DILLON CONSULTING

TOWN OF TECUMSEH

2023 Natural Environment Existing Conditions

Tecumseh Hamlet – Municipal Class Environmental Assessment

September 2024 – 23-5735

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1.0 Introduction

Dillon Consulting Limited ('Dillon') has been retained by the Town of Tecumseh (the 'Proponent') for natural environment consulting services in support of the Municipal Class Environmental Assessment (the 'EA'). The EA is required for the proposed residential development and several alternatives for watermain, sanitary, stormwater, and roads (the 'Project') at the Tecumseh Hamlet lands (the 'Project Area') in the Town of Tecumseh, County of Essex, Ontario. For the purposes of documenting the natural environment existing conditions, the Study Area includes the Project Area, as well as the area 120 metres (m) outside of the Project Area (the 'Study Area'), as shown in **Attachment A:** Figure 1.

The purpose of this report is to summarize the natural environment existing conditions and the potential for Species at Risk (SAR) to occur within the Project Area, and to detail possible, future work that may be required if development is proposed within natural heritage features (i.e., removal of any natural heritage features). Key activities for the EA include characterization of the baseline environment, identifying required permits and approvals, on-going consultation with stakeholders, issue identification, and mitigation requirements. The results of the aforementioned will be documented in an Environmental Study Report (ESR), which will be made available to the public for review and comment.

1.1 Study Area

The Study Area is in the Town of Tecumseh within the County of Essex, Ontario. The Project Area encompasses 13 properties, known collectively as the Tecumseh Hamlet. The Project Area consists of approximately 193.14 ha with County Road 22 to the north, County Road 42 to the south, and Manning Road to the east. The west boundary lies between Lauzon Road and Banwell Road. The Study Area includes the Tecumseh Hamlet lands, as well as a 120m buffer encompassing the Study Area (**Attachment A:** Figure 1). Lands within the Study Area are zoned as "Future Development" within the Town of Tecumseh Official Plan, and also include areas designated as "Natural Environment Overlay" within the Town of Tecumseh and County of Essex Official Plans (**Attachment A:** Figure 2; **Attachment B**).

2.0 Natural Environment Survey Methods

A site visit was conducted on March 21, 2023 by a Dillon biologist from within the extents of the Project Area to document existing/potential natural heritage features, significant wildlife habitat (SWH), species at risk (SAR) habitat, if present. During the site visit, the following field surveys were conducted:

- Aquatic Assessments;
- Ecological Land Classification (ELC); and
- Incidental Wildlife.

In-depth details for features over multiple seasons, targeted vegetation and wildlife surveys, including confirmation of the presence or absence of wildlife, SAR, and/or their habitats were not completed as part of the field surveys.

The Study Area is dominated by active agriculture and spans both private and public properties. Where private property access was granted, field surveys occurred within or directly adjacent to natural features. Field data collected from adjacent lands was supplemented with information collected through aerial imagery interpretation and secondary data sources.

2.1 Aquatic Assessments

The primary purpose of the aquatic assessments was to characterize fish habitat that could potentially be affected by the Project and to support identification of potential effects and mitigation.

Information collected during the assessment included the following (where applicable): channel form, presence/absence of flow, substrate type, channel dimensions (e.g., bankfull width, bankfull depth, wetted width, and wetted depth), and riparian vegetation. Photos were also taken to document existing conditions (**Attachment C**).

2.2 Ecological Land Classification

Ecological communities were assessed using a combination of aerial photograph review, previously published data, and field surveys.

Initial aerial mapping of ecological communities was confirmed in the field following methods outlined in the Ecological Land Classification for Southern Ontario (Lee *et al.*, 1998; Lee, 2008) manual. The ELC results provided a baseline dataset and were used to determine the presence of natural features, candidate SWH, and potential habitat for SAR. Soil classification surveys were completed in strategic locations to indicate/confirm the presence/absence of previously mapped wetland communities.

ELC assessments occurred from within Project Area (i.e., within natural features) where private property access was permitted. Where access may not have been permitted, assessments were conducted from adjacent lands.

While conducting ELC, the dominant species for each ecosite or community type was identified in the field, and visual estimates of species abundance was recorded. Where appropriate, additional factors such as the level of disturbance and/or presence of non-native species were also documented.

Vegetation communities observed within the Study Area are shown in **Attachment A:** Figure 3.

2.3 Wildlife and Wildlife Habitat

2.3.1 Significant Wildlife Habitat

The Ontario Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E (MNRF, 2015a) and the Significant Wildlife Habitat Technical Guide (MNR, 2000) were reviewed to assess candidate SWH within the Study Area. Based on the background review results, there is potential for candidate SWH to occur within the Study Area.

Species of conservation concern are defined as:

- Species listed as special concern, threatened, or endangered under the federal *Species at Risk Act* (*SARA*), but do not include species listed as endangered or threatened under the *Endangered Species Act* (*ESA*).
- Species that are provincially rare/tracked (i.e., have a sub-national (provincial) rank of S1 – extremely rare and critically imperiled, S2 – very rare and imperiled, or S3 – rare to uncommon and vulnerable).
- Species that are designated as special concern under the *ESA*.

The habitats of SCC may be considered SWH. Based on desktop background review, the following SCC have the potential to occur within the general vicinity of the Study Area (**Table 1**). Refer to **Attachment D** for the full list of SCC and SAR outlined in the background review.

Table 1: SCC with the Potential to Occur within the Vicinity of the Study Area

Scientific Name	Common Name	*SARA*[1]	*ESA*[2]	SRank[3]	Information Source[4]
Birds					
Haliaeetus leucocephalus	Bald Eagle	---	SC	S2N, S4B	CBC, OBBA
Contopus virens	Eastern Wood-pewee	SC	SC	S4B	OBBA
Hylocichla mustelina	Wood Thrush	THR	SC	S4B	OBBA
Mammals					
Scalopus aquaticus	Eastern Mole	SC	SC	S2	MWH
Insects					
Danaus plexippus	Monarch	END	SC	S2N, S4B	OBA
Vegetation					
Carya laciniosa	Shellbark Hickory	---	---	S3	TNHI
Fraxinus profunda	Pumpkin Ash	---	---	S2?	TNHI
Ludwigia polycarpa	Many-fruit Seedbox	---	---	S2S3	TNHI
Quercus shumardii	Shumard Oak	---	---	S3	TNHI, NHIC
Rosa setigera	Climbing Prairie Rose	SC	SC	S3	TNHI
Smilax ecirrata	Upright Carrionflower	---	---	S3?	TNHI
Vernonia missurica	Missouri Ironweed	---	---	S3?	TNHI

[1]Federal Species at risk Act, 2002 where END = endangered, THR = threatened, and SC = special concern.
[2]Provincial Endangered Species Act, 2007 where SC = special concern, END = endangered.
[3]Provincial Conservation Ranking (SRank) where S4 = common and apparently secure, S3 = rare to uncommon and vulnerable, S2 = very rare and imperiled, SU or ? = uncertain due to insufficient information, B = breeding, N = non-breeding.
[4]CBC = Christmas Bird Count, MWH = Digital Distribution Maps of the Mammals of the Western Hemisphere, version 3.0, NHIC = Natural Heritage Information Centre, OBA = Ontario Butterfly Atlas, OBBA = Ontario Breeding Bird Atlas, TNHI = Tecumseh Natural Heritage Inventory.

The habitat throughout the landscape is fragmented and sparse given the lack of natural features and existing dominant land use (i.e., active agriculture) within the vicinity of the Study Area. However, some patches of woodland and wetland are present. The following candidate SWH have the potential to occur within the Study Area.

Seasonal Concentration Areas of Animals

- Bat Maternity Colonies
- Reptile Hibernaculum

Specialized Habitat for Wildlife

- Amphibian Breeding Habitat (Woodland)
- Amphibian Breeding Habitat (Wetland)

Habitat for Species of Conservation Concern

- Terrestrial Crayfish
- Special Concern and Rare Wildlife Species (See **Table 1**)

Specific field surveys to confirm the candidate SWH identified above were not completed as part of 2023 site visit.

2.3.2 Species at Risk

The federal *SARA* applies to species listed under Schedule 1 of the Act on federal lands and/or aquatic species, as well as migratory birds listed under both the *Migratory Birds Convention Act*, 1994, as well as Schedule 1 of the Act. Under *SARA*, species listed on Schedule 1 receive species protection (Section 32) and residence protection (Section 33). Critical Habitat is defined under Section 2 of *SARA* as "the habitat that is necessary for the survival or recovery of a listed wildlife species and that is identified as the species' critical habitat in the recovery strategy or in an action plan for the species".

The provincial *ESA* applies to species listed as extirpated, endangered, or threatened under Ontario Regulation 230/08 on private and public lands and provides both species protection (Section 9) and habitat protection (Section 10). Under the *ESA*, habitat is defined as either General Habitat or Regulated Habitat. General Habitat is defined as the area a species currently depends on, either directly or indirectly, to carry out its life processes. General Habitat does not include areas where a species once lived and/or where in may be re-introduced. General Habitat protection is in place until a regulation is made prescribing an area as Regulated Habitat. Regulated Habitat is the area prescribed for a species in a habitat regulation (under clause 56(1)(a) of the *ESA*) and may include: specific features/boundaries and areas where the species lives, used to live, or is believed to be capable of living.

The following SAR listed in **Table 2** were identified as having the potential to occur within the general vicinity of the Study Area. Refer to **Attachment D** for the full list of SCC and SAR outlined in the background review.

Table 2: SAR with the Potential to Occur within the Vicinity of the Study Area

Scientific Name	Common Name	*SARA*[1]	*ESA*[2]	SRank[3]	Information Source[4]
Birds					
Dolichonyx oryzivorus	Bobolink	THR	THR	S4B	OBBA
Hylocichla mustelina	Wood Thrush	THR	SC	S4B	OBBA
Melanerpes erythrocephalus	Red-headed Woodpecker	END	END	S4B	CBC, OBBA
Sturnella magna	Eastern Meadowlark	THR	THR	S4B	OBBA, NHIC
Mammals					
Myotis leibii	Eastern Small-footed Myotis	---	END	S2S3	MWH
Myotis lucifugus	Little Brown Myotis	END	END	S4	MWH
Myotis septentrionalis	Northern Myotis	END	END	S3	MWH
Pipistrellus subflavus	Tri-colored Bat	END	END	S3?	MWH
Reptiles					
Pantherophis gloydi pop. 2	Eastern Foxsnake (Carolinian population)	END	END	S2	ORAA, MECP/MNRF Reg. Habitat
Thamnophis butleri	Butler's Gartersnake	END	END	S2	ORAA, NHIC
Vegetation					
Cornus florida	Eastern Flowering Dogwood	END	END	S2?	MECP/MNRF Reg. Habitat
Juglans cinerea	Butternut	END	END	S3?	NHIC
Liparis liliifolia	Purple Twayblade	THR	THR	S2	NHIC
Platanthera leucophaea	Eastern Prairie Fringed-orchid	END	END	S2	MECP/MNRF Reg. Habitat
Symphotrichum praealtum	Willowleaf Aster	THR	THR	S2	NHIC

[1]Federal Species at risk Act, 2002 where END = endangered, THR = threatened, and SC = special concern.
[2]Provincial Endangered Species Act, 2007 where END = endangered, THR = threatened, and SC = special concern.
[3]Provincial Conservation Ranking (SRank) where S4 = common and apparently secure, S3 = rare to uncommon and vulnerable, S2 = very rare and imperiled, SU or ? = uncertain due to insufficient information, B = breeding.
[4]CBC = Christmas Bird Count, MECP Reg. Habitat = MECP Regulated Habitat (O. Reg. 832/21), MWH = Digital Distribution Maps of the Mammals of the Western Hemisphere, version 3.0, NHIC = Natural Heritage Information Centre, OBBA = Ontario Breeding Bird Atlas, ORAA = Ontario Reptile and Amphibian Atlas.

2.4 Incidental Wildlife

Incidental observations of wildlife, including dens, tracks, and scat were documented during the field surveys. These observations helped to determine potential ecological functions or linkages within the Study Area.

3.0 Natural Environment Survey Results

Field surveys for the Project were conducted on March 21, 2023. Each section below summarizes the results of the field assessments.

3.1 Aquatic Assessments

The Study Area lies within the Little River and Pike Creek Watersheds and overlays several municipal drains: the Robinet Drain, the Gouin Drain, the Lachance Drain, the Desjardins Drain, the Banwell Road Drain, the Antaya Drain, and the East Townline Road Drain (**Attachment A**: Figure 3). According to the Essex Region Watershed Report Card, the water quality within the Little River Watershed was classified as Fair, while the water quality within the Pike Creek Watershed was classified as Poor (Essex Region Watershed Report Card, 2023). The Robinet Drain, the Gouin Drain, the Lachance Drain, and the Desjardins Drain flow east to west, and the Banwell Road Drain flows south to north; all discharging into the Little River west of the Project Area. The Antaya Drain flows west to east and the East Townline Road Drain flows south to north, both discharging into Lake St. Clair north of the Project Area. Fisheries and Oceans Canada (DFO) aquatic SAR mapping did not show any critical habitat or aquatic SAR likely to be present within these drains (**Attachment B**). According to the DFO Drain Classification system and Ministry of Agriculture, Food and Rural Affairs (OMAFRA) mapping, all drains located within the Project Area are Class F municipal drains. Class F municipal drains have an intermittent flow regime with no sensitive fish species present. Given that these drains have intermittent flow and are connected to larger, downstream watercourse, there is potential that fish have access to these drains during periods of higher flow.

A total of eight aquatic habitat assessments were conducted by Dillon biologists on the seven drains located within the Project Area. The drains were all in a straight, channelized form, often within narrow bands of fencerow vegetation communities. The surrounding land use of the drains is predominately active agriculture, with some drains bordering roads. A summary of parameters measured in the aquatic assessments can be found in **Table 3**. Refer to **Attachment C** for representative site photographs.

Table 3: Aquatic Habitat Assessment Observations

Assessment Number	Drain	Photo # (Attachment C)	Mean Wetted Width (m)	Mean Wetted Depth (m)	Mean Bankfull Width (m)	Mean Bankfull Depth (m)	Substrate	Habitat Features
1	Robinet Drain	10, 11	1.5	0.25	3.5	0.5	Clay	Woody debris and overhanging vegetation present.
2	Gouin Drain	12, 13	1	0.07	5.5	1.75	Clay	Woody debris and overhanging vegetation present. Standing water present at time of assessment.
3	Lachance Drain	14, 15	1.25	0.28	7	2.5	Clay	Emergent Cattails (*Typha spp.*) and European Common Reed (*Phragmites australis ssp. australis*). Standing water present at time of assessment.
4	Desjardins Drain	16, 17	2	0.4	4	1.2	Clay	Woody debris and overhanging vegetation present.
5	Desjardins Drain	8, 18, 19	2	0.5	4	1.5	Clay	Woody debris and overhanging vegetation present.
6	Banwell Road Drain	20, 21	1.5	0.32	2.5	0.5	Clay	Emergent Cattails and European Common Reed, and overhanging vegetation present. Standing water present at time of assessment.

Assessment Number	Drain	Photo # (Attachment C)	Mean Wetted Width (m)	Mean Wetted Depth (m)	Mean Bankfull Width (m)	Mean Bankfull Depth (m)	Substrate	Habitat Features
7	Antaya Drain	9, 22, 23	1	0.07	5	1.5	Clay	Woody debris and overhanging vegetation present. Standing water present at time of assessment.
8	East Townline Road Drain	25, 25	1	0.12	4	1.5	Clay	Emergent European Common Reed and overhanging vegetation present. Standing water present at time of assessment.

3.2 Ecological Land Classification

A total of seven natural communities and six cultural communities were observed within the Study Area during the ELC surveys (**Attachment A**: Figure 3). Given the time of the year of the field study (i.e., not fully within the growing season) and knowing that previous Ecological Land Classification (ELC) and a floral inventory were completed in 2008, ELC baseline conditions for five natural vegetation communities were taken from the Town of Tecumseh Natural Heritage Inventory (**Attachment E**) using the ELC System for Southern Ontario (Lee *et al.*, 1998) with 2008 updates (Lee, 2008).

The majority of the Study Area consists of developed cultural communities, most of which are active agricultural lands with Annual Row Crops (OAGM1). Additional cultural communities identified throughout the Study Area consist of Fencerow (TAGM5), low-density Residential (CVR), Commercial and Institutional (CVC), Greenlands (CGL) and Transportation and Utility (CVI). Natural communities within the Study Area include Oak Mineral Deciduous Swamp (SWDM1), Hawthorne Deciduous Shrub Thicket (THDM2-11), and Red Oak Deciduous Forest (FODM1-2) which are all associated with the McAuliffe Woods Conservation Area. There are also small patches of Native Deciduous Regeneration Thicket (THDM4-1), Swamp White Oak Mineral Deciduous Swamp (SWDM1-1), Mixed Meadow (MEM), and Deciduous Forest (FOD) within the Study Area.

Within the Project Area, two natural communities and two cultural communities were observed. The natural communities are Swamp White Oak Mineral Deciduous Swamp (SWDM1-1) and Mixed Meadow (MEM). The cultural communities include Annual Row Crops (OAGM1) and Fencerow

(TAGM5) which is mainly associated with constructed municipal drains and informal agricultural drainage ditches.

A breakdown of the total aggregate area (ha) of each ELC community observed within the Project Area is provided below in **Table 4**.

Table 4: ELC Communities Identified within the Project Area

ELC Community	Area within the Project Area (ha)	Location	Dominant Plant Species
Natural ELC Communities			
SWDM1-1 – Swamp White Oak Mineral Deciduous Swamp	1.15	This community is located within the northern portion of the Project Area.	Swamp White Oak (*Quercus bicolor*), Black Walnut (*Juglans nigra*), Eastern Cottonwood (*Populus deltoides*), Green Ash (*Fraxinus pennsylvanica*), American Elm (*Ulmus Americana*), Dogwood species (*Cornus spp*), Willow species (*Salix spp*), Aster species (*Symphotrichum spp*), Evening Primrose (*Oenothera biennis*), Canada Goldenrod (*Solidago canadensis*), Wild Carrot (*Daucus carota*), Velvetleaf (*Abutilon theophrasti*), and Milkweed species (*Asclepias spp*).
MEM - Mixed Meadow	2.61	This community is located within the central/western portion of the Project Area, west of Banwell Road.	---
Cultural ELC Communities			
OAGM1 - Annual Row Crop	171.78	This community makes up the majority of the Project Area and is found throughout.	Annual Row Crops.
TAGM5– Fencerow	11.21 ha	This community is located throughout the Project Area, mainly along the constructed drains but also along informal drainage ditches in agricultural areas of the Project Area.	Eastern Cottonwood, Willow species, Staghorn Sumac (*Rhus typhina*), Red-osier Dogwood (*Cornus sericea*), European Common Reed (*Phragmites australis australis*), Canada Thistle (*Cirsium arvense*), Common Scouring-rush (*Equisetum hyemale*), Multiflora Rose (*Rosa multiflora*), Aster species, Milkweed species, Evening Primrose, Velvetleaf, Wild Carrot, Vervain species (*Verbena spp*), and Teasel species (*Dipsacus spp*).

3.3 Incidental Wildlife Observations

During the field surveys, 19 species were incidentally observed within the Study Area (**Table 5**).

All of the incidentally observed species are considered Secure (SRank of S5) or Apparently Secure (SRank of S4) in the province.

Table 5: Incidental Wildlife Observed within the Study Area

Scientific Name	Common Name	SARA[1]	ESA[2]	SRank[3]	Evidence
Birds					
Agelaius phoeniceus	Red-winged Blackbird	---	---	S4	Observed
Ardea herodias	Great Blue Heron	---	---	S4	Observed
Buteo jamaicensis	Red-tailed Hawk	---		S5	Observed
Anas platyrhynchos	Mallard	---	---	S5	Observed
Branta canadensis	Canada Goose	---	---	S5	Observed
Cathartes aura	Turkey Vulture	---	---	S5B	Observed
Charadrius vociferus	Killdeer	---	---	S5B, S5N	Observed
Cyanocitta cristata	Blue Jay	---	---	S5	Observed
Falco sparverius	American Kestrel	---	---	S4	Observed
Turdus migratorius	American Robin	---	---	S5B	Observed
Zenaida macroura	Mourning Dove	---	---	S5	Observed
Amphibians					
Lithobates clamitans	Green Frog	---	---	S5	Observed
Pseudacris triseriata pop. 2	Western Chorus Frog (Carolinian Population)	---	---	S5	Observed
Mammals					
Canis latrans	Coyote	---	---	S5	Footprints Observed
Didelphis virginiana	Virginia Opossum	---	---	S4	Observed
Odocoileus virginianus	White-tailed Deer	---	---	S5	Footprints Observed
Sciurus carolinensis	Eastern Gray Squirrel	---	---	S5	Observed
Sylvilagus floridanus	Eastern Cottontail	---	---	S5	Observed
Insects					
Vanessa atalanta	Red Admiral	---	---	S5	Observed

[1]Federal Species at risk Act, 2002. [2]Provincial Endangered Species Act, 2007. [3]Provincial Conservation Ranking (SRank) where S5 = Common and secure, S4 = common and apparently secure, B = breeding, N = non-breeding.

4.0 Evaluation of Natural Heritage Features within the Study Area

4.1 Fish Habitat

As identified in **Section 3.1**, the municipal drains within the Project Area have intermittent flow and are connected to larger, down stream watercourses they do have the potential to provide direct and contributing fish habitat.

4.2 Area of Natural and Scientific Interest

Based on the background review and existing conditions, no life science or earth science areas of natural and scientific interest exist within the Study Area.

4.3 Valleylands

Based on the background review and existing conditions, no ravines, riparian areas associated with sloped topography or floodplain areas meeting criteria for significant valleylands exist within the Study Area.

4.4 Woodlands

The woodlands that intersect the Study Area were assessed for significance based on the significant woodland definitions within the MNRF Natural Heritage Reference Manual (2010), as well as the Town of Tecumseh Official Plan (2021), the Essex Region Natural Heritage System Strategy (ERNHSS) (2013), and Town of Tecumseh Natural Heritage Inventory (NHI; 2011).

The ERNHSS (2013) states that Significant Woodland consists of "Treed features that are greater than 2 ha in size". Additional criteria for significance is provided within the 2011 Town of Tecumseh NHI. Ten criteria were provided by the Town of Tecumseh NHI (2011); if a feature meets any of criteria #1-5 then it is considered significant at the Province level. If features meet additional criteria #6-10 then they may also meet criteria for significance for the Town.

Four woodlands intersect the Study Area; an assessment of these features based on the criteria of the ERNHSS (2013) or the Town of Tecumseh NHI (2011) is provided in **Table 6** below and shown **Figure 4b.**

Table 6: Evaluation Summary of Significant Woodlands

Description			Evaluation Criteria										No. of Evaluation Criteria Fulfilled
			1	2	3	4	5	6	7	8	9	10	
Site	ELC	Total Area (ha)	Significant Wetland	SAR	Significant Woodland	SWH	Significant Valleyland	Ecological Function	Diversity	Significant Species	Significant Communities	Condition	
North (Woodland Site 1)	SWDM1-1	1.07	Unevaluated wetlands present	X	---	X	---	X	X	X	---	---	5
Central (Woodland Site 2, McAuliffe Park)	SWDM1 FODM1-2 THDM2-11	11.8	Unevaluated wetlands present	X	X	X	---	X	X	X	---	---	6
East (Woodland Site 3)	FOD	1.68	---	X	---	X	---	X	---	---	---	---	3
West (Woodland Site 4)	FOD	1.94	---	X	---	X	---	X	---	---	---	---	3

While potential habitat for SAR and Candidate SWH was identified in all four woodlands, additional focused field assessments would be required to confirm or rule out the presence of this habitat (See **Section 4.6**).

The woodlands to the north (Study Site 1) and associated within the McAuliffe Park (Study Site 2 and 3) were assessed previously as part of the Town of Tecumseh NHI (2011). As shown in Table 6 the the McAuliffe Park woodlands are considered significant by the Town and Province based on size, its composition as an unevaluated wetland as well as its capacity to provide potential SAR and candidate SWH. The other three woodlands do not meet criteria for significance due to their small size (< 2 ha).

4.5 Wetlands

Based on MNRF mapping, there are no mapped wetlands within the Study Area. However, within the Town of Tecumseh NHI (2011), two communities within the Study Area have been classified as Swamp using the ELC System for Southern Ontario (Lee *et al*., 1998). One is associated with McAuliffe Woods; which is partially classified as SWDM1 - Oak Mineral Deciduous Swamp. The other wetland located in the northern portion of the Project Area has been classified as SWDM1-1 - Swamp White Oak Mineral Deciduous Swamp (**Attachment A:** Figure 3). During the field surveys, two soil samples were taken within the SWDM1-1 community within the Project Area. Soil samples indicated heavy clay soil with imperfect drainage and moist soil. Mottling was present in the samples greater than 40 cm depth. Additionally, a large depression was present with standing water greater than 32 cm deep (**Attachment C**).

Neither of these areas appear to have been evaluated for significance by the province. Future assessments conducted in accordance with the Ontario Wetland Evaluation System (OWES), 2022 may be required to determine significance. The OWES (2022) scores wetlands using a points-based system. As per Section 6.3.1 of the NHRM (2010) and OWES (2022), a Provincially Significant Wetland (PSW) is an evaluated wetland that achieves a score of 600 or more points or achieves a score of 200 or more points in either biological components or special features components. As described in Section 6.3.1 of the NHRM (2010) and under OWES (MNRF, 2022), wetland units have the potential to meet criteria for significance if they provide potential biological, hydrological, and special feature components.

4.6 Wildlife and Wildlife Habitat

4.6.1 Significant Wildlife Habitat

Criteria for determining the significance of wildlife habitat follow the guidelines outlined in the NHRM (MNRF, 2010) and the Significant Wildlife Habitat Technical Guide Ecoregion 7E Criterion Schedules (MNRF, 2015), where applicable. Based on the observations, as well as the results of the

ELC, and feedback provided during the Class EA consultation process, the following Candidate and Confirmed SWH were observed (**Attachment A:** Figure 4a).

Seasonal Concentration Areas of Animals

Bat Maternity Colonies

While surveys for snag and cavity trees were not formally conducted within the Project Area, Candidate SWH for Bat Maternity Colonies have the potential to occur within the Deciduous Forest (FOD, FODM1-2) and Swamp (SWDM1, SWDM1-1) communities identified within the Study Area.

Reptile Hibernacula

While formal snake surveys were not conducted within the Project Area, candidate SWH for Reptile Hibernacula have the potential to occur within the Deciduous Forest (FOD, FODM1-2), Swamp (SWDM1, SWDM1-1), and Deciduous Thicket (THDM4-1, THDM2-11) communities within the Study Area. It should be noted that during the March 21, 2023 site visit, no snakes or apparent hibernacula were observed within the Project Area.

Specialized Habitat for Wildlife

Amphibian Breeding Habitat (Woodland/Wetlands)

Candidate SWH for Amphibian Breeding Habitat (Woodland/Wetlands) has the potential to occur within the Swamp (SWDM1, SWDM1-1) and Deciduous Forest (FOD, FODM1-2) communities identified within the Study Area.

Habitat for Species of Conservation Concern

Terrestrial Crayfish

The swamp communities (SWDM1, SWDM1-1) within the Study Area have the potential to contain Candidate SWH for Terrestrial Crayfish.

Special Concern and Rare Wildlife Species

Both Candidate and Confirmed SWH for Special Concern and Rare Wildlife Species exists within vegetation communities within the Study Area. The Deciduous Forest (FOD), Mixed Meadow (MEM) and Fencerow (TAGM5) communities contain Candidate SWH for Special Concern and Rare Wildlife Species. Pumpkin Ash (S2?), Climbing Prairie Rose (S3 and special concern), Missouri Ironweed (S3?), and Many-fruit Seedbox (S2S3) are SCC that have been previously documented within the SWDM1-1 and THDM4-1 communities within the Study Area (**Attachment E**). Similarly, Shellbark Hickory (S3), Shumard Oak (S3 and special concern), Climbing Prairie Rose (S3 and special concern), Upright Carrionflower (S3?), and Missouri Ironweed (S3?) have been documented in the THDM2-11, SWDM1, and FODM1-2 communities within the Study Area (**Attachment E**). Therefore, these communities contain confirmed SWH for Special Concern and Rare Wildlife Species.

4.6.2 Species at Risk

Although SAR were not observed during field assessments, natural features within the Study Area were assessed as potential SAR habitat based on background review and known species occurrences. Summaries of SAR observations and descriptions of suitable habitat for each of the aforementioned species are provided in the following subsections (**Attachment A:** Figure 4b).

SAR Birds

The Recovery Strategy for Bobolink (ECCC, 2022a) states that this species is associated with large, open, and expansive grasslands with dense groundcover; meadows, fallow fields and marshes. Similarly, the Recovery Strategy for Eastern Meadowlark (ECCC, 2022b) states that this species is found in open, grassy meadows, cultivated land a weedy area with trees. Therefore, there is potential for the Mixed Meadow (MEM) and Annual Row Crop (OAGM1) communities to provide habitat for Bobolink and Eastern Meadowlark, depending on the agricultural crop.

The Recovery Strategy for Wood Thrush (COSEWIC, 2012) states that this species is found in Carolinian forest zones, undisturbed moist mature deciduous or mixed forest with deciduous sapling growth, near ponds or swamps, and hardwood forest edges. Therefore, there is potential for the Swamp (SWDM1, SWDM1-1) and Deciduous Forest (FOD, FODM1-2) communities to support habitat for Wood Thrush.

The Recovery Strategy for Red-Headed Woodpecker states that this species is found in open, deciduous forests, wooded swamps, small woodlots, and forest edges, and requires cavity trees with at least 40cm diameter at breast height (DBH). Therefore, there is potential for the Swamp (SWDM1, SWDM1-1) and Deciduous Forest (FOD, FODM1-2) communities to support habitat for Red-headed Woodpecker.

SAR Bats

Eastern Small-footed Myotis, Little Brown Myotis, Northern Myotis, and Tri-colored Bat roost in a variety of habitats including in or under rocks, in rock outcrops, in buildings, under bridges, in caves, mines, or hollow trees, or under loose bark (Humphrey, 2017; Humphrey *et al*., 2019). Therefore, there is potential for SAR bat habitat within the FOD, FODM1-2, SWDM1, SWDM1-1, and TAGM 5 communities within the Study Area.

SAR Snakes

According to the Recovery Strategy for Eastern Foxsnake – Carolinian and Georgian Bay populations in Ontario (MNRF, 2010), Eastern Foxsnake prefer a variety of habitats, with a strong preference for hedgerows, marshes, naturalized pasture, open woodland areas and habitats near water. Eastern Foxsnake (Carolinian population) habitat is regulated per Section 9 of Ontario Regulation 832/21. Critical habitat is classified as nesting and hibernacula. Nest sites include rotting cavities of downed

trees, decaying vegetation piles, rodent burrows and hay piles. From late-October until April the species hibernates in burrows, limestone bedrock fissures, canals, and old building foundations.

The Recovery Strategy for Butler's Gartersnake in Ontario (MECP, 2019) states that Butler's Gartersnake prefer a variety of habitats, with a strong preference for open, moist habitats such as grasslands with dense cover, old fields, and small marshes and bodies of water. Critical habitat is classified as locations for live birthing and hibernacula. Sites for live birthing include tallgrass prairie communities, grasslands, cultural meadows, thicket, old fields, or deciduous swamps that contain wet areas. From mid-September until early April the species hibernates in burrows or dens, log piles, drains, dogwood bushes, or rocky outcrops.

Although specific surveys to identify hibernacula habitat for Eastern Foxsnake and Butler's Gartersnake were not included as part of the field assessment, hibernacula habitat has the potential to occur within the Study Area. No features with the potential to support hibernacula habitat were incidentally observed within the Study Area during field investigations.

Based on the aforementioned habitat descriptions, the Swamp (SWDM1, SWDM1-1), Fencerows (TAGM5), Mixed Meadow (MEM), and Deciduous Thicket (THDM4-1, THDM2-11) are identified as potential Butler's Gartersnake habitat within the Study Area. Similarly, the Swamp (SWDM1, SWDM1-1), Fencerows (TAGM5), Deciduous Thicket (THDM4-1, THDM2-11), Mixed Meadow (MEM), and Deciduous Forest (FOD, FODM1-2) are identified as potential Eastern Foxsnake habitat within the Study Area.

Given that Eastern Foxsnake have Regulated habitat protection under the *ESA*, in the event the Project has the potential to impact Eastern Foxsnake habitat, the MECP will be consulted to determine whether a permit under the *ESA* is required.

SAR Vegetation

Although specific surveys for SAR vegetation were not conducted and considering the time of year that the field investigation was completed (i.e., not fully within the growing season) potential habitat for SAR vegetation exists within several communities within the Study Area.

The recovery strategy for Eastern Flowering Dogwood (Bickerton and Thompson-Black, 2010), states that this species is found within mid-age to mature deciduous and mixed forests, and is also found on floodplains, along roadsides and fencerows (Bickerton and Thompson-Black, 2010). Therefore, the fencerow (TAGM5), Deciduous Forest (FOD, FODM1-2), and Swamp (SWDM1 and SWDM1-1) communities within the Study Area have the potential to support habitat for Eastern Flowering Dogwood.

The Recovery Strategy for the Butternut (Poisson and Ursic, 2013) states that this species can be found along edges and open areas of deciduous forest and along streams (Poisson and Ursic, 2013). Therefore, the fencerow (TAGM5), Deciduous Forest (FOD, FODM1-2), and Swamp (SWDM1 and SWDM1-1) communities within the Study Area have the potential to support habitat for Butternut.

The Recovery Strategy for Willowleaf Aster states that this species is found in open areas within oak savannahs, along railways, roadsides and in abandoned fields (Jones, 2013). Therefore, habitat for Willowleaf Aster has the potential to be present within the fencerow (TAGM5), Deciduous Thicket (THDM2-11, THDM4-1), Deciduous Forest (FOD, FODM1-2), Mixed Meadow (MEM) and Swamp (SWDM1, SWDM1-1) communities within the Study Area.

The Recovery Strategy for Eastern Prairie Fringed-orchid (Eastern Prairie Fringed-orchid Recovery Team, 2010) states that this species grows in wetlands, fens, swamps and tallgrass prairie vegetation communities. Therefore, the Swamp (SWDM1 and SWDM1-1), Deciduous Thicket (THDM2-11, THDM4-1), and Mixed Meadow (MEM) communities within the Study Area have the potential to support habitat for Eastern Prairie Fringed-orchid.

The Recovery Strategy for Purple Twayblade (ECCC, 2018) states that this species is found in habitats including open oak woodlands, shrub thickets, and deciduous swamps. This species has been documented to be present within McAuliffe woods in the Study Area (ECCC, 2018). The McAuliffe woods includes Deciduous Thicket (THDM2-11), Deciduous Forest (FODM1-2), and Deciduous Swamp (SWDM1). Further, the other Deciduous Swamp (SWDM1-1), Deciduous Forest (FOD), and Deciduous Thicket (THDM4-1) communities within the Study area also have the potential to support habitat for Purple Twayblade.

After considering the proposed development plan (**Attachment A:** Figure 5) certain ELC communities, and possible associated SWH and/or SAR habitat is anticipated to be impacted (**Attachment A:** Figure 6).

5.0 Proposed Land Use Plan

As outlined in **Attachment A**- Figure 5, future land use within the Study Area will be primarily residential, with low, medium and high density residential positioned throughout the Project Area. Main street and commercial areas are positioned along Maisonneuve Street; additional commercial and institutional areas are identified in this vicinity, as well as farther south within the Project Area. The north and south sections of the Project Area are separated by a segment of Hydro Corridor. Stormwater management (SWM) facilities (dry and wet ponds) are proposed along the north, middle, and east end of the Project Area. The Gouin Drain, Lachance Drain and Dejardins Drain are proposed for removal to support the SWM facility construction. Park land areas are identified in lands associated with the McAuliffe Park, institutional areas and SWM facilities throughout the land use plan.

5.1 Anticipated Impacts to Natural Heritage Features

The removal of vegetation within the Project Area is minimal, as the majority of the Study Area consists of agricultural lands (OAGM1; **Attachment A** - Figure 6). To this effect, impacts to vegetation required in support of the proposed development are generally limited to the non-significant woodlands and riparian vegetation associated with municipal drains within the Study Area.

The Significant Woodlands and unevaluated wetlands associated with the McAuliffe Park are to be retained in the proposed development. While direct impacts to the Significant Woodlands are not anticipated, a municipal road is proposed to overlap with the western buffer applied to the dripline (**Attachment A** – Figure 6). Detailed studies in the area of the McAuliffe Park should occur to delineate the woodland dripline; the grading and constructions limits should be reviewed in the buffer area adjacent the to the woodland dripline should be reviewed by an ISA certified Arborist at the time of site preparation to mitigate potential impacts to root zones of individual trees. The installation of erosion sediment control (ESC) fencing should be applied in the buffer areas as well to reduce erosion and sedimentation impacts to the unevaluated wetland. Compensation and restoration for the area of overlap of the proposed road alignment with the Significant Woodland buffer should occur and be carried out by the Town at a 1:1 compensation ratio in lands adjacent to the retained woodland in other areas of the park. Compensation should consist of naturalized plantings of native species detailed in a landscaping plan.

On the other hand, the non-significant woodlands and unevaluated wetlands located in the northern portion of the Project Area will be removed and replaced as part of the proposed natural heritage system (NHS) in the northern section of the Project Area (**Attachment A** – Figure 6). Detailed studies to further delineate the feature in order to appropriately provide compensation at a 1:1 ratio would be required by individual land owners. Planting plans composed of native

naturalized plantings that replace the wetland habitat should be submitted to support this work for approval by the Town. Additional studies and mitigation to maintain the hydrologic function of the unevaluated wetland within the general area may also be required to support the removal of the feature.

Additional non-significant woodlands located in the east and west of the Study Area are identified for removal to support low-density residential and institutional areas. Furthermore, riparian habitat of municipal drains may be identified for removal during site preparation activities or to support the construction of SWM facilities (i.e. Desjardin Drain, Lachance Drain and Gouinn Drain). Detailed studies of individual land owners should be conducted to further assess the impacts to the features (i.e, tree inventory, wildlife surveys) in accordance with relevant municipal tree by-laws and to confirm or rule out potential SAR or SWH. Additional permitting and consultation with the MECP may be required prior to the removal of SAR habitat in accordance with the Endangered Species Act (2007). Vegetation removals with the potential to provide wildlife habitat should also adhere to appropriate timing windows to avoid potential impacts during the breeding bird (April – August) and active bat season (May – October)

Additional mitigation identified to support and protect the Town's Natural Heritage System (NHS) are discussed in the succeeding sections.

6.0 Natural Heritage System

The Town of Tecumseh Official Plan (OP; 2021) currently indicates that the NHS designation comprises of three categories (i.e., Natural Environment, Natural Environment Overlay, and Restoration Opportunities Overlay; Schedule C, Natural Heritage System). As per Section 4.9 of the Town's OP, features under the Natural Environment designation meet criteria for significance, requiring priority for protection. The Natural Environment Overlay and Restoration Opportunities Overlay are intended to identify secondary priority features and potential restoration lands in order to provide linkage opportunities in the landscape. The aforementioned woodlands and unevaluated wetlands identified in the 2023 Natural Environment Existing Conditions Report are currently designated under the Town's Natural Environment Overlay within the Town's NHS.

Following this, Section 4.9 of the Town's OP states "*the NHS contains potential linkages and corridors as well as expansions to the core existing natural heritage features. It reinforces the protection, restoration and enhancement of identified natural heritage features, and promotes the overall diversity and interconnectivity of natural heritage features, functions and areas (2021)*." In coordination of this statement, Goal vii of the Town's OP is "*to support the creation of new or expanded linkages between natural heritage features, where feasible. Corridors that link isolated natural heritage features or enhance existing linkages improve or enhance the ecological functions of designated natural heritage features and strengthen the overall NHS.*" At the greater landscape level, the Town's NHS for the Study Area should be contiguous with the NHS for the neighbouring Sandwich South Master Servicing Plan (2023). This is supported by the Town's OP through Policy xiv (a), which indicates the Town may "*cooperate in identifying and protecting inter-municipal natural connections regarding multi-purpose (recreational/utility/natural) connections and linkages which cross municipal boundaries*." While isolated natural heritage features are identified within the Study Area by the Town's OP in Schedule C, connections between these features are not mapped and linkages to the NHS of the City of Windsor are not shown.

To improve and maintain corridor widths of local linkages within the upper Little River watershed, and to support an NHS within the Study Area in accordance with the Town's OP (2021), alignment with the City of Windsor's Integrated Environmental and Stormwater Management (SWM)/Open Space System is recommended to extend within the Tecumseh Hamlet Study Area. This integrated system aligns with the Upper Little River Watershed and Stormwater Management Study, Sandwich South Master Servicing Plan (2023), policies for the Greenway System of the City of Windsor Official Plan (Section 6; 2013), and the County Road 42 Secondary Plan. The Greenway System has been noted by the City as a "*planning framework which recognizes that natural heritage features and their associated landscapes need to be considered in a holistic manner in order to provide a comprehensive and integrated approach for conservation and enhancement.*" The Greenway System currently identified within the Country Road 42 Secondary Plan policies is comprised of a combination of Core Areas consistent with an NHS (i.e. woodlands, wetlands, valleylands, fish

habitat, species at risk and significant wildlife habitat), as well as SWM infrastructure. As per Section 8.4.2.2.2, ecological linkages within the Greenway System are to be a minimum of 30 m wide. The 30 m width is considered the minimum distance to maintain appropriate connections for wildlife movement (i.e. a "Local Linkage"). The width of the linkages identified in the County Road 42 Secondary Plan, permitted the inclusion of SWM infrastructure as Non-Core Natural Heritage Areas as per Section 8.4.2.2.3. Infrastructure included under the Non-Core Natural Heritage designation is not considered wildlife habitat as it is man-made; however, natural vegetation utilised in designs for these areas are considered a supplemental to adjacent natural heritage features and provide cover supportive of wildlife movement.

6.1 Assigned Designations

As mentioned previously, natural features identified and discussed in this report currently are classified under the natural environment overlay designation in Schedule C of the Town's OP. Based on the existing conditions discussed within this report, the following adjustments to the Town's NHS are proposed in order to protect natural heritage features in accordance with their significance, and to improve linkages within and outside the municipality.

6.1.1 Natural Environment Designation

It is recommended that the McAuliffe Woods be included within the Natural Environment designation under the Town's OP (Schedule C) for priority protection. The upgrade to this designation is proposed as this feature meets criteria for significance by the Province, County and Town (discussed previously under **Section 4.4**).

6.1.2 Natural Environment Overlay Designation

It is recommended that the remaining three woodlands identified within the Study Area remain under the natural environment overlay designation in Schedule C of the Town's OP as these features did not meet criteria for significance by the Town, County or Province.

6.1.3 Restoration Opportunities Overlay

Currently, no areas within the Study Area are mapped under the Restoration Opportunities Overlay. To support wildlife movement within the Study Area and between municipalities it is recommended that the NHS identify naturalized infrastructure within the landscape under the Restoration Opportunities Overlay designation to provide a minimum corridor width (30 m). The proposed adjustment to the Town's NHS will provide a continuation of linkages identified in the City of Windsor's Greenway System and Integrated Environmental and Stormwater Management (SWM)/Open Space System of Sandwich South. The adjustments are also intended to replace the linkage function of select municipal drains anticipated to be removed in support of the proposed land use plan for the Study Area.

Gouin Drain/Robinet Drain

Section of Gouin and Robinet Drains, east of Banwell Road, are to be replaced with a dry SWM pond along the south boundary of the County Road 22 right-of-way. The proposed dry pond will be at 90 m in width and will consist of a depressed stormwater detention area, paths and naturalised vegetation. Despite the naturalised plantings and parkland proposed in the area, linkages to the west are not recommended as connections no longer exist outside of the Study Area. While previous connections were identified to the west in the City of Windsor, development occurring on adjacent parcels have since been adjusted to include industrial land uses (i.e. battery plant).

Lachance Drain

Lachance Drain is to be removed east of Banwell Road and will be replaced with a wet SWM pond along the CN Rail line. The proposed pond will be at greater than 30 m wide (approximately 65 m wide) and will consist of naturalised vegetation in the active storage areas. This feature will provide a linkage to the existing hydro corridor to the south. The CN Rail line is located between the LaChance Drain and hydro utilities corridor. The CN Rail right of way is 30 m wide however the elevated rail area is approximately +/- 15 m (horizontal width). While a break exists due to this infrastructure, the CN Rail does not provide a wall to wildlife movement; indirect connections shall be provided via a steppingstone approach to northern lands within the Study Area (Table 3-3; Natural Heritage Reference Manual, 2015).

It is recommended that the proposed Restoration Opportunities Overlay cover the proposed SWM pond area to identify this linkage in the land use plan for the Study Area. The linkage connection would be shown by an arrow on the updated Schedule C.

Desjardin Drain

The Desjardin Drain is to be removed and replaced with a storm water management (SWM) pond along the path of the existing drain which will outlet to the McAuliffe Wood swamp communities to maintain wet conditions for these features. To replace the drain and to maintain surface flow within the area, a swale is being proposed to be constructed along the western edge of McAuliffe Woods; the swales alignment will extend up to the northern hydro corridor. The proposed linkage provided by the hydro utility corridor, replaced swale, and McAuliffe Woods are to be at least 30 m in width (corridor width is approximately 110 meters) and will consist of naturalised vegetation and riparian areas supporting terrestrial and aquatic wildlife movement. We recommend the Town include utilities corridors as Restoration Opportunities Overlay in their proposed NHS for the Study Area's land use plan; the linkage connection would be shown by an arrow on the updated Schedule C.

7.0 Implementation and Management

Future studies will be required at the draft plan or site plan stage within and outside of the presented Environmental System and SWM /Open Space System in order to refine the boundaries of natural heritage features. As mentioned above, the limits to natural heritage features presented in this report are considered preliminary based on available background information and recent site visits. Additional studies may be required in order to identify additional SWH and SAR habitat, as well as to formally stake the limits of woodlands, wetlands, and the top of bank of watercourses with regulatory agencies.

In accordance with policies of the Town's OP, the following mitigation are identified to further protect natural heritage features identified within the Town's NHS (Schedule C).

7.1 Buffers

In addition to the proposed local linkages, buffers from natural heritage features are recommended in accordance with Section 4.9.3 of the Towns OP (2021). While specific buffer widths are not identified in the OP, policies indicate that a net gain should be achieved and that features be protected. For the purposes of establishing an NHS the following buffers listed in **Table 7** are proposed to protect the existing natural heritage features associated with Core Natural Heritage Areas within the Study Area.

Table 7: Buffers proposed for Natural Heritage Features within the Study Area

Natural Heritage Feature	Approximate Location[1]	Recommended Buffer Width	Limit of Feature
Significant Woodlands	McAuliffe Woods (SWDM1 and FODM1-2)	10 m	Staked Dripline
Unevaluated Wetlands	McAuliffe Woods (SWDM1)	15 m	Extent of wetland vegetation as defined by the Ontario Wetland Evaluation System (OWES) criteria
	North/County Road 22 (SWDM1-1)		

*1.Ecological Land Classification codes for vegetation communities identified in **Attachment A**, Figure 3*

It is noted that the McAuliffe Woods are considered both an unevaluated wetland and a Significant Woodland because of the dominant swamp community and therefore the greater of the two proposed buffers (15 m) would apply to the dripline.

The limits of these features should be reviewed and approved on site as part of formal staking exercises conducted in partnership with the City and if requested, the help of ERCA staff (i.e. of woodland dripline or extend of wetland vegetation). Buffer widths may be refined further as a result of additional studies produced during the Detailed Design process or subsequent Planning Act approvals through consultation and approval with relevant agency contacts. Buffers are to be

planted with native species to provide long-term protection to the Natural Environment and Natural Environment Overlay designation areas. Temporary encroachments to accommodate grading may occur within the buffer during the construction phases; in addition, passive uses (SWM infrastructure and trails) may be permitted as well, pending no potential impacts to the Natural Environment and Natural Environment Overlay designation areas may occur.

In addition, is recommended that the north-south local 20 m road allowance running along the west boundary of the McAuliffe Park be maintained. The road cross section is recommended to be altered to maximize separation from the tree line. It is proposed that upon development, a 10 m road cross section that shifts the road to the west ROW limit but also integrates with future drainage required between the road and McAuliffe Park. The remaining 10 m of right of way would be used for lighting, pathways, drainage swale and landscaping to promote the buffer to the wooded area.

7.2 Drains

The drains within the Study Area provide fish habitat and aquatic ecological linkages. Realignment or redevelopment of select drains within the Study Area should maintain the existing form and function to protect this fish habitat. Realignment and redevelopment also provides an opportunity to enhance the drains through restoration plantings using native species to provide riparian and suitable in-stream habitat as long as these plantings do not impede the drains function under the *Drainage Act*. Where applicable, species-specific habitat enhancements should be considered (i.e., creating live birthing areas for SAR snakes when in potential/confirmed habitat). With realignment, expansion, and creation work occurring in multiple drains, proper mitigation and controls for the management of Common Reed are recommended in order to prevent further spread.

Construction/re-alignment of the drains should take place when water levels are at their lowest and studies should be completed to determine potential impacts to fish habitat. In warm water aquatic habitats, the appropriate timing window for in-water work in southern Ontario is July 15 – March 14th. The *Fisheries Act* prohibits projects causing serious harm to fish unless authorized by the DFO. This applies to work being conducted in or near waterbodies that support fish that are part of, or that support, a commercial, recreational or Aboriginal (CRA) fishery. Since November 25, 2013, proponents must take the responsibility to ensure their projects meet the DFO requirements under the Self-Assessment process, or if serious harm cannot be avoided, contact DFO for a formal review or approval under the *Fisheries Act*.

7.3 Hydrogeology

Groundwater management in the Study Area should focus on maintaining current infiltration and recharge levels. In locations where development will occur in proximity to the NHS boundary, the total impervious area and subsequent decrease in infiltration should be addressed using best management practices to minimize the loss of infiltration area. This will, in turn, minimize the impact to the groundwater system and limit changed to the groundwater dependent features.

7.4 Permitted Activities within the NHS

7.4.1 Trails

A system of authorized recreational trails may be located within the corridors associated with the Natural Environment Overlay and Restoration Opportunities overlays of the Town's NHS. Pathways used for maintenance within the Restoration Opportunities Overlay may also be used for public access to limit the overall disturbance area. Where feasible, trails may also be located within the buffers of features mapped under the Natural Environment designation of the NHS. Positioning trails within the buffers and outside the Natural Environment designation will minimize the disturbance to the NHS. A designated trail system associated with the NHS located within close proximity will be the best strategy to discourage informal trail creation (i.e. trail blazing). Additionally, a system of signage educating residents and other users of the natural values of the surround lands should also be implemented.

This trail system should be determined in the field to ensure that important features or species are avoided.

The future locations of the trail system will require special consideration and evaluation in planning the location should consider the following:

- Trails should cross the NHS with existing and proposed road crossings;
- Trails should be located a distance from the natural heritage feature (i.e. "a no-touch zone" to be determined based on key features significance) while balancing the setback requirement from residential buildings;
- The integration of native plants should be used during the development of the trails, to screen features from the trail system;
- Trails should be developed to minimize stream corridor crossings;
- Low impact trails should be utilized as much as possible (mulch, crushed stone);
- If lighting is required it should be implemented in way that minimize light into the Environmental System;
- Limit the requirement for winter maintenance within the NHS to minimize disturbance; and
- Avoid trail crossings within Natural Environment designation of the NHS (particularly unevaluated wetlands, and Significant Woodlands).

7.4.2 Road Crossings

Should the need for improvements to existing roadways or development of new/additional roadways for servicing within the Study Area be required crossings through the NHS should be improved/made to accommodate the passage of wildlife. In doing so, this would mitigate two main potential impacts caused by roadways bisecting natural areas by reducing the number of wildlife-vehicular collisions and reducing fragmentation of the proposed Environmental System being

established. The MNRF's *Best Management Practices for Mitigating the Effects of Roads on Amphibian and Reptile Species at Risk in Ontario* (MNRF, 2016b) and *Fish and Wildlife Crossing Guidelines* (Credit Valley Conservation, 2017) provides recommendations based on the most recent scientific research. Consultations regarding potential road crossings should be held with MNRF, MECP, municipalities and ERCA, where applicable.

Potential crossing structures will ideally be designed to maximize species usage and maintain or improve the connective of the habitat for a variety of wildlife groupings; the largest grouping being mid-sized mammals (skunks, raccoons, etc.). As such, the following recommendations would satisfy the requirements associated with the wildlife groupings relevant to the Environmental System, up to mid-sized mammals:

- Openness ratio of $\geq$ 0.4 m;
- Crossing structure width and height $\geq$ 1m; and
- It is necessary to incorporate dry passage for mid-size mammals and small mammals 0.5-0.7 m in width (preferably 1 m) on either side of the water course.

The openness ratio is a measure of permeability of the crossing structure to wildlife and an important factor to consider when implementing wildlife crossings. It is calculated as the cross sectional area of the structure entrance divided by its length.

Other considerations such as substrate within the structure, fencing to guide the animals, and design of the approach to the structure are details that can be discussed at the detailed design stage. However, the width and height of the structure should be designed around the watercourse and the required dry passage within the structure.

In accounting for road crossings through natural areas, the following should be considered:

- Road alignments through the natural environment designation should be minimized to avoid fragmentation and limit wildlife-vehicle collisions;
- Wildlife crossing signs should be installed where applicable to warn motorists;
- Road alignments through linkages should avoid wetland features, stream crossings or significant natural areas;
- Plantings should be used to direct wildlife intending to cross the roadway to wildlife crossings;
- Dimensions of wildlife crossings should reflect the wildlife using the specific crossing, discussed above; and
- Aim to minimize the width of the roadway that passes through natural features through alternative road design or reducing the right-of-way.

7.4.3 Stormwater Management Infrastructure

Three linear SWM facilities are proposed within the Study Area to support residential, institutional, industrial and commercial development. The proposed SWM facilities have been aligned to replace

the location of municipal drains within the Study Area and provide connections to natural heritage features while included under the Restoration Opportunities Overlay of the NHS.

As mentioned above, the design of the SWM infrastructure into linkages for wildlife movement as well as recreational trails. Therefore, SWM infrastructure are proposed to be located adjacent to/in replacement of municipal drains provided that they are designed in a way that will improve habitat and not degrade existing conditions. A buffer is recommended between existing Natural Environment designated areas and proposed SMW facilities located within the NHS. While buffers are recommended in **Table 7**. In addition, grading of the SWM infrastructure should be designed to direct wildlife into the SWM corridors and away from roads to enhance driver and wildlife safety. Grading should also be design to avoid corridors, wildlife crossings and eco-passages from becoming 'prey funnels" for predators. The proposed SWM ponds are to be constructed on the landscape via a phased approach to follow the construction of developable areas based on the established land use plan.

7.4.3.1 Windsor Airport Considerations

The Tecumseh Hamlet located east of the Windsor International Airport (YQG). Due to the proximity of the airport to the study area SWM ponds should be designed to discourage use by waterfowl to reduce the likelihood of bird strikes. There are a number of criteria that should be considered in the design and implementation of the ponds and vegetated areas.

It is understood that SWM ponds, especially those that have permanent pools of standing water have the potential to attract waterfowl and are identified as hazardous when in the vicinity of airports per Transportation Canada Aviation guidelines such as the Canadian Aviation Regulations (CARs). The Windsor International Airport is located east of the Study Area and therefore precautionary and active management of waterfowl is required to mitigate risks of collisions that pose hazard to human health and safety.

The proposed stormwater management ponds are located outside the Zone of Monitoring (4 km radius form airport centre) and therefore those facilities are mandated to be monitored regularly by airport staff however as a best practice it is recommended that all stormwater management and other natural heritage features meet or be designed to mitigate waterfowl habitat. The Supplementary Waterfowl Adaptive Mitigation Plan for Stormwater Management Facilities memo prepared for the Sandwich South Master Servicing Plan, City of Windsor (May 17, 2023) has more information on the types of restoration that is suitable in this instance.

7.4.3.2 Fish Habitat

As the existing drain infrastructure provides direct and contributing habitat for fish species, SWM best practices should be employed that include measures to mitigate increases in water temperatures, maintaining base flows in receiving streams, reducing the amount of suspended

solids and nutrients within the water column and isolating pollutants (e.g., petro carbons and pesticides) for further treatment or removal.

7.4.4 Grading within the Natural Heritage System

Grading activities within the NHS should be kept to a minimum but may be permitted under the following or similar situations:

- Reconfiguration/removal of municipal drains;
- Construction of SWM corridors and ponds;
- Undertaking of restoration activities; and
- Roads, sidewalks and associated development that cross through Natural Environment and Natural Environment Overlay designated areas and associated buffers.

The impact and extent of grading activities should be further studied as a part of future development studies to demonstrate that there will be no negative impacts to the NHS. Where grading is required within or adjacent to the Environmental System, the following recommendations are provided:

- Grading must not negatively impact existing natural features or functions identified in the Town's NHS;
- Grading within or adjacent to natural areas should avoided;
- Erosion control measures should be recommended and implemented at the design stage; and
- Grading slopes should be stabilized with increased topsoil and seeded immediately after grading (at a minimum).

7.4.5 Interpretive Signage

It is anticipated that, along with future development within the Study Area, anthropogenic land use adjacent to and within the Town's NHS will increase. It is recommended that signage be implemented at strategic locations to educate residents on the natural features and emphasize the sustainable use of NHS lands, as well as identify potential SAR. The signs should be installed within the buffers of the Natural Environment designated areas that will result in low impact to the natural features.

7.4.6 Opportunities for Restoration

Areas of restoration and enhancement exist within the Natural Environment Designation area of the Study Area and ecological linkages. Specifically, it is noted that a road is anticipated to be aligned within the western buffer of the Significant Woodland and unevaluated wetland habitat of the McAuliffe Park. While the road alignment would not directly impact the Significant Woodland habitat, the area of overlap of the road footprint within the buffer provides an opportunity to provide compensation or restoration work elsewhere within the park in order to increase the area of naturalized plantings within the Woodland. The area for restoration work proposed to

accommodate the overlap of the road within the buffer should generally meet a compensation ratio of 1:1. A net benefit to the NHS would be considered for the proposed restoration work if a planting plan included naturalized plantings with native species that improved interior woodland habitat or provided additional edge management protection to the feature to increase its ecological function as a whole.

A landscape and planting plan for restoration areas should be designed through consultation with the Town and ERCA. Topsoil within a development area should be preserved for future onsite or offsite landscape applications.

Additionally, utility infrastructure identified as linkages through the Restoration Opportunities Overlay should permit the growth of maintained naturalized vegetation in order to encourage wildlife movement. While mowing may be required as part of regular maintenance of the infrastructure, outside of these periods it is encouraged that vegetation be left to grow naturally.

7.4.7 Buffer Restoration

The integration of Buffer Planting Plans and fencing within buffer areas increases the ecological function of the buffer by:

- Providing a physical barrier to deter anthropogenic access and activities that can result in impacts;
- Protecting the root zone;
- Providing additional areas for habitat use and enhancement of habitats;
- Manage water flows and attenuation;
- Providing early establishment of vegetation and, therefore, habitat opportunities for some species;
- Planning and management of the vegetation community succession with the buffer;
- Greater control and prevention of the establishment of invasive plant species; and
- Social and aesthetic value.

Natural regeneration in buffers should be managed to remove invasive species to ensure that species composition in these areas are not negatively impacting the adjacent key features. Additionally, the fencing will deter trail users from entering into the Town's NHS. Long-term monitoring of restoration and management of buffers should be applied.

7.5 Lands Outside of the Environmental System Boundaries

For the Study Area lands outside the Town's NHS, relevant legislation should be consulted (i.e. Municipal tree by-laws). Landowners will be required to complete detailed studies at future land development and Planning Act approval stages which demonstrate adequate studies were completed with respect to Candidate SWH, SAR and potential SAR habitat. When appropriate, the

Town's Natural Areas team should be given a chance to comment on pre-submission applications, as well as on subsequent monitoring reports. It should be noted that additional species may become provincially or federally listed subsequent to the release of this report. Due diligence should be taken in consulting the SAR listings at the time of land development to ensure studies conducted reflect the most current species. It is also noted that while potential SAR and SWH habitat was identified as a result of the field studies that additional targeted studies should be performed at the Detailed Design stage to confirm presence or absence. Additional mitigation and/or compensation may be required for individual properties within the Study Area where development is proposed within confirmed SWH or SAR habitat.

8.0 Monitoring

It is recommended that the following parameters be monitored pre-development, during construction and post-construction. A minimum of 1 year pre-development monitoring is required to establish existing conditions. Depending on timing, this condition may be addressed via work completed as part of this Natural Heritage Characterization Report (field work completed in 2022 but may require updating (i.e., where time elapsed is greater than 5 years). It is anticipated that monitoring is to occur on an every other year cycle for the duration of construction (to 80% build out) or for 10 years, whichever is longer). It is recommended that post-construction monitoring occur for an additional 3 years following the completion of construction activities. Details of the monitoring requirements and schedule are to be determined during the draft plan stage for specific properties within the Study Area. The maintenance period monitoring shall be the responsibility of the developer and/or proponent of the proposed works. A clear plan and allocation of resources both from the developer and municipal site shall be defined at the pre-planning stages of the project.

8.1 Terrestrial

The focus of the monitoring plan is to detect potential changes in habitats, plants and wildlife species compositions based on wildlife and vegetation surveys. Acknowledging a natural system is dynamic, and will vary, naturally, from year to year the monitoring program will seek to document a range of changes in the system; including:

- Existing natural habitat maintenance:
  - Mature woodlands;
  - Wetland communities; and
  - Wildlife populations.
- Successional changes in habitat composition; and
- The success of restoration and enhancement activities.

Monitoring will focus on factors that can be readily monitored, are documented to be sensitive to change, and have standardized monitoring methodologies.

8.1.1 Vegetation

Vegetation communities of the Natural Environment Designation and buffers should be monitored for vegetation compositions and boundaries. This monitoring data will be useful in detecting change resulting from natural succession, maintenance, restoration and enhancement activities, and impacts of development activities. The ELC system is a standardized vegetation classification system for monitoring vegetation community composition and boundary. This approach to mapping the

extent of the vegetation communities can be completed through either field surveys and/or aerial photography.

8.1.2 Wildlife

Wildlife monitoring is recommended to be conducted concurrently with vegetation monitoring activities. The recommended wildlife monitoring consists of breeding bird surveys and amphibian call surveys within the retained Natural Environment Designation. These two wildlife groups are fairly readily monitored and sensitive to changes in habitat. The following standard monitoring protocols can be used to track changes in species overtime:

- The Ontario Breeding Bird Atlas protocols should be used to monitor breeding birds at strategic locations in the Study Area.
- The Marsh Monitoring Protocol provides a standard for conducting early spring call surveys at strategic wetland areas.

In addition, road mortality and wildlife monitoring with motion cameras for new wildlife road crossings and habitat structures throughout the Town's NHS are recommended to ensure their successful use post-construction.

8.1.3 Biodiversity

Fish communities are recommended to be monitored for biodiversity purposes. Species richness and evenness should be incorporated into the measure of biodiversity.

8.2 Restoration and Enhancement Area Monitoring

Monitoring techniques will require adaptation based on the feature being restored or enhanced. It should be noted that additional monitoring may be required as part of permitting. A degree of regeneration within the buffers and NHS will occur naturally. Natural regeneration and active restoration/enhancement activities should be monitored to determine changes in vegetation community boundaries, vegetation cover and species compositions. This monitoring will assist in determine the success of these activities and provide recommendations for future restoration practices.

9.0 Summary

The Study Area contains 13 ELC communities; seven natural and six cultural. The Study Area does not contain any provincial parks, or Areas of Natural and Scientific Interest (ANSI), Life Science, or Earth Science. However, natural heritage features associated with the McAuliffe Park were considered Significant Woodlands, and unevaluated wetlands. Additional unevaluated wetlands were identified farther north within the Study Area. These features as well as other woodlands were assessed as potential SAR habitat and candidate SWH. Seven municipal drains with Class F designation intersect the Project Area. These drains have intermittent flow regimes and no sensitive species present. Background review and field study did not indicate any aquatic SAR with the potential to be found within the Project Area. Fifteen terrestrial SAR have the potential to occur within the Project Area and Study Area, as well as Confirmed and Candidate Significant Wildlife Habitat.

Attachment A

Figures

TECUMSEH HAMLET

NATURAL ENVIRONMENT EXISTING CONDITIONS

PROJECT LOCATION

FIGURE 1

- Project Area (193.14 ha)
- Study Area (120 m buffer)
- Municipal Drain
- Railway
- Assessment Boundary

SCALE 1:13,000

0 150 300 600 METRES

N W E S

MAP DRAWING INFORMATION:
DATA PROVIDED BY Dillon Consulting

MAP CREATED BY: JL/SCM
MAP CHECKED BY: LMH
MAP PROJECTION: NAD 1983 CSRS UTM Zone 17N

DILLON CONSULTING

PROJECT: 23-5735
STATUS: DRAFT
DATE: 2024-05-15

FILE LOCATION: K:\2023\235735\Product\Client\Natural Environment Existing Conditions\Natural Environment Existing Condtions_20240514.aprx

TECUMSEH HAMLET

NATURAL ENVIRONMENT EXISTING CONDITIONS

NATURAL HERITAGE FEATURES

FIGURE 2

- Project Area (193.14 ha)
- Study Area (120 m buffer)
- Municipal Drain
- Railway
- Assessment Boundary

County of Essex Official Plan

- Natural Environment Overlay

ERCA

- Limit of Regulated Area

Town of Tecumseh Official Plan

- Business Park
- Community Facility
- Future Development
- General Commercial
- Hydro Right-of-Way
- Recreational
- Residential

SCALE 1:13,000

0 145 290 580 METRES

N W E S

MAP DRAWING INFORMATION:
DATA PROVIDED BY Dillon Consulting

MAP CREATED BY: JL/SCM
MAP CHECKED BY: LMH
MAP PROJECTION: NAD 1983 CSRS UTM Zone 17N

DILLON CONSULTING

PROJECT: 23-5735
STATUS: DRAFT
DATE: 2024-05-15

FILE LOCATION: K:\2023\235735\Product\Client\Natural Environment Existing Conditions\Natural Environment Existing Condtions_20240514.aprx

TECUMSEH HAMLET

NATURAL ENVIRONMENT EXISTING CONDITIONS

SURVEY LOCATIONS AND ECOLOGICAL LAND CLASSIFICATION

FIGURE 3

- Aquatic Assessment Location
- Project Area (193.14 ha)
- Municipal Drain
- OHN Watercourse Selected
- ORN_Segment_With_Address
- Railway
- Study Area (120 m buffer)
- Assessment Boundary

Ecological Land Classification

- 1. OAGM1 - Annual Row Crops (212.97 ha)
- 2. TAGM5 - Fencerow (12.99 ha)
- 3. CVR - Residential (35.44 ha)
- 4. CVC - Commercial and Institutional (32.32 ha)
- 5. FOD - Deciduous Forest (3.91 ha)
- 6. FODM1-2 - Red Oak Deciduous Forest (0.26 ha)
- 7. SWDM1 - Oak Mineral Deciduous Swamp (3.92 ha)
- 8. SWDM1-1 Swamp White Oak Mineral Deciduous Swamp (1.15 ha)
- 9. THDM2-11 - Hawthorn Deciduous Shrub Thicket (2.66 ha)
- 10. THDM4-1 - Native Deciduous Regeneration Thicket (2.36 ha)
- 11. ME - Meadow (2.61 ha)
- 12. CGL - Greenlands (4.03 ha)
- 13. CVI - Transportation and Utilities (18.62 ha)

SCALE 1:13,000

0 145 290 580 METRES

N W E S

MAP DRAWING INFORMATION:
DATA PROVIDED BY Dillon Consulting

MAP CREATED BY: JL/SCM
MAP CHECKED BY: LMH
MAP PROJECTION: NAD 1983 CSRS UTM Zone 17N

DILLON CONSULTING

PROJECT: 23-5735
STATUS: FINAL
DATE: 2024-05-15

FILE LOCATION: K:\2023\235735\Product\Client\Natural Environment Existing Conditions\Natural Environment Existing Condtions_20240514.aprx

TECUMSEH HAMLET SECONDARY PLAN AREA ENVIRONMENTAL STUDY REPORT

FIGURE 3-1

Candidate Significant Wildlife Habitat

Bat Maternity Colonies
within FOD, FODM1-2, SWDM1, SWDM1-1

Reptile Hibernaculum
within FOD, FODM1-2, SWDM1, SWDM1-1, THDM2-11, THDM4-1

Amphibian Breeding Habitat (Woodland)
within FOD, FODM1-2, SWDM1, SWDM1-1

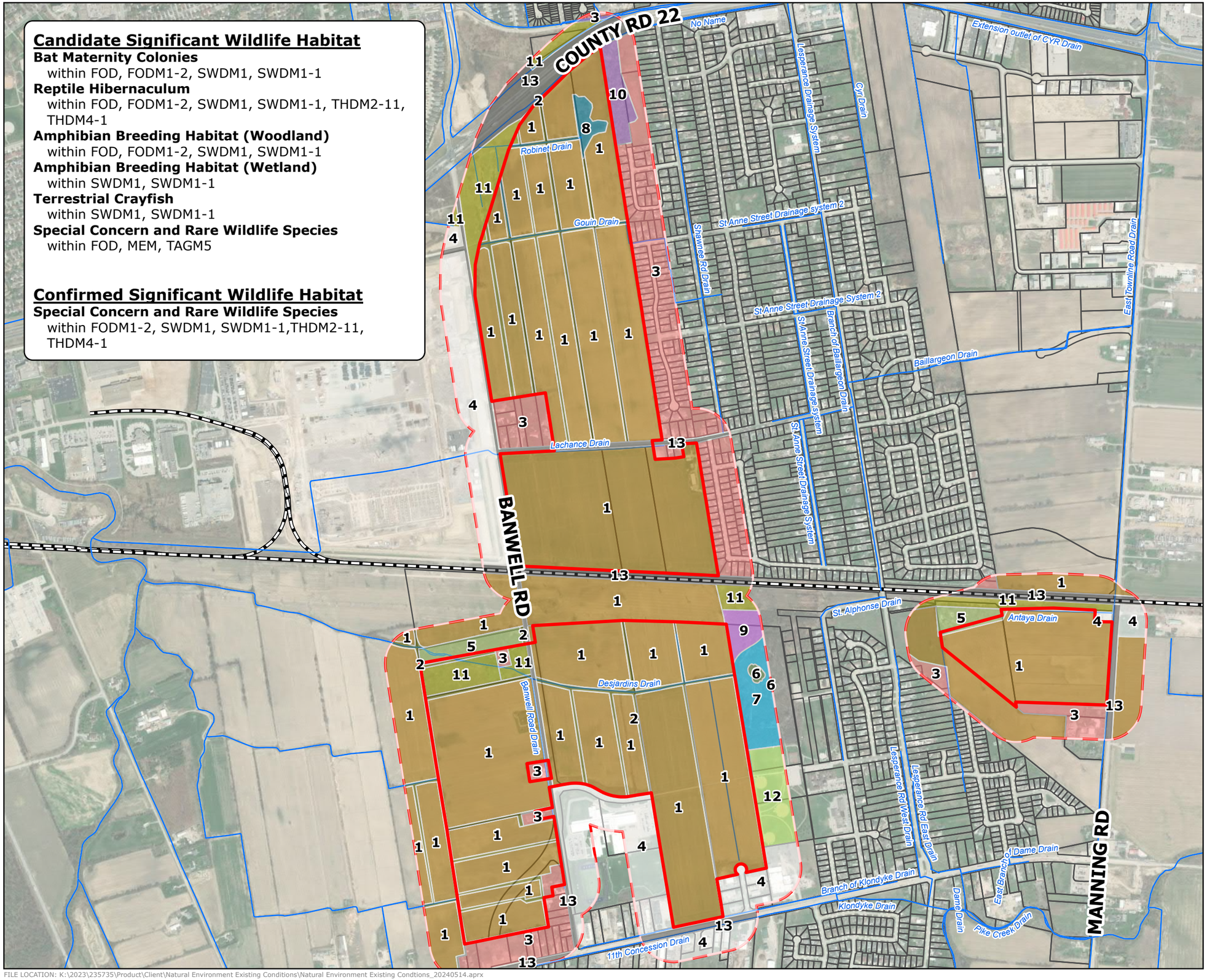
Amphibian Breeding Habitat (Wetland)
within SWDM1, SWDM1-1

Terrestrial Crayfish
within SWDM1, SWDM1-1

Special Concern and Rare Wildlife Species
within FOD, MEM, TAGM5

Confirmed Significant Wildlife Habitat

Special Concern and Rare Wildlife Species
within FODM1-2, SWDM1, SWDM1-1,THDM2-11, THDM4-1



- Project Area (193.14 ha)

Ecological Land Classification

Number,ELC

- 1. OAGM1 - Annual Row Crops (212.97 ha)
- 2. TAGM5 - Fencerow (12.99 ha)
- 3. CVR - Residential (35.44 ha)
- 4. CVC - Commercial and Institutional (32.32 ha)
- 5. FOD - Deciduous Forest (3.91 ha)
- 6. FODM1-2 - Red Oak Deciduous Forest (0.26 ha)
- 7. SWDM1 - Oak Mineral Deciduous Swamp (3.92 ha)
- 8. SWDM1-1 Swamp White Oak Mineral Deciduous Swamp (1.15 ha)
- 9. THDM2-11 - Hawthorn Deciduous Shrub Thicket (1.69 ha)
- 10. THDM4-1 - Native Deciduous Regeneration Thicket (2.36 ha)
- 11. ME - Meadow (12.32 ha)
- 12. CGL - Greenlands (4.03 ha)
- 13. CVI - Transportation and Utilities (18.62 ha)
- Municipal Drain
- OHN Watercourse Selected
- ORN_Segment_With_Address
- Railway
- Study Area (120 m buffer)
- Assessment Boundary

SCALE 1:12,739

0 140 280 560 METRES

N W E S

MAP DRAWING INFORMATION:
DATA PROVIDED BY Dillon Consulting

MAP CREATED BY: JL/SCM
MAP CHECKED BY: LMH
MAP PROJECTION: NAD 1983 CSRS UTM Zone 17N

DILLON CONSULTING

PROJECT: 23-5735
STATUS: FINAL
DATE: 2024-05-15

FILE LOCATION: K:\2023\235735\Product\Client\Natural Environment Existing Conditions\Natural Environment Existing Condtions_20240514.aprx

Candidate SAR Habitat

Bobolink/Eastern Meadowlark
within ME, OAGM1

Wood Thrush and Red-headed Woodpecker
within FOD, FODM1-2, SWDM1, SWDM1-1

SAR Bat Species
within FOD, FODM1-2, SWDM1, SWDM1-1, TAGM5

Eastern Foxsnake and Butler's Garternsnake
within FOD, FODM1-2, MEM, SWDM1, SWDM1-1, TAGM5, THDM2-11, THDM4-1

Willowleaf Aster
within FOD, FODM1-2, MEM, SWDM1, SWDM1-1, TAGM5, THDM2-11, THDM4-1

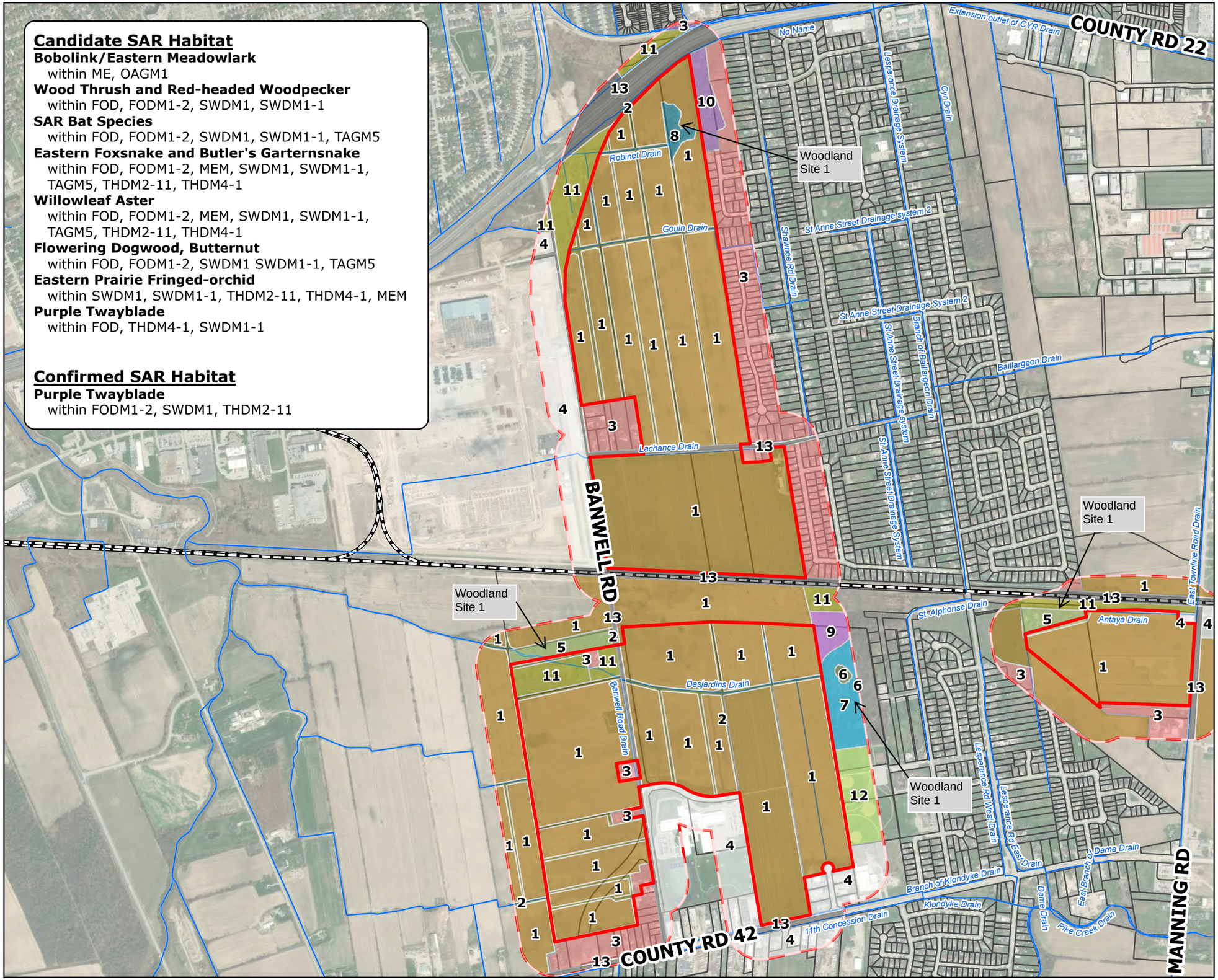
Flowering Dogwood, Butternut
within FOD, FODM1-2, SWDM1 SWDM1-1, TAGM5

Eastern Prairie Fringed-orchid
within SWDM1, SWDM1-1, THDM2-11, THDM4-1, MEM

Purple Twayblade
within FOD, THDM4-1, SWDM1-1

Confirmed SAR Habitat

Purple Twayblade
within FODM1-2, SWDM1, THDM2-11



TECUMSEH HAMLET

NATURAL ENVIRONMENT EXISTING CONDITIONS

SPECIES AT RISK HABITAT

FIGURE 4b

- Project Area (189.30 ha)
- Study Area (120 m buffer)
- Municipal Drain
- Railway
- Assessment Boundary

Ecological Land Classification

- 1. OAGM1 - Annual Row Crops (212.97 ha)
- 2. TAGM5 - Fencerow (12.99 ha)
- 3. CVR - Residential (35.44 ha)
- 4. CVC - Commercial and Institutional (32.32 ha)
- 5. FOD - Deciduous Forest (3.91 ha)
- 6. FODM1-2 - Red Oak Deciduous Forest (0.26 ha)
- 7. SWDM1 - Oak Mineral Deciduous Swamp (3.92 ha)
- 8. SWDM1-1 Swamp White Oak Mineral Deciduous Swamp (1.15 ha)
- 9. THDM2-11 - Hawthorn Deciduous Shrub Thicket (1.69 ha)
- 10. THDM4-1 - Native Deciduous Regeneration Thicket (2.36 ha)
- 11. ME - Meadow (12.32 ha)
- 12. CGL - Greenlands (4.03 ha)
- 13. CVI - Transportation and Utilities (18.62 ha)

SCALE 1:13,000

0 145 290 580 METRES

N W E S

MAP DRAWING INFORMATION:
DATA PROVIDED BY Dillon Consulting

MAP CREATED BY: JL/SCM
MAP CHECKED BY: LMH
MAP PROJECTION: NAD 1983 CSRS UTM Zone 17N

DILLON CONSULTING

PROJECT: 23-5735
STATUS: FINAL
DATE: 2024-05-15

FILE LOCATION: K:\2023\235735\Product\Client\Natural Environment Existing Conditions\Natural Environment Existing Condtions_20240514.aprx

TECUMSEH HAMLET

NATURAL ENVIRONMENT EXISTING CONDITIONS

PROPOSED DEVELOPMENT PLAN

FIGURE 5

- Project Area (189.30 ha)
- Study Area (120 m buffer)
- Municipal Drain
- Railway
- Assessment Boundary

Proposed Development Plan

- Low Density Residential
- Medium Density Residential
- High Density Residential
- Park Space
- Natural Heritage / Woodlot
- Hydro Corridor
- Stormwater Management Pond
- Plaza Commercial
- Institutional / Cemetery
- Main Street Mixed-Use
- Anchor Commercial

SCALE 1:13,000

0 145 290 580 METRES

N W E S

MAP DRAWING INFORMATION:
DATA PROVIDED BY Dillon Consulting

MAP CREATED BY: JL/SCM
MAP CHECKED BY: LMH
MAP PROJECTION: NAD 1983 CSRS UTM Zone 17N

DILLON CONSULTING

PROJECT: 23-5735
STATUS: FINAL
DATE: 2024-06-06

FILE LOCATION: K:\2023\235735\Product\Client\Natural Environment Existing Conditions\Natural Environment Existing Condtions_20240514.aprx

Significant Wildlife Habitat Removed

TAGM5
- Candidate Special Concern and Rare Wildlife Species Habitat

MEM
- Candidate Special Concern and Rare Wildlife Species Habitat

FOD
- Candidate Bat Maternity Colonies, Reptile Hibernaculum, Amphibian Breeding Habitat (Woodland), Special Concern and Rare Wildlife Species Habitat

SWDM1-1
- Candidate Bat Maternity Colonies, Reptile Hibernaculum, Amphibian Breeding Habitat (Woodland/Wetland), Terrestrial Crayfish Habitat
- Confirmed Special Concern and Rare Wildlife Species Habitat

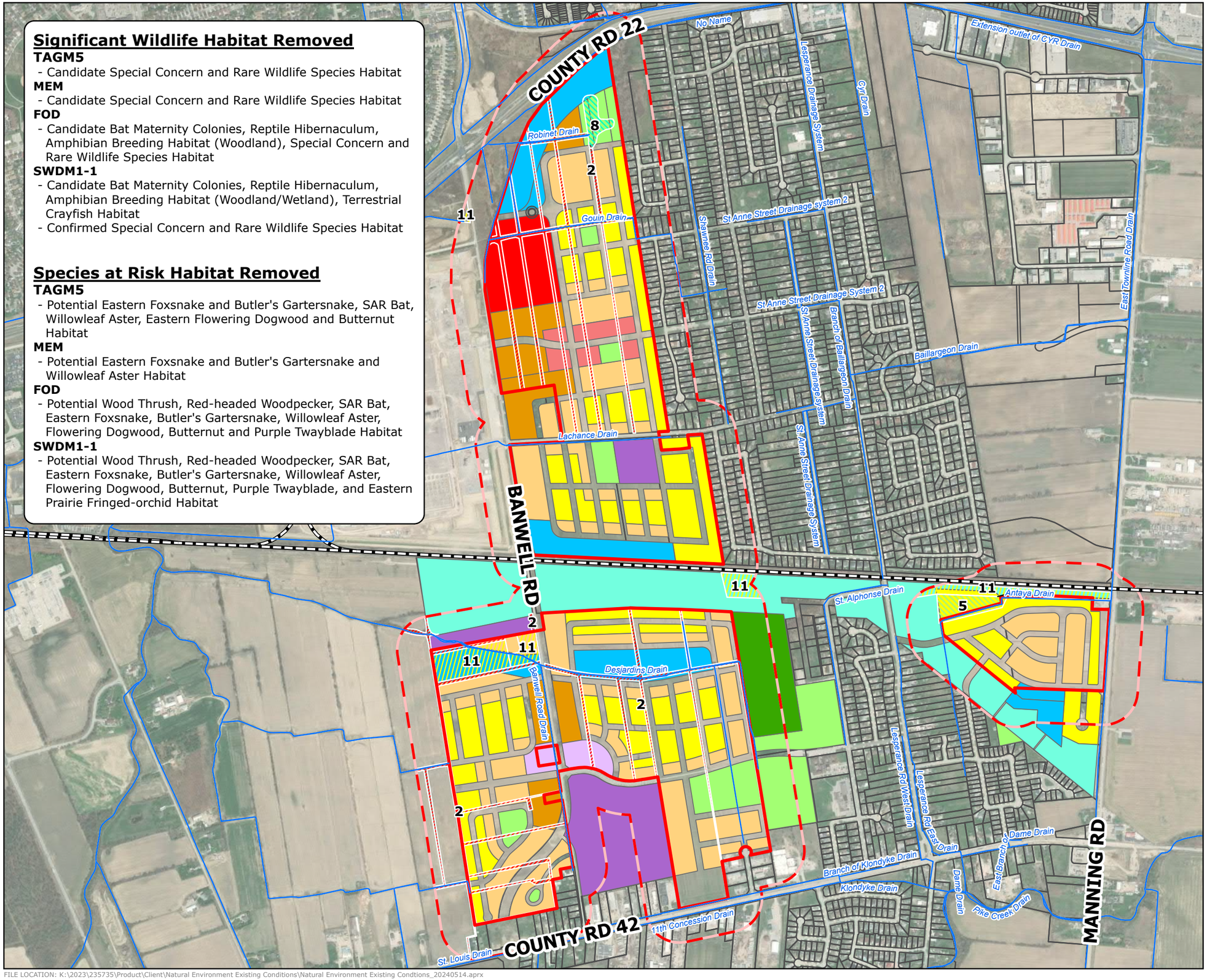
Species at Risk Habitat Removed

TAGM5
- Potential Eastern Foxsnake and Butler's Gartersnake, SAR Bat, Willowleaf Aster, Eastern Flowering Dogwood and Butternut Habitat

MEM
- Potential Eastern Foxsnake and Butler's Gartersnake and Willowleaf Aster Habitat

FOD
- Potential Wood Thrush, Red-headed Woodpecker, SAR Bat, Eastern Foxsnake, Butler's Gartersnake, Willowleaf Aster, Flowering Dogwood, Butternut and Purple Twayblade Habitat

SWDM1-1
- Potential Wood Thrush, Red-headed Woodpecker, SAR Bat, Eastern Foxsnake, Butler's Gartersnake, Willowleaf Aster, Flowering Dogwood, Butternut, Purple Twayblade, and Eastern Prairie Fringed-orchid Habitat



TECUMSEH HAMLET

NATURAL ENVIRONMENT EXISTING CONDITIONS

POTENTIAL IMPACTS

FIGURE 6

- Project Area (193.14 ha)
- Study Area (120 m buffer)
- Municipal Drain
- Railway
- Assessment Boundary

Proposed Development Plan
- Low Density Residential
- Medium Density Residential
- High Density Residential
- Park Space
- Natural Heritage / Woodlot
- Hydro Corridor
- Stormwater Management Pond
- Plaza Commercial
- Institutional / Cemetery
- Main Street Mixed-Use
- Anchor Commercial

ELC Units Removed
- 2. TAGM5 - Fencerow (12.99 ha)
- 5. FOD - Deciduous Forest (1.67 ha)
- 8. SWDM1-1 Swamp White Oak Mineral Deciduous Swamp (0.54 ha)
- 11. ME - Meadow (12.32 ha)

SCALE 1:13,000

0 145 290 580 METRES

N W E S

MAP DRAWING INFORMATION:
DATA PROVIDED BY Dillon Consulting

MAP CREATED BY: JL/SCM
MAP CHECKED BY: LMH
MAP PROJECTION: NAD 1983 CSRS UTM Zone 17N

DILLON CONSULTING

PROJECT: 23-5735
STATUS: FINAL
DATE: 2024-06-06

FILE LOCATION: K:\2023\235735\Product\Client\Natural Environment Existing Conditions\Natural Environment Existing Condtions_20240514.aprx

Attachment B

Background Mapping

County of Essex

Schedule A1

Land Use Plan

Project Location

Lake St. Clair

CITY OF WINDSOR

Peche Island

St. Clair Beach

Puce

Belle River

Stoney Point

Lighthouse Cove

St. Joachim

LAKESHORE

Comber

Ruscom

Staples

Municipality of Chatham - Kent

Fighting Island

Turkey Island

Detroit River

Crystal Island

Boblo Island

LASALLE

TECUMSEH

Oldcastle

Maidstone

Woodslee

Essex Centre

McGregor

ESSEX

Gesto

Cottam

KINGSVILLE

Blytheswood

LEAMINGTON

AMHERSTBURG

Malden Centre

Harrow

Ruthven

Colchester

Lake Erie

Pelee Island

Point Pelee National Park

Legend

- Local Roads
- County Roads
- Provincial Highway
- Railway
- Essex County Municipalities
- Lot Fabric
- Settlement Areas
- Agricultural
- Natural Environment

N W E S

0 2.5 5 10 km

Path: G:\Planning Drawings\ESS-09223\Maps\ESS-09223-OP-schedule-A1.mxd
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County of Essex

Schedule B1

Natural Heritage System
Natural Environment Designation

Project Location

Legend

- Local Roads
- County Roads
- Provincial Highway
- Railway
- Essex County Municipalities
- Settlement Areas
- Lot Fabric
- Significant Terrestrial Features
- Provincially Significant Wetlands

Note*
The current mapping does not differentiate between those features which are related to components of Table 3. Specifically, existing natural features identified as Significant Terrestrial Features may represent multiple Significant Natural Heritage Features as indicated in Table 3, i.e., Significant habitat of Endangered Species or Threatened Species, lands designated in local Official Plans for natural heritage protection, other high priority existing natural features, fish habitat, significant woodlands, Areas of Natural and Scientific Interest, Significant Wildlife Habitat, or Significant Valleylands.

N W E S

0 2.5 5 10 km

Lake St. Clair
Lake Erie
Detroit River
CITY OF WINDSOR
LAKESHORE
LASALLE
TECUMSEH
ESSEX
KINGSVILLE
LEAMINGTON
AMHERSTBURG
Municipality of Chatham - Kent
Point Pelee National Park
Pelee Island
Peche Island
Fighting Island
Turkey Island
Crystal Island
Boblo Island
St. Clair Beach
Puce
Belle River
Stoney Point
Lighthouse Cove
St. Joachim
Oldcastle
Maidstone
Woodslee
Ruscom
Comber
Staples
McGregor
Essex Centre
Gesto
Cottam
Blytheswood
Malden Centre
Harrow
Ruthven
Colchester

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County of Essex

Schedule B2

Natural Heritage System
Natural Environment Overlay

Project Location

Lake St. Clair

Lake Erie

Detroit River

CITY OF WINDSOR

LAKESHORE

LASALLE

TECUMSEH

AMHERSTBURG

ESSEX

KINGSVILLE

LEAMINGTON

Municipality of Chatham - Kent

Peche Island

St. Clair Beach

Puce

Belle River

Stoney Point

Lighthouse Cove

St. Joachim

Fighting Island

Turkey Island

Crystal Island

Boblo Island

Oldcastle

Maidstone

Woodslee

Ruscom

Comber

Staples

Essex Centre

McGregor

Gesto

Cottam

Blytheswood

Malden Centre

Harrow

Ruthven

Colchester

Point Pelee National Park

Pelee Island

Legend

- Local Roads
- County Roads
- Provincial Highway
- Railway
- Essex County Municipalities
- Settlement Areas
- Lot Fabric
- Natural Environment Overlay

N W E S

0 2.5 5 10 km

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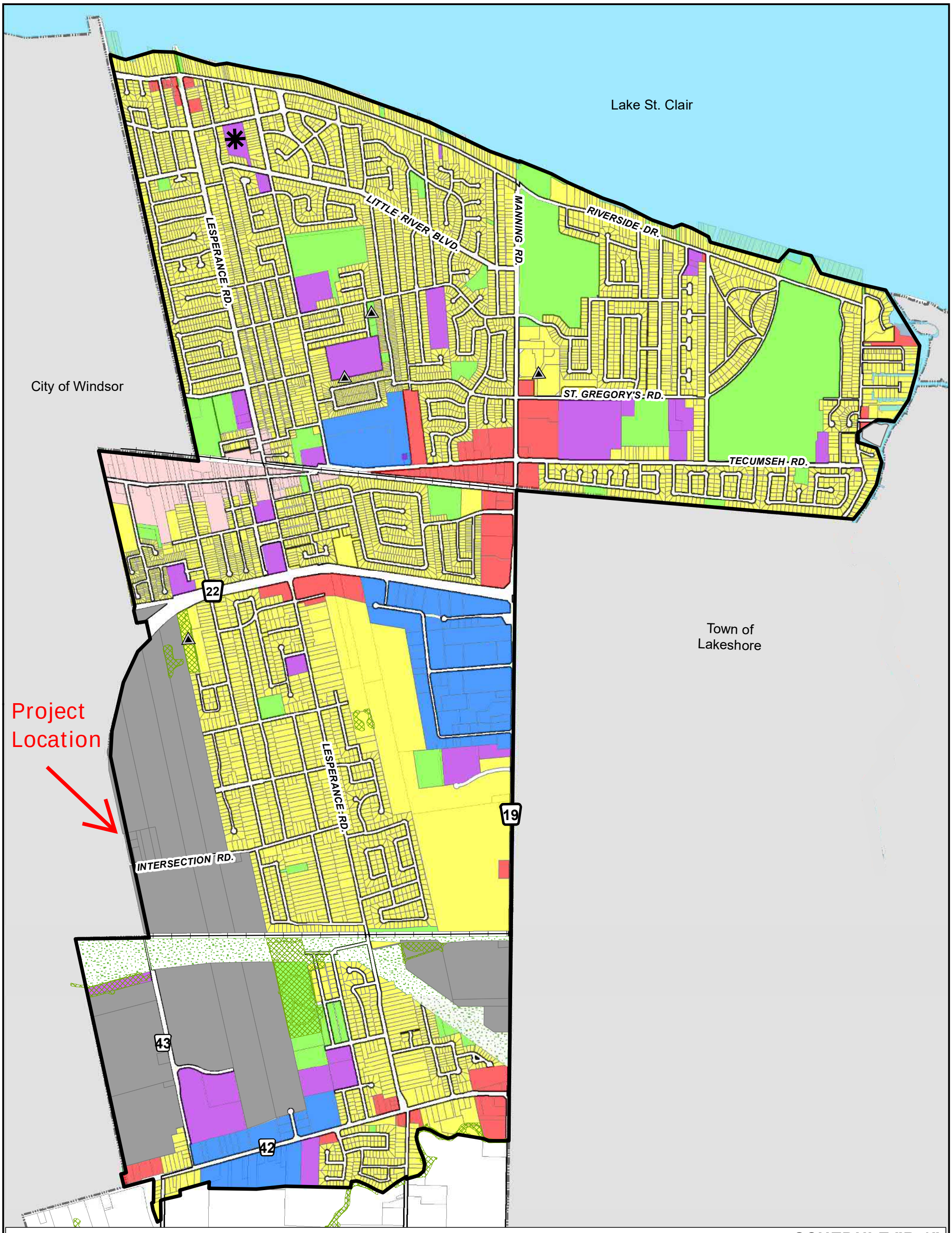
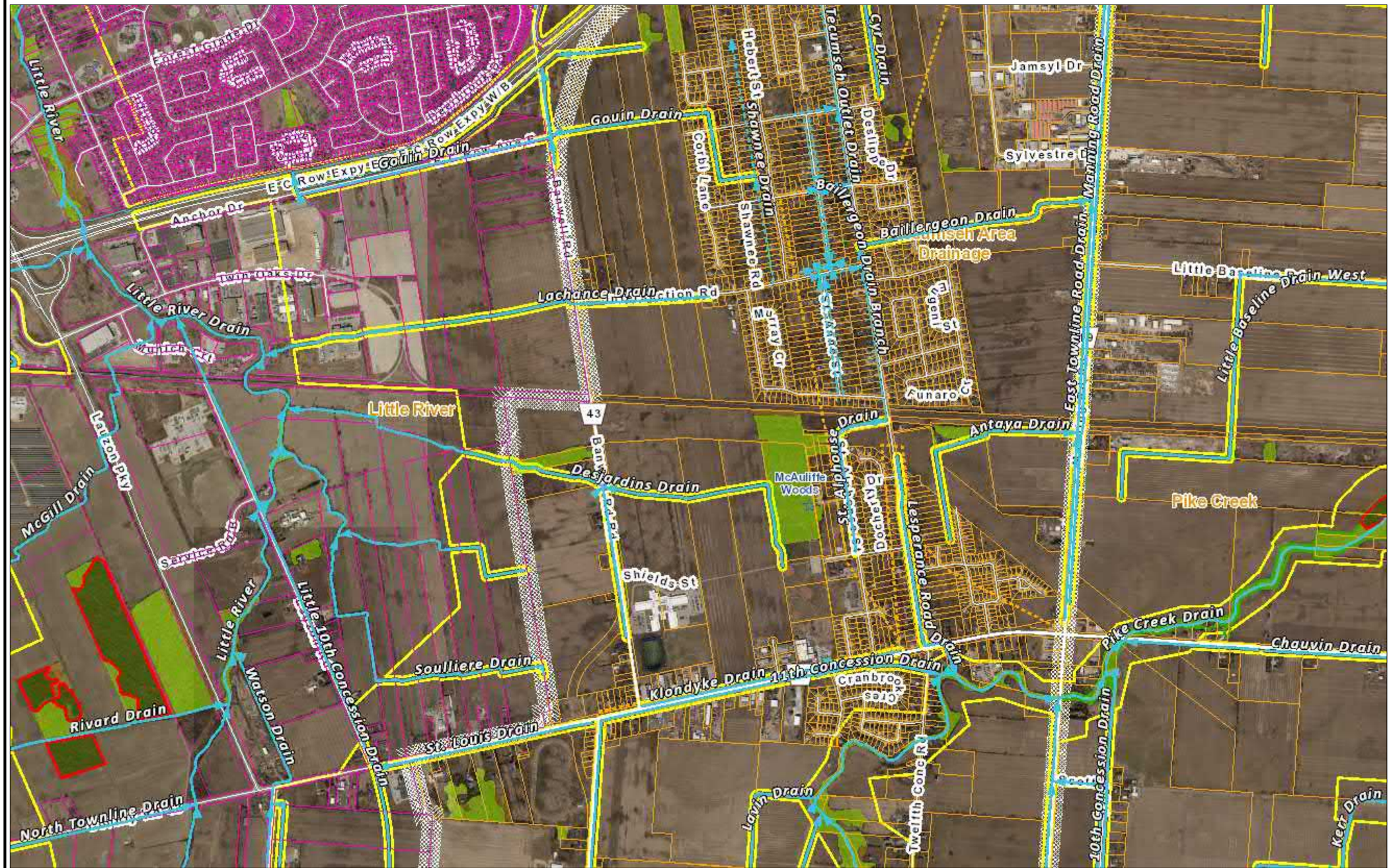


SCHEDULE "B-1"
Town of Tecumseh Official Plan
Tecumseh North Settlement Area Land Use Plan

Prepared By:
Tecumseh Planning and Building Services Department



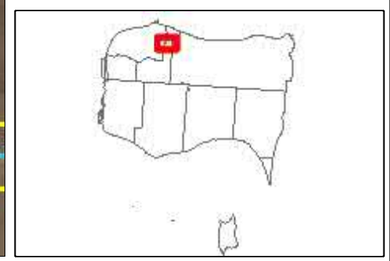
Essex Region Conservation Authority

Public Interactive Mapping

Legend

- Municipal Drains (ERCA)
  - Natural
  - Municipal Drain (Open)
  - Municipal Drain (Closed)
  - Unknown/Other Status (Open)
  - Unknown/Other Status (Closed)
  - Private/Roadside (Open)
  - Private/Roadside (Closed)
- Parcel Fabric - City
- Parcel Fabric - County
- Conservation Areas
- Provincially Significant Wetland (PSW)
- Area of Natural & Scientific Interest (ANSI)
- Environmentally Significant Area (ESA)
- Significant Valley Land (SVL)
- Existing Natural Feature (ERNHSS Report, 201
  - Open Water
  - Marsh
  - Swamp
  - Forest
  - Other Terrestrial Natural Feature
- Limit of Regulated Area
- Subwatershed (Line)

Location



0 374.06 748.1

Meters

1: 16,831

3/3/2023

ERCA Geomatics

THIS MAP HAS BEEN PRODUCED BY THE GENERAL PUBLIC AND NOT BY QUALIFIED ERCA STAFF.

Notes

Ontario

Ministry of Natural Resources and Forestry

Make-a-Map: Natural Heritage Areas

Notes: Enter map notes

Map created: 3/3/2023

Legend

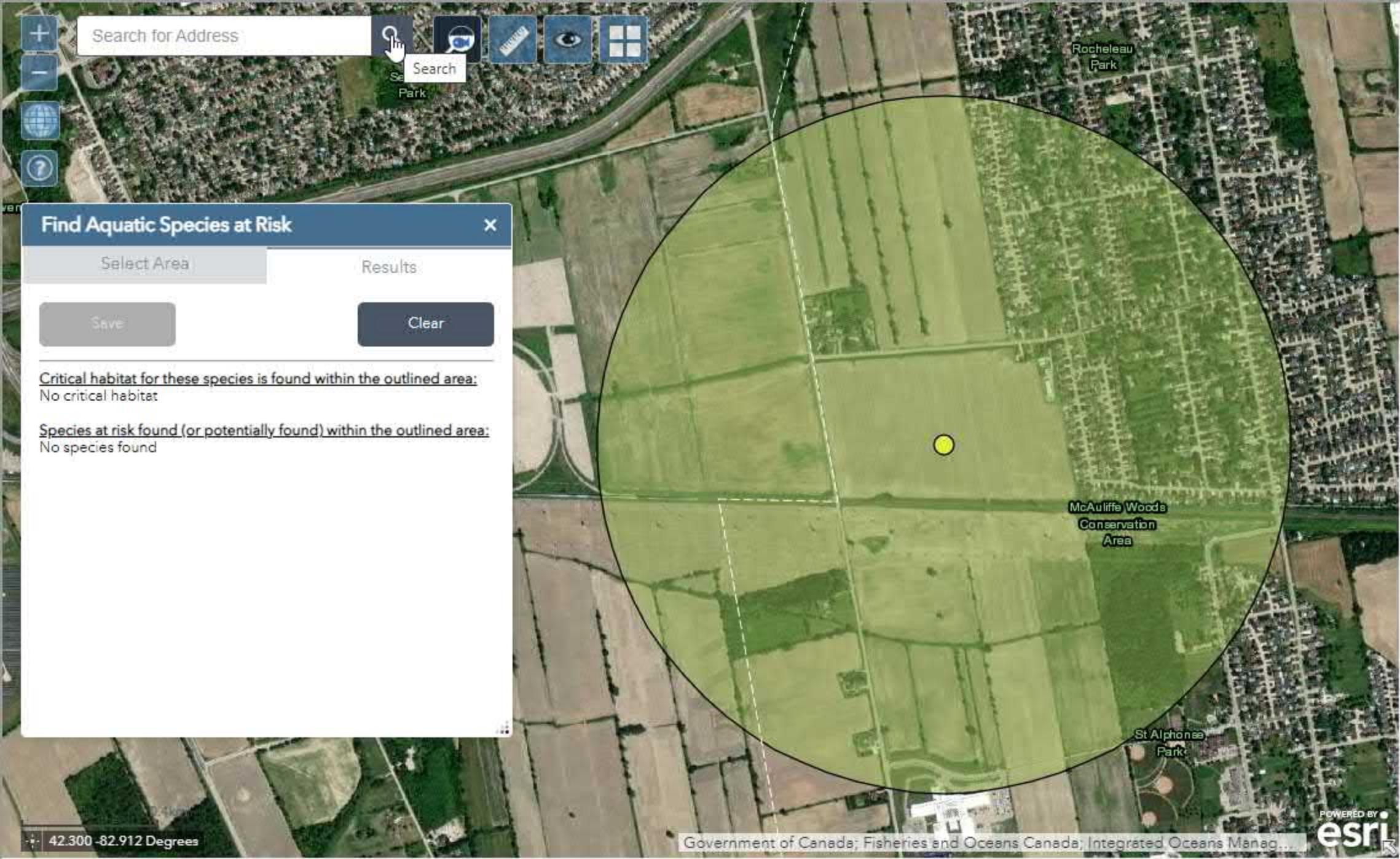
- Assessment Parcel
- ANSI
- Earth Science Provincially Significant/sciences de la terre d'importance provinciale
- Earth Science Regionally Significant/sciences de la terre d'importance régionale
- Life Science Provincially Significant/sciences de la vie d'importance provinciale
- Life Science Regionally Significant/sciences de la vie d'importance régionale
- Evaluated Wetland
- Provincially Significant/considérée d'importance provinciale
- Non-Provincially Significant/non considérée d'importance provinciale
- Unevaluated Wetland
- Woodland
- Conservation Reserve
- Provincial Park
- ORM Land Use Designation
- Countryside Area/zone de campagne
- Natural Core Area/zone centrale naturelle
- Natural Linkage Area/lien naturel
- Palgrave Estates Residential Community/communauté résidentielle de Palgrave Estates
- Rural Settlement/zone de peuplement rurale
- Settlement Area/zone de peuplement
- NEP Land Use Designation
- Escarpment Natural Area/zone naturelle de l'escarpement
- Escarpment Protection Area/zone protégée l'escarpement
- Escarpment Recreation Area/zone récréative de l'escarpement
- Escarpment Rural Area/zone rurale de l'escarpement
- Mineral Resource Extraction Area/zone d'extraction de resources minérales
- Urban Area/zone urbaine
- Natural Heritage System

0 0.7 Kilometres

This map should not be relied on as a precise indicator of routes or locations, nor as a guide to navigation. The Ontario Ministry of Natural Resources and Forestry(OMNRF) shall not be liable in any way for the use of, or reliance upon, this map or any information on this map.

Absence of a feature in the map does not mean they do not exist in this area.

Projection: Web Mercator


Search for Address
Search
Rocheleau Park
McAuliffe Woods Conservation Area
St Alphonse Park
Find Aquatic Species at Risk
Select Area
Results
Save
Clear
Critical habitat for these species is found within the outlined area:
No critical habitat
Species at risk found (or potentially found) within the outlined area:
No species found
42.300 -82.912 Degrees
Government of Canada; Fisheries and Oceans Canada; Integrated Oceans Manag...
POWERED BY esri

Attachment C

Site Photographs

Photograph 1 March 21, 2023 Facing north within the swamp community (SWDM1-1) within the Project Location. Note: Water depth is 32 cm measured 30 cm from the edge.	
Photograph 2 March 21, 2023 Facing northwest within the swamp community (SWDM1-1) within the Project Location.	

Photograph 3 March 21, 2021 Soil sample taken from within the swamp community (SWDM1-1) within the Project Location. Note: Mottles and gley present starting at 42 cm from surface.	
Photograph 4 March 21, 2021 Facing north within the swamp community (SWDM1-1) within the Project Location. Note: A tree tally was taken at this location with a Basal Area of 4.	

Photograph 5 March 21, 2021 Facing north within the swamp community (SWDM1-1) within the Project Location. Note: Mottles and gley present starting at 40 cm from surface.	
Photograph 6 March 21, 2023 Facing north at Intersection Road within the Project Location. Note: Agricultural land use.	

Photograph 7 March 21, 2023 Facing south at Intersection Road within the Project Location. Note: Invasive European Common Reed (*Phragmites australis australis*) within Lachance Drain, and agricultural land use.	
Photograph 8 March 21, 2023 Facing south at Desjardins Drain, Aquatic Assessment 5 within the Project Location. Note: Agricultural land use in foreground and McAuliffe Woods visible in background.	

Photograph 9 March 21, 2023 Facing East at Antaya Drain, Aquatic Assessment 7 within the Project Location. Note: Agricultural land use with fencerow along the drain.	
Photograph 10 March 21, 2023 Facing upstream at Robinet Drain, Aquatic Assessment 1 within the Project Location.	

Photograph 11 March 21, 2023 Facing downstream at Robinet Drain, Aquatic Assessment 1 within the Project Location.	
Photograph 12 March 21, 2023 Facing upstream at Gouin Drain, Aquatic Assessment 2.	

Photograph 13 March 21, 2023 Facing downstream at Gouin Drain, Aquatic Assessment 2.	
Photograph 14 March 21, 2023 Facing upstream at Lachance Drain Aquatic Assessment 3.	

Photograph 15 March 21, 2023 Facing downstream at Lachance Drain, Aquatic Assessment 3.	
Photograph 16 March 21, 2023 Facing upstream at Desjardins Drain, Aquatic Assessment 4.	

Photograph 17 March 21, 2023 Facing downstream at Desjardins Drain, Aquatic Assessment 4.	
Photograph 18 March 21, 2023 Facing upstream at Desjardins Drain, Aquatic Assessment 5.	

Photograph 19 March 21, 2023 Facing upstream at Desjardins Drain, Aquatic Assessment 5.	
Photograph 20 March 21, 2023 Facing upstream at Banwell Drain, Aquatic Assessment 6.	

Photograph 21 March 21, 2023 Facing downstream at Banwell Drain, Aquatic Assessment 6.	
Photograph 22 March 21, 2023 Facing upstream at Antaya Drain Aquatic Assessment 7.	

Photograph 23 March 21, 2023 Facing downstream at Antaya Drain, Aquatic Assessment 7.	
Photograph 24 March 21, 2023 Facing upstream at East Townline Drain, Aquatic Assessment 8.	

Photograph 25 March 21, 2023 Facing downstream at East Townline Drain, Aquatic Assessment 8.	

Attachment D

SAR Habitat Screening

Table 1: Species at Risk and Species of Conservation Concern with the potential to occur within the study area.

Family	Group	Scientific Name	Common Name	SARA Status[1]	ESA Status[2]	SRank[3]	Information Source[4]	Regulated Habitat	Habitat Requirements[2,5]	Potential Habitat in the Study Area
Birds										
Accipitridae	Hawks, Kites, Eagles, and Allies	*Haliaeetus leucocephalus*	Bald Eagle	---	SC	S2N, S4B	CBC, OBBA	FALSE	Require large continuous area of deciduous or mixed woods around large lakes, rivers; require area of 255 ha for nesting, shelter, feeding, roosting; prefer open woods with 30 to 50% canopy cover; nest in tall trees 50 to 200 km from shore; require tall, dead, partially dead trees within 400 m of nest for perching; sensitive to toxic chemicals.	Yes
Anatidae	Ducks, Geese, and Swans	*Aythya americana*	Redhead	---	---	S2B, S4N	CBC	FALSE	Shallow cattail/bulrush marshes, lakes and ponds and fens; preferred nesting usually close to shallow water (most within 2 m), but can be found as far as 266 m from water's edge.	No
Anatidae	Ducks, Geese, and Swans	*Aythya valisineria*	Canvasback	---	---	S1B, S4N	CBC	FALSE	Large marshes for nesting; prefer deep, permanent water- bodies for feeding and courtship.	No
Apodidae	Swifts	*Chaetura pelagica*	Chimney Swift	THR	THR	S4B, S4N	OBBA	FALSE	Commonly found in urban areas near buildings and man-made structures with vertical faces, of which are used as surfaces for nest-building. Nests and roosts are most common in chimneys with preference for larger chimneys with open tops. This species will also nest and roost in hollow trees and crevices of rock cliffs. Nesting and roosting sites are situated near areas of water with an abundance of insects for feeding.	No
Calcariidae	Longspurs and Snow Buntings	*Calcarius lapponicus*	Lapland Longspur	---	---	S3B	CBC	FALSE	Occurs in open, treeless habitats.	No
Gaviidae	Loons	*Gavia stellata*	Red-throated Loon	---	---	S1N, S3B	CBC	FALSE	Found breeding in tundra wetlands, at high elevations. Inhabit lakes, ponds, and shorelines.	No
Laridae	Gulls, Terns, and Skimmers	*Larus marinus*	Great Black-backed Gull	---	---	S2B	CBC	FALSE	Found along the Atlantic coast and inland on the Great Lakes	No
Hirundinidae	Swallows	*Hirundo rustica*	Barn Swallow	SC	SC	S4B	OBBA	FALSE	Farmlands or rural areas; cliffs, caves, rock niches; buildings or other man-made structures for nesting; open country near body of water.	No
Hirundinidae	Swallows	*Riparia riparia*	Bank Swallow	THR	THR	S4B	OBBA	FALSE	Sand, clay or gravel river banks or steep riverbank cliffs; lakeshore bluffs of easily crumbled sand or gravel; gravel pits, road-cuts, grassland or cultivated fields that are close to water; nesting sites are limiting factor for species presence.	No

Family	Group	Scientific Name	Common Name	SARA Status[1]	ESA Status[2]	SRank[3]	Information Source[4]	Regulated Habitat	Habitat Requirements[2,5]	Potential Habitat in the Study Area
Caprimulgidae	Goatsuckers	*Chordeiles minor*	Common Nighthawk	THR	SC	S4B	OBBA	FALSE	Open ground; clearings in dense forests; ploughed fields; gravel beaches or barren areas with rocky soils; open woodlands; flat gravel roofs.	No
Icteridae	Blackbirds	*Euphagus carolinus*	Rusty Blackbird	SC	SC	S4B	CBC	FALSE	Openings in coniferous woodlands bordering bodies of water; tree-bordered marshes, beaver ponds, muskegs, bogs, fends or wooded swamps; stream borders with alder, willow; wooded island on lakes.	No
Picidae	Woodpeckers and Allies	*Melanerpes erythrocephalus*	Red-headed Woodpecker	END	END	S4B	CBC, OBBA	FALSE	Open, deciduous forest with little understory; fields or pasture lands with scattered large trees; wooded swamps; orchards, small woodlots or forest edges; groves of dead or dying trees; feeds on insects and stores nuts or acorns for winter; loss of habitat is limiting factor; requires cavity trees with at least 40cm dbh; require about 4 ha for a territory.	Yes
Icteridae	Blackbirds	*Dolichonyx oryzivorus*	Bobolink	THR	THR	S4B	OBBA	FALSE	Large, open expansive grasslands with dense ground cover; hayfields, meadows or fallow fields; marshes; requires tracts of grassland >50 ha.	Yes
Tyrannidae	Tyrant Flycatchers	*Contopus virens*	Eastern Wood-pewee	SC	SC	S4B	OBBA	FALSE	Open, deciduous, mixed or coniferous forest; predominated by oak with little understory; forest clearing, edges; farm woodlots, parks.	Yes
Turdidae	Thrushes	*Hylocichla mustelina*	Wood Thrush	THR	SC	S4B	OBBA	FALSE	Carolinian and Great Lakes-St. Lawrence forest zones; undisturbed moist mature deciduous or mixed forest with deciduous sapling growth; near pond or swamp; hardwood forest edges; must have some trees higher than 12m.	Yes
Icteridae	Blackbirds	*Sturnella magna*	Eastern Meadowlark	THR	THR	S4B	OBBA, NHIC	FALSE	Open, grassy meadows, farmland, pastures, hayfields or grasslands with elevated singing perches; cultivated land and weedy areas with trees; old orchards with adjacent, open grassy areas >10 ha in size.	Yes
Butterflies and Moths										
Hesperiidae	Butterflies and Moths	*Erynnis martialis*	Mottled Duskywing	---	END	S2	OBA	FALSE	The mottled duskywing tends to live in dry habitats with sparse vegetation. These include open barrens, sandy patches among woodlands, and alvars. In Ontario, the mottled duskywing will only deposit their eggs on two closely-related plants: New Jersey Tea and Prairie Redroot.	No
Nymphalidae	Butterflies and Moths	*Danaus plexippus*	Monarch	END	SC	S2N, S4B	OBA	FALSE	Monarch are commonly found in meadow habitats, abandoned farmland and roadsides where milkweed and wildflowers (such as goldenrods, asters and purple loosestrife) are abundant	Yes
Reptiles and Amphibians										
Caudata	Newts and Salamanders	*Ambystoma texanum*	Small-mouthed Salamander	END	END	S1	ORAA	FALSE	Found in moist habitats on Pelee Island, such as dense deciduous forest with suitable breeding ponds.	No

Family	Group	Scientific Name	Common Name	SARA Status[1]	ESA Status[2]	SRank[3]	Information Source[4]	Regulated Habitat	Habitat Requirements[2,5]	Potential Habitat in the Study Area
Chelydridae	Turtle	*Chelydra serpentina*	Snapping Turtle	SC	SC	S3	ORAA	FALSE	Permanent, semi-permanent fresh water; marshes, swamps or bogs; rivers and streams with soft muddy banks or bottoms; often uses soft soil or clean dry sand on south-facing slopes for nest sites; may nest at some distance from water; often hibernate together in groups in mud under water; home range size ~28 ha.	No
Colubridae	Snakes	*Coluber constrictor foxii*	Blue Racer	END	END	S1	ORAA	FALSE	Inhabits fields and open woodlands on Pelee Island	No
Colubridae	Snakes	*Heterodon platirhinos*	Eastern Hog-nosed Snake	THR	THR	S3	ORAA	FALSE	Sandy upland fields, pastures, savannahs, sandy beaches; dry open oak-pine-maple forest with sandy soils; prefer forest areas > 5ha.	No
Colubridae	Snakes	*Nerodia sipedon insularum*	Lake Erie Watersnake	END	SC	S2	ORAA	FALSE	Found on rocky shorelines of Lake Erie Islands with good shrub and tree cover.	No
Colubridae	Snakes	*Regina septemvittata*	Queensnake	END	END	S2	ORAA, MECP Reg. Habitat	TRUE	Queensnake inhabit streams or rivers with rock or gravel in the channel and along the banks, typically with bank and channel substrates of limestone or slate, and are less commonly found in marshes, lakeshores, and quarries. This species stays close to water, rarely venturing more than 15 metres from shore. Supporting habitat requirements include substantial supplies of crayfish for food, and hanging woody riparian vegetation for basking. This species hibernates communally in subterranean areas accessed by natural features such as animal burrows and cracks in rock outcrops, or in anthropogenic structures such as bridge abutments.	No
Emydidae	Turtle	*Emydoidea blandingii*	Blanding's Turtle	THR	THR	S3	ORAA	FALSE	Shallow water marshes, bogs, ponds or swamps, or coves in larger lakes with soft muddy bottoms and aquatic vegetation; basks on logs, stumps, or banks; surrounding natural habitat is important in summer as they frequently move from aquatic habitat to terrestrial habitats; hibernates in bogs; not readily observed.	No
Emydidae	Turtle	*Graptemys geographica*	Northern Map Turtle	SC	SC	S3	ORAA	FALSE	This species is found in rivers and lakeshores, with a preference for slow moving currents, muddy bottoms, and abundant aquatic vegetation. Through spring and summer, it needs suitable basking sites on emergent rocks and fallen trees, with an unobstructed view from which it can drop immediately into the water if startled. Northern Map Turtle require high-quality water that supports the female's mollusc prey. In winter, individuals hibernate on the bottom of deep, slow-moving sections of river.	No

Family	Group	Scientific Name	Common Name	SARA Status[1]	ESA Status[2]	SRank[3]	Information Source[4]	Regulated Habitat	Habitat Requirements[2,5]	Potential Habitat in the Study Area
Kinosternidae	Turtle	*Sternotherus odoratus*	Eastern Musk Turtle	SC	SC	S3	ORAA	FALSE	Aquatic, except when laying eggs; shallow slow-moving water of lakes, streams, marshes and ponds; hibernate in underwater mud, in banks or in muskrat lodges; eggs are laid in debris or under stumps or fallen logs at waters edge; often share nest sites; sometimes congregate at hibernation sites; not readily observed.	No
Scincidae	Skink	*Plestiodon fasciatus pop. 1*	Common Five-lined Skink (Carolinian population)	END	END	S2	ORAA, NHIC	TRUE	The Carolinian population can be found under woody debris in clearings with sand dunes, open forested areas, and wetlands. They 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.	No
Viperidae	Snakes	*Sistrurus catenatus pop. 2*	Massasauga (Carolinian population)	END	END	S1	ORAA	FALSE	Use upland, old field in summer; marsh, shrub swamp or bog; rivers and streams that provide sedge or low vegetative growth; in fall and winter; hibernate underground in mammal burrows, under rotting stumps, in rock crevices.	No
Colubridae	Snakes	*Pantherophis gloydi pop. 2*	Eastern Foxsnake (Carolinian population)	END	END	S2	ORAA, MECP Reg. Habitat	TRUE	Individuals of the Carolinian population are typically 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 Foxsnake hibernate in groups, deep in the cracks of bedrock, as well as in some man-made structures. Distribution of the Carolinian population is limited to the regions of Essex-Kent and Halidimond-Norfolk, where occurrences range from the shores of Lake Huron, Lake St. Clair, to Lake Erie.	Yes
Colubridae	Snakes	*Thamnophis butleri*	Butler's Gartersnake	END	END	S2	ORAA, NHIC	FALSE	This species prefers habitats of open to early-successional areas, including old fields, disturbed sites, urban and industrial sites, rural/agricultural sites, parks, and dense grasslands or tallgrass prairie. Preferred habitat also includes areas of wet depressions surrounded by higher and drier lands, and can include small bodies of water, including seasonally dry marshes and drainage swales. Habitats require dense cover of grasses or forbs with a heavy thatch layer, and abundance of earthworms and/or leeches as prey. This species hibernates in small mammal burrows, ant mounds, loose fill or crayfish burrows, and is often be found in rock piles or old stone walls. In Canada, it occurs only in southwestern Ontario in western Essex and Lambton Counties, typically within 10 km of the Detroit River, Lake St. Clair, the St. Clair River and Lake Huron from Amherst to Point Errol, with occurrences in Skunk's Misery (Lambton and Middlesex Counties), Parkhill (Middlesex County) and Luther Marsh (Dufferin and Wellington Counties).	Yes
Mammals										

Family	Group	Scientific Name	Common Name	SARA Status[1]	ESA Status[2]	SRank[3]	Information Source[4]	Regulated Habitat	Habitat Requirements[2,5]	Potential Habitat in the Study Area
Vespertilionidae	Plain-nosed Bats	*Myotis leibii*	Eastern Small-footed Myotis	---	END	S2S3	MWH	FALSE	Roosts in caves, mine shafts, crevices or buildings that are in or near woodland; hibernates in cold dry caves or mines; maternity colonies in caves or buildings; hunts in forests.	Yes
Vespertilionidae	Plain-nosed Bats	*Myotis lucifugus*	Little Brown Myotis	END	END	S4	MWH	FALSE	Uses caves, quarries, tunnels, hollow trees or buildings for roosting; winters in humid caves; maternity sites in dark warm areas such as attics and barns; feeds primarily in wetlands, forest edges.	Yes
Vespertilionidae	Plain-nosed Bats	*Myotis septentrionalis*	Northern Myotis	END	END	S3	MWH	FALSE	Hibernates during winter in mines or caves; during summer males roost alone and females form maternity colonies of up to 60 adults; roosts in houses, manmade structures but prefers hollow trees or under loose bark; hunts within forests, below canopy.	Yes
Vespertilionidae	Plain-nosed Bats	*Pipistrellus subflavus*	Tri-colored Bat	END	END	S3?	MWH	FALSE	Can be found in a variety of forested habitats. They form day roosts and maternity colonies in older forest and occasionally in barns or other structures, and overwinter in caves. They forage over water and along streams in the forest.	Yes
Canidae	Dogs, Foxes and Wolves	*Urocyon cinereoargenteus*	Gray Fox	THR	THR	S1	MWH	FALSE	Hardwood forests with a mix of fields and woods; swamps; wooded, brushy or rocky habitats; woodland farmland edge; old fields with thickets; dens in hollow log or tree; individual has numerous winter dens throughout its range which is > 40 ha.	No
Cricetidae	Voles, Lemmings and New World Mice	*Microtus pinetorum*	Woodland Vole	SC	SC	S3?	MWH	FALSE	Mature deciduous forest in the Carolinian forest zone, with loose sandy soil and deep humus; grasslands, meadows and orchards with groundcover of duff or grass.	No
Mustelidae	Weasels and Allies	*Mustela nivalis*	Least Weasel	---	---	SU	MWH	FALSE	Grassy, brushy areas; open woodland; river bottoms; marshes; floodplains; dens in stump, log, rabbit hole or rock pile; makes food caches.	No
Mustelidae	Weasels and Allies	*Taxidea taxus jacksoni*	American Badger (Southwestern Ontario population)	END	END	---	MWH	TRUE	This species resides in open fields and forest openings, including grasslands, golf courses and the uncultivated portions of agricultural fields. Dens are often in close proximity to linear corridors, including roads, fencerows, field edges and hedgerows. The American Badger can travel long distances and occupy large home ranges of many square kilometers. A key habitat requirement for this species is friable soil, of which is required for burrowing and supporting small mammals used as prey. For the southwestern Ontario population, such soils are typically sands and loams, particularly those of the Norfolk Sand Plain. This population is located close to Lake Erie in Norfolk and Middlesex Counties.	No

Family	Group	Scientific Name	Common Name	SARA Status[1]	ESA Status[2]	SRank[3]	Information Source[4]	Regulated Habitat	Habitat Requirements[2,5]	Potential Habitat in the Study Area
Soricidae	Shrews	*Cryptotis parva*	Least Shrew	---	---	SH	MWH	FALSE	Found in mesic grasslands, marshes and meadows. Isolated population in Canada.	No
Talpidae	Moles	*Scalopus aquaticus*	Eastern Mole	SC	SC	S2	MWH	FALSE	Occurs in forests, open woodlands, meadows, pastures and fields. Prefers stone-free sand and sandy loam soil with a cover of woody plants.	Yes
Vegetation										
Smilacaceae	Dogwoods	*Smilax ecirrata*	Upright Carrionflower	---	---	S3?	NHIC	FALSE	Rich deciduous forests, moist forests, thickets along river banks and floodplains, and oak-hickory forests.	Yes
Asteraceae	Dogwoods	*Vernonia missurica*	Missouri Ironweed	---	---	S3?	NHIC	FALSE	River bottom forests, wet prairies, fens, sedge meadows, moist to dry open ground, river banks, fields, and roadsides.	Yes
Juglandaceae	Dogwoods	*Carya laciniosa*	Shellbark Hickory	---	---	S3	NHIC	FALSE	Moist to wet deciduous woods.	Yes
Onagraceae	Dogwoods	*Ludwigia polycarpa*	Many-fruit Seedbox	---	---	S2S3	NHIC	FALSE	Marshy and swampy ground, ditches and sandy excavations.	Yes
Rosaceae	Dogwoods	*Rosa setigera*	Climbing Prairie Rose	SC	SC	S3	NHIC	FALSE	Open woods, roadsides, thickets, alvars, prairies.	Yes
Oleaceae	Dogwoods	*Fraxinus profunda*	Pumpkin Ash	---	---	S2?	NHIC	FALSE	Deciduous swamps.	Yes
Cornaceae	Dogwoods	*Cornus florida*	Eastern Flowering Dogwood	END	END	S2?	MECP Reg. Habitat	TRUE	Grows under taller trees in mid-age to mature deciduous or mixed forests. Most commonly grows on floodplains, slopes, bluffs and in ravines, and is sometimes found along roadsides and fencerows.	Yes

Family	Group	Scientific Name	Common Name	SARA Status[1]	ESA Status[2]	SRank[3]	Information Source[4]	Regulated Habitat	Habitat Requirements[2,5]	Potential Habitat in the Study Area
Orchidaceae	Orchids	*Liparis liliifolia*	Purple Twayblade	THR	THR	S2	NHIC	FALSE	This orchid occurs in a variety of habitats, including: open oak woodland and savannah, mixed deciduous forest, shrub thicket, shrub alvar, deciduous swamp and coniferous plantations. Soils are typically dry to mesic, but are most commonly found growing in sandy soil conditions. Prefers partial shade, and will not tolerate full shade, and is most commonly found in areas of natural disturbances, such as areas impacted by storms or fires, of which provide sunny openings.	Yes
Orchidaceae	Orchids	*Platanthera leucophaea*	Eastern Prairie Fringed-orchid	END	END	S2	MECP Reg. Habitat	TRUE	Occurs in wetlands, fens, swamps and tallgrass prairie, as well as ditches and railroad rights of way.	Yes
Fagaceae	Beeches and Oaks	*Quercus shumardii*	Shumard Oak	---	SC	S3	NHIC	FALSE	Prefers moist soils, can grow close to water and in swampy areas. It typically grows in deciduous forest or along fencerows.	Yes
Juglandaceae	Walnuts	*Juglans cinerea*	Butternut	END	END	S3?	NHIC	TRUE	Butternut usually grows alone or in small groups in deciduous forests. It prefers moist, well-drained gravel sites and rarely on dry, rocky soil. Often grows in sunny openings and near forest edges.	Yes
Asteraceae	Asters	*Symphyotrichum praealtum*	Willowleaf Aster	THR	THR	S2	NHIC	TRUE	Found in openings of oak savannahs, and along railways, roadsides and in abandoned farm fields.	Yes
Fish										
Percidae	Fish and Eels	*Ammocrypta pellucida*	Eastern Sand Darter (Ontario populations)	THR	END	S2	MECP Reg. Habitat	FALSE	Found in Lake St. Clair, Lake Erie, West Lake, Big Creek and in the Grand, Sydenham, Thames and Detroit Rivers.	No
Esocidae	Fish and Eels	*Esox americanus vermiculatus*	Grass Pickerel	SC	SC	S3	DFO, NHIC	FALSE	Found in wetlands, ponds, slow-moving streams and shallow bays or larger lakes with warm, shallow, clear water and an abundance of aquatic plants.	No

[1]Status identified under the federal Species at Risk Act: END = Endangered, THR = Threatened, SC = Special Concern; [2]Status identified under the provincial Endangered Species Act: END = Endangered, THR = Threatened, SC = Special Concern; [3]SRank is an indicator of commonness in the Province of Ontario. A scale between 1 and 5: S4 = common and apparently secure, S3 = rare to uncommon and vulnerable, S2 = very rare and imperiled, S1 = extremely rare and critically imperiled, SU or ? = uncertain due to insufficient information, B = breeding, N = non-breeding; [4]Information sources include: CBC = Christmas Bird Count, MECP Reg. Habitat = MECP Regulated Habitat (O. Reg. 242/08), MWH = Digital Distribution Maps of the Mammals of the Western Hemisphere, version 3.0, NHIC = MNRF Natural Heritage Information Centre, OBA = Ontario Butterfly Atlas, OBBA = Ontario Breeding Bird Atlas, ORAA = Ontario Reptile and Amphibian Atlas; [5]MNRF Significant Wildlife Technical Guide – Appendix G (2000); --- denotes no information or not applicable.

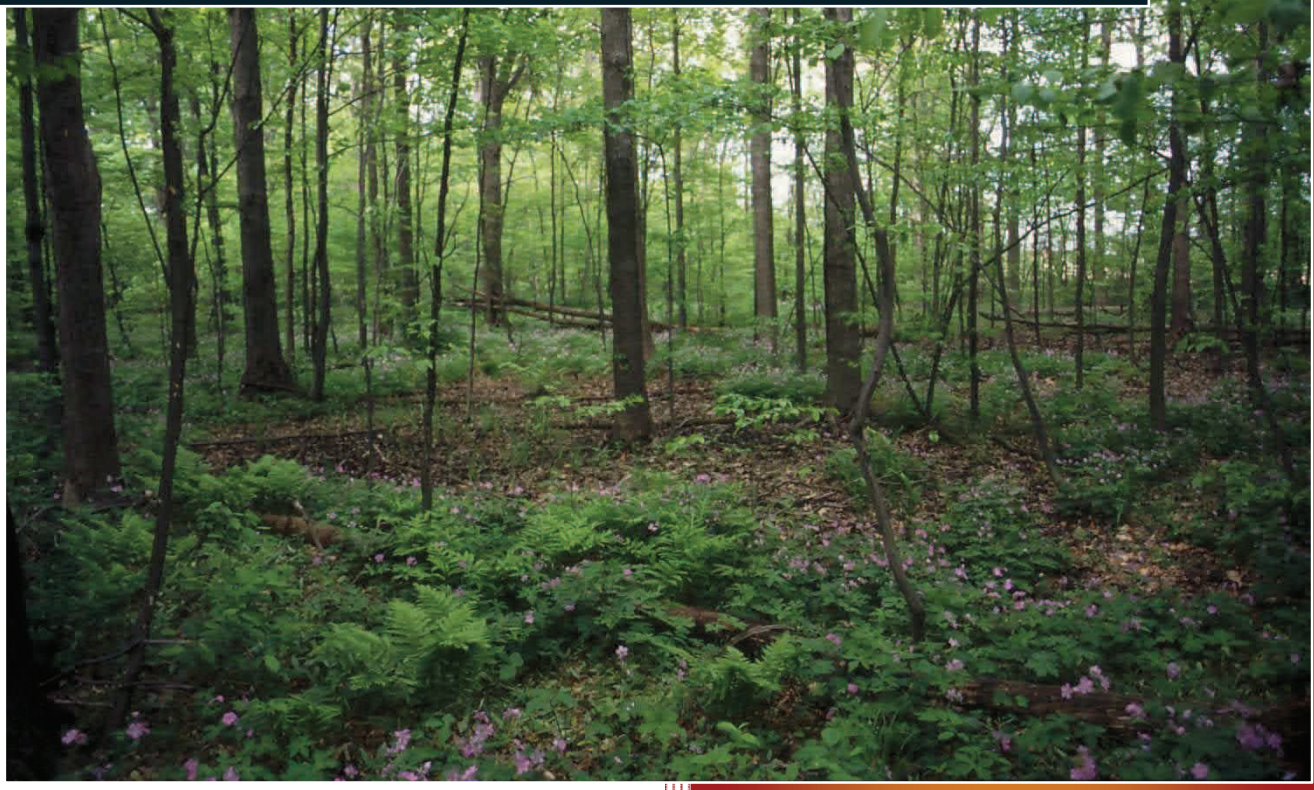
Attachment E

Tecumseth Natural Heritage Inventory

DILLON CONSULTING

2011

Town of Tecumseh Natural Heritage Inventory



Essex Region Conservation Authority

Town of Tecumseh

3/1/2011

March 1, 2011

Published by: The Essex Region Conservation Authority (ERCA)

Report prepared by: Gerry Waldron, *Consulting Ecologist*, Dan Lebedyk, *Conservation Biologist* (ERCA) and Tom Dufour, *GIS Technician* (ERCA).

Funding support provided by the Town of Tecumseh.

Copies of this report may be obtained from:

Essex Region Conservation Authority
360 Fairview Ave. W., Suite 311
Essex ON N8M 1Y6

This report may be cited as:

Essex Region Conservation Authority. 2011. Town of Tecumseh Natural Heritage Inventory. Essex, Ontario. 315 pp.

Tecumseh Natural Heritage Inventory Site #1

1. Site Location

Municipality: Town of Tecumseh
Legal Description: Lots 147 & 148, Concession 1 Petite Cote
ARN: 374457000045902, 374457000045930, 374457000041100, 374457000046900 and 374457000046950
PIN: 015670469, 752420056, 752420054, 752420153, 752420205 and 752420204
UTM Zone 17N: 344011 4685179

2. Size

3.2 hectares (7.9 acres)

3. Ownership

Private

4. General Description

Site #1 consists of two wooded parcels which closely approach each other. The easternmost parcel runs from Maynard Crescent to County Road 22. A partially mown successional field bounds the east side and an agricultural field lies along the west. The irregularly shaped western parcel lies within this field. The two parcels are separated by 16 metres of agricultural land.

The eastern parcel has been covered with fill to variable depths up to several metres. The fill contains demolition rubble. A dogwood thicket, with scattered emergent Eastern Cottonwood trees, grows on the fill.

The western parcel is in a less disturbed state, but has several shallow excavated areas. These contain ephemeral ponds. Mature trees of several species grow around the ponds and on excavated piles of soil. Swamp White Oak predominates. Ashes were formerly co-dominant.

The site's soils are classified as Brookston Clay Sand Spot Phase.

5. Evaluation Criteria Fulfilled

Evaluation analyses have determined that the natural heritage feature has fulfilled the following 1 out of 10 evaluation criteria.

Criterion No. 8 – Significant Species

The following significant floral species were observed:

Scientific Name	Common Name	GRank	SRank	COSEWIC	COSSARO
Fraxinus profunda	Pumpkin Ash	G3G4	S2		
Ludwigia polycarpa	False Loosestrife	G4	S2S3		
Rosa setigera	Prairie Rose	G5	S3	SC	SC
Vernonia missurica	Missouri Ironweed	G4G5	S3?		

The following significant faunal species were observed:

The Significant Fauna Summary includes breeding species and the species that use the site in large numbers for an extended period of time. Migrants and occasional visitors are not included as significant fauna.

Common Name	SRank	COSEWIC COSSARO	Essex Breeding Status	Partners in Flight Level of Concern	Other Significance
Baltimore Oriole	S4	-	Common Widespread	Regional Concern Regional Stewardship	-

6. Comments

These heavily disturbed areas, one covered with fill and the other partially excavated, fulfill only one of the evaluation criteria, yet they are the only sizable semi-natural areas north of McAuliffe Woods Conservation Area in the Town of Tecumseh.

7. Floral Inventory

Surveyors: G. Waldron and P. Hurst
Field Dates: June 2, November 2, 2009

SCIENTIFIC NAME	COMMON NAME	GRank	SRank	COSEWIC	COSSARO
Acalypha rhomboidea	Three-seeded Mercury	G5	S5		
Acer negundo	Manitoba Maple	G5	S5		
ACER PLATANOIDES	Norway Maple	GNR	SNA		
Acer saccharinum	Silver Maple	G5	S5		
Achillea millefolium	Yarrow	G5	S5		
Agrimonia parviflora	Swamp Agrimony	G5	S4		
AGROSTIS GIGANTEA	Redtop	G4G5	SNA		
Agrostis stolonifera	Creeping Bent	G5	S5		
Alisma plantago-aquatica	Water-plantain	G5	S5		
ALLIARIA PETIOLATA	Garlic Mustard	GNR	SNA		
Anemone virginiana	Thimbleweed	G5	S5		
ARCTIUM MINUS	Common Burdock	GNR	SNA		
Asclepias incarnate	Swamp Milkweed	G5	S5		
Asclepias syriaca	Common Milkweed	G5	S5		
ASPARAGUS OFFICINALIS	Asparagus	G5	SNA		
Aster lanceolatus	Eastern Lined Aster	G5	S5		
Aster lateriflorus	Calico Aster	G5	S5		
Aster novae-angliae	New England Aster	G5	S5		
Aster pilosus	Hairy Aster	G5	S5		
Barbarea verna	Early Winter Cress				
Bidens frondosa	Common Beggar-ticks	G5	S5		
Bidens vulgate	Tall Beggar-ticks	G5	S5		
BRASSICA KABER	Wild Mustard				
BROMUS INERMIS SSP. INERMIS	Smooth Brome	G5	S5		
Carex blanda	Woodland Sedge	G5?	S5		
Carex cristatella	Crested Sedge	G5	S5		
Carex granularis	Meadow Sedge	G5	S5		
Carex hyalinolepis	Hyaline-scaled Sedge	G4G5	S4		

SCIENTIFIC NAME	COMMON NAME	GRank	SRank	COSEWIC	COSSARO
Carex lupulina	Hop Sedge	G5	S5		
Carex normalis	Larger Straw Sedge	G5	S4		
Carex tenera	Straw Sedge	G5	S5		
Carex tribuloides	Blunt Broom Sedge	G5	S4S5		
Carex vulpinoidea	Fox Sedge	G5	S5		
Cephalanthus occidentalis	Buttonbush	G5	S5		
CERASTIUM FONTANUM	Mouse-ear Chickweed	GNR	SNA		
Chelone glabra	Turtlehead	G5	S5		
Cicuta maculate	Spotted Water Hemlock	G5	S5		
Circaea lutetiana	Enchanter's Nightshade	G5	S5		
CIRSIUM ARVENSE	Canada Thistle	GNR	SNA		
CIRSIUM VULGARE	Bull Thistle	GNR	SNA		
Cornus amomum	Silky Dogwood	G5	S5		
Cornus drummondii	Rough-leaved Dogwood	G5	S4		
Cornus foemina	Gray Dogwood	G5	S5		
Crataegus mollis	Downy Hawthorn	G5	S5		
DACTYLIS GLOMERATA	Orchard Grass	GNR	SNA		
Elymus virginicus	Virginia Wild Rye	G5	S5		
EPIPACTIS HELLEBORINE	Helleborine	GNR	SNA		
Equisetum arvense	Common Horsetail	G5	S5		
Erigeron philadelphicus	Marsh Fleabane	G5	S5		
Euthamia graminifolia	Grass-leaved Goldenrod	G5	S5		
FESTUCA PRATENSIS	Meadow Fescue	G5	S5		
Fragaria virginiana	Wild Strawberry	G5	SU		
Fraxinus pennsylvanica	Red Ash	G5	S5		
Fraxinus profunda	Pumpkin Ash	G4	S2		
Galium aparine	Annual Bedstraw	G5	S5		
Geum aleppicum	Yellow Avens	G5	S5		
Geum canadense	White Avens	G5	S5		
Geum laciniatum	Rough Avens	G5	S4		
GLECHOMA HEDERACEA	Ground Ivy	GNR	SNA		
Glyceria striata	Fowl Manna Grass	G5	S5		
HEMEROCALLIS FULVA	Orange Day-lily	GNR	SNA		
HEMEROCALLIS LILIOASPHODELUS	Yellow Day-lily	GNR	SNA		
IRIS GERMANICA	Garden Iris	GNR	SNA		
Juglans nigra	Black Walnut	G5	S4		
Juncus tenuis	Path Rush	G5	S5		
Juniperus virginiana	Red Cedar	G5	S5		
LIGUSTRUM VULGARE	Common Privet	GNR	SNA		
LONICERA TATARICA	Tartarian Honeysuckle	GNR	SNA		
LOTUS CORNICULATA	Birdfoot Trefoil	GNR	SNA		
Ludwigia polycarpa	False Loosestrife	G4	S2S3		
LYCHNIS ALBA	White mullein				
MELILOTUS OFFICINALIS	Yellow Sweet Clover	GNR	SNA		
MORUS ALBA	White Mulberry	GNR	SNA		
NEPETA CATARIA	Catnip	GNR	SNA		
Oxalis stricta	Yellow Wood-sorrel	G5	S5		
Penthorum sedoides	Ditch Stonecrop	G5	S5		
Poa compressa	Canada Bluegrass	GNR	SNA		
Poa palustris	Fowl Meadow Grass	G5	S5		
Poa pratensis	Kentucky Bluegrass	G5	S5		

SCIENTIFIC NAME	COMMON NAME	GRank	SRank	COSEWIC	COSSARO
Podophyllum peltatum	May Apple	G5	S5		
Polygonum pensylvanicum	Pinkweed	G5	S5		
Populus deltoides	Cottonwood	G5	S5		
Populus tremuloides	Trembling Aspen	G5	S5		
PRUNUS DOMESTICA	Common Plum	GNR	SNA		
Prunus serotina	Wild Black Cherry	G5	S5		
Quercus bicolor	Swamp White Oak	G5	S4		
Quercus palustris	Pin Oak	G5	S4		
Rhus typhina	Staghorn Sumac	G5	S5		
Ribes americanum	Wild Black Currant	G5	S5		
ROBINIA PSEUDOACACIA	Black Locust	G5	SNA		
Rosa blanda	Wild Rose	G5	S5		
ROSA CANINA	Dog Rose	GNR	SNA		
ROSA MULTIFLORA	Multiflora Rose	GNR	SNA		
Rosa palustris	Swamp Rose	G5	S5		
Rosa setigera	Prairie Rose	G5	S3	SC	SC
Rubus allegheniensis	Common Blackberry	G5	S5		
Rubus flagellaris	Northern Dewberry	G5	S4		
Rubus occidentalis	Black Raspberry	G5	S5		
RUMEX ACETOSELLA	Sheep or Red Sorrel	GNR	SNA		
SALIX ALBA	White Willow	G5	SNA		
Salix amygdaloides	Peach-leaved Willow	G5	S5		
Salix exigua	Sandbar Willow	G5	S5		
SALIX FRAGILIS	Crack Willow	GNR	SNA		
Sambucus canadensis	Elderberry	G5	S5		
Sanicula Spp.					
Scirpus atrovirens	Dark-green Bulrush	G5?	S5		
Scutellaria lateriflora	Mad-dog Skullcap	G5	S5		
SEDUM TELEPHIUM	Live Forever	GNR	SNA		
Smilax lasioneura	Carrion-flower	G5	S4		
SOLANUM DULCAMARA	Bittersweet Nightshade	GNR	SNA		
Solanum ptycanthum	Eastern Black Nightshade	G5	S5		
SONCHUS ARVENSIS	Perennial Sow Thistle	GNR	SNA		
Typha angustifolia	Narrow-leaved Cat-tail	G5	SNA		
Typha x glauca	Hybrid Cat-tail	GNA	SNA		
Ulmus americana	White Elm	G5?	S5		
Ulmus rubra	Red or Slippery Elm	G5	S5		
Verbena urticifolia	White Vervain	G5	S5		
Vernonia missurica	Missouri Ironweed	G4G5	S3?		
Viburnum lentago	Nannyberry	G5	S5		
VIBURNUM OPULUS	European Highbush Cranberry	G5	SNA		
VIOLA ODORATA	Sweet Violet	GNR	SNA		
Vitis riparia	Riverbank Grape	G5	S5		
Xanthium strumarium	Common Cocklebur	G5	S5		

8. Faunal Inventory

Surveyors: Dave Martin, Linda Wladarski
Field Date: June 29, 2009

Birds

Common Name	# Individuals or Territories / Breeding Evidence	SRank	COSEWIC/ COSSARO designation	Essex Breeding Status % squares	Partners in Flight Level of Concern	Other Significance
Red-tailed Hawk	2 A	S5	NAR NAR	Common Widespread 75%	-	-
Downy Woodpecker	1 SH	S5	-	Common Widespread 89%	-	-
Warbling Vireo	2 SM	S5	-	Common Widespread 81%	-	-
Blue Jay	1 SH	S5	-	Common Widespread 83%	-	-
House Wren	1 SM	S5	-	Common Widespread 86%	-	-
American Robin	11 SH	S5	-	Common Widespread 89%	-	-
Gray Catbird	6 SM	S4	-	Common Widespread 81%	-	-
Cedar Waxwing	1 SM	S5	-	Common Widespread 89%	-	-
Yellow Warbler	2 SM	S5	-	Common Widespread 86%	-	-
American Redstart	1 SM	S5	-	Uncommon Widespread 29%	-	Area Sensitive
Song Sparrow	3 SM	S5	-	Common Widespread 83%	-	-
Indigo Bunting	1 SM	S4	-	Common Widespread 78%	-	-
Baltimore Oriole	1 SM	S4	-	Common Widespread 94%	Regional Concern Regional Stewardship	-
American Goldfinch	1 SM	S5	-	Common Widespread 86%	-	-

Breeding evidence codes: SH = suitable habitat, SM = singing male, T = territory, P = pair, A = agitated behaviour, N = nest building or excavation of nest hole, V = visiting probable nest site, AE = adult entering presumed active nest hole, FY = fledged young, CF = carrying food, NE = nest with eggs, NY = Nest with young. SNA = Exotic, non-native species.

Mammals

Common Name	Evidence/# Individuals	SRank	COSEWIC COSSARO	Essex Status	Other Significance
Eastern Gray Squirrel	1	S5	-	Common Widespread	-
Northern Raccoon	1	S5	-	Common Widespread	-

Reptiles

No reptiles were observed.

Amphibians

Common Name	Evidence/# Individuals	SRank	COSEWIC COSSARO	Essex Status	Other Significance
American Toad	1	S5	-	Common Widespread	-

Butterflies

Common Name	Evidence/# Individuals	SRank	COSEWIC COSSARO	Essex Status	Other Significance
Silver-spotted Skipper	3	S4	-	Common Widespread	-
Eastern Tiger Swallowtail	1	S5	-	Common Widespread	-
Cabbage White	6	SNA	-	Common Widespread	-
Clouded Sulphur	1	S5	-	Common Widespread	-
Summer Azure	1	S5	-	Common Widespread	-

Odonata

Common Name	Evidence/# Individuals	SRank	COSEWIC COSSARO	Essex Status	Other Significance
Common Whitetail	2	S5	-	Common	-
Twelve-spotted Skimmer	1	S5	-	Common	-

9. Restoration and Enhancement Opportunities

No specific habitat restoration recommendations, as proposed in the Biodiversity Conservation Strategy (BCS), are noted for this site. However, restoration of agricultural lands between the two disjunct natural features would effectively link the two remnants, increase the size of the ultimate feature and reduce the amount of edge habitat.

Town of Tecumseh
Natural Heritage Inventory
Ecological Land Classification (ELC) Mapping

Site 1

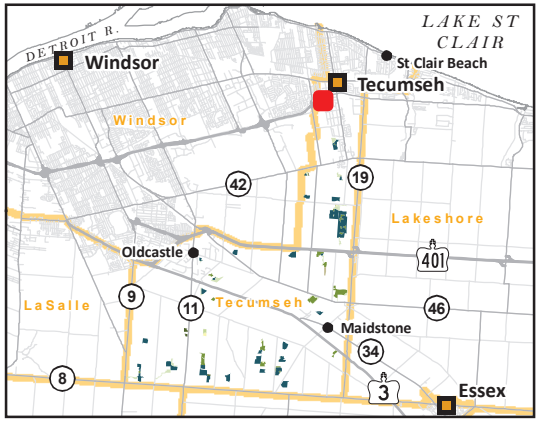
Legend

- Extent of Ecological Land Classification (ELC) Mapping
- Vegetation Community Boundary*
- ELC Site Boundary

**Vegetation Community Code descriptions may be found under 'Criteria No. 7 - Diversity' section of the site report. Community Codes highlighted with a red halo (ex. SAF_1-2) denote provincially rare vegetation communities (S Rank).*

Community Class

Meadow, Thicket, Savanna, Woodland, Forest, Plantation/Park, Swamp



0 25 50 100 Meters

0 75 150 300 Feet

1:2,500

Data Sources: ERCA field surveys, Spring 2008 aerial photography
Aerial photo copyright the Corporation of the County of Essex, 2008

Source: \\swp\Projects\ERCA Projects\Natural Heritage Mapping\Municipal Projects\Tecumseh\Site Report Maps\Tecumseh CNHS - Site Report Map - Dec 2010.mxd
TD 20/12/2010

Tecumseh Natural Heritage Inventory Sites #2 & 3

1. Site Location

Municipality: Town of Tecumseh
Legal Description: Lots 148, 149 and 150, Concession 3 Petite Cote
ARN: 374457000030900, 374457000031000, 374457000031100, 374457000031200, 374457000031300, 374457000031400, 374457000031500, 374457000031600, 374457000033930, 374457000034000 and 374459000000500
PIN: 752400073, 752400074, 752400086, 752400090, 752400091, 752400092, 752400093, 752400094, 752400095, 752400096,752400097, 752400099, 752400105, 752400106, 752400107 and 752400136
UTM Zone 17N: 344551 4683230

2. Size

11.8 hectares (29.1 acres)

3. Ownership

Private and Public (ERCA, Town of Tecumseh)

4. General Description

Study Sites 2 and 3 are contiguous natural areas divided only by an east-west hydro transmission corridor. They are bounded on the west by agricultural fields, on the south by school playing fields, on the north by a railway line and on the east by a mix of abandoned fields, residential lots and a parking area.

Site #3 is a Conservation Area (McAuliffe Woods C.A.) managed by the Town of Tecumseh. There is a system of wide trails through the site. More than half of Site #3 is mature oak woodland. The slight elevations are dominated by White Oak. Beech, Red Maple, Black Cherry and Ironwood are also found on these elevations. The lower areas are dominated by an oak-hickory mix of Swamp White Oak, Pin Oak, Shumard Oak, Shagbark Hickory and Shellbark Hickory. White Elm is dominant in the understorey.

The south end of Site #3 and most of Site #2, except for the eastern portion, supports a successional hawthorn thicket with scattered young trees of Pin Oak, Silver Maple and other species. In the extreme north, the herbaceous openings within the thicket coalesce into larger areas with scattered shrubs and trees.

Along the west side of the site there is an open drain; shallow internal drains are found within Site #3. The collected water is conveyed westward across agricultural fields to the Little River. A dug stock watering pond is located near the middle of Site #3. None of the area appears to have been cultivated and pit and mound topography is evident despite the strong possibility of past grazing. The soils are classified as Brookston Clay Sand Spot Phase.

5. Evaluation Criteria Fulfilled

Evaluation analyses have determined that the natural heritage feature has fulfilled the following 5 out of 10 evaluation criteria.

Criterion No. 2 – Significant Habitat of Endangered/Threatened Species
The site contains one or more species which are listed as either Endangered or Threatened under the *Ontario Endangered Species Act*. Details regarding this assessment are considered confidential information. For further information, please consult with the Ontario Ministry of Natural Resources.

Criterion No. 3 – Significant Woodland
The wooded area of Site #3 is greater than two hectares.

Criterion No. 6 – Ecological Function
The sites provide the services of water retention, water purification and, because of the sand spots, possibly groundwater recharge. This water eventually flows to the Little River.

Criterion No. 7 – Diversity
The site supports three plant communities. Additionally, the hawthorn thicket community exhibits variably aged stages of succession. There are ephemeral ponds of diverse duration. The slight changes in elevation and soil type provide poorly drained and well drained sites. Fallen and standing deadwood are present.

Criterion No. 8 – Significant Species

The following significant floral species were observed:

Scientific Name	Common Name	GRank	SRank	COSEWIC	COSSARO
Carya laciniosa	Shellbark Hickory	G5	S3		
Quercus shumardii	Shumard Oak	G5	S3	SC	SC
Rosa setigera	Prairie Rose	G5	S3	SC	SC
Smilax ecirrhata	Upright Greenbriar	G5?	S3?		
Vernonia missurica	Missouri Ironweed	G4G5	S3?		

The following significant faunal species were observed:

The Significant Fauna Summary includes breeding species and the species that use the site in large numbers for an extended period of time. Migrants and occasional visitors are not included as significant fauna.

Site #2

Common Name	SRank	COSEWIC COSSARO	Essex Breeding Status	Partners in Flight Level of Concern	Other Significance
Cooper's Hawk	S4	NAR NAR	Common Widespread	-	Area Sensitive

Common Name	SRank	COSEWIC COSSARO	Essex Breeding Status	Partners in Flight Level of Concern	Other Significance
Willow Flycatcher	S5	-	Uncommon Widespread	Continental Concern	-

Site #3

Common Name	SRank	COSEWIC COSSARO	Essex Breeding Status	Partners in Flight Level of Concern	Other Significance
Cooper's Hawk	S4	NAR NAR	Common Widespread	-	Area Sensitive
Northern Flicker	S4	-	Common Widespread	Regional Concern	-
Blue-gray Gnatcatcher	S4	-	Uncommon Widespread	-	Area Sensitive

6. Comments

The fact that these sites are contiguous, separated only by a vegetated hydro corridor, suggests that they be treated as a single unit. The northern site has, however, been subjected to greater disturbance and may have been largely cleared of trees at one point. Three hydro lines traverse the area. Site #3 has recently been developed into an urban park with wide hard-surfaced trails and an associated paved parking lot.

7. Floral Inventory

Surveyors: G. Waldron and P. Hurst.
Field Dates: June 2, November 3, 2009

SCIENTIFIC NAME	COMMON NAME	GRank	SRank	COSEWIC	COSSARO
Acalypha rhomboidea	Three-seeded Mercury	G5	S5		
Acer x freemanii	Freeman's Maple	GNA	SNR		
Acer negundo	Manitoba Maple	G5	S5		
Acer rubrum	Red Maple	G5	S5		
Acer saccharinum	Silver Maple	G5	S5		
Achillea millefolium	Yarrow	G5	S5		
Agrimonia parviflora	Swamp Agrimony	G5	S4		
AGROSTIS GIGANTEA	Redtop	G4G5	SNA		
Agrostis stolonifera	Creeping Bent	G5	S5		
Alisma plantago-aquatica	Water-plantain	G5	S5		
ALLIARIA PETIOLATA	Garlic Mustard	GNR	SNA		
Allium canadense	Wild Garlic	G5	S5		
Apocynum cannabinum	Hemp Dogbane	G5	S5		
Arisaema triphyllum	Jack-in-the-pulpit	G5	S5		
ASPARAGUS OFFICINALIS	Asparagus	G5	SNA		
Aster ericoides	Heath Aster	G5	S5		
Aster lanceolatus	Eastern Lined Aster	G5	S5		
Aster lateriflorus	Calico Aster	G5	S5		
Aster novae-angliae	New England Aster	G5	S5		
Aster pilosus	Hairy Aster	G5	S5		
Bidens frondosa	Common Beggar-ticks	G5	S5		

SCIENTIFIC NAME	COMMON NAME	GRank	SRank	COSEWIC	COSSARO
BROMUS INERMIS SSP. INERMIS	Smooth Brome	G5	S5		
Carex albursina	White Bear Sedge	G5	S5		
Carex blanda	Woodland Sedge	G5?	S5		
Carex gracillima	Graceful Sedge	G5	S5		
Carex granularis	Meadow Sedge	G5	S5		
Carex grayi	Gray's Sedge	G4	S4		
Carex hyalinolepis	Hyaline-scaled Sedge	G4G5	S4		
Carex lupulina	Hop Sedge	G5	S5		
Carex molesta	Troublesome Sedge	G4	S4?		
Carex pensylvanica	Pennsylvania Sedge	G5	S5		
Carex radiata	Radiate Sedge	G4	S4		
Carex swanii	Swan's Sedge	G5	S4		
Carex tenera	Straw Sedge	G5	S5		
Carex vulpinoidea	Fox Sedge	G5	S5		
Carpinus caroliniana	Blue Beech	G5	S5		
Carya cordiformis	Bitternut Hickory	G5	S5		
Carya laciniosa	Shellbark Hickory	G5	S3		
Carya ovata	Shagbark Hickory	G5	S5		
CATALPA BIGNONIOIDES	Southern Catalpa	G3G4	SNA		
CERASTIUM FONTANUM	Mouse-ear Chickweed	GNR	SNA		
Circaea lutetiana	Enchanter's Nightshade	G5	S5		
CIRSIUM ARVENSE	Canada Thistle	GNR	SNA		
CIRSIUM VULGARE	Bull Thistle	GNR	SNA		
Cornus amomum	Silky Dogwood	G5	S5		
Cornus drummondii	Rough-leaved Dogwood	G5	S4		
Cornus foemina	Gray Dogwood	G5	S5		
Crataegus crus-galli	Cockspur Thorn	G5	S5		
Crataegus mollis	Downy Hawthorn	G5	S5		
Crataegus pruinosa	Waxy-fruited Hawthorn	G5	S4?		
Crataegus punctata	Dotted Hawthorn	G5	S5		
DACTYLIS GLOMERATA	Orchard Grass	GNR	SNA		
DAUCUS CAROTA	Wild Carrot	GNR	SNA		
DIPSACUS FULLONUM	Fuller's Teasel	GNR	SNA		
ELAEAGNUS ANGUSTIFOLIA	Russian Olive	GNR	SNA		
ELAEAGNUS UMBELLATA	Autumn Olive	GNR	SNA		
ELYMUS REPENS	Quack Grass	GNR	SNA		
Epilobium ciliatum ssp. ciliatum	Willow-herb	G5	S5		
Erigeron philadelphicus	Marsh Fleabane	G5	S5		
Erigeron strigosus	Daisy Fleabane	G5	S5		
Erythronium americanum	Yellow Trout Lily	G5	S5		
Euthamia graminifolia	Grass-leaved Goldenrod	G5	S5		
FESTUCA ARUNDINACEA	Tall Fescue	GNA	SNA		
Fragaria virginiana	Wild Strawberry	G5	SU		
Fraxinus pennsylvanica	Red Ash	G5	S5		
Galium palustre	Marsh Bedstraw	G5	S5		
Gentianopsis crinita	Fringed Gentian	G4	S4		
Geranium maculatum	Wild Geranium	G5	S5		
Geum aleppicum	Yellow Avens	G5	S5		
Geum canadense	White Avens	G5	S5		
Geum vernum	Spring Avens	G5	S4		
Glyceria striata	Fowl Manna Grass	G5	S5		

SCIENTIFIC NAME	COMMON NAME	GRank	SRank	COSEWIC	COSSARO
HIERACIUM CAESPITOSUM	King-devil	GNR	SNA		
Juncus effusus	Soft-stemmed Rush	G5	S5		
Juncus tenuis	Path Rush	G5	S5		
Juncus torreyi	Torrey's Rush	G5	S5		
Juniperus virginiana	Red Cedar	G5	S5		
LIGUSTRUM VULGARE	Common Privet	GNR	SNA		
Lobelia inflata	Indian Tobacco	G5	S5		
LONICERA JAPONICA	Japanese Honeysuckle	GNR	SNA		
LONICERA MAACKII	Amur Honeysuckle	GNR	SNA		
LONICERA TATARICA	Tartarian Honeysuckle	GNR	SNA		
LOTUS CORNICULATA	Birdfoot Trefoil	GNR	SNA		
Lycopus americanus	Common Water Horehound	G5	S5		
LYCOPUS EUROPAEUS	European Water Horehound	GNR	SNA		
LYSIMACHIA NUMMULARIA	Moneywort	GNR	SNA		
LYTHRUM SALICARIA	Purple Loosestrife	GNR	SNA		
Maianthemum canadense	Wild Lily-of-the-valley	G5	S5		
Maianthemum racemosum	False Spikenard	G5	S5		
MALUS BACCATA	Siberian Crab	GNR	SNA		
Malus coronaria	Wild Crab	G5	S4		
MALUS PUMILA	Apple	G5	SNA		
MORUS ALBA	White Mulberry	GNR	SNA		
Muhlenbergia frondosa	Common Satin Grass	G5	S4		
Onoclea sensibilis	Sensitive Fern	G5	S5		
Ostrya virginiana	Ironwood	G5	S5		
Panicum accuminatum	Accuminate Panic Grass	G5	S5		
Parthenocissus inserta	Thicket Creeper	G5	S5		
Penthorum sedoides	Ditch Stonecrop	G5	S5		
Phalaris arundinacea	Reed Canary Grass	G5	S5		
PHLEUM PRATENSE	Timothy Grass	GNR	SNA		
Phragmites australis	Reed Grass	G5	S5		
Picea glauca	White Spruce	G5	S5		
PLANTAGO LANCEOLATA	English Plantain;Ribgrass	G5	SNA		
Plantago rugelii	Rugel's Plantain	G5	SNA		
Platanus occidentalis	Sycamore	G5	S4		
Poa compressa	Canada Bluegrass	GNR	SNA		
Poa palustris	Fowl Meadow Grass	G5	S5		
Poa pratensis	Kentucky Bluegrass	G5	S5		
Podophyllum peltatum	May Apple	G5	S5		
Polygonatum pubescens	Downy Solomon's Seal	G5	S5		
Polygonum punctatum	Water Smartweed	G5	S5		
Polygonum virginianum	Jumpseed	G5	S4		
POPULUS ALBA	White or Silver Poplar	G5	SNA		
Populus deltoides	Cottonwood	G5	S5		
Populus tremuloides	Trembling Aspen	G5	S5		
Potentilla simplex	Old-field Cinquefoil	G5	S5		
Prunella vulgaris	Heal-all	G5	S5		
Prunus americana	American Wild Plum	G5	S4		
Prunus serotina	Wild Black Cherry	G5	S5		
Prunus virginiana	Choke Cherry	G5	S5		
PYRUS COMMUNIS	Pear	G5	SNA		

SCIENTIFIC NAME	COMMON NAME	GRank	SRank	COSEWIC	COSSARO
Quercus alba	White Oak	G5	S5		
Quercus bicolor	Swamp White Oak	G5	S4		
Quercus palustris	Pin Oak	G5	S4		
Quercus shumardii	Shumard Oak	G5	S3	SC	SC
Ranunculus abortivus	Small-flowered Buttercup	G5	S5		
Ranunculus sceleratus	Cursed Crowfoot	G5	S5		
RHAMNUS CATHARTICA	Common Buckthorn	GNR	SNA		
RHAMNUS FRANGULA	Glossy Buckthorn	GNR	SNA		
Rhus glabra	Smooth Sumac	G5	S5		
Rhus typhina	Staghorn Sumac	G5	S5		
Ribes americanum	Wild Black Currant	G5	S5		
RIBES NIGRUM	Black Currant	GNR	SNA		
Rosa carolina	Pasture Rose	G4G5	S4		
ROSA MULTIFLORA	Multiflora Rose	GNR	SNA		
Rosa palustris	Swamp Rose	G5	S5		
Rosa setigera	Prairie Rose	G5	S3	SC	SC
Rubus allegheniensis	Common Blackberry	G5	S5		
Rubus flagellaris	Northern Dewberry	G5	S4		
Rubus idaeus	Wild Red Raspberry	G5	S5		
Rubus occidentalis	Black Raspberry	G5	S5		
RUMEX CRISPUS	Curly Dock	GNR	SNA		
SALIX ALBA	White Willow	G5	SNA		
Salix eriocephala	Missouri Willow	G5	S5		
Salix exigua	Sandbar Willow	G5	S5		
SALIX FRAGILIS	Crack Willow	GNR	SNA		
Sambucus canadensis	Elderberry	G5	S5		
Sanicula odorata (S. gregaria)	Clustered Snakeroot	G5	S5		
Scirpus atrovirens	Dark-green Bulrush	G5?	S5		
Scirpus pendulus	Nodding Bulrush	G5	S5		
Smilax ecirrhata	Upright Carrion-flower	G5?	S3?		
Smilax hispida	Bristly Green Brier	G5Q	S4		
Solidago altissima	Tall Goldenrod	G5	S5		
Solidago canadensis	Canada Goldenrod	G5	S5		
SONCHUS ARVENSIS	Perennial Sow Thistle	GNR	SNA		
TARAXACUM OFFICINALE	Common Dandelion	G5	SNA		
Ulmus americana	White Elm	G5?	S5		
Verbena hastata	Blue Vervain	G5	S5		
Verbena urticifolia	White Vervain	G5	S5		
Vernonia missurica	Missouri Ironweed	G4G5	S3?		
Viburnum lentago	Nannyberry	G5	S5		
VIBURNUM OPULUS	European Highbush Cranberry	G5	SNA		
Viburnum rafinesquianum	Downy Arrow-wood	G5	S5		
Viola pubescens	Yellow Violet	G5	S5		
Viola sororia	Common Blue Violet	G5	S5		
Vitis riparia	Riverbank Grape	G5	S5		
Xanthium strumarium	Common Cocklebur	G5	S5		
Zanthoxylum americanum	Prickly-ash	G5	S5		

8. Faunal Inventory

Surveyors: Dave Martin, Linda Wladarski
Field Dates: June 29, 2009

Site #2

Birds

Common Name	# Individuals or Territories / Breeding Evidence	SRank	COSEWIC/ COSSARO designation	Essex Breeding Status % squares	Partners in Flight Level of Concern	Other Significance
Cooper's Hawk	1 A	S4	NAR NAR	Common Widespread 78%	-	Area Sensitive
Mourning Dove	1 SH	S5	-	Common Widespread 86%	-	-
Willow Flycatcher	1 SM	S5	-	Uncommon Widespread 67%	Continental Concern	-
Blue Jay	4 SH	S5	-	Common Widespread 83%	-	-
American Robin	1 SM	S5	-	Common Widespread 89%	-	-
Gray Catbird	4 SM	S4	-	Common Widespread 81%	-	-
Yellow Warbler	1 SM	S5	-	Common Widespread 86%	-	-
Song Sparrow	1 SM	S5	-	Common Widespread 83%	-	-
Indigo Bunting	1 SM	S4	-	Common Widespread 78%	-	-
Red-winged Blackbird	6 SH	S5	-	Abundant Widespread 94%	-	-
Common Grackle	1 SH	S5	-	Abundant Widespread 94%	-	-
Brown-headed Cowbird	1 SH	S4	-	Common Widespread 83%	-	-
American Goldfinch	5 SM	S5	-	Common Widespread 86%	-	-

Breeding evidence codes: SH = suitable habitat, SM = singing male, T = territory, P = pair, A = agitated behaviour, N = nest building or excavation of nest hole, V = visiting probable nest site, AE = adult entering presumed active nest hole, FY = fledged young, CF = carrying food, NE = nest with eggs, NY = Nest with young. SNA = Exotic, non-native species.

Mammals

Common Name	Evidence/# Individuals	SRank	COSEWIC COSSARO	Essex Status	Other Significance
Eastern Cottontail	1	S5	-	Common Widespread	-
White-tailed Deer	Tracks	S5	-	Common Widespread	-

Reptiles

No reptiles were observed.

Amphibians

No amphibians were observed.

Butterflies

Common Name	Evidence/# Individuals	SRank	COSEWIC COSSARO	Essex Status	Other Significance
Silver-spotted Skipper	2	S4	-	Common Widespread	-
European Skipper	1	SNA	-	Common Widespread	-
Eastern Tiger Swallowtail	1	S5	-	Common Widespread	-
Cabbage White	4	SNA	-	Common Widespread	-
Clouded Sulphur	1	S5	-	Common Widespread	-
Eyed Brown	1	S5	-	Locally common	-
Little Wood-Satyr	1	S5	-	Common Widespread	-

Odonata

Common Name	Evidence/# Individuals	SRank	COSEWIC COSSARO	Essex Status	Other Significance
Common Whitetail	1	S5	-	Common	-
Twelve-spotted Skimmer	2	S5	-	Common	-

Site #3

Birds

Common Name	# Individuals or Territories / Breeding Evidence	SRank	COSEWIC/ COSSARO designation	Essex Breeding Status % squares	Partners in Flight Level of Concern	Other Significance
Cooper's Hawk	1 SH	S4	NAR NAR	Common Widespread 78%	-	Area Sensitive
Ruby-throated Hummingbird	2 SH	S5	-	Common Widespread 67%	-	-
Downy Woodpecker	1 SH	S5	-	Common Widespread 89%	-	-
Northern Flicker	1 SH	S4	-	Common Widespread 89%	Regional Concern	-
Red-eyed Vireo	5 SM	S5	-	Common Widespread 86%	-	-
Black-capped Chickadee	1 SM	S5	-	Common Widespread 67%	-	-
Blue-gray Gnatcatcher	1 SM	S4	-	Uncommon Widespread 45%	-	Area Sensitive
American Robin	2 SH	S5	-	Common Widespread 89%	-	-
Song Sparrow	2 SM	S5	-	Common Widespread 83%	-	-
Northern Cardinal	3 SM	S5	-	Common Widespread 94%	-	-
Indigo Bunting	2 SM	S4	-	Common Widespread 78%	-	-
American Goldfinch	1 SM	S5	-	Common Widespread 86%	-	-

Breeding evidence codes: SH = suitable habitat, SM = singing male, T = territory, P = pair, A = agitated behaviour, N = nest building or excavation of nest hole, V = visiting probable nest site, AE = adult entering presumed active nest hole, FY = fledged young, CF = carrying food, NE = nest with eggs, NY = Nest with young. SNA = Exotic, non-native species.

Mammals

Common Name	Evidence/# Individuals	SRank	COSEWIC COSSARO	Essex Status	Other Significance
Eastern Gray Squirrel	3	S5	-	Common Widespread	-

Reptiles

No reptiles were observed.

Amphibians

No amphibians were observed.

Butterflies

Common Name	Evidence/# Individuals	SRank	COSEWIC COSSARO	Essex Status	Other Significance
Red-spotted Purple	1	S5	-	Common Widespread	-

Odonata

No dragonflies or damselflies were observed.

9. Restoration and Enhancement Opportunities

Habitat restoration, as proposed in the Biodiversity Conservation Strategy (BCS) for this site, includes 30 metre wide riparian restoration on both sides of the Desjardins Drain. This would facilitate linkage between Sites #2 and #3 with the Little River to the west.

Town of Tecumseh
Natural Heritage Inventory
Ecological Land Classification (ELC) Mapping

Site 2/3

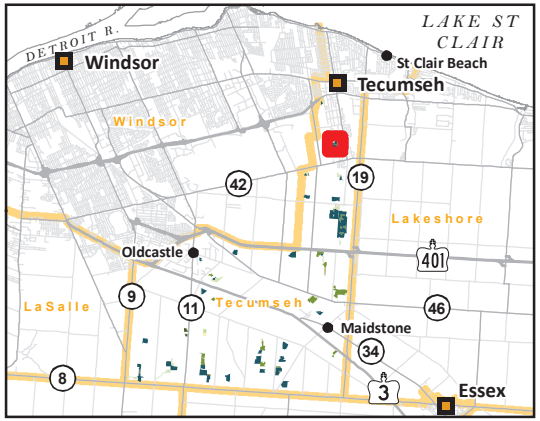
Legend

- Extent of Ecological Land Classification (ELC) Mapping
- Vegetation Community Boundary*
- ELC Site Boundary

**Vegetation Community Code descriptions may be found under 'Criteria No. 7 - Diversity' section of the site report. Community Codes highlighted with a red halo (ex. SAF_1-2) denote provincially rare vegetation communities (S Rank).*

Community Class

Meadow | Thicket | Savanna | Woodland | Forest | Plantation/Park | Swamp



0 25 50 100 Meters

0 75 150 300 Feet

1:4,000

Data Sources: ERCA field surveys, Spring 2008 aerial photography
Aerial photo copyright the Corporation of the County of Essex, 2008

Source: \\swp\Projects\ERCA Projects\Natural Heritage Mapping\Municipal Projects\Tecumseh\Site Report Maps\Tecumseh CNHS - Site Report Map - Sept 2011.mxd
TD 12/09/2011

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