ground floor will include a 278 sq.m. daycare facility and a 111 sq.m. office space dedicated to a community partner's on-site operations. The site plan incorporates a total of 103 parking spaces—split between underground and surface levels—and preserves 0.18 hectares of natural area at the rear. By combining affordable housing with childcare, the development aims to create a supportive, transit-oriented community that reduces the overall cost of living for residents. See Appendix I for the proposed site plan.

A draft TOR for the EIS Addendum was prepared by NRSI and submitted to the Town of Oakville on May 21, 2025. The Town provided comments on June 23, 2025 and July 15, 2025. A revised TOR (Appendix II) was submitted on July 14, 2025 and July 31, 2025 and approved by the Town on August 1, 2025.

An EIS is required as part of an OP and Zoning Bylaw Amendment application to support the boundary modification of the RNHS designation and zoning on the subject property (see NRSI 2024 for further details). Per Section 16.1.15 a) of Livable Oakville (2009), the specific boundaries of the Natural Area including appropriate buffers of any natural features shall be identified through an EIS.

The EIS must demonstrate that the proposed development (both during and post-construction) will not negatively impact the natural heritage features, including their ecological functions, within the Town and RNHS or unmapped Key Features. Under Section 118.3 of the Regional OP (2024), an Environmental Impact Assessment (otherwise known as an EIS) is required if development or site alteration is proposed within 120m of the RNHS to demonstrate that the proposed development will result in no negative impacts to the RNHS or unmapped Key

Features affected by the development by identifying components of the RNHS and assessing the potential environmental impacts, requirements for impact avoidance and mitigation measures, and opportunities for enhancement.

The EIS is required to demonstrate that the proposed OP and Zoning Bylaw Amendment are appropriate for the subject property. As per Section 118.4 of the Regional OP (2024), the recommendations of an EIS are required to be implemented through OP Amendments, Zoning Bylaws, site plan control, conditions of planning approval, or regulations by the appropriate authority

This EIS Addendum summarizes the results of 2025 field surveys and builds on the results of the 2024 EIS (NRSI 2024). The 2023 field survey results, along with the results of the background information review as presented in the 2024 EIS, have been used to characterize the existing natural features on the subject property, including their ecological significance and sensitivity. Recommendations have been provided to avoid, or otherwise effectively mitigate, potential impacts associated with the proposed development. Certain sections from the 2024 EIS (NRSI 2024) have been summarized in this Addendum for completeness and to provide a complete summary of constraints within the subject property. This EIS Addendum was prepared and written in accordance with Halton Region's Environmental Impact Assessment Guidelines (2020).

2.0 Planning Context

For the purposes of this EIS Addendum report, information on the natural heritage features within the study area was collected and assessed for significance. To help inform suitable land-use concepts, guide the layout of development, and identify areas to be protected, inventoried natural features were evaluated against relevant policies, regulations and planning studies (Table 1).

Table 1. Relevant Policies Legislation and Planning Studies

Policy/Legislation	Description	Project Relevance
Provincial Planning Statement (PPS; OMMAH 2024).	• Issued under the authority of Section 3 of the *Planning Act* and came into effect on October 20, 2024, replacing the 2020 PPS. • 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'. • Section 4.1.5 of the PPS identifies that development and site alteration shall not be permitted within the area outlined in sub-sections a) – f) "unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions." • The Natural Heritage Reference Manual (OMNR 2010) and the Significant Wildlife Habitat Technical Guide (OMNR 2000, MNRF 2015) were prepared by the MNR 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, ○ Potential Significant Wildlife Habitat, and ○ Potential habitat for Endangered and Threatened species.
Endangered Species Act (2007)	• The original ESA, written in 1971, underwent a year-long review which resulted in several changes which came into force in 2007. • 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. • Ontario is planning to replace the ESA with the *Species Conservation Act* (ESA). The exact date the SCA will be in place is yet to be determined by the provincial government.	• 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.
Protect Ontario by Unleashing our Economy Act, 2025 (Bill 5)	• Bill 5, the Protect Ontario by Unleashing our Economy Act, 2025, received Royal Assent on June 5, 2025. • Interim changes to the ESA will be in effect until the SCA is officially in force. Key changes include: • With the passing of Bill 5 on June 5, 2025, habitat is defined as physical dwellings (e.g., dens, nests, hibernacula) and the immediate surrounding area necessary for breeding, rearing, or hibernation.	• If SAR protected by the ESA and/or their habitat are confirmed within the study area a mitigation plan, project registration, or permit from the MECP may be required.

Policy/Legislation	Description	Project Relevance
	• Going forward, proponents will no longer have the option to pay a conservation charge instead of undertaking on-the-ground mitigation. The associated fund will also be dissolved, and the species conservation charge regime will be discontinued.	
Migratory Birds Convention Act (MBCA), 1994 and Migratory Birds Regulations (MBR), 2022	• The MBCA protects migratory game birds, insectivorous birds, and several other migratory non-game birds from persecution in the form of harassment. • The schedule of on-site work must consider MBCA timing windows, with timing of breeding bird season typically occurring between April 1 to August 31 (depending on applicable ecozone); however, this is a guideline, since the MBCA applies anytime a migratory bird is nesting. • "Incidental take" (unintentional harming, killing, disturbance, or destruction of migratory birds, their nests, or eggs as a result of an activity that is not specifically targeting the bird or nest) is considered illegal, with the exception of a permit obtained by the Canadian Wildlife Service. • Schedule 1 of the MBR 2022 provides year-round nest protection for 18 species that are known to re-use nests annually.	• The timing of construction activities, especially vegetation clearing must have consideration for the MBCA. Typically, this involves avoiding tree and vegetation removal during the peak breeding bird period (April 1 to August 31).
Fish and Wildlife Conservation Act (FWCA; Government of Ontario 1997)	• The FWCA provides protection for certain bird species not protected under the MBCA (i.e., raptors), as well as furbearing mammals and their dens or habitual dwellings, aside from the Red Fox (*Vulpes vulpes*) and Striped Skunk (*Mephitis mephitis*).	• The timing of construction activities, especially vegetation clearing and site grading, must have consideration for bird nesting and den sites for fur-bearing mammals.

The Livable Oakville Plan: Official Plan (Town of Oakville 2009, last updated April 2025)	• Land use within the Town of Oakville is guided through the OP that was adopted by the Council of the Corporation of the Town of Oakville on June 22, 2009, and was approved by the Regional Municipality of Halton on November 30, 2009.	• The subject property is designated Natural Area as per Schedule I Central Land Use.
		• Natural heritage features within the study area, and which receive protection under the Town OP, include:
		  • Woodlands;
		  • Significant Wildlife Habitat; and,
		  • Habitat for Endangered and Threatened species.

Policy/Legislation	Description	Project Relevance
		• Per Section 16.1.8, development and site alteration shall not be permitted within regionally significant woodlands or their buffers • Per Section 16.1.10, development and site alteration shall not be permitted in Significant Wildlife Habitat • Per Section 16.1.6, development and site alteration shall not be permitted in the significant habitat of Endangered or Threatened species. Development within 120m of significant habitat of Endangered or Threatened species shall require an EIS to demonstrate that there will be no negative impact on the habitat or its ecological function.

Halton Region Official Plan (Region of Halton 2024)	• As of July 1, 2025 the Halton Region OP is no longer a regional plan. It is now a Local Plan of the four local municipalities in Halton.
	• The Halton Region OP identifies the natural features, ecological functions and potential linkages and corridors that comprise the Natural Heritage System (NHS).
	• The NHS consists of both the Greenbelt Natural Heritage System and the Regional Natural Heritage System. Within the NHS, Key Features are to be protected and maintained for conservation purposes.
	• Examples of Key Features identified within the Natural Heritage System include significant habitat of SAR, fish habitat, wetlands, ANSI, significant valleylands, significant woodlands, significant wildlife habitat, streams, wetlands, lakes and their littoral zones, seepage areas and springs, aquifers and recharge areas.
		• The subject property contains the following Key Features:
		  • Significant Woodlands;
		  • Significant Wildlife Habitat; and,
		  • Significant habitat of Endangered or Threatened species.
		• Per Section 139.3.7, it is the policy of the Region to prohibit development or site alteration on lands within Key Features. It is also prohibited to develop or conduct site alteration on lands adjacent to the Key Features unless the proponent has evaluated the ecological functions of these lands through an Environmental Impact Assessment (otherwise known as an EIS).

3.0 Field Methods

Terrestrial and aquatic field surveys were completed across nine site visits between the period of April – July 2025 to characterize and map the existing natural features present within the subject property. Refer to the 2024 EIS (NRSI 2024) for field survey methodology descriptions for field surveys completed for that report. Table 2 provides a summary of field surveys undertaken within the subject property in 2025.

Table 2. Field Survey Summary

Date	Field Survey	Protocol	Time	Approximate Person Hours	Weather Conditions				
					Air Temp. (°C)	Precip.	Cloud Cover (%)	Wind (Beaufort Scale)	NRSI Staff
2025-04-15	Headwater Drainage Feature (HDF) Assessment	Ontario Stream Assessment Protocol (OSAP) (V10.S4.M11) *Unconstrained Headwater Sampling* module (Gorenc and Stanfield 2017)	11:00-11:45	1.5	8	Rained earlier (light drizzle)	80	2-4	A. Cantwell C. Kolar
2025-05-08			15:20-15:40	0.75	13	None	10	2-3	A. Cantwell C. Kolar
2025-07-16			11:00-11:45	0.75	8	Rained earlier	80	2-4	A. Cantwell
2025-04-22	Bat Habitat Assessment (Trees and Buildings)	Species at Risk Bats Survey Standard Note - 2022 (MECP 2022a)	09:30-12:15	5.5	9	None	30	3	C. Humphrey R. Pivar
2025-06-16	Bat Acoustic Monitoring	Species at Risk Bats Survey Standard Note - 2022 (MECP 2022a), Maternity Roost Surveys (Forests/Woodlands) (MECP 2022b)	-	-	-	-	-	-	C. Humphrey D. Skinner
2025-06-20			-	-	-	-	-	-	A. Van Belleghem
2025-07-03			-	-	-	-	-	-	D. Skinner
2025-07-15	Vegetation Community Mapping (Ecological Land Classification)	Lee et al. 1998	12:00-14:00	2	30	None	-	3	T. Sieg
2025-07-29	Chimney Swift Survey	Birds Canada 2023	10:29-11:32	1	26	None	9-18	2	M. Alexandrou

3.1 Vegetation Community Mapping and Vascular Flora Inventory

Vegetation communities were described and mapped according to the Ecological Land Classification (ELC) system for southern Ontario (Lee et al. 1998). This survey included the compilation of a stand description to note the dominant species and cover within each community.

Vegetation community mapping was completed as part of the 2024 EIS (NRSI 2024); however, a section of the Common Buckthorn-dominated Cultural Thicket (CUT1) community had been cleared since the 2024 EIS. Therefore, as part of this EIS Addendum, NRSI reviewed and updated the vegetation community mapping on and adjacent to the subject property. A high-level inventory of vegetation species was also conducted to inform the ELC classifications.

3.2 Chimney Swift Survey

A Chimney Swift (*Chaetura pelagica*) nesting survey was conducted by NRSI staff in accordance with the survey methodology of the *Ontario Swiftwatch Protocol* (Birds Canada 2023) on July 29, 2025. The survey focused on the potential use of the garage turret structure as nesting habitat, since the existing dwelling contains a chimney that is capped and not accessible to breeding Chimney Swifts. The garage turret was surveyed for one hour between 09:00 and one hour before sunset. To improve detectability of the species, the survey was conducted on a day with low cloud cover, low wind, good visibility, and no precipitation.

3.3 Bat Habitat and Acoustic Surveys

3.3.1 Bat Habitat Assessment

Trees

A bat habitat assessment was completed during leaf-off conditions (April 22, 2025) to document potential bat roosting habitat associated with trees (e.g., cracks, crevices, cavities, exfoliating bark, tree species that could provide suitable foliage roosts, etc.) following guidance from the *Species at Risk Bats Survey Note - 2022* (MECP 2022a) and the *Maternity Roost Surveys (Forest/Woodlands)* (MECP 2022b). All trees within the subject property were assessed for potential bat roosting habitat.

All standing live or dead trees with cracks, crevices, hollows, and/or loose or naturally exfoliating bark that could provide suitable roosting habitat for bats, including the SAR Little Brown Myotis

(*Myotis lucifugus*), Northern Myotis (*Myotis septentrionalis*), and Silver-haired Bat (*Lasionycteris noctivagans*) were documented. Tree species, diameter at breast height (DBH), decay class according to Watt and Caceres (1999), and the number, height, and type (e.g., cavity, crevice, sloughing bark, etc.) of suitable roost sites was documented for each candidate roost tree. The presence of leaf clusters with suitable roosting habitat for Tri-colored Bat (*Perimyotis subflavus*) was also assessed. The density of roost trees was determined for all wooded vegetation communities to characterize habitat availability within the study area.

Structures

Three structures are located within the subject property: a house with an attached garage, a pigeon shed, and a lawn shed. All structures are proposed for removal to accommodate the proposed development. These buildings were assessed for the potential to provide roosting and/or hibernation habitat for bats on April 22, 2025 in accordance with the *Use of Buildings by Species at Risk Bats Survey Methodology* (MECP 2021) and the *Species at Risk Bats Survey Note - 2022* (MECP 2022a).

All external features that may provide suitable roosting habitat or access points to suitable roosting habitat were examined (i.e., fascia, soffits, roofline connections with walls, flashing, siding, etc.). The ground underneath potential access points as well as window sills and walls were also examined during the external inspection for guano and fur oil staining. The structure interiors were also inspected for evidence of potential bat roosting, including attic areas.

Hibernation habitat for SAR bats includes caves, crevices in bedrock extending beyond the frost line, mines containing adits, long concrete culverts, rail tunnels, basements, concrete or stone underground bunkers, and holding tanks with surface accessibility. The basement of the home was examined during interior inspections for potential accessibility to bats and any evidence of bat presence that could indicate hibernation, such as guano.

3.3.2 Bat Passive Acoustic Monitoring

Passive acoustic monitoring was completed in proximity to potential bat roost trees. Bat acoustic monitoring methodology followed the guidelines outlined in the Ministry of Environment, Conservation and Parks (MECP) *Species at Risk Bat Survey Note – 2022* (MECP 2022a), and the MECP's survey protocol for *Maternity Roost Surveys (Forests/Woodlands)* (MECP 2022b).

Two passive acoustic monitoring station locations were selected based on the results of the bat tree habitat assessment. These stations were placed near potential bat roost trees or in suitable foraging and/or travel corridors to assess the potential presence of bats within the subject property (Map 2).

Passive acoustic monitoring was conducted with the use of a Song Meter Mini Bat acoustic recorder (Wildlife Acoustics Inc., Massachusetts, USA) between June 16 and July 3, 2025, for a total of 18 nights, 15 of which were in June. Table 3 summarizes the unit setting used for this project. Data collected on the 10 monitoring nights with the most ideal weather conditions for bat activity (i.e., ambient temperature >10°C, low wind, no precipitation) were selected for further analyses.

Table 3. Acoustic Recorder Settings Used During Bat Passive Acoustic Monitoring (2025).

Parameter	Setting Used
Detector Type	Wildlife Acoustics Song Meter Mini Bat [full-spectrum]
Gain	12 dB
Sample Rate	384 kHz
Minimum Trigger Frequency	16 kHz
Trigger Window	3 sec
Maximum Length	00:15 min
Schedule Start	Sunset + 00:00 hrs
Schedule End	Sunset + 05:00 hrs

Bat echolocation calls recorded during passive acoustic surveys were reviewed with the software program SonoBat 30.2 for the North/Northeastern US & Southern Ontario Region and initially identified to species using the SonoBat Auto-classifier.

Settings for the auto-classification of the acoustic data included the following: auto filter: 5kHz; acceptable call quality: 0.60; decision threshold: 0.90; and maximum number of calls to consider per file: 32. Further manual vetting by NRSI biologists is currently being conducted to confirm species presence and inform potential habitat use type by identified bat species within the subject property.

3.4 Headwater Drainage Feature Assessment

NRSI biologists conducted a headwater drainage feature (HDF) assessment to identify, evaluate and classify HDFs within the subject property. The Evaluation, Classification and

Management of Headwater Drainage Features Guidelines (TRCA and CVC 2014), hereafter referred to as the 'Headwater Guideline', was prepared by the Toronto and Region Conservation Authority (TRCA) and Credit Valley Conservation Authority (CVC) to provide direction for features that are not clearly covered by existing policy and legislation, but may contribute to the overall health and function of the watershed. According to the Headwater Guideline, HDFs include:

- non-permanently flowing drainage features that may not have defined bed or banks;
- first-order and zero-order intermittent and ephemeral channels;
- swales; and
- headwater wetlands.

The Headwater Guideline was developed in conjunction with the Ontario Stream Assessment Protocol (OSAP) Unconstrained Headwater Sampling module (V10.S4.M11) (Gorenc and Stanfield 2017). A feature was identified and investigated within the subject property during a site visit completed on June 9, 2023 with Conservation Halton (CH) staff. The HDF flows in a north to south direction, and drains into a tributary of Sixteen Mile Creek. The HDF falls within the Morrison-Wedgewood Diversion subwatershed catchment area. In 2025, NRSI biologists conducted a full assessment of the HDF in accordance with the methods outlined in the Headwater Guideline and the Ontario Stream Assessment Protocol (OSAP) (V10.S4.M11) Unconstrained Headwater Sampling module (Gorenc and Stanfield 2017). See Map 2 for the HDF reaches.

The feature on the subject property was reclassified from a watercourse to an HDF, prompting the need for a headwater drainage feature assessment in completion of this EIS Addendum. Historically, a culvert or crossing beneath Upper Middle Road directed flow to this feature. However, with the development north of Upper Middle Road, the culvert or crossing was removed, and upstream flows were redirected elsewhere. As a result, the catchment area feeding the feature was significantly reduced, leading to decreased flow in the former watercourse and its reclassification as a headwater drainage feature. During site visits in 2025, the historic channel bed remained visible. See the 2024 EIS (NRSI 2024) for more information.

In the field, each HDF branch was divided into "reaches". These reaches correspond to different sections of the overall feature and were designated based on changes to riparian conditions, channel morphology, and tributary confluences. Each reach was given a unique identifier in the form of "TSMC#-#". Each reach was given the label "TSMC" as the water flows

towards a tributary of Sixteen Mile Creek to the east. Each HDF identified is then assigned a number as they are assessed. Reaches along the same branch are given a secondary number to differentiate them (i.e. TSMC1-1).

For each reach along an HDF, the following data was collected:

- Feature type;
- Flow conditions;
- Flow measurements (if applicable);
- Riparian conditions;
- Feature vegetation;
- Feature and bankfull widths and depths;
- Sediment deposition and transport;
- Site features; and
- Channel connectivity.

NRSI staff conducted three site visits, as per the methods detailed in the Headwater Guideline and the OSAP Unconstrained Headwater Sampling module. The first visit was conducted on April 15, the second on May 8, and the third on July 16, 2025. A full field assessment was conducted for the first site visit which corresponded with spring high water conditions. During the second site visit, the same data was reviewed on site; if any changes occurred since the first site visit, then this additional data was collected. Refinements to reach breaks were also made during the second site visit. The third site visit was to confirm the observations from the first and second site visits and focused on collecting additional hydrology information (i.e., flow conditions and flow measurements, if applicable). The focus of the third site visit was on hydrological conditions and baseflow data collection.

3.5 Wildlife Habitat Assessment and Incidental Wildlife Observations

All incidental observations of wildlife (e.g., mammals, butterflies, odonates (dragonflies and damselflies)) and vegetation species were documented during all field visits. This included both direct and indirect (e.g., tracks, scat, dens, nests, etc.) observations of wildlife presence. Features and species that may be indicative of SWH, as informed by the results of the SWH screening (See the 2024 EIS; NRSI 2024) were documented during the course of all site investigations.

4.0 Biophysical Inventory

4.1 Vegetation

4.1.1 Vegetation communities

Overall, the vegetation communities within the subject property are highly anthropogenically disturbed due to historic use of the land as a residential property and the fragmented nature of the on-site natural features. The natural features within the subject property have been isolated since at least 1985 (Google Earth 2025) due the presence of Munn's Public School to the northeast and open fields to the north and west.

Four vegetation communities were mapped within the subject property, three of which can be classified using the ELC system (Lee et al. 1998). The locations of these communities are shown on Map 2 and the results are described below.

CUW1- Mineral Cultural Woodland Ecosite

As described in the 2024 EIS (NRSI 2024), a cultural woodland community is located at the eastern (rear) extent of the subject property. This feature was categorized as young; there were no indications that the community has undergone a series of natural thinning and replacements (i.e., large diameter trees and down woody debris). The canopy is comprised of Norway Maple (*Acer platanoides*), declining and dead White Ash (*Fraxinus americana*), Manitoba Maple (*Acer negundo*) and White Elm (*Ulmus americana*). The sub-canopy and understorey are not distinguishable due to the age of the feature and comprised an abundance of Common Buckthorn, followed by Dotted Hawthorn (*Crataegus punctata*) and regenerating White Ash. The ground cover consists mainly of common non-native species such as Garlic Mustard (*Alliaria petiolata*), Nipplewort (*Lapsana communis*), Wood Avens (*Geum urbanum*), and Creeping Jennie (*Lysimachia nummularia*).

H- Hedgerow

As described in the 2024 EIS (NRSI 2024) the hedgerow borders the north edge of the cultural meadow and connects to the cultural thicket. The canopy consists of Norway Maple and Siberian Elm (*Ulmus pumila*), while the understorey is dominated by Common Buckthorn. Ground cover consists of occasional Garlic Mustard, Cleavers (*Galium aparine*) and Common Dandelion (*Taraxacum officionale*). The hedgerow is less than 10m wide and less than 0.5ha in size and is not considered an ELC community or a woodland feature. The hedgerow does not

provide any linkage function as it fronts onto Sixth Line and the Munn's Public School parking lot.

CUT1- Mineral Cultural Thicket Ecosite

In 2023, a cultural thicket community previously encompassed the majority of the subject property but the majority of it has since been removed. The cultural thicket provides minimal habitat function, as the dominant species is Common Buckthorn and the ground cover contains greater than 60% Garlic Mustard cover in the spring and summer.

CUM1 – Mineral Cultural Meadow Ecosite

Since the partial removal of the cultural thicket community, a young cultural meadow ecosite has established within the cleared areas and now encompasses the majority of the subject property. The canopy of scattered tree growth consists of Norway Maple (*Acer plantanoides*) and Black Cherry (*Prunus serotina*). The sub-canopy consists of Gray Dogwood species (*Cornus racemosa*), Common Buckthorn and White Ash. The understory is made up of Perennial Sow-Thistle (*Sonchus arvensis*) and Canadian Horseweed (*Erigeron canadensis*). The groundcover is comprised of Black Medic (*Medicago lupulina*) and Garlic Mustard.

4.1.2 Vascular Flora

In total, 84 plants were inventoried within and immediately adjacent to the subject property in 2023 and 2025. A complete list of these species is appended to this report (Appendix III).

No plant SAR or SCC were inventoried within the subject property. No regionally rare species were inventoried within the subject property.

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. Average CC value of inventoried plant species on the subject property was 3.14 which is relatively low and indicative of species that are generalist in their habitat preferences and are typically adapted to ecologically disturbed conditions. Of the 84 plant species inventoried, 22 (26%) had CC values of 0-3. Thirty-seven (44%) are non-native in Ontario.

4.2 Wildlife

4.2.1 Birds

In total, 27 bird species were documented within the study area during site investigations in 2023 and 2025. In 2025, six new species were observed within the subject property. Refer to Appendix IV for a list of bird species recorded within in the study area.

One SAR, Chimney Swift, was recorded within the study area. This species is listed as Threatened in Ontario as well as in Canada (MECP 2024, Government of Canada 2024). On July 15, 2025, six Chimney Swift individuals were incidentally observed flying over the subject property. On July 29, 2025, three Chimney Swifts were recorded during a Chimney Swift survey; one was observed flying overhead and two were observed foraging. No Chimney Swifts were observed entering/exiting the garage turret structure, or any on-site structures.

4.2.2 Herpetofauna

NRSI biologists did not observed any herpetofauna during site investigations in 2023 and 2025. A complete list of herpetofauna species reported from the study area and vicinity is provided in Appendix V.

4.2.3 Mammals

In 2025, Northern Raccoon (*Procyon lotor*) (tracks observed; indirect observation) and Eastern Chipmunk (*Tamias striatus*) (direct observation) were recorded within the subject property. In 2023, Eastern Cottontail (*Sylvilagus floridanus*) (direct observation) and Eastern Gray Squirrel (*Sciurius carolinensis*) (direct observation) were recorded within the subject property. All of the mammal species that were recorded are common with secure populations in Ontario (MNR 2024). A complete list of mammals reported from the study area and vicinity is included in Appendix VI.

Bat Habitat Assessment

Trees

Based on the results of the bat habitat assessment, 16 trees were identified as potential roost trees for bats, one of which is located within the dripline of the Cultural Woodland (CUW1). The density of potential roost trees for SAR bats within the CUW1 is 7.7 potential roost trees/ha.

Of those outside of the dripline, 14 were identified as potential roost trees for Little Brown Myotis (*Myotis lucifugus*), Northern Myotis (*Myotis septentrionalis*) or Silver-haired Bat (*Lasionycteris noctivagans*) and one tree was identified as a potential roost tree for Tri-colored Bat (*Perimyotis subflavus*). The majority of these trees are located within the hedgerow along the north side of the property. See Map 3 for the locations of potential bat roost trees.

Structures

House with Attached Garage

The house is a deteriorating wood-sided one and half storey home with an attached garage. The house is still heated (including the basement) and serviced and is occasionally occupied. The interior of the attic space and basement were investigated. While evidence of past use by squirrels was observed, no evidence of use by bats was documented.

Several potential bat entry/exit points were observed in the garage that could provide suitable SAR bat day roosting habitat, and the garage is also easily accessible to mice, squirrels and raccoons (as noted by the presence of scat). However, no bats or bat guano was observed.

Pigeon Shed and Lawn Shed

Both the pigeon shed and lawn shed are dilapidated, with partially collapsed roofs. These buildings were not safe to enter. Given that they are highly accessible to bats, they could allow for occasional day roosting, however the high level of exposure to the elements is not suitable for supporting a maternity colony or hibernation.

Rocky Features

No open, sunny, rocky features potentially suitable for roosting Eastern Small-footed Myotis, or any features suitable for hibernation, were identified on the property.

Passive Bat Acoustic Monitoring

A total of six bat species were documented within the subject property. Five of these species, Eastern Small-footed Myotis, Little Brown Myotis, Eastern Red Bat, Silver-haired Bat, and Hoary Bat, are listed as Endangered on the Species at Risk in Ontario List (O. Reg 230/08). A summary of the acoustic monitoring results is provided in Table 4.

Table 4. Bat species and species grouping classification results.

Species or Species Grouping		Bat Call Sequences	Percent (%) of Total Bat Call Sequences	MLE Value[1]
Common Name	**Scientific Name**			
Eastern Small-footed Myotis	*Myotis leibii*	12	0.5	0.00
Little Brown Myotis	*Myotis lucifugus*	2	0.1	0.75
Myotis species[2]	*Myotis* spp.	63	2.4	-
Eastern Red Bat	*Lasiurus borealis*	30	1.2	0.00
40 kHz[3]	-	4	0.2	-
Big Brown Bat	*Eptesicus fuscus*	1,720	66.9	0.00
Silver-haired Bat	*Lasionycteris noctivagans*	37	1.4	1.00
30 kHz[4]	-	37	1.4	-
Hoary Bat	*Lasiurus cinereus*	61	2.4	0.13
Low Frequency[5]	-	606	23.6	-
TOTAL		**2,572**		

[1]Maximum likelihood estimate (MLE) calculated by SonoBat. A MLE value of 0 represents strong evidence of species presence and a value of 1 suggests weak evidence of species presence.
[2]Myotis spp. grouping includes Little Brown Myotis, Northern Myotis, and Eastern Small-footed Myotis.
[3]40kHz grouping includes Eastern Red Bat, Tri-colored Bat, Little Brown Myotis, Northern Myotis, and Eastern Small-footed Myotis.
[4]30kHz grouping includes Big Brown Bat and Silver-haired Bat.
[5]Low Frequency grouping includes Hoary Bat, Big Brown Bat and Silver-haired Bat.

Throughout the monitoring period, bat sequences were recorded on all monitoring nights analyzed. Bat activity peaked on the evening of June 30, 2025, with 500 recordings. The evening of June 19, 2025 had the fewest bat call sequences, with 29 recordings. This variation in the number of recordings could be due, in part, to factors such as weather, prey availability, and predator presence.

Of the high-frequency species, each of the *Myotis* species grouping and Eastern Red Bat were detected on nine of the 10 monitoring nights analyzed. Eastern Small-footed Myotis was detected on five monitoring nights, and Little Brown Myotis was detected on only two monitoring nights, June 19 and June 24.

Slightly higher activity was observed at station B01G (n=1,503 bat call sequences recorded), located within the treed residential area. Eastern Small-footed Myotis, *Myotis* species, Eastern Red Bat, Big Brown Bat, Silver-haired Bat and Hoary Bat were all recorded at both monitoring stations. Little Brown Myotis was only recorded at station B02G.

Activity level within 60 minutes of sunset was limited for high-frequency colony-roosting species, with only four bat call sequences identified to the *Myotis* species grouping. These *Myotis* calls were recorded beginning at 55 minutes after sunset.

Big Brown was recorded within 45 minutes of sunset on all 10 monitoring nights, including within 30 minutes of sunset on seven nights.

Across the entire monitoring period and both stations, there was minimal activity of *Lasiurus* bats documented within 60 minutes of sunset. Eastern Red Bat was not recorded until 25 minutes following sunset, while Hoary Bat was not recorded until 41 minutes after sunset,

See the results of the bat monitoring summary report for further details (Appendix VII).

4.2.4 Insects

In 2023, one butterfly species, Cabbage White (*Pieris rapae*), was incidentally recorded within the subject property during site investigations. Three additional species, Clouded Sulphur (*Colias philodice)*, Black Swallowtail (*Papilio polyxenes*), and Eastern Tiger Swallowtail (*Papilio glaucus*), were incidentally recorded within the subject property in 2025. These species are relatively common with a secure provincial population (MNR 2024). A complete list of butterfly species reported from the study area vicinity is provided in Appendix VIII.

In 2023, one odonate species, Ebony Jewelwing (*Calopteryx maculata*), was incidentally recorded within the subject property during site investigations. This species is relatively common with a secure provincial population (MNR 2024). No odonate species were recorded in 2025. A complete list of odonate species reported from the surrounding 10km squares vicinity is provided in Appendix IX.

4.3 Headwater Drainage Feature

A single HDF branch, subdivided into two reaches, was determined to be present within the study area. These reaches are described below and shown on Map 2.

Reach TSMC1-1

The TSMC1-1 is 71m long and extends beyond the study area to the southeast. This reach was fully assessed within the subject property upstream of the pedestrian bridge, this portion is a swale that was an historic channel bed. The reach originates at the edge of the Cultural Woodland (CUW1) along the northwest property boundary. The feature flows through the

Cultural Woodland community, where it receives input from Reach TSMC1-2 upstream (described below).

During the first HDF visit (April 15, 2025), the reach was minimally flowing. Feature measurements were taken during with the average wetted and feature widths identified as 0.37m and 1.0m, respectively. The average depth of the water was 29mm. During the second visit (May 8, 2025), the reach contained standing water. The average wetted width and depth was 0.48m and 38mm, respectively. The measurements from the second visit are larger due to the targeted areas that still had standing water (pools) within the reach. The entire reach was dry during the third visit (July 16, 2025); however, the substrates were damp throughout the reach (not saturated). The surrounding riparian area was made up of scrubland vegetation, in the form of deciduous shrubs. Substrates were primarily comprised of silt and clay.

An outlet was observed on the eastern bank of the reach at the downstream end. This input was minorly flowing during the first visit. No visible structure was observed; however, it is most likely tile outlet from the soccer fields to the north.

Evidence of sediment transport was observed during the site visits, including erosion on either side of the swale and outlet scour from the presumed tile input from the soccer fields. An average of 70mm of sediment deposition was measured within the feature, classifying it as 'substantial' sediment deposition under the OSAP Unconstrained Headwater Sampling module (Gorenc and Stanfield 2017).

The portion of the reach downstream of the pedestrian bridge is similar to the reach within the subject property. The feature was dry in sections near the second pedestrian crossing (culvert), located approximately 185m downstream of the subject property; this indicates water may be infiltrating. Evidence of historically larger flows were observed as a wide feature bed with poorly formed and eroding banks. As flow inputs upstream were diverted, this feature has developed into a poorly-defined feature.

Reach TSMC1-2

Reach TSMC1-2 is northwest of the subject property. Based on aerial imagery it is an approximately 145m-long grassed swale that conveys flow through a school yard to the TSMC1-1 reach.

Similar to reach TSMC1-1, reach TSMC1-2 was minimally flowing during the first visit, had some pools of standing water during the second visit, and was dry during the third visit. Due to not having site access, measurements were not taken during site visits.

5.0 Biophysical Analysis

An analysis of the significance of existing natural features within the subject property was completed. This analysis is based on the rarity or significance of features and/or associated functions/processes and/or current policies, or planning related studies. Identified significant natural features are described in detail below and are shown on Map 3.

5.1 Significant Natural Features and Habitats

As described above, the study area contains terrestrial and aquatic features and functions that are afforded significance under the Municipal OPs. The following is a summary of the significance and sensitivity of the study area natural features and how the natural heritage policies and legislation inform the identification of constraints for the proposed development.

5.1.1 Significant Woodland

As described in the 2024 EIS (NRSI 2024), the Cultural Woodland (CUW1) community represents a Significant Woodland in Halton Region and is subject to the Region's policies governing this form of Key Feature. Under the Town OP (2009), woodlands are designated as Natural Area lands. In accordance with Town and Region OPs, development or site alteration within or adjacent to (i.e., within 120m of) Regionally Significant Woodlands (as well as their associated buffers) is prohibited unless it has been demonstrated that there will be no negative impacts on the nature feature or its ecological functions (Halton Region 2024, Town of Oakville 2009).

5.1.2 Headwater Drainage Feature Classification and Management

Each HDF reach was assessed to evaluate and classify its functional importance and to identify management recommendations as per the Headwater Guideline (TRCA and CVC 2014). Each reach of the HDF was evaluated based on the four assessment steps outlined in the Headwater Guideline (TRCA and CVC 2014). Step 1 evaluates the hydrologic contribution and function of each reach, Step 2 assesses the riparian vegetation and conditions, Step 3 assesses the feature's contribution to fish and fish habitat, and Step 4 evaluates the terrestrial habitat function each reach provides. The classification results and assessment steps are summarized in Table 5, and the management recommendations for each assessed reach are shown on Map 3

The aquatic habitat assessment in the 2024 EIS (NRSI 2024) was based on one field visit in June 2023 and review of aerial imagery. The feature, which was originally identified as a watercourse, was determined to be an HDF upon further review.

Based on the full three-season field surveys completed in 2025, the overall HDF management recommendation for the reach within the subject property (TSMC1-1) is 'Conservation' and the reach upstream of the subject property (TSMC1-2) is 'Mitigation'. The following management description for 'Conservation' and 'Mitigation' is quoted directly from the Headwater Guideline (TRCA and CVC 2014):

- Conservation – Valued Functions: e.g., seasonal fish habitat with woody riparian cover; marshes with amphibian breeding habitat; or general amphibian habitat with woody riparian cover
    - Maintain, relocate, and/or enhance drainage feature and its riparian zone corridor;
    - If catchment drainage has been previously removed or will be removed due to diversion of stormwater flows, restore lost functions through enhanced lot level controls (i.e., restore original catchment using clean roof drainage), as feasible;
    - Maintain or replace on-site flows using mitigation measures and/or wetland creation, if necessary;
    - Maintain or replace external flows;
    - Use natural channel design techniques to maintain or enhance overall productivity of the reach; and,
    - Drainage feature must connect to downstream.

- Mitigation – Contributing Functions: e.g., contributing fish habitat with meadow vegetation or limited cover
    - Replicate or enhance functions through enhanced lot level conveyance measures, such as well-vegetated swales (herbaceous, shrub and tree material) to mimic online wet vegetation pockets, or replicate through constructed wetland features connected to downstream;
    - Replicate on-site flow and outlet flows at the top end of system to maintain feature functions with vegetated swales, bioswales, etc. If catchment drainage has been previously removed due to diversion of stormwater flows, restore lost functions through enhanced lot level controls (i.e. restore original catchment using clean roof drainage); and,
    - Replicate functions by lot level conveyance measures (e.g. vegetated swales) connected to the natural heritage system, as feasible and/or Low Impact

Development (LID) stormwater options (refer to Conservation Authority Water Management Guidelines for details).

Table 5. Headwater Drainage Feature Existing Conditions and Management Evaluation

HDF Reach Label	Step 1		Step 2	Step 3	Step 4	Management Recommendation
	Hydrology	Modifier(s)	Riparian Conditions	Fish and Fish Habitat	Terrestrial Habitat	
TSMC1-1	**Valued Function** Both reaches contained minimally flowing water (<0.5L/s) during the first visit, standing water during the second visit, and both reaches were dry (TSMC1-1 was surface damp) during the third visit. Due to the absence of surface water in July, this reach is categorized as "Valued" hydrology classification.	A soccer field is adjacent to this feature, tile outlets from the soccer fields may be present. This reach was historically a watercourse, but upstream development within the catchment has reduced its flow. The historic channel bed remained visible during the site visits.	**Important Function** A forest vegetation community (Cultural Woodland, CUW) is dominant within the riparian corridor of TSMC1-1, resulting in an 'Important' riparian classification.	**Contributing Function** The entire reach within the subject property was walked during all three visits; no fish were observed in 2025. Barriers to fish exist downstream of the subject property at the pedestrian crossing (culvert). Both reaches function as indirect fish habitat that convey flow, nutrients, and other allochthonous inputs (e.g., invertebrates, organic matter) to aquatic habitats downstream. As such, both reaches have 'Contributing' fish habitat classification.	**Limited Function** Amphibian habitat is not present within the subject property or upstream. Although, there is cultural woodland there is no habitat upstream of the property. Thus, these reaches do not act like a movement corridor resulting in a 'Limited' function.	**CONSERVATION**
TSMC1-2 (upstream of the subject property)		Evidence of historical and ongoing mowing is present within the grassed feature.	**Contributing Function** The riparian corridor of TSMC1-2 is dominated by mowed lawn (school yard), resulting in a 'Contributing' riparian classification.			**MITIGATION**

5.1.3 Habitat of Threatened and Endangered Species

Species at Risk Bats

Treed Bat Habitat

The bat habitat assessment identified 16 trees as potential habitat for SAR bats, 15 of which are outside of the Cultural Woodland (CUW1) community. Fourteen (14) trees are potential habitat for the SAR Little Brown Myotis, Northern Myotis, and/or Silver-haired Bat, and one tree is potential habitat for Tri-colored Bat (Map 3).

As described in Section 4.2.3, bat passive acoustic monitoring was undertaken to determine if these trees provide bat habitat within the subject property and, if so, identify which species are utilizing this potential habitat.

The results of the passive acoustic monitoring indicate that bat SAR are present within the subject property; however, maternity roosting habitat for bat SAR is not present within or adjacent to the subject property. Given the subject property's proximity to Lake Ontario, migratory stopover habitat for Eastern Red Bat, Silver-haired Bat, and Hoary Bat may be present, along with the potential for overwintering habitat for Eastern Red Bat and Silver-haired Bat.

Anthropogenic Bat Habitat

Based on the habitat assessment, all three structures were identified as capable of occasionally supporting day roosting habitat only (i.e., roosting by a male or non-reproductive female, or roosting during migrations). These are relatively low-sensitivity bat habitat functions as individual bats have less fidelity to these specific habitat features and suitable habitat is more widespread on the landscape. The habitat assessment confirmed that these structures do not support more sensitive maternity roosting or hibernation habitat.

Although no guano was identified within the attic or garage of the house, the interior spaces of the building were not fully accessible. The acoustic monitoring identified patterns of call recordings of Big Brown Bat that suggest roosting may be occurring within the house on the subject property, or in very close proximity, on at least a moderately regular basis. This could include for maternity roosting. Although not a SAR, Big Brown Bats are considered "Specially Protected Mammals" under the *Fish and Wildlife Conservation Act* (1997) and as such, intentional harm should be avoided.

5.1.4 Significant Wildlife Habitat

No SWH was confirmed within the study area. All other categories of SWH that were initially identified during SWH screening during the TOR stage (Appendix II) were subsequently ruled out based on the results of targeted surveys. See the 2024 EIS (NRSI 2024) for further details.

5.2 Buffers

Buffers are required for natural heritage features to protect them from impacts during and post-construction. At their most basic level, buffers spatially offset development areas from natural features such that direct impacts to the features are avoided. Buffers also represent an important component of a larger suite of recommended measures to mitigate impacts to the adjacent natural features, such as by reducing edge effects. Based on the significance and sensitivity of the natural features within the study area, ecological buffers must be considered in defining the limits of development on the subject property.

Significant Woodland Buffer

As described in the 2024 EIS (NRSI 2024), woodland buffers are prescribed based on protecting the trees and their root zones as well as providing associated open habitats required by forest wildlife species or for movement. Buffers from woodland driplines are important in maintaining the condition and function of trees within the woodland while protecting them from impacts of adjacent site alteration. A 10m-wide buffer is recommended from the Significant Woodland dripline limit on the subject property (Map 3). The 10m buffer ensures that existing root zones from woodland edge trees will be sufficiently protected while allowing room for future growth, and provides an area of natural woodland edge regeneration and active restoration to enhance the buffering capacity of the feature. A 10m woodland buffer recommendation is in conformance with Section 16.1.8 of the Livable Oakville OP (2009, last updated August 2021),

Headwater Drainage Feature Buffer

Given that the HDF is located within the Significant Woodland, and a 10m buffer is recommended for the Significant Woodland, the HDF will also be buffered.

6.0 Impact Assessment, Mitigation and Residual Impacts

6.1 Description of the Proposed Work

Innovative SHS is proposing the construction of a six-storey residential building comprised of 190 affordable rental housing units on the subject property with an incorporated daycare facility and office space, along with an associated parking area. See Section 1.0 for greater detail regarding the proposed development. See Map 4 for the proposed development overlaid onto the existing natural features.

6.2 Approach to Impact Assessment

Potential impacts arising from the proposed development are determined by comparing the details of the proposed undertaking with the characteristics of the existing natural features and their functions. The following is a description of the types of impacts that will be discussed, in accordance with the Region's EIA Guidelines (2020).

- Direct impacts to the natural features within the study area associated with disruption or displacement caused by the actual proposed 'footprint' of the development, including impacts caused by site grading and vegetation removal;
- 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 continued residential use of the subject property (based on the existing single detached residence), such as disturbance or degradation of the RNHS caused by occupation and use of the property; and,
- Cumulative impacts associated with the spatial and temporal implications of this continued land use in conjunction with other undertakings in the area.

6.3 Direct Impacts

6.3.1 Vegetation Removal and Site Grading

The approach to identifying and delineating the study area's natural features was used to avoid direct impacts from development on significant and sensitive natural features. The proposed development has been designed to avoid direct impacts to the Significant Woodland and HDF. The limits of the proposed development have been set back in accordance with the recommended buffer from these features as shown on Map 4.

The proposed development will be entirely located within the young cultural meadow. No significant vegetation species will be removed as a result of the proposed development.

6.3.2 Impacts to Wildlife and their Habitats

Species at Risk Bat Habitat

The habitat assessment identified 16 trees as potential habitat for SAR bats, 15 of which are outside of the CUW1 woodland that will be retained. Of those outside the woodland, 14 were identified as potential habitat for SAR Little Brown Myotis, Northern Myotis, and/or Silver-haired Bat, and one as potential habitat for Tri-colored Bat. All 14 trees are expected to require removal to accommodate the proposed development.

Although the quantity of SAR bat habitat proposed to be impacted is proportionally small in the context of the local landscape, it is still possible that permitting may be required to ensure compliance with endangered species legislation.

The province has enacted the Species Conservation Act, 2025 (SCA), to come into force on an unidentified date in the future. It is currently anticipated to come into force in early 2026. Requirements for consultation and permitting with MECP are expected to be different under the SCA than the current process under the ESA, such as project self-registration with development and implementation of a mitigation and monitoring plan. Once the SCA has come into force and requirements for consultation and permitting are known, NRSI will initiate correspondence with the MECP.

The following mitigation measures are recommended to minimize impacts to bats and their habitats:

- All tree and building removals should occur outside of the 'active' period identified by the MECP (i.e., no removals between March 15 – November 30) to avoid direct impacts to SAR bats;
- Measures to prevent direct impacts to Eastern Red Bat and Silver-haired Bat that may be overwintering during vegetation and building removals may be required, and may include, but not be limited to, the following:
    - Vegetation removal should be overseen by a qualified biologist,
    - Remove vegetation and buildings only when air temperature is greater than 0°C,
    - A qualified biologist should conduct a ground sweep for potential overwintering bats within leaf litter immediately prior to removals and machinery presence,

    - For removal of trees containing cavities, crevices or exfoliating bark: a large vehicle is recommended to shake trees at least 20 minutes, but no more than 40 minutes, prior to their removal to provide any bats in torpor the opportunity to arouse and depart before tree removal,
    - A qualified biologist should conduct a visual search of buildings, to the extent possible, for potential overwintering Silver-haired Bats immediately prior to building removals,
    - Likewise, a large vehicle is recommended to disturb (shake) buildings at least 20 minutes, but no more than 40 minutes, prior to their removal to provide any bats in torpor the opportunity to arouse and depart before building removal.
- The limit of all construction activities should be clearly delineated to avoid unnecessary encroachment into natural features and habitats to be retained;
- 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;
- Avoid the use of artificial lighting that would cause light wash effects on the treed areas; and
- Avoid the use of pesticides, or other products that adversely impact insect populations.

Other Wildlife Species

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 of April 1-August 31 so as to limit disturbances to nesting activities of birds and to avoid destruction of active nests. This includes the stripping of herbaceous plant cover from within the agricultural field. The destruction of migratory birds and their nests is prohibited under the federal *Migratory Birds Convention Act*.

6.4 Indirect Impacts

Vegetation clearing, site grading, and construction of the proposed development has the potential to cause indirect impacts to adjacent natural features and functions if not mitigated appropriately. Recommended mitigation measures are provided for each potential impact below.

6.4.1 Disturbance to Adjacent Natural Features and Wildlife Habitat

Vegetation clearing, site grading 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, which is already present within the subject property. 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 and to ensure that construction activity is maintained outside of these areas. Construction limit fencing should be delineated along the limits of disturbance.

Tree protection fencing must be installed where directed by a Tree Inventory and Preservation Plan (TIPP) and must conform to municipal guidelines in terms of fencing type, signage requirements, etc.

All tree protection fencing must be installed prior to site alteration and construction activities, and inspected by a certified arborist or environmental inspector. Where the need for tree protection and sediment and erosion protection coincides, geotextile materials may be affixed to the bottom of tree protection fencing in accordance with accepted practices. 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, or materials stockpiling should be located away from the natural features (i.e., Significant Woodland, HDF) and the buffer to limit potential to indirectly impact these features

During construction activities such as vegetation clearing and site grading, dust can potentially result in the following:

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

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

Excessive noise, vibrations, artificial lighting and human presence as a result of site preparation and construction activities may cause wildlife to temporarily avoid the area. These impacts can be mitigated by restricting the daily timing of construction activities to between 7:00hr and 19:00hr. This timing restriction should also apply to the use of generators or pumps insofar as possible. Any artificial lighting used for construction purposes should be turned off or directed away from the adjacent natural features following the completion of daily construction activities.

Such impacts resulting from dust, noise, and vibrations are expected to be temporary, minimal and localized during the construction of the proposed development. Significant effects on wildlife are not anticipated and it is expected that displaced wildlife species will return to the vicinity of the subject property following construction.

6.4.2 Changes to Hydrological Regime

Surface Water Drainage and Quantity Control

The stormwater management plan for the development has been designed such that catch basin manholes and catch basins will collect drainage and convey flows via private storm sewers to a proposed underground stormwater management tank prior to being discharged into the municipal storm system located on Sixth Line.

Two catchment areas are proposed under post-development conditions: one consisting of paved areas, rooftop areas, and landscaped areas, and another consisting of the wooded area and a concrete walkway (uncontrolled). There will be no additional sheet flow to the rear wooded area (C. Blahut, pers. comm., August 2025). The quantity of runoff will be controlled through an underground storage tank located on the southern section of the subject property as well as a 55m orifice tube to restrict flows exiting the property. The SWM plan for the site will

control post-development peak flow rates to pre-development rates between the 2-year and 100-year storm events.

Water Balance

Maintenance of a water balance between pre- and post-development conditions is important to ensure that the hydrological regimes of the receiving aquatic features are not altered through either significant increases or decreases in water inputs. Over the long-term, such imbalances would lead to alterations in the hydrological and ecological functions that these features provide, including but not limited to changes in vegetation community and species composition, and degradation or elimination of certain aquatic and terrestrial habitat functions.

Water balance requires the retention of a 25mm storm event by means of infiltration, evapotranspiration, or reuse. To provide the required volume control to meet site water balance requirements, drainage will be directed to a bottomless tank and a gravel infiltration gallery. Minor drainage will occur to the HDF; however, no additional flow will be directed to the feature from pre-development conditions (C. Blahut, pers. comm., August 2025). See Appendix E of the Functional Servicing and Stormwater Management Report (Aplin & Martin Consultants Ltd. 2025) for details.

Interference with Groundwater Flow

Based on a geotechnical study completed by Forward Engineering & Associates Inc. on the subject property (Forward Engineering & Associates Inc. 2025), no groundwater was observed within boreholes, which extended to depths of 1.60-4.67m below the existing ground surface. Due to the depth of groundwater, it is anticipated that subsurface constructions including building foundations/footings and installed servicing infrastructure are unlikely to alter existing groundwater flow patterns. In the event of water seepage into the excavations, it is expected that conventional pumping techniques will be sufficient (Forward Engineering & Associates Inc. 2025).

6.4.3 Sedimentation and Erosion

Construction-Stage

During site stripping and grading activities, areas of bare soil will be exposed which have the potential to erode during rainfall events and impact adjacent natural features such as the rear property woodland and HDF. Increased stormwater surface flow and erosion processes may

cause the deposition of sediments onto down-slope vegetation and the adjacent HDF, ultimately causing vegetation die-back or impaired health and a reduction in water quality.

Soil compaction also has potential to occur as a result of heavy machinery in the area of development. 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 natural features.

In order to protect on-site natural features from potential impacts due to sediment, an Erosion and Sediment Control (ESC) Plan must be developed prior to any construction activities on-site. The primary principles associated with sedimentation and erosion 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 is to be prepared during the site plan stage of development planning.

The following general recommendations should be implemented to mitigate erosion and sedimentation impacts, to be refined within the detailed ESC Plan as required:

- Installation of silt fencing along the construction limits in all locations where run-off will discharge to the adjacent natural features. Geotextile material can be attached to tree protection fencing where this fencing type overlaps with silt fencing requirements.
- ESC measures must be regularly inspected and repaired or replaced in a timely manner. Accumulated sediment must be removed as needed.
- Placement of topsoil and seeding of all graded areas not subject to active construction within 30 days. A native seed mix, appropriate to the site conditions and supplemented with a nurse crop, should be applied in areas adjacent to existing natural features.
- It is also recommended that topsoil piles be located away from adjacent natural features and that silt fencing be installed around piles to prevent off-site migration of water-borne sediments.

The impact resulting from soil compaction can be mitigated by minimizing the use of construction vehicles and equipment within buffer areas except where required, and by locating material stockpile and equipment storage locations away from the natural features.

Post-Construction Drainage

As described in Section 6.4.2, post-development site runoff will be controlled to the 1:5-year pre-development levels for storms up to the 1:100-year level. This will be achieved through an underground storage tank and orifice controls.

6.4.4 Water Quality

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. Water quality impairments can also pose health risks to humans wherever there is potential to come into contact with untreated or inadequately treated water discharge. The water quality of aquatic receptors can also be compromised when excess nutrient concentrations, such as from fertilizers, cause eutrophic conditions which subsequently decrease oxygen availability for fish and other aquatic organisms.

Controlled stormwater runoff will be treated to achieve an "enhanced" level of treatment (80% Total Suspended Solids removal). Stormwater runoff will be conveyed through an Up-Flo Filter. Landscaped areas and rooftops have been deemed inherently clean and have been credited at an 80% removal efficiency (Aplin & Martin Consultants Ltd. 2025). One of the catchment areas will drain to the woodland and a concrete walkway.

6.5 Induced Impacts

Establishment of the proposed development will increase the potential for human disturbances to the adjacent natural features if not properly mitigated. In general, the development may lead to increased human access to the Significant Woodland and HDF with associated potential for habitat degradation (e.g., vegetation trampling or damage, garbage disposal).

As stated in the 2024 EIS (NRSI 2024), it is recommended that the ecological buffer limit be physically demarcated to ensure that the buffer can be maintained in a natural/restored state

and kept outside of actively used portions of the property. This can be achieved by installing permanent fencing along the buffer limit. Installation of permanent fencing along the buffer limit is anticipated to represent an effective deterrence to human encroachment, and the dumping of refuse from the rear of the residential land use, into the natural features and buffer restoration areas.

The proposed development may result in off-site trespassing and garbage dumping/littering by members of the public, particularly due to the presence of an existing pedestrian trail to the immediate rear of the property. Since the Cultural Woodland (CUW1) is part of the greater RNHS, it is not recommended to fence off the rear limits of the property since this may inhibit certain wildlife movements that may occur through the CUW1 community along the wooded corridor that the on-property CUW1 is connected to. It should be noted that there was evidence of human disturbance within the rear portion of the property based on NRSI's site investigations in 2023 and 2025. Therefore, it is recommended that No Trespassing signage be installed adjacent to the current trail to ensure trail users understand that the subject property is private property.

Application of fertilizers and herbicides should not be applied to re-naturalizing vegetation within the buffer. It is recommended that any exterior artificial lighting should 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.

6.6 Cumulative Impacts

In order to evaluate the potential for cumulative impacts resulting from this proposal, it is necessary to look beyond the boundaries of the subject property to the adjacent lands. This approach looks at the character and potential changes that are occurring or may occur in the future on surrounding lands. Cumulative impacts may arise as a result of impacts from a number of sources to add up (or combine) if they overlap in space, overlap in time, occur at some receiver spatially removed from the undertaking, or at some future point in time.

We are not aware of any nearby developments that may affect the subject property natural features (i.e., Significant Woodland and HDF). Provided the recommended mitigation measures presented in this EIS Addendum are implemented, cumulative impacts to the on-site natural features are not anticipated.

6.7 Residual Impacts

Residual impacts to natural features or ecological functions may arise if implemented mitigation measures cannot completely alleviate all impacts. The residual impacts represent the potential effects that may occur, even following implementation of recommended mitigation measures. A summary of potential residual impacts, where they may be expected, is summarized in Table 6.

Table 6. Impact Assessment, Mitigation Measures, and Residual Impacts

Potential Impact	Development activity creating the impact	Description of impacts by feature and/or function	Mitigation measures	Efficacy and/or residual impacts	Recommended Response
• Erosion and sedimentation	• Site stripping and grading activities • Use of heavy machinery in the area of development • Stockpiling	• Exposed areas of bare soil have the potential to erode during rainfall events and cause sediment deposition into adjacent natural features. This is an indirect impact. • Soil compaction can reduce the permeability of soils and affect their ability to retain water during rain/snow melts. This is an indirect impact.	• Prepare and implement a comprehensive Erosion and Sediment Control (ESC) Plan. • Heavy-duty ESC fencing is to be installed prior to any vegetation removal, rough grading and construction to demarcate the limit of disturbance. Fencing is to be inspected for proper installation by a qualified inspector and must be maintained for the duration of work until exposed soils stabilize. • Any areas of bare soil within the construction area are to be re-vegetated as soon as feasible to prevent erosion of soils and keep dust to a minimum (within 30 days of area being left inactive). An appropriate native seed mix comprised of species is to be applied in areas adjacent to existing natural features • Minimize potential for soil compaction. • No material stockpile or storage of equipment is to occur within the natural areas.	• Release of some sediments into natural features.	• Remove sediment deposits that accumulate outside of the construction limits. Inspect the areas for any signs of residual vegetation damage or disturbance. • Review and augment the ESC Plan through additional protective measures where required.
• Damage to/removal of trees and vegetation	• Vegetation clearing and site grading • Use of heavy machinery in the area of development	• Vegetation clearing and site grading has the potential to inadvertently destroy, damage and degrading existing vegetation along the development limits. • Direct damage and indirect disturbances can cause stress on the natural features that weaken their	• Delineate limits of work zones with heavy-duty ESC fencing. • Tree protection fencing must be installed where directed by a Tree Inventory and Preservation Plan (TPP) and must conform to municipal guidelines. • Compensate tree/vegetation removals	• Death of planted replacement trees, as identified in the TIPP	• A Certified Arborist or Registered Professional Forester should attend the site as soon as possible to prune damaged tree limbs or roots according to arboricultural best practices.

		ecological integrity. This may result in the establishment and proliferation of invasive, non-native species.			• All unauthorized materials must be removed from fenced tree protection zones as soon as possible.
• Potential death, injury, or harassment of wildlife	• Removal of trees and buildings • Vegetation clearing • Excessive noise, vibrations artificial lighting, and human presence from site preparation (vegetation stripping) and construction activities such as grading.	• Excessive noise, vibrations, artificial lighting, and human presence due to site preparation and construction activities may cause wildlife to temporarily avoid the area	• All wood stems >1m in height should be removed outside of the bat SAR active period (i.e., no removals between April 1-November 30). • Vegetation clearing should occur outside of the bird nesting season of April 1-August 31. • Restrict daily timing of construction activities to between 7:00hr and 19:00hr. • Lighting equipment associated with construction activities to be turned off following cessation of daily construction activities, or turned away from natural features. • Moisten exposed soils / dry soil with water as needed during construction to reduce dust.	• No residual impacts are anticipated.	• N/A

• Potential death or injury of birds	• Establishment of the proposed residential buildings within proximity to the adjacent natural features	• The proposed development may lead to increased bird mortality due to glass structure (e.g., windows) collisions.	• Incorporate pre-treated glass into building design or treat glass surfaces following construction. Specifically, window markings must be:
			  • arranged in a dense pattern, leaving no gaps larger than 2x2 inches and must cover the entire surface of the glass;
			  • applied to the outside surface of the glass to effectively reduce the reflection of trees/sky; and,
			  • high contrast so that they stand out (e.g., white markings against a dark window).
				• No residual impacts are anticipated.	• N/A

• Human disturbances to the adjacent natural features	• Establishment of the proposed residential within proximity to the adjacent natural features.	• The proposed development may lead to increased human access to the adjacent natural features with associated potential for habitat degradation, such as vegetation trampling or damage and garbage disposal. The increase in human access to the natural features is an induced impact.	• The ecological buffer limit should be physically demarcated to ensure that buffers can be maintained in a natural/restored state. • Install No Trespassing signage adjacent to the current trail.	• No residual impacts are anticipated.	• N/A

6.8 Mitigation

The Mitigation Hierarchy is framework that uses an alternatives assessment to minimize negative impacts to the natural heritage system. In accordance with Halton Region's Environmental Impact Assessment Guidelines (2020), mitigation strategies are intended to address or minimize the anticipated and potential impacts such that there is no negative impact resulting from the development or site alteration. The Mitigation Hierarchy typically consists of the following steps:

Step 1: Impact Avoidance

Impact avoidance is the first mitigation measure to consider, as it completely avoids any impacts to natural heritage features.

Step 2: Minimization of Impacts

If impacts cannot be avoided, the next step is to minimize the extent and severity of the impacts. This may include identifying appropriate buffers and developing recommendations for the EIS focused on minimizing impacts such as sediment and erosion control, construction timing windows, etc.

Step 3: Restoration/Enhancement of Existing Natural Features

When impacts cannot be avoided or minimized, then efforts should be made to restore the area to pre-development conditions.

Step 4: Creation of New Natural Features (off-setting)

In some cases, where features are required to be removed to accommodate development, impacts can be mitigated through natural feature creation to address any residual impacts that are not fully addressed by avoidance, minimization, and restoration/enhancement.

The Mitigation Hierarchy was considered in the development planning for the proposed development. The development plan (Map 4) is proposed to be located entirely outside of the natural heritage system (i.e., outside of the HDF and Significant Woodland and its buffer), therefore adhering to Impact Avoidance of the Mitigation Hierarchy.

7.0 Enhancement Opportunities

As recommended in the 2024 EIS (NRSI 2024), the buffer should be planted with a mixture of White Pine (*Pinus strobus*), Eastern White Cedar (*Thuja occidentalis*), Red Oak (*Quercus rubra*), Bur Oak (*Quercus macrocarpa*), Black Cherry *(Prunus serotina*), Sugar Maple (*Acer saccharum*) and native shrubs. In order to suppress buckthorn seedbank regeneration, the conifer component of the planting should account for 50-75% of the planted trees, with the remainder consisting of deciduous species. A native meadow seed mixture, containing species appropriate to the Sixteen Mile Creek subwatershed, should be broadcast throughout the buffer to establish herbaceous cover. The planted species within the buffer should transition from predominantly trees along the eastern edge, closest to the woodland, transitioning to shrubs and meadow edge along the western extent of the buffer. It is recommended that tree and shrub plantings are completed in the spring, no later than May 15th. Refer to the planting plan prepared by MHBC, dated January 9, 2026.

To reduce the competition of invasive species within the restored buffer area, an invasive species management plan should be established prior to restoration efforts. The 10m woodland buffer is currently a Cultural Thicket dominated by Common Buckthorn. It is recommended that Common Buckthorn is managed with herbicide treatment during the late-season dormant period (fall) to maximize herbicide efficacy and align with buffer preparation activities prior to spring planting. Map 5 details the Buffer and Enhancement Plan and the sequencing of Common Buckthorn treatment, seeding, planting, and monitoring.

The restoration plantings and treatment of Common Buckthorn would improve the diversity and resiliency of the buffer to mitigate future impacts to the interior woodland area as a result of residential land use (e.g., through attenuation of light casting and noise effects from nearby human occupancy).

8.0 Monitoring Plan

Pre-, during-, and post-construction monitoring is recommended to ensure that the natural features are not negatively impacted throughout all stages of development. This plan will be implemented through the relevant conditions of planning approvals.

The recommended monitoring components are described below.

8.1 Pre-Construction Monitoring

Prior to any construction activity on-site, including vegetation clearing and site grading, on-site inspections of the following should be undertaken to ensure proper installation:

- Sediment and erosion control measures (e.g., silt fencing) in accordance with an approved ESC Plan; and,
- Tree and natural area protection measures, including proper installation of tree protection fencing in accordance with the Tree Protection Plan.

8.2 Construction Monitoring

Construction monitoring is the responsibility of the proponent and is to be undertaken by a designated environmental inspector or qualified delegate. Generally, construction monitoring must occur to ensure compliance with the conditions of various permits. Construction monitoring measures are to include the following:

- Periodic monitoring of the above measures to ensure maintenance and effectiveness;
- Pruning of any limbs or roots (of trees to be retained) damaged during construction following approved arboricultural techniques;
- Inspection of the ecological buffers to ensure no unauthorized construction encroachments, damage to trees, or other disturbances caused by construction activities outside of the construction limits;
- Fueling and maintenance of machinery to be undertaken at a designated location away from the adjacent natural features and associated buffers; and,
- Storage of machinery and material, fill, etc. in designated areas away from the natural feature and buffer areas.

8.3 Post-Construction Monitoring

Upon completion of the planting plan (MHBC 2026), the landscape contractor or restoration specialist should review plant survival and provide replacement plantings to ensure 80% survival has been achieved after one growing season as a part of the landscape warranty process. Additionally, this review should document compliance with the plan (e.g., correct species and quantities were planted).

Plant survival and succession should be assessed annually for two years after the one-year landscaping review. Vegetation monitoring should consist of a review of the restoration polygons by a qualified professional during the growing season (May to August). Data collection should include a botanical inventory, photos (preferably from a consistent location year to-year), and an inventory (species, location, abundance) of detrimental invasive plants if determined to be a threat to the establishment of native species.

An annual monitoring report should be prepared and submitted to the City of Oakville summarizing the results of monitoring and recommending/documenting adaptive management measures if needed. Adaptive management could include changes in maintenance, additional planting/seeding, or invasive species management.

9.0 Conclusion

NRSI was retained by Innovative SHS to complete an EIS Addendum associated with the proposed development of a property located at 1493 Sixth Line in the Town of Oakville. The development would include a six-storey residential building comprised of 190 rental units on the subject property with an incorporated daycare and amenity space, along with an associated surface-level parking area (Map 4). This EIS Addendum was prepared following NRSI's earlier completion of an EIS for a previous owner of the subject property in 2024, which initially characterized the existing on-site natural features. This EIS Addendum builds on the results of the original EIS through completion of additional targeted field surveys.

The subject property contains a Cultural Woodland (CUW1) within the eastern section that represents Significant Woodland within the Town and Region. The on-site portion of Significant Woodland is contiguous with Significant Woodland that extends off and to the rear of the subject property. An HDF was also identified within the eastern section of the property. Based on the full three-season field surveys, the overall HDF management recommendation for the reach within the subject property is 'Conservation' and the reach upstream of the subject property is 'Mitigation'.

A 10m buffer has been recommended from the agency-confirmed Significant Woodland dripline. The 10m Significant Woodland buffer would also spatially offset development areas from the HDF due to its location within the woodland.

Based on the bat habitat assessment, 16 trees were identified as potential habitat for SAR bats, 15 of which are outside of the Significant Woodland. Bat passive acoustic monitoring was undertaken to determine if these trees provide bat habitat within the subject property and, if so, identify which species are utilizing this potential habitat. The results of this monitoring are not yet available. All three on-site structures were identified as capable of supporting day bat SAR roosting habitat only (i.e. roosting by a male or non-reproductive female, or roosting during migrations). In the case of the house, potential bat habitat use is limited to the attached garage. The habitat assessment confirmed that these structures do not support maternity roosting or hibernation habitat. Removal of these structures will not represent a negative impact to SAR bats or their habitat. A Chimney Swift survey was conducted on the subject property; based on these results, ESA-protected habitat for this species was confirmed to be absent on the subject property.

Recommendations were provided to avoid or mitigate impacts to the natural features or their ecological functions. See Section 6.0 for further information on the potential impacts and proposed recommendations.

Based on this study, the proposed development (both during and post-construction) will not negatively impact the natural heritage features, including their ecological functions, within the Town and RNHS or unmapped Key Features, in accordance with Section 118.3 of the Regional OP (2024). Further, the proposed OP and Zoning Bylaw Amendment are appropriate for the subject property.

The bat passive acoustic survey results are still pending; our assessment of SAR bat habitat on the subject property may be updated once completed.

9.1 Summary of Recommendations

The following is a summary of the mitigation measures, enhancement opportunities, and monitoring requirements to be implemented. Please refer to the relevant section of the report for additional details about each recommendation. Where applicable, the summary identifies where these recommendations have been incorporated into existing plans for the development.

Table 7. Summary of EIS Recommendations.

Recommendations
Direct Impact Mitigation
A 10m ecological buffer is recommended from the surveyed Significant Woodland boundary.
Vegetation clearing should be maintained outside the period April 1-August 31 to avoid contravention of the *Migratory Birds Convention Act*.
All tree and building removals should occur outside of the active period for the applicable SAR bats (no removals between April 1 - November 30) to avoid direct impacts to individual bats
Indirect Impact Mitigation
Construction limits must be clearly delineated through use of silt fencing, or other forms of construction 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 natural features and outside of the buffer zone.
Dust-prone soils should be moistened with water as needed.
The daily timing of construction activities should be maintained to the period 7:00-19:00 hrs.
Any artificial lighting used for construction purposes should be turned off or directed away from the adjacent natural features following the completion of daily construction activities.
Construction-stage ESC measures must be implemented in accordance with an approved ESC Plan to effectively mitigate erosion and sedimentation impacts on the adjacent natural features.
The SWM plan for the site will control post-development peak flow rates to pre-development rates between the 2-year and 100-year storm events.
Controlled stormwater runoff will be treated to achieve an “enhanced” level of treatment (80% Total Suspended Solids removal).
Induced Impact Mitigations
Install No Trespassing signage adjacent to the current trail.
The use of pesticides and fertilizers within the buffer area should be avoided.
Permanent exterior lighting should be directed away from the woodland, and should be downward-casting to mitigate light pollution effects.
Installation of permanent fencing along the buffer to deter human encroachment.
Residual Impact Mitigation
Remove sediment deposits that accumulate outside of the construction limits. Inspect the areas for any signs of residual vegetation damage or disturbance. Review and augment the ESC Plan through additional protective measures where required.
Replacement trees must be inspected two years following their year of planting (coinciding with most nursery stock warranty periods) to ensure their proper establishment and survival. Any replacement trees that are observed to have died or are in poor condition at the time of the inspection should be replaced on a 1:1 basis.
Enhancement Opportunities
The HDF and Significant Woodland buffer zones should be enhanced with native tree and shrub plantings, as well as a native meadow seed mixture.
Monitoring Plan
Pre-construction and construction-stage inspections of tree protection and silt fencing are recommended to ensure proper installation and function.
Any limbs or roots of trees to be retained that are damaged during construction must be inspected by a certified arborist and pruned where necessary.

Construction inspections should ensure no unauthorized entry into or damage of buffer and natural features, and that fueling of machinery and stockpiling of materials is maintained away from these areas.
Inspections of enhancement plantings should be undertaken to ensure survival and proper establishment.

10.0 References

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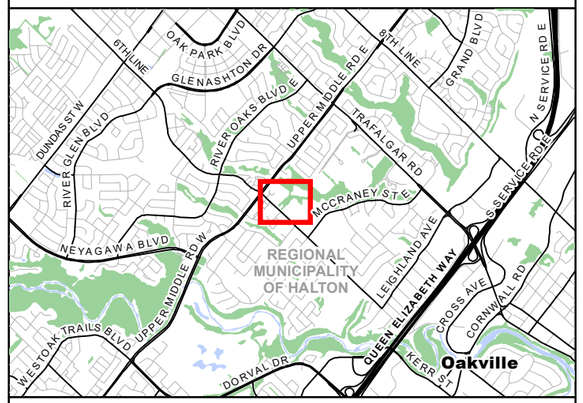
Maps

Map 1

Sixth Line, Oakville

Study Area



Legend

- Study Area (120m)
- Subject Property
- Headwater Drainage Feature (HDF)
- NRSI Surveyed Dripline Boundary (Reviewed by Halton Region on June 20, 2023)

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project: 3096 Date: January 16, 2026	NAD83 - UTM Zone 17 Size: 11x17" **1:1,700**

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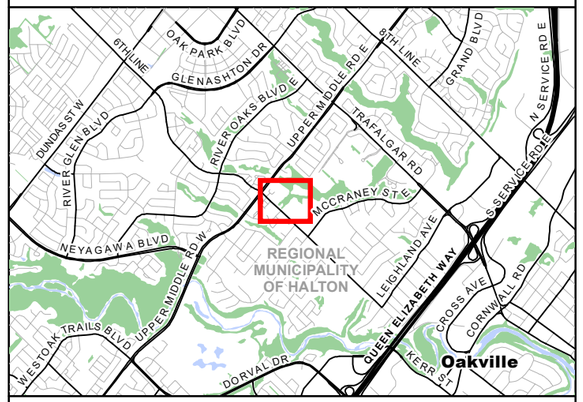
Map 2

Sixth Line, Oakville
Vegetation Communities and Survey Locations



Legend

- Study Area (120m)
- Subject Property
- Bat Acoustic Survey Station
- Headwater Drainage Feature (HDF)
- Reach Break
- NRSI Surveyed Dripline Boundary (Reviewed by Halton Region on June 20, 2023)
- Ecological Land Classification (ELC)
- ELC Inclusion

(CUM) Cultural Meadow

(CUM1) Mineral Cultural Meadow Ecosite

(CUT1) Mineral Cultural Thicket Ecosite

(CUW1) Mineral Cultural Woodland Ecosite

(FOD4) Dry - Fresh Deciduous Forest Ecosite

(H) Hedgerow

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Date: January 16, 2026

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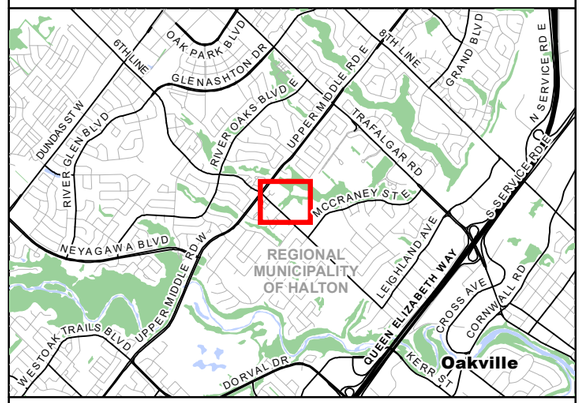
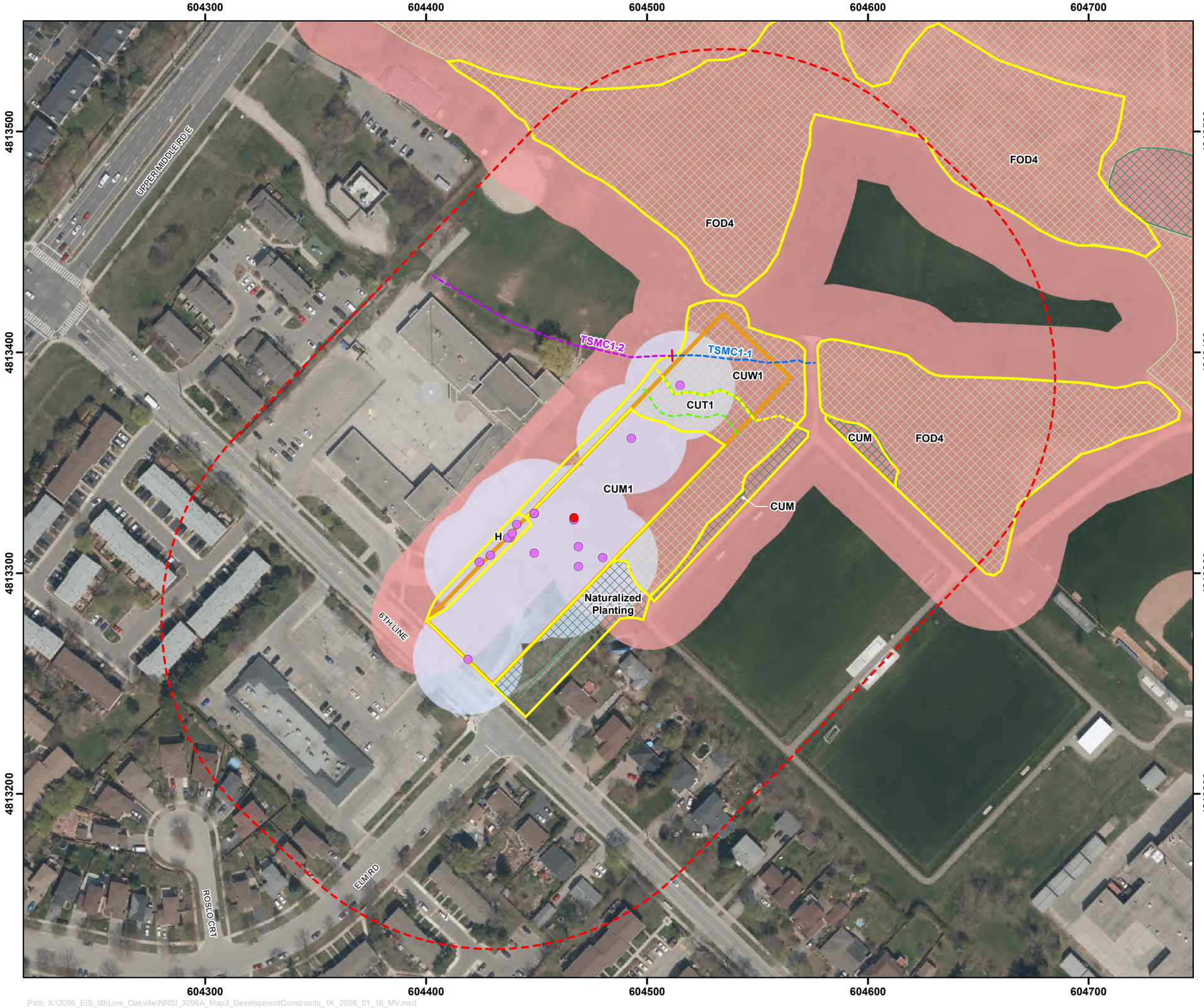
Map 3

Sixth Line, Oakville

Development Constraints





Legend

- Study Area (120m)
- Subject Property
- NRSI Surveyed Dripline Boundary (Reviewed by Halton Region on June 20, 2023)
- Significant Woodland Buffer (10m)
- Ecological Land Classification (ELC)
- ELC Inclusion
- (CUM) Cultural Meadow
- (CUM1) Mineral Cultural Meadow Ecosite
- (CUT1) Mineral Cultural Thicket Ecosite
- (CUW1) Mineral Cultural Woodland Ecosite
- (FOD4) Dry - Fresh Deciduous Forest Ecosite
- (H) Hedgerow

Headwater Drainage Feature (HDF) Management Recommendation

- Conservation
- Mitigation
- Reach Break

Potential Species at Risk Bat Roosting Habitat

- Little Brown Myotis, Northern Myotis, or Silver-haired Bat
- Tri-colored Bat

Potential Migratory Bat Stopover Habitat

- Stopover Roosting Habitat
- Staging Habitat

Potential Migratory Bat Overwintering Habitat

- Eastern Red Bat
- Silver-haired Bat

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Project: 3096
Date: January 16, 2026

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Size: 11x17"
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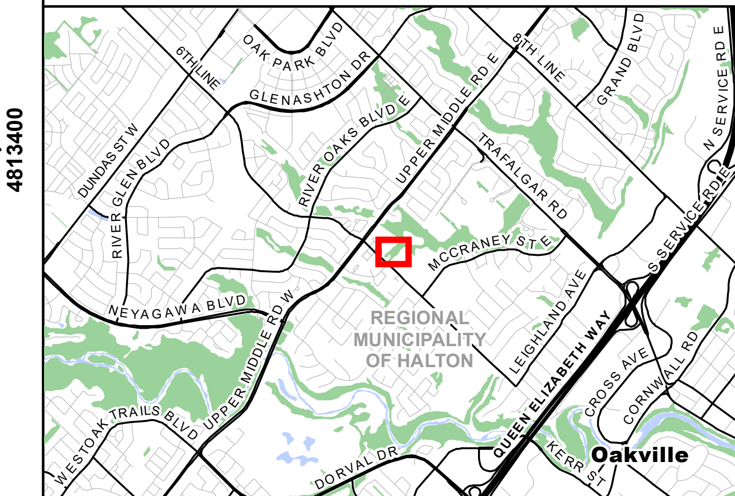
Map 4

Sixth Line, Oakville

Proposed Site Plan



Legend

- Study Area (120m)
- Subject Property
- Proposed Site Plan
- Existing Conditions
- Headwater Drainage Feature (HDF)
- Reach Break
- NRSI Surveyed Dripline Boundary (Reviewed by Halton Region on June 20, 2023)
- Significant Woodland Buffer (10m)
- Ecological Land Classification (ELC)
- ELC Inclusion

(CUM) Cultural Meadow
(CUM1) Mineral Cultural Meadow Ecosite
(CUT1) Mineral Cultural Thicket Ecosite
(CUW1) Mineral Cultural Woodland Ecosite
(FOD4) Dry - Fresh Deciduous Forest Ecosite
(H) Hedgerow

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Project: 3096
Date: January 16, 2026

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

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Objectives

Objective 1: To ensure the protection and enhancement of existing natural features by establishing a buffer and improving the condition of the existing woodland edge.
This will be achieved trough:

- Direct planting: tree, shrub and herbaceous nursery stock
- Seeding: sowing with native seed as outlined in Stage 2 of the sequencing section below
- Natural succession: to occur through natural seed dispersal from the adjacent natural areas
- Herbicide application: Invasive species will be treated adjacent to woodland features as outlined in Stage 1 of the sequencing to improve the quality of habitat and the establishment of the proposed native plantings

Objective 2: To reduce competition in restored areas by invasive species.
This will be completed through:

- Herbicide application: Invasive species will be treated as outlined in Stage 1 of the sequencing

Sequencing

Stage 1: Invasive Species Management

The proposed 10m woodland buffer is currently comprised of a cultural thicket that is dominated by Common Buckthorn *(Rhamnus cathartica)* . Management of Common Buckthorn with herbicide treatment will be prioritized prior to other restoration activities.

A cut-and-stump herbicide treatment is recommended to manage Common Buckthorn within the buffer and prepare the area for native tree and shrub planting. Buckthorn shrubs greater than approximately 1.0 m in height should be cut close to ground level using hand tools, brush cutters, or chainsaws. Immediately following cutting, the freshly exposed stumps are to be treated with Garlon RTU using a paintbrush or squirt bottle to prevent re-sprouting and eliminate future seed production. All Common Buckthorn brush is to be removed from the site after cutting. Access to the treatment area should be prohibited for a minimum of 12 hours post-application.

This treatment is to be implemented during the late-season dormant period (fall) to maximize herbicide efficacy and align with buffer preparation activities prior to spring planting. Scheduling of these activities should be coordinated with the timing of the proposed development to ensure effective site preparation.

Stage 2: Seeding

The buffer area should be raked using a Garant-type landscape rake prior to seed application to lightly scarify the soil surface and improve seed-to-soil contact. Following site preparation, the selected CVC1–Upland seed mix should be hand-broadcast in combination with a 50/50 nurse crop mixture of Annual Oats *(Avena sativa)* and White Proso Millet *(Panicum miliaceum)* . Fall installation is recommended to ensure that native seed species undergo natural cold-moist stratification over winter, promoting germination and early establishment in the subsequent growing season. Site preparation and seed broadcasting activities should occur within two weeks of the Common Buckthorn cut-and-stump treatment.

Stage 3: Planting

Planting should be completed the following spring of Stage 1 and 2. It should be completed no later than May 15th to avoid drought stress and to increase the survival of the planted material. Following planting, all trees and shrubs are to have cedar or hardwood mulch applied around the base of each stem (in a donut form) to retain moisture and reduce competition from the plants during early establishment. Mulch should not be dyed.

Direct planting is to occur in the identified planting zones of the 10m woodland buffer. Refer to the drawing prepared by MHBC, dated January 9, 2026.

Refer to the Planting Specifications section of this sheet for planting details.

Stage 4: Monitoring

Landscape Review: Upon completion of the planting plan, the landscape contractor or restoration specialist should review plant survival and provide replacement plantings to ensure 80% survival has been achieved after one growing season as a part of the landscape warranty process. Additionally, this review should document compliance with the plan (e.g., correct species and quantities were planted).

Enhancement Area Monitoring: Plant survival and succession should be assessed annually for two years after the one-year landscaping review. Vegetation monitoring should consist of a review of the restoration polygons by a qualified professional during the growing season (May to August). Data collection should include a botanical inventory, photos (preferably from a consistent location year to-year), and an inventory (species, location, abundance) of detrimental invasive plants if determined to be a threat to the establishment of native species.

An annual monitoring report should be prepared and submitted to the City of Oakville summarizing the results of monitoring and recommending/documenting adaptive management measures if needed. Adaptive management could include changes in maintenance, additional planting/seeding, or invasive species management.

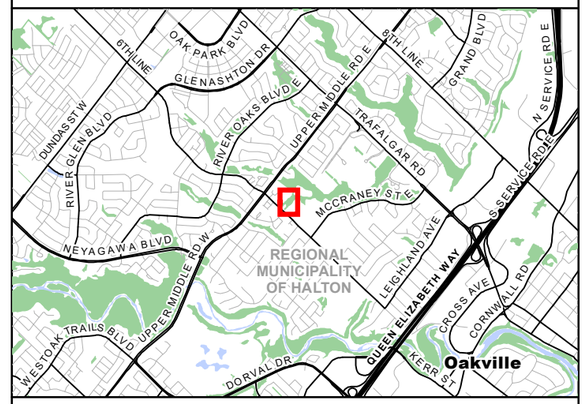
Planting Specifications

- All plant materials will be true to species.
- No garden cultivars will be accepted.
- Minimum container or plant sizes are provided for tree and shrub species.
- Material will be field fit by a Restoration Specialist based on soil moisture and aspect to emulate natural communities. Substitutions will not be permitted with out approval by the Restoration Specialist

Path: X:\3096_EIS_6thLine_Oakville\NRSI_3096B_Map5_BufferRestoration_EnhancementPlan_1K_2026_01_16_MV.mxd

Map 5

Sixth Line, Oakville
Buffer Restoration and Enhancement Plan



Legend

- Study Area (120m)
- Subject Property
- Headwater Drainage Feature (HDF)
- Reach Break
- NRSI Surveyed Dripline Boundary (Reviewed by Halton Region on June 20, 2023)
- 10m Buffer Planting Zone
- Invasive Species Management Area
- Ecological Land Classification (ELC)
- ELC Inclusion
- (CUM) Cultural Meadow
- (CUM1) Mineral Cultural Meadow Ecosite
- (CUT1) Mineral Cultural Thicket Ecosite
- (CUW1) Mineral Cultural Woodland Ecosite
- (FOD4) Dry - Fresh Deciduous Forest Ecosite
- (H) Hedgerow

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

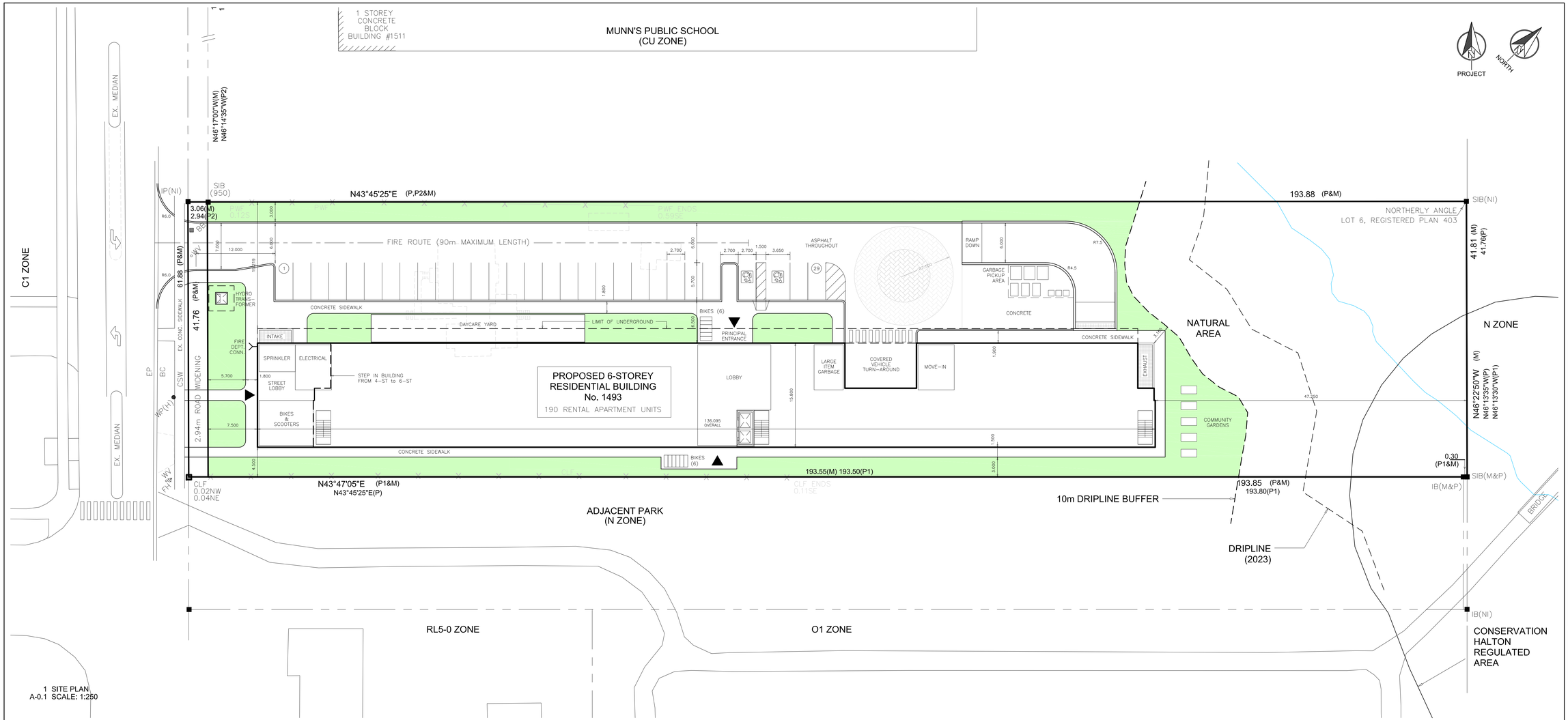
Project: 3096B
Date: January 16, 2026

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

0 10 20 30 40 50 60 Metres

N

Appendix I
Proposed Site Plan



1 SITE PLAN
A-0.1 SCALE: 1:250

RH ZONE REQUIREMENTS	REQUIREMENT	PROPOSED
Minimum lot area*	1,858.0 m2	6,166.2 m2
Minimum lot frontage	24.0 m	41.8 m
Minimum front yard*	7.5 m	7.5 m
Minimum interior side yard (north)	4.5 m	19.2 m
Minimum interior side yard (south)	4.5 m	4.5 m
Minimum rear yard (from lot line)	7.5 m	47.2 m
Minimum rear yard (from 10m buffer)	-	3.1 m
Maximum height	n/a	24.0 m
Maximum lot coverage*	35%	2,131.9 m2 (35%)
Minimum landscaping coverage*	10%	1,531.3 m2 (25%)
Landscape buffer adjacent parking area	3.0 m	3.0 m

*based on NET lot area (less widening, natural area, buffer)

PROPOSED 6-STOREY RESIDENTIAL HOUSING

LOT AREA

GROSS AREA	8,092.4 m2 (0.8092 ha)
ROAD WIDENING	122.6 m2 (0.0123 ha)
LOT AREA	7,969.8 m2 (0.7969 ha)
NATURAL AREA + 10m BUFFER	1,803.6 m2 (0.1804 ha)
NET LOT AREA*	6,166.2 m2 (0.6166 ha)

GROSS FLOOR AREA

6th FLOOR	1,979.8 m2	21,310 sf
5th FLOOR	1,979.8 m2	21,310 sf
4th FLOOR	2,131.9 m2	22,945 sf
3rd FLOOR	2,131.9 m2	22,945 sf
2nd FLOOR	2,131.9 m2	22,945 sf
1st FLOOR	2,057.5 m2	22,145 sf
TOTAL	12,412.8 m2	133,600 sf

UNIT BREAKDOWN

6th FLOOR	23 1br,	11 2br,	1 3br =	35
5th FLOOR	23 1br,	11 2br,	1 3br =	35
4th FLOOR	23 1br,	12 2br,	2 3br =	37
3rd FLOOR	23 1br,	12 2br,	2 3br =	37
2nd FLOOR	23 1br,	12 2br,	2 3br =	37
1st FLOOR	2 1br,	7 2br,	0 3br =	9
TOTAL	117 1br,	65 2br,	8 3br =	190 UNITS @ 0.6166 ha = 308 uph

ACCESSIBLE UNITS

1br UNITS	32
2br UNITS	22
3br UNITS	3
TOTAL	57 (30% OF 190)

RENTABLE AREA

117 1br @ 425 = 49,725 sf
65 2br @ 635 = 41,275 sf
8 3br @ 860 = 6,880 sf
TOTAL = 97,880 sf

PARKING

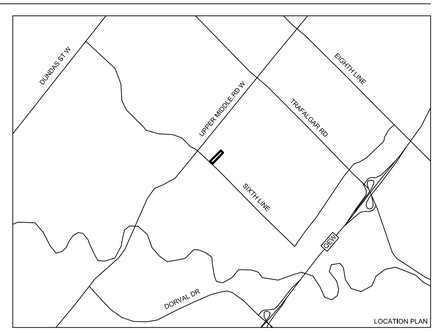
190 RENTAL UNITS @ 0.47 = 90 SPACES
450 m2 OFFICE & DAYCARE @ 1/35 = 13 SPACES
TOTAL = 103 PARKING SPACES
74 SPACES PROVIDED UNDERGROUND
29 SPACES ON SURFACE
ACCESSIBLE PARKING @ 1, PLUS 3% = 5 REQUIRED, 6 PROVIDED

FLOOR AREA BREAKDOWN

FLOOR AREA, RESIDENTIAL	11,962.8 m2	128,775 sf
INCLUDES AREA OF ALL SUITES (INCLUDING EXTERIOR WALLS), CORRIDORS, STAIRS, ELEVATORS, LOBBY, ABOVE GRADE SERVICE ROOMS AND RESIDENTIAL AMENITY AREAS.		
FLOOR AREA, NON-RESIDENTIAL	450.0 m2	4,825 sf
INCLUDES 1st FLOOR AREAS DEDICATED TO 'HSH' OFFICE, DAYCARE, AND MANAGEMENT OFFICE		
FLOOR AREA, GROSS	12,412.8 m2	133,600 sf

ADDITIONAL FLOOR AREAS (NOT INCLUDED IN GROSS AREA)

BASEMENT PARKING LEVEL	2,442.4 m2	26,290 sf
MECHANICAL PENTHOUSE	158.0 m2	1,700 sf



LOCATION PLAN

pml.A
patrick markus luckie, Architect
7260 BENDIGO CIRCLE • MISSISSAUGA, ON • L5N 1Z4 • TEL: 416 885 0108

innovative s|h|s

PENALTA

Revisions:	
Date:	Particular:
DEC.10.25	REVISED CONCEPT, BUILDING ALONG SOUTH LOT LINE

Issue:	
Date:	Particular:
JUN.17.25	ISSUED FOR REVIEW
AUG.08.25	ISSUED FOR APPLICATION

SIXTH LINE AFFORDABLE HOUSING

1493 SIXTH LINE, OAKVILLE

SITE PLAN

SCALE 1:250

A-0.1

Appendix II
Terms of Reference

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

July 31, 2025

Project #3096A

To:
Karen Reis, Town of Oakville

Re: 1493 Sixth Line, Oakville
Environmental Impact Study Addendum Terms of Reference

On behalf of Natural Resource Solutions Inc. (NRSI), I am pleased to provide the final Terms of Reference (TOR) for an Environmental Impact Study (EIS) Addendum associated with a proposed residential development on a property located at 1493 Sixth Line, Oakville.

An EIS Addendum will be completed to ensure that the Region of Halton and Town of Oakville natural heritage policies have been addressed.

The attached TOR outlines the steps required to complete the EIS Addendum for the proposed development in accordance with Region and Town requirements.

Should you have any questions or comments regarding this TOR, please do not hesitate to contact the undersigned.

Sincerely,
Natural Resource Solutions Inc.

Sydney Gilmour, M.Sc.
Terrestrial and Wetland Biologist

1493 Sixth Line, Oakville
Environmental Impact Study Addendum
Final Terms of Reference
July 31, 2025

Introduction

The subject property is located at 1493 Sixth Line, Town of Oakville, Ontario. The subject property is south of Upper Middle Road East and north of McCraney Street East. See Map 1 for the subject property location. A "study area" has also been identified in order to characterize and assess lands adjacent to (within 120m of) the subject property as site access allows.

An existing residential dwelling is located within the western section of the subject property and is surrounded by manicured grass. The eastern section contains a European Buckthorn (*Rhamnus cathartica*)-dominated Cultural Thicket (CUT1) community; a portion of this feature has recently been cleared by the landowner. The rear (easternmost) portion of the subject property also contains a Cultural Woodland (CUW1) community, which represents a Significant Woodland in the Town of Oakville. A deciduous hedgerow is located along the northern boundary of the subject property adjacent to the residential dwelling and lawns. The far east end of the property contains a Headwater Drainage Feature (HDF). This HDF was identified by NRSI as part of an EIS completed in 2024 on behalf of the previous landowner in support of proposed refinements to the Regional Natural Heritage System (NHS) on the property as mapped in the Halton Region Official Plan (OP) (NRSI 2024). In completion of the 2024 EIS, Conservation Halton confirmed that, as an HDF, the feature is not considered a regulated watercourse.

According to the Regional OP, the entire subject property is designated NHS. Based on this designation, the Town of Oakville's Zoning By-law has also zoned the subject property as N – Natural Area. The subject property was previously designated and zoned as Low Density Residential, prior to 2014.

It is our understanding that the landowner is proposing to construct a six-storey residential building comprised of 190 rental units on the subject property. The building will also include a daycare, office, bike room, and amenity space, along with associated surface (33) and one level of underground (70) parking spaces.

The purpose of the EIS is to support the boundary modifications of the natural heritage/natural area designation and zoning by-law. An EIS is required to ensure conformance with Regional and Town OP policies, the Provincial Planning Statement (OMMAH 2024), and the *Endangered Species Act*. The purpose of the EIS is to demonstrate that the proposed development will not negatively impact the natural heritage features contained within the Town and Regional NHS or unmapped Key Features and that the proposed OP and zoning amendments are appropriate for the subject property. The EIS will demonstrate that the proposed development (including during- and post-construction) will not have a negative impact on the NHS. The EIS will address Section 118 (3 and 4) of the Region OP and Section 16.1.15 a) and b) of Liveable Oakville.

Characterization of Natural Features

Collection and Review of Background Information

NRSI will utilize background natural heritage and species information that was gathered in completion of the 2024 EIS, including the following resources:

- Ontario Breeding Bird Atlas (BSC et al. 2006);
- Ontario Reptile and Amphibian Atlas (Ontario Nature 2019);
- Atlas of the Mammals of Ontario (Dobbyn 1994); and,
- Ontario Odonata Atlas (OOAD 2023).

The following additional background information sources will be reviewed for updated information to inform this study: on natural heritage features and species records will be collected from the following information sources:

- Natural Heritage Information Centre (NHIC) database of provincially-tracked species (MNR 2025);
- Ontario Butterfly Atlas (Macnaughton et al. 2025); and,
- eBird and iNaturalist online species observations (eBird 2025, iNaturalist 2025).

Background information collection and field survey results completed for the 2024 EIS will serve as a primary source of existing background information in completion of this study.

Species At Risk / Species of Conservation Concern Screening

A screening has been completed to determine the potential for Species at Risk (SAR) and Species of Conservation Concern (SCC) and their habitat to be present within the study area. The habitats within the study area, as determined through completion of the 2024 EIS, have been compared to the habitat requirements of SAR/SCC known from the vicinity of the study area (up to 10km). See Appendix I for the complete SAR/SCC screening table.

Based on the results of the screening, the following SAR that are regulated under the *Endangered Species Act* were identified as having potentially suitable habitat within the study area:

- Silver-haired Bat (*Lasionycteris noctivagans*) – provincially and federally Endangered
- Eastern Red Bat (*Lasiurus borealis*) – provincially and federally Endangered
- Hoary Bat (*Lasiurus cinereus*) – provincially and federally Endangered
- Little Brown Myotis (*Myotis lucifugus*) – provincially and federally Endangered
- Northern Myotis (*Myotis septentrionalis*) – provincially and federally Endangered
- Tri-colored Bat (*Perimyotis subflavus*) – provincially and federally Endangered

Significant Wildlife Habitat Screening

Potential Significant Wildlife Habitat (SWH) types were also screened based previous characterization of the natural features and species habitats within the study area (NRSI 2024) and following discrete significance criteria established by the MNR (MNRF 2015). The results of the SWH screening have informed surveys required to confirm such habitat within the study area, based on any updates to natural feature cover or characteristics within the study area since the 2024 EIS.

Based on the preliminary screening, the following was identified as a Candidate SWH type within the study area, pending further assessment during site investigations:

- Bat Maternity Colonies

See Appendix II for the complete SWH screening tables.

Field Surveys

Field studies have been scoped to characterize and delineate the natural features within the subject property. The following summarizes the field surveys that will be completed to inform the EIS.

Vegetation Community Mapping

NRSI biologists will review and update the vegetation community mapping completed for the 2024 EIS for lands on and adjacent to the subject property. Vegetation community mapping will be completed using the Ecological Land Classification (ELC) system for southern Ontario (Lee *et al.* 1998). A high-level inventory of vegetation species will be conducted (focusing on dominant species) to inform the ELC classifications. Any federally or provincially significant vegetation species that are observed will be documented in detail and GPS-georeferenced.

Headwater Drainage Feature Assessment

NRSI biologists will complete HDF surveys according to the methods outlined in the Headwater Guideline and the Ontario Stream Assessment Protocol (OSAP) (V10.S4.M11) Unconstrained Headwater Sampling module (Gorenc and Stanfield 2017) and the Evaluation, Classification and Management of Headwater Drainage Features Guidelines (CVC and TRCA 2014) to determine the appropriate management. Three site visits will be conducted to capture the early spring high water table conditions (March to mid-April), late spring conditions (late April to mid-May), and summer base-flow conditions (July to August). The HDF will be assessed through four steps to evaluate and classify its functional importance and to identify management recommendations. These steps assess and evaluate the hydrologic contribution and function of the reach, the riparian vegetation and conditions, the feature's contribution to fish, and fish habitat and the terrestrial habitat function the reach provides. The field work included documenting information on ecological and geomorphological form and function to inform these steps.

The full suite of three surveys was not included in the study scope for the 2024 EIS (NRSI 2024), and was recommended to be completed as part of a subsequent EIS on the subject property.

Bat Habitat Assessment

One site visit will be completed to document the presence of any potential bat roosting trees and to assess the existing house (interior and exterior) for evidence of use by bats in accordance with standard protocols (MECP 2021, MECP 2022a, MECP 2022a). This assessment will include the identification of any live trees or snags with tree cavities or loose/sloughing bark that are suitable for roosting. Identified cavity trees will be considered potential habitat for SAR bats. These trees will be recorded in detail on standardized forms and GPS-georeferenced.

Wildlife Habitat Assessment and Incidental Wildlife Observations
Each site visit will include a general assessment of the presence of wildlife habitat within the study area. Any potentially significant habitat will be documented, photographed, and GPS-georeferenced. Observations of all wildlife will be recorded during each site visit, including birds, herpetofauna, mammals, butterflies and odonates (dragonflies and damselflies). In addition to direct observations, any indirect evidence such as dens, tracks, and scat will also be documented.

Natural Feature Constraints Assessment

The results of the field surveys will be combined with any updates to the background information to provide a detailed summary of the existing natural features that occur on and adjacent to the subject property, including any significant habitat features or functions that exist. Potential for significant wildlife species habitat presence will be determined based on updates to the SAR/SCC and SWH screening tables arising from site-level characterization of features and habitat suitability.

All aspects of natural feature significance or sensitivity identified through the background review and site visits will be incorporated into the constraints assessment. An updated constraints map will be prepared for the client, including any recommended refinements to the 10m Significant Woodland buffer proposed in the 2024 EIS (NRSI 2024), to aid in ensuring that the development plan for the lands minimizes or suitably mitigates impacts to the natural features and their ecological functions. This will include the need to avoid or minimize natural feature encroachments.

Impact Assessment, Mitigations, and Recommendations

An impact assessment will be completed based on the details of the proposed development. The assessment will consider potential direct (e.g., habitat removal), indirect (e.g., construction-related, stormwater drainage), and induced (e.g., post-construction human use) impacts on the existing natural features and the ecological functions they provide.

The development plan is proposed to be located outside of the NHS, including the buffer, therefore adhering to the mitigation hierarchy requirements to prioritize opportunities that would avoid impacts to NHS features. The principles of the mitigation hierarchy will be stated and referred to in the EIS, in demonstrating how the plan to avoid direct impacts to the NHS meets this requirement.

Recommendations for key natural heritage feature enhancement and/or restoration will be made where opportunities exist. Recommendations for monitoring will also be provided where applicable, such as to confirm the effectiveness of mitigation measures and to ensure the establishment and survival of enhancement/restoration plantings and seeding.

An EIS will be prepared that includes maps and appendices including taxonomic species lists and a photolog if applicable.

References

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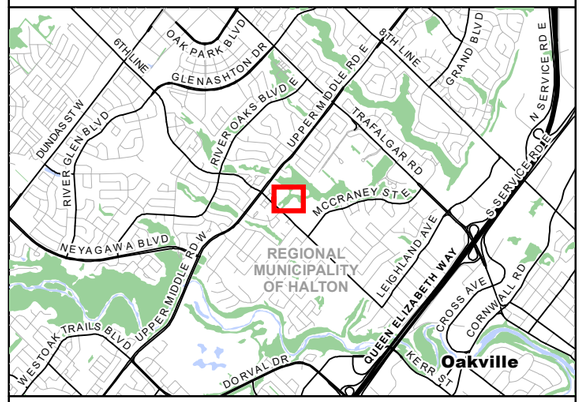
Map

Map 2

Sixth Line, Oakville

Vegetation Communities



Legend

- Subject Property
- Headwater Drainage Feature (HDF)
- NRSI Surveyed Dripline Boundary (Reviewed by Halton Region on June 20, 2023)
- Ecological Land Classification (ELC)
- ELC Inclusion
- (CUM) Cultural Meadow
- (CUM1) Mineral Cultural Meadow Ecosite
- (CUT1) Mineral Cultural Thicket Ecosite
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- (FOD4) Dry - Fresh Deciduous Forest Ecosite
- (H) Hedgerow

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project: 3096
Date: July 25, 2025

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

0 10 20 30 40 50 60 Metres

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Appendix I
Species at Risk and Species of Conservation Concern Habitat Screening

Species at Risk (SAR) and Species of Special Concern (SCC) Screening Table

Common Name	Scientific Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	Habitat Source	Habitat Preference	Suitable Habitats within Study Area	Suitable Habitats within Subject Property	Rationale
Birds											
Northern Bobwhite	*Colinus virginianus*	S1?	END	E	E	Schedule 1	Significant Wildlife Habitat Technical Guide: Appendix G (OMNR 2000)	Grassland, prairie or hay fields with woody cover in form of thickets, tangles of vines, shrubs; fence rows or woodland edges; cropland growing corn, soybeans or small grains and clover or grass; well-drained sandy or loamy soil; pond edges.	No	No	Grassland, prairie, and hay fields are not present within or adajcent to the subject property.
Eastern Whip-poor-will	*Antrostomus vociferus*	S4B	THR	SC	T	Schedule 1	Recovery Strategy for the Eastern Whip-poor-will (MECP 2019)	Areas with a mix of open and forested areas, such as open woodlands, savannas, pine plantations, woodland edges, or openings in more mature deciduous, coniferous and mixed forests. Forages in open areas and uses forested areas for roosting and nesting.	No	No	Suitable habitat is not present within or adjacent to the subject property.
Common Nighthawk	*Chordeiles minor*	S4B	SC	SC	SC	Schedule 1	Significant Wildlife Habitat Technical Guide: Appendix G (OMNR 2000)	Open ground; clearings in dense forests (including burns and logged areas); rock barrens; peat bogs; ploughed fields; gravel beaches or barren areas with rocky soils; open woodlands; flat gravel roofs.	No	No	Undisturbed open ground and forest clearings are not present within or adajcent to the subject property.
Chimney Swift	*Chaetura pelagica*	S3B	THR	T	T	Schedule 1	Significant Wildlife Habitat Technical Guide: Appendix G (OMNR 2000)	Commonly found in urban areas near buildings; nests in chimneys, hollow trees, and crevices of rock cliffs. Feeds over open water.	No	No	The on-site structure contains a chimney, however it is capped and not accessible to breeding Chimney Swifts.
Eastern Wood-Pewee	*Contopus virens*	S4B	SC	SC	SC	Schedule 1	Species at Risk in Ontario (MECP 2024)	Mid-canopy layer of forest clearings and edges of deciduous and mixed forest. Abundant in intermediate-age mature forest stands with little understory vegetation.	No	No	Eastern Wood-Pewee was not recorded during 2023 field surveys. The on-site woodland feature is likely too young to attract breeding Eastern Wood-Pewee.
Barn Swallow	*Hirundo rustica*	S4B	SC	SC	T	Schedule 1	Significant Wildlife Habitat Technical Guide: Appendix G (OMNR 2000)	Farmlands, rural areas and other open or semi-open areas near body of water. Nests almost exclusively on human-made structures such as open barns, buildings, bridges and culverts.	No	No	Suitable habitat is not present within or adjacent to the subject property.
Purple Martin	*Progne subis*	S3B					Significant Wildlife Habitat Technical Guide: Appendix G (OMNR 2000)	Open, trees areas such as farmland, parks, yards, marshes; usually near large bodies of water; colonial; nests in tree cavities, cliff ledges; most common in nest boxes; requires open space for foraging; prefers trees >15 cm dbh.	No	No	Large bodies of water, cavities, and cliff ledges are not present within or adjacent to the subject property.
Bank Swallow	*Riparia riparia*	S4B	THR	T	T	Schedule 1	Recovery Strategy for the Bank Swallow in Ontario (Falconer et al. 2016)	Nests in burrows in natural and human-made settings with vertical faces in silt and sand deposits. Usually on banks of river and lakes, but also found in sand and gravel pits.	No	No	Banks of rivers and lakes, and sand and gravel pits are not present within or adjacent to the subject property.
Tufted Titmouse	*Baeolophus bicolor*	S3					Cornell Lab of Ornithology 2024	Deciduous woodlands or mixed evergreen-deciduous woodlands with tall trees, typically in areas with a dense canopy and many tree species. Common in orchards, parks, and suburban areas. Generally found at low elevations.	No	No	Woodland does not have a dense canopy layer. Tufted Titmouse was not recorded during 2023 field surveys.
Wood Thrush	*Hylocichla mustelina*	S4B	SC	T	T	Schedule 1	Significant Wildlife Habitat Technical Guide: Appendix G (OMNR 2000)	Carolinian and Great Lakes-St. Lawrence forest zones. Undisturbed moist mature deciduous or mixed forest with deciduous sapling growth. Near pond or swamp. Must have some trees higher than 12 m.	No	No	Ponds and swamps are not present within or adjacent to the subject property.
Grasshopper Sparrow	*Ammodramus savannarum*	S4B	SC	SC	SC	Schedule 1	Significant Wildlife Habitat Technical Guide: Appendix G (OMNR 2000)	Well-drained grassland or prairie with low cover of grasses, taller weeds or sandy soil; hayfields or weedy fallow fields; uplands with ground vegetation of various densities. Requires perches for singing and tracts of grassland generally >5ha.	No	No	Tracts of grassland >5ha in size is not present within or adjacent to the subject property.

Common Name	Scientific Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	Habitat Source	Habitat Preference	Suitable Habitats within Study Area	Suitable Habitats within Subject Property	Rationale
Bobolink	*Dolichonyx oryzivorus*	S4B	THR	SC	T	Schedule 1	Recovery Strategy for the Bobolink and Eastern Meadowlark in Ontario (McCracken et al. 2013)	Large (>10 ha), open expansive grasslands, pastures, hayfields, meadows or fallow fields with dense ground cover. Occasionally nest in large (>50 ha) fields of winter wheat and rye in southwestern Ontario.	No	No	Large, open expansive grasslands, pastures, hayfields or fallow fields with dense ground cover are not present within or adjacent to the subject property.
Eastern Meadowlark	*Sturnella magna*	S4B,S3N	THR	T	T	Schedule 1	Significant Wildlife Habitat Technical Guide: Appendix G (OMNR 2000)	Open pastures, hayfields, grasslands or grassy meadows with elevated singing perches (small trees, shrubs or fence posts). Also weedy borders of croplands, roadsides, orchards, airports, shrubby overgrown fields or other open areas. Generally prefers larger tracts of habitat >10 ha, but will sometimes use smaller tracts.	No	No	Open pastures, hayfields, grasslands, and grassy meadows are not present within or adjacent to the subject property.
Reptiles and Amphibians											
Snapping Turtle	*Chelydra serpentina*	S4	SC	SC	SC	Schedule 1	Species at Risk in Ontario (MECP 2024)	Slow-flowing rivers and streams, lakes, and permanent or semi-permanent wetlands with soft substrates and vegetation. Key habitat requirements: open areas with structures for basking, open sand or gravel areas for nesting, shallow areas with soft substrates to bury in, soft banks or substrates for hibernation.	No	No	Suitable habitat is not present within or adjacent to the subject property.
Northern Map Turtle	*Graptemys geographica*	S3	SC	SC	SC	Schedule 1	Species at Risk in Ontario (MECP 2024)	Large bodies of water such as rivers and lakes with soft bottoms, aquatic vegetation, abundant mollusc prey, and basking structures such as logs or rocks. Nesting occurs in open areas with soft substrates such as sand or gravel. Hibernate on the bottom of deep areas of lakes or deep, slow-moving sections of rivers.	No	No	Large bodies of water are not present within or adjacent to the subject property.
Jefferson Salamander	*Ambystoma jeffersonianum*	S2	END	E	E	Schedule 1	Recovery Strategy for the Jefferson Salamander (Linton, J, J. McCarter & H. Fotherby)	Large deciduous or mixed forest containing, or in close proximity to, suitable breeding ponds which include fishless vernal pools or wetlands with suitable hydroperiod for larval development (was present until Aug/Sept). Habitats must contain shelter features including leaf litter, woody debris, rocks, logs, or stumps. Hibernation sites are underground in mammal burrows, root systems, or crevices or fissures in rocks.	No	No	Vernal pools or wetlands are not present within or adjacent to the subject property.
Unisexual Ambystoma (Jefferson Salamander-dependent population)	*Ambystoma laterale - (2) jeffersonianum*	S2	END	E	E	Schedule 1	Species at Risk in Ontario (MECP 2024)	Unisexual Ambystoma salamanders live in leaf litter, under logs and in underground cavities in deciduous and mixed forests, typically within close proximity to breeding habitats. Adults breeds in vernal pools (temporary woodland ponds) or fish-free permanent wetlands. They lay their eggs in clumps attached to underwater vegetation in shallow water. The eggs hatch into aquatic larvae after about one month, and the larvae transform into juveniles by the end of summer. The juveniles leave the pond and head into the surrounding forest. Unisexual Ambystoma salamanders spend the winter underground where they can get below the frost line and avoid freezing temperatures, such as in mammal burrows, rock crevices or other underground cavities. Although these salamanders spend much of the year underground or under cover, they can often be observed in early spring when they travel to breeding sites.	No	No	Vernal pools or wetlands are not present within or adjacent to the subject property.
Western Chorus Frog (Great Lakes / St. Lawrence - Canadian Shield population)	*Pseudacris triseriata pop. 2*	S4	NAR	T	T	Schedule 1	Significant Wildlife Habitat Technical Guide: Appendix G (OMNR 2000)	Roadside ditches or temporary ponds in fields; swamps or wet meadows; woodland or open country with cover and moisture; small ponds and temporary pools ponds and temporary pools.	No	No	Suitable habitat is not present within or adjacent to the subject property.
Mammals											

Common Name	Scientific Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	Habitat Source	Habitat Preference	Suitable Habitats within Study Area	Suitable Habitats within Subject Property	Rationale
Silver-haired Bat	*Lasionycteris noctivagans*	S3	END	E	NS	No schedule	COSEWIC Assessment and Status Report on the Hoary Bat Lasiurus cinereus Eastern Red Bat Lasiurus borealis Silver-haired Bat Lasionycteris noctivagans in Canada (COSEWIC 2023)	Roosts primarily in cavities, crevices, and exfoliating bark of typically large-diameter trees in forests and occasionally in or on buildings. Forages in forests of any age, along forests edges and in openings in forests. Primarily overwinters within the U.S.	Possible	Possible	Woodland feature may provide foraging habitat.
Eastern Red Bat	*Lasiurus borealis*	S3	END	E	NS	No schedule	COSEWIC Assessment and Status Report on the Hoary Bat Lasiurus cinereus Eastern Red Bat Lasiurus borealis Silver-haired Bat Lasionycteris noctivagans in Canada (COSEWIC 2023)	Roosts in foliage of trees; reproductive roosting occurs in upper foliage of typically large-diameter, super-canopy trees in deciduous and coniferous forests of any age. Males occasionally roost in shrubs or saplings. Primarily overwinters within the U.S.	Possible	Possible	Woodland feature may provide suitable roosting habitat.
Hoary Bat	*Lasiurus cinereus*	S3	END	E	NS	No schedule	COSEWIC Assessment and Status Report on the Hoary Bat Lasiurus cinereus Eastern Red Bat Lasiurus borealis Silver-haired Bat Lasionycteris noctivagans in Canada (COSEWIC 2023)	Roosts in foliage of trees; reproductive roosting occurs in upper foliage of typically large-diameter, super-canopy trees in deciduous and coniferous forests of any age. Forages in the open, such as open wetlands, grasslands and fields with patchy tree cover. Primarily overwinters in the U.S.	Possible	Possible	Woodland feature may provide suitable roosting habitat.
Little Brown Myotis	*Myotis lucifugus*	S3	END	E	E	Schedule 1	Recovery Strategy for the Little Brown Myotis, Northern Myotis and Tri-colored Bat in Ontario (Humphrey, C. & H. Fotherby. 2019)	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 and forest edges.	Possible	Possible	The subject property contains buildings that may provide suitable habitat.
Northern Myotis	*Myotis septentrionalis*	S3	END	E	E	Schedule 1	Recovery Strategy for the Little Brown Myotis, Northern Myotis and Tri-colored Bat in Ontario (Humphrey, C. & H. Fotherby. 2019)	Roosts in houses and man-made structures but prefers hollow trees or under loose bark. Hibernates in mines or caves. Hunts within forest, below the canopy.	Possible	Possible	The woodland feature may contain suitable roosting trees. The subject property also contain man-made structures.
Tri-colored Bat	*Perimyotis subflavus*	S3?	END	E	E	Schedule 1	Recovery Strategy for the Little Brown Myotis, Northern Myotis and Tri-colored Bat in Ontario (Humphrey, C. & H. Fotherby. 2019)	Roosts and maternity colonies in older forests and occassionally in barns or other sturctures. Forage over water and along streams in the forest. Hibernate in caves.	Possible	Possible	The woodland feature may contain suitable roosting trees.
Butterflies											
West Virginia White	*Pieris virginiensis*	S3	SC				Species at Risk in Ontario (MECP 2024)	Rich, moist, deciduous woods with populations of Two-leaved Toothwort (Cardamine diphylla; larval food plant).	No	No	Two-leaved Toothwort was not inventoried during the 2023 field surveys.
Monarch	*Danaus plexippus*	S2N,S4B	SC	E	E	Schedule 1	Species at Risk in Ontario (MECP 2024)	Adults found in a diversity of habitats with a variety of wildflowers. Caterpillars are confined to meadows and open areas where milkweeds grow (larval food plants).	No	No	Milkweed was not inventoried during the 2023 field surveys.

Common Name	Scientific Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	Habitat Source	Habitat Preference	Suitable Habitats within Study Area	Suitable Habitats within Subject Property	Rationale
Odonates											
Painted Skimmer	*Libellula semifasciata*	S3					Wisconsin Odonata Survey (2023)	Marshy forest ponds, bogs, slow streams, costal plains.	No	No	Suitable habitat is not present within or adjacent to the subject property.
Fish											
Redside Dace	*Clinostomus elongatus*	S1	END	E	E	Schedule 1	Species at Risk in Ontario (MECP 2024)	Pools and slow-moving areas of small streams and headwaters with a gravel bottom. Generally found in areas with overhanging grasses and shrubs. Can be found in shallow parts of streams during spawning.	No	No	A headwater drainage feature is present within eastern section of the subject property, but it does not provide suitable habitat for Redside Dace.

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Appendix II
Significant Wildlife Habitat Screening

Significant Wildlife Habitat Assessment Tables

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 7E (MNRF 2015)

Rationale	Candidate SWH			Confirmed SWH	Assessment Details	
	Wildlife Species	ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	Study Area	Subject Property
Wildlife Habitat: Waterfowl Stopover and Staging Areas (Terrestrial)					Not Present	Not Present
Habitat important to migrating waterfowl	American Black Duck Northern Pintail Gadwall Blue-winged Teal Green-winged Teal American Wigeon Northern Shoveler Tundra Swan	CUM1 CUT1 - Plus evidence of annual spring flooding from melt water or run-off within these Ecosites. - Fields with seasonal flooding and waste grain in the Long Point, Rondeau, Lake. St. Clair, Grand Bend and Pt. Pelee areas may be important to Tundra Swans.	Fields with sheet water during Spring (mid March to May). • Fields flooding during spring melt and run-off provide important invertebrate foraging habitat for migrating waterfowl. • Agricultural fields with waste grains are commonly used by waterfowl, these are not considered SWH unless they have spring sheet water available[cxlviii] <u>Information Sources</u> • Anecdotal information from the landowner, adjacent landowners or local naturalist clubs may be good information in determining occurrence. • Reports and other information available from Conservation Authorities (CAs) • Sites documented through waterfowl planning processes (eg. EHJV implementation plan) • Field Naturalist Clubs • Ducks Unlimited Canada • Natural Heritage Information Centre (NHIC) Waterfowl Concentration Area	Studies carried out and verified presence of an annual concentration of any listed species, evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • Any mixed species aggregations of 100[j] or more individuals required. • The area of the flooded field ecosite habitat plus a 100-300m radius buffer dependant on local site conditions and adjacent land use is the significant wildlife habitat[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.	Adjacent fields are too small to support aggregations of 100 or more individuals. Suitable habitat is not present within or adjacent to the subject property.	
Wildlife Habitat: Waterfowl Stopover and Staging Areas (Aquatic)					Not Present	Not Present
Important for local and migrant waterfowl populations during the spring or fall migration or both periods combined. Sites identified are usually only one of a few in the eco-district	Canada Goose Cackling Goose Snow Goose Green-winged Teal American Black Duck Northern Pintail Northern Shoveler American Wigeon Gadwall Blue-winged Teal Hooded Merganser Common Merganser Red-breasted Merganser Lesser Scaup Greater Scaup Common Goldeneye Bufflehead Long-tailed Duck Surf Scoter White-winged Scoter Black Scoter Canvasback Redhead Ruddy Duck Brant White-winged Scoter Black Scoter	MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 SWD1 SWD2 SWD3 SWD4 SWD5 SWD6 SWD7	• Ponds, marshes, lakes, bays, coastal inlets, and watercourses used during migration. Sewage treatment ponds and storm water ponds do not qualify as a SWH, however a reservoir managed as a large wetland or pond/lake does qualify. • These habitats have an abundant food supply (mostly aquatic invertebrates and vegetation in shallow water). <u>Information Sources</u> • Environment Canada • Naturalist clubs often are aware of staging/stopover areas • OMNRF Wetland Evaluations indicate presence of locally and regionally significant waterfowl staging. • Sites documented through waterfowl planning processes (eg. EHJV implementation plan) • Ducks Unlimited projects • Element occurrence specification by Nature Serve: http://www.natureserve.org • Natural Heritage Information Centre (NHIC) Waterfowl Concentration Area	Studies carried out and verified presence of: • Aggregations of 100[l] or more of listed species for 7 days[l], results in >700 waterfowl use days. • Areas with annual staging of ruddy ducks, canvasbacks, and redheads are SWH[cxlix] • The combined area of the ELC ecosites and a 100m radius area is the SWH[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.	Ponds, marshes, lakes, bays, coastel inlets, and watercourses are not present within the subject property. Suitable habitat is not present within or adjacent to the subject property.	

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 7E (MNRF 2015)

Rationale	Candidate SWH			Confirmed SWH	Assessment Details	
	Wildlife Species	ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	Study Area	Subject Property
Wildlife Habitat: Shorebird Migratory Stopover Area					Not Present	Not Present
High quality shorebird stopover habitat is extremely rare and typically has a long history of use	Greater Yellowlegs Lesser Yellowlegs Marbled Godwit Hudsonian Godwit Black-bellied Plover American Golden-Plover Semipalmated Plover Solitary Sandpiper Spotted Sandpiper Semipalmated Sandpiper Pectoral Sandpiper White-rumped Sandpiper Baird's Sandpiper Least Sandpiper Purple Sandpiper Stilt Sandpiper Short-billed Dowitcher Red-necked Phalarope Whimbrel Ruddy Turnstone Sanderling Dunlin	BBO1 BBO2 BBS1 BBS2 BBT1 BBT2 SDO1 SDS2 SDT1 MAM1 MAM2 MAM3 MAM4 MAM5	Shorelines of lakes, rivers and wetlands, including beach areas, bars and seasonally flooded, muddy and un-vegetated shoreline habitats. Great Lakes coastal shorelines, including groynes and other forms of armour rock lakeshores, are extremely important for migratory shorebirds in May to mid-June and early July to October. Sewage treatment ponds and storm water ponds do not qualify as a SWH. <u>Information Sources</u> • Western hemisphere shorebird reserve network • Canadian Wildlife Service (CWS) Ontario Shorebird Survey • Bird Studies Canada • Ontario Nature • Local birders and naturalist clubs • Natural Heritage Information Center (NHIC) Shorebird Migratory Concentration Area	Studies confirming: • Presence of 3 or more of listed species and > 1000[i] 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[i] 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.	Lakes, rivers, and wetlands are not present and therefore shoreline habitat is not present. Suitable habitat is not present within or adjacent to the subject property.	
Wildlife Habitat: Raptor Wintering Area					Not Present	Not Present
Sites used by multiple species, a high number of individuals and used annually are most significant	Rough-legged Hawk Red-tailed Hawk Northern Harrier American Kestrel Snowy Owl <u>Special Concern</u>: Short-eared Owl Bald Eagle	<u>Hawks/Owls:</u> Combination of ELC Community Series; need to have present one Community Series from each land class. Forest: FOD, FOM, FOC Upland: CUM, CUT, CUS, CUW <u>Bald Eagle:</u> Forest Community Series: FOD, FOM, FOC, SWD, SWM, or SWC, on shoreline areas adjacent to large rivers or adjacent to lakes with open water (hunting area).	The habitat provides a combination of fields and woodlands that provide roosting, foraging and resting habitats for wintering raptors. Raptor wintering (hawk/owl) sites need to be > 20ha[cxlviii, cxlix] with a combination of forest and upland[xvi, xvii, xviii, xix, xx, xxi]. Least disturbed sites, idle/fallow or lightly grazed field/meadow (>15ha) with adjacent woodlands[cxlix] Field area of the habitat is to be wind swept with limited snow depth or accumulation. Eagle sites have open water and large trees and snags aviable for roosting[cxlix] <u>Information Sources</u> • OMNRF Districts • Natural clubs • Natural Heritage Information Centre (NHIC) Raptor Winter Concentration Area • Data from Bird Studies Canada • Reports and other information available from CAs • Results of Christmas Bird Counts	Studies confirm the use of these habitats by: • One or more Short-eared Owls, or, One of more Bald Eagles or; at least 10 individuals and two listed hawk/owl species • To be significant a site must be used regularly (3 in 5 years)[cxlix] for a minimum of 20 days by the above number of birds[i]. • 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.	Woodlands and adjacent fields are present, but fields are highly disturbed (i.e., recreational fields with human presence) and therefore suitable habitat is not present within or adjacent to the subject property.	

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 7E (MNRF 2015)

Rationale	Candidate SWH			Confirmed SWH	Assessment Details	
	Wildlife Species	ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	Study Area	Subject Property
Wildlife Habitat: Bat Hibernacula					Not Present	Not Present
Bat hibernacula, are rare habitats in all Ontario landscapes.	Big Brown Bat Eastern Pipistrelle/Tri-colored Bat	Bat Hibernacula may be found in these ecosites: CCR1 CCR2 CCA1 CCA2 (Note: buildings are not considered to be SWH)	Hibernacula may be found in caves, mine shafts, underground foundations and Karsts. Active mine sites should not be considered The locations of bat hibernacula are relatively poorly known. <u>Information Sources</u> • OMNRF for possible locations and contact for local experts • Natural Heritage Information Centre (NHIC) Bat Hibernaculum • Ministry of Northern Development and Mines for location of mine shafts • Clubs that explore caves (eg. Sierra Club) • University Biology Departments with bat experts	• All sites with confirmed hibernating bats are SWH[l]. • The area includes 200m radius around the entrance of the hibernaculum[cxlviii, ccvii, l]. for the development types and 1000m for wind farms [ccv]. • Studies are to be conducted during the peak swarming period (Aug. – Sept.). Surveys should be conducted following methods outlined in the[ccv]."Bats and Bat Habitats: Guidelines for Wind Power Projects" [ccv] • SWHMIST[cxlix] Index #1 provides development effects and mitigation measures.	Caves, mines shafts, underground foundations, and Karsts are not known to occur in this area. Suitable habitat is not present within or adjacent to the subject property.	
Wildlife Habitat: Bat Maternity Colonies					Possible	Possible
Known locations of forested bat maternity colonies are extremely rare in all Ontario landscapes.	Big Brown Bat Silver-haired Bat	Maternity colonies considered SWH are found in forested Ecosites. All ELC Ecosites in ELC Community Series: FOD FOM SWD SWM	Maternity colonies can be found in tree cavities, vegetation and often in building [sxxii, xxv, xxvi, xxvii, xxxi] (buildings are not considered to be SWH). • Maternity roosts are not found in caves and mines in Ontario[xxii]. • Maternity colonies located in Mature deciduous or mixed forest stands[ccix, ccx] with >10/ha large diameter (>25cm dbh) wildlife trees[ccvii]. • Female Bats prefer wildlife tree (snags) in early stages of decay, class 1-3[ccxiv] or class 1 or 2[ccxii]. • Silver-haired Bats prefer older mixed or deciduous forest and form maternity colonies in tree cavities and small hollows. Older forest areas with at least 21 snags/ha are preferred[ccx]. <u>Information Sources</u> • OMNRF for possible locations and contact for local experts • University Biology Departments with bat experts	Maternity Colonies with confirmed use by: • >10 Big Brown Bats[l] • >5 Adult Female Silver-haired Bats[l] • The area of the habitat includes the entire woodland or the forest stand ELC Ecosite containing the maternity colonies[l]. • Evaluation methods for maternity colonies should be conducted following methods outlined in the "Bats and Bat Habitats: Guidelines for Wind Power Projects"[ccv]. • SWHMIST[cxlix] Index #12 provides development effects and mitigation measures.	Suitable tree cavities may be present within the Cultural Woodland (CUW1) feature.	

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 7E (MNRF 2015)

Rationale	Candidate SWH			Confirmed SWH	Assessment Details	
	Wildlife Species	ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	Study Area	Subject Property
Wildlife Habitat: Turtle Wintering Area					Not Present	Not Present
Generally sites are the only known sites in the area. Sites with the highest number of individuals are most significant.	Midland Painted Turtle <u>Special Concern</u>: 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 <u>Information Sources</u> • EIS studies carried out by Conservation Authorities • Field naturalists clubs • OMNRF Ecologist or Biologist • Natural Heritage Information Centre (NHIC)	• Presence of 5 over-wintering Midland Painted Turtles is significant[l]. • One or more Northern Map Turtle or Snapping Turtle over-wintering within a wetland is significant[l]. • 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. – Apr)[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.	Permanent water bodies, large wetlands, and bogs or fens are not present within or adjacent to the subject property.	
Wildlife Habitat: Reptile Hibernaculum					Not Present	Not Present
Generally sites are the only known sites in the area. Sites with the highest number of individuals are most significant	<u>Snakes:</u> Eastern Gartersnake Northern Watersnake Northern Red-bellied Snake Northern Brownsnake Smooth Green Snake Northern Ring-necked Snake <u>Special Concern</u>: Milksnake Eastern Ribbonsnake	For all snakes, habitat may be found in any ecosite in southern Ontario other than very wet ones. Talus, Rock Barren, Crevice and Cave, and Alvar sites may be directly related to these habitats. Observations of congregations of snakes on sunny warm days in the spring or fall is a good indicator. The existence of rock piles or slopes, stone fences, and crumbling foundations assist in identifying candidate SWH.	For snakes, hibernation takes place in sites located below frost lines in burrows, rock crevices and other natural locations. Areas of broken and fissured rock are particularly valuable since they provide access to subterranean sites below the frost line[xliv, l, li, lii, cxii]. Wetlands can also be important over-wintering habitat in conifer or shrub swamps and swales, poor fens, or depressions in bedrock terrain with sparse trees or shrubs with sphagnum moss or sedge hummock ground cover. <u>Information Sources</u> • In spring, local residents or landowners may have observed the emergence of snakes on their property (e.g. old dug wells). • Reports and other information available from CAs • Local naturalists and experts, as well as university herpetologists may also know where to find some of these sites. • Natural Heritage Information Centre (NHIC)	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)[l]. • Note: If there are Special Concern Species present, then site is SWH • Note: Sites for hibernation possess specific habitat parameters (e.g. temperature, humidity, etc.) and consequently are used annually, often by many of the same individuals of a local population (i.e. strong hibernation site fidelity). Other critical life processes (e.g. mating) often take place in close proximity to hibernacula. The feature in which the hibernacula is located plus a 30m buffer is the SWH[l]. • SWHMIST[cxlix] Index #13 provides development effects and mitigation measures for snake hibernacula.	Rock piles, slopes, stone fences, and crumbling foundaiton are not present within or adjacent to the subject property.	

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 7E (MNRF 2015)

Rationale	Candidate SWH			Confirmed SWH	Assessment Details	
	Wildlife Species	ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	Study Area	Subject Property
Wildlife Habitat: Colonially - Nesting Bird Breeding Habitat (Bank and Cliff)					Not Present	Not Present
Historical use and number of nests in a colony make this habitat significant. An identified colony can be very important to local populations. All swallow population are declining in Ontario.	Cliff Swallow Northern Rough-winged Swallow (this species is not colonial but can be found in Cliff Swallow colonies)	Eroding banks, sandy hills, borrow pits, steep slopes, and sand piles Cliff faces, bridge abutments, silos, barns Habitat found in the following ecosites: CUM1 CUT1 CUS1 BLO1 BLS1 BLT1 CLO1 CLS1 CLT1	• Any site or areas with exposed soil banks, undisturbed or naturally eroding that is not a licensed/permitted aggregate area. • Does not include man-made structures (bridges or buildings) or recently (2 years) disturbed soil areas, such as berms, embankments, soil or aggregate stockpiles. • Does not include a licensed/permitted Mineral Aggregate Operation. <u>Information Sources</u> • Reports and other information available from CAs • Ontario Breeding Bird Atlas[ccv]. • Bird Studies Canada: Nature Counts http://www.birdscanada.org/birdmon/ • Field Naturalist clubs	Studies confirming: • 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.	Exposed soil banks and associated landscape types are not present within or adjacent to the subject property.	
Wildlife Habitat: Colonially - Nesting Bird Breeding Habitat (Tree/Shrubs)					Not Present	Not Present
Large colonies are important to local bird population, typically sites are only known colony in area and are used annually.	Great Blue Heron Black-crowned Night-Heron Great Egret Green Heron	SWM2 SWM3 SWM5 SWM6 SWD1 SWD2 SWD3 SWD4 SWD5 SWD6 SWD7 FET1	• Nests in live or dead standing trees in wetlands, lakes, islands, and peninsulas. Shrubs and occasionally emergent vegetation may also be used. • Most nests in trees are 11 to 15 m from ground, near the top of the tree. <u>Information Sources</u> • Ontario Breeding Bird Atlas[ccv], colonial nest records. • Ontario Heronry Inventory 1991 available from Bird Studies Canada or NHIC (OMNRF). • Natural Heritage Information Centre (NHIC) Mixed Wader Nesting Colony • Aerial photographs can help identify large heronries. • Reports and other information available from CAs • MNRF District Offices • Field naturalist clubs	Studies confirming: • Presence of 2 or more active nests of Great Blue Heron or other list species. • The habitat extends from the the edge of the colony and a minimum 300m radius or extent of the Forest Ecosite containing the colony or any island <15.0ha with a colony is the SWH[cc, ccvii]. • Confirmation of active colonies must be achieved through site visits conducted during the nesting season (April to August) or by evidence such as the presence of fresh guano, dead young and/or eggshells • SWHMIST[cxlix] Index #5 provides development effects and mitigation measures.	Wetlands, lakes, islands, and peninsulas are not present within or adjacent to the subject property.	

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 7E (MNRF 2015)

Rationale	Candidate SWH			Confirmed SWH	Assessment Details	
	Wildlife Species	ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	Study Area	Subject Property
Wildlife Habitat: Colonially - Nesting Bird Breeding Habitat (Ground)					Not Present	Not Present
Colonies are important to local bird population, typically sites are only known colony in area and are used annually.	Herring Gull Great Black-backed Gull Little Gull Ring-billed Gull Common Tern Caspian Tern Brewer's Blackbird	Any rocky island or peninsula (natural or artificial) within a lake or large river (two-lined on a 1:50,000 NTS map). Close proximity to watercourses in open fields or pastures with scattered trees or shrubs (Brewer's Blackbird) MAM1 – 6 MAS1 – 3 CUM CUT CUS	• 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. <u>Information Sources</u> • Ontario Breeding Bird Atlas[ccv], rare/colonial species records. • Canadian Wildlife Service • Reports and other information available from CAs • Natural Heritage Information Centre (NHIC) Colonial Waterbird Nesting Area • MNRF District Offices • Field naturalist clubs	Studies confirming: • Presence of >25 active nests for Herring Gulls, >5 active nests for Common Tern or >2 active nests for Caspian Tern[l]. • Any active nesting colony of one or more Little Gull, and Great Black-backed Gull is significant[l]. • Presence of 5 or more pairs for Brewer's Blackbird[l]. • The edge of the colony and a minimum 150m radius area of the habitat, or the extent of the ELC ecosites containing the colony or any island <3.0ha with a colony is the SWH[cc, ccvii]. • Studies would be done during May/June when actively nesting. Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi]. • SWHMIST[cxlix] Index #6 provides development effects and mitigation measures.	Rocky islands or peninsulas within a lake or large river are not located within or adjacent to the subject property.	
Wildlife Habitat: Migratory Butterfly Stopover Areas					Not Present	Not Present
<u>Rationale:</u> Butterfly stopover areas are extremely rare habitats and are biologically important for butterfly species that migrate south for the winter	Painted Lady Red Admiral <u>Special Concern</u>: Monarch	Combination of ELC Community Series; need to have present one Community Series from each landclass: Field: CUM CUT CUS Forest: FOC FOD FOM CUP Anecdotally, a candidate site for butterfly stopover will have a history of butterflies being observed.	A butterfly stopover area will be a minimum of 10ha in size with a combination of field and forest habitat present, and will be located within 5km of Lake Ontario and Erie[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]. <u>Information Sources</u> • MNRF District Offices • Natural Heritage Information Centre (NHIC) • Agriculture Canada in Ottawa may have list of butterfly experts. • Field Naturalist Clubs • Toronto Entomologists Association • Conservation Authorities	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 White Admiral's is to be considered significant[l]. • SWHMIST[cxlix] Index #16 provides development effects and mitigation measures.	The subject property is located within 5km of Lake Ontario and forest and field habitat are present. However, the study area is highly disturbed; adjacent lands include recretional fields, schools, and residential areas.	

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 7E (MNRF 2015)

Rationale	Candidate SWH			Confirmed SWH	Assessment Details	
	Wildlife Species	ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	Study Area	Subject Property
Wildlife Habitat: Landbird Migratory Stopover Areas					Not Present	Not Present
Sites with a high diversity of species as well as high numbers 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 >5 ha[I] in size and within 5km [iv, v, vi, vii, viii, ix, x, xi, xii, xiii, xiv, xv] of Lake Ontario and Erie. If woodlands are rare in an area of shoreline, woodland fragments 2-5ha can be considered for this habitat • If multiple woodlands are located along the shoreline those Woodlands <2km from Lake Erie or Ontario are more significant[cxlix]. • Sites have a variety of habitats: forest, grassland and wetland complexes[cxlix]. • The largest sites are more significant[cxlix] • Woodlots and forest fragments are important habitats to migrating birds[ccxviii], these features located along the shore and located within 5km of Lake Ontario and Lake Erie are Candidate SWH[cxlviii]. <u>Information Sources</u> • Bird Studies Canada • Ontario Nature • Local birders and naturalist clubs • Ontario Important Bird Areas (IBA) Program	Studies confirm: • Use of the habitat by >200 birds/day and with >35 spp. with at least 10 bird spp. recorded on at least 5 different survey dates[I]. This abundance and diversity of migrant bird species is considered above average and significant. • Studies should be completed during spring (March/May) and fall (Aug/Oct) migration using standardized assessment techniques. Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”[ccxi]. • SWHMIST[cxlix] Index #9 provides development effects and mitigation measures.	The subject property is located within 5km of Lake Ontario, and the woodland is larger than 5ha in size. However, abundance (>200 birds/day) and diversity (>35 spp.) were not observed during 2023 field surveys. The wooded community within the subject property was identified as CUW1 and therefore does not meet the ELC ecosite criteria to support landbird migratory stopover areas. Suitable habitat is not present within or adajcent to the subject property.	
Wildlife Habitat: Deer Winter Congregation Areas					Not Present	Not Present
Deer movement during winter in the southern areas of Ecoregion 7E are not constrained by snow depth, however deer will annually congregate in large numbers in suitable woodlands to reduce or avoid the impacts of winter conditions [cxlviii]	White-tailed Deer	All Forested Ecosites with these ELC Community Series: FOC FOM FOD SWC SWM SWD Conifer plantations (CUP) smaller than 50 ha may also be used.	• Woodlots >100 ha in size or if large woodlots are rare in a planning area woodlots>50ha[I]. • Deer movement during winter in Ecoregion 7E are not constrained by snow depth, however deer will annually congregate in large numbers in suitable woodlands[cxlviii]. • Large woodlots > 100ha and up to 1500 ha are known to be used annually by densities of deer that range from 0.1-1.5 deer/ha[ccxxiv]. • Woodlots with high densities of deer due to artificial feeding are not significant[I]. <u>Information Sources</u> • 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 MNRF[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]. • SWHMIST[cxlix] Index #2 provides development effects and mitigation measures.	Deer wintering area is not mapped by the Ministry of Natural Resources. Further, the woodland does not meet the >100ha size criterion for this SWH. Suitable habitat is not present within or adajcent to the subject property.	

Significant Wildlife Habitat Assessment Tables

Table 2. Characteristics of Rare Vegetation Communities for Ecoregion 7E (MNRF 2015)

	Candidate SWH			Confirmed SWH	Assessment Details	
Rationale	**ELC Ecosite Codes**	**Habitat Description**	**Detailed Information and Sources**	**Defining Criteria**	**Study Area**	**Subject Property**
Cliff and Talus Slopes					Not Present	Not Present
Cliffs and Talus Slopes are extremely rare habitats in Ontario.	Any ELC Ecosite within Community Series: TAO TAS TAT CLO CLS 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. <u>Information Sources</u> • The Niagara Escarpment Commission has detailed information on location of these habitats. • OMNRF Districts • Natural Heritage Information Centre (NHIC) has location information available on their website • Field naturalist clubs • Conservation Authorities	• Confirm any ELC Vegetation Type for Cliffs or Talus Slopes[lxxviii] • SWHMIST[cxlix] Index #21 provides development effects and mitigation measures.	Cliff and Talus Slopes are not present within or adjacent to the subject property	
Sand Barrens					Not Present	Not Present
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%.	A sand barren area >0.5ha in size <u>Information Sources</u> • OMNRF Districts • Natural Heritage Information Centre (NHIC) has location information available 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 are exotics sp)[l]. • SWHMIST[cxlix] Index #20 provides development effects and mitigation measures.	Sand Barrens are not present within or adjacent to the subject property.	

Table 2. Characteristics of Rare Vegetation Communities for Ecoregion 7E (MNRF 2015)

Rationale	Candidate SWH			Confirmed SWH	Assessment Details	
	ELC Ecosite Codes	Habitat Description	Detailed Information and Sources	Defining Criteria	Study Area	Subject Property
Alvar					Not Present	Not Present
Alvars are extremely rare habitats in Ecoregion 7E	ALO1 ALS1 ALT1 FOC1 FOC2 CUM2 CUS2 CUT2-1 CUW2 Five Alvar Indicator Species: 1) *Carex crawei* 2) *Panicum philadelphicum* 3) *Eleocharis compressa* 4) *Scutellaria parvula* 5) *Trichostema brachiatum* These indicator species are very specific to Alvars within Ecoregion 7E[cxlix]	An alvar is typically a level, mostly unfractured calcareous bedrock feature with a mosaic of rock pavements and bedrock overlain by a thin veneer of soil. The hydrology of alvars is complex, with alternating periods of inundation and drought. Vegetation cover varies from sparse lichen-moss associations to grasslands and shrublands and comprising a number of characteristic or indicator plant. Undisturbed alvars can be phyto- and zoogeographically diverse, supporting many uncommon or are relict plant and animals species. Vegetation cover varies from patchy to barren with a less than 60% tree cover[lxxviii].	An Alvar site > 0.5ha in size[lxxv]. Alvar is particularly rare in Ecoregion 7E where the only known sites are found in the western islands of Lake Erie[cxcix]. <u>Information Sources</u> • Alvars of Ontario (2000), Federation of Ontario Naturalists[lxxvi]. • Ontario Nature – Conserving Great Lakes Alvars[ccviii]. • Natural Heritage Information Centre (NHIC) has location information available on their website • OMNRF Staff • Field Naturalist clubs • Conservation Authorities	Field studies identify four of the five **Alvar indicator species**[lxxv] at a candidate Alvar site is Significant • Site must not be dominated by exotic or introduced species (<50% vegetative cover exotics). • The alvar must be in excellent condition and fit in with surrounding landscape with few conflicting land uses[lxxv]. • SWHMIST[cxlix] Index #17 provides development effects and mitigation measures.	Alvars are not present within or adjacent to the subject property.	
Old Growth Forest					Not Present	Not Present
Due to historic logging practices and land clearance for agriculture, old growth forest is rare in Ecoregion 7E.	Forest Community Series: FOD FOC FOM SWD SWC SWM	Old growth forests are characterized by heavy mortality or turnover of overstorey trees resulting in a mosaic of gaps that encourage development of a multi-layered canopy and an abundance of snags and downed woody debris.	Woodland area is >0.5ha <u>Information Sources</u> • OMNRF Forest Resource Inventory mapping • OMNRF Districts • Field naturalist clubs • Conservation Authorities • Sustainable Forestry Licence (SFL) companies will possibly know locations through field operations. • Municipal forestry departments	Field Studies will determine: • If dominant trees species of the ecosite are >140 years old, then stand is Significant Wildlife Habitat[cxlviii]. • The forested area containing the old growth characteristics will have experienced no recognizable forestry activities [cxlviii] (cut stumps will not be present) • Determine ELC Vegetation Type for forest area containing the old growth characteristics[lxxviii]. • SWHMIST[cxlix] Index #23 provides development effects and mitigation measures.	Old growth forests are not present within or adjacent to the subject property.	

Table 2. Characteristics of Rare Vegetation Communities for Ecoregion 7E (MNRF 2015)

Rationale	Candidate SWH			Confirmed SWH	Assessment Details	
	ELC Ecosite Codes	Habitat Description	Detailed Information and Sources	Defining Criteria	Study Area	Subject Property
Savannah					Not Present	Not Present
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%. In Ecoregion 7E, known Tallgrass Prairie and savannah remnants are scattered between Lake Huron and Lake Erie, near Lake St. Clair, north of and along the Lake Erie shoreline, in Brantford and in the Toronto area (north of Lake Ontario)[cc].	No minimum size to site[l] Site must be restored or a natural site. Remnant sites such as railway right of ways are not considered to be SWH. <u>Information Sources</u> • OMNRF Districts • Natural Heritage Information Centre (NHIC) has location data available on their website • Field naturalists clubs • Conservation Authorities	Field studies confirm one or more of the Savannah indicator species listed in[lxxv] Appendix N should be present[l]. Note: Savannah plant spp. list from Ecoregion 7E should be used. • Area of the ELC Vegetation type is the SWH[lxxviii]. • Site must not be dominated by exotic or introduced species (<50% vegetative cover exotics). • SWHMIST[cxlix] Index #18 provides development effects and mitigation measures.	Savannahs (i.e., tallgrass prairie habitat that has 25-60% tree cover) are not present within or adjacent to the subject property.	
Tallgrass Prairie					Not Present	Not Present
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. In Ecoregion 7E, known Tallgrass Prairie and savannah remnants are scattered between Lake Huron and Lake Erie, near Lake St. Clair, north of and along the Lake Erie shoreline, in Brantford and in the Toronto area (north of Lake Ontario)[cc].	No minimum size to site[l]. Site must be restored or a natural site. Remnant sites such as railway right of ways are not considered to be SWH. <u>Information Sources</u> • Natural Heritage Information Centre (NHIC has location information available on their website • OMNRF Districts • Field naturalists clubs • Conservation Authorities	Field studies confirm one or more of the Prairie indicator species listed in[lxxv] Appendix N should be present[l]. Note: Prairie plant spp. list from Ecoregion 7E should be used. • Area of the ELC Vegetation Type is the SWH[lxxviii]. • Site must not be dominated by exotic or introduced species (<50% vegetative cover exotics). • SWHMIST[cxlix] Index #19 provides development effects and mitigation measures.	Tallgrass Prairie habitat is not present within or adjacent to the subject property.	
Other Rare Vegetation Communities					Not Present	Not Present
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 OMNRF/NHIC will have up to date listing for rare vegetation communities. <u>Information Sources</u> • Natural Heritage Information Centre (NHIC) has location information available on their website • OMNRF Districts • Field naturalists clubs • Conservation Authorities	Field studies should confirm if an ELC Vegetation Type is a rare vegetation community based on listing within Appendix M of SWHTG[cxlviii]. • Area of the ELC Vegetation Type polygon is the SWH. • SWHMIST[cxlix] Index #37 provides development effects and mitigation measures.	Beaches, fens, barrens, dunes, and swamps are not present within the subject property. Rare vegetation communities are not present within or adjacent to the subject property.	

Significant Wildlife Habitat Assessment Tables

Table 3. Characteristics of Specialized Wildlife Habitat for Ecoregion 7E (MNRF 2015)

Rationale	Candidate SWH			Confirmed SWH	Assessment Details	
	Wildlife Species	ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	Study Area	Subject Property
Wildlife Habitat: Waterfowl Nesting Area					Not Present	Not Present
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 (>0.5ha) or a wetland (>0.5ha) with small wetlands (0.5ha) within 120m or a cluster of 3 or more small (<0.5 ha) wetlands within 120m of each individual wetland where waterfowl nesting is known to occur[cxlix]. • Upland areas should be at least 120m wide so that predators such as racoons, skunks, and foxes have difficulty finding nests. • Wood Ducks and Hooded Mergansers utilize large diameter trees (>40cm dbh) in woodlands for cavity nest sites. <u>Information Sources</u> • Ducks Unlimited staff may know the locations of particularly productive nesting sites. • OMNRF Wetland Evaluations for indication of significant waterfowl nesting habitat. • Reports and other information available from CAs	Studies confirmed: • Presence of 3 or more nesting pairs for listed species excluding Mallards[j], or, • Presence of 10 or more nesting pairs for listed species including Mallards[j]. • 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.	No wetlands within 120m are present within or adjacent to the subject property.	
Wildlife Habitat: Bald Eagle and Osprey Nesting, Foraging and Perching Habitat					Not Present	Not Present
Nest sites are fairly uncommon in Ecoregion 7E and are used annually by these species. Many suitable nesting locations may be lost due to increasing shoreline development pressures and scarcity of habitat.	Osprey <u>Special Concern</u>: 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). <u>Information Sources</u> • Natural Heritage Information Center (NHIC) compiles all known nesting sites for Bald Eagles in Ontario • MNRF values information (LIO/NRVIS) will list known nesting locations, Note: data from NRVIS is provided as a point format and does not include all the habitat. • Nature Counts, Ontario Nest Records Scheme data • OMNRF Districts • Check the Ontario Breeding Bird Atlas[ccv] or Rare Breeding Birds in Ontario for species documented • Reports and other information available from CAs • Field naturalists clubs	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 SWH[ccvii], 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 dependant on site lines from the nest to the development and inclusion of perching and foraging habitat[cvi]. • To be significant a site must be used annually. When found inactive, the site must be known to be inactive for ≥3 years or suspected of not being used for >5 years before being considered not significant[ccvii]. • Observational studies to determine nest site use, perching sites and foraging areas need to be done from mid March to mid August. • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • SWHMIST[cxlix] Index #26 provides development effects and mitigation measures.	Lakes, ponds, rivers, and wetlands are not present. Suitable habitat is not present within or adjacent to the subject property.	

Table 3. Characteristics of Specialized Wildlife Habitat for Ecoregion 7E (MNRF 2015)

Rationale	Candidate SWH			Confirmed SWH	Assessment Details	
	Wildlife Species	ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	Study Area	Subject Property
Wildlife Habitat: Woodland Raptor Nesting Habitat					Not Present	Not Present
Nests sites for these species are rarely identified; these area sensitive habitats 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 combined >30ha or with >4ha of interior habitat[lxxxviiii, 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 Coopers hawk nest along forest edges sometimes on peninsulas or small off-shore islands. • In disturbed sites, nests may be used again, or a new nest will be in close proximity to old nest. <u>Information Sources</u> • OMNRF Districts • Check the Ontario Breeding Bird Atlas[ccv] or Rare Breeding Birds in Ontario for species documented. • Check data from Bird Studies Canada • Reports and other information available from CAs	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 28 ha of habitat is the SWH[ccvii].(the 28ha habitat area would be applied where optimal habitat is irregularly shaped around the nest) • Barred Owl – A 200m radius around the nest is the SWH[ccvii]. • Broad-winged Hawk and Coopers Hawk – A 100m radius around the nest is the SWH[ccvii]. • Sharp-Shinned Hawk – A 50m radius around the nest is the SWH[ccvii]. • Conduct field investigations from early March to end of May. The use of call broadcasts can help in locating territorial (courting/nesting) raptors and facilitate the discovery of nests by narrowing down the search area. • SWHMIST[cxlix] Index #27 provides development effects and mitigation measures.	The woodland does not meet the >30ha size criterion for this SWH. Suitable habitat is not present within or adjacent to the subject property.	
Wildlife Habitat: Turtle Nesting Area					Not Present	Not Present
These habitats are rare and when identified will often be the only breeding site for local populations of turtles.	Midland Painted Turtle <u>Special Concern</u>: 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. <u>Information Sources</u> • 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	Studies confirm: • Presence of 5 or more nesting Midland Painted Turtles[i] • 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 dependant on slope, riparian vegetation and adjacent land use is the SWH[cxlviii]. • Travel routes from wetland to nesting area are to be considered within the SWH as part of the 30-100m area of habitat[cxlix]. • Field investigations should be conducted in prime nesting season typically late spring to early summer. Observation studies observing the turtles nesting is a recommended method. • SWHMIST[cxlix] Index #28 provides development effects and mitigation measures for turtle nesting habitat.	Adjacent areas are highly disturbed (i.e., recreational fields with human presence, surrounding roads), do not contain sandy areas and are not near water. Suitable habitat is not present within or adjacent to the subject property.	

Table 3. Characteristics of Specialized Wildlife Habitat for Ecoregion 7E (MNRF 2015)

Rationale	Candidate SWH			Confirmed SWH	Assessment Details	
	Wildlife Species	ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	Study Area	Subject Property
Wildlife Habitat: Seeps and Springs					Not Present	Not Present
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]. <u>Information Sources</u> • Topographical Map • Thermography • Hydrological surveys conducted by CAs and MOE • Field naturalists and landowners • Municipalities and Conservation Authorities may have drainage maps and headwater areas mapped	Field Studies confirm: • Presence of a site with 2 or more[f] seeps/springs should be considered SWH. • The area of a ELC forest ecosite containing the seeps/springs is the SWH. The protection of the recharge area considering the slope, vegetation, height of trees and groundwater condition need to be considered in delineation of the habitat[cxlviii]. • SWHMIST[cxlix] Index #30 provides development effects and mitigation measures.	Seeps and springs are not present within or adjacent the subject property. The on-site Headwater Drainage Feature is largely formed by drainage from Munn's School.	
Wildlife Habitat: Amphibian Breeding Habitat (Woodland)					Not Present	Not Present
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]. <u>Information Sources</u> • Ontario Herpetofaunal Summary Atlas (or other similar atlases) for records • Local landowners may also provide assistance as they may hear spring-time choruses of amphibians on their property. • OMNRF Districts and wetland evaluations • Field naturalist clubs • Canadian Wildlife Service Amphibian Road Call Survey • Ontario Vernal Pool Association: http://www.ontariovernalpools.org	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 with at least 20 individuals (adults or eggs masses) or 2 or more of the listed frog/toad species with Call Level Codes of 3. • A combination of observational study and call count surveys [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 wetland 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 to be included in the habitat. • SWHMIST[cxlix] Index #14 provides development effects and mitigation measures.	Wetlands, ponds, and woodland pools (including vernal pools) are not located adjacent (within 120m) to a woodland. Suitable habitat is not present within or adjacent to the subject propery	

Table 3. Characteristics of Specialized Wildlife Habitat for Ecoregion 7E (MNRF 2015)

Rationale	Candidate SWH			Confirmed SWH	Assessment Details	
	Wildlife Species	ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	Study Area	Subject Property
Wildlife Habitat: Amphibian Breeding Habitat (Wetland)					Not Present	Not Present
Wetlands supporting breeding for these amphibian species are extremely important and fairly rare within Central Ontario Landscapes	Eastern Newt American Toad Spotted Salamander Four-toed Salamander Blue-spotted Salamander Gray Treefrog Western Chorus Frog Northern Leopard Frog Pickerel Frog Green Frog Mink Frog Bullfrog	ELC Community Classes SW, MA, FE, BO, OA and SA. Typically these wetland ecosites will be isolated (>120m) from woodland ecosites, however larger wetlands containing predominantly aquatic species (e.g. Bull Frog) may be adjacent to woodlands.	• Wetlands >500m^2 (about 25m diameter)[ccvii] supporting high species diversity are significant: some small or ephemeral habitats may not be identified on MNR 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. <u>Information Sources</u> • 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 1or more of the listed newt/salamander species or 2 or more of the listed frog or toad species and with at least 20 breeding individuals (adults and eggs masses)[lxxi, lxxiii] or 2 or more of the listed frog/toad species with Call Level of 3. or; Wetland with confirmed breeding Bullfrogs are significant[í]. • The ELC ecosite wetland area and the shoreline are the SWH. • A combination of observational study and call count surveys cviii to determine breeding/larval stages will be required during the spring (May March-June) when amphibians are concentrated around suitable breeding habitat within or near the woodland/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.	Wetlands are not present within or adjacent to the subject property.	
Wildlife Habitat: Woodland Area-Sensitive Bird Breeding Habitat					Not Present	Not Present
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 Pileated Woodpecker <u>Special Concern</u>: 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 >30ha[cv, cxxxi, cxxxii, cxxxiii, cxxxiv, cxxxv, cxxxvi, cxxxvii, cxxxviii, cxxxix, cxl, cxli, cxlii, cxliii, cxliv, cxlv, cxlvi, cl, cli, clii, cliii, cliv, clv, clvi, clvii, clviii, clix]. • Interior forest habitat is at least 200m from forest edge habitat[clxiv]. <u>Information Sources</u> • Local birder clubs • Canadian Wildlife Service (CWS) for the location of forest bird monitoring • Bird Studies Canada conducted a 3-year study of 287 woodlands to determine the effects of forest fragmentation on forest birds and to determine what forests were of greatest value to interior species. • Reports and other information available from CAs	Studies confirm: • Presence of nesting or breeding pairs of 3 or more of the listed wildlife species[í]. • Note: any site with breeding Cerulean Warblers or Canada Warbler is to be considered SWH[í]. • Conduct field investigations in 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.	The on-site woodland does not meet the >30ha size criterion for this SWH. Further, large mature (>60yrs old) forest stands or woodlots are not present. Suitable habitat is not present within or adjacent to the subject property.	

Significant Wildlife Habitat Assessment Tables

Table 4. Characteristics of Habitat for Species of Conservation Concern for Ecoregion 7E (MNRF 2015)

Rationale	Candidate SWH			Confirmed SWH	Assessment Details	
	Wildlife Species	ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	Study Area	Subject Property
Wildlife Habitat: Marsh Bird Breeding Habitat					Not Present	Not Present
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 Green Heron Trumpeter Swan <u>Special Concern</u>: 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. <u>Information Sources</u> • OMNRF Districts and wetland evaluations • Field naturalist clubs • Natural Heritage Information Centre (NHIC) • Reports and other information available from CAs • Ontario Breeding Bird Atlas[ccv]	Studies confirm: • Presence of 5 or more nesting pairs of Sedge Wren or Marsh Wren or breeding by any combination of 4 or more of the listed species[l]. • Note: any wetland with breeding of 1 or more Trumpeter Swans, Black Terns, Green Heron or Yellow Rail is SWH[l]. • 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	Wetlands are not present within or adjacent to the subject property.	
Wildlife Habitat: Open Country Bird Breeding Habitat					Not Present	Not Present
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 <u>Special Concern</u>: Short-eared Owl	CUM1 CUM2	Large grassland areas (includes natural and cultural fields and meadows) >30ha[clx, clxi, clxii, clxiii, clxiv, clxv, clxvi, clxvii, clxviii, clxix]. Grasslands not Class 1 or 2 agricultural lands, and not being actively used for farming (i.e. no row cropping or intensive hay or livestock pasturing in the last 5 years)[l]. 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. <u>Information Sources</u> • Agricultural land classification maps Ministry of Agriculture • Local birder clubs • Ontario Breeding Bird Atlas[ccv] • EIS Reports and other information available from CAs	Field Studies confirm: • Presence of nesting or breeding of 2 or more of the listed species[l]. • A field with 1 or more breeding Short-eared Owls is to be considered SWH. • The area of SWH is the contiguous ELC ecosite field areas. • Conduct field investigations of the most likely areas in spring and early summer when birds are singing and defending their territories. • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • SWHMIST[cxlix] Index #32 provides development effects and mitigation measures	Large grassland areas (>30ha in size) are not present within or adjacent to the subject property.	

Table 4. Characteristics of Habitat for Species of Conservation Concern for Ecoregion 7E (MNRF 2015)

Rationale	Candidate SWH			Confirmed SWH	Assessment Details	
	Wildlife Species	ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	Study Area	Subject Property
Wildlife Habitat: Shrub/Early Successional Bird Breeding Habitat					Not Present	Not Present
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.	Indicator Spp: Brown Thrasher Clay-coloured Sparrow Common Spp. Field Sparrow Black-billed Cuckoo Eastern Towhee Willow Flycatcher <u>Special Concern</u>: Yellow-breasted Chat Golden-winged Warbler	CUT1 CUT2 CUS1 CUS2 CUW1 CUW2 Patches of shrub ecosites can be complexed into a larger habitat such as woodland area for some bird species.	Large natural field areas succeeding to shrub and thicket habitats >10ha[clxiv] in size. Shrub land or early successional fields, not class 1 or 2 agricultural lands, not being actively used for farming (i.e. no row-cropping, haying or live-stock pasturing in the last 5 years)[í]. 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. <u>Information Sources</u> • 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[í]. • A field with breeding Yellow-breasted Chat or Golden-winged Warbler is to be considered as Significant Wildlife Habitat[í]. • 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.	Large natural field areas succeeding to shrub and thicket habitats >10ha in size are not present. Suitable habitat is not present within or adjacent to the subject property.	
Wildlife Habitat: Terrestrial Crayfish					Not Present	Not Present
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 CUM1 with inclusions of above meadow marsh ecosites can be used by terrestrial crayfish.	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. <u>Information Sources</u> • 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 large ecosite area is the SWH • Surveys should be done April to August in temporary or permanent water. Note the presence of burrows or chimneys are often the only indicator of presence, observance or collection of individuals is very difficult [cci] • SWHMIST[cxlix] Index #36 provides development effects and mitigation measures.	Wet meadows and edges of shallow marshes are not present. Suitable habitat is not present within or adjacent to the subject property.	
Wildlife Habitat: Special Concern and Rare Wildlife Species					Not Present	Not Present
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 (NHIC).	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]. <u>Information Sources</u> • Natural Heritage Information Centre (NHIC) will have the Special Concern and Provincially Rare (S1-S3, SH) species lists and element occurrences for these species. • NHIC Website: "Get Information" http://nhic.mnr.gov.on.ca • Ontario Breeding Bird Atlas[ccv] • Expert advice should be sought as many of the rare spp. have little information available about their requirements.	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 neess to be easily mapped and cover an important life stage component for a species e.g. specific nesting habitat for foraging habitat. • SWHMIST[cxlix] Index #37 provides development effects and mitigation measures.	Suitable habitat for SCC is not present within or adjacent to the subject property.	

Significant Wildlife Habitat Assessment Tables

Table 5. Characteristics of Animal Movement Corridors for Ecoregion 7E (MNRF 2015)

Rationale	Candidate SWH			Confirmed SWH	Assessment Details	
	Wildlife Species	ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	Study Area	Subject Property
Wildlife Habitat: Amphibian Movement Corridors					Not Present	Not Present
Movement corridors for amphibians moving from their terrestrial habitat to breeding habitat can be extremely important for local populations.	Eastern Newt American Toad Blue-spotted Salamander Spotted Salamander Four-toed Salamander Gray Treefrog Northern Leopard Frog Pickerel Frog Western Chorus Frog	Corridors may be found in all ecosites associated with water. • Corridors will be determined based on identifying the significant breeding habitat for these species in Table 1.1.	Movement corridors between breeding habitat and summer habitat[clxxiv, clxxv, clxxvi, clxxvii, clxxviii, clxxix, clxxx, clxxxi] Movement corridors must be considered when Amphibian breeding habitat is confirmed as SWH from Table 1.2.2 (Amphibian Breeding Habitat – Wetland) of this Schedule[í]. <u>Information Sources</u> • MNRF District Office • Natural Heritage Information Centre NHIC • Reports and other information available from CAs • Field naturalist Clubs	• Field Studies must be conducted at the time of year when species are expected to be migrating or entering breeding sites. • Corridors should consist of native vegetation, with several layers of vegetation. Corridors unbroken by roads, waterways or bodies, and undeveloped areas are most significant[cxlix]. • Corridors should have at least 15m of vegetation on both sides of waterwaycxlix or be up to 200m widecxlix 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 is not present within and adjacent to the subject property (i.e., wetlands are not present). Therefore, suitable amphibian movement corridors are not present within or adjacent to the subject property.	

Significant Wildlife Habitat Assessment Tables

Table 6. Exceptions for Ecodistricts within Ecoregion 7E-2 (MNRF 2015)

Rationale	Candidate SWH			Confirmed SWH	Assessment Details	
	Wildlife Species	Ecosites	Habitat Criteria and Information Sources	Defining Criteria	Study Area	Subject Property
Bat Migratory Stopover Area					Not Present	Not Present
Stopover areas for long distance migrant bats are important during fall migration.	Hoary Bat Eastern Red Bat Silver-haired Bat	No specific ELC types	• Long distance migratory bats typically migrate during late summer and early fall migrating summer breeding habitats throughout Ontario to southern wintering areas. Their annual fall migration may concentrate these species of bats at stopover areas. • This is the only known bat migratory stopover habitats based on current information. <u>Information Sources</u> • OMNRF for possible locations and contact for local experts • University of Waterloo, Biology Department	• Long Point (42°35'N, 80°30'E, to 42°33'N, 80°03'E) has been identified as a significant stop-over habitat for fall migrating Silver-haired bats, due to significant increases in abundance, activity and feeding that was documented during fall migration[ccxv]. • The confirmation criteria and habitat areas for this SWH are still being determined. • SWHMIST[cxlix] Index #38 provides development effects and mitigation measures	The study area is not near Long Point. Stopover areas are not known to be present within the study area. Suitable habitat is not present within or adjacent to the subject property.	

Appendix III
Vascular Flora Species Observed within the Subject Property

Plant Species Reported from the Study Area - 1493 Sixth Line, Oakville (Project #3096A)

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	Halton Region	NRSI Observed
		MNR 2025	MECP 2024	Government of Canada 2024	Government of Canada 2024	Government of Canada 2024	Varga 2000	NRSI Results From 2023 and 2025
Dicotyledons	**Dicots**							
Aceraceae	**Maple Family**							
Acer negundo	Manitoba Maple	S5					X	X
Acer platanoides	Norway Maple	SE5					X	X
Acer saccharinum	Silver Maple	S5					X	X
Anacardiaceae	**Sumac or Cashew Family**							
Rhus typhina	Staghorn Sumac	S5					X	X
Asteraceae	**Composite or Aster Family**							
Ambrosia artemisiifolia	Common Ragweed	S5					X	X
Arctium lappa	Great Burdock	SE5					X	X
Arctium minus	Common Burdock	SE5					X	X
Cirsium arvense	Creeping Thistle	SE5					X	X
Cirsium vulgare	Bull Thistle	SE5					X	X
Erigeron philadelphicus	Philadelphia Fleabane	S5					X	X
Lapsana communis	Common Nipplewort	SE5					X	X
Solidago sp.	Goldenrod sp.							X
Solidago altissima	Tall Goldenrod	S5						X
Sonchus arvensis	Field Sow-thistle	SE5						X
Symphyotrichum sp.	Aster sp.							X
Symphyotrichum lanceolatum	Panicled Aster	S5					X	X
Taraxacum officinale	Common Dandelion	SE5					X	X
Balsaminaceae	**Touch-me-not Family**							
Impatiens capensis	Spotted Jewelweed	S5					X	X
Betulaceae	**Birch Family**							
Betula alleghaniensis	Yellow Birch	S5					X	X
Bignoniaceae	**Bignonia Family**							
Catalpa speciosa	Northern Catalpa	SE1						X
Boraginaceae	**Borage Family**							
Hackelia virginiana	Virginia Stickseed	S5					U	X
Brassicaceae	**Mustard Family**							
Alliaria petiolata	Garlic Mustard	SE5					X	X
Barbarea vulgaris	Bitter Wintercress	SE5					X	X
Caprifoliaceae	**Honeysuckle Family**							
Lonicera tatarica	Tatarian Honeysuckle	SE5					X	X
Sambucus canadensis	Common Elderberry	S5					X	X
Caryophyllaceae	**Pink Family**							
Dianthus armeria	Deptford Pink	SE5					X	X
Chenopodiaceae	**Goosefoot Family**							
Chenopodium album	White Goosefoot	SE5					X	X
Clusiaceae	**St. John's-wort Family**							
Hypericum perforatum	Common St. John's-wort	SE5					X	X
Cornaceae	**Dogwood Family**							
Cornus racemosa	Gray Dogwood	S5					X	X
Fabaceae	**Pea Family**							
Medicago lupulina	Black Medic	SE5					X	X
Robinia pseudoacacia	Black Locust	SE5					X	X
Trifolium aureum	Yellow Clover	SE5					X	X
Trifolium repens	White Clover	SE5					X	X
Vicia cracca	Tufted Vetch	SE5					X	X
Geraniaceae	**Geranium Family**							
Geranium robertianum	Herb-Robert	S5					X	X
Grossulariaceae	**Currant Family**							
Ribes rubrum	Northern Red Currant	SE5					X	X
Juglandaceae	**Walnut Family**							
Carya cordiformis	Bitternut Hickory	S5					X	X
Carya ovata	Shagbark Hickory	S5						X

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	Halton Region	NRSI Observed
		MNR 2025	MECP 2024	Government of Canada 2024	Government of Canada 2024	Government of Canada 2024	Varga 2000	NRSI Results From 2023 and 2025
Juglans nigra	Black Walnut	S4?					X	X
Lamiaceae	**Mint Family**							
Glechoma hederacea	Ground Ivy	SE5					X	X
Leonurus cardiaca	Common Motherwort	SE5						X
Nepeta cataria	Catnip	SE5					X	X
Prunella vulgaris	Self-heal	S5						X
Malvaceae	**Mallow Family**							
Abutilon theophrasti	Velvetleaf	SE5					X	X
Oleaceae	**Olive Family**							
Fraxinus americana	White Ash	S4					X	X
Ligustrum vulgare	European Privet	SE5					X	X
Onagraceae	**Evening-primrose Family**							
Circaea canadensis	Broad-leaved Enchanter's Nightshade	S5					X	X
Oenothera sp.	Evening-primrose sp.							X
Oxalidaceae	**Wood Sorrel Family**							
Oxalis stricta	Upright Yellow Wood-sorrel	SE5					X	X
Plantaginaceae	**Plantain Family**							
Plantago major	Common Plantain	SE5					X	X
Primulaceae	**Primrose Family**							
Lysimachia nummularia	Creeping Jennie	SE5					X	X
Ranunculaceae	**Buttercup Family**							
Ranunculus caricetorum	Northern Swamp Buttercup	S5					X	X
Ranunculus pensylvanicus	Pennsylvania Buttercup	S5					U	X
Rhamnaceae	**Buckthorn Family**							
Rhamnus cathartica	Common Buckthorn	SE5					X	X
Rosaceae	**Rose Family**							
Agrimonia gryposepala	Hooked Agrimony	S5					X	X
Crataegus sp.	Hawthorn sp.							X
Crataegus punctata	Dotted Hawthorn	S5					X	X
Fragaria virginiana	Wild Strawberry	S5						X
Geum sp.	Avens sp.							X
Geum canadense	White Avens	S5					X	X
Geum urbanum	Wood Avens	SE3					X	X
Potentilla recta	Sulphur Cinquefoil	SE5					X	X
Prunus avium	Sweet Cherry	SE4					X	X
Prunus serotina	Black Cherry	S5					X	X
Prunus virginiana	Choke Cherry	S5					X	X
Rosa multiflora	Multiflora Rose	SE5					X	X
Rubus idaeus	Common Red Raspberry	S5						X
Rubus occidentalis	Black Raspberry	S5					X	X
Rubiaceae	**Madder Family**							
Galium aparine	Cleavers	S5					U	X
Galium asprellum	Rough Bedstraw	S5					U	X
Scrophulariaceae	**Figwort Family**							
Veronica serpyllifolia	Thyme-leaved Speedwell	SU					X	X
Solanaceae	**Nightshade Family**							
Solanum dulcamara	Bittersweet Nightshade	SE5					X	X
Ulmaceae	**Elm Family**							
Ulmus americana	American Elm	S5					X	X
Ulmus pumila	Siberian Elm	SE3					X	X
Verbenaceae	**Vervain Family**							
Verbena urticifolia	White Vervain	S5					X	X
Violaceae	**Violet Family**							
Viola nephrophylla	Northern Bog Violet	S5						X
Viola odorata	English Violet	SE2					X	X
Vitaceae	**Grape Family**							
Parthenocissus vitacea	Thicket Creeper	S5					X	X
Vitis riparia	Riverbank Grape	S5					X	X

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	Halton Region	NRSI Observed
		MNR 2025	MECP 2024	Government of Canada 2024	Government of Canada 2024	Government of Canada 2024	Varga 2000	NRSI Results From 2023 and 2025
Monocotyledons	**Monocots**							
Cyperaceae	**Sedge Family**							
Carex vulpinoidea	Fox Sedge	S5					X	X
Scirpus atrocinctus	Black-girdled Bulrush	S5						X
Juncaceae	**Rush Family**							
Juncus effusus	Soft Rush	S5						X
Poaceae	**Grass Family**							
Glyceria striata	Fowl Mannagrass	S5					X	X
Poa pratensis	Kentucky Bluegrass	S5						X
Total								**84**

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Appendix IV
Bird Species Report from the Study Area

Bird Species Reported from the Study Area - 1493 Sixth Sixth Line, Oakville (Project #3096A)

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	OBBA*	NHIC Data**	NRSI Observed: Highest Level of Breeding Evidence
		MNR 2025	MECP 2024	Government of Canada 2024	Government of Canada 2024	Government of Canada 2024	BSC et al. 2006	MNR 2024	NRSI Results from 2023 and 2025
Anatidae	**Ducks, Geese & Swans**								
Aix sponsa	Wood Duck	S5B,S3N					CO		
Anas platyrhynchos	Mallard	S5					CO		
Anas rubripes	American Black Duck	S4					PR		
Branta canadensis	Canada Goose	S5					CO		
Cygnus olor	Mute Swan	SNA					CO		
Odontophoridae	**New World Quails**								
Colinus virginianus	Northern Bobwhite	S1?	END	E	E	Schedule 1		X	
Columbidae	**Pigeons & Doves**								
Columba livia	Rock Pigeon	SNA					CO		
Zenaida macroura	Mourning Dove	S5					CO		**PO**
Cuculiformes	**Cuckoos & Anis**								
Coccyzus americanus	Yellow-billed Cuckoo	S4B					PO		
Coccyzus erythropthalmus	Black-billed Cuckoo	S4S5B					CO		
Caprimulgidae	**Goatsuckers**								
Antrostomus vociferus	Eastern Whip-poor-will	S4B	THR	SC	T	Schedule 1	PR		
Chordeiles minor	Common Nighthawk	S4B	SC	SC	SC	Schedule 1	PO		
Apodidae	**Swifts**								
Chaetura pelagica	Chimney Swift	S3B	THR	T	T	Schedule 1	CO	X	**OB**
Trochilidae	**Hummingbirds**								
Archilochus colubris	Ruby-throated Hummingbird	S5B					PO		
Charadriidae	**Plovers & Lapwings**								
Charadrius vociferus	Killdeer	S4B					CO		
Scolopacidae	**Sandpipers & Allies**								
Actitis macularia	Spotted Sandpiper	S5B					CO		
Scolopax minor	American Woodcock	S4B					PR		
Ardeidae	**Herons & Bitterns**								
Ardea herodias	Great Blue Heron	S4					CO		
Butorides virescens	Green Heron	S4B					PO		
Cathartidae	**Vultures**								
Cathartes aura	Turkey Vulture	S5B,S3N					PR		**OB**
Accipitridae	**Hawks, Kites, Eagles & Allies**								
Accipiter cooperii	Cooper's Hawk	S4	NAR	NAR	NS	No schedule	CO		
Accipiter striatus	Sharp-shinned Hawk	S5	NAR	NAR	NS	No schedule	CO		
Buteo jamaicensis	Red-tailed Hawk	S5	NAR	NAR	NS	No schedule	CO		
Strigidae	**Typical Owls**								
Bubo virginianus	Great Horned Owl	S4					CO		
Megascops asio	Eastern Screech-Owl	S4	NAR	NAR	NS	No schedule	PR		
Alcedinidae	**Kingfishers**								
Megaceryle alcyon	Belted Kingfisher	S5B,S4N					CO		
Picidae	**Woodpeckers**								
Colaptes auratus	Northern Flicker	S5					CO		**PR**
Dryobates pubescens	Downy Woodpecker	S5					CO		**PO**
Dryobates villosus	Hairy Woodpecker	S5					CO		**PR**
Dryocopus pileatus	Pileated Woodpecker	S5					CO		
Falconidae	**Caracaras & Falcons**								
Falco sparverius	American Kestrel	S4					CO		
Tyrannidae	**Tyrant Flycatchers**								
Contopus virens	Eastern Wood-Pewee	S4B	SC	SC	SC	Schedule 1	PR	X	
Empidonax alnorum	Alder Flycatcher	S5B					PO		**OB**
Empidonax minimus	Least Flycatcher	S5B					PO		
Empidonax traillii	Willow Flycatcher	S4B					PR		
Myiarchus crinitus	Great Crested Flycatcher	S5B					CO		
Sayornis phoebe	Eastern Phoebe	S5B					PO		
Tyrannus tyrannus	Eastern Kingbird	S4B					CO		
Vireonidae	**Vireos**								

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	OBBA*	NHIC Data**	NRSI Observed: Highest Level of Breeding Evidence
		MNR 2025	MECP 2024	Government of Canada 2024	Government of Canada 2024	Government of Canada 2024	BSC et al. 2006	MNR 2024	NRSI Results from 2023 and 2025
Vireo gilvus	Warbling Vireo	S5B					PR		
Vireo olivaceus	Red-eyed Vireo	S5B					CO		
Corvidae	**Crows & Jays**								
Corvus brachyrhynchos	American Crow	S5					CO		**PR**
Corvus corax	Common Raven	S5							**OB**
Cyanocitta cristata	Blue Jay	S5					CO		**PR**
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		
Progne subis	Purple Martin	S3B					PR		
Riparia riparia	Bank Swallow	S4B	THR	T	T	Schedule 1	PR		
Stelgidopteryx serripennis	Northern Rough-winged Swallow	S4B					CO		
Tachycineta bicolor	Tree Swallow	S4S5B					PR		**OB**
Paridae	**Chickadees & Titmice**								
Baeolophus bicolor	Tufted Titmouse	S3					PR	X	
Poecile atricapillus	Black-capped Chickadee	S5					CO		**PR**
Sittidae	**Nuthatches**								
Sitta canadensis	Red-breasted Nuthatch	S5					CO		
Sitta carolinensis	White-breasted Nuthatch	S5					CO		
Certhiidae	**Creepers**								
Certhia americana	Brown Creeper	S5					PO		
Troglodytidae	**Wrens**								
Thryothorus ludovicianus	Carolina Wren	S4					CO		**PO**
Troglodytes aedon	House Wren	S5B					CO		**PO**
Polioptilidae	**Gnatcatchers**								
Polioptila caerulea	Blue-gray Gnatcatcher	S4B					PR		
Regulidae	**Kinglets**								
Corthylio calendula	Ruby-crowned Kinglet	S5B,S3N							**OB**
Turdidae	**Thrushes**								
Catharus fuscescens	Veery	S5B					PO		
Hylocichla mustelina	Wood Thrush	S4B	SC	T	T	Schedule 1	PR		
Turdus migratorius	American Robin	S5					CO		**CO**
Mimidae	**Mockingbirds, Thrashers & Allies**								
Dumetella carolinensis	Gray Catbird	S5B,S3N					CO		
Mimus polyglottos	Northern Mockingbird	S4					CO		
Toxostoma rufum	Brown Thrasher	S4B					CO		**OB**
Sturnidae	**Starlings**								
Sturnus vulgaris	European Starling	SNA					CO		
Bombycillidae	**Waxwings**								
Bombycilla cedrorum	Cedar Waxwing	S5					CO		**OB**
Passeridae	**Old World Sparrows**								
Passer domesticus	House Sparrow	SNA					CO		**PR**
Fringillidae	**Finches & Allies**								
Haemorhous mexicanus	House Finch	SNA					CO		
Spinus tristis	American Goldfinch	S5					CO		**PR**
Emberizidae	**New World Sparrows & Allies**								
Ammodramus savannarum	Grasshopper Sparrow	S4B	SC	SC	SC	Schedule 1	PO		
Junco hyemalis	Dark-eyed Junco	S5							**OB**
Melospiza melodia	Song Sparrow	S5					CO		**PO**
Passerculus sandwichensis	Savannah Sparrow	S5B,S3N					CO		
Pipilo erythrophthalmus	Eastern Towhee	S4B,S3N					PR		
Pooecetes gramineus	Vesper Sparrow	S4B					PO		
Spizella passerina	Chipping Sparrow	S5B,S3N					CO		
Spizella pusilla	Field Sparrow	S4B,S3N					PO		**OB**
Icteridae	**Troupials & Allies**								
Agelaius phoeniceus	Red-winged Blackbird	S5					CO		**OB**

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	OBBA*	NHIC Data**	NRSI Observed: Highest Level of Breeding Evidence
		MNR 2025	MECP 2024	Government of Canada 2024	Government of Canada 2024	Government of Canada 2024	BSC et al. 2006	MNR 2024	NRSI Results from 2023 and 2025
Dolichonyx oryzivorus	Bobolink	S4B	THR	SC	T	Schedule 1	PO		
Icterus galbula	Baltimore Oriole	S4B					CO		
Molothrus ater	Brown-headed Cowbird	S5					CO		
Quiscalus quiscula	Common Grackle	S5					CO		**PR**
Sturnella magna	Eastern Meadowlark	S4B,S3N	THR	T	T	Schedule 1	PR		
Parulidae	**Wood Warblers**								
Geothlypis philadelphia	Mourning Warbler	S5B					PO		
Geothlypis trichas	Common Yellowthroat	S5B,S3N					PR		
Seiurus aurocapilla	Ovenbird	S5B					PO		
Setophaga coronata	Yellow-rumped Warbler	S5B,S4N							**OB**
Setophaga pensylvanica	Chestnut-sided Warbler	S5B					PO		
Setophaga petechia	Yellow Warbler	S5B					CO		
Setophaga pinus	Pine Warbler	S5B,S3N					PR		
Setophaga ruticilla	American Redstart	S5B					PR		
Cardinalidae	**Cardinals, Grosbeaks & Allies**								
Cardinalis cardinalis	Northern Cardinal	S5					CO		**CO**
Passerina cyanea	Indigo Bunting	S5B					CO		
Pheucticus ludovicianus	Rose-breasted Grosbeak	S5B					CO		
Piranga olivacea	Scarlet Tanager	S5B					PO		
Total							**91**	**4**	**27**

*OBBA Atlas Square: 17PJ01

**NHIC Atlas Square: 17PJ0413

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Appendix V
Herpetofauna Species Reported from the Study Area

Reptile and Amphibian Species Reported from the Study Area - 1493 Sixth Line, Oakville (Project #3096A)

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	ORAA*	NHIC Data**	NRSI Observed
		MNR 2025	MECP 2024	Government of Canada 2024	Government of Canada 2024	Government of Canada 2024	Ontario Nature 2019	MNR 2024	NRSI Results from 2023 and 2025
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	Eastern Milksnake	S4	NAR	SC	SC	Schedule 1	X		
Opheodrys vernalis	Smooth Greensnake	S4					X		
Nerodia sipedon sipedon	Northern Watersnake	S5	NAR	NAR	NS	No schedule	X		
Storeria dekayi	Dekay's Brownsnake	S5	NAR	NAR	NS	No schedule	X		
Storeria occipitomaculata	Red-bellied Snake	S5					X		
Thamnophis sirtalis sirtalis	Eastern Gartersnake	S5					X		
Salamanders									
Ambystoma jeffersonianum	Jefferson Salamander	S2	END	E	E	Schedule 1	X		
Ambystoma laterale - (2) jeffersonianum	Unisexual Ambystoma (Jefferson Salamar	S2	END	E	E	Schedule 1	X		
Ambystoma maculatum	Spotted Salamander	S4					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		
Dryophytes versicolor	Gray Treefrog	S5					X		
Pseudacris triseriata pop. 2	Western Chorus Frog (Great Lakes / St. L	S4	NAR	T	T	Schedule 1	X		
Pseudacris crucifer	Spring Peeper	S5					X		
Lithobates clamitans	Green Frog	S5					X		
Lithobates pipiens	Northern Leopard Frog	S5	NAR	NAR	NS	No schedule	X		
Lithobates sylvaticus	Wood Frog	S5					X		
Total							**23**	**0**	**0**

*ORAA Atlas Square: 17PJ01
**NHIC Atlas Square: 17PJ0413

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Appendix VI
Mammal Species Reported from the Study Area

Mammal Species Reported from the Study Area - Sixth Line, Oakville (Project #3096A)

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	Ontario Mammal Atlas	NHIC Data**	NRSI Observed
		MNRF 2024a	MECP 2024	Government of Canada 2024	Government of Canada 2024	Government of Canada 2024	Dobbyn 1994	MNRF 2024b	NRSI Results from 2023 and 2025
Didelphimorphia	**Opossums**								
Didelphis virginiana	Virginia Opossum	S4					X		
Eulipotyphla	**Shrews, Moles, Hedgehogs, and Allies**								
Blarina brevicauda	Northern Short-tailed Shrew	S5					X		
Condylura cristata	Star-nosed Mole	S5					X		
Parascalops breweri	Hairy-tailed Mole	S4					X		
Sorex cinereus	Masked Shrew	S5					X		
Sorex fumeus	Smoky Shrew	S5					X		
Sorex hoyi	Pygmy Shrew	S4					X		
Sorex palustris	Water Shrew	S5					X		
Chiroptera	**Bats**								
Eptesicus fuscus	Big Brown Bat	S4					X		X
Lasionycteris noctivagans	Silver-haired Bat	S3	END	E	NS	No schedule	X		X
Lasiurus borealis	Eastern Red Bat	S3	END	E	NS	No schedule	X		X
Lasiurus cinereus	Hoary Bat	S3	END	E	NS	No schedule	X		X
Myotis leibii	Eastern Small-footed Myotis	S2S3	END						X
Myotis lucifugus	Little Brown Myotis	S3	END	E	E	Schedule 1	X		X
Myotis septentrionalis	Northern Myotis	S3	END	E	E	Schedule 1	X		
Perimyotis subflavus	Tri-colored Bat	S3?	END	E	E	Schedule 1	X		
Lagomorpha	**Rabbits and Hares**								
Lepus americanus	Snowshoe Hare	S5					X		
Lepus europaeus	European Hare	SNA					X		
Sylvilagus floridanus	Eastern Cottontail	S5					X		X
Rodentia	**Rodents**								
Castor canadensis	Beaver	S5					X		
Erethizon dorsatum	Porcupine	S5					X		
Glaucomys sabrinus	Northern Flying Squirrel	S5					X		
Marmota monax	Woodchuck	S5					X		
Microtus pennsylvanicus	Meadow Vole	S5					X		
Mus musculus	House Mouse	SNA					X		
Ondatra zibethicus	Muskrat	S4					X		
Peromyscus leucopus	White-footed Mouse	S5					X		
Peromyscus maniculatus	Deer Mouse	S5					X		
Rattus norvegicus	Norway Rat	SNA					X		
Sciurus carolinensis	Eastern Gray Squirrel	S5					X		X
Tamias striatus	Eastern Chipmunk	S5					X		X
Tamiasciurus hudsonicus	Red Squirrel	S5					X		
Zapus hudsonius	Meadow Jumping Mouse	S5					X		
Canidae	**Canines**								
Canis latrans	Coyote	S5					X		
Vulpes vulpes	Red Fox	S5					X		
Mephitidae	**Skunks and Stink Badgers**								
Mephitis mephitis	Striped Skunk	S5					X		
Mustelidae	**Weasels and Allies**								
Lontra canadensis	North American River Otter	S5					X		
Mustela richardsonii	American Ermine	S5					X		
Neogale frenata	Long-tailed Weasel	S4					X		
Neogale 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**								
Alces alces	Moose	S5					X		
Odocoileus virginianus	White-tailed Deer	S5					X		
Total							**43**	**0**	**10**

*Mammal Atlas Square Number: PU
**NHIC Atlas Square: 17PJ0413

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Appendix VII
Bat Monitoring Summary Report

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

January 9, 2026 Project No. 3096B

Memo

To: **Ben Wallace**

From: **Sydney Gilmour**

Date: **January 9, 2026**

Re: **1493 Sixth Line, Oakville**
Bat Monitoring Results

1.0 Introduction

Natural Resource Solutions Inc. (NRSI) was retained by Innovative SHS to complete an Environmental Impact Study (EIS) Addendum associated with a proposed residential development located at 1493 Sixth Line, Oakville and referred to herein as the subject property (Map 1). See the EIS Addendum for further details on the proposed development.

The subject property is approximately 0.87ha in size and contains a single residential dwelling home that was built in 1950, along with two accessory structures (i.e., pigeon shed and lawn shed). The residential dwelling is located within the western section of the property and is surrounded by Cultural Meadow (CUM1), landscaped trees, and a deciduous hedgerow along the northern boundary. A Common Buckthorn (*Rhamnus cathartica*)-dominated Cultural Thicket community (CUT1) is located within the eastern section of the property; a portion of this CUT1 was recently cleared by the landowner. The rear (easternmost) portion of the subject property contains a Cultural Woodland community (CUW1).

Tree removal will be required to accommodate the proposed development; thus, to ensure compliance with the *Endangered Species Act* (ESA), 2007, NRSI completed habitat assessments and passive acoustic monitoring to assess the potential presence of bat habitat within the subject property.

This memo provides a summary of the methods and results of these surveys.

2.0 Methods

2.1 Bat Habitat Assessment

Bat habitat assessments were completed during leaf-off conditions on April 25, 2025 to document potential bat roosting habitat associated with trees following the guidance documents *Species at Risk Bats Survey Note - 2022* (MECP 2022a) and *Maternity Roost Surveys (Forest/Woodlands)* (MECP 2022b).

All standing live or dead trees with cracks, crevices, hollows, cavities, and/or loose or naturally exfoliating bark that could provide suitable roosting habitat for bats, including the Species at Risk (SAR) Little Brown Myotis (*Myotis lucifugus*), Northern Myotis (*Myotis septentrionalis*), and

Silver-haired Bat (*Lasionycteris noctivagans*) were documented within the assessment area. Tree species, diameter at breast height (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 features were documented for each potential roost tree. The presence of leaf clusters with suitable roosting habitat for the SAR, Tri-colored Bat (*Perimyotis subflavus*), were also documented.

Any open, sunny rocky features which could provide suitable maternity roosting habitat for the rock specialist, Eastern Small-footed Myotis (*Myotis leibii*), were also noted. Examples of potentially suitable open, sunny rocky features that may be used by Eastern Small-footed Myotis include large unvegetated rock piles, talus slopes, cliffs, rock barrens, road cuts through bedrock, retaining walls, concrete piers or pillars, or quarries.

In addition, the three structures present on the subject property were assessed for the potential to provide roosting and/or hibernation habitat for bats on April 22, 2025, in accordance with the *Species at Risk Bats Survey Note - 2022* (MECP 2022a).

All external features that may provide suitable roosting habitat or access points to suitable roosting habitat were examined, including fascia, soffits, roofline connections with walls, flashing, siding, etc. The ground underneath potential access points as well as windowsills and walls were also examined for guano and fur oil staining during external inspections. The interior of the house was inspected for potential roosting habitat.

During habitat assessments, any features which could provide hibernation habitat for SAR bats were noted. Examples include caves, crevices in bedrock extending beyond the frost line, mines containing adits, long concrete culverts, rail tunnels, or concrete or stone underground bunkers or holding tanks with surface accessibility.

2.2 Acoustic Monitoring for Species at Risk Bats

Acoustic monitoring for bats was completed in proximity to potential bat roost trees. Bat acoustic monitoring methodology followed current Ministry of Environment, Conservation and Parks (MECP) guidelines (MECP 2022a, 2022b) and is described in detail below.

2.2.1 Station Locations

Two acoustic monitoring stations were placed near potential bat roost trees to assess the presence of SAR bats within the subject property (Map 2). Details for each acoustic monitoring station are provided in Appendix I.

2.2.2 Detector Settings and Deployment

Bat activity was monitored with the use of a Song Meter MiniBat ultrasound acoustic recorder (Wildlife Acoustics Inc., Massachusetts, USA). Table 1 summarizes the unit settings used for this project. Microphones were deployed on a pole at a height of approximately 4.8m and oriented towards the potential habitat being surveyed.

Table 1. Acoustic recorder settings used for bat acoustic monitoring

Parameter	Setting Used
Detector Type	Wildlife Acoustics Song Meter Mini Bat
Recording Format	Full Spectrum
Sample Rate	384 kHz
Minimum Trigger Frequency	16 kHz

Maximum Length	15 seconds
Trigger Window	3 sec
Gain	12 dB
Schedule Start	Sunset + 00:00 hrs
Schedule End	Sunset + 05:00 hrs

2.2.3 Monitoring Frequency and Timing

Acoustic detectors were set to record bat call sequences for five hours each night during the monitoring period, commencing at sunset. Passive acoustic monitoring was conducted between June 16 and July 2, 2025 totalling 17 nights, with 15 nights of data collected in June.

Upon review of weather conditions, bat echolocation calls recorded on the 10 evenings with the most ideal weather conditions for bat activity (ambient temperature >10°C, low wind and no precipitation) in June were selected for further analyses (Appendix II). As per MECP guidelines (2022b), 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.

2.2.4 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 (15-120 kHz) 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. Each 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 30.2 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: 32.

All bat call sequences, except those auto-classified as Big Brown Bat, were manually reviewed by NRSI biologists to bat species or species grouping (Table 2). Calls auto-classified to Big Brown Bat were not manually reviewed as they are a common species on the landscape and a high number of call auto-classified to the species were recorded.

Table 2. Call classifications for Ontario bat species.

Species	Typical Characteristic Frequency (kHz)	NRSI Call Sequence Classification		
Hoary Bat (*Lasiurus cinereus*)	~20	Low Frequency	-	Hoary Bat
Big Brown Bat (*Eptesicus fuscus*)	~30		30 kHz	Big Brown Bat
Silver-haired Bat (*Lasionycteris noctivagans)*	~30			Silver-haired Bat
Eastern Red Bat (*Lasiurus borealis*)	~40	High Frequency	-	Eastern Red Bat
Tri-colored Bat (*Perimyotis subflavus*)	~40			Tri-colored Bat
Little Brown Myotis (*Myotis lucifugus*)	~40		*Myotis* spp.	Little Brown Myotis
Northern Myotis (*Myotis septentrionalis*)	~40			Northern Myotis
Eastern Small-footed Myotis (*Myotis leibii*)	~40			Eastern Small-footed Myotis

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). A MLE value provides an indication of the strength of evidence for the presence of a species. A MLE value of 0 suggests that the data presents strong evidence of species presence and a value of 1 suggests that the data presents weak evidence of species presence. It is important to note that the likelihood estimate provides a probabilistic estimate and does not convey certainty.

3.0 Results

3.1 Bat Habitat Assessment

In total, 16 potential roost trees for Little Brown Myotis, Northern Myotis, Silver-haired Bat, or Big Brown Bat and 1 potential roost tree for Tri-colored Bat was documented within the bat habitat assessment area (Map 2). Detailed information on each of the documented potential roost trees within the subject property for the species listed above, is available in Appendix III.

The one and a half storey house contains knee wall (or side) attic spaces, a heated basement, and an attached garage. Bats could enter the building through several openings to the knee wall attic spaces and many openings to the attached garage. There are also openings through which bats could access the main portion of the house from the attic spaces. Given the configuration of the knee wall attic spaces, they could not be fully explored but were noted to be

small with many cobwebs and with evidence of historical squirrel use. No guano was observed within the house, the portions of the attic spaces that were visible, or within the garage.

Given the lack of guano observed despite potential bat accessibility to the entire house, combined with the abundance of large cobwebs and lack of flying space within the knee wall attics, it was determined very unlikely that the house would support a maternity colony of bats. While the basement was unfinished, it was fully heated and as a result not suitable to support bat overwintering/hibernation. The house and/or garage may provide occasional day roosting for bats; however, the building is unlikely to provide maternity roosting or hibernation habitat protected under the *Endangered Species Act*, 2007.

The two sheds present on the subject property were highly exposed to the elements due to significant damage to the roofs. Given that they are highly accessible to bats, they could allow for occasional day roosting, however the high level of exposure to the elements is not suitable for supporting a maternity colony or hibernation.

No open, sunny, rocky features potentially suitable for roosting Eastern Small-footed Myotis, or any features suitable for hibernation, were identified on the property.

3.2 Acoustic Monitoring

During acoustic monitoring, six bat species were documented within the subject property. Five of these species are listed as Endangered on the *Species at Risk in Ontario List* (O. Reg. 230/08).

A summary of the acoustic monitoring results from the 2 monitoring stations is provided in Table 3. A detailed breakdown of the MLE for each species by monitoring station is provided in Appendix IV.

Table 3. Bat species and species grouping classification results.

Species or Species Grouping		Bat Call Sequences	Percent (%) of Total Bat Call Sequences	MLE Value[1]
Common Name	**Scientific Name**			
Eastern Small-footed Myotis	*Myotis leibii*	12	0.5	0.00
Little Brown Myotis	*Myotis lucifugus*	2	0.1	0.75
Myotis species[2]	*Myotis* spp.	63	2.4	-
Eastern Red Bat	*Lasiurus borealis*	30	1.2	0.00
40 kHz[3]	-	4	0.2	-
Big Brown Bat	*Eptesicus fuscus*	1,720	66.9	0.00
Silver-haired Bat	*Lasionycteris noctivagans*	37	1.4	1.00
30 kHz[4]	-	37	1.4	-
Hoary Bat	*Lasiurus cinereus*	61	2.4	0.13
Low Frequency[5]	-	606	23.6	-
TOTAL		**2,572**		

[1]Maximum likelihood estimate (MLE) calculated by SonoBat. A MLE value of 0 represents strong evidence of species presence and a value of 1 suggests weak evidence of species presence.
[2]Myotis spp. grouping includes Little Brown Myotis, Northern Myotis, and Eastern Small-footed Myotis.
[3]40kHz grouping includes Eastern Red Bat, Tri-colored Bat, Little Brown Myotis, Northern Myotis, and Eastern Small-footed Myotis.
[4]30kHz grouping includes Big Brown Bat and Silver-haired Bat.
[5]Low Frequency grouping includes Hoary Bat, Big Brown Bat and Silver-haired Bat.

3.2.1 Monitoring Night

Bat call sequences were recorded on all monitoring nights analyzed (Figure 1). Bat activity peaked on the evening of June 30, 2025, with 500 recordings. The evening of June 19, 2025 had the fewest bat call sequences, with 29 recordings.

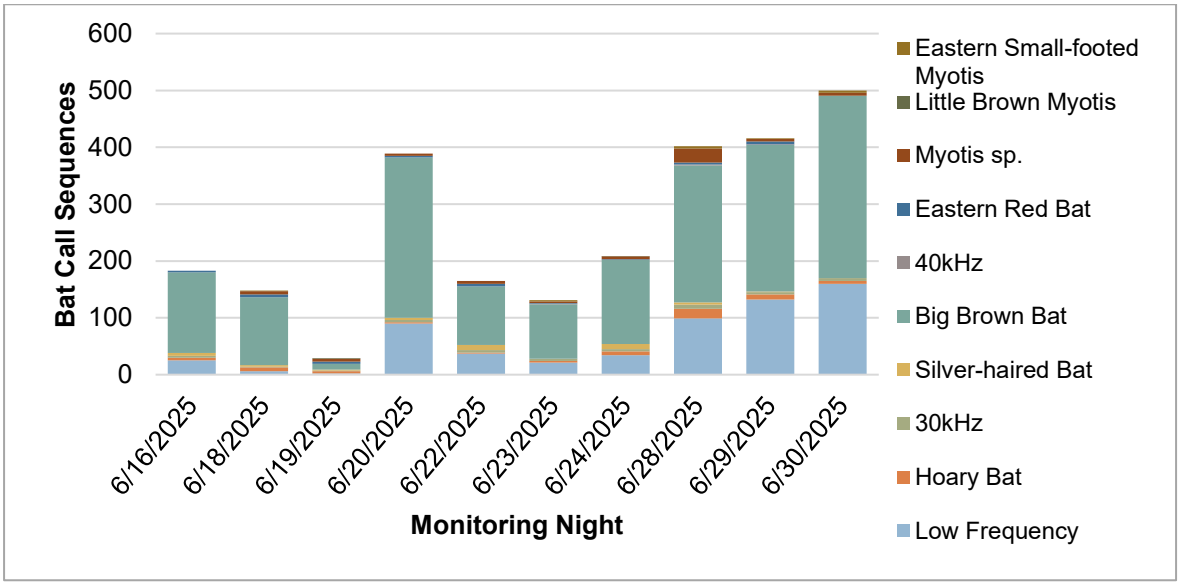

Figure 1. Bat call sequences per classification and monitoring night.

Variation in the number of bat call sequences recorded per monitoring night may be due to several factors. Variation in weather conditions may influence the number of recordings; 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 2022b). Emergence of individuals from their roost can also be influenced by the presence/absence of predators and insect activity. Appendix II summarizes the weather conditions for each recording interval throughout the monitoring period.

Of the high-frequency species, each of the *Myotis* species grouping and Eastern Red Bat were detected on nine of the 10 monitoring nights analyzed. Eastern Small-footed Myotis was detected on five monitoring nights, and Little Brown Myotis was detected on only two monitoring nights, June 19 and June 24 (Figure 2).

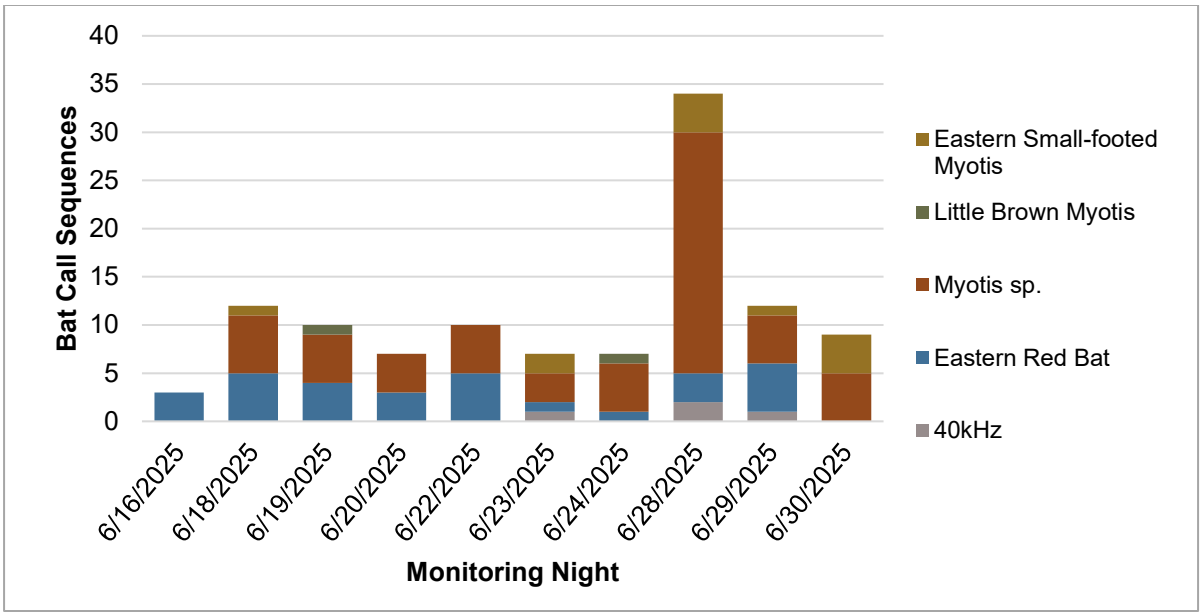

Figure 2. Bat call sequences classified to High Frequency species per monitoring night.

Of the low-frequency species, Big Brown Bat and Hoary Bat were detected on all 10 monitoring nights while Silver-haired Bat was documented on eight monitoring nights (Figure 3).

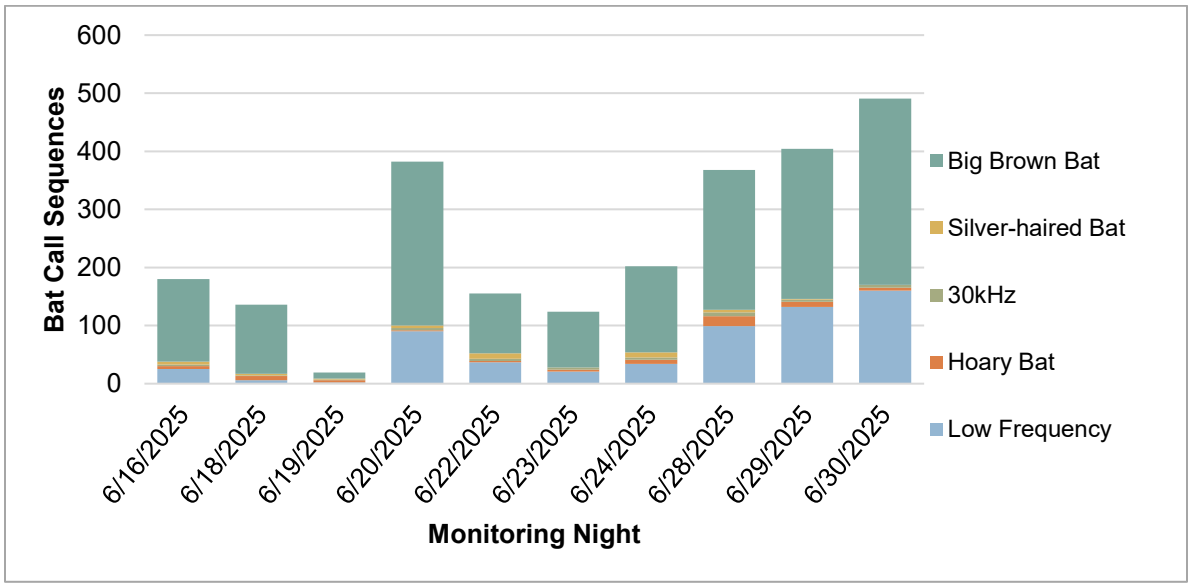

Figure 3. Bat call sequences classified to Low Frequency species per monitoring night.

3.2.2 Monitoring Station

Slightly higher activity was observed at station B01G with 1,503 bat call sequences recorded, while station B02G recorded 1,069 bat call sequences (Figure 4). Eastern Small-footed Myotis, *Myotis* species, Eastern Red Bat, Big Brown Bat, Silver-haired Bat and Hoary Bat were all recorded at both monitoring stations. Little Brown Myotis was only recorded at station B02G.

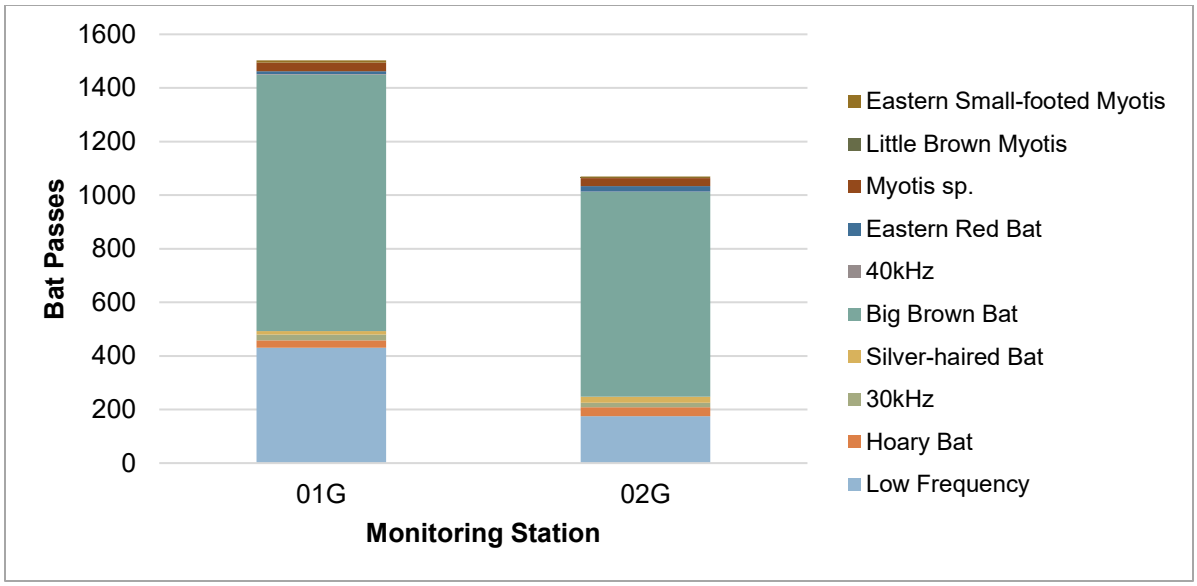

Figure 4. Bat call sequences per classification and monitoring station.

3.2.3 Time of Night

Colonially Roosting Species

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). Figure 5 below presents the timing of calls recorded within the subject property 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. Sunset at the subject property occurred between 21:01 and 21:03hrs during the monitoring period.

This pattern outlined by Henry et al. (2002) was not observed for high-frequency colony-roosting species and the activity level within 60 minutes of sunset was limited, with only four bat call sequences identified to the *Myotis* species grouping (Figure 5). These *Myotis* calls were recorded beginning at 55 minutes after sunset.

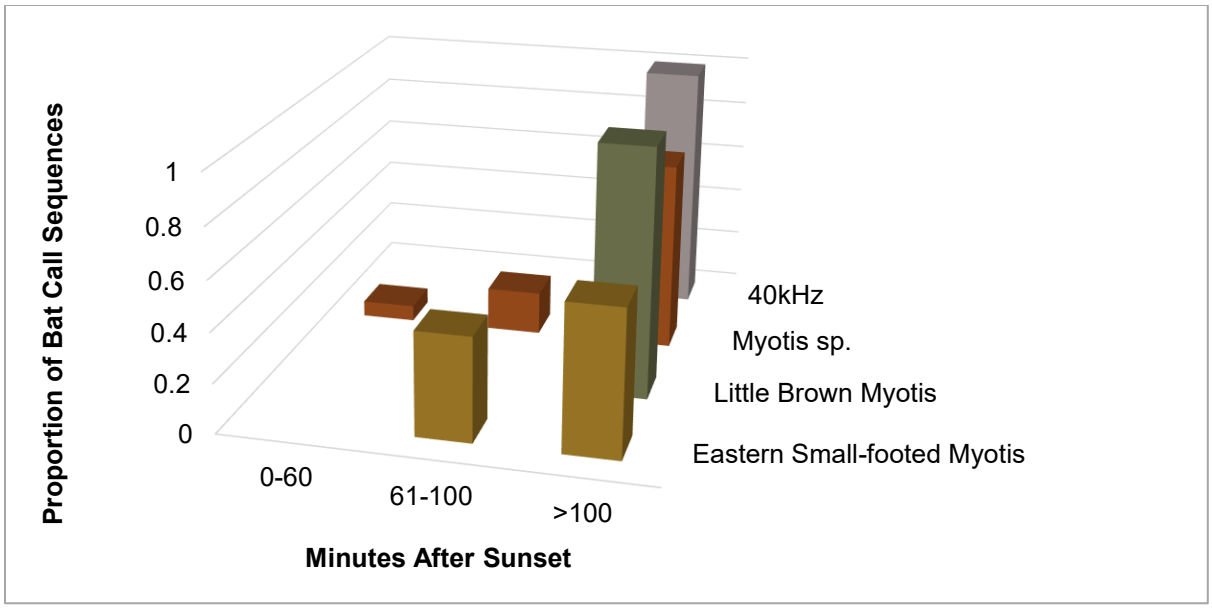

Figure 5. Within-species proportion of high frequency, colony-forming bat call sequences per time period after sunset.

The pattern described by Henry et al. (2002) was also not observed for Silver-haired Bat but was observed for Big Brown Bat (Figure 6). Big Brown Bat was also recorded within 45 minutes of sunset on all 10 monitoring nights, including within 30 minutes of sunset on seven nights. The first recording was made at 23 minutes after sunset. In NRSI's experience, Big Brown Bats begin emerging from building roosts typically around 25-45 minutes after sunset but may emerge earlier on some nights.

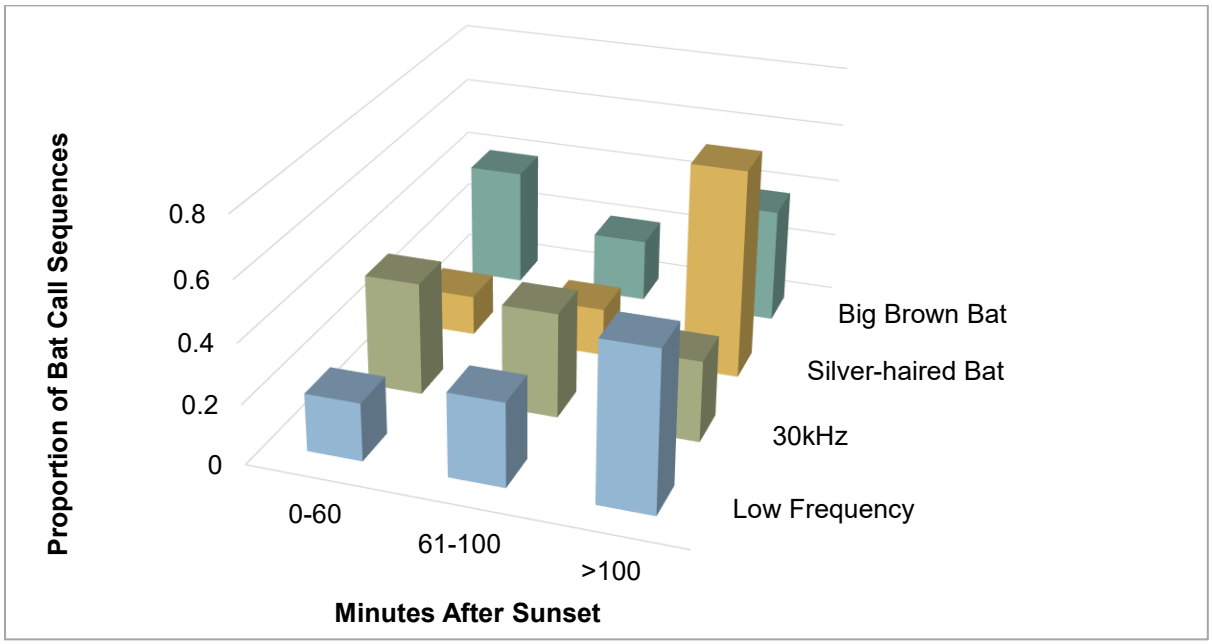

Figure 6. Within-species proportion of Low Frequency, colony-forming bat call sequences per time period after sunset.

Solitary Roosting Species

Eastern Red Bat and Hoary Bat maternity roost solitarily with their flightless young rather than forming colonies. In NRSI's experience, the earliest call recordings of both species are typically made around sunset or shortly after, suggesting that individuals roosting in proximity to recording equipment are expected to be recorded around that time.

Across the entire monitoring period and both stations, there was minimal activity of *Lasiurus* bats documented within 60 minutes of sunset (Figure 7). Eastern Red Bat was not recorded until 25 minutes following sunset, while Hoary Bat was not recorded until 41 minutes after sunset (Figure 7).

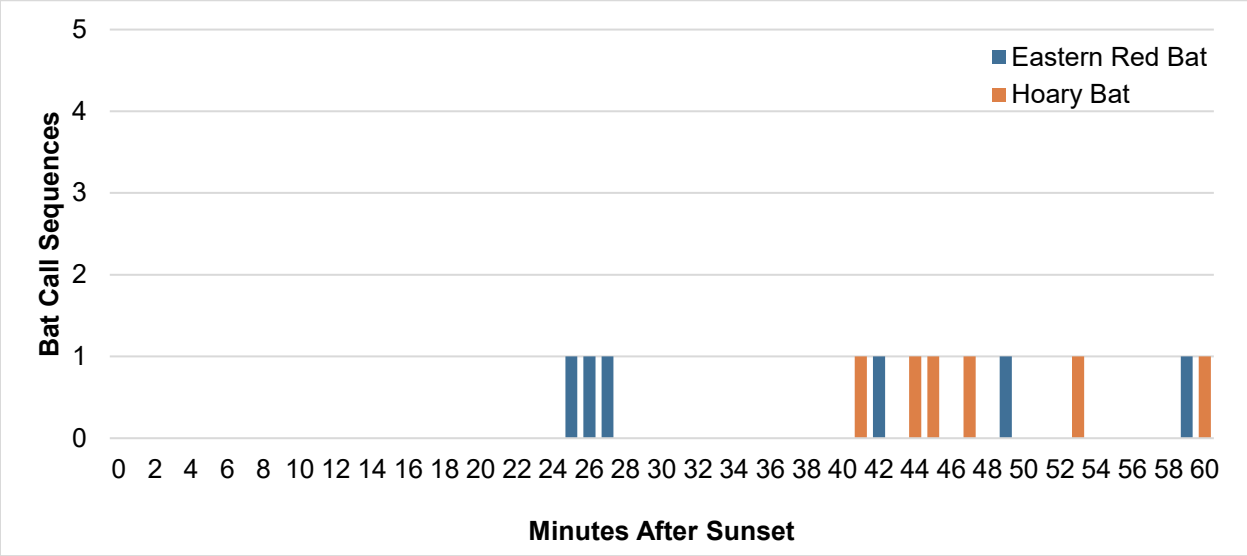

Figure 7. Call sequences of Eastern Red Bat and Hoary Bat within the first hour of sunset.

4.0 Discussion

Six bat species were documented as present during passive acoustic monitoring within the subject property. Five of these species are listed as a SAR on the *Species at Risk in Ontario List* (O. Reg. 230/08).

The presence and use of the subject property by bats are discussed further in the following sections.

4.1 SAR Bat Habitat

4.1.1 Maternity Habitat

The results of the acoustic monitoring suggest that maternity roosting habitat for SAR bats is not present within the subject property, or within 1km of the subject property. Only four call sequences classified of any *Myotis* species were documented within 60 minutes of sunset, and were not documented until at least 55 minutes after sunset. Similarly, only five recordings of Silver-haired Bat within 60 minutes following sunset were documented, the earliest of which was 40 minutes after sunset. Calls of Eastern Red Bat and Hoary Bat were not documented in proximity to sunset, when the earliest calls of these species are typically recorded.

When maternity roosting habitat is present within or adjacent to the subject property, it would be expected that a high volume of recordings would occur within the first 60 minutes following sunset, and typically closer to sunset.

4.1.2 Migratory Stopover Habitat

Stopover habitats for Eastern Red Bat, Silver-haired Bat and Hoary Bat are treed areas or buildings relied upon by multiple individuals for roosting and foraging before carrying on with another stage of their long-distance migration. In Ontario, Long Point on Lake Erie is known to be a provincially significant stopover area for migratory bats (MNRF 2015), however, other areas are under-studied.

Reports of these species in Ontario during late fall (October-November) and early spring (March-April) are generally restricted to areas within 5km of the Great Lakes and their connecting rivers, with increasing abundance of observations reported within closer proximity to the shoreline, and frequently on points of land (iNaturalist Community 2025).

As the subject property is approximately 4.3km from the Lake Ontario shoreline, it is possible that the woodland and other trees within the subject property may be used by migratory bats stopping over during migration.

In addition to the occupied feature, any migratory stopover habitat also includes areas within 1km that are required for staging (MECP 2025), such as foraging and drinking resources. Suitable foraging and drinking resources beyond the extent of the woodland are not found within the subject property. Being recently cleared of understorey, the Cultural Meadow (CUM1) located in the centre of the property does not contain a developed groundcover layer or diverse vegetation community that could support a reliable population of insects for foraging.

The area identified as potential migratory stopover habitat for Eastern Red Bat, Silver-haired Bat, and Hoary Bat is shown on Map 3.

Further investigations may be able to confirm or rule out the presence of migratory stopover habitat in the subject property. This could include passive acoustic monitoring during the fall migratory period to capture activity on warmer nights when movement to or from trees may be occurring. There is currently no guidance available from the province for identifying or surveying for migratory stopover habitat.

4.1.3 Overwintering Habitat

While no underground hibernacula for Little Brown Myotis, Northern Myotis, Eastern Small-footed Myotis, or Tri-colored Bat are located within or within 1km of the subject property, overwintering habitat for Eastern Red Bat and Silver-haired Bat may be present.

Eastern Red Bat is known to overwinter in leaf litter in regions with moderate winters such as the mid- and south-latitude United States (COSEWIC 2023). However, Eastern Red Bat has also recently been documented in areas within 5km of the north shore of Lake Erie in Ontario in December and January (iNaturalist Community 2025). Since the subject property is within 5km of Lake Ontario (which may have a moderating effect), it is possible that Eastern Red Bat may overwinter in leaf litter within woodlands in this local area, and woodland is present within the subject property.

Silver-haired Bat overwinters in mines, rock crevices, trees, and snags (COSEWIC 2023), as well as on or in buildings (iNaturalist Community 2025). Silver-haired Bat is known to

occasionally overwinter within the Great Lakes region, though they primarily overwinter further south in the United States and in more moderate regions of Canada, such as southeastern British Columbia (COSEWIC 2023). The species has been documented in small numbers throughout winter in Ontario near the Great Lakes; primarily in areas less than 5km from Lake Erie. However, Silver-haired Bat has also been documented at Presqu'ile on Lake Ontario in the winter months in recent years (iNaturalist Community 2025). Given the subject property is within 5km of Lake Ontario, it is possible that Silver-haired Bat may be overwintering in trees or buildings within the subject property.

The area of overwintering habitat for migratory bat species including Eastern Red Bat and Silver-haired Bat is considered to include all area within 25m from the occupied feature (MECP 2025). Potential overwintering habitat is shown on Map 3.

Little is known about the winter ecology of Hoary Bat, but they are primarily found in warmer climates of the United States during the winter months (COSEWIC 2023). Hoary Bat is generally not observed in Ontario between November and April (iNaturalist Community 2025, NRSI unpublished data).

Further investigations may be able to confirm or rule out the presence of overwintering habitat for Eastern Red Bat and Silver-haired Bat in the subject property. This could include passive acoustic monitoring during the winter to capture activity on warmer nights when any bats present may be active during arousal periods. There is currently no guidance available from the province on identifying or surveying for overwintering habitat for the long-distance migratory bat species.

4.2 Non-SAR Bat Habitat

Although no guano was identified within the attic or garage of the house, the interior spaces of the building were not fully accessible. The acoustic monitoring identified patterns of call recordings of Big Brown Bat that suggest roosting may be occurring within the house on the subject property, or in very close proximity, on at least a moderately regular basis. This could include for maternity roosting. While Big Brown Bat is not a SAR in Ontario, consideration for use of the building by the species should also be given as it is a specially protected mammal under the *Fish and Wildlife Conservation Act* (1997). It is recommended that building removal occurs outside of the bat active season (i.e., removal is recommended to occur between October 1 – March 31) to avoid impacting any Big Brown Bats that may be roosting there.

5.0 Conclusions

NRSI was retained by Innovative SHS to complete an EIS associated with a proposed residential development located at 1493 Sixth Line, Oakville.

NRSI conducted a bat habitat assessment as well as follow-up bat passive acoustic monitoring within the subject property to assess the presence of potential maternity habitat for bat SAR. The results of the habitat assessment identified 16 trees as potential roosts for the SAR Little Brown Myotis, Northern Myotis and Silver-haired Bat, and 1 tree as potential habitat for Tri-colored Bat within the subject property. The results of the passive acoustic monitoring indicate that bat SAR are present within the subject property; however, maternity habitat for bat SAR is not present within or adjacent to the subject property.

In addition, given the subject property's proximity to Lake Ontario, migratory stopover habitat for Eastern Red Bat, Silver-haired Bat, and Hoary Bat may be present, along with the potential for overwintering habitat for Eastern Red Bat and Silver-haired Bat.

Results of the passive acoustic monitoring suggest that roosting habitat for the non-SAR Big Brown Bat may be present within the house.

5.1 Recommendations

Although the quantity of SAR bat habitat proposed to be impacted is proportionally small in the context of the local landscape, it is still possible that permitting may be required to ensure compliance with endangered species legislation.

The province has enacted the Species Conservation Act, 2025 (SCA), to come into force on an unidentified date in the future. It is currently anticipated to come into force in early 2026. Requirements for consultation and permitting with MECP are expected to be different under the SCA than the current process under the ESA, such as project self-registration with development and implementation of a mitigation and monitoring plan.

The following mitigation measures are currently recommended to minimize impacts to bats and their habitats:

- All tree and building removals should occur outside of the 'active' period identified by the MECP (i.e., no removals between March 15 – November 30) to avoid direct impacts to SAR bats;
- Measures to prevent direct impacts to Eastern Red Bat and Silver-haired Bat that may be overwintering during vegetation and building removals may be required, and may include, but not be limited to, the following:
    - Vegetation removal should be overseen by a qualified biologist,
    - Remove vegetation and buildings only when air temperature is greater than 0°C,
    - A qualified biologist should conduct a ground sweep for potential overwintering bats within leaf litter immediately prior to removals and machinery presence,
    - For removal of trees containing cavities, crevices or exfoliating bark: a large vehicle is recommended to shake trees at least 20 minutes, but no more than 40 minutes, prior to their removal to provide any bats in torpor the opportunity to arouse and depart before tree removal,
    - A qualified biologist should conduct a visual search of buildings, to the extent possible, for potential overwintering Silver-haired Bats immediately prior to building removals,
    - Likewise, a large vehicle is recommended to disturb (shake) buildings at least 20 minutes, but no more than 40 minutes, prior to their removal to provide any bats in torpor the opportunity to arouse and depart before building removal.
- The limit of all construction activities should be clearly delineated to avoid unnecessary encroachment into natural features and habitats to be retained;
- 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;
- Avoid the use of artificial lighting that would cause light wash effects on the treed areas; and
- Avoid the use of pesticides, or other products that adversely impact insect populations.

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Maps

Map 1

Sixth Line, Oakville

Study Area

Legend

- Study Area (120m)
- Subject Property
- Headwater Drainage Feature (HDF)
- NRSI Surveyed Dripline Boundary (Reviewed by Halton Region on June 20, 2023)

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project: 3096
Date: August 1, 2025

NAD83 - UTM Zone 17
Size: 11x17"
1:1,750

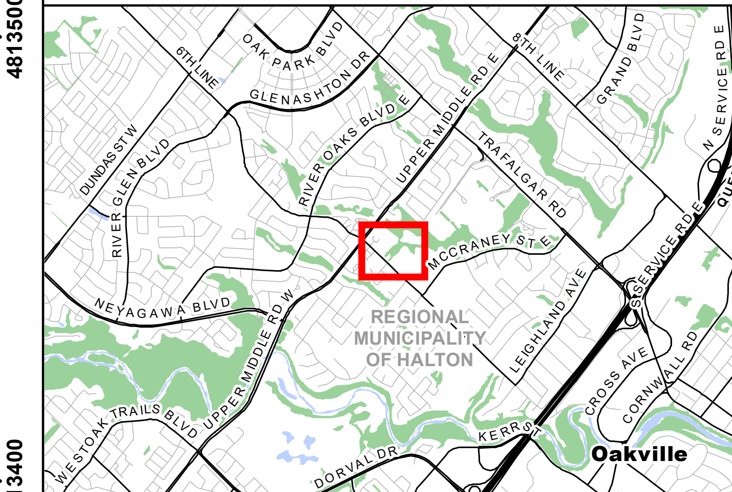
0 20 40 60 80 100 Metres

N

Path: X:\3096_EIS_6thLine_Oakville\NRSI_3096_Map1_StudyArea_2K_2025_08_01_LRC.mxd

Map 2

Sixth Line, Oakville
Existing Conditions and Monitoring Stations



Legend

- Study Area (120m)
- Subject Property
- Acoustic Bat Monitoring Station

Potential Species at Risk Bat Roosting Habitat

- Little Brown Myotis, Northern Myotis, or Silver-haired Bat
- Tri-colored Bat
- Ecological Land Classification (ELC)
- ELC Inclusion

(CUM) Cultural Meadow

(CUM1) Mineral Cultural Meadow Ecosite

(CUT1) Mineral Cultural Thicket Ecosite

(CUW1) Mineral Cultural Woodland Ecosite

(FOD4) Dry - Fresh Deciduous Forest Ecosite

(H) Hedgerow

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project: 3096 Date: January 8, 2026	NAD83 - UTM Zone 17 Size: 11x17" 1:1,700

0 20 40 60 80 100 Metres

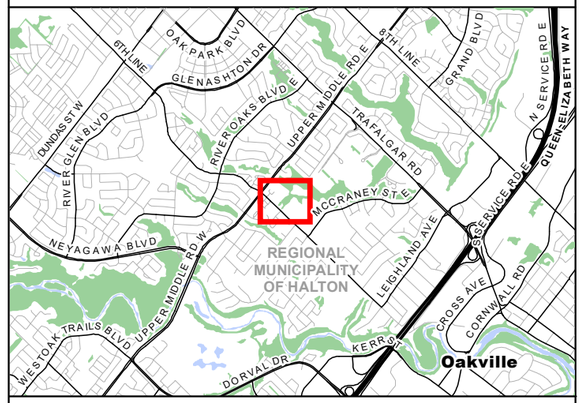
N

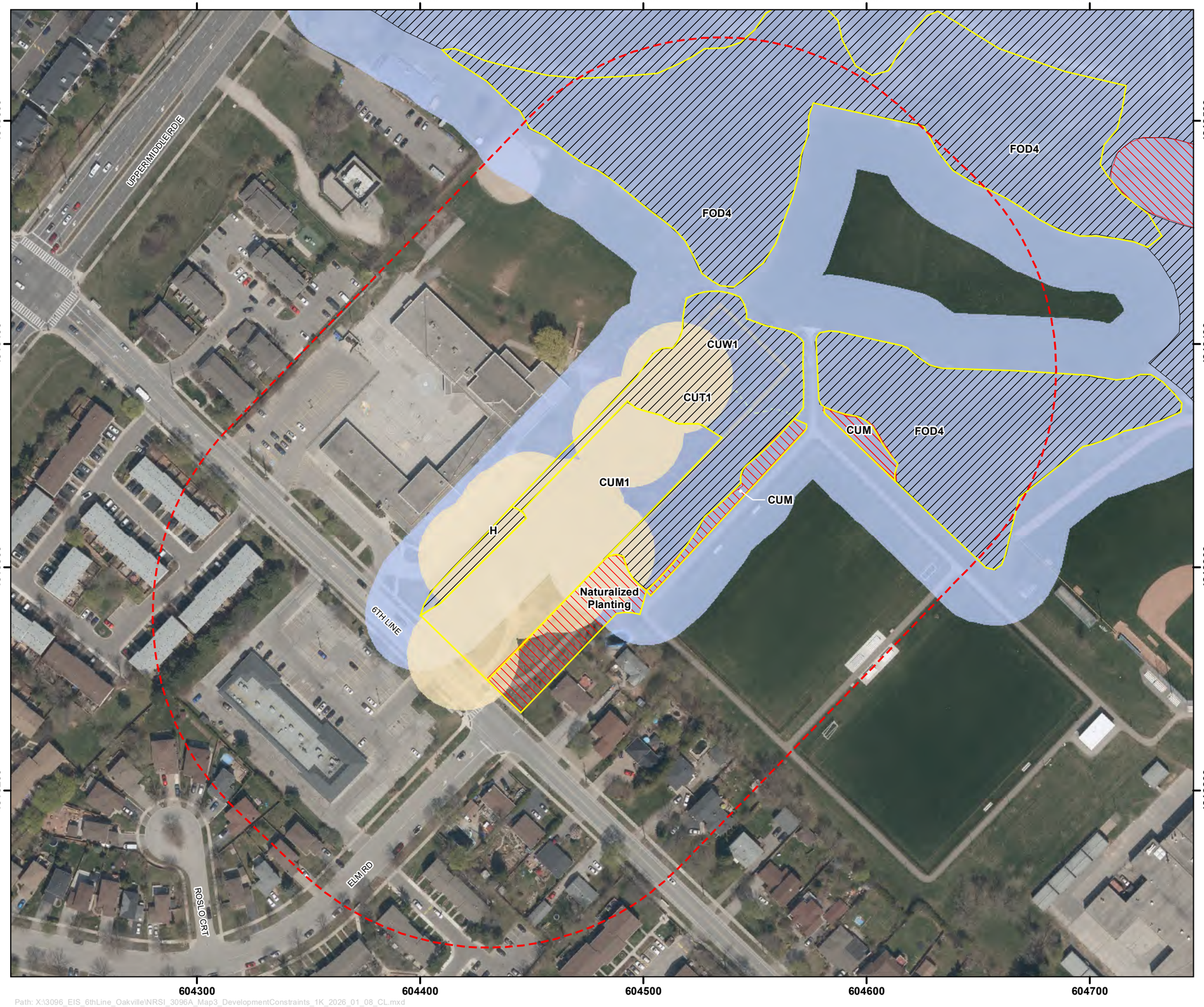
Path: X:\3096_EIS_6thLine_Oakville\NRSI_3096A_Map2_VegetationCommunitiesSurveyLocations_1K_2026_01_08_CL.mxd

Map 3

Sixth Line, Oakville

Species at Risk Bat Habitat





Legend

- Study Area (120m)
- Subject Property
- Ecological Land Classification (ELC)
- ELC Inclusion
- (CUM) Cultural Meadow
- (CUM1) Mineral Cultural Meadow Ecosite
- (CUT1) Mineral Cultural Thicket Ecosite
- (CUW1) Mineral Cultural Woodland Ecosite
- (FOD4) Dry - Fresh Deciduous Forest Ecosite
- (H) Hedgerow

Potential Migratory Bat Stopover Habitat

- Stopover Roosting Habitat
- Staging Habitat

Potential Migratory Bat Overwintering Habitat

- Eastern Red Bat
- Silver-haired Bat

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Aquatic, Terrestrial and Wetland Biologists

Project: 3096
Date: January 8, 2026

NAD83 - UTM Zone 17
Size: 11x17"
1:1,700

0 20 40 60 80 100 Metres

N

Path: X:\3096_EIS_6thLine_Oakville\NRSI_3096A_Map3_DevelopmentConstraints_1K_2026_01_08_CL.mxd

Appendix I
Bat Acoustic Monitoring Stations

Acoustic Monitoring Station	Locations UTM Zone 17T		Microphone Height (m)	Microphone Direction (degrees)	Habitat Type	Clutter[1]
	Easting	Northing				
B01G	604451	4813313	4.8	115	Treed residential yard	MED
B02G	604491	4813353	4.8	50	Scattered trees	MED

[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 21:00		Survey End 02:00		Total Precipitation 21:00 - 02:00 (mm)[2]
	Temperature (ºC)[1]	Wind Speed (km/hr)[1]	Temperature (ºC)[1]	Wind Speed (km/hr)[1]	
16 Jun 25	17.3	4	16.2	3	0
17 Jun 25	23.7	17	21.9	12	0
18 Jun 25	19.5	4	21	18	0.2
19 Jun 25	19	13	17.2	12	0
20 Jun 25	21.5	3	17.1	0	0
21 Jun 25	27.5	21	26.7	20	0
22 Jun 25	29.2	9	25.7	8	0
23 Jun 25	29	12	26.3	9	0
24 Jun 25	21.3	8	20.9	30	0
25 Jun 25	21.3	8	20.9	30	3.0
26 Jun 25	17.1	26	16.3	25	0
27 Jun 25	17.2	8	23.3	13	7.5
28 Jun 25	21.1	3	18.2	9	0
29 Jun 25	22	5	20	4	0
30 Jun 25	19	0	22.4	10	0

[1]Government of Canada 2025, Burlington Piers

[2]Government of Canada 2025, Hamilton RBG

Note: shaded cells indicate dates with suitable weather that were included in analysis

Appendix III
Potential Bat Roost Trees

Tree ID	Species		Location		DBH[1] (cm)	Height Class[2]	Decay Class[3]	Microhabitat Details
	Common Name	Scientific Name	Easting	Northing				
A	Norway Maple	*Acer platanoides*	604419	4813261	37	2	2	Loose Bark
B	Siberian Elm	*Ulmus pumila*	604424	4813305	20	2	5	Loose Bark
C	Siberian Elm	*Ulmus pumila*	604429	4813308	26	2	4	Loose Bark
D	Siberian Elm	*Ulmus pumila*	604438	4813316	24, 25	2	4	Loose Bark
E	Siberian Elm	*Ulmus pumila*	604437	4813316	17	2	5	Loose Bark
F	Siberian Elm	*Ulmus pumila*	604439	4813318	20, 28	2	5	Loose Bark
G	Siberian Elm	*Ulmus pumila*	604441	4813322	20	2	5	Loose Bark
H	Siberian Elm	*Ulmus pumila*	604449	4813327	28	2	2	Cavity
I	Siberian Elm	*Ulmus pumila*	604449	4813327	49	2	2	Loose Bark
J	Silver Maple	*Acer saccharinum*	604449	4813309	60	2	1	Cavity
K	Norway Maple	*Acer platanoides*	604469	4813303	49	2	1	Loose Bark
L	Bitternut Hickory	*Carya cordiformis*	604469	4813312	33	2	1	Cavity
M	Hawthorn sp.	*Crataegus sp.*	604480	4813307	18, 19	2	1	Cavity
N	Bitternut Hickory	*Carya cordiformis*	604467	4813324	37	2	1	Cavity
O	Bitternut Hickory	*Carya cordiformis*	604465	4813325	21	2	1	Dead Leaf Cluster
P	American Elm	*Ulmus americana*	604493	4813361	25	2	3	Loose Bark
Q	Bitternut Hickory	*Carya cordiformis*	604515	4813385	20	2	1	Cavity

[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

Appendix IV
Maximum Likelihood Estimates by Station

Station	B01G		B02G	
Species	MLE[1]	Number of Recordings	MLE[1]	Number of Recordings
Eastern Small-footed Myotis	**0**	**8**	**0.06**	**4**
Northern Myotis	1	0	1	0
Little Brown Myotis	1	0	0.67	2
Tri-colored Bat	1	0	1	0
Eastern Red Bat	**0.01**	**10**	**0.00**	**20**
Big Brown Bat	**0**	**956**	**0.00**	**764**
Silver-haired Bat	1	14	1	23
Hoary Bat	0.75	27	0.23	34
***Myotis* species[2]**	--	33	--	30
High Frequency[3]	--	3	--	1
30 kHz[4]	--	21	--	16
Low Frequency[5]	--	431	--	175

[1]Maximum likelihood estimate (MLE) calculated by Sonobat. A MLE value of 0 represents strong evidence of species presence and a value of 1 suggests weak evidence of species presence.

[2]*Myotis* spp. includes Little Brown Myotis, Eastern Small-footed Myotis and Northern Myotis

[3]High Frequency includes Eastern Red Bat, Little Brown Myotis, Eastern Small-footed Myotis, Northern Myotis and Tri-colored Bat

[4]30 kHz includes Big Brown Bat and Silver-haired Bat

[5]Low Frequency includes Hoary Bat, Big Brown Bat and Silver-haired Bat

Appendix IX
Lepidoptera Species Reported from the Study Area

Butterfly Species Reported from the Study Area - 1493 Sixth Line, Oakville EIS (Project #3096A)

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	Ontario Butterfly Atlas*	NHIC Data**	NRSI Observed
		MNR 2025	MECP 2024	Government of Canada 2024	Government of Canada 2024	Government of Canada 2024	Macnaughton et al. 2025	MNR 2024	NRSI Results from 2023 and 2025
Hesperiidae	**Skippers**								
Anatrytone logan	Delaware Skipper	S4					X		
Ancyloxypha numitor	Least Skipper	S5					X		
Epargyreus clarus	Silver-spotted Skipper	S4					X		
Erynnis baptisiae	Wild Indigo Duskywing	S4					X		
Erynnis icelus	Dreamy Duskywing	S5					X		
Erynnis juvenalis	Juvenal's Duskywing	S5					X		
Euphyes dion	Dion Skipper	S4					X		
Euphyes vestris	Dun Skipper	S5					X		
Hylephila phyleus	Fiery Skipper	SNA					X		
Pholisora catullus	Common Sootywing	S4					X		
Polites mystic	Long Dash Skipper	S5					X		
Polites origenes	Crossline Skipper	S4					X		
Polites themistocles	Tawny-edged Skipper	S5					X		
Thorybes pylades	Northern Cloudywing	S5					X		
Thymelicus lineola	European Skipper	SNA					X		
Papilionidae	**Swallowtails**								
Battus philenor	Pipevine Swallowtail	SNA					X		
Heraclides cresphontes	Giant Swallowtail	S4					X		
Papilio glaucus	Eastern Tiger Swallowtail	S5							X
Papilio polyxenes	Black Swallowtail	S5					X		X
Pieridae	**Whites and Sulphurs**								
Colias eurytheme	Orange Sulphur	S5					X		
Colias philodice	Clouded Sulphur	S5					X		X
Pieris oleracea	Mustard White	S4					X		
Pieris rapae	Cabbage White	SNA					X		X
Pieris virginiensis	West Virginia White	S3	SC				X		
Lycaenidae	**Harvesters, Coppers, Hairstreaks, Blues**								
Callophrys niphon	Eastern Pine Elfin	S5					X		
Celastrina lucia	Northern Spring Azure	S5					X		
Celastrina neglecta	Summer Azure	S5					X		
Celastrina sp.	Azure species	SNA					X		
Cupido comyntas	Eastern Tailed Blue	S5					X		
Glaucopsyche lygdamus	Silvery Blue	S5					X		
Polyommatus icarus	European Common Blue	SNA					X		
Satyrium acadica	Acadian Hairstreak	S4					X		
Satyrium calanus	Banded Hairstreak	S4					X		
Satyrium caryaevorus	Hickory Hairstreak	S4					X		
Satyrium liparops	Striped Hairstreak	S5					X		
Nymphalidae	**Brush-footed Butterflies**								
Aglais milberti	Milbert's Tortoiseshell	S5					X		
Boloria bellona	Meadow Fritillary	S5					X		
Cercyonis pegala	Common Wood-Nymph	S5					X		
Chlosyne nycteis	Silvery Checkerspot	S5					X		
Coenonympha california	Common Ringlet	S5					X		
Danaus plexippus	Monarch	S2N,S4B	SC	E	E	Schedule 1	X		
Euphydryas phaeton	Baltimore Checkerspot	S4					X		
Euptoieta claudia	Variegated Fritillary	SNA					X		
Junonia coenia	Common Buckeye	SNA					X		
Lethe anthedon	Northern Pearly-Eye	S5					X		
Lethe appalachia	Appalachian Brown	S4					X		
Lethe eurydice	Eyed Brown	S5					X		
Libytheana carinenta	American Snout	SNA					X		
Limenitis archippus	Viceroy	S5					X		
Limenitis arthemis arthemis	White Admiral	S5					X		
Limenitis arthemis astyanax	Red-spotted Purple	S5					X		
Megisto cymela	Little Wood-Satyr	S5					X		
Nymphalis antiopa	Mourning Cloak	S5					X		
Nymphalis l-album	Compton Tortoiseshell	S5					X		
Phyciodes cocyta	Northern Crescent	S5					X		
Phyciodes tharos	Pearl Crescent	S4					X		
Polygonia comma	Eastern Comma	S5					X		

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	Ontario Butterfly Atlas*	NHIC Data**	NRSI Observed
		MNR 2025	MECP 2024	Government of Canada 2024	Government of Canada 2024	Government of Canada 2024	Macnaughton et al. 2025	MNR 2024	NRSI Results from 2023 and 2025
Polygonia interrogationis	Question Mark	S5					X		
Polygonia progne	Gray Comma	S5					X		
Vanessa atalanta	Red Admiral	S5B					X		
Vanessa cardui	Painted Lady	S5B					X		
Vanessa virginiensis	American Lady	S5					X		
Total							**61**	**0**	**4**

*TEA Atlas Square: 17PJ01
**NHIC Atlas Square: 17PJ0413

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Appendix X
Odonata Species Reported from the Study Area

Odonate Species Reported from the Study Area - 1493 Sixth Line, Oakville (Project #3096A)

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	Odonate Atlas*	NHIC Data**
		MNR 2025	MECP 2024	Government of Canada 2024	Government of Canada 2024	Government of Canada 2024	OOAD 2023	MNR 2024
Calopterygidae	**Broadwinged Damselflies**							
Calopteryx aequabilis	River Jewelwing	S5					X	
Calopteryx maculata	Ebony Jewelwing	S5					X	
Hetaerina americana	American Rubyspot	S4					X	
Lestidae	**Spreadwings**							
Lestes dryas	Emerald Spreadwing	S5					X	
Coenagrionidae	**Narrow-winged Damselflies**							
Argia fumipennis violacea	Violet Dancer	S5					X	
Argia moesta	Powdered Dancer	S5					X	
Enallagma antennatum	Rainbow Bluet	S4					X	
Enallagma civile	Familiar Bluet	S5					X	
Enallagma exsulans	Stream Bluet	S5					X	
Ischnura posita	Fragile Forktail	S4					X	
Ischnura verticalis	Eastern Forktail	S5					X	
Aeshnidae	**Darners**							
Aeshna canadensis	Canada Darner	S5					X	
Anax junius	Common Green Darner	S5					X	
Basiaeschna janata	Springtime Darner	S5					X	
Gomphidae	**Clubtails**							
Ophiogomphus rupinsulensis	Rusty Snaketail	S4					X	
Phanogomphus lividus	Ashy Clubtail	S4					X	
Libellulidae	**Skimmers**							
Erythemis simplicicollis	Eastern Pondhawk	S5					X	
Libellula luctuosa	Widow Skimmer	S5					X	
Libellula pulchella	Twelve-spotted Skimmer	S5					X	
Libellula quadrimaculata	Four-spotted Skimmer	S5					X	
Libellula semifasciata	Painted Skimmer	S3					X	
Pachydiplax longipennis	Blue Dasher	S5					X	
Pantala hymenaea	Spot-winged Glider	S4					X	
Plathemis lydia	Common Whitetail	S5					X	
Tramea lacerata	Black Saddlebags	S4					X	
Tramea onusta	Red Saddlebags	SNA					X	
Total							**26**	**0**

**Odonate Atlas Square Numbers: 17PJ01*
**NHIC Atlas Square: 17PJ0413

References

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Ontario Odonata Atlas Database (OOAD). 2023. Natural Heritage Information Centre, Ontario Ministry of Natural Resources and Forestry. Species data by 10x10 km square accessed on June 8, 2023