

Species at Risk Impact Assessment

0 Catherine Street, Windsor



Prepared For:

Rock Developments East Windsor Inc.

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1.0 INTRODUCTION

Insight Environmental Solutions Inc., (IES) was retained by Rock Developments East Windsor Inc., to undertake a Species at Risk (SAR) Impact Assessment for the development of a Costco Wholesale Warehouse at the property identified as 0 Catherine Street, Windsor, Essex County, Ontario (hereafter described as the 'Subject Property'). IES has conducted a background review of the proposed works and has conducted targeted Species at Risk (SAR) field investigations. This has involved surveying the existing flora and fauna and associated habitats within the Study Area. This report provides an overview of the existing site conditions and applicable *Endangered Species Act* (ESA), 2007 policies, identifies any environmental constraints and opportunities, and provides recommendations with respect to the proposed project. The goal of this report is to ensure that the project is not likely to contravene Section 9 (species protection) or Section 10 (habitat protection) of the ESA 2007. This report confirms that the abovementioned proponent has completed their due diligence to avoid and reduce impacts to SAR and SAR habitat through the following actions:

1. Hiring a Qualified Biologist to identify the presence of SAR and potential SAR habitat.
2. Implementing avoidance and mitigation measures to reduce impacts of the proposed development to potential SAR habitat and avoid incidental encounters with SAR individuals.
3. Consulting the Ministry of the Environment, Conservation and Parks (MECP) via an Information Gathering Form (IGF) when impacts to SAR and/or SAR habitat cannot be avoided.

As per the results of the background review and field investigations, the proposed development may impact possible habitat of SAR and an Information Gathering Form will be submitted to MECP.

1.1 STUDY AREA

The project is located at 0 Catherine Street, Essex County, Windsor, Ontario (17T 339346 4686770). The property includes:

- Part of Lot 18 Concession 1 Petite Cote Sandwich
- Part of Lot 119 Concession 1 Petite Cote Sandwich
- Part of Lot 120 Concession 1 Petite Cote Sandwich

The Subject Property is approximately 600m long (north - south) and 250m wide (east - west) with an area of approximately 14.6 hectares. The Subject Property currently consists of agricultural and disturbed land. It is bordered by a rail corridor to the north, agricultural land to the east, a Home Depot to the south and a meadow to the west. An agricultural drain exists to the north of the property, flowing in an eastward direction. **Figure 1** shows the property in a regional context.

1.2 DEVELOPMENT PROPOSAL

The project proposes to build a Costco and associated parking lot on the southern half of the property. The northern portion of the property measuring 2.6 ha will be used for stormwater management. A pump house will be built to aid the flow of water through an outlet into the agricultural drain located to the

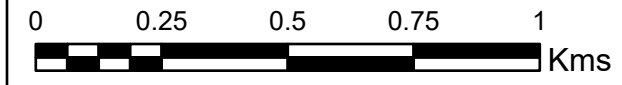
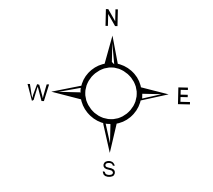
north of the property. The remaining 3.1ha located between the proposed Costco and stormwater management (SWM) pond will be retained for future commercial use. The Concept Plan for the proposed development can be seen in **Figure 2**.

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Key Plan

0 Catherine Street, Windsor



Legend

— Legal Parcel

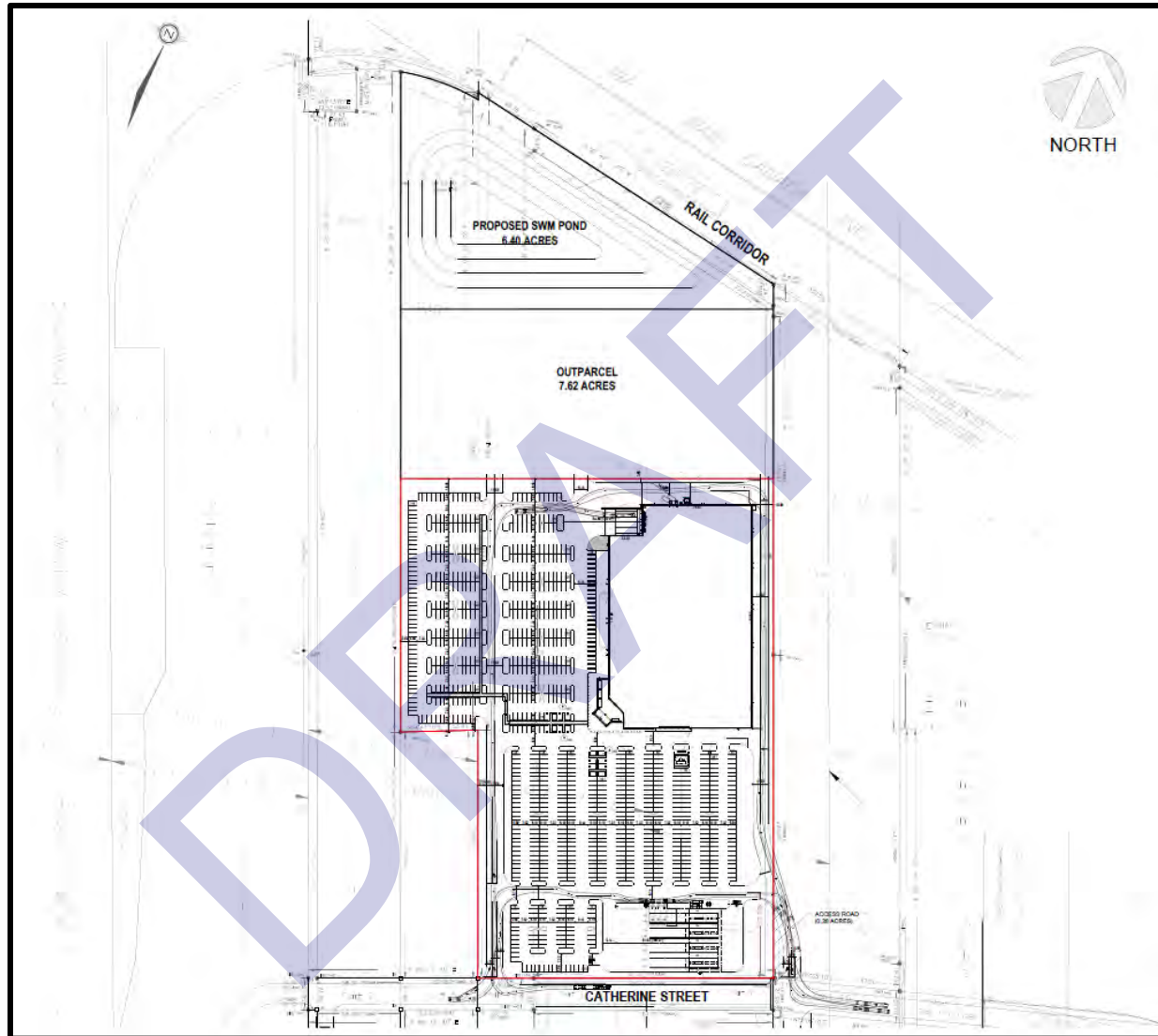
Figure No.: 1
 Project No.: IES24-211
 Scale: 1:15,000
 Date: November 8, 2024
 Creator: Nicole Wajmer



**INSIGHT
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Esri Community Maps Contributors: City of Windsor, Province of Ontario, Esri Canada, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, USFWS, NRCan, Parks Canada

FIGURE 2: CONCEPT PLAN



2.0 METHODOLOGIES

2.1 BACKGROUND REVIEW

The following sections discuss all applicable information and resources used to support a discussion with Ministry Staff at the preliminary screening stage for the proposed development. Background documents and supporting technical documents containing information relevant to potential Species at Risk (SAR) and SAR habitat features on or within the vicinity of the Study Area were reviewed. These documented include:

1. Endangered Species Act (2007)
2. Ministry of Natural Resources and Forestry. Make A Map: Natural Heritage Areas. Interactive Map (2024)
3. Ontario Reptile and Amphibian Atlas (ORAA)
4. Ontario Breeding Bird Atlas (OBBA)
5. Atlas of Mammals of Ontario (Dobbyn 1994)
6. Ontario Butterfly Atlas
7. E-bird
8. I-Naturalist
9. Google Earth Imagery

2.2 PROTOCOL FOR VEGETATION COMMUNITY AND STRUCTURE ANALYSIS

Vegetation communities were mapped and described according to the Ecological Land Classification (ELC) system for Southern Ontario (Lee et al., 1998 and 2008), which involved delineating vegetation communities on an aerial photograph of the property and recording pertinent information concerning the structure and composition of the vegetation in each community. At the same time as vegetation community mapping was undertaken, a plotless floral inventory occurred, which consisted of a compilation of a list of plants observed on the property, as well as the height and cover of each layer and the dominance of species in each layer.

2.3 FLORISTIC QUALITY ASSESSMENT

According to Swink and Wilhelm (1994) Floristic Quality Assessment (FQA) is a method to assess the floristic integrity of vegetation communities. FQA is used to determine the significance and amount of restoration required for individual vegetation communities. This assessment provides a dependable and repeatable method for evaluating the relative significance of vegetation communities in terms of their native floristic composition. This assessment is not intended for use as a stand-alone method, but instead can be applied to complement and support other methods of evaluating the natural quality of a site.

2.3.1 Floristic Quality Index

FQA is applied by calculating a mean Coefficient of Conservatism (CC) value and a Floristic Quality Index (FQI) value from a comprehensive list of plant species obtained from a particular site (Swink and Wilhelm 1994; Wilhelm and Masters 1995). FQI determines the quality of a vegetation community based on its plant species composition and relative abundance.

Coefficients of conservatism range from 0 - 10 and embody an estimated probability that a plant is likely to occur in a landscape relatively unaltered from what is believed to be pre-European settlement condition. Therefore, a coefficient of zero is given to plants that have demonstrated little fidelity to any remnant natural community, while a coefficient of ten is applied to those plants that are almost always restricted to a pre-settlement remnant.

FQI is calculated by summing the CC of an inventory of plants and dividing by the total number of plant taxa (n), yielding the mean coefficient of conservatism ($\text{Mean CC} = \text{Sum of CC} / n$). The Mean CC is then multiplied by the square root of the total number of plants (n) to yield the FQI ($\text{FQI} = \text{Mean CC} \sqrt{n}$). The square root of n is used as a multiplier to transform the Mean CC and allow for better comparison of the FQI between large sites with a high number of species and small sites with fewer species. Other methods used to determine the significance of each vegetation community include relative abundance, size and level of anthropogenic disturbance.

Based upon the above criteria, vegetation communities were classified as follows:

- Rare and Extremely Significant if community FQI value was greater than 50;
- High Significance if community FQI value was between 37 and 49;
- Moderate to High Significance if community FQI value was between 25 and 36;
- Moderate Significance if community FQI value was between 13 and 24; or
- Low Significance if community FQI value was less than 12.

2.4 WETNESS INDEX

The Floristic Quality Assessment System for Southern Ontario (1995) identifies several components to assess the floristic integrity of vegetation communities. One of the components is the Wetland Index (W). The wetness index allows a mean wetness value to be calculated which is used for evaluating the predominance of upland or wetland species for a natural area or vegetation community.

The National Wetland Indicator Categories define the estimated probability for which a species occurs in wetlands (Reed 1988, Wilhelm 1989, 1992). Positive signs (+) indicating a dry tendency and negative signs (-) indicating a wet tendency are attached to the three "facultative" categories to express the tendencies for those species (Reed 1988). Coefficients of wetness (CW) values have been assigned by Wilhelm (1989, 1992) to the eleven wetland indicator categories. Plants are designated as Obligate Wetland, Facultative Wetland, Facultative Upland, and Obligate Upland.

CW of taxa recorded from a site inventory (n) can be averaged and the mean regarded as a wetness index ($W = \sum CW / n$). If the wetness index is zero or below, then the site has a predominance of wetland species (Wilhelm 1989).

Wetland Category		Definition	Wetness Index	
OBL	Obligate Wetland	Occurs almost always in wetlands under natural conditions (estimated >99% probability)	OBL	-5
FACW	Facultative Wetland	Usually occurs in wetlands, but occasionally found in non-wetlands (estimated 67 -99% probability)	FACW+	-4
			FACW	-3
			FACW-	-2
FAC	Facultative	Equally likely to occur in wetlands or non-wetlands (estimated 34-66% probability)	FAC+	-1
			FAC	0
			FAC-	1
FACU	Facultative Upland	Occasionally occurs in wetlands, but usually occurs in non-wetlands (estimated 1-33% probability)	FACU+	2
			FACU	3
			FACU-	4
UPL	Upland	Occurs almost never in wetlands under natural conditions (estimated <1% probability)	UPL	5

2.4.1 Habitat Quality

Habitat quality was determined by evaluating the level of human disturbances (i.e. mowing, dumping, construction, tracks and trails, noise, etc.), the abundance of native species, floristic quality index value, and flora and fauna diversity.

2.5 WILDLIFE AND WILDLIFE HABITAT

Wildlife surveys and habitat quality assessments were completed throughout the Study Area. These surveys were chosen based on professional expertise, a thorough background review of available data and a visual assessment of potential ecological communities from air photo/Google Streetview interpretation.

2.5.1 Incidental Wildlife Surveys

A wildlife assessment within the study area was completed through incidental observations while on site. Any incidental observations of wildlife were noted, as well as other wildlife evidence such as direct observation, vocalizations, dens, tracks, browse and scat. Random searches of natural objects that provide cover (large branches, logs, rocks) were conducted to search for reptiles and amphibians. Aquatic features were scanned using binoculars to identify any basking turtle species. Special focus was placed upon searching for SAR individuals, SAR habitat and habitat features such as vernal pools, dens, burrows (small and large), snake thermoregulation areas, tree cavities and basking sites.

2.6 SPECIES AT RISK SURVEY (SAR) METHODS

Field surveys were carried out to determine the potential population and distribution of SAR individuals and to delineate the habitat and habitat features within the study area. The survey was carried out to provide detailed and reliable information on SAR presence or absence, suitable habitat, habitat features, location, distance from the proposed development, population size, management concerns and to ensure that the proposed development does not contravene the Endangered Species Act, 2007.

The search efforts were focused on inspecting sites and features with a high probability of supporting SAR. When documenting each SAR specimen/population, habitat or habitat feature the following data was recorded on paper and on a Global Positioning System (GPS):

1. Species (Scientific name)
2. Habitat or habitat feature
3. Location (Universal Transverse Mercator (UTM) co-ordinates)
4. Relative abundance

Points were used to delineate the location. UTM coordinates were recorded on hand-held GPS units, downloaded to a computer, and mapped on an ortho-rectified digital air photo using a Geographic Information System (GIS).

3.0 BACKGROUND REVIEW

3.1 NATURAL HERITAGE FEATURES

The Ministry of Natural Resources and Forestry (MNRF) recommends that natural heritage features within 120m of a proposed development and/or site alteration be examined for potential impacts (Natural Heritage Reference Manual, 2010).

According to the Ministry of Natural Resources and Forestry Make-A-Map: Natural Heritage Areas online tool the Subject Property contains a small strip of woodland. Small patches of woodland also exist to the west and east of the property (**Figure 3**).

3.2 PHYSIOGRAPHY AND SOILS

According to the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) on-line interactive 'Ag Maps' Application the property is within a "Built Up Area" and the mapping application does not provide any soil data.

3.3 HYDROLOGY

The OMAFRA online interactive map indicates that the Subject Property is adjacent to an agricultural drain called Hawkins Drain, which runs parallel to the railway corridor along the northern edge of the property.

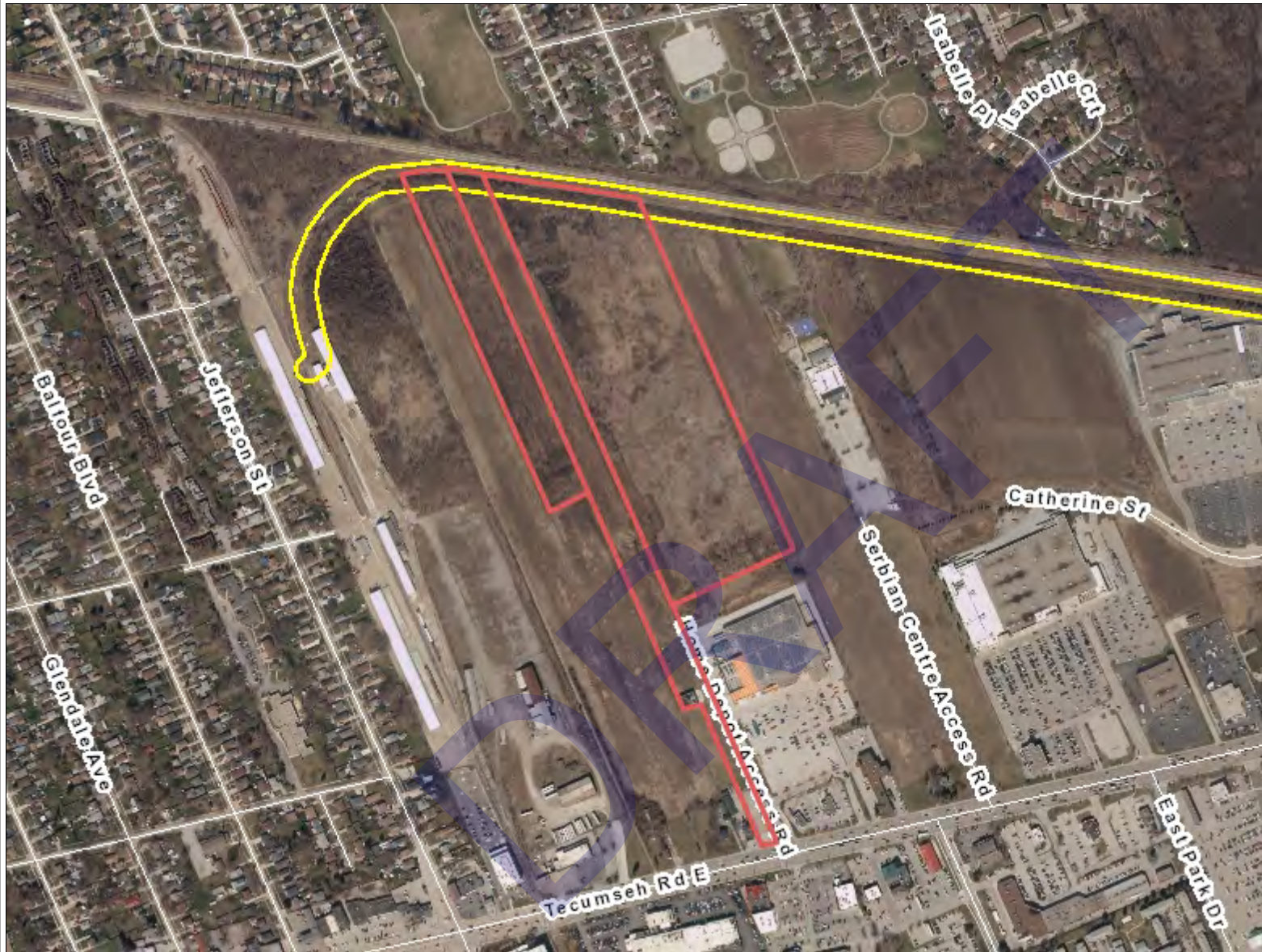
The Department of Fisheries and Oceans (DFO) classifies Hawkins Drain as a Class F Drain, meaning it is an intermittent watercourse that is dry for at least three months each year and does not support sensitive fish species. During the field investigations, Hawkins Drain was observed to have deep flowing water. Additionally, there is a ditch or drain along the eastern edge of the property between agricultural fields, which was dry during the investigations. It's important to note that the northern edge of the property near Hawkins Drain is within the Regulated Area of the Essex Region Conservation Authority (ERCA; see **Figure 4**).

3.4 TOPOGRAPHY

The topography associated with the legal parcel is tableland. According to Lee et al. (1998): tableland is a *“Site on a more or less level plain, not associated with any marked topographic feature.”*

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Figure 4: ERCA Regulated Area



Legend

- Provincially Significant Wetland (PSW)
- Area of Natural & Scientific Interest (ANSI)
- Significant Valley Land (SVL)
- 1:100 yr Flood Line
- Limit of Regulated Area

Location



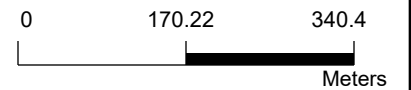
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Notes



1: 7,659



11/1/2024

4.0 SPECIES AT RISK SCREENING

4.1 LAND INFORMATION ONTARIO (LIO)

Table 1 presents a 1km grid search (17LG3986) of SAR records in the Natural Heritage Information Centre (NHIC) database surrounding the Study Area.

TABLE 1: NATURAL HERITAGE INFORMATION CENTRE 1KM GRID SEARCH

Common Name	Scientific Name	S - Rank	SARO Status	COSEWIC Status	Habitat Present in Development Envelope?	Key Habitats Used by Species	Observed in 2024 Field Surveys?
Midland Painted Turtle	<i>Chrysemys picta marginata</i>	S4	SC	SC	No	Fresh shallow waters, with slow moving currents, with soft bottoms, basking sites, and aquatic vegetation. Suitable habitat consists of creeks, marshes, ponds, and the shores of lakes (MNRF, 2014). ESA Protection: N/A. *Habitat may exist in Hawkins Drain located to the north of the property.	No
Snapping Turtle	<i>Chelydra serpentina</i>	S4	SC	SC	No	Slow-moving water with a soft mud or sand bottom and abundant vegetation (MNRF, 2014). ESA Protection: N/A. *Habitat may exist in Hawkins Drain located to the north of the property.	No
Climbing Prairie Rose	<i>Rosa setigera</i>	S2S3	SC	SC	Yes	Grows in early successional habitats around Lake Erie. It colonizes open and disturbed habitats open habitats with moist heavy clay to clay-loam soils such as old fields, abandoned agricultural land, as well as prairie remnants and shrub thickets (MNRF, 2014). ESA Protection: N/A.	No

4.2 BREEDING BIRD ATLAS

Table 2 lists possible SAR birds based on the square (17TLG38) encompassing the property in the 2005 Breeding Bird Atlas. The Subject Property did not contain any natural heritage features at the time of field investigations and consisted of tilled agricultural lands. A Class F drain was located along the northern limit of the property. As such, the property provides limited habitat for SAR birds.

TABLE 2: BREEDING BIRD ATLAS SPECIES AT RISK (2005)

Common Name	Scientific Name	S - Rank	SARO Status	COSEWIC Status	Breeding Status	Habitat Present in Development Envelope?	Key Habitats Used by Species	Observed in 2024 Field Surveys?
Peregrine Falcon	<i>Falco peregrinus</i>	S4	SC	NAR	Probable	No	Peregrine Falcons usually nest on tall, steep cliff ledges close to large bodies of water. Although most people associate Peregrine Falcons with rugged wilderness, some of these birds have adapted well to city life. Urban peregrines raise their young on ledges of tall buildings, even in busy downtown areas. Cities offer peregrines a good year-round supply of pigeons and starlings to feed on (MNRF 2014). ESA Protection: NA.	No
Short-eared Owl	<i>Asio flammeus</i>	S4?B ,S2S 3N	THR	THR	Confirmed	No	Lives in open areas such as grasslands, marshes and tundra where it nests on the ground and hunts for small mammals, especially voles (MNRF, 2014). ESA Protection: Species and general habitat protection.	No

TABLE 2: BREEDING BIRD ATLAS SPECIES AT RISK (2005)

Common Name	Scientific Name	S - Rank	SARO Status	COSEWIC Status	Breeding Status	Habitat Present in Development Envelope?	Key Habitats Used by Species	Observed in 2024 Field Surveys?
Common Nighthawk	<i>Chordeiles minor</i>	S4B	SC	SC	Probable	No	Open areas with little to no ground vegetation, such as logged or burned-over areas, forest clearings, rock barrens, peat bogs, lakeshores, and mine tailings. Also nests in cultivated fields, orchards, urban parks, mine tailings and along gravel roads and railways (MNRF, 2014). ESA Protection: N/A.	No
Chimney Swift	<i>Chaetura pelagica</i>	S4B, S4N	THR	THR	Confirmed	No	Before European settlement Chimney Swifts mainly nested on cave walls and in hollow trees or tree cavities in old growth forests. Today, they are more likely to be found in and around urban settlements where they nest and roost (rest or sleep) in chimneys and other manmade structures. They also tend to stay close to water as this is where the flying insects, they eat congregate (MNRF 2014). ESA Protection: Species and general habitat protection.	No
Eastern Wood-pewee	<i>Contopus virens</i>	S4B	SC	SC	Probable	No	Deciduous and mixed forests with little understory vegetation; often found in clearings or on edges of deciduous and mixed forests (MNRF, 2015). ESA Protection: N/A.	No
Red-headed Woodpecker	<i>Melanerpes erythrocephalus</i>	S4B	END	END	Confirmed	No	Prefers open woodland and woodland edges. Requires dead trees for nesting and will often be found in parks, golf courses and cemeteries (MNRF, 2014). ESA Protection: Species and general habitat protection.	No

TABLE 2: BREEDING BIRD ATLAS SPECIES AT RISK (2005)

Common Name	Scientific Name	S - Rank	SARO Status	COSEWIC Status	Breeding Status	Habitat Present in Development Envelope?	Key Habitats Used by Species	Observed in 2024 Field Surveys?
Acadian Flycatcher	<i>Empidonax virescens</i>	S1B	END	END	Probable	No	It is typically found in mature, shady forests with ravines, or in forested swamps with lots of maple and beech trees. The nest is placed near the tip of a lower limb on a tree, and is loosely woven, with strands of plant material hanging down. In Canada, the Acadian Flycatcher nests only in southwestern Ontario, mostly in large forests and forested ravines near the shore of Lake Erie. ESA Protection: Species and general habitat protection.	No
Barn Swallow	<i>Hirundo rustica</i>	S4B	SC	SC	Confirmed	No	Build nests almost exclusively on human-made structures such as open barns, under bridges or in culverts (MNRF, 2014). Will use a variety of habitats for foraging. ESA Protection: NA	No
Wood Thrush	<i>Hylocichla mustelina</i>	S4B	SC	THR	Confirmed	No	Typically associated with moist mature deciduous and mixed forests with a well-developed understory (COSEWIC, 2012). ESA Protection: N/A	No
Bobolink	<i>Dolichonyx oryzivorus</i>	S4B	THR	THR	Confirmed	No	Historically, Bobolinks lived in North American tallgrass prairie and other open meadows. With the clearing of native prairies, Bobolinks moved to living in hayfields. Bobolinks often build their small nests on the ground in dense grasses. Both parents usually tend to their young, sometimes with a third Bobolink helping (MNRF, 2024). ESA Protection: Species and general habitat protection.	No

TABLE 2: BREEDING BIRD ATLAS SPECIES AT RISK (2005)

Common Name	Scientific Name	S - Rank	SARO Status	COSEWIC Status	Breeding Status	Habitat Present in Development Envelope?	Key Habitats Used by Species	Observed in 2024 Field Surveys?
Eastern Meadowlark	<i>Sturnella magna</i>	S4B	THR	THR	Confirmed	No	Tall grasslands such as pastures and hayfields. Utilize small trees, shrubs, or fence posts for elevated song perches (MNRF, 2014). ESA Protection: Species and general habitat protection.	No

4.3 E-BIRD

Ebird was used to review the list of observed species at the closest birding hotspot located approximately 1.5km to the northeast of Subject Property, known as Tranby Park and Woodlot. While this data cannot be field verified, it provides a basis for the composition of bird species that may be present in vicinity of the Subject Property. The list contained a total of 61 species and consisted mainly of species that are tolerant of anthropogenic areas, woodland birds and wading/aquatic birds. The list of birds includes several species of ducks, hawks, sparrows, woodpeckers, kinglets, nuthatches, vireos, thrushes, warblers, swallows, wrens, as well as common urban species. Based on the observation dates and available habitat, it is likely that some of these species were observed on fall and spring migration and would not use the Subject Property or adjacent lands for breeding purposes. One SAR species was detected and is presented below in **Table 3**.

TABLE 3: E-BIRD SPECIES AT RISK

Common Name	Scientific Name	S - Rank	SARO Status	COSEWIC Status	Observation Date	Habitat Present in Development Envelope?	Key Habitats Used by Species	Observed in 2024 Field Surveys?
Barn Swallow	<i>Hirundo rustica</i>	S4B	SC	SC	October 2016	No	See Table 2	No

4.4 I – NATURALIST

A total of 101 species have been identified on i-Naturalist within 1 km of the proposed development. One SAR species or species of special conservation concern was detected and is shown in **Table 4**.

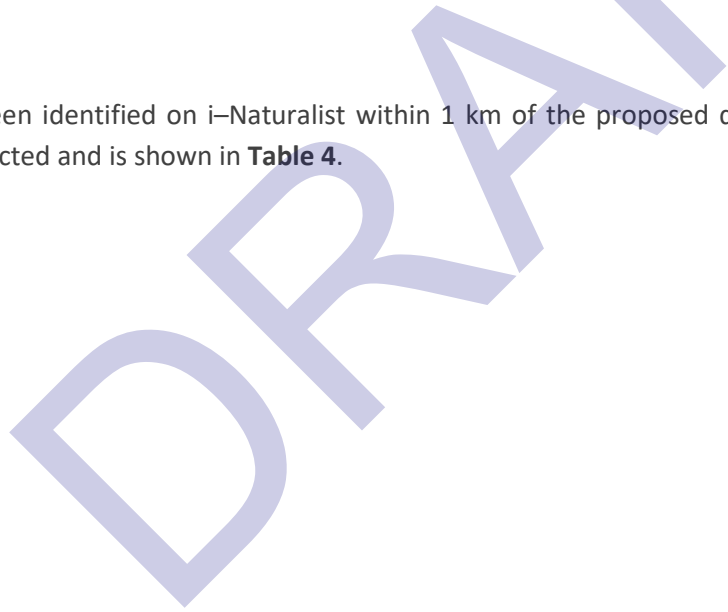


TABLE 4: I - NATURALIST SPECIES AT RISK

Common Name	Scientific Name	S - Rank	SARO Status	COSEWIC Status	Observation Date	Habitat Present in Development Envelope?	Key Habitats Used by Species	Observed in 2024 Field Surveys?
Monarch	<i>Danaus plexippus</i>	S2N, S4B	SC	END	September 27, 2021 (Research Grade)	No	The Monarch’s range extends from Central America to southern Canada. In Canada, Monarchs are most abundant in southern Ontario and Quebec where milkweed plants and breeding habitat are widespread. During late summer and fall, Monarchs from Ontario migrate to central Mexico where they spend the winter months. During migration, groups of Monarchs numbering in the thousands can be seen along the north shores of Lake Ontario and Lake Erie (MNRF, 2022). ESA Protection: NA.	No

4.5 ONTARIO REPTILE AND AMPHIBIAN ATLAS

The proposed development encompasses square 17LG38 on the Ontario Reptile and Amphibian Atlas (ORAA). A total of twelve common reptiles and amphibians and seven SAR herpetofauna have been observed between the years of 1959 and 2019. The following SAR reptiles and amphibians have been recorded in square 17LG48 on the ORAA (Table 5).

TABLE 5: ORAA SPECIES AT RISK

Common Name	Scientific Name	S - Rank	SARO Status	COSEWIC Status	Observation Date	Habitat Present in Development Envelope?	Key Habitats Used by Species	Observed in 2024 Field Surveys?
Blanding's Turtle	<i>Emydoidea blandingii</i>	S3	THR	END	2019	No	Prefer shallow water, usually in large wetlands and shallow lakes with lots of water plants. May travel hundreds of metres from water, especially while they are searching for a mate or traveling to a nesting site. Hibernate in the mud at the bottom of permanent water bodies from late October until the end of April (MNRF, 2014). ESA Protection: Species and general habitat protection. *Habitat may exist in Hawkins Drain located to the north of the property.	No
Midland Painted Turtle	<i>Chrysemys picta marginata</i>	S4		SC	2019	No	See Table 1 .	No
Northern Map Turtle	<i>Graptemys geographica</i>	S3	SC	SC	2018	No	Inhabits rivers and lakes where it basks on emergent rocks, banks, logs and fallen trees. Prefer shallow, soft-bottomed aquatic habitats with exposed objects for basking (COSEWIC, 2012g). ESA Protection: N/A. *Habitat may exist in Hawkins Drain located to the north of the property.	No
Snapping Turtle	<i>Chelydra serpentina</i>	S4	SC	SC	2019	No	See Table 1 .	No

TABLE 5: ORAA SPECIES AT RISK

Common Name	Scientific Name	S - Rank	SARO Status	COSEWIC Status	Observation Date	Habitat Present in Development Envelope?	Key Habitats Used by Species	Observed in 2024 Field Surveys?
Butler's Gartersnake	<i>Thamnophis butleri</i>	S4	SC	SC	2019	Yes (Adjacent habitat)	Prefers open, moist habitats, such as dense grasslands and old fields, with small wetlands where it can feed on leeches and earthworms. Often found in rock piles and old stonewall. Burrows made by small mammals and even crayfish are sometimes used as hibernation sites (MNRF, 2014). ESA Protection: Species and general habitat protection.	No
Eastern Foxsnake	<i>Pantherophis gloydi pop. 2</i>	S2	END	END	2019	Yes	Eastern Foxsnakes in the Carolinian population are usually found in old fields, marshes, along hedgerows, drainage canals and shorelines. Females lay their eggs in rotting logs, manure, or compost piles, which naturally incubate the eggs until they hatch. During the winter, Eastern Foxsnakes hibernate in groups in deep cracks in the bedrock and in some man-made structures (MNRF, 2014). ESA Protection: Species and general habitat protection.	No
Five-lined Skink	<i>Plestiodon fasciatus pop. 1</i>	S2	END	END	1992	No	Common Five-lined Skinks like to bask on sunny rocks and logs to maintain a preferred body temperature (28-36°C). During the winter, they hibernate in crevices among rocks or buried in the soil. The Carolinian population can be found under woody debris in clearings with sand dunes, open forested areas, and wetlands (MNRF, 2014). ESA Protection: Species and general habitat protection.	No

4.6 ATLAS OF MAMMALS OF ONTARIO

The atlas of mammals of Ontario did not reveal any SAR within the square encompassing the Study Area.

4.7 ONTARIO BUTTERFLY ATLAS

The proposed development encompasses square 17LG38 on the Ontario Butterfly Atlas (OBA). A total of 87 common butterflies and one SAR butterfly have been observed between the years of 1893 to 2023. The following SAR butterflies have been recorded in square 17LG48 on the ORAA (Table 6).

TABLE 6: ONTARIO BUTTERFLY ATLAS

Common Name	Scientific Name	S - Rank	SARO Status	COSEWIC Status	Observation Date	Habitat Present in the Development Envelope?	Key Habitats Used by Species	Observed in 2024 Field Surveys?
Monarch	<i>Danaus plexippus</i>	S2N, S4B	SC	END	2023	No	See Table 4.	No

4.8 CONSERVATION AUTHORITIES

IES recommends that consultation with Essex Region Conservation Authority (ERCA) be conducted to determine whether a permit for development is required. The northern border of the property abuts the ERCA’s Regulated Area along the agricultural drain (Figure 4).

4.9 LOCAL NATURALIST GROUPS

As the proposed development is occurring on private property and across a regional road, no local naturalist groups were contacted regarding this project.

4.10 LOCAL INDIGENOUS COMMUNITIES

No local indigenous communities were contacted regarding this project.

5.0 EXISTING CONDITIONS

5.1 FIELD SURVEY DATES AND WEATHER CONDITIONS

Details on the local temperatures and weather conditions at the Subject Property during field investigations can be seen in **Table 7**.

TABLE 7: SURVEY FIELD DATES AND WEATHER CONDITIONS

Date	Type of Surveys	Temperature (°C)	Cloud Cover (%)	Beaufort Wind Scale ¹	Precipitation Code ²	Surveyor Names
October 3, 2024	Vegetation Inventory, Ecological Land Classification, SAR Survey, and Incidental Wildlife Survey.	19	10	2 - 3	0	Nicole Wajmer
December 17, 2024	Vegetation Inventory, Ecological Land Classification, Aquatic Assessment, Headwater Drainage Feature Assessment and Dripline Staking.	2	100	2 - 3	0	Nicole Wajmer and Jennifer Neill

¹Beaufort Wind Scale: 0 (Calm); 1 (Light Air); 2 (Light Breeze); 3 (Gentle Breeze); 4 (Moderate Breeze); 5 (Fresh Breeze); 6 (Strong Breeze).

²Precipitation Codes: 0 (Clear); 1 (Fog); 2 (Light Drizzle); 3 (Light Rain); 4 (Moderate Rain); 5 (Heavy Rain); 6 (Thunder or Lightning).

5.2 FLORA AND VEGETATION COMMUNITIES

5.2.1 Ecological Land Classification Vegetation Communities

The Study Area (Subject Property and adjacent lands) contains two anthropogenic areas and three natural vegetation communities (**Figure 5**). These areas are described briefly below.

The Open Disturbed Area occurs along the southern and part of the western property boundaries. European Reed (*Phragmites australis ssp. australis*) has established along the edges and fencerows in varying densities, from mature dense stands to sparse, linear formations. This area has been colonized by a mix of common, non-native invasive species, which are most concentrated along margins inaccessible to equipment and spread more sparsely toward the north. Evidence of recent grading and skid tracks were also observed in this area. **Photo 1** shows an example of this anthropogenic area during field investigations.

The Open Agriculture (OAG) occupies the remaining portions of the Subject Property and includes two distinct sections, a large OAG and a small OAG, differentiated by crop type. The small OAG field appeared to be more recently tilled with a heavier level of recent disturbance shown through the presence of brush piles and upturned roots within the field. There was also a large section of pooling present in the small OAG field. This pooled area did not contain any vegetation. In 2024, the OAG fields were planted with soy. Soy is also planned for the 2025 growing season. At the time of site investigations, both fields had been harvested and tilled, allowing some time for non-native invasive plants to establish in scattered and patchy patterns across each field, with higher plant densities observed in the small OAG. **Photo 2** shows an example of this anthropogenic area during field investigations.

The Fresh - Moist Deciduous Woodland Ecosite (WODM5) extends along the northern property boundary and is distributed across several small polygons. These polygons are predominantly composed of young trees interspersed with occasional canopy veterans. The WODM5 exhibits a semi-closed canopy observing 35% < tree cover < 60% with a cultural legacy. One WODM5 polygon, on the eastern property boundary contains a prominent standing pool of water, bordered by Eastern Cottonwood (*Populus deltoides*). Several central polygons exhibit vertical cuts along their southern edges, with exposed tree roots visible. These cuts measure approximately 1 to 1.5 meters in height. The remaining polygons exhibit a heterogeneous composition of tree species lacking typical associations. The canopy is primarily dominated by Manitoba Maple (*Acer negundo*), with occasional to rare occurrences of Eastern Cottonwood, Silver Maple (*Acer saccharinum*), and Bur Oak (*Quercus macrocarpa*). The tall shrub layer (2–10 m) is characterized by regenerating young trees, predominantly Green Ash (*Fraxinus pennsylvanica*), with occasional to rare occurrences of White Elm (*Ulmus americana*), Hackberry (*Celtis occidentalis*), and Common Apple (*Malus pumila*). A total of 26 species were observed in this community, 17 (65%) native species exist, while nine (35%) are classified as non-native. The mean Coefficient of Wetness (CW) for this community is 1.08. This number indicates that there is a slight predominance of upland species present. The mean Coefficient of Conservatism (CC) for this community is 2.08. This number indicates the floristic quality is not sufficient to identify a community of remnant natural quality. The Floristic Quality Index (FQI) for this community is 10.59 indicating low significance from a natural quality perspective. Disturbance history includes light browse, gaps in the canopy, flooding, tracks and trails, cutting, dumping and invasive species. **Photo 3** shows an example of site conditions as they were during field investigations.

The Fresh - Moist Deciduous Thicket Ecosite (THDM5) surrounds the WODM5 polygons and extends down to the southern edge of the Hawkins Drain. The THDM5 is dominated by a mix of common native and exotic shrub species with shrub cover > 25%; tree cover < 25%; varying from scattered and patchy to continuous. A total of 41 species were observed in this community, 22 (54%) native species exist, while 19 (46%) are classified as non-native. The mean CW for this community is 0.73. This number indicates that there is a slight predominance of upland species present. This number is slightly lower than expected due to the presence of several facultative and obligate wetland species occurring at the interface of this community and the Hawkins Drain (some within the drain bed itself). The mean CC for this community is 1.22. This number indicates the floristic quality is not sufficient to identify a community of remnant natural quality. The FQI for this community is 7.81 indicating low significance from a natural quality perspective. Disturbance history includes light browse, anthropogenic disturbance (CSP Culverts), steep banks and invasive species. **Photo 4** shows an example of site conditions as they were during field investigations.

The Fresh - Moist Mixed Meadow Ecosite (MEMM4) is located on the adjacent lands to the west and along the northern bank of the Hawkins Drain. The MEMM4 is an open herbaceous community with tree and shrub cover < 25%, ranging from scattered and patchy to continuous meadow. The MEMM4 ecosite located on the adjacent lands is a higher-quality mixed meadow characterized by greater native species diversity and the presence of several provincially significant plants. Portions of this MEMM4 polygon exhibit areas of standing, pooled water, with facultative wetland species present; however, their coverage does not exceed 50%. The MEMM4 located along the northern bank of the drain is dominated by invasive species and demonstrates relatively low species diversity in comparison. A total of 48 species were observed in this community, 23 (48%) native species exist, while 25 (52%) are classified as non-native. The mean CW for this community is 1.33. This number indicates that there is a slight predominance of upland species present. The mean CC for this community is 1.04. This number indicates the floristic quality is not sufficient to identify a community of remnant natural quality. The FQI for this community is 10.43 indicating low significance from a natural quality perspective. Disturbance history includes light browse, flooding and invasive species. **Photo 5** shows an example of site conditions as they were during field investigations.

All vegetation communities within the Study Area are considered widespread and common in Ontario and are secure globally. **Table 8** presents the vascular plant taxa found on and adjacent to the Subject Property.



Photo 1: Open Disturbed Area, looking southeast.



Photo 2: Large OAG, looking north.



Photo 3: Fresh - Moist Deciduous Woodland Ecosite (WODM5), looking northeast.



Photo 4: Fresh - Moist Deciduous Thicket Ecosite (THDM5), looking north.



Photo 5: Fresh - Moist Mixed Meadow Ecosite (MEMM4), looking north.

5.2.2 Flora

A total of 115 vascular plant taxa were recorded within the study area (**Table 8**). Of the 115 species identified to a species level, 59 species (51%) are considered native to Ontario while 56 species (49%) are classified as non-native. No plant SAR were observed however, field investigations confirmed the presence of three provincially significant plant species; Missouri Ironweed (*Eupatorium altissimum*) and Stiff Goldenrod (*Solidago rigida*) both with a provincial S-Rank of Vulnerable (S3) and Tall Boneset (*Eupatorium altissimum*) with a provincial S-rank of (S1) Critically Imperiled.

A single individual of Missouri Ironweed was observed along the western edge of the small OAG community, while a single individual of Stiff Goldenrod was identified within the MEMM4 community on the adjacent lands. Additionally, a small patch of Tall Boneset was documented along the western margin of the Open Disturbed Area, with several additional individuals observed within the MEMM4 community on adjacent lands. As the proposed development will not encroach upon the adjacent lands, and protective measures will be implemented for their margins, the Missouri Ironweed, Stiff Goldenrod, and Tall Boneset populations in these areas will remain undisturbed and safeguarded. However, the small patch of Tall Boneset located along the western margin of the Open Disturbed Area will require removal to accommodate the proposed road construction. To mitigate the impact of removing this S1-ranked plant species, seed collection was conducted on December 17th, 2024, as agreed upon by City of Windsor staff

and Jennifer Neill. These seeds will be utilized to augment plantings within the SWM pond, ensuring the preservation and propagation of this species in the local landscape.

TABLE 8: OBSERVED VASCULAR PLANT LIST

Scientific Name	Common Name	CW ¹	Status		
			SARA (SCH. 1) STATUS ²	SARO STATUS ³	SRANK ⁴
<i>Abutilon theophrasti</i>	Velvetleaf	3			SE5
<i>Acalypha rhomboidea</i>	Common Three-seeded Mercury	3			S5
<i>Acer negundo</i>	Manitoba Maple	0			S5
<i>Acer saccharinum</i>	Silver Maple	-3			S5
<i>Acer saccharum</i>	Sugar Maple	3			S5
<i>Alisma subcordatum</i>	Southern Water-plantain	-5			S4?
<i>Alliaria petiolata</i>	Garlic Mustard	0			SE5
<i>Ambrosia artemisiifolia</i>	Common Ragweed	3			S5
<i>Apocynum androsaemifolium</i>	Spreading Dogbane	5			S5
<i>Apocynum cannabinum</i>	Hemp Dogbane	0			S5
<i>Arctium minus</i>	Common Burdock	3			SE5
<i>Asclepias syriaca</i>	Common Milkweed	5			S5
<i>Barbarea vulgaris</i>	Bitter Wintercress	0			SE5
<i>Brassica nigra</i>	Black Mustard	5			SE5
<i>Brassica rapa</i>	Field Mustard	5			SE5
<i>Bromus arvensis</i>	Field Brome	3			SE1
<i>Bromus inermis</i>	Smooth Brome	5			SE5
<i>Butomus umbellatus</i>	Flowering-rush	-5			SE5
<i>Carex crinita</i>	Fringed Sedge	-5			S5
<i>Carex plantaginea</i>	Plantain-leaved Sedge	5			S5
<i>Carex vulpinoidea</i>	Fox Sedge	-5			S5
<i>Celtis occidentalis</i>	Common Hackberry	0			S4
<i>Chenopodium album</i>	Common Lamb's-quarters	3			SE5
<i>Cichorium intybus</i>	Wild Chicory	3			SE5
<i>Cirsium arvense</i>	Canada Thistle	3			SE5
<i>Cornus drummondii</i>	Rough-leaved Dogwood	0			S4
<i>Cornus racemosa</i>	Grey Dogwood	0			S5
<i>Cornus sericea</i>	Red-osier Dogwood	-3			S5
<i>Cyperus esculentus</i>	Perennial Yellow Flatsedge	-3			S5
<i>Dactylis glomerata</i>	Orchard Grass	3			SE5
<i>Daucus carota</i>	Wild Carrot	5			SE5

TABLE 8: OBSERVED VASCULAR PLANT LIST

Scientific Name	Common Name	CW ¹	Status		
			SARA (SCH. 1) STATUS ²	SARO STATUS ³	SRANK ⁴
<i>Dipsacus fullonum</i>	Common Teasel	3			SE5
<i>Echinochloa crus-galli</i>	Large Barnyard Grass	-3			SE5
<i>Epilobium hirsutum</i>	Hairy Willowherb	-3			SE5
<i>Epilobium parviflorum</i>	Small-flowered Hairy Willowherb	3			SE4
<i>Erigeron canadensis</i>	Canada Horseweed	3			S5
<i>Eupatorium altissimum</i>	Tall Boneset	5			S1
<i>Eupatorium serotinum</i>	Late Boneset	0			SE1
<i>Euthamia graminifolia</i>	Grass-leaved Goldenrod	0			S5
<i>Festuca rubra</i>	Red Fescue	3			S5
<i>Fragaria virginiana</i>	Wild Strawberry	3			S5
<i>Fraxinus americana</i>	White Ash	3			S4
<i>Fraxinus pennsylvanica</i>	Red Ash	-3			S4
<i>Geum aleppicum</i>	Yellow Avens	0			S5
<i>Geum canadense</i>	Canada Avens	0			S5
<i>Geum macrophyllum</i>	Large-leaved Avens	-3			S5
<i>Glechoma hederacea</i>	Ground-ivy	3			SE5
<i>Hibiscus trionum</i>	Flower-of-an-hour	5			SE4
<i>Hypericum perforatum</i>	Common St. John's-wort	5			SE5
<i>Impatiens capensis</i>	Spotted Jewelweed	-3			S5
<i>Juncus compressus</i>	Compressed Rush	-3			SE5
<i>Juncus tenuis</i>	Path Rush	0			S5
<i>Juncus torreyi</i>	Torrey's Rush	-3			S5
<i>Leonurus cardiaca</i>	Common Motherwort	5			SE5
<i>Lepidium densiflorum</i>	Common Peppergrass	3			SE5
<i>Lolium arundinaceum</i>	Tall Ryegrass	3			SE5
<i>Lonicera japonica</i>	Japanese Honeysuckle	3			SE2
<i>Lonicera maackii</i>	Maack's Honeysuckle	5			SE2
<i>Lonicera tatarica</i>	Tatarian Honeysuckle	3			SE5
<i>Lythrum salicaria</i>	Purple Loosestrife	-5			SE5
<i>Malus pumila</i>	Common Apple	5			SE4
<i>Medicago lupulina</i>	Black Medick	3			SE5
<i>Melilotus albus</i>	White Sweet-clover	3			SE5
<i>Mentha spicata</i>	Spearmint	-3			SE4
<i>Oenothera biennis</i>	Common Evening-primrose	3			S5
<i>Panicum dichotomiflorum</i>	Fall Panicgrass	-3			SE5



TABLE 8: OBSERVED VASCULAR PLANT LIST

Scientific Name	Common Name	CW ¹	Status		
			SARA (SCH. 1) STATUS ²	SARO STATUS ³	SRANK ⁴
<i>Parthenocissus quinquefolia</i>	Virginia Creeper	3			S4?
<i>Parthenocissus vitacea</i>	Thicket Creeper	3			S5
<i>Persicaria maculosa</i>	Spotted Lady's-thumb	-3			SE5
<i>Phalaris arundinacea</i>	Reed Canarygrass	-3			S5
<i>Phleum pratense</i>	Common Timothy	3			SE5
<i>Phragmites australis ssp. australis</i>	European Reed	-3			SE5
<i>Pilosella aurantiaca</i>	Orange Hawkweed	5			SE5
<i>Plantago lanceolata</i>	English Plantain	3			SE5
<i>Populus balsamifera</i>	Balsam Poplar	-3			S5
<i>Populus deltoides</i>	Eastern Cottonwood	0			S5
<i>Prunella vulgaris</i>	Common Self-heal	0			S5
<i>Quercus alba</i>	White Oak	3			S5
<i>Quercus bicolor</i>	Swamp White Oak	-3			S4
<i>Quercus macrocarpa</i>	Bur Oak	3			S5
<i>Ranunculus acris</i>	Common Buttercup	0			SE5
<i>Rhamnus cathartica</i>	European Buckthorn	0			SE5
<i>Rhus typhina</i>	Staghorn Sumac	3			S5
<i>Rosa multiflora</i>	Multiflora Rose	3			SE5
<i>Rosa rubiginosa</i>	Sweetbriar Rose	3			SE4
<i>Rubus idaeus ssp. idaeus</i>	European Red Raspberry	3			SE1
<i>Rubus occidentalis</i>	Black Raspberry	5			S5
<i>Rumex crispus</i>	Curled Dock	0			SE5
<i>Salix euxina</i>	Crack Willow	0			SE
<i>Scirpus atrovirens</i>	Dark-green Bulrush	-5			S5
<i>Scirpus cyperinus</i>	Common Woolly Bulrush	-5			S5
<i>Setaria faberi</i>	Giant Foxtail	3			SE4
<i>Setaria pumila</i>	Yellow Foxtail	0			SE5
<i>Setaria viridis</i>	Green Foxtail	5			SE5
<i>Solanum dulcamara</i>	Bittersweet Nightshade	0			SE5
<i>Solidago altissima</i>	Tall Goldenrod	3			S5
<i>Solidago canadensis</i>	Canada Goldenrod	3			S5
<i>Solidago rigida</i>	Stiff Goldenrod	3			S3
<i>Solidago rugosa</i>	Rough-stemmed Goldenrod	0			S5
<i>Sonchus arvensis</i>	Field Sow-thistle	3			SE5
<i>Symphotrichum lanceolatum</i>	Paniced Aster	-3			S5



TABLE 8: OBSERVED VASCULAR PLANT LIST

Scientific Name	Common Name	CW ¹	Status		
			SARA (SCH. 1) STATUS ²	SARO STATUS ³	SRANK ⁴
<i>Symphotrichum lateriflorum</i>	Calico Aster	0			S5
<i>Symphotrichum novae-angliae</i>	New England Aster	-3			S5
<i>Symphotrichum pilosum</i>	Old Field Aster	3			S5
<i>Taraxacum officinale</i>	Common Dandelion	3			SE5
<i>Toxicodendron radicans</i>	Poison Ivy	0			S5
<i>Trifolium repens</i>	White Clover	3			SE5
<i>Typha latifolia</i>	Broad-leaved Cattail	-5			S5
<i>Ulmus americana</i>	White Elm	-3			S5
<i>Verbascum thapsus</i>	Common Mullein	5			SE5
<i>Verbena hastata</i>	Blue Vervain	-3			S5
<i>Vernonia missurica</i>	Missouri Ironweed	0			S3?
<i>Vicia cracca</i>	Tufted Vetch	5			SE5
<i>Vitis riparia</i>	Riverbank Grape	0			S5
<i>Xanthium strumarium</i>	Rough Cocklebur	0			S5

¹ Coefficient of Wetness (CW): Refer to Section 2.4 for definitions.

² Species at Risk Act (SARA) Schedule 1 Status: END (Endangered); THR (Threatened); SC (Special Concern); NAR (Not at Risk)

³ Species at Risk in Ontario (SARO) Status: END (Endangered); THR (Threatened); SC (Special Concern); NAR (Not at Risk)

⁴ S-Rank (Provincial): S1 (Critically Imperiled), S2 (Imperiled), S3 (Vulnerable), S4 (Apparently Secure), S5 (Secure), S#B (Breeding), SNA (Species Not Suitable Target for Conservation Activities)

5.3 FAUNA AND WILDLIFE HABITAT

A total of eleven wildlife species were identified within the study area or in the adjacent lands field investigations (Table 9). These species were identified either through auditory and visual observations or through evidence of occurrence. Of the eleven species identified, there were nine bird species, one mammal species, and one crustacean species.

5.3.1 Birds

A total of nine bird species were visually observed or identified through calls during field investigations (Table 9). Of the nine species of birds that were observed in the Study Area, five species are protected under the *Migratory Birds Convention Act* (MBCA), which protects and conserves migratory birds and their nests during the breeding bird season.

No SAR birds were detected during field investigations. The proposed development is occurring entirely within the agricultural or disturbed lands within the Subject Property. As such, no tree or shrub removal is required to accommodate the proposed development, and no impacts are expected to breeding birds. The fields will be planted with soy in the 2025 growing season which will not provide suitable nesting habitat for rare grassland birds.

5.3.2 Herpetofauna

5.3.2.1 Amphibians

The Ontario Reptile and Amphibian Atlas (ORAA) provides records of the following amphibian species within the 10 Km X 10 Km survey square that encompasses the proposed study area (square 17LG38):

- American Bullfrog (*Lithobates catesbeianus*)
- Green Frog (*Lithobates Clamitans*)
- Northern Leopard Frog (*Lithobates Pippiens*)
- Spring Peeper (*Pseudacris crucifer*)
- Western Chorus Frog (*Pseudacris maculata*)
- American Toad (*Anaxyrus Americanus*)
- Mudpuppy (*Necturus maculosus*)

No amphibians were observed during field investigations. An intermittent Class F Drain exists along the northern property border. This feature may provide amphibian breeding habitat in the spring as water was present during the December site visit. A large pool of water existed within the recently tilled field on the western side of the property resulting from heavy rainfall events prior to field investigations. This pool of water will likely not provide breeding habitat for amphibians next spring as the field will be planted with crop and actively farmed.

5.3.2.2 Reptiles

The Ontario Reptile and Amphibian Atlas (ORAA) provides records of the following amphibian species within the 10 Km X 10 Km survey square that encompasses the proposed study area (square 17LG38):

- Blanding's Turtle (*Emydoidea blandingii*)
- Midland Painted Turtle (*Chrysemys picta marginate*)
- Northern Map Turtle (*Graptemys geographica*)
- Red-eared Slider (*Trachemys scripta elegans*)
- Snapping Turtle (*Chelydra serpentina*)
- Butler's Gartersnake (*Thamnophis butleri*)
- Eastern Foxsnake (*Pantherophis vulpinus*)
- Eastern Gartersnake (*Thamnophis sirtalis sirtalis*)

- Dekay's Brownsnake (*Storeria dekayi*)
- Northern Watersnake (*Nerodia sipedon*)
- Red-bellied Snake (*Storeria occipitomaculata*)
- Five-lined Skink (*Plestiodon fasciatus pop. 1*)

Most of the property consisted of agricultural or disturbed lands and do not provide suitable habitat for the reptiles listed by the ORAA. The agricultural drain located along the northern property border contained flowing water at the time of field investigations, which could potentially support the life processes of turtles during certain times of the year.

The railway corridor and meadow located on adjacent lands to the east of the property provide suitable foraging, movement and thermoregulation habitat for SAR snakes. Brush piles that could be used for cover were noted at the northern property limit as well. Additionally, several Digger Crayfish burrows were noted along the margins of the adjacent meadow community. Butler's Gartersnake (END) are known to utilize these burrows for overwintering hibernaculum habitat. Mitigation measures to protect SAR reptiles can be found in **Section 6.1**.

5.3.3 Mammals

One mammal species was detected during field investigations (**Table 9**). White-tailed Deer is tolerant of anthropogenically disturbed habitats and is considered secure (S5) in the province of Ontario.

5.3.4 Crustaceans

Chimney (or digger) Crayfish (*Fallicambarus fodiens*) holes were observed along the western property border adjacent to the meadow (**Table 9; Figure 5**). Chimney crayfish construct burrows which are marked by a chimney of mud pellets left over from construction. Chimney crayfish have a provincial s-rank of Vulnerable (S3).

TABLE 9: OBSERVED WILDLIFE SPECIES

Scientific Name	Common Name	Statu s	Protection				Location
		S-RANK ¹	COSEWIC STATUS ²	SARA SCHEDULE ³ STATUS	SARO STATUS ⁴	MBCA ⁵	Outside Of Subject Property
BIRDS							
<i>Columba livia</i>	Rock Pigeon	SNA				^	
<i>Zenaida macroura</i>	Mourning Dove	S5				^	
<i>Charadrius vociferus</i>	Killdeer	S4B				^	
<i>Buteo jamaicensis</i>	Red-tailed Hawk	S5	NAR	NAR			Yes
<i>Colaptes auratus</i>	Northern Flicker	S5				^	Yes
<i>Cyanocitta cristata</i>	Blue Jay	S5					
<i>Corvus brachyrhynchos</i>	American Crow	S5					
<i>Sturnus vulgaris</i>	European Starling	SNA					
<i>Cardinalis cardinalis</i>	Northern Cardinal	S5				^	
MAMMALS							
<i>Odocoileus virginianus</i>	White-tailed Deer	S5					
CRUSTCEANS							
<i>Creaserinus fodiens</i>	Digger Crayfish	S3					

¹ S-Rank (Provincial): S1 (Critically Imperiled), S2 (Imperiled), S3 (Vulnerable), S4 (Apparently Secure), S5 (Secure), S#B (Breeding), SNA (Species Not Suitable Target for Conservation Activities)

² Committee on the Status of Endangered Wildlife in Canada (COSEWIC): EXP (Extirpated), END (Endangered); THR (Threatened); SC (Special Concern); NAR (Not at Risk); NA (Not Active); DD (Data Deficient)

³ Species at Risk Act (SARA) Schedule 1 Status: END (Endangered); THR (Threatened); SC (Special Concern); NAR (Not at Risk)

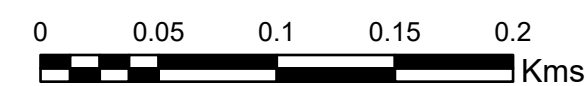
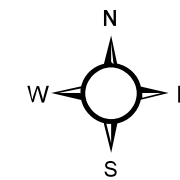
⁴ Species at Risk in Ontario (SARO) Status: END (Endangered); THR (Threatened); SC (Special Concern); NAR (Not at Risk)

⁵ Migratory Birds Convention Act



Existing Conditions

0 Catherine Street, Windsor



Legend

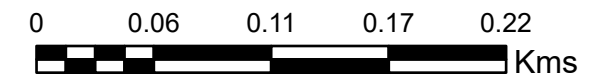
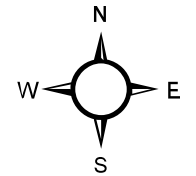
- Legal Parcel
- Tall Boneset (*Eupatorium altissimum*) - S1
- Missouri Ironweed (*Vernonia missurica*) - S3
- Stiff Goldenrod (*Solidago rigida*) - S3
- Chimneystack Crayfish (*Fallicambarus fodiens*) Burrow - S3
- Brushpile, Rock Pile or Uprooted Tree
- Hawkins Drain (Class F)
- Agricultural Drainage Ditch
- Pooling/Standng Water
- CSP Culverts**
- Buried (Potential Snake Hibernaculum)
- Fuctioning
- ELC**
- WODM5: Fresh - Moist Deciduous Woodland Ecosite
- THDM5: Fresh - Moist Deciduous Thicket Ecosite
- MEMM4: Fresh - Moist Mixed Meadow Ecosite
- Large OAG: Open Agriculture
- Small OAG: Open Agriculture
- Open Disturbed Area

Figure No.: 5
 Project No.: IES24-211
 Scale: 1:3,200
 Date: January 8, 2025
 Creator: Nicole Wajmer



Mitigation and Buffers

0 Catherine Street, Windsor



Legend

- Legal Parcel
 - ELC
 - Hawkins Drain (Class F)
 - Fish Habitat Buffer (30m)
 - Agricultural Drainage Ditch
 - Headwater Drainage Feature (HDF)
 - Pooling/Standing Water
 - Brushpile, Rock Pile or Uprooted Tree
 - Tall Boneset (*Eupatorium altissimum*) - S1
 - Stiff Goldenrod (*Solidago rigida*) - S3
 - Missouri Ironweed (*Vernonia missurica*) - S3
 - Chimney Crayfish (*Fallicambarus fodiens*) Burrow - S3
 - Chimney Crayfish Burrow Buffer (5m)
 - Snake Exclusion Fencing
- ### CSP Culverts
- Buried (Potential Snake Hibernaculum)
 - Functioning

Figure No.: 6
 Project No.: IES24-211
 Scale: 1:15,000
 Date: January 9, 2025
 Creator: Nicole Wajmer



6.0 MITIGATION TO REDUCE IMPACTS TO SPECIES AT RISK AND THEIR HABITAT

6.1 POTENTIAL SAR HABITAT ON AND ADJACENT TO THE STUDY AREA

Potential SAR habitat as determined by the background review and field investigations of species within or adjacent to the project area are shown in **Table 10**.

TABLE 10: POTENTIAL SAR HABITAT ON AND ADJACENT TO THE STUDY AREA

Species Group	Potential Habitat
Potential SAR Habitat Surrounding the Bridge Rehabilitation	
SAR Bats	The proposed development does not require any removal of trees, shrubs or buildings accommodate the proposed development. As such, there will not be any impacts to SAR bats.
SAR Birds	The property did not contain suitable habitat to support the breeding of SAR birds. The agricultural lands will be planted with soy in the 2025 growing season and will not be suitable habitat to support the breeding of rare grassland birds. As such, the proposed development will not have an impact on SAR birds.
SAR Plants	<p>The proposed development is occurring in agricultural or disturbed land and no tree or shrub removal is required. Additionally, no SAR (THR or END) plants were identified along the margins of the property. As such, there will not be any impacts to SAR plants.</p> <p>Field investigations confirmed the presence of three provincially significant plant species; Stiff Goldenrod (<i>Solidago rigida</i>) and Missouri Ironweed (<i>Vernonia missurica</i>) with a provincial S-Rank of Vulnerable (S3) and Tall Boneset (<i>Eupatorium altissimum</i>) with a provincial S-rank of (S1) Critically Imperiled. As both most of these plants were found on the margins of the Subject Property or on adjacent lands, they will not be impacted by the proposed development. See mitigation measures for Tall Boneset in Section 6.2.</p>
SAR Turtles	Turtles may incidentally enter the worksite due the close proximity of Hawkins Drain. As such, mitigation measures should be implemented to ensure that they do not enter the worksite (Section 6.3).

TABLE 10: POTENTIAL SAR HABITAT ON AND ADJACENT TO THE STUDY AREA

Species Group	Potential Habitat
SAR Snakes	It is possible that SAR snakes, specifically Butler’s Gartersnake or Eastern Foxsnake, may incidentally enter the work site due to suitable habitat for the species found within adjacent lands in the meadow to the west or along the rail corridor located to the north. The proposed outlet for the SWM pond may also impact the woodland feature. See Section 6.2 for mitigation measures for SAR Snakes. See Section 6.4 for next steps regarding consultation with MECP.

6.2 MITIGATION FOR TALL BONESET

Tall Boneset (*Eupatorium altissimum*) was observed in the Disturbed Area that is being considered for the extension of Catherine Street. This plant has a provincial S-rank of S1, indicating that it is Critically Imperiled in Ontario. Additionally, the vicinity surrounding the plant is classified as Significant Wildlife Habitat (SWH) under the Provincial Policy Statement (PPS). To mitigate the impact of removing this S1-ranked plant species, seed collection was conducted on December 17th, 2024, as agreed upon by City of Windsor staff and Jennifer Neill. These seeds will be utilized to augment plantings within the proposed SWM pond, ensuring the preservation and propagation of this species in the local landscape.

6.3 MITIGATION FOR SAR REPTILES

Mitigation measures should be incorporated to the development stage of the project to ensure that SAR reptiles do not enter the worksite. Chimney Crayfish burrows were observed along the margins of the western property boundary and are known to provide hibernaculum habitat to Butler’s Gartersnake (END). Additional, snake habitat features were located along and within the THDM5 and WODM5 communities. SAR turtles may also incidentally enter the worksite due to the proximity of Hawkins Drain. As such, it is imperative to incorporate mitigation measures into the project planning to ensure that SAR reptiles are excluded from the worksite (**Figure 6**).

1. All on-site personnel must be made aware of the potential presence of Species at Risk (SAR) snakes and turtles, specifically Butler’s Gartersnake (END) and Eastern Foxsnake (END).
2. **Reptile exclusion fencing should be placed around the development envelope to ensure that SAR Reptiles do not enter the worksite. Fencing should be installed according to the Ontario Species at Risk Branch Best Practices Technical Note: Reptile and Amphibian Exclusion Fencing (2013). To prevent the entanglement of SAR snakes, an alternative product such as Curlex Net-**

free® blanket or the use of riprap over geotextile fabric is recommended. This document can be seen in Appendix B.

3. Fencing should be placed at least 5m to the east of the western property boundary to ensure that Chimney Crayfish burrows are not disturbed (**Figure 6**).
4. Once reptile exclusion fencing has been erected, a Visual Area Survey should be conducted to ensure that there are no individuals trapped inside.
5. Construction machinery and equipment that is left idle for over 1 hour or is parked overnight on the property between April 1st to November 30th must be surveyed for the presence of Eastern Foxsnake before (re)ignition. This visual examination should include all lower components of the machinery, including operational extensions and running gear.
6. Any SAR individual that is present on the property should be reported to the Ministry of Environment, Conservation and Parks (MECP) within 48 hours of the observation or the next working day, whichever comes first.
7. If a SAR individual is encountered, the individual must be allowed to disperse from the project site under its own ability, and project machinery and equipment must maintain a minimum operating distance of 30 meters from the individual. MECP must be contacted if this cannot be done.
8. If an injured or deceased SAR is found, the specimen must be placed in a non-airtight container maintained at an appropriate temperature and MECP staff must be contacted immediately.

6.4 CONSULTATION WITH MECP FOR SAR SNAKES

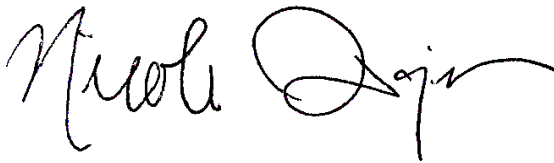
The proposed project entails impact to the WODM5 community on the northeast section of the property to accommodate the proposed SWM pond and outlet into Hawkins Drain. The woodland feature contains habitat features that could support Eastern Foxsnake including foraging, thermoregulation, movement and hibernaculum habitat. Old buried CSP culverts could also be functioning as possible hibernation habitat for snakes. Additionally, Chimney Crayfish burrows were observed along the margins of the western property boundary and are known to provide hibernaculum habitat to Butler's Gartersnake (END). The adjacent MEMM4 community also provides suitable habitat to support the foraging, mating, movement and thermoregulation of Butler's Garter snake. As such, consultation is required with MECP to determine if a permit under the Endangered Species Act is required. Next steps include the completion and submission of an Information Gathering Form (IGF) and an Avoidance Alternative Form (AAF) to the Ministry of Environment, Conservation and Parks (MECP) to discuss potential impacts to SAR snakes including Butler's Gartersnake (END) and Eastern Foxsnake (END).

7.0 CONCLUSION

Based on Species at Risk information gathering efforts and field investigations conducted by Insight Environmental Solutions Inc., no site alterations should be completed on the Subject Property until consultation with MECP has been completed to determine whether the project will require a permit under the Endangered Species Act for impacts to Threatened or Endangered species.

Insight Environmental Solutions Inc. trusts that the material presented in this report will satisfy the requirements to move forward with the proposed activities. The data and conclusions contained in this letter are based upon work performed by qualified professionals in accordance with accepted scientific methods and protocols. The information should be interpreted and implemented only in relation to the specific project as identified. This report was prepared on behalf of Rock Developments East Windsor Inc., and the undersigned accepts no responsibility for future use by other parties.

Yours sincerely,



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APPENDICES

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**APPENDIX A: NAME AND
QUALIFICATIONS OF RETAINED
CONSULTANT**

Wildlife Biologist – Nicole Wajmer, Hon. B.Sc., M.Sc.

Nicole is a wildlife biologist, GIS technician and managing partner of Insight Environmental Solutions Inc. She completed the Wildlife Biology undergraduate and Integrative Biology graduate program at the University of Guelph and learned Geomatic Information Systems at Fanshawe College. Nicole has a wide range of aquatic and terrestrial experiences from her time working in various sectors of biology including industry, government, and academia. She has strong interests in conservation biology and has been involved in recovery programs for the Endangered Northern Spotted Owl and Eastern Loggerhead Shrike. She has successfully completed certifications for First Aid and CPR, ACUC Diver, Ontario Benthos Biomonitoring, Backpack 2 Electrofishing, Ontario Stream Assessment Protocol, Ontario Fish Identification (ID), the Department of Fisheries and Oceans (DFO) Freshwater Mussel Identification Course, Instream Fish Habitat Restoration Techniques, the Ontario Reptile and Amphibian Survey Course, the Butternut Health Expert Workshop, the TRCA Headwater Drainage Assessment Course and the Royal Ontario Museum Fish ID and Species at Risk (SAR) Fish ID courses. She has completed the Combined Field Survey Training Workshop with Bat Survey Solutions to learn contact and non-contact survey techniques for studying bats, including capture methods, bat removal and handling skills, in-field species identification metrics, and non-contact survey methods, using various tools such as photo, video, and audio recordings, and full-spectrum bat detectors. Nicole has contributed to a wide range of environmental and restoration projects throughout Ontario including SAR Assessments, Environmental Impact Studies (EIS), Natural Heritage Evaluations (NHE), Environmental Impact Assessments (EIA), Land Management Reports and DFO permitting.

Ecologist – Jennifer Neill, BFA, Dip. Env. Technician, ISA Certified Arborist

Jennifer is a senior ecologist and managing partner of Insight Environmental Solutions Inc. She holds an honours graduate from the Environmental Technician - Sampling and Monitoring program at Seneca College, a Bachelor of Fine Arts from the Ontario College of Art and Design (OCAD U) and is currently pursuing a Diploma in Ecological Land Design at Gaia College. Jennifer has managed numerous large and small-scale environmental projects throughout Ontario. Her contributions include, detailed terrestrial and aquatic botanical inventories (native, cultivated, and exotic species), ecological land classification, invasive species management plans, incidental wildlife surveys, benthic macro-invertebrate identification, Ontario plant Species at Risk (SAR) individual identification, SAR habitat evaluation, Environmental Impact Studies (EIS), Natural Heritage Evaluations (NHE), Environmental Impact Assessments (EIA), Oak Ridges Moraine (ORM) Conformity Statements, Arborist Reports, Land Management, Aquatic and Terrestrial Ecological Restoration and/or Compensation Planting Plans. Jen is a certified Arborist under the International Society of Arboriculture (ISA) and is a Butternut Health Expert (BHE). She is also certified under the Ontario Stream Assessment Protocol, Ontario Fish Identification, the Ontario Benthos Biomonitoring Network, RX100 Low Complexity Prescribed Burn Worker, Firesmart 101, the Ontario Wetland Evaluation System, Ecological Land Classification and is an Organic Master Gardener. Jennifer has a strong interest in Botany and the native flora of Ontario and holds a seven-year position on the Board of Directors for Tallgrass Ontario (TgO).

**APPENDIX B: BEST PRACTICES TECHNICAL
NOTE - REPTILE AND AMPHIBIAN
EXCLUSION FENCING**

SPECIES AT RISK BRANCH BEST PRACTICES TECHNICAL NOTE

REPTILE AND AMPHIBIAN EXCLUSION FENCING

Version 1.1

July 2013



July 2013

Ontario Ministry of Natural Resources
Species at Risk Branch

Recommended Citation:

OMNR. 2013. Reptile and Amphibian Exclusion Fencing: Best Practices, Version 1.0. Species at Risk Branch Technical Note. Prepared for the Ontario Ministry of Natural Resources, Peterborough, Ontario. 11 pp.

Cover illustration: Photograph by Matthew J. Aresco, Conservation Director, Nokuse Plantation

Before an activity can be initiated, permissions, approvals or authorizations may be required from MNR (e.g. Endangered Species Act authorization, Wildlife Scientific Collector's Authorization) or other agencies, levels of government (e.g. a conservation authority, municipality, federal or provincial government), or landowners. It is your responsibility to ensure that all necessary permissions, approvals and authorizations are acquired prior to proceeding with your activity.

This document presents information as of the point in time of publication and is meant to be updated through time as improved information becomes available.

Cette publication hautement spécialisée, Reptile and Amphibian Exclusion Fencing Best Practices n'est disponible qu'en anglais en vertu du Règlement 671/92 qui en exempte l'application de la Loi sur les services en français. Pour obtenir de l'aide en français, veuillez communiquer avec le ministère des Richesses naturelles au Pamela Wesley, 705-755-5217.

Document History

Revision Number	Revision Date	Summary of Changes	Originated	Reviewed	Authorized
1.1	June, 2013	Pre-publishing edits	June, 2013	June, 2013	June, 2013

REPTILE AND AMPHIBIAN EXCLUSION FENCING - BEST PRACTICES -

The purpose of this guidance document is to provide an overview of proven design and installation techniques for reptile and amphibian exclusion fencing. Though this document points to site and species-specific design requirements, it is important to recognize that every situation is different. This guidance is not meant to replace site-specific advice obtained from local MNR staff or experienced exclusion fencing contractors. Moreover, exclusion fences are only effective when well planned, properly constructed, and maintained.

Exclusion fencing seeks to eliminate access to specific areas where activities that could harm animals are occurring (e.g. active aggregate operations, construction sites, and roads). The selection and installation of exclusion fencing can present some challenges, particularly if multiple species are being excluded. For example, some reptiles and amphibians are able to dig under fencing while others can climb over. Some may also take advantage of burrows dug by other animals. To maintain effectiveness, the bottom of the fence should be buried or secured firmly to the ground and minimum height recommendations (Table 1) are considered.

Exclusion fence design should consider the target species as well as those that might be unintentionally impacted. Fencing material should not pose a risk of entanglement or permit individuals to pass underneath or between openings. Landscape features such as topography and substrate need to be considered as they may constrain fencing design.

Including plans for fencing in advance of a project can increase efficiency and fence

effectiveness. For example, long-term road projects that will include a permanent sound barrier could design the sound barrier such that it also meets the specifications of the required exclusion fence.

EFFECTIVE FENCE CHARACTERISTICS

The fence burial and height recommendations listed in Table 1 below have been compiled from scientific literature, established management practices, and practitioner best advice. These are general recommendations and at times other specifications may be more appropriate. For instance, in areas where the substrate does not permit fence burial, weighing down the fence with heavy items (e.g. sand bags) or backfilling may be acceptable. Where needed, speak with your local MNR staff or experienced exclusion fencing contractor to develop site-specific plans.

If multiple species are being excluded from the same area, and the species-specific fencing specifications differ, the uppermost minimum height and greatest depth recommendation should be used (Table 1). If you are excluding both Blanding's Turtle and Gray Ratsnake, for example, the exclusion fence should be a minimum of 2 m tall (see Gray Ratsnake section below for additional details).

Exclusion fences should be installed prior to emergence from hibernation. A survey of the enclosed/secluded area should be conducted immediately following fence installation to ensure that no individuals have been trapped on the wrong side of the fence.

Table 1. Recommended burial depth and height requirements of exclusion fencing for reptiles and amphibians. Recommended height is the height of the fence after it has been installed including the buried components and any installed overhangs or extended lips.

SPECIES	RECOMMENDED DEPTH OF FENCE BURIED (cm) *	RECOMMENDED HEIGHT OF FENCE (cm) **
Turtles – general	10 – 20	60
Eastern Musk Turtle, Wood Turtle	10 – 20	50
Massasauga, Eastern Hog-nosed Snake, Butler’s Gartersnake, Queensnake	10 – 20	60
Gray Ratsnake & Eastern Foxsnake	10 – 20	200
Fowler’s Toad	10 – 20	50
Snakes - general	10 – 20	100
Common Five-lined Skink	10 – 20	unknown
Salamanders	10 – 20	30

* does not include the 10 cm horizontal lip that should extend outward an additional 10 – 20 cm (see Figure 2)

** the height of fencing has been provided as an approximate. Fencing materials may in fact not be available in proportions that would allow for these precise measurements. It is most effective, if the height and burial depth recommendations are met.

DURATION OF ACTIVITIES & DEGREE OF ANTICIPATED DISTURBANCE

The type of disturbance, the proximity to disturbance, and the planned fence longevity are factors that influence which type of exclusion fence is most effective. For short-term activities (i.e. 1 to 6 months) such as minor road repairs, a light-duty geotextile fence is appropriate. Longer term or permanent fencing projects, however, require more durable materials such as – heavy-duty geotextile, wood, concrete, woven-wire, sheet metal, vinyl panels, or galvanized mesh.

weather is generally damaging to geotextile materials and the cost of maintenance over the long-term should be considered during the planning phase. Depending upon the quality, geotextile can be resistant to UV degradation and the bio-chemical soil environment.

Light-duty Geotextile Fencing:

Light-duty geotextile fencing is made of nylon material and is typically purchased with wooden stakes pre-attached at 2 m to 3 m intervals (Plate 1). It can also come without pre-attached stakes. Light-duty geotextiles are largely intended for projects with shorter durations of only a few months in duration and up to one season.

GEOTEXTILE FENCES

Geotextile fences (e.g. silt fences) come in many types and qualities. They can be very effective for the temporary exclusion of reptiles and amphibians. For the purposes of this document, temporary use ranges from a few months up to 2-3 years. Winter

Geotextile fencing with nylon mesh lining should be avoided due to the risk of entanglement by snakes.

To use light-duty geotextile fencing:

- Fencing fabric is effective if attached to wooden, heavy plastic or metal stakes using heavy-duty wire staples or tie-wire (Figure 2).
- Secure the fence on posts that are placed at 2 m to 3 m apart. If using the greater recommended distance between posts, additional maintenance may be required to maintain effectiveness.
- Securely drive the stakes into the ground to a recommended depth of 30 cm. The fencing fabric should be buried to the recommended specifications in Table 1 and back-filled with soil.
- For snakes, supporting posts should be staked on the activity side (e.g. on the side facing the aggregate stock pile or the road - Figure 2).
- Light-duty geotextile fences are not effective where rocks or other hard surfaces prevent proper anchoring of fence posts and burial of the fence fabric.
- Light-duty geotextile fences are not effective where a large amount of concentrated run-off is likely or to cross streams, ditches or waterways without specific modifications.
- Contact your local MNR staff or experienced exclusion fencing contractor for advice and recommendations.
- See general best practices section below for additional details.

Generally, light-duty geotextile fences are not effective if they exceed 1 metre in height unless purposely manufactured for greater height (e.g. stakes placed at closer intervals or cross braces). If greater height is required consider using heavy duty geotextile, hardware cloth or other fencing materials.



Plate 1. Light-duty geotextile fencing with pre-attached wooden stakes used to exclude turtles from a road as seen on a regular maintenance check (photo credit: Brad Steinberg).

Heavy-duty Geotextile Fencing:

Heavy-duty geotextile fencing is typically constructed of a thick felt-like fabric. It may also be called ‘double row’ or ‘trenched’ fencing. For support, this fencing uses a woven wire fence (e.g. chain link) or some other structure (Plate 2). It is recommended that a minimum density of 270R or equivalent woven geotextile fabric is used.

Heavy-duty geotextile material can be effective for up to 2 or 3 years with proper maintenance. This type of fencing can be damaged by small mammals chewing through or torn by heavy debris (e.g. tree branches). Therefore, it may be best suited to turtles, which are less likely to take advantage of holes or tears in the fabric. If

used to exclude snakes or other animals, more maintenance may be required.

Heavy-duty geotextile fencing:

- The wire fence should be installed on the activity side to prevent animals from leveraging and climbing into the exclusion area while allowing the animal to escape if they find themselves on the wrong side (Figure 2).
- Geotextile fences across streams, ditches or waterways should have case-specific modifications.
- Contact your local MNR staff or experienced exclusion fencing contractor for advice.
- See light-duty geotextile section above and general best practices below for additional details.



Plate 2. Example of a heavy-duty geotextile fencing used to exclude snake species (photo credit: Jeremy Rouse).

HARDWARE CLOTH FENCES

Hardware cloth (also known as galvanized mesh or Birdscreen) is durable, cost effective and useful for excluding reptiles and amphibians. The fence should be made of heavy galvanized hardware cloth with a ¼ inch mesh. For fences intended to exclude small snakes, a ⅛ inch mesh may be more effective. In contrast, fencing intended to exclude turtle species can have a larger mesh size (e.g. ½ inch). Larger mesh may have a longer lifespan as it is constructed from a thicker material compared to smaller mesh sizes.

To use hardware cloth fencing:

- Secure the fence on posts placed a recommended 2.5 m apart with the stakes on the activity side (Figure 2).
- Pull the mesh taut and staple or secure with screws and a metal stripping to prevent the mesh from being ripped when pressure is applied.
- Installing a top rail or folding the mesh over a taut smooth wire reduces tearing (Plates 3 and 4).
- An outward facing lip installed on the species side ensures that snakes and amphibians are unable to climb or jump over the fence (Figure 2; Plate 4)
- Tears can be mended with 18-gauge galvanized wire.
- See general best practices section below for additional details.



Plate 3. Example of a galvanized mesh fencing used for the long-term exclusion of snakes and turtles from the adjacent highway (photo credit: Megan Bonenfant).



Plate 4. Long-term to permanent exclusion fencing using galvanized mesh with over-hanging lip to prevent animals from climbing or jumping over (photo credit: Megan Bonenfant).

WOOD LATH SNOW FENCING

In certain circumstances, wood lath snow fencing can be effective at excluding turtles. This fencing is typically constructed from soft wood slats that have been woven together with 13-gauge wire and is then attached to steel fence posts which have been driven into the ground.

Wood lath fencing is cost effective and can easily be laid down during the winter to prevent damage. The durability of the material, however, is not meant for very long-term use (e.g. more than 3 years), unless regular maintenance occurs.

To use wood lath snow fencing:

- The fencing should be attached to heavy plastic or metal stakes using heavy-duty wire staples or tie-wire.
- The stakes are recommended to be placed at 2 to 3 m intervals and securely driven into the ground 30 cm or more.
- Wood lath snow fencing across streams, ditches or waterways should have case-specific modifications.
- Wood lath snow fencing lends itself well to being combined with other types of material to ensure complete exclusion.
- See general best practices section below for additional details.



Plate 5. Example of a wood lath snow fencing used to exclude turtles (photo credit: Karine Beriault).

EXCLUSION FENCING FOR GRAY RATSNAKE AND EASTERN FOXSNAKE

Gray Ratsnake and Eastern Foxsnake are the largest snakes in Ontario - reaching nearly 2 m in length. They are also excellent climbers. For this reason, fencing intended to exclude either of these species has additional recommended design specifications.

- The fence should be at least 2 m high.
- The material on the species side (Figure 2) should be smooth to prevent the snakes from climbing into the excluded area.
- Stakes should be on the activity side of the fence (Figure 2).
- Due to the increase in fence height, it is valuable to decrease the distance between posts or install diagonal braces.
- See general best practices section below for additional details.

CONCRETE, SHEET METAL & VINYL WALLS

Concrete, metal or vinyl walls can stand alone or be combined with woven wire or chain link fences. They are durable, require minimal maintenance and are effective in excluding target species from high risk areas and guiding them to crossing structures or other desired locations (Plates 6 and 7). This fence type is comprised of a continuous vertical face of concrete, metal or vinyl sheeting with no gaps. Concrete walls can be installed as either pre-cast sections or pour directly in place.



Plate 6. Stand-alone continuous concrete wall used to exclude salamander species installed as pre-cast forms (photo credit: Steven Roorda).



Plate 7. Pre-formed vinyl sheeting fence intended to exclude salamanders for a construction site (photo credit: Herpetosure Ltd.)

The wall height depends upon the target species, but they are usually between 45 and 60 cm tall and buried 25 cm. Concrete, metal or vinyl exclusion fencing is most appropriate for salamanders, skinks, small snakes, and small turtles. For large turtle species, a chain link fence can be installed directly on top of the concrete wall for complete exclusion.

HABITAT CONNECTIVITY

Habitat connectivity is the connectedness between patches of suitable habitat or the degree to which the landscape facilitates animal movement. Exclusion fencing installed along roads or other large projects can effectively reduce or eliminate habitat connectivity for animals. In these scenarios, exclusion fencing should be considered with eco-passages in order to maintain connectivity. Fencing in isolation should be viewed as a temporary method to reduce mortality until species movement can be restored. Where eco-passages are not feasible they should be identified for consideration with any future road work or development to improve connectivity.

During the installation of fencing with an eco-passage, it is important that the fencing sits flush with the passage to ensure that

there are no gaps where animals can squeeze through.



Plate 7. A wood turtle travelling through a dry eco-passage. Ecopassages such as this help to ensure the long-term connectivity of seasonal habitat for this and other reptile and amphibian species (photo credit: Amy Mui).

GENERAL BEST PRACTICES:

- To deter digging, bury the fence 10 cm down with an additional 10 cm horizontal lip (Figure 2).
- Backfill and compact soil along the entire length on both sides of the fence (Figure 2).
- Once the fence is installed, a survey should be done to ensure that no individuals have been trapped inside (speak with MNR for survey advice).
- Exclusion fencing intended to exclude snakes should have the stakes installed on the activity side (opposite the normal requirement for sediment control fencing) to prevent snakes from using the stakes to maneuver over the fencing.
- For snakes and toads, the fence should have an overhanging lip on the species side (Figure 2).
- Fences should be inspected after spring thaw and at regular intervals throughout the active season, especially following heavy rain events. This is particularly important

for geotextile fences. Any damage that affects the integrity of the fence (e.g. tears, loose edges, collapses, etc.) should be fixed promptly.

- Tall or woody vegetation on the species side of the fence should be managed if there is a risk that it may enable the animals to climb over. This is most important during spring and fall. Proceed cautiously to not harm animals protected plant species during vegetation removal.
- When installing an eco-passage, fencing or exclusion walls should be used as a guiding system to direct animals to passage openings.
- Natural screens such as trees or shrubs can help to reduce road access and can be combined with fencing to provide protection of individuals from predation.
- Install fences with a turn-around at the ends furthest from the wetland habitat and at any access areas to assist in redirecting animals away from any fence openings (Figure 1).
- Curving the ends of the fencing inward (i.e. away from the road or construction site) may help to reduce access to these locations. The ends may also be tied off to natural features on the landscape such as trees or rock cuts.

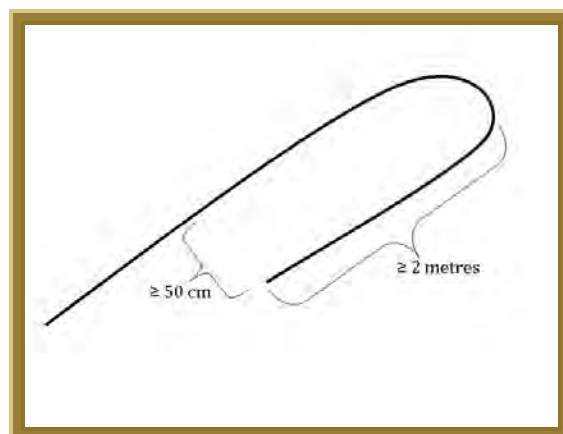


Figure 1. Diagram of the ends of the fence designed to curve inward in order to direct animals away from the area of exclusion.

WATER MOVEMENT & DRAINAGE

- In areas where surface water run-off may erode a soil-based backfill, consider using rocks or sand bags. Ensure these materials cannot be used by animals to climb over the fence.
- Where possible, minimize the number of water crossings: when necessary, it should occur where flow is minimal.
- Fence posts in waterways or areas prone to seasonal flooding should be driven rather than dug – unless following established best practices.
- Fencing should be placed above the high water mark anticipated for high water events such as spring freshet or periods of heavy or continuous rainfall.

TOPOGRAPHY:

- Fence posts should be closer together in undulating topography.
- Fences installed on slopes have a different effective height depending upon whether the animal will be approaching from the up or down slope. The fence height can be adjusted accordingly.

Improvements or questions regarding exclusion fencing can be brought to the local MNR Species at Risk Biologist or other MNR staff.

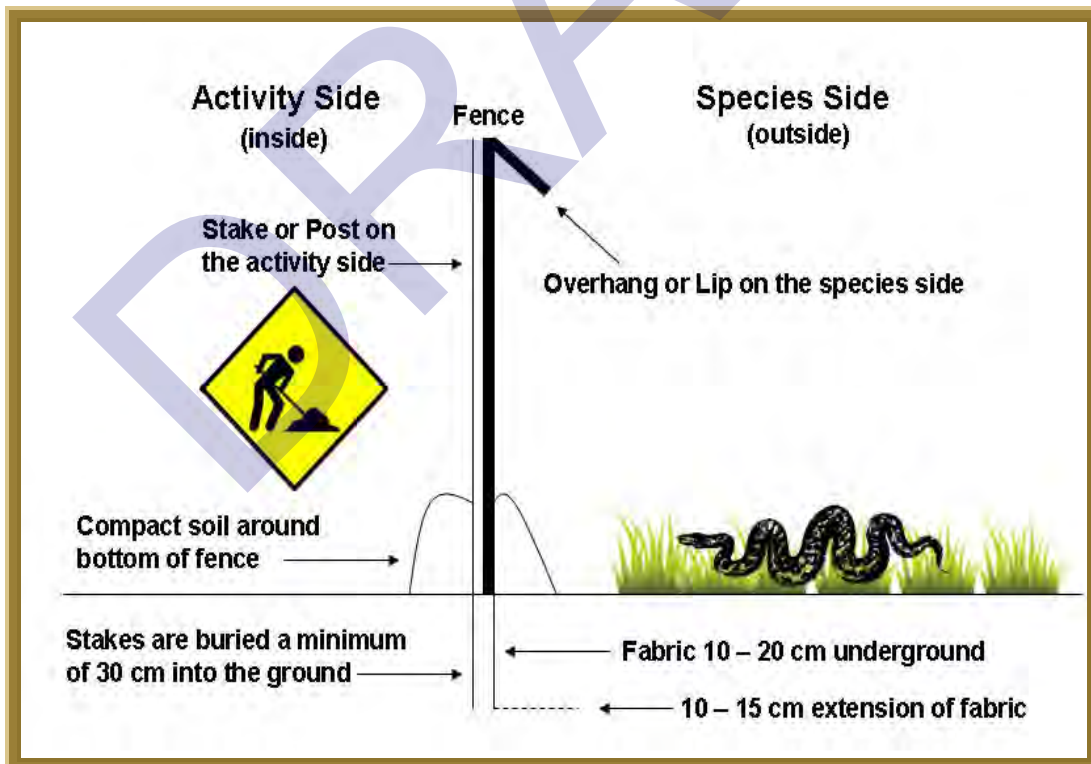


Figure 1. A side view of a basic exclusion fence including an overhang or flexible lip to deter animals from climbing or jumping over the fence. Placement of the stake on the Activity Side or on the inside of excluded area is also illustrated. This is particularly important for snake species which may use the stakes to maneuver over the fence.

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For additional information:

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