TOWN OF TECUMSEH

Species at Risk Mitigation Plan for Drainage Works

Mitigation Plan was prepared in accordance with Section 23.9 of Ontario Regulation 242/08 under the *Endangered Species Act*, 2007.

March 2018 – 17-4938

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DILLON CONSULTING LIMITED

Disclaimer: This Species at Risk Mitigation Plan for Drainage Works ('Plan') has been prepared by Dillon Consulting Limited ('Dillon') for the Town of Tecumseh ('Town') under Section 23.9 of Ontario Regulation 242/08 (O.Reg. 242/08) of the Endangered Species Act, 2007 (ESA, 2007). Reasonable efforts were made to utilize current information to assist the Town in the preparation of the Plan. This Plan was prepared in the absence of Agency input and contents are subject to change. Dillon utilized a team of biologists who collectively have the general expertise required in relation to the species/species assemblages identified in this Plan and best management practices to minimize or avoid adverse effects on the species.

Mitigation Plan History

Version	Date	Author	Reviewed By	Description of Revision(s)
1.0	December 8, 2017	Kelly McLean, Dillon Consulting Limited	Allen Benson, Dillon Consulting Limited	Plan first drafted
2.0	March 2, 2018	Kelly McLean, Dillon Consulting Limited	Allen Benson, Dillon Consulting Limited	Updates to mapping

1.0 Introduction

Under the *Drainage Act*, 1990, the Town of Tecumseh (Town) is required to regularly maintain and repair all drainage works constructed under by-law. When working in and around drains there is the potential to encounter a variety of flora and fauna including species identified as being at risk. In Ontario, the *Endangered Species Act*, 2007 (*ESA*, 2007) legally protects species at risk (SAR) (Section 9), and provides SAR habitat protection (Section 10) from activities that could have potentially negative impacts. When the *ESA*, 2007 came into effect, a transition exemption under Ontario Regulation 242/08 (O.Reg. 242/08) existed for activities to maintain and repair drainage infrastructure provided that the Proponent (i.e. the Town) entered into an Agreement with the Ministry of Natural Resources and Forestry (MNRF) (formerly Ministry of Natural Resources (MNR)). On June 29, 2010 the Town entered into a Municipal Drain Agreement with the MNRF under subsection 14, Section 23 of O.Reg. 242/08 under the *ESA,* 2007 regarding Drainage Works (File #: AY-23D-010-10). In the Agreement, a Mitigation Plan (Schedule C) outlined the measures the Town was to undertake to minimize the adverse effects on SAR in accordance with general and taxa-specific conditions, and the monitoring and reporting requirements. If conditions of the Agreement were met, Sections 9 and 10 of the *ESA*, 2007 did not apply to Drainage Works (as outlined in Schedule C of the Agreement) conducted under the *Drainage Act,* 1990.

On July 1, 2013 new amendments to O.Reg. 242/08 came into effect, replacing the existing Municipal Drain Agreement, which then expired on June 30, 2015. Under the newly amended O.Reg. 242/08, the Town now has the ability to register certain municipal drainage works with the MNRF by completing a Notice of Drainage Work Activity Form (Section 23.9 of O.Reg. 242/08). Permitted drainage works under Section 23.9 of O.Reg. 242/08 are outlined in the **Section 2.0** below. Dillon Consulting Limited (Dillon) has been retained by the Town to assist in registering municipal drainage work activities and to prepare a Mitigation Plan in accordance with O.Reg. 242/08 of the *ESA*, 2007. In addition, Dillon has prepared a Drain Database that includes drain locations, names, lengths and information on existing environmental conditions within and adjacent to the drains, to assist in the registration process and for reference when conducting maintenance, improvement and repair activities.

As mentioned above, to register municipal drainage work activity, the Town is required complete a Notice of Drainage Work Activity Form, providing information on all of the municipal drains that are within its jurisdiction and a list of the species, listed as endangered or threatened on the Species at Risk in Ontario (SARO) List (O.Reg. 230/08) that could potentially be affected by drainage works. As part of the registration process, the Town is required to prepare Mitigation Plans for each SAR that may potentially be impacted by drainage works in accordance with subsections 6, 11, 12 and 13 of Section 23.9 of O.Reg. 242/08. Mitigation Plans are to be updated at minimum every five (5) years to include newly listed species or delisted species and include the most up-to-date best management practices (subparagraph iii, paragraph 5, subsection 6 of O.Reg. 242/08). In addition, the Town is required prepare annual reports on or before December 31st of each year outlining the drainage works conducted in the previous year (subparagraph i, paragraph 6, subsection 6 of Section 23.9 of O.Reg. 242/08).

In support of the MNRF registration, Dillon has prepared this consolidated Mitigation Plan, as per subparagraph ii, paragraph 1, subsection 6 of Section 23.9, for the species listed on the SARO List (O.Reg. 230/08) as either endangered or threatened that have the potential to be affected by drainage work activities in the Town of Tecumseh, within the County of Essex, Ontario (see **Figure 1**). In addition, the Town and Dillon have prepared an inventory of the municipal drains, that includes information on drain name, location, and adjacent natural features (if any) as it pertains to each municipal drain as identified in this Mitigation Plan.

This Mitigation Plan does not preclude the need for consultation with other relevant regulatory authorities when applicable (i.e., Fisheries and Oceans Canada (DFO) and the Essex Region Conservation Authority (ERCA)).

2.0 Purpose

This Mitigation Plan has been prepared in accordance with Section 23.9 of O.Reg. 242/08, as last amended on September 14, 2016. Under this section of the regulation, the Town is able to continue conducting the following drainage works that is habitat of SAR listed in this plan:

1. Improving or maintaining drainage works, if an agreement for the improvement or maintenance was filed under subsection 2 (2) of the *Drainage Act,* 1990.
2. Improving, maintaining or repairing drainage works, if a report that applies to the drainage works was adopted under subsection 45 (1) of the *Drainage Act,* 1990 or under subsection 3 (15) of that Act, as that subsection read on October 24, 2010.
3. Maintaining a ditch constructed under *The Ditches and Watercourses Act*, being chapter 109 of the Revised Statutes of Ontario, 1960, in accordance with subsection 3 (18) of the *Drainage Act*, 1990. O.Reg. 176/13, s. 14.

This Mitigation Plan cannot be used for the development/construction of new drains and does not apply when conducting activities that may impact the following species or species habitat, as indicated in Table 1, subsection 2, Section 23.9 of O. Reg. 242/08:

- Bogbean Buckmoth (*Hemileuca sp. 1*)
- Cherry Birch (*Betula lenta*)
- False Hop Sedge (*Carex lupuliformis*)
- False Rue Anemone (*Enemion biternatum*)
- Grey Fox (*Urocyon cinereoargenteus*)
- Heart-leaved Plantain (*Plantago cordata*)
- Pugnose Minnow (*Opsopoeodus emiliae*)
- Scarlet Ammannia (*Ammannia robusta*)
- Small-mouthed Salamander (*Ambystoma texanum*)
- Toothcup (*Rotala ramosior*)

Species listed after June 27, 2014 that have the potential to occur within the Study Area are outlined below. If one or more of these species are encountered during drainage work activity, the Town has up to three (3) years to add the species to this Mitigation Plan:

- Lilliput *(Toxolasma paryum)*
- Threehorn Wartyback *(Obliquaria reflexa)*
- Bank Swallow *(Riparia riparia)*
- Blue Ash *(Fraxinus quadrangulata)*
- Tri-colored Bat *(Perimyotis subflavus)*

This Plan fulfills the requirements listed under subsection 12 of O.Reg. 242/08. Requirements and location of requirements can be found in **Table 1**.

Table 1: Mitigation Plan Information Requirements as outlined in Subsection 12, Section 23.9 of O.Reg. 242/08 under the *ESA*, 2007

Information Requirements	Location in Plan
Name and contact information of the person who is carrying out the activity.	Section 3.0
A description of the area within the drainage works or ditch that will be affected by the activity and that is used by, or is the habitat of, a member of a species identified in the notice of drainage works form.	Section 5.0 and Drainage Maps ***(Appendix B)***
Details of how the person will carry out the steps described in subsection (13) that are required to minimize the adverse effects of the activity on a species identified in the notice of drainage works form, including the dates during the year when the species is likely to be carrying out a life process related to hibernation or reproduction, including rearing, and when the person must take reasonable steps to minimize or avoid killing, harming or harassing members of the species.	Section 7.0
A description of any steps the person will take to minimize the adverse effects of the activity on a species identified in the notice of drainage works form, in addition to the steps described in subsection (13), including a description of any measures to restore or enhance the habitat of the species that is affected by the activity. O. Reg. 176/13, s. 14.	Section 8.0

3.0 Contact Information

Maintenance, improvement and repair of drainage works or ditch will be completed by the Town of Tecumseh. The primary contact responsible for the drainage infrastructure within the municipality is as follows:

Full Name of Company Name:	The Corporation of the Town of Tecumseh
Prime Contact:	Sam Paglia, Drainage Superintendent
Address:	917 Lesperance Road, Tecumseh, Ontario, N8N 1W9
Telephone:	519-735-2184 ext. 105
Fax:	519-735-6712
Email:	spaglia@tecumseh.ca

4.0 Expertise of Plan Author(s)

Dillon is the consultant responsible for preparing this *Mitigation Plan*. Dillon employs a team of biologists that have expertise and experience in relation to the species listed in this plan (subsection 11, Section 23.9 of O.Reg. 242/08). The primary contact at Dillon is:

Full Name of Company Name:	Dillon Consulting Limited
Prime Contact:	Allen Benson - Biologist
Address:	235 Yorkland Blvd Suite 800, Toronto, Ontario, M2J 4Y8
Telephone:	416-229-4647 Ext. 2315
Fax:	416-229-4692
Email:	abenson@dillon.ca

A complete list of sources and records reviewed by Dillon to complete this Plan can be found in ***Appendix A***.

5.0 Location

Located along the southern shores of Lake St. Clair in Essex County and in the Essex Region Watershed, the Town of Tecumseh (Study Area) encompasses a geographic area of 9,538.60 hectares (ha) that is bordered by the City of Windsor and the Town of LaSalle on its western side and the Town of Lakeshore to the east and shown on **Figure 1** (Essex Region Conservation Authority (ERCA), 2013). There are four (4) subwatersheds (total area): Pike Creek subwatershed (8,993 ha), Canard River subwatershed (34,776 ha), Tecumseh Area Drainage subwatershed (1,150 ha), Turkey Creek subwatershed (6,112 ha), and Little River subwatershed (6,490 ha) that traverse the lands within the Town's boundaries (ERCA, 2011). Approximately 95.15% (9,079.38 ha) of the landscape consists of anthropogenic features (residential, commercial, agricultural, etc.) while the remaining 4.81% (459.22 ha) is made up of natural areas (terrestrial (4.49%) and other terrestrial (0.32%)) (ERCA, 2013).

There are one hundred and twenty (120) municipal drains measuring 221 kilometers (km) within the Town of Tecumseh (Town of Tecumseh, 2014). Through our background review we identified 3 dominant habitat types surrounding/within the drains that have potential to provide habitat for SAR. Habitats consist of:

Existing Natural Features:

- Forest

Existing Anthropogenic Features:

- Urban (residential, commercial, recreational, right-of-ways)
- Agricultural (row crop, hayfield, old abandoned fields)

Within the Town, there are no forest patches greater than 100 ha in size with the largest being Fairplay Woods (an Environmentally Significant Area (ESA)) which spans a total area of 52.9 ha (ERCA, 2013). There are 2 forest patches that contain 200 m interior forest and 16 patches that contain 100 m interior forest (ERCA, 2013). In accordance with subparagraph i, of paragraph 2, of subsection 6 under Section 23.9 of O.Reg. 242/08, **Drainage Maps** have been prepared that show drain locations, surrounding land use types, proximity to sensitive natural features (e.g. Forest) and potential SAR habitat that exists within the Town's jurisdiction (see ***Appendix B***). A list of all the drains and adjacent habitat type(s) has been provided in ***Appendix B*** following the Drainage Maps. In addition, a **Tecumseh Drain Database** (provided electronically) contains the drain names, adjacent habitat types, and relevant information found during our background review from the MNRF and ERCA.

Detroit River
Lake St. Clair
Peche Island (ER 33)
RIVERSIDE DRIVE EAST
RIVERSIDE DRIVE WEST
WYANDOTTE STREET EAST
WYANDOTTE STREET WEST
UNIVERSITY AVENUE WEST
COLLEGE AVENUE
TECUMSEH ROAD WEST
TOTTEN STREET
HURON CHURCH ROAD
South Cameron Wetland Complex (ER 38)
Ojibway Prairie Complex (ER 28)
TODD LANE
Turkey Creek Wetlands (ER 12)
NORMANDY STREET
LaSalle Woods (ER 29)
MALDEN ROAD
BOUFFARD ROAD
TOWN OF LASALLE
DOMINION BOULEVARD
DOUGALL AVENUE
OUELLETTE AVENUE
DOUGALL AVENUE
ERIE STREET EAST
MCDOUGALL STREET
LANGLOIS AVENUE
LINCOLN ROAD
KILDARE ROAD
HOWARD AVENUE
YPRES AVENUE
GRAND MARAIS ROAD EAST
E.C. ROW EXPRESSWAY
CITY OF WINDSOR
DIVISION ROAD
Devonwood
WALKER ROAD
CABANA ROAD WEST
CABANA ROAD EAST
PROVINCIAL ROAD
DOUGALL PARKWAY
HIGHWAY 3
CONCESSION ROAD 6
LAURIER PARKWAY
DISPUTED ROAD
HURON CHURCH LINE ROAD
HOWARD AVENUE
NORTH TOWNLINE ROAD
Canard River Marshes (ER 2)
TOWN OF AMHERSTBURG
Canard River Swamp Wetland Complex (ER 37)
SEMINOLE STREET
PILLETTE ROAD
LAUZON ROAD
LITTLE RIVER BOULEVARD
MCHUGH STREET
TECUMSEH ROAD EAST
CENTRAL AVENUE
RIVARD AVENUE
JEFFERSON BOULEVARD
LAUZON PARKWAY
NORTH SERVICE ROAD EAST
Windsor Airport Swamps (ER 23)
BASELINE ROAD
8TH CONCESSION ROAD
COUNTY ROAD 17
SOUTH TALBOT ROAD
WALKER ROAD
TOWN OF TECUMSEH
NORTH TALBOT ROAD
COUNTY ROAD 46
CONCESSION ROAD 11
HIGHWAY 401
COUNTY ROAD 34
MANNING ROAD
TALBOT ROAD
TOWN OF ESSEX
LACASSE BOULEVARD
RIVERSIDE DRIVE
Pike Creek
TECUMSEH ROAD
LESPERANCE ROAD
BANWELL ROAD
COUNTY ROAD 22
Pike Creek Wetlands (ER 26)
LITTLE BASELINE ROAD
COUNTY ROAD 42
TOWN OF LAKESHORE
Russell Woods Swamp (ER 25)
OLD TECUMSEH ROAD
Patillo Road Marsh (ER 24)
PUCE ROAD
NAYLOR SIDEROAD
COUNTY ROAD 8
TOWN OF KINGSVILLE

TOWN OF TECUMSEH

NATURAL FEATURES
FIGURE 1

- Mainland
- Provincially Significant Wetland
- ANSI, Life Science
- Natural Heritage System
- Municipal Drain
- Quaternary Watershed
- Water Body
- Woodland

1:75,000
0 0.5 1 2 km

N W E S

MAP DRAWING INFORMATION:
DATA PROVIDED BY MNRF, TOWN OF TECUMSEH

MAP CREATED BY: GM
MAP CHECKED BY: KM/AB
MAP PROJECTION: NAD 1983 UTM Zone 17N

DILLON CONSULTING

PROJECT: 174938
STATUS: FINAL
DATE: 2017-12-08

FILE LOCATION: I:\GIS\174938 - Tecumseh Drain\mxd\Figure 1 Natural Features.mxd

6.0 Species at Risk

A review of secondary source information, including the expired MNRF Agreement[1], Natural Heritage Information Centre (NHIC) GIS Database records (i.e. 1 km squares that overlap the Study Area) were reviewed to gather a list of the SAR that have the potential to occur within the Town's boundaries. A total of sixty-six (66) species listed as either endangered or threatened on the SARO list (O.Reg. 230/08) were identified to occur within the Study Area (see ***Appendix C***). One Restricted Species Record was also identified in 1988 (NHIC 1 km Square 17LG4478).

The habitat requirements for each of the sixty-six species was crossed referenced with habitats identified within the Study Area. A total of Nineteen (19) species listed as endangered or threatened were identified as having potential habitat within the Study Area drains, consisting of Turtles (2 species), Snakes (2 species), Fishes (2 species), Birds (3 species), and Plants (10 species). **Table 2** lists the SAR, preferred habitat type(s) (Forest, Agricultural, Urban or All), need for water presence (requirement for some species), and the dates during the year when the species is likely to be carrying out sensitive life processes, referred to herein as the Restricted Activity Period (RAP).

Four (4) species listed in Table 1, subsection 2, Section 23.9 of O. Reg. 242/08 were identified as having the potential to occur within the Town of Tecumseh drains, these species include: Pugnose Minnow (*Opsopoeodus emiliae*) (1 fish species), False Hop Sedge (*Carex lupuliformis*), Heart-leaved Plantain (*Plantago cordata*) and Scarlet Ammannia (*Ammannia robusta*) (3 plant species). Since these species are listed in Table 1, subsection 2, Section 23.9 of O. Reg. 242/08, this mitigation plan cannot be used for these species and as such, they have not been included in **Table 2** below. Permitting related to these species may be required when working in specific drains. More information on these species, their habitat preferences, known distribution within the area and steps that need to be taken to determine whether a permit is required are outlined in ***Appendix D***.

Table 2: Species at Risk with Potential to Occur within the Study Area

Scientific Name	Common Name	ESA[1]	Preferred Habitat Type[2]	Restricted Activity Period
Turtles (2 species)				
Emydoidea blandingii	Blanding's Turtle	THR	Forest, Water is present	November 1 to April 30 ***Important to Note: Activities that require water level reduction cannot occur in areas when and where turtles are hibernating (paragraph 6, subsection 13, under Section 23.9 of O.Reg. 242/08).***
Apalone spinifera	Spiny Softshell	THR	Forest, Water is present	

[1] Agreement under Section 23 of O.Reg. 242/08 made under the *ESA*, 2007 (File # AY-23D-010-10)

Scientific Name	Common Name	ESA[1]	Preferred Habitat Type[2]	Restricted Activity Period
Snakes (2 species)				
Pantherophis gloydi	Eastern Foxsnake (Carolinian population)	END	All[3]	September 20 to May 31
Thamnophis butleri	Butler's Gartersnake	END	All[3]	
Fishes (2 species)				
Notropis anogenus	Pugnose Shiner	END	Water is present	March 15 to June 30
Lepisosteus oculatus	Spotted Gar	THR		
Birds (3 species)				
Dolichonyx oryzivorus	Bobolink	THR	Agricultural	May 1 to July 15
Sturnella magna	Eastern Meadowlark	THR	Agricultural	
Hirundo rustica	Barn Swallow	THR	All[3]	
Vascular Plants (10 species)				
Gymnocladus dioicus	Kentucky Coffee-tree	THR	Forest	Not Applicable
Liparis liliifolia	Purple Twayblade	THR	Forest	
Cornus florida	Eastern Flowering Dogwood	END	Forest	
Castanea dentata	American Chestnut	END	Forest	
Juglans cinerea	Butternut	END	Forest	
Morus rubra	Red Mulberry	END	Forest	
Aletris farinosa	Colicroot	THR	Agricultural, Forest	
Smilax rotundifolia	Round-leaved Greenbrier (Great Lakes Plains population)	THR	Forest	
Liatris spicata	Dense Blazing Star	THR	Agricultural	
Symphyotrichum praealtum	Willowleaf Aster	THR	Forest	

[1]Endangered Species Act – status as defined by O.Reg. 242/08 as of April 27, 2017; [2]Preferred Habitat Types – The habitat types listed are areas where a SAR has the potential to occur. It should be noted that species have the potential to occur outside of these habitats; [3]All – Structures such as culverts and bridges may provide suitable habitat for nesting Barn Swallow. Culverts, rip rap and gabion baskets also have the potential to provide nesting and/or hibernaculum for snake species.

7.0 Mitigation Measures

Based on the types of drainage work activities outlined above (in Section 2.0) and the potential for SAR and SAR habitat within and adjacent to the drainage features, the following best practices and mitigation measures are recommended when conducting drainage works. Prior to starting drainage works, the following steps are recommended to help determine the appropriate mitigation/management measures:

Step 1
- Determine Drainage Work Activity and Timing of Works.

Step 2
- Review **Drainage Maps** ***(Appendix B)*** and/or **KMZ File** to confirm habitat(s) the activity may impact.

Step 3
- Cross-reference **Habitat Type(s)** (determined in **Step 2**) with **Table 2** (in **Section 6.0**) to confirm which species may be impacted by activity and their RAP to determine most appropriate time to conduct activity.

Step 4
- Conduct **Site Visit** to verify Habitat Type(s). Identify potential SAR Habitat/Sensitive Natural Features and distance from activities. Confirm the presence/absence of water flow.

Step 5
- Implement recommended Mitigation Measures. Review Tecumseh Checklist (***Appendix E***) and provide **Contractor Information Package** (***Appendix F***) with Species Specific Mitigation Measures (**Section 7.2**), ID cards and Activity and SAR Observation Forms (***Appendix F***).

Step 6
- Upon completion of each Drainage Work Activity collect Observation/Reporting Form from Contractors and record activity in log form (***Appendix E***) for annual reporting to MNRF.

7.1 General Mitigation Measures

The following mitigation measures are recommended to avoid or minimize impacts to the natural environment when conducting drainage works. Following this section species specific mitigation measures are provided.

When planning for drainage works, activities should be planned outside of sensitive timing windows for all wildlife species wherever possible. **Table 2** in Section 6.0 indicates the Restricted Activity Periods for the different SAR having the potential to occur within the Study Area. **Table 3** indicates sensitive timing windows for various types of wildlife (including SAR) based on habitat types.

This information can be used to determine what time(s) of year may be sensitive at a particular site, based on which types of habitat and wildlife are present.

Where possible, activities are recommended to be planned outside of these sensitive time(s); otherwise additional species specific mitigation measures are recommended and/or consultation with the MNRF.

Table 3: Sensitive Timing Windows for other Wildlife Species (including SAR)

Habitat Type	Wildlife	Sensitive Timing Windows
Agricultural (Hayfields and pastures)	Migratory Birds	March through July (breeding season for most species)
Waterbodies	Migratory Birds (including waterfowl)	March through Mid-August
	Turtles and Amphibians	March through Mid-August; and Mid-October through March (for overwintering wildlife, including turtles).
	Mammals	March through mid-August; and Mid-October through March (overwintering wildlife)
	Fish	In-water timing restriction for warmwater fishes March 15 to June 30.
Forest	Migratory Birds	March through mid-August
	Mammals	March through mid-August; and Mid-October through March (overwintering wildlife)
	Snakes	March through mid-August; and Mid-October through March (overwintering wildlife)
Urban	Snakes	March through mid-August; and October through March (overwintering wildlife)
	Mammals	

The following list provides general measures that are recommended when conducting any drainage work activities:

- **Bats**: The work associated with drainage maintenance covered under this management plan would typically not include the removal of trees. As such, the potential for drainage work activities to impact bat SAR is low. However, if a tree that exhibits a diameter at breast height of 25 cm or greater or a tree that exhibits loose shaggy bark requires removal for drainage works, removal should be completed between November 1 and March 1, outside of the active season for bats. If the tree removal needs to occur during the active season, removal should be completed after dusk.
- Review species specific seasonal timing windows to avoid sensitive periods for species
- Where possible, abide by regulatory timing windows and setback distances and avoid regulated habitat features
- Minimize duration of in-water work (where applicable)

- Any in-stream work should be conducted during periods of low flow
- Schedule work to avoid wet, windy and rainy periods that may increase erosion and sedimentation
- Conduct wildlife sweeps prior to the commencement of drainage work activities to determine if SAR (or other wildlife) are present at the site and engaged in critical life processes (e.g. nesting, etc.)
- Following the wildlife sweep, the area of activity is to be isolated with silt fencing to keep SAR and other wildlife from entering the work space area.
- Develop and implement an erosion and sediment control plan for the site that minimizes the risk of sedimentation to the drain during all phases of an activity. Erosion and sediment control measures should be maintained until all disturbed ground has been permanently stabilized, suspended sediment has resettled to the bed of the drain of settling basin and runoff water is clear. Following the DFO's Measures to Avoid Harm (as outlined on DFO's website: http://www.dfo-mpo.gc.ca/pnw-ppe/measures-mesures/measures-mesures-eng.html), an erosion and sediment control plan, where applicable, is to include the following:
    - Installation of effective erosion and sediment control measures before starting work to prevent sediment from entering the drain
    - Measures for managing water flowing onto the site, as well as water being pumped/diverted from the site such that sediment is filtered out prior to the water entering the drain
    - Site isolation measures, where required, to contain suspended sediment
    - Measures for containing and stabilizing waste materials generated from activities are stored away from any water bodies and prevent materials from re-entering water bodies
    - Erosion and sediment control measures are inspected and maintained on a regular basis during drainage works
    - Any damages to erosion and control measures are to be repaired immediately
    - Removal of non-biodegradable erosion and sediment control materials once site has been stabilized

- ***Phragmites*** is a non-native perennial grass species that has been observed throughout much of the province and Tecumseh, developing tall dense stands that degrade wetlands and other features by outcompeting native vegetation and changing habitat. To further prevent the spread and introduction of this unwanted species in the province, the provincial government has regulated invasive *Phragmites* as restricted under the *Invasive Species Act*, 2015. Restricted species under the Act, prohibits i) the transport of species into any provincial park and conservation reserve and ii) the deposit or release of species in Ontario. For further information on the *Invasive Species Act*, 2015 please visit: www.ontario.ca/invasionON. It is recommended that care be taken when working in areas with *Phragmites* and efforts be taken to prevent further spread of species through equipment transfer. Methods to prevent the spread of *Phragmites* while conducting drainage works should include:
    - Inspection of vehicles, equipment and heavy machinery thoroughly inside and out for accumulation of dirt, plant material or snow/ice, including the underside of vehicles, radiators, spare tires, foot wells and bumpers before entering onto a site. Remove any guards, covers, plates or other easy to remove external equipment;

- Inspections should be completed when: moving vehicles out of local area of operation; moving machinery between properties or sites within the same property where invasive species may be present or known to occur; and using machinery along roadsides, in ditches and along watercourses.
- Vehicles, equipment and heavy machinery should be cleaned: before moving out of local area where invasive species has been identified or known to occur; and when accumulations of dirt, plant material or snow/ice has been observed.
- Clean vehicles, equipment and heavy machinery in an area where risk of contamination is low, ideally on a mud free hard surface, at least 30 m away from any watercourse, waterbody, wetland or other natural area, if possible. Where risk of runoff is high, cleaning stations should be contained by sediment fence as per standard erosion and sediment control specifications.
- Remove large accumulations of dirt, using a compressed air device, high pressure hose or other device as necessary. Clean the vehicle starting at the top and working down, with particular attention to the undersides, wheels, wheel arches, guards, chassis, engine bays, grills and other attachments.
- Clean inside vehicles by sweeping, vacuuming or using compressed air device including floor, foot wells, pedals, seats and under the seats.

Additional details on cleaning equipment and/or managing invasive species can be found in the Clean Equipment Protocol for Industry (J. Halloran, et al., 2013) and online at the Government of Ontario's website: https://www.ontario.ca/page/stop-spread-invasive-species.

7.2 Species Specific Mitigation Plans

In the event a SAR or SAR habitat has been identified within the proposed area for drainage work activity, the following information should be clearly conveyed to the on-site staff as part of the drainage works protocol, via notes or plans and on-site briefings with construction/personnel:

- Schedule for pre-construction activities such as wildlife inspections, silt fencing installation and contractor briefing.
- Description of wildlife mitigation measured to be used during drainage work activities, including:
  - Placement and specifications of required protection measures (e.g. fencing, signage)
  - Phasing and direction of site clearing activities
  - Any recommendations regarding access routes for equipment, vehicle parking, materials, stockpiling, etc.
- Guidance on what to do in the event of a wildlife encounter, including SAR and arrangements for dealing with injured or orphaned animals (as indicated in **Table 5** and ***Appendix F***). This guidance should be summarized in a handout suitable for quick reference by on-site staff.
- SAR awareness training should be provided to all on-site staff, including truck drivers.

In the Contractor Information Package (***Appendix F***) Dillon has provided SAR identification sheets for SAR with the potential to occur within the Study Area.

7.2.1 Species Specific Mitigation Measures for Snake Species

Snake species can be found in a variety of habitat types and most of the drainage work activities have the potential to encounter snakes. Particular attention should be given when conducting works on catch basins, culverts, rip rap and crossing structures, as snakes carry out sensitive life processes in structures such as these. **Table 4** shows the sensitive timing windows for snake species when carrying out life processes related to hibernation and staging.

Table 4: Sensitive Timing Windows for Snake Species

Month	Jan			Feb			Mar			Apr			May			Jun			Jul			Aug			Sep			Oct			Nov			Dec		
Date Codes[1]	E	M	L	E	M	L	E	M	L	E	M	L	E	M	L	E	M	L	E	M	L	E	M	L	E	M	L	E	M	L	E	M	L	E	M	L
Hibernation																																				
Staging																																				

[1]Monthly intervals: E = Early (days 1-10); M = Middle (days 11-20); L = Late (days 21-31). Adapted from the Seasonal Timing Windows Chart in the MNRF Agreement under Section 23 of O.Reg. 242/08 made under ESA, 2007 (File #: AY-23D-010-10).

Table 5 below outlines the recommended mitigation measures to avoid impacts to snake species during and outside of RAP. Photographs of habitat observed within and adjacent to drains that have the potential to support SAR snakes, have been included in ***Appendix G*** (Photographs #1 - 4).

Table 5: Mitigation Measures for Snake Species

Common Name	Recommended Mitigation Measures to Avoid Impacts to SAR Snakes in Study Area

Eastern Foxsnake (Carolinian population)
 	
and
 	
Butler's Gartersnake
	• Preconstruction planning that includes review for potential habitat.
	• During site visit, verify if attributes of regulated habitat occur and delineate where possible.
	• Establish constraints for activities, where possible, that abide by timing windows and setback distances and avoid regulated habitat features
	• Narrow construction footprint if possible.
	• Flag or fence off environmentally sensitive areas prior to drainage work activity. Bury fencing a minimum of 10 – 20 cm and vertical height of at least 60 cm. Note, stakes should be installed on the activity side to prevent snake use of stakes to climb fence.
	• Complete wildlife sweep within the exclusion area following fence installation to ensure no trapped wildlife.
	• Staff/workers conducting drainage works should be trained in snake species identification and procedures if encountered (review and sign off form in Contractor Information Package)
	• One staff member/worker or qualified biologist should be trained in proper snake handling procedures and protocols outlined in Section 2 of the Ontario Species at Risk Handling Manual: For Endangered Species Act Authorization Holders (Included in the Contractor Information Package). This person should be onsite at all times (when required) for the potential capture, temporary holding, transfer and release of any snakes encountered during construction. A minimum of two holding tubs and cotton sacks should be onsite at all times.
	• Prior to commencement of daily drainage work activity, the area should be cleared of snakes through machinery inspections (e.g. wheels, engine compartment) each morning and after machinery is left idle for more than one (1) hour if left on site during the snake active season.
	• If a nest is uncovered during drainage work activity:
	  ○ Collect any displaced or damaged eggs and transfer them to a holding tub
	  ○ Capture and transfer all injured dispersing juveniles of that species into a light-coloured drawstring cotton sack
	  ○ Place all cotton sacks with the captured injured individuals into a holding tub out of direct sunlight
	  ○ Immediately contact the MNRF to seek direction and to arrange for transfer of the injured individuals
	  ○ Immediately stop any disturbance to the next site and loosely cover exposed portions with soil or organic material to protect the integrity of the remaining individuals
	  ○ Do not drive over the nest site or conduct any activities within 5 m of the nest site
	  ○ Do not place any dredged materials removed from drainage works on top of the nest site
	  ○ Mark out the physical location of the nest site but not by any means that might increase the susceptibility of the nest to predation or poaching
	  ○ Where there are no collected eggs or captured individuals, contact the MNRF within 24 hours to provide information on the location of the nest
	• Any injured captured snakes should be stored outside of direct sunlight and the MNRF should immediately be contacted to seek direction and to arrange for transfer. MNRF may require transfer to the nearest MNRF authorized Wildlife Rehabilitator. Contact Information for Authorized Wildlife Rehabilitator can be found in SAR Information Sheets (***Appendix F***).
	• If conducting drainage works during a species sensitive timing window and one or more individuals belonging to a snake species is encountered or active hibernacula is discovered:
	  ○ Trained staff/worker or qualified biologist shall capture and transfer all injured and uninjured individual snakes of that species into individual light-coloured, drawstring cotton sacks
	  ○ Place cotton sacks into a holding tub
	  ○ Ensure that the holding tub with captured individuals is stored at a cool temperature to protect snakes from freezing until the individuals can be retrieved or transferred
	  ○ If an active hibernacula is uncovered cease all work and immediately, contact MNRF to seek advice and arrange for transfer and/or removal
	• If conducting drainage works outside of a species sensitive timing window and one or more individuals belonging to a snake species is encountered:
	  ○ Briefly stop the activity for a reasonable period of time to allow any uninjured individual snakes of that species to leave the work area
	  ○ If the individuals do not leave the work area after the activity is briefly stopped, trained staff/worker or qualified biologist shall capture all uninjured individuals and release them in accordance with the methods outlined below
	  ○ Where circumstances do not allow for the immediate release of captured uninjured individuals, they may be transferred into individual, light-coloured, drawstring cotton sacks before placing them into a holding tub which shall be stored out of direct sunlight for a maximum of 24 hours before releasing them in accordance with the methods outlined below
	  ○ Capture and transfer any individuals injured as a result of conducting drainage works into a holding tub separate from any holding tub containing uninjured individuals
	  ○ Store all captured injured individuals out of direct sunlight and immediately contact the MNRF to seek direction and to arrange their transfer
	• Uninjured individuals captured during drainage works, are to be released within 24 hours of capture, in an area immediately adjacent to the drainage works with natural vegetation cover within 50 m and out of harm's way (as per subsections 2.3 and 2.4 of Handling Manual included in the Contractor Information Package; ***Appendix F***).

Common Name	Recommended Mitigation Measures to Avoid Impacts to SAR Snakes in Study Area

	• Uninjured individuals captured during drainage works, are to be released within 24 hours of capture, in an area immediately adjacent to the drainage works with natural vegetation cover within 50 m and out of harm's way (as per subsections 2.3 and 2.4 of Handling Manual included in the Contractor Information Package; ***Appendix F***).
	• Where one or more individuals belonging to a snake species is killed as a result of drainage work activity, or a person finds a deceased individual of a snake species, the following measures should be followed:
	  ○ Collect and transfer any dead individuals into a holding tub outside of direct sunlight; and,
	  ○ Contact the MNRF within 72 hours to seek direction and to arrange for the transfer of the carcasses of the dead individuals.
	• If the methods of handling snakes outlined in subsection 2.3 and 2.4 of the Handling Manuals are not applicable due to a snake's injuries, use a shovel or flat object to pick up the snake, ensuring that injured areas are supported and place in a large plastic bin or bucket with a lid with air holes. Immediately transport the turtle to an MNRF authorized veterinarian or wildlife rehabilitator and contact the MNRF. Contact Information for Authorized Wildlife Rehabilitator can be found in **Appendix F** and on SAR Information Sheets (***Appendix F***).
	• Complete a SAR Encounter Reporting Form included in Contractor Information Package (***Appendix F*****).**

7.2.2 Species Specific Mitigation Measures for Turtle Species

Turtles can generally be found associated with large slow moving water features that have logs or stumps for basking. For nesting, turtles prefer moist well drained, loose soils for digging and on a gradual typically south facing slope. Species such as Blanding's Turtle and Spiny Softshell hibernate underwater in permanent waterbodies. Sensitive timing windows for turtle species includes the nesting period and has been provided in **Table 6.**

When conducting drainage works where there is potential for turtle species to be hibernating, water level **cannot be reduced** as per Paragraph 6 of subsection 13 of Section 23.9 of O.Reg. 242/08.

Table 6: Restricted Activity Period for Turtle Species

Month	Jan			Feb			Mar			Apr			May			Jun			Jul			Aug			Sep			Oct			Nov			Dec		
Date Codes[1]	E	M	L	E	M	L	E	M	L	E	M	L	E	M	L	E	M	L	E	M	L	E	M	L	E	M	L	E	M	L	E	M	L	E	M	L
Hibernation																																				

[1]Monthly intervals: E = Early (days 1-10); M = Middle (days 11-20); L = Late (days 21-31). Adapted from the Seasonal Timing Windows Chart in the MNRF Agreement under Section 23 of O.Reg. 242/08 made under ESA, 2007 (File #: AY-23D-010-10).

In **Table 7** below, the recommended mitigation measures to avoid impacts to turtle species during and outside sensitive timing windows and what to do when turtles or turtle nests are encountered is provided. Photographs of habitat observed within and adjacent to drains that have the potential to support SAR Turtles, have been included in ***Appendix G*** (Photographs #5 - 6).

Table 7: Mitigation Measures for Turtle Species

Common Name	Recommended Mitigation Measures to Avoid Impacts to SAR Turtles within the Study Area
Blanding's Turtle	• Preconstruction planning that includes review for potential habitat. • During site visit, verify if attributes of regulated habitat occur and delineate where possible. • Establish constraints for activities, where possible, that abide by timing windows, setback distances and avoid regulated habitat features. • Narrow construction footprint if possible. • Flag or fence off environmentally sensitive areas prior to drainage work activity. Bury fencing a minimum of 10 – 20cm and vertical height of at least 60 cm. • Complete wildlife sweep within the exclusion/construction area following fence installation to ensure no trapped wildlife. • Staff/workers conducting drainage works should be trained in turtle species identification and procedures if encountered (Review and sign off form in the Contractor Information Package; ***Appendix F***). • One staff member/worker or qualified biologist should be trained in proper turtle handling procedures and protocols outlined in Section 1 of the Ontario Species at Risk Handling Manual: For Endangered Species Act Authorization Holders (provided in the Contractor Information Package; ***Appendix F***). This person should be onsite at all times (when required) for the potential capture, temporary holding, transfer and release of any turtles encountered during construction. A minimum of two holding tubs and cotton sacks should be onsite at all times. • If construction is planned to commence during the turtle nesting period, prior to site preparation a turtle nesting search should be completed to identify turtle nests. If nests are encountered, the MNRF must be consulted immediately. Nests should be relocated to an appropriate facility for incubation with MNRF approval. Contact information for MNRF Authorized Wildlife Rehabilitator can be found in SAR Information Sheets (***Appendix F***). • Drainage work activity related to excavation of sediment or disturbance to banks should be avoided during the sensitive timing windows for turtles. • During turtle hibernation periods, water in drains or ditches cannot be reduced. • Prior to commencement of daily activity, the area should be cleared of turtles and turtle nests by a specially trained staff member or qualified biologist.

Spiny Softshell	• Do not disturb a turtle encountered laying eggs and do not conduct activities within 20 m of the turtle while it is laying eggs.
	• If conducting drainage works during a species sensitive timing window and one or more individuals belonging to a turtle species is encountered:
	  ○ Trained staff/worker or qualified biologist shall capture and transfer all injured and uninjured individuals of that species to a holding tub
	  ○ Capture and transfer all individuals injured as a result of the drainage work activity into a holding tub separate from any holding tub containing uninjured individuals
	  ○ Ensure that the holding tub with captured individuals is stored at a cool temperature until the individuals can be retrieved or transferred
	  ○ Contact the MNRF immediately to seek advice and arrange for transfer and/or removal
	• If a nest is uncovered during construction, immediately stop all activity near the nest. Cover the nest with soil or organic material. Do not drive within 5 m of the nest and contact the MNRF within 24 hours if no eggs or individuals were captured/collected.
	• Isolate material stockpile areas with fencing.
	• Any injured captured turtles should be stored outside of direct sunlight and the MNRF should immediately be contacted to seek direction and to arrange for transfer.
	• Machinery should be inspected each morning (e.g. under vehicles) for presence of turtles.
	• Uninjured individuals captured during drainage works, are to be released within 1 hour of capture, out of harm's way no more than 125 m of where it was found, unless absolutely necessary. If it is not possible to relocate the turtle within 125 m of the capture location, contact the MNRF for further direction. MNRF may require transport of turtle(s) to MNRF Authorized Wildlife Rehabilitator or Veterinarian. Contact information can be found in ***Appendix F***.
	• If the methods of handling turtles outlined in subsection 1.3 of the Handing Protocol are not possible due to a turtle's injuries, use a shovel or flat object to pick up the turtle, ensuring that injured areas are supported and place in a large plastic bin or bucket with a lid with air holes. Immediately transport the turtle to an MNRF Authorized Wildlife Rehabilitator or Veterinarian and contact the MNRF. Contact Information for Authorized Wildlife Rehabilitator can be found in ***Appendix F*** and on SAR Information Sheets (***Appendix F***). See subsection 1.7 of the Handling Manual (included in the Contractor Information Package; ***Appendix F***) for more details.
	• **Complete a SAR Encounter Reporting Form included in the Contractor Information Package** (***Appendix F***).

7.2.3 Species Specific Mitigation Measures for Aquatic Species

Review of background information including, DFO's Aquatic SAR Mapping (Map 29 of 33), NHIC and MNRF Agreement[2] identified 10 fish and 10 mollusc species listed as endangered or threatened under the *ESA*, 2007 with occurrence records within and/or adjacent to the Study Area. Of the 20 aquatic SAR identified only two fish species have been included in the Plan based on the presence of suitable habitat within the Study Area drains.

Although suitable habitat for SAR mussel species was not identified during our background review and site visits, if at any time a mussel species (of any type) are encountered, stop work and contact DFO for direction on how to proceed. A SAR Information Sheet for mussels species found during the background review has been provided in ***Appendix F***.

Watercourses and drains identified during the background review and subsequent field investigations found all features to be of warm water thermal regime and to support warm water fish species. **Table 8** below indicates the in-water timing window restriction for warm water fish species. **Table 9** provides a list of recommended measures to follow to avoid impacts to fish species. As previously mentioned, activities that affect a species listed in Table 1, subsection 2, Section 23.9 of O. Reg. 242/08 still require a permit to conduct drainage works (see ***Appendix D*** for details). DFO's *Guidance for Maintaining and Repairing Municipal Drains in Ontario version 1.0* (2017) document should be consulted when conducting all drainage works.

Table 8: In-water Timing Window Restriction for Warm Water Fish Species

Month	Jan			Feb			Mar			Apr			May			Jun			Jul			Aug			Sep			Oct			Nov			Dec		
Date Codes[1]	E	M	L	E	M	L	E	M	L	E	M	L	E	M	L	E	M	L	E	M	L	E	M	L	E	M	L	E	M	L	E	M	L	E	M	L
In-water Restriction																																				

[1]Monthly intervals: E = Early (days 1-10); M = Middle (days 11-20); L = Late (days 21-31). Adapted from the Seasonal Timing Windows Chart in the MNRF Agreement under Section 23 of O.Reg. 242/08 made under ESA, 2007 (File #: AY-23D-010-10).

[2] Agreement under Section 23 of O.Reg. 242/08 made under the *ESA*, 2007 (File # AY-23D-010-10).

Table 9: Mitigation Measures for Aquatic Species

Common Name	Recommended Mitigation Measures to Avoid Impacts to SAR Aquatic Species within the Study Area
Pugnose Shiner Spotted Gar	• Consult with MNRF if in-water timing window restrictions cannot be adhered to. • Allow for fish salvage within the isolated work area prior to dewatering. • Limit duration of in-water work as much as possible. • Conduct in-stream work during periods of low flow to reduce the risk to fish and their habitat and to allow work in-water to be isolated from flows. • Schedule work to avoid wet, windy, and rainy periods that may increase erosion and sedimentation. Suspend in-stream work immediately if sedimentation is detected. • Implement water quality monitoring if required. • Ensure equipment is clean and free of leaks. Wash, refuel and service machinery and store fuel and other materials for the machinery in such a way as to prevent any deleterious substances from entering the water. • Alter activities to reduce disturbance to species and habitat and follow current DFO Measures to Avoid Harm • If federally listed SAR fish are encountered or have the potential to be present, contact the DFO to review next steps. • If SAR encountered, complete a SAR Encounter Reporting Form that will be included in the annual reporting.

7.2.4 Species Specific Mitigation Measures for Bird Species

Environment and Climate Change Canada (ECCC) identifies general nesting periods for migratory birds in Canada. Essex County is located within nesting zone C1, **Table 10** provides the RAPs for two habitat types: open field habitat and forest habitat. The RAPs provided are based on 61-100% of the migratory bird species predicted to be nesting during the identified time period (as indicated on the ECCC C1 nesting zone table).

Table 10: Restricted Activity Period for Bird Species

Month	Jan			Feb			Mar			Apr			May			Jun			Jul			Aug			Sep			Oct			Nov			Dec		
Date Codes[1]	E	M	L	E	M	L	E	M	L	E	M	L	E	M	L	E	M	L	E	M	L	E	M	L	E	M	L	E	M	L	E	M	L	E	M	L
Open																																				
Forest																																				

[1]Monthly intervals: E = Early (days 1-10); M = Middle (days 11-20); L = Late (days 21-31). Adapted from the Seasonal Timing Windows Chart in the MNRF Agreement under Section 23 of O.Reg. 242/08 made under *ESA*, 2007 (File #: AY-23D-010-10).

Based on our review of potential SAR birds to occur within the Study Area, the following mitigation measures are recommended while conducting drainage work activities:

Table 11: Mitigation Measures for Bird Species

Common Name	Recommended Mitigation Measures to Avoid Impacts to SAR Birds within the Study Area
Bobolink Eastern Meadowlark	• Planning activities should include review of area for potential habitat (including box culverts and bridges for Barn Swallow nests). • Limit construction footprint where possible. • Conduct work outside of the RAP for birds where possible. • Pre-construction activities should include bird nest sweeps if activities occur during migratory bird sensitive timing window identified in **Table 10**, above. • Protect active nests by flagging or fencing off an appropriate setback distance. • Suspend activity if active habitat is discovered that cannot be adequately setback from.
Barn Swallow	• Maintain habitat connections where possible during activities. • Implement measures to restore lost habitat/ habitat connections. • If sensitive habitat is on site, a qualified biologist should be on site daily. • If SAR encountered, complete a SAR Encounter Reporting Form that will be included in the annual submission to the MNRF.

7.2.5 Species Specific Mitigation Measures for Vegetation Communities

Potential impacts to plant SAR may include trampling by personnel or equipment, alteration of growing conditions (e.g. soil compaction, sunlight availability, and moisture regime), disturbance to localized seed bank and introduction of invasive species. Mitigation measures that will be incorporated during drainage work activities to minimize the impacts to adjacent forest communities and SAR vegetation include:

- Planning activities should include review of area for identification of potential SAR vegetation.
- Limit construction footprint where possible to minimize the disturbance to plant species.
- Installing temporary erosion and sediment control measures prior to activity, and maintaining them throughout activity, including routinely inspecting and repairing them, as required. Enhanced sediment and erosion control measures will be implemented for sensitive areas where SAR habitat has been identified within and abutting the work site.
- Vegetation that does not require removal for the purposes of construction will be protected through the installation and maintenance of temporary vegetation protection fencing (e.g. snow fencing or erosion sediment control fencing). This includes protection of any SAR trees identified.
- Equipment, materials and other construction activities will not be permitted in zones delineated for protection.
- If drainage work activity cannot be undertaken without disturbing a SAR plant(s), the Town should contact the MNRF for additional site-specific measures.
- Operational procedures and Best Management Practices for handling material and excess material, and spill prevention will be implements. Vehicular and equipment maintenance and refuelling will be carried out in a controlled manner, and where applicable, at designated maintenance areas. Refuelling will not be permitted within 30 m of any forest, or watercourse.
- Stabilize and re-vegetate exposed soil surfaces as soon as possible following activities, using native groundcover seed mixes and plantings.

8.0 Measures to Restore or Enhance Habitat

Paragraph 4 of subsection 12 under section 23.9 of O.Reg. 242/08 requires that the Town not only describe the steps taken to minimize the adverse effects of drainage works on SAR within Study Area (provided above in **Section 7.0**) but also requires that the Town describe the measures to restore or enhance the habitat of the SAR affected. **Table 12** below outlines opportunities to enhance/restore SAR habitat based on current standard practices. Note this is not a complete list of enhancement/restoration opportunities, if a SAR is observed consultation with the MNRF is recommended for site specific opportunities.

Table 12: Potential Enhancement/Restoration Opportunities for Species at Risk Habitat

SAR	Habitat Enhancement/Restoration Opportunity
Fishes	• Fish passage improvement (e.g. barrier removal, incorporation of low flow channels, pools, and riffles) • Repair eroding banks and re-stabilize • Native vegetation plantings in riparian zone to provide shade and cover
Turtles	• For Blanding's Turtle native plantings and creation of key habitat features (nesting basking habitats) • Locations where turtles are observed near roadways, install signage along roadway to reduce potential mortality • For Spiny Softshell create nesting habitats along banks of larger drains (where appropriate) • Where turtles have been observed, install educational signage
Snakes	• Create brush and rock piles for nesting and basking • Construct hibernaculum • Locations where snakes are observed near roadways, install signage along roadway to reduce potential mortality • Where snakes have been observed, install educational signage
Birds	• At top of banks (where appropriate) plant native flora that would provide cover and food sources for migratory birds • Where birds have been observed install educational signage
Vegetation	• Control non-native (i.e. *Phragmites*) and noxious flora from drains and banks. Dispose of plant materials at off-site disposal area. Seed/plant with native riparian species. • Where plants have been observed install educational signage

9.0 Next Steps

9.1 What if Mitigation Doesn't Work

If this Mitigation Plan has not been effective in minimizing the adverse effects of a drainage work activity on a SAR, the Town must:

- Take actions necessary to increase the effectiveness of steps outlined in the Mitigation Plan, or
- Take such other reasonable steps as may be necessary to minimize the adverse effects of a drainage work activity.

If the mitigation measures outlined in this Plan when implemented are found to be ineffective, results from monitoring activities will be used to decide on changes (if any) that need to be made to the Plan. If once changes are implemented, the adapted management plan is still not effective at minimizing adverse effects from activities consultation with the MNRF is recommended.

9.2 Annual Reporting

Following drainage work activities, as per paragraph 6 of subsection 6 under Section 23.9 of O. Reg. 242/08, the Town is required to prepare an annual report for each year drain or ditch improvement, maintenance and repairs are conducted. The Town is required to:

1. Prepare an annual report prior to December 31st of the year prior as per subsection 14 under Section 23.9
2. Retain a copy of the annual report for a minimum of five (5) years
3. Provide a copy of the annual report to the Ministry within 14 days of receiving a request for it

The annual report must include the following details on the drainage works completed in the previous year (subsection 14, Section 23.9 of O. Reg. 242/08):

- A record of the steps taken by the Town when conducting drainage works in the previous 12 months, to minimize adverse effects of the activity on a species identified in the Notice of drainage works form submitted to the Registry
- An assessment of the effectiveness of the steps taken
- Details of any observations of a species identified in the notice of drainage works form submitted to the Registry in the previous 12 months. SAR encounter forms should include:
    - Species identification
    - Date and general weather conditions
    - Name of staff/worker submitting encounter
    - Type of habitat where encountered
    - GPS coordinates (if able)
    - Photograph(s)
    - Circumstances of encounter

- Outcome of encounter. Include information actions undertaken (as outlined above in species specific mitigation measures) and on whether the species encountered was left on its own, relocated, injured/uninjured.

Annual Drainage Works Reporting Forms and Species Observation Forms have been provided in ***Appendix E*** and ***Appendix F***, respectively.

9.3 Five Year Review of Mitigation Plan

As per requirements of subparagraph iii, paragraph 5, subsection (6) of O.Reg. 242/08, the Mitigation Plan is to be updated at least once every five (5) years. Five years after the Notice of Drainage Works registration is filed, with direction from the Town, Dillon can review the existing Mitigation Plan and update based on information obtained from observing the effects of drainage works on the listed species and add/remove newly listed and delisted species, respectively.

10.0 Summary

This document fulfills the requirements under Section 23.9 of O.Reg. 242/08 for a SAR Mitigation Plan when conducting drainage work activity under the *Drainage Act,* 1990. In accordance with subsection 12, the Mitigation Plan includes:

- Known SAR, based on Dillon's background review and scoped field investigations, with the potential to occur within the Study Area.
- Contact information of person carrying out Activity (**Section 3.0**).
- A description of the area where the drainage work activities will occur that has the potential SAR and their habitat (**Section 5.0** and ***Appendix B*** Drainage Maps).
- Measures the Town will take to avoid or mitigate harm on a SAR including the times during the year that a SAR is likely carrying out life processes (e.g. hibernation, reproduction) and when the Town must take reasonable steps to minimize or avoid killing, harming or harassing members of the species (**Section 7.0**).
- Description of any steps the Town will take to minimize the adverse effects of the activity and describe measures to restore or enhance the habitat of the SAR that is affected by the activities (**Section 9.0**).

This plan is to be updated at least every 5 years to include newly listed or delisted species and the most up-to-date management practices as per paragraph 5 subsection 6 under Section 23.9 of O.Reg. 242/08. For every year that the Town conducts drainage works under the *Drainage Act*, 1990, an annual report is to be prepared on or before December 31st of each year in accordance with subsections 6 and 14. The annual reports are to include all drainage work activities conducted in the previous 12 months, details of SAR observations and the effectiveness of mitigation efforts.

11.0 References

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Appendix A

Records and Sources Reviewed

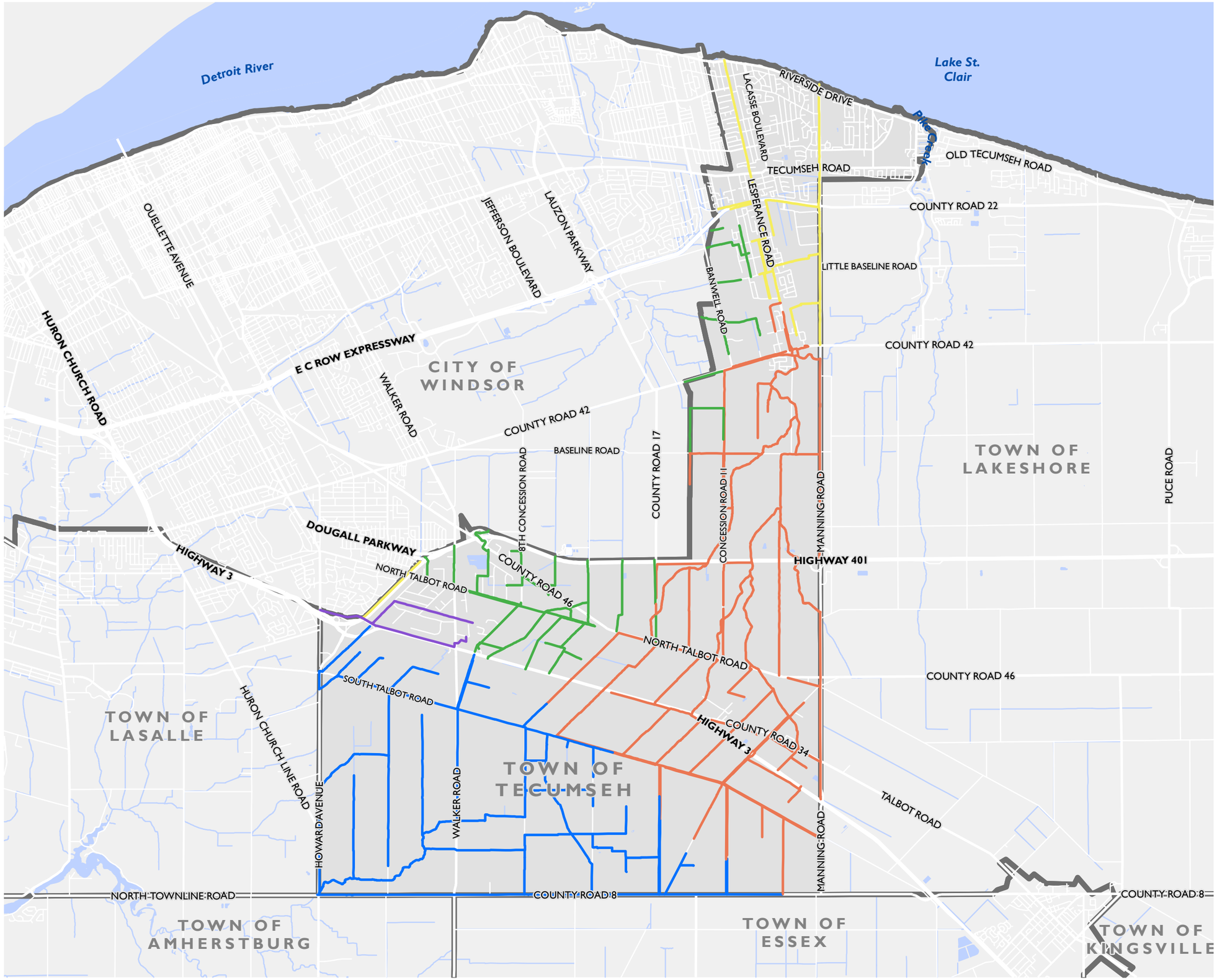
Table A-1: Records and Sources Consulted

Record Source	Records Review
Policies, Legislation and Guidelines	
Drainage Act, 1990	Ontario Ministry of Agricultural, Food and Rural Affairs
Endangered Species Act, 2007	Ontario Ministry of Natural Resources and Forestry
Invasive Species Act, 2015	Ontario Ministry of Natural Resources and Forestry
*Species at Risk Act,*2002	Environment and Climate Change Canada
Conservation Authorities Act, 1990	Essex Region Conservation Authority
Ministry of Natural Resources and Forestry	
Land Information Ontario, data requested/accessed Aug	Interactive Online Mapping Tool Warehouse Data
Natural Heritage Information Centre (NHIC), online data accessed March 2017. 1 km Square #s: 17LG2672, 17LG2673, 17LG2674, 17LG2675, 17LG2676, 17LG2677, 17LG2678, 17LG2679, 17LG2680, 17LG2772, 17LG2773, 17LG2774, 17LG2775, 17LG2776, 17LG2777, 17LG2778, 17LG2779, 17LG2872, 17LG2873, 17LG2874, 17LG2875,17LG2876,17LG2877, 17LG2878, 17LG2879, 17LG2872, 17LG2873, 17LG2874, 17LG2875, 17LG2876, 17LG2877, 17LG2878,17LG2879, 17LG2880, 17LG3072, 17LG3073, 17LG3074, 17LG3075, 17LG3076, 17LG3077, 17LG3078, 17LG3079, 17LG3172, 17LG3173, 17LG3174, 17LG3175, 17LG3176, 17LG3177, 17LG3178, 17LG3179, 17LG3272, 17LG3273, 17LG3274, 17LG3275, 17LG3276, 17LG3277, 17LG3278, 17LG3279, 17LG3372, 17LG3373, 17LG3374, 17LG3375, 17LG3376, 17LG3377, 17LG3378, 17LG3379, 17LG3472, 17LG3473, 17LG3474, 17LG3475, 17LG3476, 17LG3477, 17LG3478, 17LG3574, 17LG3575, 17LG3576, 17LG3577, 17LG3578	GIS Database for Species of Conservation Concern – uses 1 km squares based on the military grid reference system (MGRS).
MNRF Species at Risk in Ontario (SARO) List, O.Reg. 230/08, under *ESA*, 2007, accessed April 2017	Accessed to determine status of wildlife species as a Species of Conservation Concern or a Species at Risk.
General, O.Reg. 242/08 under *ESA*, 2007, accessed April 2017	Accessed to determine Species at Risk with regulated habitat.
Federal Government	
Species at Risk Public Registry, accessed May 2017	Accessed to determine status of wildlife species as a Species of Conservation Concern or a Species at Risk.
Fisheries and Oceans Canada (DFO) Aquatic Species at Risk Maps, accessed April 2017	Maps 29 of 33 were reviewed to determine Species at Risk with the potential to occur

Record Source	Records Review
Wildlife Atlas	
Reptile and Amphibian Atlas accessed via Ontario Nature April 2017	List of Reptile and Amphibian Species occurrences for Square 17LG27 and 17LG37
Conservation Authority and Municipal	
Interactive GIS Mapping	Essex Region Conservation Authority. Reviewed April 2017
Essex Region Natural Heritage System Strategy	Results of natural heritage system mapping exercise to accurately map existing features and prioritize habitat restoration opportunities.
Environmentally Significant Areas Status Update (Report)	Essex Region Conservation Authority inventory of ESAs within the Essex Region (1994)
Tecumseh drains data Online Mapping	Reviewed list of names and locations of municipal drains within the Town's jurisdiction

Appendix B

Town of Tecumseh Drainage Maps



TOWN OF TECUMSEH

OVERVIEW MAP

Municipal Drain by Subwatershed

- Canard River
- Lake St Clair
- Little River
- Pike Creek
- Turkey Creek

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MAP DRAWING INFORMATION:
DATA PROVIDED BY MNRF, TOWN OF TECUMSEH

MAP CREATED BY: GM
MAP CHECKED BY: KM/AB
MAP PROJECTION: NAD 1983 UTM Zone 17N

DILLON CONSULTING

PROJECT: 174938
STATUS: FINAL
DATE: 2018-02-28

FILE LOCATION: I:\GIS\174938 - Tecumseh Drain\mxd\Tecumseh Drain Overview.mxd

TOWN OF TECUMSEH

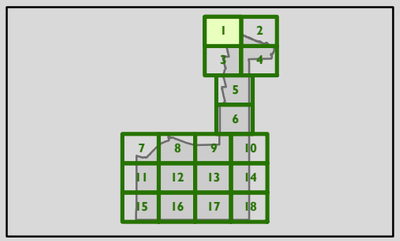
STUDY AREA WITH DRAINS
APPENDIX B
MAP 1

Drain by Habitat Type

- Forest
- Agricultural
- Urban
- Closed
- Watercourse
- Municipal Boundary
- Woodland (MNRF)

[1] Potential for Aquatic SAR based on DFO Aquatic Species at Risk Mapping (Map 29 of 30). Where water is present additional site specific mitigation measures may be required as well as consultation with DFO. Pugnose Minnow has been identified as having potential to occur within these drains, please refer to Appendix D for more details on species habitat preferences and consultation with MNRF. (Appears on Maps 5, 6, and 10)

[2] Drains that convey flow downstream to drains with the potential for Aquatic SAR. Depending on conditions (presence of water, suitable habitat, etc.) these features have the potential for Aquatic SAR. (Appears on Maps 5, 6, 9, 10, 13, and 14)



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MAP DRAWING INFORMATION:
DATA PROVIDED BY MNR

MAP CREATED BY: GM
MAP CHECKED BY: KM/AB
MAP PROJECTION: NAD 1983 UTM Zone 17N

DILLON CONSULTING

PROJECT: 174938
STATUS: FINAL
DATE: 2017-12-08

FILE LOCATION: I:\GIS\174938 - Tecumseh Drain\mxd\Appendix B Study Area Drains.mxd

TOWN OF TECUMSEH

STUDY AREA WITH DRAINS

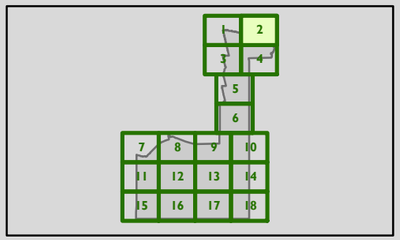
APPENDIX B
MAP 2

Drain by Habitat Type

- Forest
- Agricultural
- Urban
- Closed
- Watercourse
- Municipal Boundary

[1] Potential for Aquatic SAR based on DFO Aquatic Species at Risk Mapping (Map 29 of 30). Where water is present additional site specific mitigation measures may be required as well as consultation with DFO. Pugnose Minnow has been identified as having potential to occur within these drains, please refer to Appendix D for more details on species habitat preferences and consultation with MNRF. (Appears on Maps 5, 6, and 10)

[2] Drains that convey flow downstream to drains with the potential for Aquatic SAR. Depending on conditions (presence of water, suitable habitat, etc.) these features have the potential for Aquatic SAR. (Appears on Maps 5, 6, 9, 10, 13, and 14)



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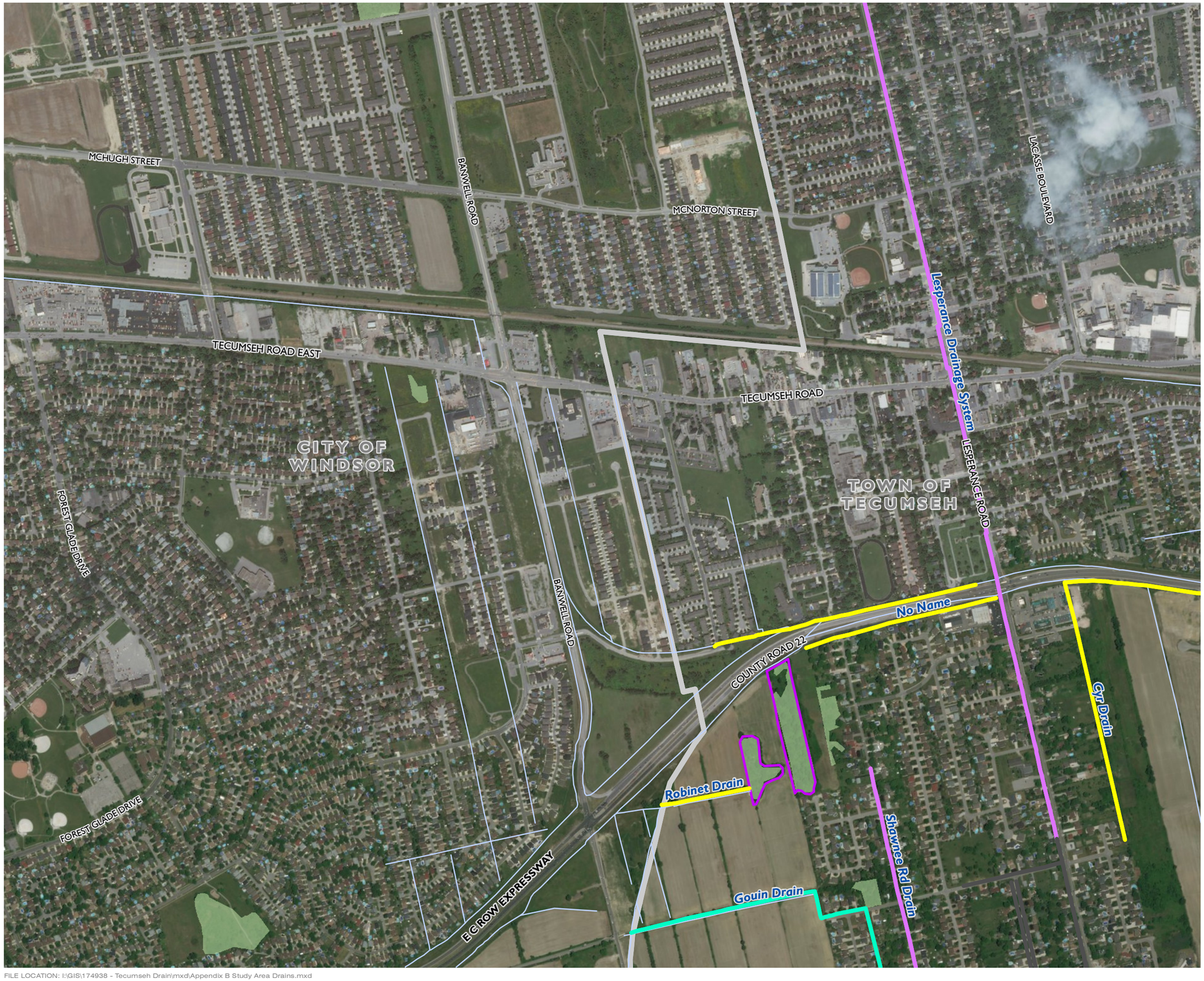
MAP DRAWING INFORMATION:
DATA PROVIDED BY MNR

MAP CREATED BY: GM
MAP CHECKED BY: KM/AB
MAP PROJECTION: NAD 1983 UTM Zone 17N

DILLON CONSULTING

PROJECT: 174938
STATUS: FINAL
DATE: 2017-12-08

FILE LOCATION: I:\GIS\174938 - Tecumseh Drain\mxd\Appendix B Study Area Drains.mxd



TOWN OF TECUMSEH

STUDY AREA WITH DRAINS

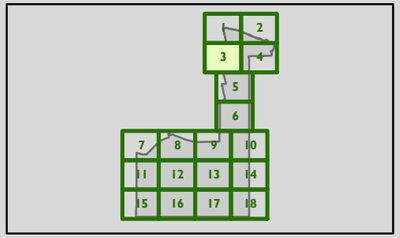
APPENDIX B
MAP 3

Drain by Habitat Type

- Forest
- Agricultural
- Urban
- Closed
- Watercourse
- Municipal Boundary
- Natural Heritage System (Town of Tecumseh)
- Woodland (MNRF)

[1] Potential for Aquatic SAR based on DFO Aquatic Species at Risk Mapping (Map 29 of 30). Where water is present additional site specific mitigation measures may be required as well as consultation with DFO. Pugnose Minnow has been identified as having potential to occur within these drains, please refer to Appendix D for more details on species habitat preferences and consultation with MNRF. (Appears on Maps 5, 6, and 10)

[2] Drains that convey flow downstream to drains with the potential for Aquatic SAR. Depending on conditions (presence of water, suitable habitat, etc.) these features have the potential for Aquatic SAR. (Appears on Maps 5, 6, 9, 10, 13, and 14)



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MAP DRAWING INFORMATION:
DATA PROVIDED BY MNR

MAP CREATED BY: GM
MAP CHECKED BY: KM/AB
MAP PROJECTION: NAD 1983 UTM Zone 17N

DILLON CONSULTING

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STATUS: FINAL
DATE: 2017-12-08

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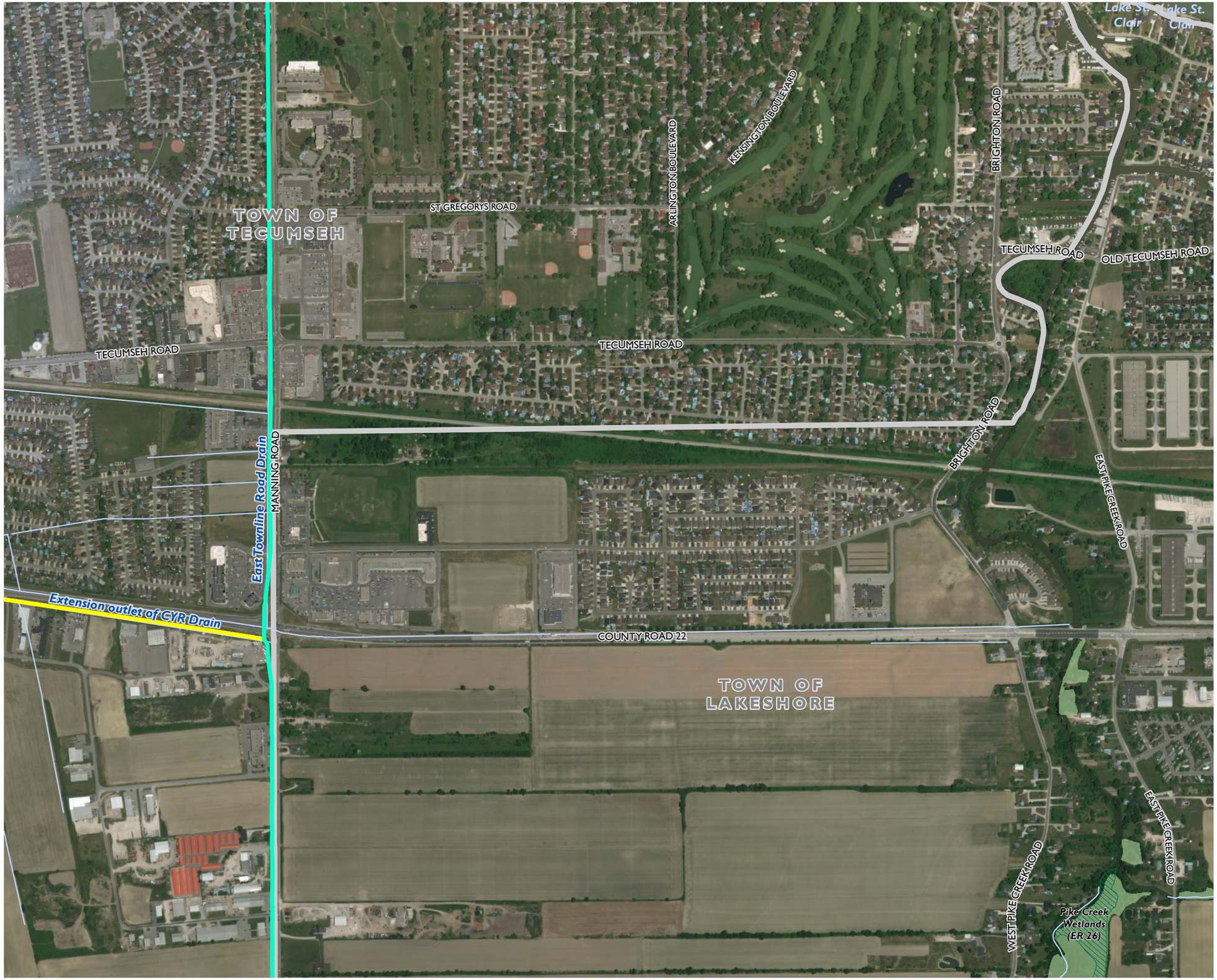


TOWN OF TECUMSEH

STUDY AREA WITH DRAINS

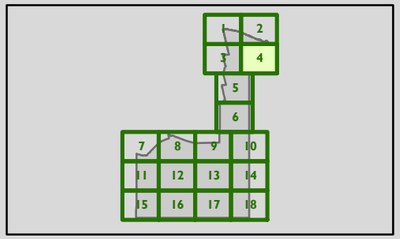
APPENDIX B
MAP 4

Drain by Habitat Type

- Forest
- Agricultural
- Urban
- Closed
- Watercourse
- Municipal Boundary
- Provincially Significant Wetland
- Woodland (MNRF)

[1] Potential for Aquatic SAR based on DFO Aquatic Species at Risk Mapping (Map 29 of 30). Where water is present additional site specific mitigation measures may be required as well as consultation with DFO. Pugnose Minnow has been identified as having potential to occur within these drains, please refer to Appendix D for more details on species habitat preferences and consultation with MNRF. (Appears on Maps 5, 6, and 10)

[2] Drains that convey flow downstream to drains with the potential for Aquatic SAR. Depending on conditions (presence of water, suitable habitat, etc.) these features have the potential for Aquatic SAR. (Appears on Maps 5, 6, 9, 10, 13, and 14)



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DATA PROVIDED BY MNR

MAP CREATED BY: GM
MAP CHECKED BY: KM/AB
MAP PROJECTION: NAD 1983 UTM Zone 17N

DILLON CONSULTING

PROJECT: 174938
STATUS: FINAL
DATE: 2017-12-08

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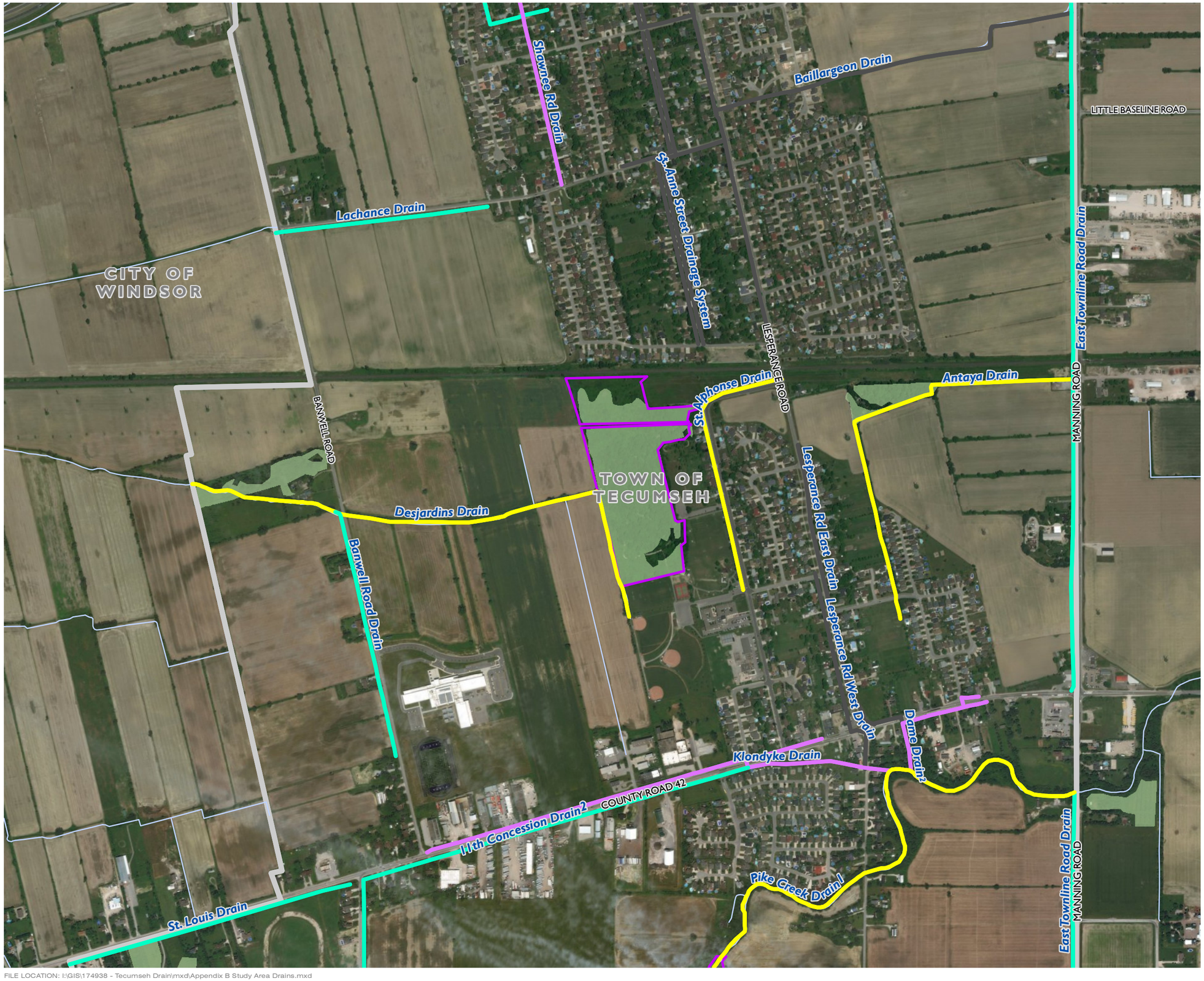


TOWN OF TECUMSEH

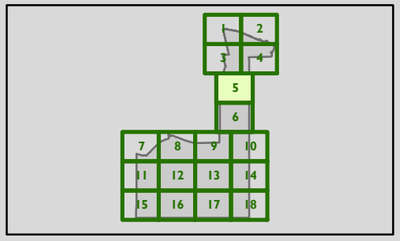
STUDY AREA WITH DRAINS
APPENDIX B
MAP 5

Drain by Habitat Type

- Forest
- Agricultural
- Urban
- Closed
- Watercourse
- Municipal Boundary
- Natural Heritage System (Town of Tecumseh)
- Woodland (MNRF)

[1] Potential for Aquatic SAR based on DFO Aquatic Species at Risk Mapping (Map 29 of 30). Where water is present additional site specific mitigation measures may be required as well as consultation with DFO. Pugnose Minnow has been identified as having potential to occur within these drains, please refer to Appendix D for more details on species habitat preferences and consultation with MNRF. (Appears on Maps 5, 6, and 10)

[2] Drains that convey flow downstream to drains with the potential for Aquatic SAR. Depending on conditions (presence of water, suitable habitat, etc.) these features have the potential for Aquatic SAR. (Appears on Maps 5, 6, 9, 10, 13, and 14)



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MAP DRAWING INFORMATION:
DATA PROVIDED BY MNR

MAP CREATED BY: GM
MAP CHECKED BY: KM/AB
MAP PROJECTION: NAD 1983 UTM Zone 17N

DILLON CONSULTING

PROJECT: 174938
STATUS: FINAL
DATE: 2017-12-08

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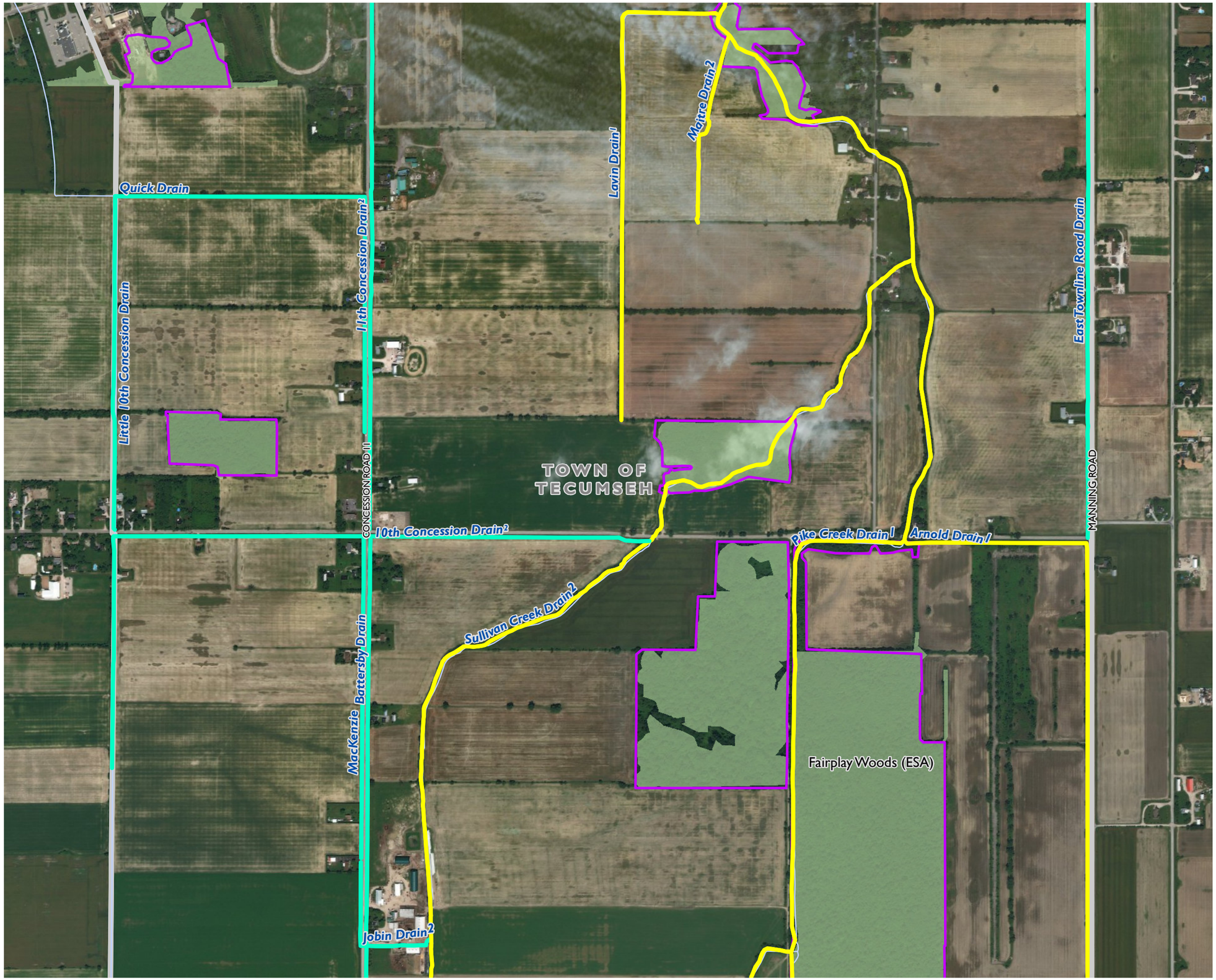


TOWN OF TECUMSEH

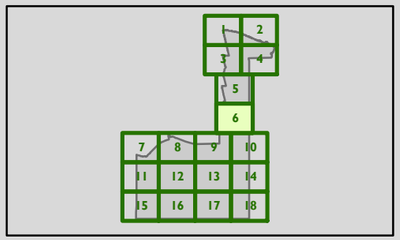
STUDY AREA WITH DRAINS
APPENDIX B
MAP 6

Drain by Habitat Type

- Forest
- Agricultural
- Urban
- Closed
- Watercourse
- Municipal Boundary
- Natural Heritage System (Town of Tecumseh)
- Woodland (MNRF)

[1] Potential for Aquatic SAR based on DFO Aquatic Species at Risk Mapping (Map 29 of 30). Where water is present additional site specific mitigation measures may be required as well as consultation with DFO. Pugnose Minnow has been identified as having potential to occur within these drains, please refer to Appendix D for more details on species habitat preferences and consultation with MNRF. (Appears on Maps 5, 6, and 10)

[2] Drains that convey flow downstream to drains with the potential for Aquatic SAR. Depending on conditions (presence of water, suitable habitat, etc.) these features have the potential for Aquatic SAR. (Appears on Maps 5, 6, 9, 10, 13, and 14)



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MAP CREATED BY: GM
MAP CHECKED BY: KM/AB
MAP PROJECTION: NAD 1983 UTM Zone 17N

DILLON CONSULTING

PROJECT: 174938
STATUS: FINAL
DATE: 2017-12-08

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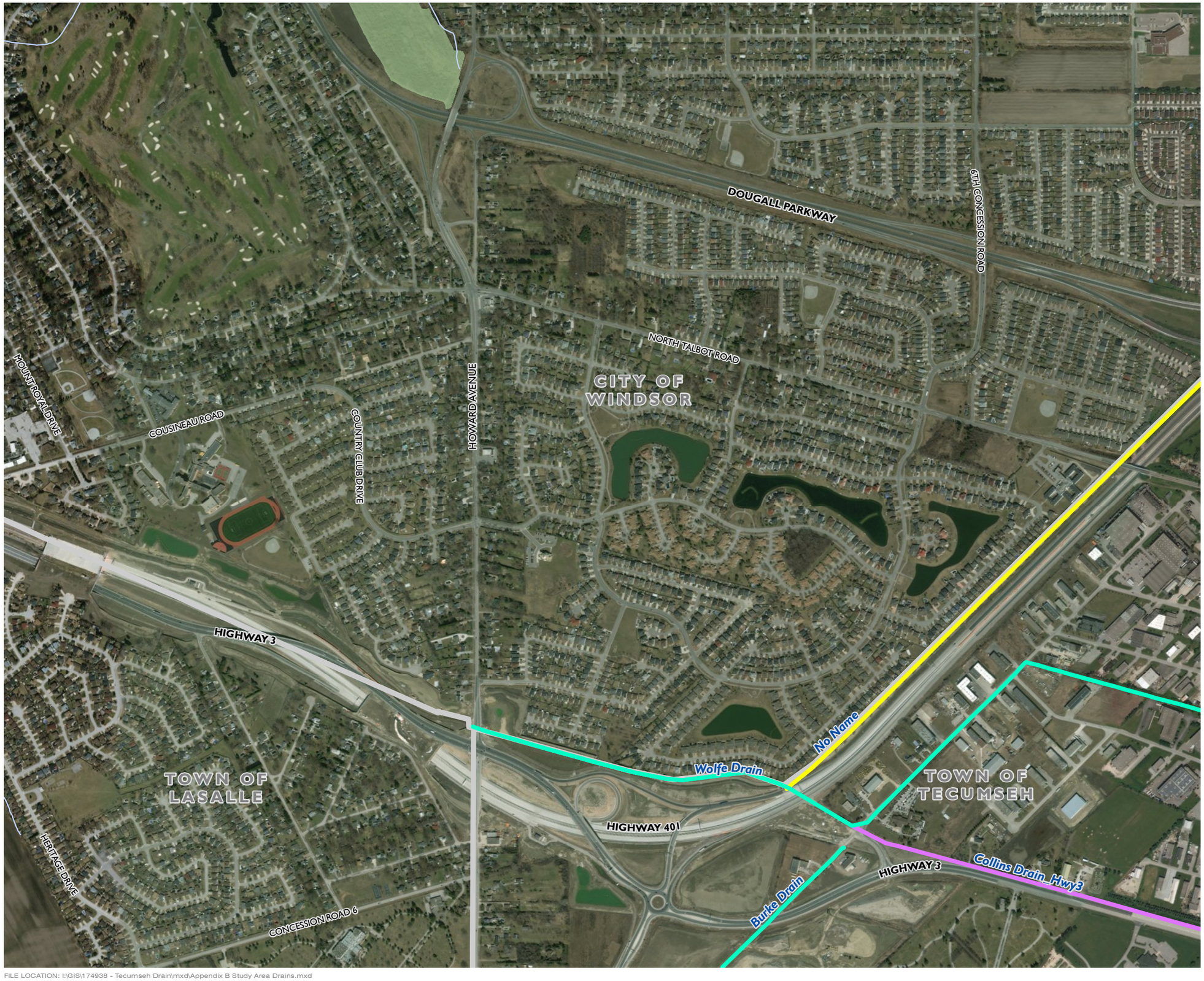


TOWN OF TECUMSEH

STUDY AREA WITH DRAINS

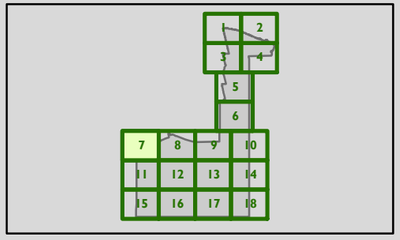
APPENDIX B
MAP 7

Drain by Habitat Type

- Forest
- Agricultural
- Urban
- Closed
- Watercourse
- Municipal Boundary
- Woodland (MNRF)

[1] Potential for Aquatic SAR based on DFO Aquatic Species at Risk Mapping (Map 29 of 30). Where water is present additional site specific mitigation measures may be required as well as consultation with DFO. Pugnose Minnow has been identified as having potential to occur within these drains, please refer to Appendix D for more details on species habitat preferences and consultation with MNRF. (Appears on Maps 5, 6, and 10)

[2] Drains that convey flow downstream to drains with the potential for Aquatic SAR. Depending on conditions (presence of water, suitable habitat, etc.) these features have the potential for Aquatic SAR. (Appears on Maps 5, 6, 9, 10, 13, and 14)



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MAP DRAWING INFORMATION:
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MAP CHECKED BY: KM/AB
MAP PROJECTION: NAD 1983 UTM Zone 17N

DILLON CONSULTING

PROJECT: 174938
STATUS: FINAL
DATE: 2017-12-08

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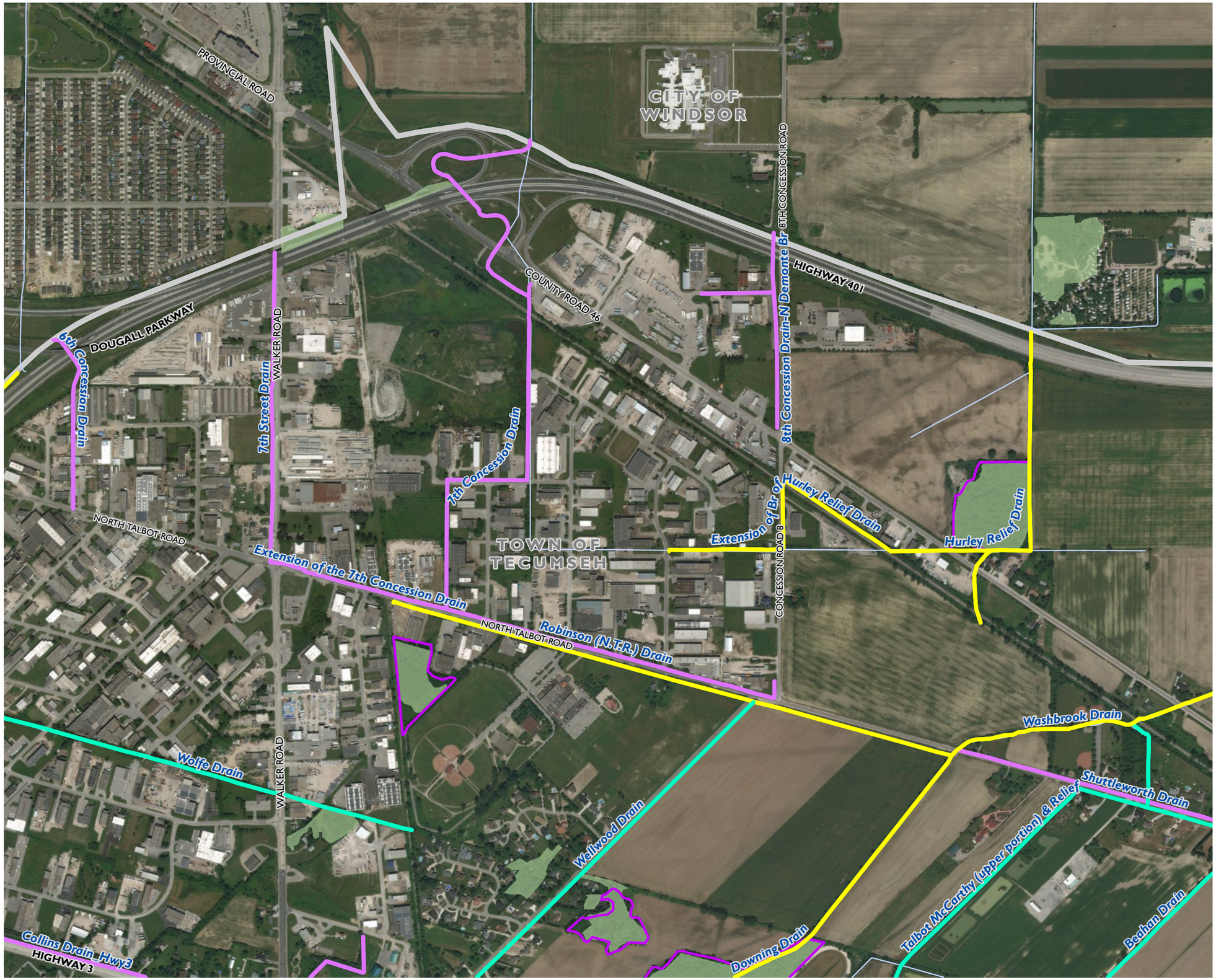


TOWN OF TECUMSEH

STUDY AREA WITH DRAINS

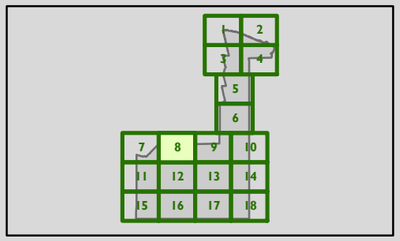
APPENDIX B
MAP 8

Drain by Habitat Type

- Forest
- Agricultural
- Urban
- Closed
- Watercourse
- Municipal Boundary
- Natural Heritage System (Town of Tecumseh)
- Woodland (MNRF)

[1] Potential for Aquatic SAR based on DFO Aquatic Species at Risk Mapping (Map 29 of 30). Where water is present additional site specific mitigation measures may be required as well as consultation with DFO. Pugnose Minnow has been identified as having potential to occur within these drains, please refer to Appendix D for more details on species habitat preferences and consultation with MNRF. (Appears on Maps 5, 6, and 10)

[2] Drains that convey flow downstream to drains with the potential for Aquatic SAR. Depending on conditions (presence of water, suitable habitat, etc.) these features have the potential for Aquatic SAR. (Appears on Maps 5, 6, 9, 10, 13, and 14)



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MAP CREATED BY: GM
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DILLON CONSULTING

PROJECT: 174938
STATUS: FINAL
DATE: 2017-12-08

FILE LOCATION: I:\GIS\174938 - Tecumseh Drain\mxd\Appendix B Study Area Drains.mxd

TOWN OF TECUMSEH

STUDY AREA WITH DRAINS

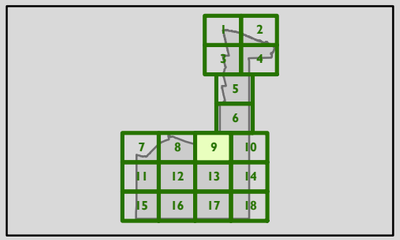
APPENDIX B
MAP 9

Drain by Habitat Type

- Forest
- Agricultural
- Urban
- Closed
- Watercourse
- Municipal Boundary
- Natural Heritage System (Town of Tecumseh)
- Woodland (MNRF)

[1] Potential for Aquatic SAR based on DFO Aquatic Species at Risk Mapping (Map 29 of 30). Where water is present additional site specific mitigation measures may be required as well as consultation with DFO. Pugnose Minnow has been identified as having potential to occur within these drains, please refer to Appendix D for more details on species habitat preferences and consultation with MNRF. (Appears on Maps 5, 6, and 10)

[2] Drains that convey flow downstream to drains with the potential for Aquatic SAR. Depending on conditions (presence of water, suitable habitat, etc.) these features have the potential for Aquatic SAR. (Appears on Maps 5, 6, 9, 10, 13, and 14)



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DILLON CONSULTING

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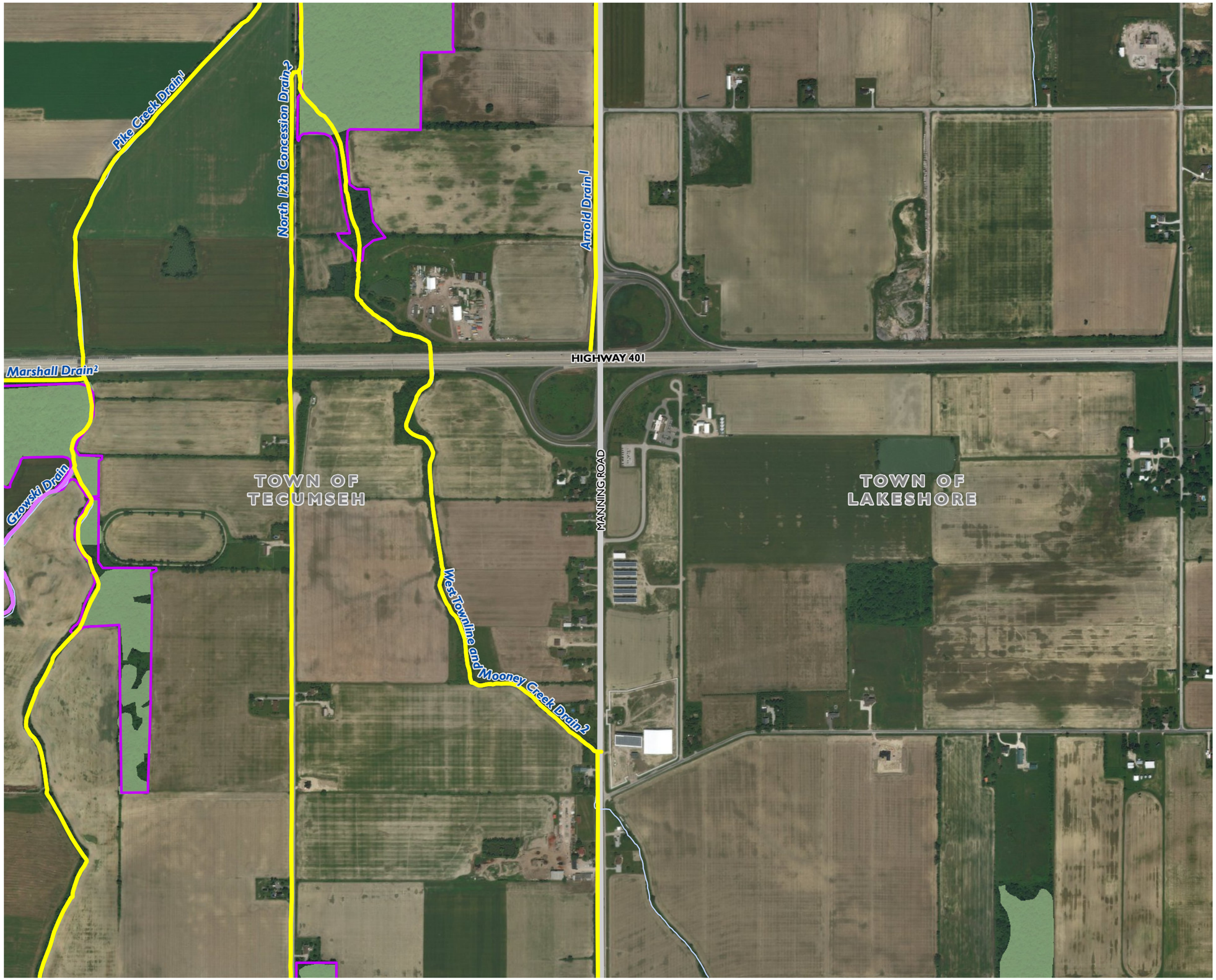


TOWN OF TECUMSEH

STUDY AREA WITH DRAINS

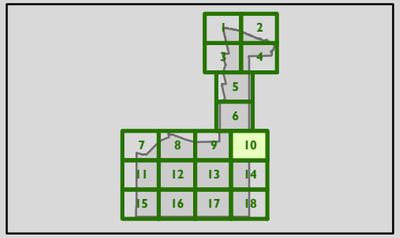
APPENDIX B
MAP 10

Drain by Habitat Type

- Forest
- Agricultural
- Urban
- Closed
- Watercourse
- Municipal Boundary
- Natural Heritage System (Town of Tecumseh)
- Woodland (MNRF)

[1] Potential for Aquatic SAR based on DFO Aquatic Species at Risk Mapping (Map 29 of 30). Where water is present additional site specific mitigation measures may be required as well as consultation with DFO. Pugnose Minnow has been identified as having potential to occur within these drains, please refer to Appendix D for more details on species habitat preferences and consultation with MNRF. (Appears on Maps 5, 6, and 10)

[2] Drains that convey flow downstream to drains with the potential for Aquatic SAR. Depending on conditions (presence of water, suitable habitat, etc.) these features have the potential for Aquatic SAR. (Appears on Maps 5, 6, 9, 10, 13, and 14)



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DILLON CONSULTING

PROJECT: 174938
STATUS: FINAL
DATE: 2017-12-08

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TOWN OF TECUMSEH

STUDY AREA WITH DRAINS

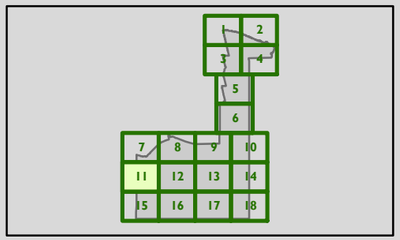
APPENDIX B
MAP 11

Drain by Habitat Type

- Forest
- Agricultural
- Urban
- Closed
- Watercourse
- Municipal Boundary
- Woodland (MNRF)

[1] Potential for Aquatic SAR based on DFO Aquatic Species at Risk Mapping (Map 29 of 30). Where water is present additional site specific mitigation measures may be required as well as consultation with DFO. Pugnose Minnow has been identified as having potential to occur within these drains, please refer to Appendix D for more details on species habitat preferences and consultation with MNRF. (Appears on Maps 5, 6, and 10)

[2] Drains that convey flow downstream to drains with the potential for Aquatic SAR. Depending on conditions (presence of water, suitable habitat, etc.) these features have the potential for Aquatic SAR. (Appears on Maps 5, 6, 9, 10, 13, and 14)



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MAP DRAWING INFORMATION:
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MAP CHECKED BY: KM/AB
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DILLON CONSULTING

PROJECT: 174938
STATUS: FINAL
DATE: 2017-12-08

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TOWN OF TECUMSEH

STUDY AREA WITH DRAINS

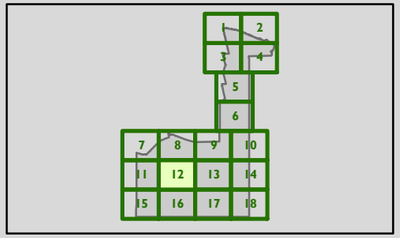
APPENDIX B
MAP 12

Drain by Habitat Type

- Forest
- Agricultural
- Urban
- Closed
- Watercourse
- Municipal Boundary
- Natural Heritage System (Town of Tecumseh)
- Woodland (MNRF)

[1] Potential for Aquatic SAR based on DFO Aquatic Species at Risk Mapping (Map 29 of 30). Where water is present additional site specific mitigation measures may be required as well as consultation with DFO. Pugnose Minnow has been identified as having potential to occur within these drains, please refer to Appendix D for more details on species habitat preferences and consultation with MNRF. (Appears on Maps 5, 6, and 10)

[2] Drains that convey flow downstream to drains with the potential for Aquatic SAR. Depending on conditions (presence of water, suitable habitat, etc.) these features have the potential for Aquatic SAR. (Appears on Maps 5, 6, 9, 10, 13, and 14)



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MAP DRAWING INFORMATION:
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MAP CHECKED BY: KM/AB
MAP PROJECTION: NAD 1983 UTM Zone 17N

DILLON CONSULTING

PROJECT: 174938
STATUS: FINAL
DATE: 2017-12-08

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TOWN OF TECUMSEH

STUDY AREA WITH DRAINS

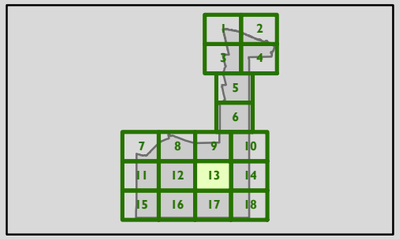
APPENDIX B
MAP 13

Drain by Habitat Type

- Forest
- Agricultural
- Urban
- Closed
- Watercourse
- Municipal Boundary
- Natural Heritage System (Town of Tecumseh)
- Woodland (MNRF)

[1] Potential for Aquatic SAR based on DFO Aquatic Species at Risk Mapping (Map 29 of 30). Where water is present additional site specific mitigation measures may be required as well as consultation with DFO. Pugnose Minnow has been identified as having potential to occur within these drains, please refer to Appendix D for more details on species habitat preferences and consultation with MNRF. (Appears on Maps 5, 6, and 10)

[2] Drains that convey flow downstream to drains with the potential for Aquatic SAR. Depending on conditions (presence of water, suitable habitat, etc.) these features have the potential for Aquatic SAR. (Appears on Maps 5, 6, 9, 10, 13, and 14)



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MAP DRAWING INFORMATION:
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MAP CREATED BY: GM
MAP CHECKED BY: KM/AB
MAP PROJECTION: NAD 1983 UTM Zone 17N

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PROJECT: 174938
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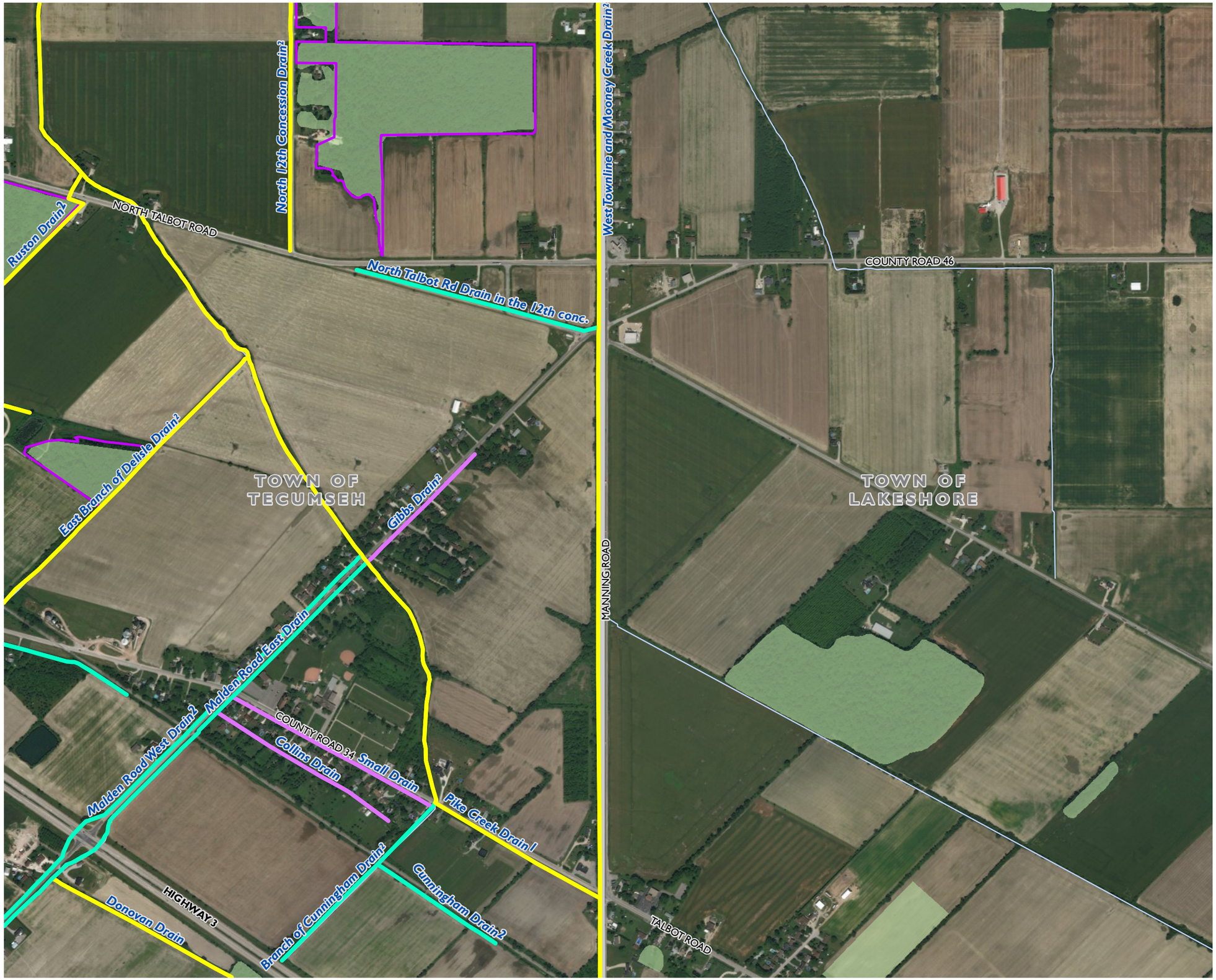


TOWN OF TECUMSEH

STUDY AREA WITH DRAINS

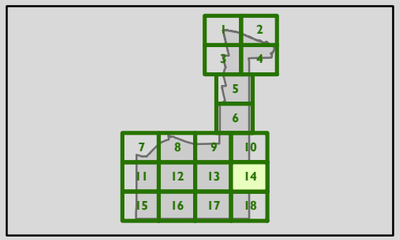
APPENDIX B
MAP 14

Drain by Habitat Type

- Forest
- Agricultural
- Urban
- Closed
- Watercourse
- Municipal Boundary
- Natural Heritage System (Town of Tecumseh)
- Woodland (MNRF)

[1] Potential for Aquatic SAR based on DFO Aquatic Species at Risk Mapping (Map 29 of 30). Where water is present additional site specific mitigation measures may be required as well as consultation with DFO. Pugnose Minnow has been identified as having potential to occur within these drains, please refer to Appendix D for more details on species habitat preferences and consultation with MNRF. (Appears on Maps 5, 6, and 10)

[2] Drains that convey flow downstream to drains with the potential for Aquatic SAR. Depending on conditions (presence of water, suitable habitat, etc.) these features have the potential for Aquatic SAR. (Appears on Maps 5, 6, 9, 10, 13, and 14)



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DILLON CONSULTING

PROJECT: 174938
STATUS: FINAL
DATE: 2017-12-08

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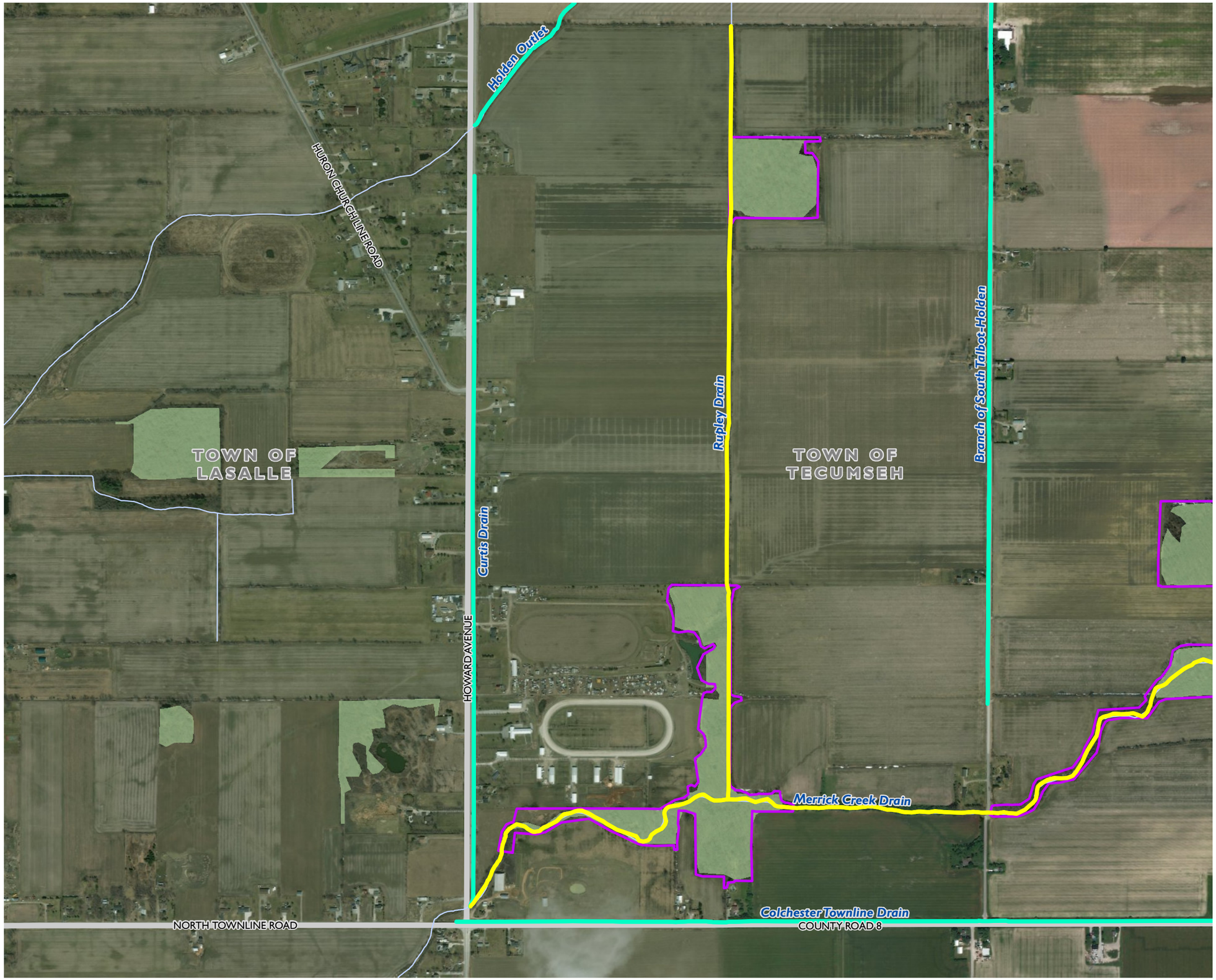


TOWN OF TECUMSEH

STUDY AREA WITH DRAINS

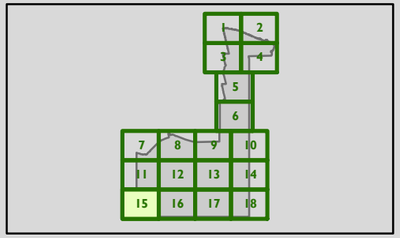
APPENDIX B
MAP 15

Drain by Habitat Type

- Forest
- Agricultural
- Urban
- Closed
- Watercourse
- Municipal Boundary
- Natural Heritage System (Town of Tecumseh)
- Woodland (MNRF)

[1] Potential for Aquatic SAR based on DFO Aquatic Species at Risk Mapping (Map 29 of 30). Where water is present additional site specific mitigation measures may be required as well as consultation with DFO. Pugnose Minnow has been identified as having potential to occur within these drains, please refer to Appendix D for more details on species habitat preferences and consultation with MNRF. (Appears on Maps 5, 6, and 10)

[2] Drains that convey flow downstream to drains with the potential for Aquatic SAR. Depending on conditions (presence of water, suitable habitat, etc.) these features have the potential for Aquatic SAR. (Appears on Maps 5, 6, 9, 10, 13, and 14)



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PROJECT: 174938
STATUS: FINAL
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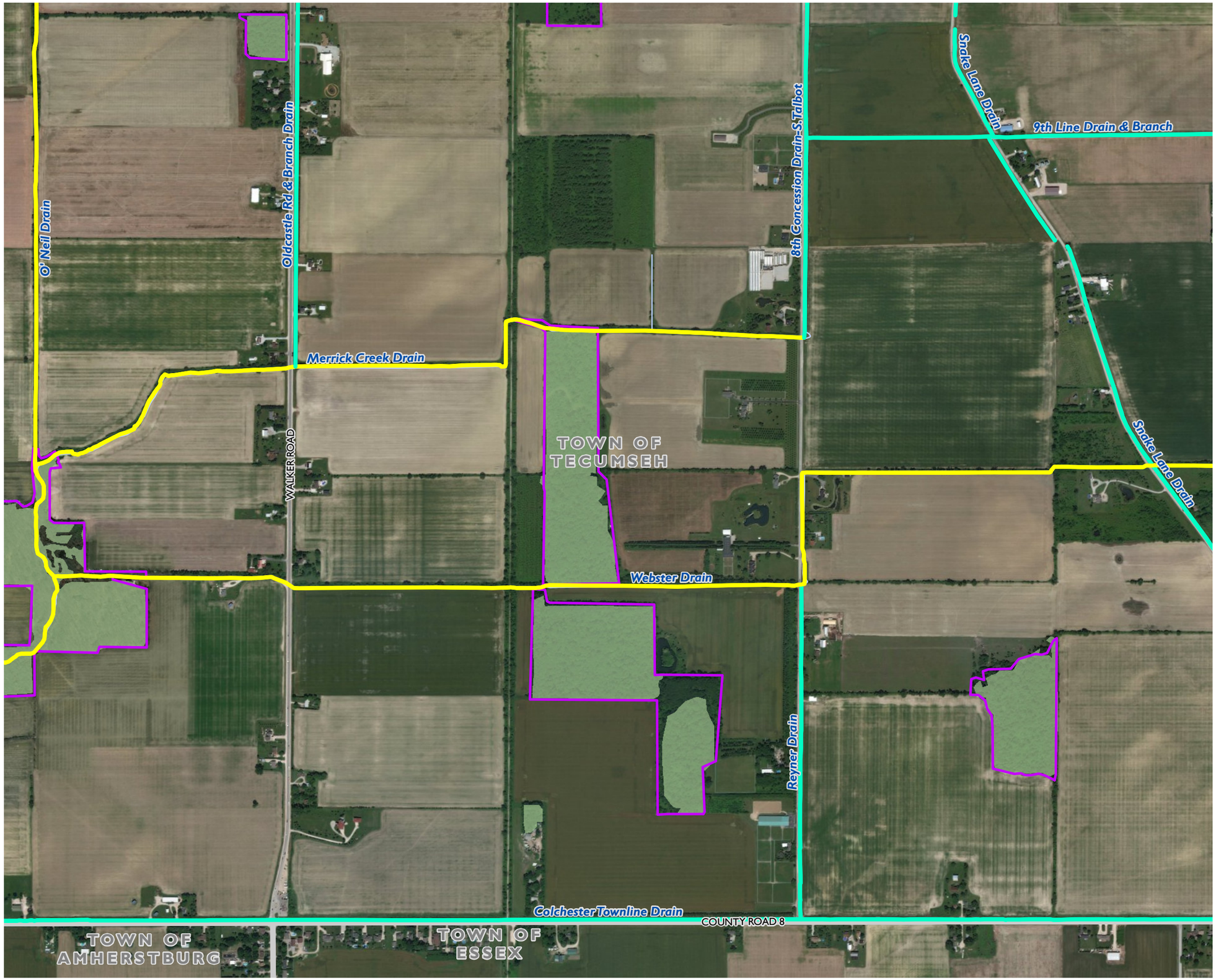


TOWN OF TECUMSEH

STUDY AREA WITH DRAINS

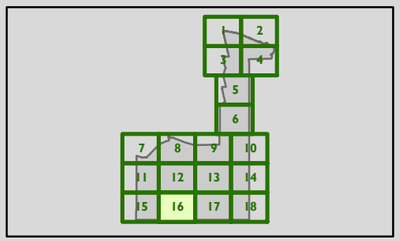
APPENDIX B
MAP 16

Drain by Habitat Type

- Forest
- Agricultural
- Urban
- Closed
- Watercourse
- Municipal Boundary
- Natural Heritage System (Town of Tecumseh)
- Woodland (MNRF)

[1] Potential for Aquatic SAR based on DFO Aquatic Species at Risk Mapping (Map 29 of 30). Where water is present additional site specific mitigation measures may be required as well as consultation with DFO. Pugnose Minnow has been identified as having potential to occur within these drains, please refer to Appendix D for more details on species habitat preferences and consultation with MNRF. (Appears on Maps 5, 6, and 10)

[2] Drains that convey flow downstream to drains with the potential for Aquatic SAR. Depending on conditions (presence of water, suitable habitat, etc.) these features have the potential for Aquatic SAR. (Appears on Maps 5, 6, 9, 10, 13, and 14)



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DILLON CONSULTING

PROJECT: 174938
STATUS: FINAL
DATE: 2017-12-08

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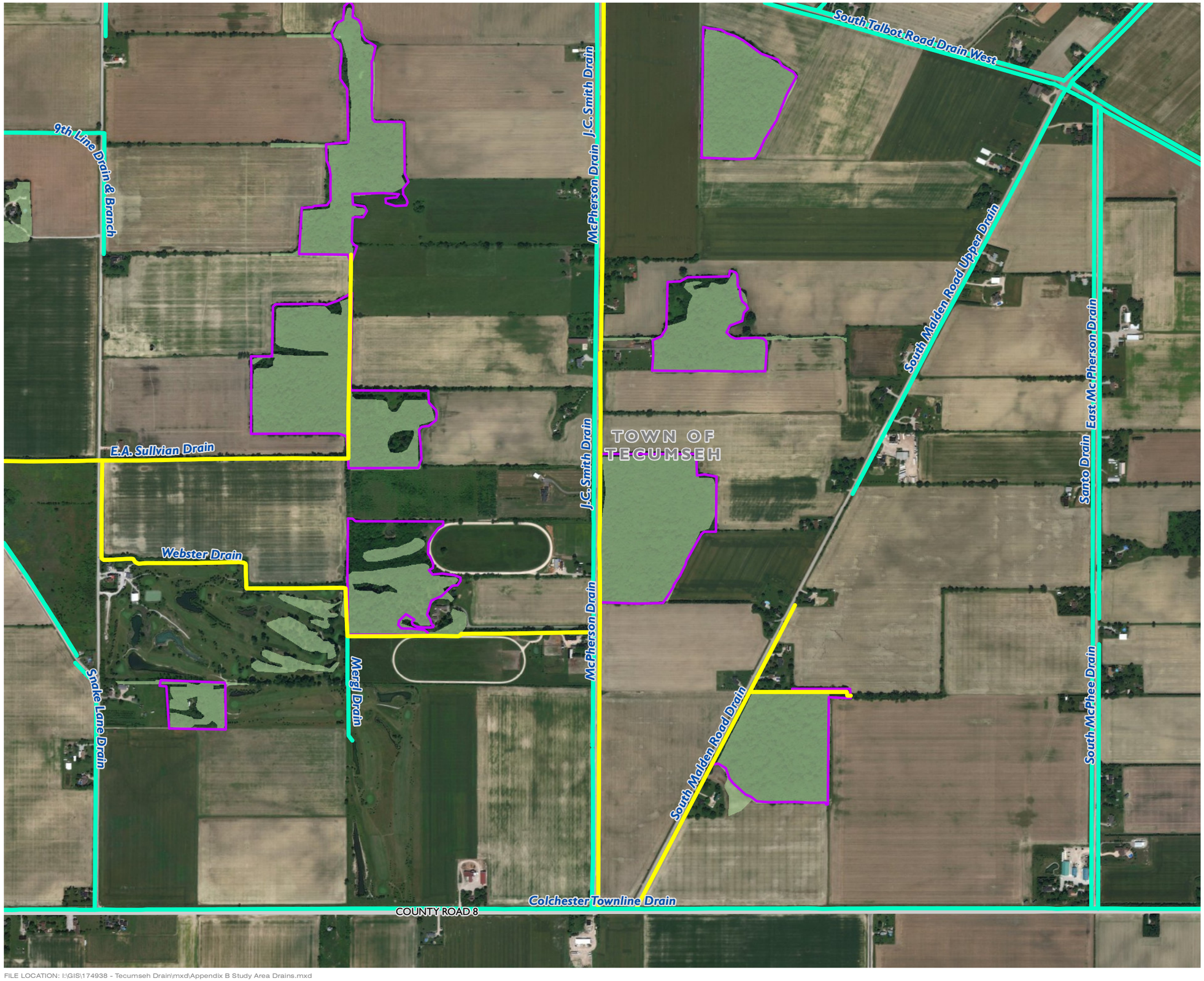

TOWN OF TECUMSEH

STUDY AREA WITH DRAINS

APPENDIX B
MAP 17

Drain by Habitat Type

- Forest
- Agricultural
- Urban
- Closed
- Watercourse
- Municipal Boundary
- Natural Heritage System (Town of Tecumseh)
- Woodland (MNRF)

[1] Potential for Aquatic SAR based on DFO Aquatic Species at Risk Mapping (Map 29 of 30). Where water is present additional site specific mitigation measures may be required as well as consultation with DFO. Pugnose Minnow has been identified as having potential to occur within these drains, please refer to Appendix D for more details on species habitat preferences and consultation with MNRF. (Appears on Maps 5, 6, and 10)

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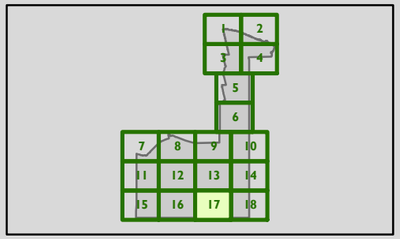

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MAP DRAWING INFORMATION:
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DILLON CONSULTING

PROJECT: 174938
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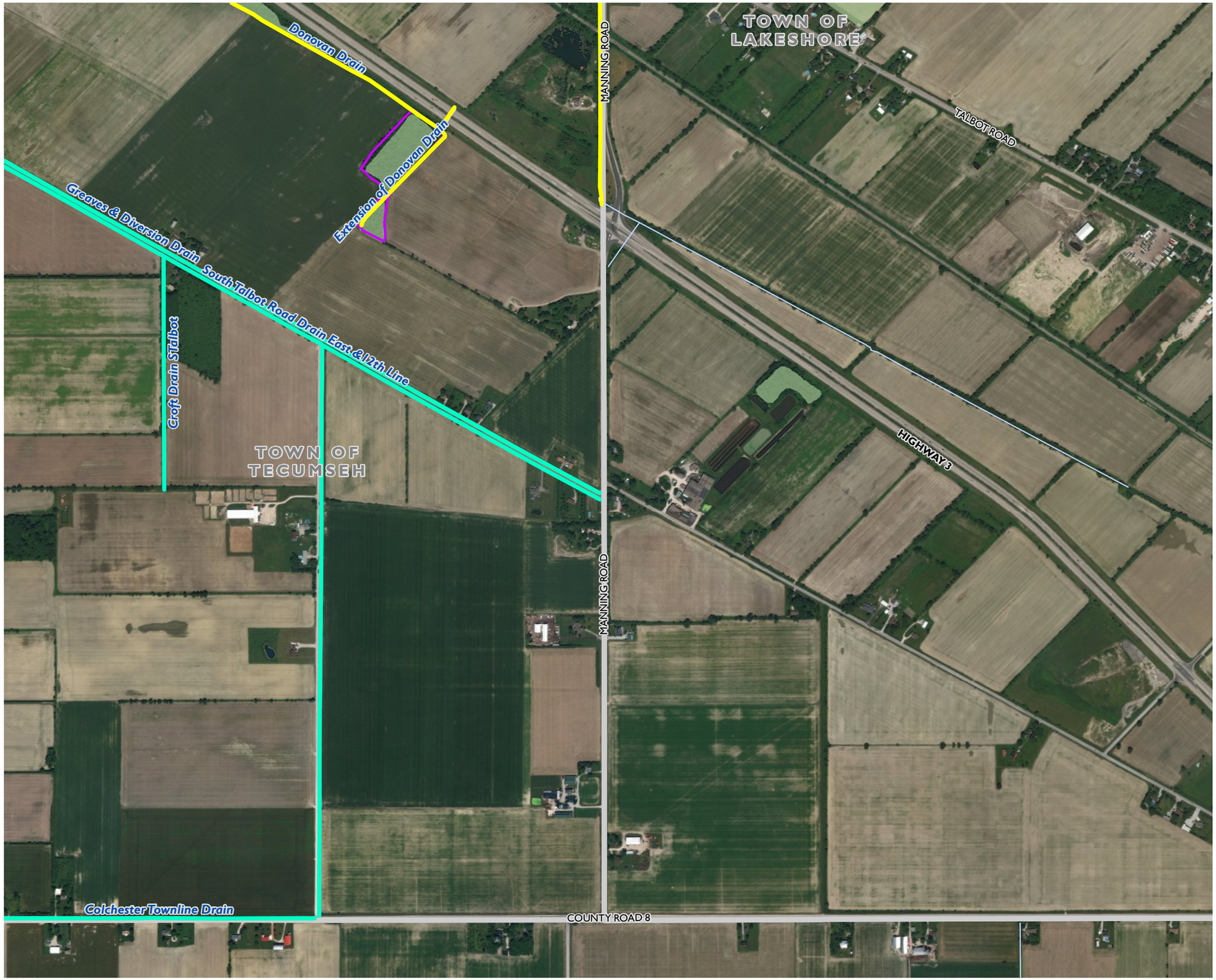

TOWN OF TECUMSEH

STUDY AREA WITH DRAINS

APPENDIX B
MAP 18

Drain by Habitat Type

- Forest
- Agricultural
- Urban
- Closed
- Watercourse
- Municipal Boundary
- Natural Heritage System (Town of Tecumseh)
- Woodland (MNRF)

[1] Potential for Aquatic SAR based on DFO Aquatic Species at Risk Mapping (Map 29 of 30). Where water is present additional site specific mitigation measures may be required as well as consultation with DFO. Pugnose Minnow has been identified as having potential to occur within these drains, please refer to Appendix D for more details on species habitat preferences and consultation with MNRF. (Appears on Maps 5, 6, and 10)

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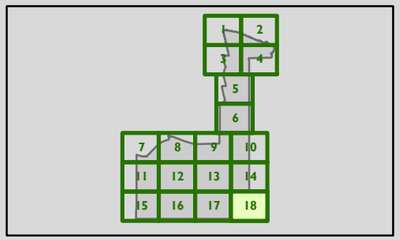

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MAP DRAWING INFORMATION:
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MAP CHECKED BY: KM/AB
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DILLON CONSULTING

PROJECT: 174938
STATUS: FINAL
DATE: 2017-12-08

FILE LOCATION: I:\GIS\174938 - Tecumseh Drain\mxd\Appendix B Study Area Drains.mxd

Table B-1: Town of Tecumseh Drains and Adjacent Existing Land Use(s)

Drain Name	Existing Land Use(s)	Drains Assessed (at roadside crossing)
Tenth 10 th Conc.[2]	Agricultural	
Eleventh 11th Conc.[2]	Agricultural	X
Sixth 6th conc.	Urban	
Seventh 7th Conc. & Extension	Urban	X
Seventh 7th Street	Urban	X
Eight 8th Conc. North & Demonte Br	Urban	
Eight 8th Conc. & South Talbot	Agricultural	X
Ninth 9th Conc.	Agricultural	
Ninth 9th Line & Branch	Agricultural	
Antaya	Forest	
Arnold[1]	Forest, Agricultural	X*
Baillargeon & Branch	N/A	
Banwell Rd	Agricultural	
Battersby	Agricultural	X
Beehan East & West Branch & Ext.	Agricultural	
Benson	Agricultural	
Baillargeon & Branch	N/A	
Cunningham & Branch[2]	Agricultural	
Downing and branch	Forest	
Gzowski & Branch	Urban	
Hurley Relief & Branch & Ext.	Forest	
Klondyke & Branch	Urban	X
Sullivan Creek- upper part & Branch	Agricultural	
Delisle/West branch of	Agricultural	
Burke	Agricultural	
Colchester Townline	Agricultural	X*
Collins	Urban	
Collins/Hwy#3	Urban	
Croft / Ct.Rd46[2]	Forest	
Croft /S. Talbot	Agricultural	

Drain Name	Existing Land Use(s)	Drains Assessed (at roadside crossing)
Cunningham & Branch[2]	Agricultural	
Curtis	Agricultural	
CYR & Extension outlet	Forest	
Dame - East Branch & extension[2]	Urban	
Dawson & Outlet	Agricultural	
Eight 8th Conc. North & Demonte Br	Urban	
Desjardins & Extension	Forest	
Dickson Branch	Agricultural	
Dickson	Agricultural	
Donavan & Extension	Forest	
Downing & Branch	Forest	
E.A. Sullivan	Forest	
Delisle/ East Branch of the East b	Agricultural	
Beehan East & West Branch & Ext.	Agricultural	
Dame & East Branch & extension	N/A	
Delisle/ East branch[2]	Forest	
McPherson East	Agricultural	
East Townline	Agricultural	
East Townline pump	Agricultural	X
Beehan East & West Branch & Ext.	Agricultural	
Hurley Relief & Branch & Ext.	Urban	
Donavan & Extension	Forest	
Seventh 7th Conc. & Extension	Urban	
CYR Extension outlet	Agricultural	
Gibbs[2]	Urban	
Gouin	Agricultural	
Graham & south malden rd.	Forest	
Greaves & diversion	Agricultural	
Grondin[2]	Agricultural	
Gzowski & Branch	Forest, Agricultural	X
Halford	Agricultural	

Drain Name	Existing Land Use(s)	Drains Assessed (at roadside crossing)
Hurley Relief & Branch & Ext.	Forest	
JC Smith	Agricultural	
Jobin[2]	Agricultural	
Kavanagh	Agricultural	
Klondyke & Branch[2]	Agricultural	
Lachance	Agricultural	
Lavin[1]	Forest	
Tecumseh outlet	Urban	
Lesperance Rd East	N/A	
Lesperance Rd West	N/A	
Little Tenth 10th Conc.	Agricultural	
Little River upper part	Agricultural	
MacKenzie	Agricultural	
Maitre[2]	Forest	
Malden Rd East	Agricultural	
Malden Rd West[2]	Agricultural	
Marshall[2]	Forest, Agricultural	
McCarthy[2]	Agricultural	
McLean-Hergott	Agricultural	
McPherson	Forest, Agricultural	
Mergl	Agricultural	
Merrick Creek	Forest	X*
Moynahan	Agricultural	
North 12th conc.[2]	Forest	
North Talbot Rd. in the 12th conc	Agricultural	
O'Neil	Forest	
O'Connell Outlet Drain	Agricultural	
O'Keefe	Agricultural	
Oldcastle Rd & Branch	Agricultural	
Dawson & Outlet	Agricultural	
Pike Creek[1]	Forest	X*

Drain Name	Existing Land Use(s)	Drains Assessed (at roadside crossing)
Quick	Agricultural	
Reyner	Agricultural	
Robinet Drain	Forest	
Robinson (N.T.R.)	Urban	
Robinson	Agricultural	
Rupley	Forest	
Ruston[2]	Forest, Agricultural, Urban	X
Santo	Agricultural	
Shawnee Rd.	Urban	
Shreve	Agricultural	
Shuttleworth	Urban	
Small	Urban	
Snake Lane	Agricultural	
Malden Rd. south	Forest	
Malden Rd. south upper	Agricultural	
South McPhee	Agricultural	
South Talbot & Holden outlet & branch	Agricultural	X
South Talbot East & 12th Line	Agricultural	
South Talbot West	Agricultural	
South Talbot & O'conell	Agricultural	
St Anne Street drainage System	N/A	
St Anne Street drainage System 2	N/A	
St. Alphonse	Forest	
St. Julian	Agricultural	
St. Louis	Agricultural	
Sullivan Creek[2]	Forest, Agricultural	X*
Sylvester	Agricultural	
Talbot McCarthy-low-upper & Relief	Agricultural	
Sullivan Creek- upper part & Branch	Forest	
Washbrook	Forest	X
Watson	Agricultural	

Drain Name	Existing Land Use(s)	Drains Assessed (at roadside crossing)
Webster	Forest	
Wellwood	Agricultural	
Delisle/ West branch of East branch	Agricultural	
Beehan East & West Branch & Ext.	Agricultural	
Delisle / West branch of	Agricultural	
West Townline & Mooney Creek[2]	Forest, Agricultural	X*
Wolfe	Agricultural	

[1]Potential for Aquatic SAR based on DFO Aquatic SAR Mapping (Map 29 of 33). Where water is present additional site specific mitigation measures may be required as well as consultation with DFO. Pugnose Minnow has been identified as having potential to occur within these drains, please refer to ***Appendix D*** for more details on species habitat preferences and consultation with MNRF; [2]Drains that convey flow downstream to drains with the potential for Aquatic SAR. Depending on conditions (presence of water, suitable habitat, etc.) these features have the potential for Aquatic SAR; *Indicates drains that were assessed at multiple roadside crossings.

Appendix C
Species Records

Table C-1: Species at Risk Identified within the Study Area

Scientific Name	Common Name	SARA[1]	ESA[2]	Source[3]	Habitat Requirements[4]	Potential for SAR and SAR Habitat	Rationale for Potential to Occur in Study Area
Plants							
Aletris farinosa	Colicroot	THR	THR	MNRF SAR in Area	Colicroot has been found in open moist prairie, old fields, roadsides and edges of woody areas. This species appears to tolerate disturbances such as drought, fire and grazing.	High	Based on review of background information, Colicroot has the potential to occur adjacent to drains within the Study Area, particularly in areas adjacent to old fields, moist prairie and wooded areas.
Camassia scilloides	Wild Hyacinth	THR	THR	MNRF SAR in Area	Wild Hyacinth grows best in light to moderate shade. In Ontario, Wild hyacinth prefers openings in woodlands, shrubby areas and forest edges. This species requires rich soil. In Ontario, Lake Erie islands within Essex County is the northern extent of Wild Hyacinth's range.	Low	Based on review of background information, encountering Wild Hyacinth within the Study Area is considered to be low based on the known locations of the populations and habitat requirements.
Smilax rotundifolia	Round-leaved Greenbrier (Great Lakes Plains population)	THR	THR	MNRF SAR in Area	The Round-leaved Greenbrier prefers open moist to wet woodlands, often growing on sandy soil. Round-leaved Greenbrier in Ontario have been observed in Essex, Norfolk Counties and Niagara Region. In Essex County extant and historical, presumed extant populations are associated with ESAs along the north shores of Lake Erie and an extirpated population on Point Pelee.	Moderate	Based on review of background information and species inclusion on previous Agreement, potential for encountering Round-leaved Greenbrier is considered moderate. Forest patches and Fairplay Woods (ESA) may provide suitable habitat for this species.
Triphora trianthophoros	Nodding Pogonia	END	END	MNRF SAR in Area	Nodding Pogonia is found in rich, moist deciduous forests with a well-developed tree canopy and a deep layer of leaf litter. Nodding Pogonia is restricted to two locations in Ontario: Rondeau Provincial Park in the Municipality of Chatham-Kent and Three Birds Woodlot, near Leamington in Essex County.	Low	Based on background review and known locations of populations in Ontario, the likelihood of encountering Nodding Pogonia is considered low.
Opuntia humifusa	Eastern Prickly Pear Cactus	END	END	MNRF SAR in Area	The Eastern Prickly Pear Cactus grows in dry sandy areas that are relatively open and sunny. It cannot grow in complete shade. It is found on sandy openings on dry, sometimes forested, hillsides and in sand dunes near beaches. Canadian populations of Prickly Pear Cactus are limited to Point Pelee National Park and Pelee Island.	Low	Based on background review and existing habitat types within the Study Area, suitable habitat does not exist and encounters with Eastern Prickly Pear Cactus is considered to be low.
Liparis liliifolia	Purple Twayblade	END	THR	MNRF SAR in Area	Purple Twayblade has been found in open oak woodland and savannah, mixed deciduous forest, shrub thicket, shrub alvar, deciduous swamp, and even conifer plantations.	Moderate	Known populations of Purple Twayblade are located in Windsor (west of the Study Area). Based on the proximity and suitable habitat (i.e. forest areas) there is potential to encounter Purple Twayblade.
Platanthera leucophaea	Eastern Prairie Fringed-orchid	END	END	MNRF SAR in Area, MNRF Reg. Habitat	The Eastern Prairie Fringed-orchid grows in wetlands, fens, swamps and tallgrass prairie. It has been found in ditches and railroad rights of way.	Low	Based on review of suitable habitat types and MNRF distribution mapping there does not appear to be suitable habitat for Eastern Prairie Fringed-orchid within the Study Area.
Liatris spicata	Dense Blazing Star	THR	THR	MNRF SAR in Area	Dense Blazing Star grows in moist prairies, grassland savannahs, wet areas between sand dunes, and abandoned fields.	Low	Based on review of existing background information, known populations of Dense Blazing Star do not exist within the Study Area. Therefore potential to encounter this species is considered low within the Study Area.
Symphyotrichum praealtum	Willowleaf Aster	THR	THR	AGR., MNRF SAR in Area	In Ontario, the Willowleaf Aster is found in openings of oak savannahs, a very rare type of vegetation community containing many tallgrass prairie herbs and oak trees. It has also been found along railways, roadsides and in abandoned farm fields.	Moderate	Based on review of existing background information, results from site investigations and since it was listed in the previous Agreement, potential for Willowleaf Aster to occur within the Study Area is considered to be moderate.
Cornus florida	Eastern Flowering Dogwood	END	END	MNRF SAR in Area, MNRF Reg. Habitat	Eastern Flowering Dogwood grows under tall trees in mid-age to mature deciduous forests. Commonly grows on floodplains, slopes, bluffs and ravines. Sometimes found along roadsides and fencerows.	Moderate	Based on review of existing information and MNRF distribution there is potential habitat along the Study Area drains for Eastern Flowering Dogwood. The potential for encountering this species is considered to be moderate.

Scientific Name	Common Name	SARA[1]	ESA[2]	Source[3]	Habitat Requirements[4]	Potential for SAR and SAR Habitat	Rationale for Potential to Occur in Study Area
Castanea dentata	American Chestnut	END	END	MNRF SAR in Area	American Chestnut grows in moist to well drained forests on sand, occasionally heavy soils.	High	Based on review of existing background information, there is potential for American Chestnut to occur within the Study Area. The potential for encountering this species is considered to be high.
Gymnocladus dioicus	Kentucky Coffee-tree	THR	THR	AGR., MNRF SAR in Area	Kentucky Coffee-tree is found in a variety of habitats, but grows best on moist, rich soil. Consequently, it is often found in floodplains, though it will tolerate shallow rocky or sandy soils. It is shade-intolerant, and therefore grows along the edges of woodlots or relies on canopy openings in forests and woodlots.	Moderate	MNRF distribution mapping has occurrences in close proximity to the Study Area boundaries. There is potential for this species to occur within the Study Area.
Lespedeza virginica	Slender Bush-clover	END	END	MNRF SAR in Area	Slender Bush-clover grows on dry, sandy soil in tallgrass prairies. This plant does not do well in the shade and can be harmed by other plants that compete for light and space. The open and sunny prairie habitat it prefers, depends on natural disturbances, such as fire and drought, which naturally remove many unwanted trees and shrubs.	Low	MNRF Mapping indicates that Slender Bush-clover has only been identified at three locations in close proximity to the Study Area. These locations include Tallgrass Prairie Heritage Park, Ojibway Park and Black Oak Heritage Park in the City of Windsor. Based on species distribution mapping and habitat preferences (dry, sandy soils) the potential for encountering this species is considered low.
Juglans cinerea	Butternut	END	END	AGR.	Butternut are often found in moist, well-drained gravel sites, sunny openings, forest edges.	Moderate	Though no gravel sites were identified during site assessments, forest edges adjacent to drains exist throughout the Study Area which could provide suitable habitat.
Ptelea trifoliata	Common Hoptree	THR	THR	MNRF SAR in Area	In Ontario, Common Hoptree is only known to occur along or near the shoreline of Lake Erie. It is often found in areas of natural disturbance where it forms part of the outer edge of shoreline woody vegetation.	Low	Based on the background information, habitat requirements and known distribution in Ontario, the potential for encountering Common Hoptree within the Study Area drains is considered low.
Justicia americana	American Water-willow	THR	THR	MNRF SAR in Area	The American Water-willow grows along the shores and in the waters of streams, rivers, lakes, ditches and occasionally wetlands. It can grow on wet soil and in up to 1.2 m of water, but appears to require periodic flooding and wave action to reduce competition from other aquatic plants. The underlying subsoil on which it grows is usually gravel, sand or organic matter. Extant populations have been observed at Point Pelee National Park and along the shorelines of Lake Erie.	Low	Based on the background information, habitat requirements and known distribution in Ontario, the potential for encountering American Water-willow within the Study Area drains is considered low.
Fraxinus quadrangulata	Blue Ash	SC	THR	MNRF SAR in Area	Blue ash is one of the rarest species of ash trees in Ontario, confined small patches on the islands and northern shores of Lake Erie, and the floodplains of the Thames and St. Clair rivers.	Low	Based on the background information, habitat requirements and known distribution in Ontario, the potential for encountering Blue Ash within the Study Area drains is considered low.
Polygala incarnata	Pink Milkwort	END	END	MNRF SAR in Area	Pink milkwort grows in moderately moist to dry, sandy, prairie habitats, where it is often found growing with Little Bluestem grass (*Schizachyrium scoparium*). Periodic fire is important to maintain open prairie conditions.	Low	Based on the background information, habitat requirements and known extant populations, the potential for encountering Pink Milkwort within the Study Area drains is considered low.
Agalinis skinneriana	Skinner's Agalinis	END	END	MNRF SAR in Area	Skinner's Agalinis only grows in tallgrass prairie habitats in Ontario, an extremely rare ecosystem in the province. It probably has a range of host species, but the only confirmed connection is to the prairie grass, Little bluestem (*Schizachyrium scoparium*). In southwestern Ontario, this species has been observed on two islands in the St. Clair River delta, at Lake St. Clair, and also in a small prairie near Windsor.	Low	Based on the background information, habitat requirements and known distribution in Ontario, the potential for encountering Skinner's Agalinis within the Study Area drains is considered low.
Celtis tenuifolia	Dwarf Hackberry	THR	THR	MNRF SAR in area	Dwarf Hackberry grows in several different habitats. These include dry, sandy areas near lakeshores, inland dunes, ridge tops and limestone alvars. Several plant communities in which Dwarf Hackberry occurs are considered rare to extremely rare, such as shrub and treed sand dunes, oak savannas, and red cedar-treed alvars. Dwarf Hackberry is a sun-loving tree that does best in areas where it will not be shaded-out by other trees and vegetation. Extant populations within Essex County, are located on Pelee Island (2 populations) and on Point Pelee National Park (SARA).	Low	Based on the background information, habitat requirements and known extant populations, the potential for encountering Dwarf Hackberry within the Study Area drains is considered low.
Morus rubra	Red Mulberry	END	END	MNRF SAR in area	Red Mulberry has been observed in moist open-canopy forest habitat in both sandy and limestone-based loamy soils.	Moderate	MNRF and SARA distribution mapping has occurrences in close proximity to the Study Area boundaries. There is a moderate potential for this species to occur within the Study Area.

Scientific Name	Common Name	SARA[1]	ESA[2]	Source[3]	Habitat Requirements[4]	Potential for SAR and SAR Habitat	Rationale for Potential to Occur in Study Area
Carex lupuliformis	False Hop Sedge	END	END	MNRF SAR in Area	False Hop Sedge most often grows in riverine swamps and marshes, and around temporary forest ponds. It prefers open areas and areas under forest canopy openings, with lots of sunlight. The Ontario populations grow within the Carolinian Forest zone in areas with swamps, marshes or temporary pools flooded in spring. Populations are largest in open areas with ample sunlight, such as forest edges or clearings.	Low	Based on review of existing background information, MNRF distribution mapping and subsequent site visit, it does not appear that the drains within the Study Area provide suitable habitat for the False Hop Sedge. The potential for encountering this species is considered to be low.
Ammannia robusta	Scarlet Ammannia	END	END	MNRF SAR in Area	In Ontario, Scarlet Ammannia is found on mudflats, sand beaches, and the edges of wetlands and ponds that are seasonally flooded. Fluctuating water levels are important to its survival. It does well in habitat that is generally submerged early in the year and when water levels recede later in the summer the plants emerge.	Low	Based on the background review and habitat surrounding the drains within the Study area, the potential for encountering Scarlet Ammannia is considered to be low.
Plantago cordata	Heart-leaved Plantain	END	END	NHIC	Heart-leaved Plantain is a semi-aquatic plant, found in relatively undisturbed wet woods, often along the rocky or gravelly limestone beds of shallow, slow-moving clear streams. Moisture is generally always present above or just below the soil surface. The most common trees in Ontario woodlots associated with this plant are Sugar Maple (*Acer saccharum*), Silver Maple (*Acer saccharinum*), Red Maple (*Acer rubrum*), Blue-beech (Carpinus caroliniana), Shagbark Hickory (*Carya ovata*), White Ash (Fraxinus americana), Black Ash (*F. pennsylvanica*) and Basswood (*Tilia americana*). Recovery Strategy for species (SARA) indicate that populations within Essex County, Canard River and Amherstburg have gone extinct.	Low	Based on review of background information, encountering Heart-leaved Plantain within the Study Area is considered to be low based on the known locations of the populations and habitat requirements.
Bryophytes							
Bryoandersonia illecebra	Spoon-leaved Moss	END	END	MNRF SAR in area	Spoon-leaved moss grows in a range of habitat types but most Canadian populations are located on soil in low-lying areas that are seasonally flooded under trees or shrub thickets. It is often found in close proximity to a species of moss called narrow-leaved wetland plume moss, which is associated with swamps, marshes, and wet meadows.	Low	Based on review of existing background information and distribution mapping, it does not appear that the drains within the Study Area provide suitable habitat for the Spoon-leaved Moss. The potential for encountering this species Is considered to be low.
Birds							
Dolichonyx oryzivorus	Bobolink	---	THR	OBBA, MNRF SAR in area	Bobolink require large, open expansive grasslands with dense ground cover for nesting; prefer hayfields, meadows or fallow fields but will also use marshes.	High	Large open expanses of field with drains were observed during aerial interpretation and site investigation that could provide habitat for Bobolink. Likelihood of encountering this species is considered high.
Sturnella magna	Eastern Meadowlark	—	THR	OBBA, MNRF SAR in area	Eastern Meadowlark primarily breed in moderately tall grasslands, such as pastures and hayfields, but also in alfalfa fields, weedy borders of croplands, roadsides, orchards, airports, shrubby overgrown fields, or other open areas. They may use small trees, shrubs or fence posts as elevated song perches.	High	Large open expanses of field with drains were observed during aerial interpretation and the site assessment that could provide habitat for Eastern Meadowlark. Likelihood of encountering this species is considered high.
Hirundo rustica	Barn Swallow	---	THR	OBBA, MNRF SAR in area	Farmlands or rural areas; cliffs, caves, rock niches; buildings or other man-made structures for nesting; open country near body of water.	High	Large box culverts within the Study Area provide suitable habitat for Barn Swallow. During the site investigation on May 29, 2017 Barn Swallow were observed actively using the culvert associated with Sullivan Drain (UTM 17T: x: 0343670 / y: 4680445)
Turtles							
Emydoidea blandingii	Blanding's Turtle	THR	THR	NHIC, OHA, MNRF SAR in area, AGR.	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..	Moderate	Review of background information and information collected during field investigations found that there is potential for Blanding's Turtle to occur within the Study Area drains. Although no wetland areas were found within the Study Area, drains with slow moving water, logs or stumps along banks and soft muddy substrate may provide suitable habitat for this species. The potential for encountering Blanding's Turtle is considered moderate.

Scientific Name	Common Name	SARA[1]	ESA[2]	Source[3]	Habitat Requirements[4]	Potential for SAR and SAR Habitat	Rationale for Potential to Occur in Study Area
Apalone spinifera	Spiny Softshell	THR	THR	NHIC, OHA, MNRF SAR in area,	Spiny softshells are highly aquatic turtles that rarely travel far from water. They are found primarily in rivers and lakes but also in creeks and even ditches and ponds near rivers. Key habitat requirements are open sand or gravel nesting areas, shallow muddy or sandy areas to bury in, deep pools for hibernation, areas for basking, and suitable habitat for crayfish and other food species. These habitat features may be distributed over an extensive area, as long as the intervening habitat doesn't prevent the turtles from traveling between them.	Moderate	Pike Creek (larger permanent system) may provide sufficient habitat for Spiny Softshell at some point in their life cycle. The potential for encountering this species is considered moderate.
Frogs and Toads							
Anaxyrus fowleri	Fowler's Toad	END	END	MNRF SAR in area	Fowler's Toads inhabit open beaches, dunes, sandy shorelines, rocky pools, creek and stream mouths, backshore wetlands, and marshes along the northern shore of Lake Erie.	Low	MNRF distribution mapping indicates that the occurrences of Fowler's Toad are on the north shore of Lake Erie. In addition, there is a lack of significant habitat for this species within the Study Area. There is a low potential for this species to occur within the Study Area.
Snakes							
Coluber constrictor foxii	Blue Racer	END	END	OHA, MNRF SAR in area	Species records indicate that the Blue Racer is only located on Pelee Island (MNRF).	Low	N/A
Heterodon platirhinos	Eastern Hog-nosed Snake	THR	THR	OHA	Intolerant of pollution; large river systems, shallow lakes and ponds with muddy bottoms and aquatic vegetation; basks on sandbars, mud flats, grassy beaches, logs or rocks; eggs are laid near water on sandy beaches or gravel banks in areas with sun; requires acceptable feeding, nesting, habitat and natural, undisturbed corridors between these critical habitats.	Low	Based on background information and species distribution, the likelihood of encountering Eastern Hog-nosed Snake within the Study Area drains is considered low.
Nerodia sipedon insularum	Lake Erie Watersnake	END	END	OHA, MNRF SAR in area	The global distribution of the Lake Erie Watersnake is limited to islands in the western end of Lake Erie, including Pelee Island. There are no current population estimates, but it is believed the population has declined over the past few decades.	Low	N/A
Pantherophis gloydi pop. 2	Eastern Foxsnake (Carolinian population)	END	END	AGR., MNRF SAR in area, MNRF Reg. habitat	Eastern Foxsnakes are usually found in unforested areas such as old fields, marshes, drainage canals and shorelines. Females lay their eggs in rotting logs, manure, or compost piles which naturally incubate the eggs. During the winter, they will hibernate in groups in deep cracks in the bedrock and in some man-made structures.	High	Based on review of background information and mapping, suitable habitat for Eastern Foxsnake exists within the Study Area drains.
Regina septemvittata	Queensnake	END	END	OHA, MNRF SAR in area, MNRF Reg. Habitat	The Queensnake is predominantly aquatic and is rarely found more than a few metres from water. It prefers clear water streams and lakes with rocky or gravel substrate, with many places to hide and an abundance of crayfish. Suitable hibernacula include abutments of old bridges and crevices in bedrock.	Low	Based on background information and habitat requirements, suitable habitat for Queensnake is considered to be low. As such the likelihood of encountering Queensnake within the Study Area drains is considered to be low.
Thamnophis butleri	Butler's Gartersnake	THR	END	AGR.,NHIC, MNRF SAR in area, OHA	Butler's Gartersnake occur in open areas with dense grasses near ditches, seasonally dry marshes, or other small waterbodies. It has been found in vacant lots near urban areas and areas partially overgrown with shrubs and trees. They will sometime use burrows made by small mammals and crayfish for hibernacula and are commonly associated with rock piles and old stone walls.	High	Based on review of background information and mapping, suitable habitat for Butler's Gartersnake exists within the Study Area drains.

Scientific Name	Common Name	SARA[1]	ESA[2]	Source[3]	Habitat Requirements[4]	Potential for SAR and SAR Habitat	Rationale for Potential to Occur in Study Area
Sistrurus catenatus pop. 2	Massasauga (Carolinian population)	THR	END	MNRF SAR in area, OHA	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.	Low	Based on review of background information and known distribution in Ontario, suitable habitat within the Study Area drains does not exist. The likelihood of encountering Massasauga is considered low.
Lizards and Salamanders							
Plestiodon fasciatus pop. 1	Common Five-lined Skink (Carolinian population)	END	END	MNRF SAR in area, OHA, MNRF Reg. Habitat	The Carolinian population can be found under woody debris in clearings with sand dunes, open forested areas, and wetlands. Carolinian population lives, skinks inhabit open forests, small meadows, beaches and stabilized sand dunes. Five-lined skinks hibernate in groups under rocks or tree stumps and in rotting wood. In Essex County, only two populations since 1995 have been observed; located at Oxley Poison Sumac Swamp and Point Pelee National Park.	Low	Based on background information, habitat requirements and locations of known populations in Essex County, the potential for encountering Common Five-lined Skink is considered to be low.
Ambystoma texanum	Small-mouthed Salamander	END	END	OHA, MNRF SAR in area	Species records indicate that the Small-mouthed Salamander is only located on Pelee Island (MNRF).	Low	N/A
Mammals							
Myotis leibii	Eastern Small-footed Myotis	---	END	MNRF SAR in area	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.	Low	Suitable habitat within the Study Area drains is limited for Eastern Small-footed Myotis. As such, likelihood of species encounters is considered low.
Myotis lucifugus	Little Brown Myotis	END	END	MNRF SAR in area	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.	Low	Suitable habitat within the Study Area drains is limited for Little Brown Myotis. As such, likelihood of species encounters is considered low.
Myotis septentrionalis	Northern Myotis	END	END	MNRF SAR in area	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.	Low	Suitable habitat within the Study Area drains is limited for Northern Myotis. As such, likelihood of species encounters is considered low.
Urocyon cinereoargenteus	Grey Fox	THR	THR	MNRF SAR in area	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. In southwestern Ontario breeding populations are limited to Pelee Island and the north shore of Lake Erie.	Low	Review of background information indicates that this species has limited range within southwestern Ontario and has not been observed in the Study Area within the last 50 years.
Taxidea taxus jacksoni	American Badger (Southwestern Ontario population)	END	END	MNRF SAR in area	American Badgers are found in a variety of habitats, such as tall grass prairie, sand barrens and farmland. In Ontario, the Southwestern population of American Badger is found in the southwestern part of the province, primarily close to Lake Erie in the Norfolk and Middlesex counties.	Low	Based on review of background information, the likelihood of encountering American Badger is considered low.
Molluscs							
Epioblasma torulosa rangiana	Northern Riffleshell	END	END	MNRF SAR in area	In Ontario, the Northern Riffleshell can be found within rivers or streams with rocky, sand or gravel bottoms.	Low	Based on review of existing background information, MNRF distribution mapping and information from site assessments, it does not appear that the drains within the Study Area provide suitable habitat for the Northern Riffleshell. The potential for encountering this species Is considered to be low.
Epioblasma triquetra	Snuffbox	END	END	MNRF SAR in area	The Snuffbox is typically found in small to medium-sized rivers in shallow riffle areas. They prefer clean, clear, swift-flowing water and firm rocky, gravel or sand river bottoms.	Low	Based on review of existing background information, MNRF distribution mapping and information from site assessments, it does not appear that the drains within the Study Area provide suitable habitat for the Snuffbox. The potential for encountering this species Is considered to be low.

Scientific Name	Common Name	SARA[1]	ESA[2]	Source[3]	Habitat Requirements[4]	Potential for SAR and SAR Habitat	Rationale for Potential to Occur in Study Area
Lampsilis fasciola	Wavy-rayed Lampmussel	SC	THR	AGR., MNRF SAR in area	The Wavy-rayed lampmussel is usually found in small to medium rivers with clear water. It lives in shallow riffle areas with clean gravel or sand bottoms. Mussel larvae are parasitic and must attach to a fish host, where they consume nutrients from the fish body until they transform into juvenile mussels and drop off. The Wavy-rayed lampmussel's fish hosts are the Largemouth bass and Smallmouth bass. The presence of fish hosts is one of the key features for an area to support a healthy mussel population.	Low	Based on review of existing background information, MNRF distribution mapping and information from site assessments, it does not appear that the drains within the Study Area provide suitable habitat for the Wavy-rayed Lampmussel. The potential for encountering this species Is considered to be low.
Ligumia nasuta	Eastern Pondmussel	END	END	AGR., MNRF SAR in area	Found in sheltered areas of lakes and slow-moving rivers and canals with sand or mud bottoms.	Low	Based on review of existing background information, MNRF distribution mapping and information from site assessments, it does not appear that the drains within the Study Area provide suitable habitat for the Eastern Pondmussel. The potential for encountering this species Is considered to be low.
Obovaria subrotunda	Round Hickorynut	END	END	MNRF SAR in area	The Round hickorynut is mainly found in rivers with clay, sand, or gravel bottoms. It also lives in shallow areas of lakes with firm sand. It prefers moderately fast moving water.	Low	Based on review of existing background information, MNRF distribution mapping and information from site assessments, it does not appear that the drains within the Study Area provide suitable habitat for the Round Hickorynut. The potential for encountering this species Is considered to be low.
Pleurobema sintoxia	Round Pigtoe	END	END	MNRF SAR in area	The Round pigtoe is usually found in rivers of various sizes with deep water and sandy, rocky, or mud bottoms.	Low	Based on review of existing background information, MNRF distribution mapping and information from site assessments, it does not appear that the drains within the Study Area provide suitable habitat for the Round Pigtoe. The potential for encountering this species Is considered to be low.
Ptychobranchus fasciolaris	Kidneyshell	END	END	MNRF SAR in area, DFO	The Kidneyshell is generally found in small to medium sized rivers and prefers shallow, clear, swift-moving water with gravel and sand.	Low	Based on review of existing background information, DFO and MNRF distribution mapping and information from site assessments, it does not appear that the drains within the Study Area provide suitable habitat for the Kidneyshell. The potential for encountering this species Is considered to be low.
Truncilla donaciformis	Fawnsfoot	---	END	AGR	The Fawnsfoot is generally found in the lower portions of medium to large rivers, at depths ranging from less than one to over five metres. This mussel is usually associated with substrates of mud, soft sand or even gravel.	Low	Based on review of existing background information, DFO and MNRF distribution mapping and information from site assessments, it does not appear that the drains within the Study Area provide suitable habitat for the Fawnsfoot. The potential for encountering this species Is considered to be low.
Villosa fabalis	Rayed Bean	END	END	MNRF SAR in area	The Rayed bean is typically found buried in sand or gravel in shallow, clear headwaters and riffle areas of small tributaries. It is often found buried among the roots of aquatic plants.	Low	Based on review of existing background information, MNRF distribution mapping and information from site assessments, it does not appear that the drains within the Study Area provide suitable habitat for the Rayed Bean. The potential for encountering this species Is considered to be low.
Villosa iris	Rainbow Mussel	END	SC	DFO	The Rainbow mussel prefers small to medium-sized rivers with a moderate to strong current and sand, rocky, or gravel bottoms. It is found in or near riffle areas and along the edges of vegetation in water less than one metre deep.	Low	Based on review of existing background information, DFO and MNRF distribution mapping and information from site assessments, it does not appear that the drains within the Study Area provide suitable habitat for the Rainbow Mussel. The potential for encountering this species Is considered to be low.
Fishes							
Acipenser fulvescens pop. *3*	Lake Sturgeon (Great Lakes - Upper St. Lawrence River population)	---	THR	MNRF SAR in area	Lake Sturgeon can be found in freshwater lakes and rivers with soft bottoms of mud, sand or gravel and generally found at depths of five to 20 metres. They spawn in relatively shallow, fast-flowing water (usually below waterfalls, rapids, or dams) with gravel and boulders at the bottom. They will spawn in deeper water where habitat is available.	Low	The drains reviewed within the Study Area do not appear to provide the optimal habitat suitable for Lake Sturgeon (i.e., larger water body with swift moving currents) and the potential for encountering habitat within the drain systems is considered low.

Scientific Name	Common Name	SARA[1]	ESA[2]	Source[3]	Habitat Requirements[4]	Potential for SAR and SAR Habitat	Rationale for Potential to Occur in Study Area
Erimyzon sucetta	Lake Chubsucker	END	THR	MNRF SAR in area	Lives in marshes and lakes with clear, still, warmer water and plenty of aquatic plants. This habitat is found in bays, channels, ponds, and coastal wetlands. During the breeding season, from April to early June in Ontario, adults move into marshes where eggs are laid among vegetation in shallower water. The Lake Chubsucker eats algae, plankton, molluscs, and aquatic insects.	Low	Review of distribution mapping for Lake Chubsucker found no occurrences in the Study Area. There are no wetlands within the Study Area, where Lake Chubsucker tend to lay eggs, as such species encounters within the Study Area is considered low.
Macrhybopsis storeriana	Silver Chub	SC	THR	MNRF SAR in area, DFO	Silver Chub prefer medium to large rivers with substantial current and silt, sand or gravel substrate. It is usually found in depths between 7 and 12 metres, and is believed to spawn in May and June in open water areas. There are species occurrence records along the shores of Lake St. Clair within the Study Area.	Low	Based on the review of habitat requirements and DFO distribution mapping this species appears to prefer larger river and open water areas. The drains within the Study Area do not appear to provide sufficient habitat for Silver Chub and likelihood of encountering this species while conducting drainage works is considered to be low.
Notropis anogenus	Pugnose Shiner	END	THR	MNRF SAR in area, DFO	The Pugnose Shiner is found in lakes and calm areas of rivers and creeks having clear water and bottoms of sand, mud or organic matter. It prefers water bodies with plenty of aquatic vegetation, particularly Stonewart (*Chara sp.*).	High	Based on the review of habitat requirements and DFO distribution mapping this species has potential to occur within the Study Area drains. Segments of Pike Creek and associated drains with clear water and aquatic vegetation may provide sufficient habitat for the Pugnose Shiner.
Lepisosteus oculatus	Spotted Gar	THR	THR	MNRF SAR in area	Spotted Gar live in calm, clear pools and bays with plenty of aquatic plants. It is usually found in lakes with soft mud substrate. During the breeding season, the adults will migrate to shallow water with lots of aquatic vegetation, to mate and lay eggs.	Moderate	Based on the review of habitat preferences for Spotted Gar and DFO distribution mapping, drains within the Study Area may at times provide habitat. However since many of the drains are cleared to maintain flow and prevent flooding upstream the potential for this species within drains is considered moderate. There is potential for upstream migration into the Pike Creek and its associated tributaries during spawning season.
Lepomis gulosus	Warmouth	SC	END	MNRF SAR in area	Warmouth prefers silt-free marshes, ponds and lakes with abundant aquatic plants and mucky bottoms.	Low	Based on review of existing background information, DFO mapping and information from site assessments, it does not appear that the drains within the Study Area provide suitable habitat for the Warmouth. The potential for encountering this species Is considered to be low.
Ammocrypta pellucida	Eastern Sand Darter (Ontario populations)	THR	END	AGR., MNRF Reg. Habitat, MNRF SAR in area, DFO	The Eastern Sand Darter prefers shallow habitats in lakes, streams, and rivers with clean, sandy bottoms.	Low	Based on review of existing background information, DFO mapping and information from site assessments, it does not appear that the drains within the Study Area provide suitable habitat for the Eastern Sand Darter. The potential for encountering this species Is considered to be low.
Percina copelandi	Channel Darter	THR	THR	AGR., MNRF SAR in area, DFO	The Channel Darter may inhabitat smaller channels and tributaries, but is frequently found in large river systems. It is commonly found over sand and gravel shoals of larger rivers or beaches with low current. During the breeding season in late spring, it prefers riffle areas with fairly fast moving water but spends the winter in deeper, calmer water.	Low	Based on review of existing background information including DFO distribution mapping and information gathered on the drains, there is limited habitat for Channel Darter within the Study Area. The potential for encountering this species is considered to be low.
Noturus stigmosus	Northern Madtom	END	END	AGR., MNRF SAR in area, NHIC, DFO	The Northern Madtom usually lives in large creeks and rivers with a moderate to swift current, and a sand, gravel, or mud bottom. It prefers clean, unpolluted water but can tolerate slightly muddy water.	Low	Based on review of existing background information, DFO mapping and information from site assessments, it does not appear that the drains within the Study Area provide suitable habitat for the Northern Madtom. The potential for encountering this species Is considered to be low.
Opsopoeodus emiliae	Pugnose Minnow	SC	THR	MNRF SAR by area, DFO	The Pugnose Minnow prefers coastal wetlands, and slow-moving rivers and streams with clear, warm water, little or no current, and abundant vegetation. Small populations have been observed in Lake St. Clair and the Detroit River.	Moderate	Review of background information and distribution mapping indicate that there is potential for Pugnose Minnow to occur within the Study Area drains. Along the shorelines of Lake St. Clair, pumphouses restrict the upstream movement of fish species, leaving Pike Creek as the most likely location for species encounters.

Scientific Name	Common Name	SARA[1]	ESA[2]	Source[3]	Habitat Requirements[4]	Potential for SAR and SAR Habitat	Rationale for Potential to Occur in Study Area
Hymenoptera							
Bombus affinis	Rusty-patched Bumble Bee	END	END	MNRF SAR in area	The Rusty-patched Bumble Bee can be found in open habitat such as mixed farmland, urban settings, savannah, open woods and sand dunes. The most recent sightings have been in oak savannah, which contains both woodland and grassland flora and fauna.	Low	Based on review of species distribution mapping and existing habitats within the Study Area. Species encounter during drainage work activities is considered low.

[1]: Status is defined as Schedule 1 of the SARA as of April 27, 2017; [2]ESA, 2007 status as defined by Ontario Regulation 230/08 as of April 27, 2017; [3]: Sources: DFO - Aquatic SAR Maps (Maps 29 of 33); MNRF SAR by Area – SAR by Municipality; MNRF Reg. Habitat – MNRF Regulated Habitat (O.Reg. 242/08); OHA – Herptiles by Municipality; NHIC – Provincially tracked species; OBBA – Ontario Breeding Bird Atlas; AGR. – MNRF Agreement under Section 23 of O.Reg. 242/08 made under *ESA, 2007* (File # AY-23D-010-10); [4] :Habitat descriptions observed from MNRF Species at Risk Ontario List: Species Descriptions, COSEWIC assessment and update status reports or Ontario Reptile and Amphibian Atlas, DFO Aquatic Species Act Risk (http://www.dfo-mpo.gc.ca/species-especes/sara-lep/identify-eng.html);

Appendix D

Excluded SAR and Aquatic SAR Mapping

Species Exempt from Mitigation Plan

As indicated in Section 2 and Section 6 above, this Mitigation Plan does not apply when conducting drainage activities that may impact the following species or species habitat (Table 1, subsection 2, Section 23.9 of O. Reg. 242/08):

- Bogbean Buckmoth (*Hemileuca sp. 1*)
- Cherry Birch (*Betula lenta*)
- False Hop Sedge (*Carex lupuliformis*)
- False Rue Anemone (*Enemion biternatum*)
- Grey Fox (*Urocyon cinereoargenteus*)
- Heart-leaved Plantain (*Plantago cordata*)
- Pugnose Minnow (*Opsopoeodus emiliae*)
- Scarlet Ammannia (*Ammannia robusta*)
- Small-mouthed Salamander (*Ambystoma texanum*)
- Toothcup (*Rotala ramosior*)

During our background review the following species from the list above were identified as having the potential to occur within the study area:

- Pugnose Minnow (Opsopoeodus emiliae)
- False Hop Sedge (Carex lupuliformis)
- Scarlet Ammannia (Ammannia robusta)
- Heart-leaved Plantain (Plantago cordata)

Pugnose Minnow was identified on Map 29 of 33 on the DFO's Aquatic SAR Mapping (see below) as having the potential to occur within Pike Creek and its associated tributaries (yellow shading). It is recommended that before conducting activities within Pike Creek and its associated tributaries (where water is present) that consultation with both the MNRF and DFO occur to determine species location(s) and whether a Species at Risk Overall Benefit Permit under clause 17(2)(c) is required. In Dillon's past experience with obtaining a permit such as this, from the initial information request to obtaining the permit has typically taken 10 to 14 months.

Historically, Pugnose Minnow have been observed in clear, slow-moving, heavily vegetated waters, however, more recent observations have found this species inhabiting warm, turbid (murky), slow-moving waters, with limited vegetation, over substrates composed of silt, sand or clay (DFO, 2016). When planning activities for drains with the potential for Pugnose Minnow, careful consideration should be given.

False Hop Sedge most often grows in riverine swamps and marshes, and around temporary forest ponds. It prefers open areas and areas under forest canopy openings, with lots of sunlight. The Ontario populations grow within the Carolinian Forest zone in areas with swamps, marshes or temporary pools flooded in spring. Populations are largest in open areas with ample sunlight, such as forest edges or clearings. MNRF occurrence mapping does not show the species mapped within the Study Area. Furthermore, based on the Recovery Strategy for Scarlet Ammannia (*Ammannia robusta*) in Canada document (Environment Canada, 2014), within Essex County the only known population is in Amherstburg and is historical, with the last locumentation in 1985. Based on the occurrence records as well as False Hop Sedge's general habitat requirements, the likelihood of encountering this species within the Town's drains is considered to be low. If the species is encountered during drainage activities, stop work immediately and consult with MNRF to determine whether a permit is required.

Figure D-1: False hop sedge (*Carex lupuliformis*)

In Ontario, **Scarlet Ammannia** is found on mudflats, sand beaches, and the edges of wetlands and ponds that are seasonally flooded. Fluctuating water levels are important to its survival. It does well in habitat that is generally submerged early in the year and when water levels recede later in the summer the plants emerge. MNRF occurrence mapping does not show the species mapped within the Study Area. Furthermore, based on the Recovery Strategy for Scarlet Ammannia (*Ammannia robusta*) in Canada document (Environment Canada, 2015), known populations of the species were not documented within the Study Area. Based on the occurrence records as well as Scarlet Ammannia's general habitat requirements, the likelihood of encountering this species within the Town's drains is considered to be low. If the species is encountered during drainage activities, stop work immediately and consult with MNRF to determine whether a permit is required.

Figure D-2: Scarlet Ammannia (*Ammannia robusta*)

Heart-leaved Plantain is a semi-aquatic plant, found in relatively undisturbed wet woods, often along the rocky or gravelly limestone beds of shallow, slow-moving clear streams. Moisture is generally always present above or just below the soil surface. The most common trees in Ontario woodlots associated with this plant are Sugar Maple (*Acer saccharum*), Silver Maple (*Acer saccharinum*), Red Maple (*Acer rubrum*), Blue-beech (*Carpinus caroliniana*), Shagbark Hickory (*Carya ovata*), White Ash (*Fraxinus americana*), Black Ash (*F. pennsylvanica*) and Basswood (*Tilia americana*). Review of the MNRF's Ontario Recovery Strategy for Heart-leaved Plantain (2012) indicate that there are historical occurrence records within the study area associated with the Canard River (last documented in 1863). This population is now considered extirpated as a result of water quality degradation and flooding and scouring due to deforestation (MNR, 2012). Since Heart-leaved Plantain is considered to be extirpated from the Study Area and based on the species general habitat requirements, the likelihood of encountering this species within the Town's Drains is considered to be low. If the species is encountered during drainage activities, stop work immediately and consult with MNRF to determine whether a permit is required.

Figure D-3: Heart-leaved Plantain (*Plantago cordata*)

Federal Aquatic Species at Risk

Aquatic Species at Risk Mapping (Ontario Southwest Maps 29 of 33)

As previously indicated, the DFO's Aquatic Species at Risk Maps were reviewed to determine species that have the potential to occur within the Town of Tecumseh drains. The figure and table below provide an overview of the distribution of aquatic SAR with the potential to occur within the Town of Tecumseh drains.

DFO is responsible for federally listed aquatic Species at Risk (SAR) under the *Species at Risk Act* (*SARA*). If aquatic SAR are present within a drain proposed for drainage works, consultation with the DFO is recommended (see DFO's *Guidance for Maintaining and Repairing Municipal Drains in Ontario* (2017) for further guidance).

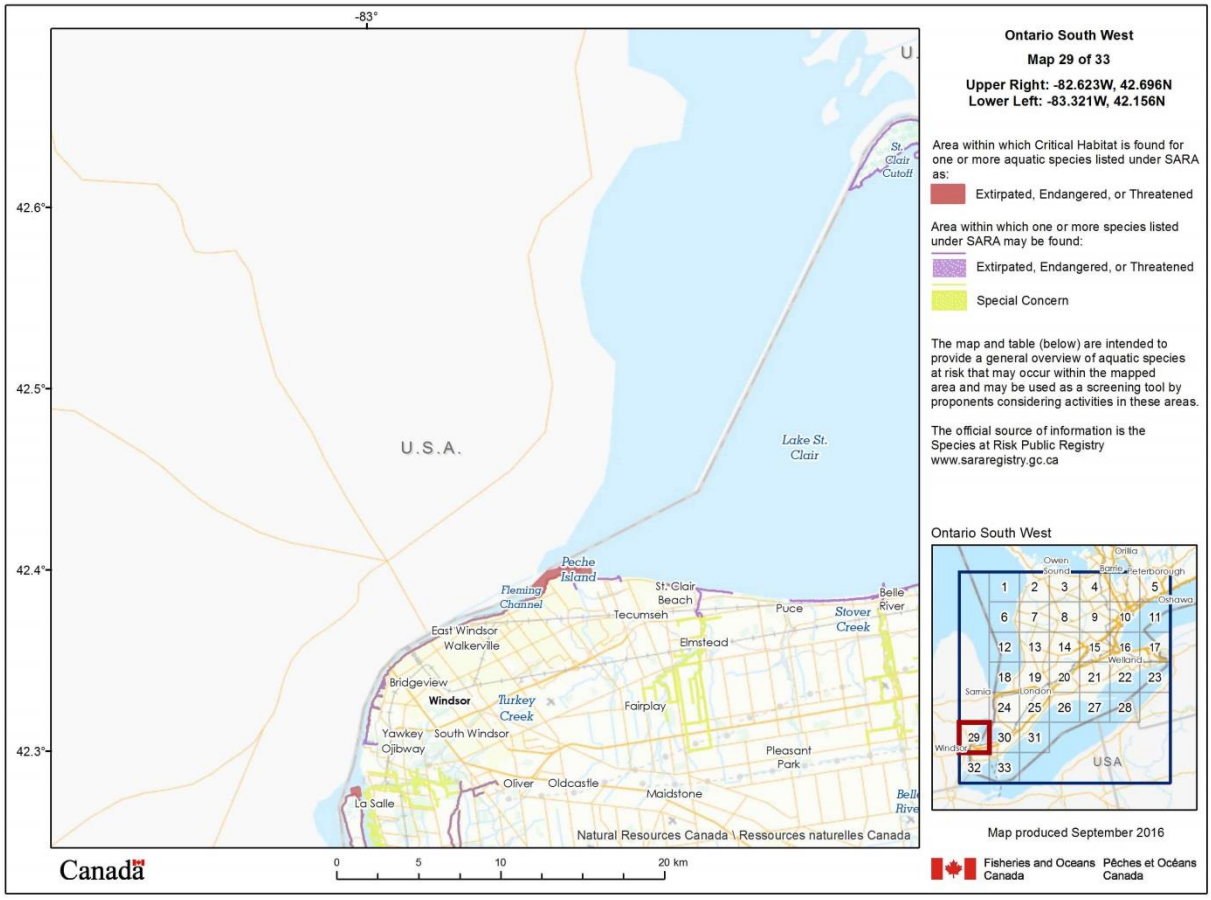

Figure D-4: Aquatic Species at Risk distribution Map 29 of 33

Table D-1: Aquatic Species at Risk list for Map 29 of 33
(Adapted from http://www.dfo-mpo.gc.ca/species-especes/fpp-ppp/index-eng.htm)

Common Name	Scientific Name	Taxon	Species at Risk Status[1]	ESA, 2007[2]
Channel Darter	*Percina copelandi*	Fishes	Threatened	Threatened
Eastern Sand Darter	*Ammocrypta pellucida*	Fishes	Threatened	Endangered
Grass Pickerel	*Esox americanus vermiculatus*	Fishes	Special Concern	Special Concern
Kidneyshell	*Ptychobranchus fasciolaris*	Molluscs	Endangered	Endangered
Northern Madtom	*Noturus stigmosus*	Fishes	Endangered	Endangered
Pugnose Minnow	*Opsopoeodus emiliae*	Fishes	Special Concern	Threatened
Pugnose Shiner	*Notropis anogenus*	Fishes	Endangered	Endangered
Rainbow	*Villosa iris*	Molluscs	Endangered	Special Concern
Silver Chub	*Macrhybopsis storeriana*	Fishes	Special Concern	Threatened
Spotted Sucker	*Minytrema melanops*	Fishes	Special Concern	Special Concern

[1]: Status is defined as Schedule 1 of the SARA as of April 27, 2017 [2]ESA, 2007 status as defined by Ontario Regulation 230/08 as of April 27, 2017.

Appendix E

Town of Tecumseh Checklist and Reporting Form

Town of Tecumseh Checklist

Presented in **Table E-1** below is a list of items the Town must provide Contractors carrying out drainage work activities and annual reporting requirements. A **Contractor Information Package** (***Appendix E***) must be provided for every drainage work activity to each Contractor.

Table E-1: Town of Tecumseh Checklist

Step	Task/Item	Completed
Prior to Activity:		
1	In the Contractor Information Package include the Drainage Work Activity Name/ID and list the potential SAR present at the work area	
3	Include the General Mitigation Measures (**Section 7.1**)	
4	Include the Applicable Species Specific Mitigation Measures (**Section 7.2**)	
5	Include the Applicable Species at Risk Identification Cards (***Appendix F***)	
6	Include the Ontario Species at Risk Handling Manual (***Appendix H***)	
7	Species at Risk Observation Forms (***Appendix F***)	
8	Staff Review and Sign off Form (***Appendix F***)	
Following Activity:		
9	Collect Observation Form(s) from Contractor	
10	Complete Annual Activity Reporting Form (***Appendix E*** or in **Tecumseh Drain Database**)	
11	Submit Observation and Annual Activity Forms to Dillon by November 1st of each year	

Annual Reporting Form

Once a drainage work activity is complete, add activity to **Tecumseh Drain Database** under tab '**B – Annual Reporting**' and/or to **Table E-2** below indicating whether or not a SAR was encountered. If a SAR was encountered include details under the **'B – Annual Reporting'** tab of the **Tecumseh Drain Database** or complete the form following **Table E-2** for each SAR encountered throughout the entire year.

All drainage work activity must be recorded for annual reporting to the MNRF regardless if SAR were encountered or not.

Table E-2: Annual Drainage Works Reporting Form

	Drain Name	Location (GPS Coordinates)	Length of Work zone (m)	Date of Works (Start – End)	Detailed Description of Activities	Was a SAR observed (Y/N)
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						

Species at Risk Reporting Form (Town of Tecumseh)

Drain Name
Location (GPS Coordinates)
Start and End Dates
Name of SAR Encountered
Time of day when SAR encountered
Activities being carried out at time of encounter
Mitigation Measures Implemented by Staff
Were measures effective?

Appendix F

Contractor Information Package

Contractor Information Package

Prior to undertaking drainage work activity required by the Town of Tecumseh, Mitigation Measures contained within this package must be reviewed and signed off by each staff member working on-site. Staff must be aware of the species at risk that have the potential to occur within the work area and report all sightings in the **Species at Risk Observation Form** included in this package. In addition, if a Species at Risk or Species at Risk habitat is observed, photographs should be taken and submitted with the Species at Risk Observation Form.

Included in this Contractor Information Package for (Drainage Work Activity Name/ID) is information pertaining to the following:

1. **General Mitigation Measures**
2. *LIST SAR IDENTIFIED + SPECIES SPECIFIC MITIGATION + SAR ID CARD*
3. *LIST SAR IDENTIFIED + SPECIES SPECIFIC MITIGATION + SAR ID CARD*
4. *LIST SAR IDENTIFIED + SPECIES SPECIFIC MITIGATION + SAR ID CARD*
5. *LIST SAR IDENTIFIED + SPECIES SPECIFIC MITIGATION + SAR ID CARD*
6. **Species at Risk Handling Manual (for review by key staff members)**
7. **Species at Risk Observation Form**
8. **Staff Review and Sign Off Sheet**

SAR Identification Cards

Include the applicable SAR ID cards to the Contractor Information Package.

Species at Risk – Snakes

Eastern Foxsnake

Pantherophis gloydi

PROVINCIAL STATUS: **Endangered**

NATIONAL STATUS: **Endangered**

Eastern Foxsnake

Species overview	Found in old fields, marshes, along hedgerows, drainage canals and shorelines. Females lay their eggs in rotting logs, manure or compost pile, which naturally incubate the eggs until they hatch.
Identification	Reaching over 1.7 m in length the Eastern Foxsnake has a shiny, rusty orange head and golden to light brown body with dark blotches. The belly is light yellow and black.

Key Identification Features:

- Rusty Orange Head
- Golden to light brown body

What to do if found

If the Eastern Foxsnake is found within the construction zone, the following procedure must be followed:

- Refer to SAR Mitigation Measures for Snakes.
- If possible, take a photo.
- Fill out the observation record form on the back of this sheet.
- Protect species from construction activities.
- Report all SAR sightings to an MNRF Management Biologist–Aylmer District ((519) 773-9241) within 2 business days.
- Any injured species must be reported immediately to MNRF and to:

  Ontario SPCA –Windsor/Essex County Human Society
  1375 Provincial Road
  Windsor, ON, N8W 5V8
  (519) 966-5751
  Email: melanie@windsorhumane.ca

- MNRF may require contact and transport to an Authorized Wildlife Rehabilitator. Call to arrange for transport:
  Bonnie Dupuis at Erie Wildlife Rescue
  11168 Tecumseh Road East
  Windsor, Ontario, N8R 1A8
  (519) 735-3919

Photo Credits: MNRF, 2014

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Butler's Gartersnake

Thamnophis butleri

PROVINCIAL STATUS: **Endangered**

NATIONAL STATUS: **Threatened**

Butler's Gartersnake

Key Identification Features:

1. Yellow to orange stripes on dark brown-black background
2. Tiny head
3. Overall small (25 – 57 cm in length)

Species overview	Similar to the eastern gartersnake, the Butler's Gartersnake is small, less than 50 cm in length. The Butler's Gartersnake feeds on worms and leeches and is found in open, moist habitats such as dense grasslands and old fields.
Identification	Non-venomous snake, 25 to 57 cm long. Tiny head and yellow to orange stripes running lengthwise on a dark brown-black background. Looks similar to the Common Gartersnake.

What to do if found

If the Butler's Gartersnake is found within the construction zone, the following procedure must be followed:

- Refer to SAR Mitigation Measures for Snakes.
- If possible, take a photo.
- Fill out the observation record form provided in Contractor Info Package for submission to the Town.
- Protect species from construction activities.
- Report all SAR sightings to an MNRF Management Biologist– Aylmer District (519-773-9241) within 2 business days.
- Any injured species must be reported immediately to MNRF and to:

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Photo Credits: Royal Ontario Museum, 2011

Species at Risk – Turtles

Blanding's Turtle

Emydoidea blandingii

PROVINCIAL STATUS: **Threatened**

NATIONAL STATUS: **Threatened**

Colour	• The upper shell is usually black or dark brown but sometimes grey or a lighter brown • Upper shell covered in tan to yellow lines or spots scattered at random • Lower shell is a rich yellow • Skin is often black or dark brown
Distinctive Features	• Domed shell resembles an army helmet • Throat and chin a bright yellow • Upper jaw is notched and the mouth curves upwards, giving the impression that the turtle is smiling
Typical Size	Can reach up to 27 cm (10") long
Other	Shells are hinged so some individuals can completely close the shell after pulling in the head and limbs

Hinged Shells of the Blanding's Turtle

What to do if found

If a Blanding's Turtle is found within the construction zone, the following procedure must be followed:

- Refer to SAR Mitigation Measures for Turtles.
- If possible, take photo.
- Protect species from construction activities.
- Fill out the observation form within the Contractor Information Package for submission to the Town.
- Report all sightings to an MNRF Management Biologist – Aylmer District ((519) 773-9241) within 2 business days.
- Any injured species must be reported immediately to MNRF and to:

  Ontario SPCA –Windsor/Essex County Human Society
  1375 Provincial Road
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Photo Credits: Joe Crowley, Parks Canada, Ontario Ministry of Natural Resources, Mary Ferguson, Detroit Zoo

Spiny Softshell Turtle

Apalone spinifera

PROVINCIAL STATUS: **Threatened**

NATIONAL STATUS: **Threatened**


Spiny Softshell Turtle


Spiny Softshell Turtle – snorkel-like snout


Spiny Softshell– note the dark blotches and soft shell


Spiny Softshell Hatchling

Colour	• The shell is olive or tan in colour with dark blotches and tiny spine projections along the front edge • The body is typically olive, brown or grey in colour • The legs and head are dark green or grey with dark patterning • Along each side of the head is a distinct yellow stripe outlined in black
Distinctive Features	• Soft shell which is round, rather flat and leathery • Snorkel-like snout
Typical Size	Reach an average length of 12.7 to 48cm
Other	Diet consists of insects and crayfish but they may also eat molluscs, fish, amphibians, carrion and vegetation

What to do if found

If a Spiny Softshell is found within the construction zone, the following procedure must be followed:

- Refer to SAR Mitigation Measures for Turtles.
- If possible, take photo.
- Protect species from construction activities.
- Fill out the observation form within the Contractor Information Package for submission to the Town.
- Report all sightings to an MNRF Management Biologist – Aylmer District ((519) 773-9241) within 2 business days.
- Any injured species must be reported immediately to the MNRF and to:

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  (519) 735-3919

Photo Credits: Scott D. Gillingwater, The Art of Conservation, CBC News Windsor

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Species at Risk – Fishes

Pugnose Shiner

Notropis anogenus

PROVINCIAL STATUS: **Endangered**

NATIONAL STATUS: **Endangered**

Species overview	The pugnose shiner is found in lakes and calm areas of rivers and creeks having clear water and bottoms of sand, mud or organic matter. It prefers water bodies with plenty of aquatic vegetation, particularly stonewart (Chara sp.).
Identification	The Pugnose Shiner is a small, slender minnow that can reach 5 to 6 cm in length. Silvery in color with pale yellow to olive-coloured markings on its back and a dark (sometimes inconspicuous) stripe along the side of the body that extends tail to snout.

What to do if found

If the Pugnose Shiner is found within the construction zone, the following procedure must be followed:

- Refer to SAR Mitigation Measures for Aquatic Species.
- If possible, take a photo.
- Fill out the observation record form within Contractor Info Package for submission to the Town.
- Protect species from construction activities.
- Report all SAR sightings to an MNRF Management Biologist – Aylmer District (519-773-9241) within 2 business days.
- Immediately report SAR sightings to a DFO Fisheries Protection Program Biologist for Central and Arctic Region (1-855-852-8320) for further instructions.

References:

Queens Printer for Ontario. 2016. Pugnose shiner (Notropis anogenus). Last updated September 24, 2015. Accessed online November 2016. https://www.ontario.ca/page/pugnose-shiner

Photo Credits: Photo 1, courtesy of Konrad Schmidt; Photo 2, courtesy of Brian Zimmerman

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Spotted Gar

Lepisosteus oculatus

PROVINCIAL STATUS: **Threatened**

NATIONAL STATUS: **Special Concern**

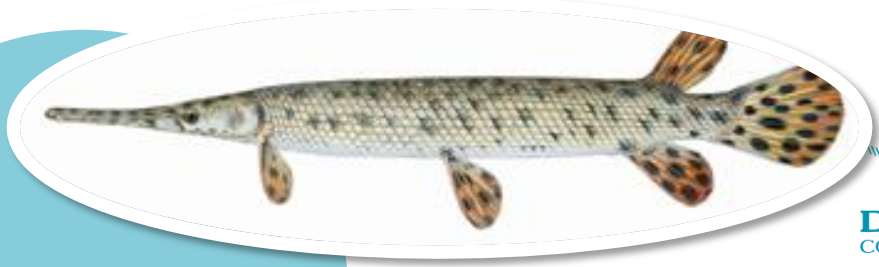
Species overview	Spotted Gar live in calm, clear pools and bays with plenty of aquatic plants. It is usually found in lakes with soft mud substrate. During the breeding season, the adults will migrate to shallow water with lots of aquatic vegetation, to mate and lay eggs.
Identification	In Ontario, the Spotted Gar lives in calm, clear pools and bays with plenty of aquatic plants. It is usually found in lakes with soft mud bottoms. During the spring breeding season, the adults move to shallow water with lots of aquatic plants, where they mate and lay eggs. The eggs are slightly sticky and attach to aquatic plants. The Spotted Gar feeds on small fishes.

What to do if found

If the Spotted Gar is found within the construction zone, the following procedure must be followed:

- Refer to SAR Mitigation Measures for Aquatic Species.
- If possible, take a photo.
- Fill out the observation record form within Contractor Info Package for submission to the Town.
- Protect species from construction activities.
- Report all SAR sightings to an MNRF Management Biologist – Aylmer District (519-773-9241) within 2 business days.
- Immediately report SAR sightings to a DFO Fisheries Protection Program Biologist for Central and Arctic Region (1-855-852-8320) for further instructions.

Photo Credits: J.R. Tomelleri; W.R. Glass; Brian Gratwicke



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Species at Risk – Mussels

Ontario Mussels

- THERE ARE 41 FRESHWATER MUSSEL SPECIES IN ONTARIO LAKES AND RIVERS.
- IMPORTANT PART OF AQUATIC ECOSYSTEMS AS THEY CLEAN THE WATER AND ARE A SOURCE OF FOOD.
- OVER 65% OF THESE SPECIES ARE LISTED AS ENDANGERED IN ONTARIO DUE TO HABITAT LOSS, POLLUTION AND COMPETITION WITH INVASIVE MUSSELS.
- FOUR (10) SPECIES OF FRESHWATER MUSSELS WITH THE POTENTIAL TO OCCUR WITHIN THE TOWN'S DRAINS.

Northern Riffleshell (*Epioblasma torulosa rangiana*)

- Approximately 4.5-7.5 cm long.
- Shell is brownish-yellow with thin, diffuse green rays.
- Found in riffle areas within rivers or streams with rocky, sand, or gravel bottoms

Kidneyshell (*Ptychobranchus fasciolaris*)

- Medium to large mussel that grows to approximately 12 cm.
- Shell is kidney-shaped and thick, solid and smooth.
- Typically found in small to medium sized rivers.
- Prefers shallow, clear, swift-moving water with gravel and sand

Snuffbox (*Epioblasma triquetra*)

- Shell is solid and thick, triangular in shape in males, somewhat longer and "puffed-up" in females.
- Males may reach 7 cm, females may reach 6 cm in length.
- Outside shell is smooth, yellowish to yellow-green and marked with many dark green rays.
- Typically found in small- to medium-sized rivers in riffles, shallow areas with clear, swift-flowing water.
- Mainly found over coarse, firmly packed rubble/gravel/sand substrates.

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Wavy-rayed Lampmussel (*Lampsilis fasciola*)

- Medium-sized freshwater mussel that can reach up to 10 cm in length.
- Yellow or yellowish-green, rounded shell with numerous thin wavy green lines.
- Usually found in small to medium rivers with clear water. It lives in shallow riffle areas with clean gravel or sand bottoms.

Round Pigtoe (*Pleurobema sintoxia*)

- Medium-to-large freshwater mussel, reaching lengths between 7.5 and 13 cm.
- Adult shells are deep reddish-brown in colour, juveniles are tan.
- Usually found in rivers of various sizes with deep water and sandy, rocky, or mud bottoms.

Round Hickorynut (*Obovaria subrotunda*)

- Small to medium freshwater mussel that can reach up to 6.5 cm long.
- Shell is thick, solid, and dark chocolate brown in colour, with a distinctly lighter coloured band along one side.
- Mainly found in rivers with clay, sand, or gravel bottoms.
- Prefers moderately fast moving water.

Eastern Pondmussel (*Ligumia nasuta*)

- Medium -sized freshwater mussel that can grow to 10 cm long.
- Shell is rough with growth lines that resemble the growth rings on a tree stump.
- Prefers nearshore, sheltered areas of lakes or slow-moving streams and rivers in substrates of fine sand.

Fawnsfoot (*Truncilla donaciformis*)

- Small, 35 to 45-millimetre- long freshwater mussel.
- Yellowish to greenish-brown shell is smooth with dark green rays broken into v-shaped markings called chevrons.
- Medium and large rivers with moderate to slow flowing water.
- Prefers shallow waters (1-5 m deep) with gravel, sand or muddy bottoms.

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Rayed Bean (*Villosa fabalis*)

- One of Canada's smallest freshwater mussels, reaching less than 4 cm in length.
- Shell is oval-shaped, smooth, slightly shiny, and is green, yellow-green, or brown in colour with numerous wavy dark green lines.
- Typically found buried in sand or gravel in shallow, clear headwaters and riffle areas of small tributaries.

Rainbow Mussel (*Villosa iris*)

- Small freshwater mussel that can reach up to 8 cm long.
- shell is yellow, green, or brown on the outside.
- The inside of the shell is iridescent giving this species its name.
- Elongated oval-shaped shell that has many broken, dark green lines.
- Prefers small to medium-sized rivers with a moderate to strong current and sand, rocky, or gravel bottoms
- Often found in or near riffle areas and along the edges of vegetation in water less than 1 m deep.

What to do if found

STOP WORK IMMEDIATELY and contact the DFO Fisheries Protection Program Biologist for Central and Arctic Region (1-855-852-8320) on how to proceed. Report all SAR sightings to an MNRF Management Biologist – Aylmer District (519-773-9241) within two business days.

Photo Credits: 1: Environment Canada; 2: T. Morris, DFO.
Information sources: Toronto Zoo: http://www.torontozoo.com/conservation/mussels.asp; DFO: http://www.dfo-mpo.gc.ca/species-especes/sara-lep/identify-eng.html; MNRF: https://www.ontario.ca/environment-and-energy/species-risk-ontario-list

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Species at Risk – Birds

Bobolink

Dolichonyx oryzivorus

PROVINCIAL STATUS: **Threatened**

NATIONAL STATUS: **None**


Adult Male Bobolink


Adult Female Bobolink


Similar Species – Grasshopper Sparrow


Similar Species – Female Red-winged Blackbird

Colour	• Males are black with a white/grey back/rump and a yellow nape • Females and non-breeding males are yellowish brown with bold black stripes on the head and back • Juveniles are similar in appearance to the female but contain more yellow
Distinctive Features	• Males have a contrasting colour pattern • Thick, short bill similar to a finch
Typical Size	• Typically 15 to 21 cm long (5” to 5.5”)
Other	• Males tend to appear unexpectedly, flying over vegetation and singing a bubbly, metallic song

What to do if found

If the Bobolink is found within the construction zone, the following procedure must be followed:

- Ensure species is protected from construction activities.
- If possible, take a photo.
- Fill out the observation record form within Contractor Info Package for submission to the Town.
- Report all SAR sightings to a MNRF Management Biologist– Aylmer (519-773-9241) within 2 business days.
- Any injured species must be reported immediately to the MNRF and to:
  Ontario SPCA –Windsor/Essex County Human Society, 1375 Provincial Road
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  (519) 966-5751
- MNRF may require contact and transport to an Authorized Wildlife Rehabilitator. Call to arrange for transport:
  Bonnie Dupuis at Erie Wildlife Rescue
  11168 Tecumseh Road East
  Windsor, Ontario, N8R 1A8 (519) 735-3919

Photo Credits: **Dillon,** Wikimedia Commons

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Eastern Meadowlark

Eastern Meadowlark

Sturnella magna

PROVINCIAL STATUS: **Threatened**

NATIONAL STATUS: **No Status**

Colour	• Pale brown, marked with blackish streaking on the back, wings & tail • Bright yellow underparts and a bold black "V" across the breast • Males and females have similar colouration
Distinctive Features	• Bright yellow breast • Black "V" across the breast • Long, slender, spear-shaped bill • Outer tail feathers are white and conspicuous during flight
Typical Size	Typically 19-26 cm in length (7.5"-10") Wingspan of 35-40 cm (14"- 16")
Other	• Often perched and singing from a post, pole, wires or tops of shrubs


Meadowlark in flight – note the distinctive white outer tail feathers

Habitat

- Ground-nesting species most commonly found in pasture, perennial cover crop, grassland and savannah
- Can be found in a wide variety of other habitats including weedy meadow, young orchard, golf courses, restored grassland, and herbaceous fencerows

What to do if found

If Eastern Meadowlark is found within the construction zone, the following procedure must be followed:

- Ensure species is protected from construction activities.
- If possible, take a photo.
- Fill out the observation record form within Contractor Info Package for submission to the Town.
- Report all SAR sightings to a MNRF Management Biologist– Aylmer (519-773-9241) within 2 business days.
- Any injured species must be reported immediately to the MNRF and to:
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Photo Credits: Gerrit Vyn, Kirk M. Rogers, Ontario Ministry of Natural Resources, Phillip Simmons

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Barn Swallow

Hirundo rustica

PROVINCIAL STATUS: **Threatened**

NATIONAL STATUS: **None**


Barn Swallow

Colour	• Glossly, steel-blue back and upper wings • Rusty –red forehead and throat • Beige coloured belly • Juveniles are more dusky blue-gray and have a pale yellow bill
Distinctive Features	• Pointed wings • Deeply-forked tail
Typical Size	Typically 15 to 18 cm long (6" to 7")
Other	• Diet consists of flying insects


Barn Swallow at Nest

Habitat

- Prefers open habitats such as meadows, pastures and farmland during the breeding season
- Often uses man-made structures (e.g. bridges, culverts, barns) for nesting
- Nests are typically made of mud and grass and attached to the side of a structure or on a flat edge.
- Nests are cup-shaped.

What to do if found

If Barn Swallow is found within the construction zone, the following procedure must be followed:

- Ensure species is protected from construction activities.
- If possible, take a photo.
- Fill out the observation record form within Contractor Info Package for submission to the Town.
- Report all SAR sightings to a MNRF Management Biologist– Aylmer (519-773-9241) within 2 business days.
- Any injured species must be reported immediately to the MNRF and to:
  Ontario SPCA –Windsor/Essex County Human Society, 1375 Provincial Road
  Windsor, ON, N8W 5V8
  (519) 966-5751
- MNRF may require contact and transport to an Authorized Wildlife Rehabilitator. Call to arrange for transport:
  Bonnie Dupuis at Erie Wildlife Rescue
  11168 Tecumseh Road East
  Windsor, Ontario, N8R 1A8 (519) 735-3919


Barn Swallow in Flight

Photo Credits: Eddie Y, Jo-Anna Ghadban, Stephen Ramirez, IanF, Jeff Mitton

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Species at Risk – Plants

Kentucky coffee-tree

Gymnocladus dioicus

PROVINCIAL STATUS: **Threatened**

NATIONAL STATUS: **Threatened**

Species overview	The Kentucky Coffee-tree has been observed in a variety of habitat types, but has been found to grow best in rich, moist soil. It is often found in floodplains, shade-intolerant and grows along the edges of woodlots or relies on canopy openings in forest and woodlots.
Identification	The Kentucky Coffee-tree can grows 15 to 25 metres in height. The large leaves measuring 60 to 90 centimetres are double compound, divided into many, small bluish-green leaflets on grayish-brown twigs and branches. The flowers are greenish-white in color and the bark is dark gray and scaly.

What to do if found

If the Kentucky Coffee-tree is found within the construction zone, the following

procedure must be followed:

- Refer to SAR Mitigation Measures for Vegetation.
- If possible, take a photo.
- Fill out the observation record form within Contractor Info Package for submission to the Town.
- Protect species from construction activities.
- Report all SAR sightings to an MNRF Management Biologist – Aylmer District (519-773-9241) within 2 business days.

References:

Queens Printer for Ontario. 2017. Kentucky coffee-tree (Gymnocladus dioicus). Last updated October 2, 2015. Accessed online March 2017. https://www.ontario.ca/page/kentucky-coffee-tree-species-risk

Photo Credits: Photo 1, courtesy of Gary Allen; Photo 2, courtesy of Gary Allen

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Purple Twayblade

Liparis liliifolia

PROVINCIAL STATUS: **Threatened**

NATIONAL STATUS: **Endangered**

Flower	• Small orchid • Five to 30 flowers grow along the stem and are clustered towards the tip • Flower petals are green to mauve-purple and the lower lip is decorated with reddish purple veins • Flowers have no fragrance
Distinctive Features	• Two broadly elliptical, toothless, shiny green leaves at the base and a single straight green or purplish tinged stem
Typical Size	• Reaches approximately 25 cm in height
Other	• Has few fleshy roots • Flowers from the beginning of May to the beginning of July

Habitat

- Primarily found in southwestern Ontario
- Can be found in a variety of habitats including open oak woodland and savannah, mixed deciduous forest, shrub thicket, shrub alvar, deciduous swamp and conifer plantations
- Can grow in partial shade however it does not like dense shade
- Purple Twayblade depend on natural disturbances, such as storms and fire, to keep its habitat relatively open and sunny

What to do if found

- Refer to SAR Mitigation Measures for Plants.
- If possible take photo.
- Fill out the observation record form provided in Contractor Info Package for submission to the Town.
- Protect species from construction activities.

Report all SAR sightings to an MNRF Management Biologist– Aylmer District (519-773-9241) within 2 business days.

Photo Credits: 1 – MNRF; 2 – Gary Allen

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Eastern Flowering Dogwood

Cornus florida

PROVINCIAL STATUS: **Endangered**

NATIONAL STATUS: **Endangered**

Flower	• Tiny yellow flowers grow in clusters at the ends of small branches and are surrounded by 4 large, showy white leaves that look like petals. • Berries grow in clusters of two to six and are smooth and turn bright red in late summer.
Distinctive Features	• The bark of larger trees is brownish-grey and separated into scales, giving it the appearance of alligator skin.
Typical Size	Reaches approximately 3 to 10 m in height

Habitat

Eastern Flowering Dogwood grows under taller trees in mid-age to mature deciduous forests or mixed forests. It is commonly found on floodplains, slopes, bluffs and in ravines, and has also been found along roadsides and fencerows.

What to do if found

- Refer to SAR Mitigation Measures for Plants.
- If possible take photo.
- Fill out the observation record form provided in Contractor Info Package for submission to the Town.
- Protect species from construction activities.
- Report all SAR sightings to an MNRF Management Biologist–Aylmer District (519-773-9241) within 2 business days.

Photo Credits: 1 – MNRF, 2 - Wasyl Bakowsky, NHIC Archives

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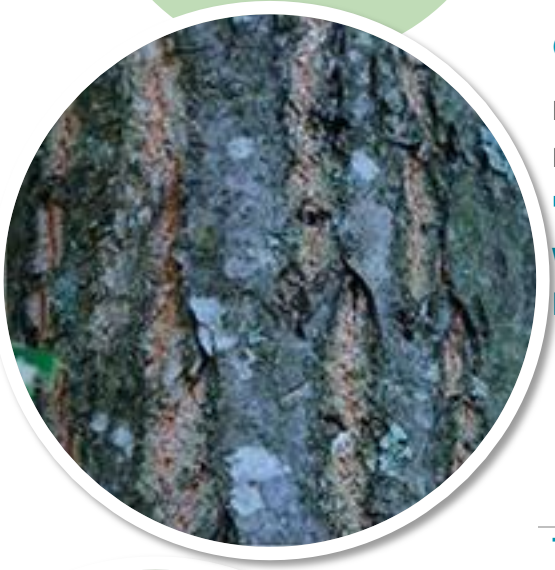
American Chestnut

Castanea dentate

PROVINCIAL STATUS: **Endangered**

NATIONAL STATUS: **Endangered**



What is looks like	• Bark is dark grey-brown and cracks with age. • Leaves are hairless and 15-30 cm long and 5-10 cm wide at maturity. • Fruit is a spiny bur-like husk enclosing 1-5 nuts
Typical Size	In Ontario they typically grow 5-10 m tall but can reach heights of 30 m.

Habitat

Generally found in dryer upland deciduous forests with sandy, acidic to neutral soils. It grows alongside red oak, black cherry, sugar maple, American beech and other deciduous tree species.

What to do if found

- Refer to SAR Mitigation Measures for Plants.
- If possible take photo.
- Fill out the observation record form provided in Contractor Info Package for submission to the Town.
- Protect species from construction activities.
- Report all SAR sightings to an MNRF Management Biologist–Aylmer District (519-773-9241) within 2 business days.

Photo Credits: MNRF

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Butternut

Juglans cinerea

PROVINCIAL STATUS: **Endangered**

NATIONAL STATUS: **Endangered**

Butternut – ridges with flat gray bark

Colour	• Bark of younger trees is grey and smooth • Older trees have bark with ridges and flat grayish bark in-between
Distinctive Features	• Compound leaves with a feather-like pattern • Leaflets are opposite one another • Leaves are very hairy underneath • Leave has a large terminal leaf • Leaf scar is flat on the upper margin with a pad of hairs
Typical Size	Grows up to 30 m (98') in height and a diameter of up to 90 cm (3')
Other	• Fruit and husk are ovid shaped • Husk is covered in dense hairs

Butternut leaf – large terminal leaflet

Habitat

- Usually found alone or in small groups in deciduous forests
- Prefers moist, well-drained soil and is often found along streams
- Also found on well-drained gravel sites and rarely on dry rocky soil
- Does not do well in the shade, and often grows in sunny openings and near forest edges

What to do if found

- Refer to SAR Mitigation Measures for Plants.
- If possible take photo.
- Fill out the observation record form provided in Contractor Info Package for submission to the Town.
- Protect species from construction activities.
- Report all SAR sightings to an MNRF Management Biologist–Aylmer District (519-773-9241) within 2 business days.

Photo Credits: Barb Boyson, Gary Fewless

Date: August 7, 2013

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Red Mulberry

Morus rubra

PROVINCIAL STATUS: **Endangered**

NATIONAL STATUS: **Endangered**

What it looks like	• The leaves are quite large, and heart-shaped. The bark of mature trees is reddish in colour and flaky. The fleshy fruit is deep red and matures in mid-July.
Typical Size	Small trees that grows 6-18 m tall.

Habitat

In Ontario, Red Mulberry grows in moist, forested habitats and on both sandy and limestone-based loamy soils.

What to do if found

- If possible take photo.
- Fill out the observation record form provided in Contractor Info Package for submission to the Town.
- Protect species from construction activities.
- Report all SAR sightings to an MNRF Management Biologist–Aylmer District (519-773-9241) within 2 business days.

Photo Credits: 1 – MNRF, 2 – Will Cook

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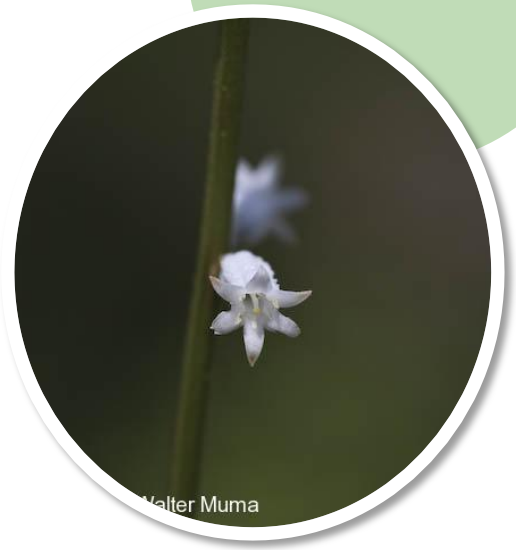

Colicroot

Aletris farinose

PROVINCIAL STATUS: **Threatened**

NATIONAL STATUS: **Threatened**

Flower	• Tall flowering stalk • Many tubular flowers • Flowers are generally white to creamy white • Flowers end with six spreading lobes
Distinctive Features	• Thin, pale yellowish-green leaves • Leaves reach about 8-15 cm in length • Leaves are basal (at the ground) • The basal rosette is in a star shape •
Typical Size	• Stem reaches 40 to 100 cm in height
Other	• Flowers June to July

Habitat

- Tends to be found in open habitats with sandy soils an acidity measure (pH) of 5.0 – 7.0.
- Generally found in tallgrass prairie, lake shores, swales, meadows, clearings, fallow fields, and open thicket.
- Can also be found in highly disturbed topsoils or sand pits.

Other Information

- The star shaped basal rosette inspired another common name “Stargrass”

What to do if found

- Refer to SAR Mitigation Measures for Plants.
- If possible take photo.
- Fill out the observation record form provided in Contractor Info Package for submission to the Town.
- Protect species from construction activities.
- Report all SAR sightings to an MNRF Management Biologist– Aylmer District (519-773-9241) within 2 business days.

Photo Credits: W. Muma

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Round-leaved Greenbrier

Smilax rotundifolia

PROVINCIAL STATUS: **Threatened**

NATIONAL STATUS: **Threatened**

Distinctive Features	• Woody climbing vine • The main stems are rounded and have flattened prickles • Leaves are egg-shaped and approximately 10 cm in length • Produces clusters of small, green flowers that bloom from late May to mid-June
Typical Size	• Can reach 6 m in length wrapping around shrubs and trees
Other	• Prefers open moist wet woodlands, often growing on sandy soil

What to do if found

- Refer to SAR Mitigation Measures for Plants.
- If possible take photo.
- Fill out the observation record form provided in Contractor Info Package for submission to the Town.
- Protect species from construction activities.
- Report all SAR sightings to an MNRF Management Biologist– Aylmer District (519-773-9241) within 2 business days.

Photo Credits: *1 - MNRF; 2 - Mike Crewe*

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Dense Blazing Star

Liatris spicata

PROVINCIAL STATUS: **Threatened**

NATIONAL STATUS: **Threatened**

Flower	• Flower heads have six to 10 disk flowers • Arranged in a long dense spike at the top of the plant • Flowers are generally bright purple but can be white • Flower stalks shaped by 4-18 flowering heads
Distinctive Features	• Stem is usually smooth with leaves arranged around it in a spiral • Lower leaves 10-40 cm long by 5-20 mm wide • Upper leaves are reduced in size • Stems are tall and spike like
Typical Size	Reaches up to 200 cm in height
Other	• Flowers mid-summer • Tends to grow in colonies

Habitat

- Can be found in a variety of habitats including sandy plains, shores, marshy meadows, wet prairie, fens, swamps, mucky swales, marly shores, roadsides, railroads, fields and other open places.
- Can be found in savannah and woodland openings but rarely
- Prefers areas of full sun within moist upland sites or along the water's edge in full sun

What to do if found

- Refer to SAR Mitigation Measures for Plants.
- If possible take photo.
- Fill out the observation record form provided in Contractor Info Package for submission to the Town.
- Protect species from construction activities.
- Report all SAR sightings to an MNRF Management Biologist– Aylmer District (519-773-9241) within 2 business days.

Photo Credits: W. Muma
Date: March 22, 2016

DILLON CONSULTING

www.dillon.ca

Willowleaf Aster

Symphyotrichum praealtum

PROVINCIAL STATUS: **Threatened**

NATIONAL STATUS: **Threatened**

Flower	• Small daisy-like flowers • Pale blue-violet, lavender or white petals • A yellow centre that turns purple with age
Distinctive Features	• Upper leaves are narrow and grass-like with a few small teeth along the edge • Smooth and somewhat waxy stem • Larger stems are occasionally reddish with lines of white hairs • Alternate leaves 7-13 cm long/8-18 mm wide • Leaves become smaller and narrower further up the stem • Underneath the leaves is whitish-green with a net-like formation of fine veins that are conspicuous
Typical Size	Reaches up to 150 cm in height
Other	• Late flowering (early to mid-fall) • Tends to grow in colonies

Habitat

- Wet, loamy and sandy soils
- Can be found in a variety of habitats including fallow fields, streambanks, lake shores, recent clearings, open thickets, oak savannah, open woods, ditches, roadsides, railroads, meadows, and prairie.

What to do if found

- Refer to SAR Mitigation Measures for Plants.
- If possible take photo.
- Fill out the observation record form provided in Contractor Info Package for submission to the Town.
- Protect species from construction activities.
- Report all SAR sightings to an MNRF Management Biologist– Aylmer District (519-773-9241) within 2 business days.

Photo Credits: W. Muma
Date: March 22, 2016

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Species Observation Form									
#	**Date (dd/mm/yy)**	**General Weather Conditions (Cloud cover, temp., precipitation)**	**Name of Staff**	**Drain Name and Habitat**	**Photo(s) - #**	**GPS Coordinates (if able)**	**Approx. # Obs.**	**Description of Activity**	**Description of Encounter and Outcome**
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									

Staff Review and Sign Off

I have read, understood and will comply with the conditions outlined in this Contractor Information Package for (Drainage Work Activity Name/ID)

Print Name	Signature	Date	Company

Appendix G
Photographs

Photograph 1: Culverts/ crossing structures with voids and spaces may provide suitable habitat for hibernation.

Photograph 2: Rip rap adjacent to drainage features provide suitable basking habitat for snakes.

Photograph 3: Holes in man-hole covers provide a refuge for snakes.

Photograph 4: Crayfish chimneys are frequently used by Butler's Gartner snakes for hibernacula.

Photograph 5: Wide drains with slow moving water and areas for potential basking opportunities.

Photograph 6: Drains with gently sloped sandy banks for turtle nesting and areas for basking.

Appendix H

MNRF Wildlife Handling Protocol

Ontario Species at Risk Handling Manual: For Endangered Species Act Authorization Holders

Table of Contents

Introduction

Ontario's *Endangered Species Act, 2007* (ESA) protects endangered and threatened species and their habitats.

Ontario is home to over 30,000 species, about 200 of which are considered at risk. Roughly 40 per cent of the species at risk in Canada are found in Ontario.

Activities that would harm individual species at risk or their habitats are prohibited by the ESA, unless they are authorized under the act. Authorizations include permits, stewardship agreements and exemption agreements.

This manual is designed to provide guidance to those whose authorization under the ESA may require the capture, relocation, handling, and/or transport of species at risk.

Enclosed is both a DVD presentation and CD of this manual which are also available from your Ministry of Natural Resources (MNR) District Office.

For additional information and assistance with species identification, please consult MNR *Ontario Species at Risk Quick Reference Guide*, or email: esa.permits.agreements@ontario.ca.

Visit our wesite **ontario.ca/speciesatrisk** for more general information about all Ontario's species at risk.

1. Safe Handling of Turtles

1.1 Materials

a) The following materials are required for the handling, capture, temporary safe keeping and transport of turtles:

» Large plastic bin and lid with air holes, a large bucket or a cloth/burlap bag. Ensure both sides of the container/bag and the lid are well marked with “live animal”. See section 1.5 to determine when it is appropriate to use a specific type of container.

» Thick work gloves

» Thermometer

» SAR Notification/Contact Schedule

» SAR Encounter Reporting Form

» Broom or broom handle with small paint brush roller attached to end.

b) Equipment must be maintained on each job site.

1.2 Safety considerations

a) Generally, there is little risk associated with handling turtles. However, all turtles can scratch and bite, and work gloves should be worn to help avoid minor injuries.

b) Snapping, Spiny Softshell and Eastern Musk Turtles cannot completely retract into their shell and are more likely to bite in defence. These species should be handled more cautiously and as follows:

I. **Always keep your hands as close to the back of the turtle’s shell as possible, and always behind the midpoint of the shell**. These species have a considerable reach above their shells. Snapping Turtles can reach the midpoint of the shell, and in some cases Spiny Softshell Turtles and Eastern Musk Turtles can almost reach the back of their shell.

II. Always maintain a safe distance between the front of the turtle and other people.

c) Snapping and Spiny Softshell Turtles have a powerful and painful bite that is likely to bruise and may break the skin. However, it will almost never break bone. The damage inflicted by a Snapping Turtle bite is greatly exaggerated (such as being able to bite a boat oar or golf club in half). Forcing a Snapping Turtle to bite hard implements may result in an injury to the turtle. Wearing gloves will significantly reduce the risk of injury from these turtles.

d) If bitten by a turtle, remain calm and allow the turtle to relax and let go on its own. Pulling away from the turtle may cause further injury to you or the turtle.

e) Always wash your hands after handling a turtle. Turtles (and many other animals, including humans) carry potentially harmful bacteria in their gut. Although it is possible to contract salmonella from handling turtles, there are few reported cases of contracting these bacteria from wild turtles. Cases of salmonella poisoning from turtles are almost always limited to pet turtles, since these captive turtles are forced to live in the same small space that they defecate in.

1.3 Capture and handling of turtles

Safely handle, move or capture a turtle by following these steps:

a) Always handle turtles carefully and slowly, yet firmly. Rough handling may cause injury or stress to the turtle and/or the developing eggs and may cause the turtle to be more defensive (increased biting and scratching).

b) With the exception of very small individuals, always handle turtles with both hands. Turtles are good at freeing themselves with a bit of wiggling, kicking, clawing and biting, and a good grip is essential to ensure no harm comes to you or the turtle.

c) Never pick up a turtle by the tail. This can dislocate bones throughout the tail and is extremely painful for the turtle. For larger, heavier turtles this may result in dislocation of bones in the spinal cord as well.

d) Wear gloves when handling turtles to minimize risk from scratches and bites. If gloves are not available, handle turtles with clean hands that are free of insect repellent, antibacterial hand sanitizer, sunscreen, etc.

e) **Painted, Map, Wood, Blanding's and Spotted Turtles:** Pick up these species using both of your hands, one on each side of the shell, between the front and back legs.

f) **Snapping Turtle:** Always wear gloves when handling a Snapping Turtle and always keep your hands behind the midpoint of the top or sides of the turtle's shell. To pick up a Snapping Turtle:

I. Hold it by the back of the shell, placing your thumbs on the top of the shell and your fingers in the hind leg pockets (the space between the upper shell and the hind legs). Your hands will be at approximately 5 and 7 o'clock.

II. Or use one hand to hold the base of the tail near the shell and slide your second hand under the turtle to support its weight. Lift the turtle using the hand underneath the turtle. Never pick up a turtle by the tail.

III. Or you can move it by guiding it into a pail or garbage can with a broom.

IV. It is important to get a good, strong hold on the turtle's shell as the force that is exerted by the turtle snapping may result in an unexpected release. A good grip will ensure that both the turtle and the handler remain safe and uninjured.

g) **Eastern Musk Turtle:** Pick up Eastern Musk Turtles by the back of the shell. This turtle species can be held with one hand, as long as you ensure that you have a good grip.

h) **Spiny Softshell:** Always wear gloves when handling a Spiny Softshell, and always keep your hands well behind the midpoint of the top or sides of the turtle's shell. To pick up a Spiny Softshell turtle:

I. Use both hands, one on each side of the shell, as close as possible to the back legs.

II. Or place one hand under the turtle between its back legs (in the middle to balance its weight) and the other hand, also from behind, on the top of the turtle's shell (close to the back).

i) Turtles can be difficult to capture. If a turtle escapes or heads for cover, let it disperse on its own, ensuring it is safe from harm before allowing activities to continue. If continuing activities poses a threat to the turtle, postpone activities for up to 24 hours to allow the turtle to disperse. If it is not possible to leave the area for 24 hours, have a Qualified Member relocate the individual. Do not disturb any natural cover under which the turtle has retreated. If necessary, contact MNR for further direction using the SAR Notification/ Contact Schedule.

1.4 Moving turtles out of harm's way (distances under 50 metres)

a) If it is necessary to move a turtle more than 50 metres, refer to section 1.6 on turtle relocation.

b) Turtles should only be moved when they are in imminent, unavoidable danger.

c) If possible, allow the turtle to move on its own by walking toward the turtle in the direction that you want it to move. This will not work for Snapping Turtles, as they often turn to face a potential threat head-on rather than running away. If the turtle does not move on its own, you may have to pick it up and move it (see section 1.3).

d) When moving a turtle a short distance, such as across a road, move the turtle in the direction that it was heading, regardless of what the habitat looks like. These animals often make intentional movements to specific areas, and if you put them back where they started they may simply turn around and start their journey again. If it is not clear which direction the turtle was headed, move the turtle to the closest suitable habitat that will not be disturbed. In this case, suitable habitat includes a water body or the vegetation/forest at the edge of the road allowance, disturbed area or clearing.

e) If possible, release the turtle near a retreat site (somewhere the animal can seek shelter from the elements and avoid predators, such as water or dense vegetation) to allow it to take cover. Do not release it in the open where it could be exposed to inclement weather, extreme sunlight or predators.

1.5 Temporary safe keeping and transportation of turtles

a) You are responsible for this animal. Remember, once you have put it in a container, it depends on you to keep it safe and at the right temperature.

b) Always create air holes in the lid of a container prior to placing an animal in the container.

c) If the turtle will be in captivity for **less than one hour**, place the turtle in a cloth or burlap bag, a large bucket or a large plastic bin with a lid that has adequate air holes. Cloth or mesh bags should not be used for snapping turtles as they can become tangled and strangle themselves. Always use large plastic bins or large buckets for snapping turtles.

d) If the turtle will be in captivity for **more than one hour**, avoid the use of cloth or burlap bags. For adults, use a large plastic bin or bucket with a lid that has adequate air holes and a small amount of water (no more than an inch deep). Ensure that the turtle is not fully submerged, as it will drown if it cannot breathe. For hatchlings and juveniles, use an appropriately sized container with a lid that has air holes and line the bottom of the container with wet towels or paper towels. Never transport small juveniles or hatchlings in water.

e) It is extremely important to monitor the air temperature regularly in the container to ensure it **never exceeds 30°C or drops below 5°C**. Never leave the container in direct sunlight or in a closed vehicle parked in the sun, as this will cause the turtle to overheat and could be fatal.

f) Never put more than one turtle in a container or bag at a time, especially in the case of Snapping Turtles. This will help to minimize stress and prevent injury to the turtles.

g) Once the turtle is in the container or bag, ensure that the lid is secure or that the bag is tied tightly.

h) **Never leave the container or bag unattended** in an unsecured location (e.g., side of road).

i) If using a bag, ensure that it is in a secure location where it cannot fall if the turtle moves the bag. The movement of a turtle within a bag can easily cause the bag to fall off of a table.

j) Do not offer the turtle any food. Turtles do not have to eat as often as mammals, and it is no problem for a turtle in temporary captivity to go a few days without food.

k) Turtles should be checked periodically (every hour should suffice). Hatchlings are especially susceptible to dehydration and must be carefully monitored during transport.

1.6 Relocation of turtles

a) A turtle should only be relocated if the destruction of its habitat is unavoidable or if it is not possible to release it at the capture location.

b) Transport and release the turtle within one hour of capture in order to minimize stress on the animal.

c) Turtles should not be relocated during their over-wintering season. This varies depending on the species and location, but is generally from October to May. If you are unsure whether you should relocate the turtle or take it to a wildlife custodian, contact MNR for further direction using the SAR Notification/ Contact Schedule.

d) If it is not possible to relocate the turtle due to the time of year (October to May) or other conditions, transport the turtle to a wildlife custodian per the SAR Notification/Contact Schedule.

e) **Turtles should never be moved more than 250 metres** from the location where they were found. Only move a turtle as far as necessary to avoid potential harm to the turtle, and avoid moving turtles more than 125 metres unless absolutely necessary. If it is not possible to relocate the turtle within 250 metres of the capture location, contact MNR for further direction using the SAR Notification/Contact Schedule.

f) If hatchlings are found and must be relocated, move them to the nearest permanent body of water. Never place hatchlings directly into water. Release the turtle at the shoreline of the appropriate habitat (see below). The turtle may or may not choose to enter the water; do not force it.

g) Whenever possible, release the turtle in the same water body where it was found and in the same type of natural habitat as the capture site. To determine if the habitat is of the same type, consider the water depth, water current, substrate type (mud, rock, etc.) and vegetation type (cattails vs. lily pads vs. aquatic vegetation).

h) If possible, release the turtle near a retreat site (somewhere the animal can seek shelter from the elements and avoid predators, such as water or dense vegetation) to allow it to take cover. Do not release it in the open where it could be exposed to inclement weather, extreme sunlight or predators.

i) To release the turtle, gently pick up the turtle (per section 1.3) from the container and set it down in the new location. To release a Snapping Turtle or Spiny Softshell Turtle, you may wish to tip the container on its side and allow the turtle to move out on its own. Allow the turtle to disperse on its own at this new location.

1.7 Injured turtles

a) Use the methods outlined in section 1.3 to handle injured turtles whenever possible. If those methods are not applicable due to the turtle's injuries, use a shovel or other flat object to pick up the turtle. Ensure that any injured areas are supported.

b) Place the turtle in a large plastic bin or large bucket with a lid that has air holes. Darkness helps to reduce stress to the turtle. Do not place anything else in the container with the turtle, including water or other turtles.

c) Thoroughly wash your hands after handling injured turtles.

d) Immediately transport the turtle to a veterinarian or wildlife custodian per the SAR Notification/Contact Schedule, in order to increase its chances of survival.

2. Safe Handling of Snakes

2.1 Materials

a) The following personal protective equipment should be worn when working with Massasauga rattlesnakes:

» High-ankle hiking or rubber boots

» Thick pants (jeans) or baggy pants

» Leather work gloves

b) The following materials are required for the handling, capture, temporary safe keeping and transport of snakes:

» Pail, large garbage can or bucket (1 metre deep) with air holes in the lid. Ensure both the side of the container and the lid are well marked “live animal” or “caution rattlesnake”.

» A snake bag (for non-venomous species only). A snake bag must be cloth. (A pillowcase works well.) Plastic and non-breathable materials are not appropriate. Ensure the bag is well marked “live animal”.

» Broom or broom handle with small paint brush roller holder attached to end. Never use “snake pinchers”.

» Thermometer

» SAR Notification/Contact Schedule

» SAR Encounter Reporting Form

c) Equipment must be maintained on each job site.

2.2 Safety considerations

a) **The Massasauga is the only venomous snake in Ontario.**

The venom is an adaptation for hunting and is used to kill prey (primarily small rodents).

As a defence mechanism, Massasaugas may also bite when threatened, at which time they may or may not release venom. Camouflage, rattling and retreating are their primary defensive strategies, and they generally bite as a last resort.

Their maximum striking distance is about half of their body length. Generally, your safety zone is yourheight plus 50 centimetres away from the snake. (This accounts for the snake’s striking distance to you if you fall.)

A Massasauga bite is generally not deadly. Only two people have ever died from a Massasauga bite in Ontario. Neither person received medical attention, and both cases were almost 50 years ago.

If you are bitten by a Massasauga, remain calm and seek medical attention immediately. Do not apply a tourniquet or try to suck out the venom. Never try to capture the snake to take it to the hospital; if you were bitten by a venomous snake in Ontario, we know it was a Massasauga. Have someone else drive you safely.

b) **Never under any circumstances pick up a Massasauga rattlesnake**. Massasaugas occur in very specific regions of the province, and if you are well outside of those regions it should be safe to handle any native snake you find. If you are working within a region where Massasaugas may occur, never pick up a snake unless you are absolutely certain that it is not a Massasauga.

c) All other Ontario snakes are non-venomous and harmless. Despite being harmless, many of Ontario’s snakes will put on defensive displays to intimidate potential predators. These include:

I. Rearing up, hissing and striking.

II. Eastern Hog-nosed Snakes will flatten out their necks like cobras, hiss loudly and pretend to strike (although their mouths remain closed).

III. Eastern Foxsnakes, Milksnakes, Gray Ratsnakes and Eastern Hog-nosed Snakes sometimes vibrate their tails to imitate a rattlesnake. If their tails come into contact with rocks, dry leaves, or some other medium, they can produce a buzzing sound like that of a rattlesnake. Combined with their blotchy pattern, this mimicry is often very effective at fooling humans.

d) Holding the snake properly (see section 2.4) will significantly reduce stress to the snake and the likelihood that it will try to bite in self-defence.

2.3 Capture and handling of the Massasauga rattlesnake

Safely move a Massasauga by following these steps:

a) Put on personal protective equipment (per section 2.1).

b) Clear the area of unnecessary bystanders to lessen the stress on the animal.

c) Determine your plan for capture to anticipate where the snake may move or retreat as well as any potential hazards you may encounter.

d) If capturing injured snakes, avoid touching or manipulating injured areas.

e) Tip the 1-metre-deep pail on its side.

f) Use the broom to position the snake near the pail.

g) Gently and slowly guide the snake into the pail, being careful not to push the snake too hard or lift if off the ground. Never pin a Massasauga or use tools that constrict or pinch the snake. Quick, abrupt movements are threatening to the snake and may also cause it to make quick movements in an attempt to escape.

h) Be patient and gentle with the snake. Gravid (pregnant) females are carrying live young, and rough handling may cause damage to the developing snakes.

i) Once the snake is in the pail, slowly tip the pail upright and secure the lid.

j) Snakes can be difficult to capture. If a snake escapes or heads for cover, let it disperse on its own, ensuring it is safe from harm before allowing activities to continue. If allowing activities to continue is not safe for the snake, postpone activities for up

to 24 hours to allow the snake to disperse. If it is not possible to leave the area for 24 hours, have a Qualified Member relocate the individual. Do not disturb any natural cover under which the snake has retreated. If necessary, contact MNR for further direction using the SAR Notification/Contact Schedule.

2.4 Capture and handling of non-venomous snakes

a) If you are uncomfortable handling large, non-venomous snakes with your hands, you can use the above method for capturing venomous snakes (section 2.3). However, it is much easier to capture most non-venomous snakes using your hands. Some of the smaller species, such as the Butler's Gartersnake, are almost impossible to capture with a stick and a pail.

b) If you elect to use thick gloves, be very careful not to squeeze the snake too hard, as you can crush internal organs and kill it. Do not use gloves to capture small snakes, as the risk of accidentally crushing them is too high.

c) Clear the area of unnecessary bystanders to lessen the stress on the animal.

d) Determine your plan for capture to anticipate where the snake may move or retreat and to anticipate any potential hazards you may encounter.

e) Never grab the snake behind the head or grip the snake tightly in order to restrain it. This may injure or scare the snake, cause it to struggle and encourage it to bite in self-defence.

f) Always support the snake's body with both hands and never pick up a snake only by the tail. Holding a snake only by the tail can result in dislocated bones or other serious injury to the snake.

g) To capture a large snake (more than 30 centimetres in length):

I. Gently grab it by the back of the body to prevent it from getting away.

II. Holding the snake by the back end while it is still on the ground, slide your other hand underneath the snake to support its weight and lift it up. Do not lift if off the ground by the tail.

III. As soon as the snake is off the ground, continue to support its weight by keeping both hands under the snake, with one hand about a third of the way back and one hand about two thirds of the way back along the snake's body.

IV. As the snake tries to move forward, reposition the hand from the back of the snake to the front of the snake, and continue to rotate your hands between the front and back of the snake to allow it to continue to crawl through your hands. Calm and slow movements will help the snake relax and make it move more slowly.

V. Often a snake will stop moving once it no longer feels threatened. If the snake continues to move rapidly after a minute or so, you can try holding the back end of the snake more firmly to prevent it from continuing to move forward. Continue to support the unrestricted front half of the snake with your other hand.

h) To capture a small snake (less than 30 centimetres in length):

I. Grasp the snake gently but firmly with one or both hands. It may be necessary to gently restrain it against the ground with your hands initially to prevent it from escaping. Never use a stick, snake hook or any other object to pin a snake.

II. Hold the back end of the snake in one hand and support the front of the snake with your fingers or your second hand. Allowing the snake's front end to remain free helps the snake remain calm.

III. For very small snakes, hold the snake in the palm of your hand using your thumb or fingers to gently apply only enough pressure to prevent the snake from wiggling free.

i) Snakes can be difficult to capture. If a snake escapes or heads for cover, let it disperse on its own, ensuring it is safe from harm before allowing activities to continue. If continuing activities poses a threat to the snake, postpone activities for up to 24 hours to allow the snake to disperse. If it is not possible to leave the area for 24 hours, have a Qualified Member relocate the individual. Do not disturb any natural cover under which the snake has retreated. If necessary, contact MNR for further direction using the SAR Notification/ Contact Schedule.

2.5 Moving a snake out of harm's way (distances under 50 metres)

a) If it is necessary to move a snake more than 50 metres, refer to section 2.7 on snake relocation.

b) Snakes should only be moved when they are in imminent, unavoidable danger.

c) If possible, allow the snake to move on its own by walking toward the snake in the direction that you want it to move. If the snake does not move on its own, you will have to pick it up and move it (see section 2.4). Unlike most snake species, Massasaugas may not

move away when you walk toward them. Rather, they often adopt a defensive position (coiled), hold their ground and rattle (asking you to go the other way). To encourage a Massasauga to move away on its own, give it lots of space and observe it from a distance (ideally so the snake cannot see you).

d) When moving a snake out of harm's way, such as across a road, move the snake in the direction that it was heading, regardless of what the habitat looks like. These animals often make intentional movements to specific areas, and if you put them back where they started they will simply turn around and start their journey again. If it is not clear which direction the snake was headed, move it to the closest habitat that will not be disturbed. In this case, suitable habitat includes a rock pile or other cover that the snake can retreat under, or the vegetation at the edge of the road allowance, disturbed area or clearing.

e) If possible, release the snake near a retreat site (somewhere the animal can seek shelter from the elements and avoid predators: loose rocks, logs, rock crevices or dense vegetation) to allow it to take cover upon release. Do not release the snake in the open where it could be exposed to inclement weather, extreme sunlight or predators.

2.6 Temporary safe keeping and transportation of snakes

a) You are responsible for this animal. Remember, once you have put it in a container, it depends on you to keep it safe and at the right temperature.

b) Always use a pail, large garbage can or bucket (at least 1 metre deep) with adequate air holes in the lid for Massasaugas. Ensure the lid is properly secured, and always create the air holes before putting the snake in the container.

c) If using a snake bag:

I. **Make sure it is properly closed**. To close the snake bag, gather the material at the opening together in one hand and run your other hand down the bag to ensure that the snake is in the bottom. Twist the neck of the bag and tie it into a tight knot. Never rely on a drawstring, as snakes can wiggle out of tight holes. When tying a snake bag, make sure the snake remains in the bottom of the bag so it does not get tangled in the part you are tying.

II. **Make sure it is in a secure location** where it cannot fall if the snake moves the bag. The movement of a snake within a bag can easily cause the bag to fall off of a table.

III. If transporting the snake or holding it for a longer time (over an hour), the closed snake bag should be placed in a well-ventilated hard container (such as plastic tub) for added protection.

d) It is extremely important to monitor the air temperature regularly in the container or around the snake bag to ensure it **never exceeds 30°C or drops below 5°C**. Never leave the container or snake bag in direct sunlight or in a closed vehicle parked in the sun, as this will cause the snake to overheat and could be fatal.

e) **Never leave the container or snake bag unattended** in an unsecured location (e.g., side of road).

f) Do not offer the snake any food. Snakes do not have to eat as often as mammals, and it is no problem for a snake in temporary captivity to go a few days without food.

2.7 Relocation of snakes

a) A snake should only be relocated if the destruction of its habitat is unavoidable or if it is not possible to release it at the capture location.

b) Snakes should not be relocated during their over-wintering season. This varies depending on the species and location, but is generally from October to May. If you are unsure whether you should relocate the snake or take it to a wildlife custodian, contact MNR for further direction using the SAR Notification/Contact Schedule.

c) If it is not possible to relocate the snake due to the time of year (October to May) or other conditions, transport the snake to a wildlife custodian per the SAR Notification/Contact Schedule.

d) Transport and release the snake within one hour of capture in order to minimize stress on the animal.

e) **Snakes should never be moved more than 250 metres** from the location where they were found. Only move a snake as far as necessary to avoid potential harm to the snake, and avoid moving snakes more than 125 metres unless absolutely necessary. If it is not possible to relocate the snake within 250 metres of the capture location, contact MNR for further direction using the SAR Notification/Contact Schedule.

f) Release the snake in the same type of natural habitat as the capture site. If this is not possible, contact MNR for further direction using the SAR Notification/Contact Schedule.

g) If possible, release the snake near a retreat site (somewhere the animal can seek shelter from the elements and avoid predators: loose rocks, logs, rock crevices or dense vegetation) to allow it to take cover upon release. Do not release the snake in the open where it could be exposed to inclement weather, extreme sunlight or predators.

h) To release the snake from a pail, gently tip the pail onto its side, remove the lid, back away from the pail and allow the snake to leave on its own. If necessary, use the broom to gently guide the snake out of the pail or gently tip the pail on an angle to slide the snake out of the pail.

i) To release a non-venomous snake from a bag, untie the bag, gently tip the bag by holding one of the bottom corners (make sure you are not holding the snake) and gently slide the snake onto the ground.

2.8 Injured snakes

a) If dealing with an injured Massasauga, ensure compliance with all instructions and safety considerations provided in sections 2.1-2.3.

b) If the methods of handling snakes that are outlined in section 2.3 or 2.4 are not applicable due to the snake's injuries, use a shovel or other flat object to pick up the snake. Ensure that any injured areas are supported.

c) Place the snake in a large plastic bin or bucket with a lid that has air holes (the darkness helps to reduce stress to the snake). You can place newspaper in the container to provide cover for the snake and help to reduce its stress. Do not place anything else in the container with the snake or offer it any food.

d) Thoroughly wash your hands after handling injured snakes.

e) Immediately transport the snake to a veterinarian or wildlife custodian per the SAR Notification/Contact Schedule, in order to increase its chances of survival.

Snakes

3. Safe Handling Of The Five-lined Skink

3.1 Materials

a) The following materials are required for the handling, capture, temporary safe keeping and transport of Five-lined Skinks:

» Small plastic container with a lid that has air holes. Ensure the container and the lid are well marked “live animal”.

» Thermometer

» SAR Notification/Contact Schedule

» SAR Encounter Reporting Form

b) Equipment must be maintained on each job site.

3.2 Capture and handling of Five-lined Skinks

a) There is no risk associated with handling Five-lined Skinks. They may bite, but this will not cause any substantial injury – they have small mouths and tiny teeth.

b) Safely handle, move or capture a Five-lined Skink by following these steps:

I. Always handle Five-lined Skinks gently and slowly. Rough handling may cause injury or stress to the animal. Skinks can drop their tail as an anti-predator defence and may do so if they feel threatened, even if they are not being held by the tail.

II. **Never grab or pick up a Five-lined Skink by the tail**. This may cause the skink to drop its tail (even if you are being gentle) and can be detrimental to the survival of the animal.

III. Do not pick up Five-lined Skinks by the body; exerting too much pressure by accident can result in internal injury.

IV. Capture a skink by cupping your hands over the skink while it is on the ground. (You have to be quick!)

V. Carefully close your hand(s) around the skink to pick it up. Note that they can fit through small holes between your fingers.

c) Always wash your hands after handling any wildlife.

3.3 Moving a Five-lined Skink out of harm’s way (distances under 25 metres)

a) If it is necessary to move a skink more than 25 metres, refer to section 3.5 on Five-lined Skink relocation.

b) Five-lined Skinks should only be moved when they are in imminent, unavoidable danger.

c) If possible, allow the skink to move on its own by walking toward the skink in the direction that you want it to move. Skinks are fast and tend to hide whenever possible. If the skink continues to seek shelter within the area where work is taking place, it will have to be picked up and moved (see section 3.5).

d) When moving a skink out of harm’s way, such as across a road, move the skink in the direction that it was heading, regardless of what the habitat looks like. These animals often make intentional movements to specific areas, and if you put them back where they started they will simply turn around and start their journey again. If it is not clear which direction the skink was headed, move the skink to the closest suitable habitat that will not be disturbed. In this case, suitable habitat includes rocks or other cover objects that the skink can retreat under.

e) If possible, release the Five-lined Skink near a retreat site, which is somewhere the animal can seek shelter from the elements and avoid predators (vegetation, rocks, logs or leaf litter). Do not release it in the open where it could be exposed to inclement weather, extreme sunlight or predators.

3.4 Temporary safe keeping and transportation of Five-lined Skinks

a) You are responsible for this animal. Remember, once you have put it in a container, it depends on you to keep it safe, moist and at the right temperature.

b) Keep Five-lined Skinks in a small container with a lid that has air holes. Always create the air holes before putting the skink in the container.

c) Skinks can move very quickly and may try to escape before the lid is on the container. Be careful that the skink does not get crushed when you place the lid on the container.

d) It is extremely important to monitor the air temperature regularly in the container to ensure it **never exceeds 30°C or drops below 5°C**. Never leave the container in direct sunlight or in a closed vehicle parked in the sun, as this will cause the animal to overheat and could be fatal.

f) **Never leave the container unattended** in an unsecured location (e.g., side of road).

3.5 Relocation of Five-lined Skinks

a) A Five-lined Skink should only be relocated if the destruction of its habitat is unavoidable or if it is not possible to release it at the capture location.

b) Transport and release the skink within one hour of capture in order to minimize stress on the animal.

c) Five-lined Skinks should not be relocated during their over-wintering season, which is generally from October to May. If you are unsure whether you should relocate the skink or take it to a wildlife custodian, contact MNR for further direction using the SAR Notification/Contact Schedule.

d) If it is not possible to relocate the skink due to the time of year (October to May) or other conditions, transport it to a wildlife custodian per the SAR Notification/Contact Schedule.

e) Five-lined Skinks should never be moved more than 100 metres from the location where they were found. Only move a skink as far as necessary to avoid potential harm to the skink, and avoid moving skinks more than 50 metres unless absolutely necessary. If it is not possible to relocate the animal within 100 metres of the capture location, contact MNR for further direction using the SAR Notification/Contact Schedule.

f) Always release Five-lined Skinks in the same type of natural habitat as the capture site.

g) If possible, release Five-lined Skinks near a retreat site, which is somewhere the animal can seek shelter from the elements and avoid predators (vegetation, rocks, logs or leaf litter). Do not release them in the open where they could be exposed to inclement weather, extreme sunlight or predators.

h) To release Five-lined Skinks, remove the lid and gently tip the container onto its side and allow the animal to leave on its own. If necessary, gently tip the container on an angle to slide the animal out.

3.6 Injured Five-lined Skinks

a) Use the methods outlined in section 3.2 to handle injured skinks whenever possible. If those methods are not applicable due to the skink's injuries, use a shovel or other thin, flat object to pick up the skink. Ensure that any injured areas are supported.

b) Place the Five-lined Skink in a small container with a lid that has air holes. Always create the air holes before putting the skink in the container.

c) Newspaper or paper towels may be added to the container to give the skink something to hide in. Do not place water, other skinks, food or anything else in the container with the skink.

d) Thoroughly wash your hands after handling injured skinks.

e) Immediately transport the skink to a veterinarian or wildlife custodian per the SAR Notification/Contact Schedule, in order to increase its chances of survival.

Five-lined Skink

4. Safe Handling of Amphibians

Important Note: Many amphibian species absorb oxygen through their skin as well as breathing with lungs; some species rely completely on their skin for respiration. If their skin dries out, they can suffocate. Therefore, careful handling of amphibians (especially salamanders) includes ensuring that their skin is kept moist.

4.1 Materials

a) The following materials are required for the handling, capture, temporary safe keeping and transport of amphibians:

- A pail, bucket or large plastic bin with a lid that has air holes (for frogs). Ensure both the side of the container and the lid are well marked “live animal”.
- Plastic kitchen-style container lined with paper towel (needs to be wet when used) with a lid that has air holes (for salamanders and toads). Ensure both the side of the container and the lid are well marked “live animal”.
- Thermometer
- SAR Notification/Contact Schedule
- SAR Encounter Reporting Form
- Net (optional)

b) Equipment must be acquired and maintained on each job site.

4.2 Capture and handling of salamanders, toads and frogs

Note: Eastern Newts have toxins in their skin and some salamanders may release a white, mildly toxic substance from their skin and tail. If ingested, these toxins may cause mild nausea. There is no risk associated with handling Ontario’s amphibians, provided you wash your hands afterwards. Toads will not give you warts.

Safely handle, move or capture a salamander, toad or frog by following these steps:

a) Always make sure your hands are clean and free of insect repellent, antibacterial hand sanitizer, sunscreen, etc. Amphibians have very wet, porous skin through which they absorb oxygen and other compounds. Harmful chemicals (such as bug repellent) are quickly absorbed through an amphibian’s skin and can cause serious damage to the animal.

b) If possible, wet your hands before picking up salamanders in order to avoid drying out their skin. Some species rely completely on their skin for respiration. If their skin dries out, they can suffocate and die. You can also ensure dampness is maintained by picking up some wet soil with the salamander.

c) Keep handling times to a minimum as oil produced by human skin can easily clog amphibian pores, causing suffocation in some species.

d) Always handle amphibians gently and slowly. Rough handling may cause injury or stress to the animal. Salamanders can drop their tail as an anti-predator defence, and may do so if they feel threatened (even if you are not holding them by the tail).

e) Never grab or pick up a salamander by the tail. This may cause the salamander to drop its tail (even if you are being gentle) and can be detrimental to the survival of the animal.

f) Capture a **frog or toad** using a net or pick it up with your hands by:

I. Cupping your hands over the frog or toad while it is on the ground. (You have to be quick!)

II. Closing your hand(s) to create a “cage” around the animal and picking it up. Note that they are slippery and can fit through small holes between your fingers.

III. If it is necessary to identify the species after picking it up, carefully allow it to partially crawl out of your hand between your thumb and forefinger and then gently tighten your grip around its back legs (near its waist), holding onto both back legs. Support its front legs with your other hand.

g) Pick up a **salamander or newt** by scooping it up in one or two hands and then closing your hands to create a “cage”. Note that these animals are slippery and can fit through small holes between your fingers.

h) Use a net, container or your hands to catch frog tadpoles or salamander larvae. A net is easiest.

4.3 Moving amphibians out of harm's way (distance under 25 metres)

a) If it is necessary to move an amphibian more than 25 metres, refer to section 4.5 on amphibian relocation.

b) Amphibians should only be moved when they are in imminent, unavoidable danger.

c) Salamanders do not move large distances and will tend to hide whenever possible. If there is the need to move a salamander, you will have to pick it up and move it (refer to section 4.2).

d) If possible, allow a frog and a toad to move on its own by walking toward it in the direction that you want it to move. If the frog or toad does not move on its own, you will have to pick it up and move it (see section 4.2).

e) When moving an amphibian out of harm's way, such as across a road, move it in the direction that it was heading, regardless of what the habitat looks like. These animals often make intentional movements to specific areas and if you put them back where they started they will simply turn around and start their journey again. If it is not clear which direction the animal was headed, move it to the closest suitable habitat that will not be disturbed. Suitable habitat includes: any shoreline habitat in the case of frogs; leaf litter, rocks or logs in a vegetated/forested area that the animal can hide under in the case of salamanders; any cover, such as rocks or vegetation, in the case of toads.

4.4 Temporary safe keeping and transportation of amphibians

a) You are responsible for this animal. Remember, once you have put it in a container, it depends on you to keep it safe, moist and at the right temperature.

b) Make sure that all containers that will be housing amphibians are thoroughly washed and rinsed and do not contain any soap or chemical residue.

c) Keep **frogs** in a pail, bucket or large plastic bin with a lid that has adequate air holes. Always create the air holes before putting the animal in the container. Fill the container with less than one inch of water. Frogs should never be fully submerged, or they will drown.

d) Keep **toads** in a pail, bucket, large plastic bin or plastic kitchen-style container with a lid that has adequate air holes. Always create the air holes before putting the animal in the container. Line the bottom of the container with wet paper towels.

e) Keep **salamanders** in a plastic kitchen-style container with a lid that has adequate air holes. Line the bottom of the container with wet paper towels.

f) Keep **newts and mudpuppies** in a pail, bucket, large plastic bin or plastic kitchen-style container with a lid, and fill the container with water. Replace water twice daily to ensure proper aeration, as these animals breathe through gills (like fish).

g) It is extremely important to monitor the air temperature regularly in the container to ensure it **never exceeds 25°C or drops below 5°C**. Never leave the container in direct sunlight or in a closed vehicle parked in the sun, as this will cause the animal to overheat and could be fatal.

h) **Never leave the container unattended** in an unsecured location (e.g., side of road).

4.5 Relocation of amphibians

a) Amphibians should only be relocated if the destruction of their habitat is unavoidable, or if it is not possible to release the animal at the capture location.

b) Transport and release it within one hour of capture in order to minimize stress on the animal.

c) Amphibians should not be relocated during their over-wintering season. This varies depending on the species and location, but is generally from October to May. If you are unsure whether you should relocate the animal or take it to a wildlife custodian, contact MNR for further direction using the SAR Notification/ Contact Schedule.

d) If it is not possible to relocate the animal due to the time of year (October to May) or other conditions, transport it to a wildlife custodian per the SAR Notification/Contact Schedule.

e) **Amphibians should never be moved more than 100 metres** from the location where they were found. Only move the amphibian as far as necessary to avoid potential harm to the amphibian, and avoid moving amphibians more than 50 metres unless absolutely necessary. If it is not possible to relocate the animal within 100 metres of the capture location, contact MNR for further direction using the SAR Notification/Contact Schedule.

f) Release amphibians as close as possible to the capture site.

g) Always release frogs and larvae in the same water body where they were found, or in the same type of natural habitat as the capture site.

h) Release salamanders and toads in the same type of natural habitat as the capture site.

i) If possible, release frogs, toads and salamanders near a retreat site, which is somewhere the animal can seek shelter from the elements and avoid predators (vegetation, rocks, logs or leaf litter in the case of salamanders; water or vegetation in the case of frogs). Do not release them in the open where they could be exposed to inclement weather, extreme sunlight or predators.

j) To release frogs, toads and salamanders, remove the lid and gently tip the container onto its side and allow the animal to leave on its own. If necessary, gently tip the container on an angle to slide the animal out of the container.

4.6 Injured amphibians

a) Use the methods outlined in section 4.2 to handle injured amphibians whenever possible. If those methods are not applicable due to the animal's injuries, use a shovel or other thin, flat object to pick up the animal. Ensure that any injured areas are supported.

b) Place the amphibian in a small container with a lid that has air holes and line the bottom of the container with wet paper towels. Always create the air holes before putting the animal in the container.

c) Newspaper or paper towels may be added to the container to give the amphibian something to hide in. Do not place water, other animals, food or anything else in the container with the individual.

d) Thoroughly wash your hands after handling injured amphibians.

e) Immediately transport the injured animal to a veterinarian or wildlife custodian per the SAR Notification/Contact Schedule, in order to increase its chances of survival.

Amphibians

5. Safe Handling of Birds

The protocol for handling birds is based on the size of the birds you may encounter.

Small Birds: e.g., Loggerhead Shrike, Prothonotary Warbler, Whip-poor-will

Large Birds: e.g., King Rail, Least Bittern, Peregrine Falcon

5.1 Materials

a) The following materials are required for the handling, capture, temporary safe keeping and transport of birds:

- Sturdy cardboard box or large plastic bin and lid with air holes. Ensure both sides of the box/ container and the lid are well marked with “live animal”.
- Sheet or blanket large enough to cover a large bird
- Thick work gloves
- Safety glasses
- Thermometer
- Digital camera (optional)
- MNR Notification/Contact Schedule
- SAR Encounter Reporting Form

b) Equipment must be acquired and maintained on each job site.

5.2 Safety considerations

a) Generally, there is little risk associated with handling birds. However, some species can scratch or bite, and work gloves should be worn to help avoid minor injuries. Safety glasses are recommended for larger birds, especially the Least Bittern.

b) Always wash your hands after handling a bird. In addition, cloths, blankets and containers used to hold or transport birds should be washed with soap and water after each use. Discard a cardboard box after using it to hold or transport a bird.

5.3 Capture and handling of birds

a) The first consideration is to determine if the bird needs handling. It may be that the bird is healthy and can fly away. To find out, approach the bird slowly and wave your arms to make it fly or move away. Ensure that the direction in which the bird will fly is clear and free of obstruction. If this occurs (i.e., bird flies away), there is no need to proceed further with trying to catch it. If it doesn’t fly and instead crouches down or wobbles, indicating that it can’t fly, then it may be injured or a young bird not yet capable of flight.

c) Determine if it is a small or large bird from the list above. If possible, take a picture of the bird so that it can be identified without having to reopen the container.

d) **Small birds:** Use your bare or gloved hands, or the cloth or blanket, if that is more appropriate. Place your hands or the cloth/blanket over the bird around its body and over its wings to keep it from escaping. Gently pick it up and place it in the cardboard box or the large plastic bin. If it attempts to escape, work it towards a corner and attempt capture again.

e) **Large birds:** Use gloves and safety goggles for protection. Take the cloth or blanket and throw it over the bird to keep it from escaping. Use both hands to clasp the body of the bird through the cloth and gently restrain it. Pick up the bird, including the cloth, and place it all in the cardboard box/plastic bin. Free the bird from the cloth, remove the cloth, and then place the cover on the box.

If the bird jabs or bites at you during capture, use your gloved hand to fend off the attacks. Ensure it does not get close to your eyes if you are not wearing glasses.

f) Always handle birds carefully and gently, yet firmly. Birds may at any time struggle in an attempt to escape.

g) Never pick up a bird by the legs alone. Always support the body by grasping it around the wings.

5.4 Moving and releasing young birds or recovered birds

a) If the bird is a young bird incapable of long flight, it may be that its parents are nearby. Check around the site where the bird was found for the parents. If you locate parents, the young bird should be moved to a nearby tree, bush or ledge where the parents can attend to it and feed it. The location should be close to the parents and removed from danger. Watch the bird for 15 minutes and see if a parent attends to it.

b) In other cases, the captured bird may recover in the container and begin struggling to escape. In this case, you may wish to try releasing it in a natural habitat near where it was found. Place it in a location where it has shelter from the elements and can avoid predators. Allow it to move into cover. Do not release it in the open where it could be exposed to inclement weather, extreme sunlight or predators.

5.5 Temporary safe keeping and transportation of birds

a) You are responsible for this bird. Remember, once you have put it in a container, it depends on you to keep it safe and at the right temperature.

b) Always create air holes in the sides or lid of the box or container prior to placing the bird in it.

c) Place the box in a sheltered environment, preferably in the dark or semi-dark. This will quiet the bird down and let it rest.

d) Contact one of the MNR staff indicated on the SAR Notification/Contact Schedule. Ask for instructions on how to care for the bird. Send a picture of the bird if necessary.

e) It is extremely important to monitor the air temperature regularly in the container to ensure it **never exceeds 30°C or drops below 15°C**. Never leave the container in direct sunlight or in a closed vehicle parked in the sun, as this could cause the bird to overheat and could be fatal.

f) Never put more than one bird in a container at a time, especially raptors (Peregrine Falcon).

g) Once the bird is in the container, ensure that the lid is secure.

h) **Never leave the container unattended** in an unsecured location (e.g., side of road) or on the edge of a car seat.

i) Do not offer the bird any food or water unless instructed to do so following consultation with MNR staff on the SAR Notification/Contact Schedule.

j) Birds should be checked periodically (every hour should suffice). Young birds are especially susceptible to dehydration and must be carefully monitored during transport.

5.6 Evaluation and disposition of captured birds

a) Contact the MNR staff person listed on the SAR Notification/Contact Schedule immediately. Inform him or her of the capture and holding of the bird and ask for advice on the next steps.

b) It may be useful to take a picture of the bird for identification purposes. Send the photo to the MNR staff person or another person as requested.

c) You may be asked by the staff person to take the bird to a wildlife custodian.

5.7 Injured birds

a) If the bird is injured, immediately request and follow instructions given by the MNR staff person listed on the SAR Notification/Contact Schedule.

b) If so instructed, immediately transport the bird to a veterinarian or wildlife custodian per the SAR Notification/Contact Schedule, in order to increase the chances of the bird's survival.

6. Reporting Species at Risk Encounters

a) Contact MNR to report the occurrence (including dead animals) within the period of time set out in the permit or agreement, or within 24 hours if not stipulated. Report injured animals to MNR immediately.

b) Complete and submit the SAR Encounter Reporting Form, which includes the following information:

I. Name of Qualified Member

II. Contact number of Qualified Member

III. Date and time of the encounter

IV. Detailed location of the encounter (with lat-long or UTM coordinates, if possible). To obtain coordinates without a GPS, zoom into the area using Google Maps, right click on the location and select “what’s here?” from the right-click menu. The coordinates (in decimal degrees) will be provided to you in the Google Maps search bar.

V. Species encountered, with photo documentation, when possible. For assistance with species identification, see MNR’s *Ontario Species at Risk Quick Reference Guide*. Detailed species accounts can be found at **www.ontarionature.org/atlas** or the “Species Guides” at **www.torontozoo.com/AdoptAPond**.

VI. Action taken

Risk Encounters

7. Handling and Transporting Dead Animals

Dead species at risk that are encountered should be reported to the MNR as soon as possible. It is possible that the Ministry will request that the individual be stored and/or transported to the MNR.

Many researchers are currently studying the genetics of wild populations in Ontario, and genetic materials extracted from dead animals can make a valuable contribution to this research.

Examining a dead animal may provide important information about the cause of death or threats affecting the population.

If the MNR asks to see the species at risk and it is not possible to transport it on the same day it was found, the specimen should be stored in a freezer.

7.1 Materials

a) The following materials must be used for the handling and transport of dead species at risk:

I. A plastic resealable bag or plastic kitchen-style container with a tight lid with label “dead SAR for transport to MNR”

II. Permanent, water-resistant marker for labelling the bag or container with additional information, such as the date and location

III. Latex gloves or thick work gloves that can be washed

IV. Cooler with cold ice packs, if possible

V. SAR Notification/Contact Schedule

VI. SAR Encounter Reporting Form

7.2 Safety Considerations

Always wear gloves or wash your hands after handling any dead animal. Turtles (and many other animals) carry potentially harmful bacteria in their gut. Handling dead, rotting animals may also expose you to bacteria that can make you sick.

Handle a dead Massasauga with extreme caution

I. The snake’s venom is still a serious biohazard even after the snake is dead.

II. Never handle a dead Massasauga with your hands. Use a broom or sticks to place it into a container with a secure lid (not a bag).

III. Although unlikely, nerves can trigger the Massasauga’s bite reflex even after the snake is dead.

IV. In some situations, it can be very difficult to confirm that a snake is dead. For example, extreme shock can make a snake appear dead for several minutes until it slowly regains its senses. Unless you can confirm that the Massasauga is dead, always treat it as though it is alive and never place any part of your body within its potential strike range (approximately half of the snake’s body length).

Dead Animals

7.3 Handling a dead animal

a) Always make sure that an animal is actually dead before handling or capturing it. In some situations, live animals can easily be mistaken for being dead:

I. Extreme shock can make a reptile or amphibian motionless and appear dead for several minutes until it slowly regains its senses.

II. Air temperature controls the metabolism, and therefore the activity level, of reptiles and amphibians. If an over-wintering snake or turtle is encountered, it will only be 4 or 5°C and may be so inactive that it will appear dead. Very cold animals in the spring or fall may also be very inactive and appear dead until closely examined.

III. Eastern Hog-nosed Snakes sometimes play dead as a defensive strategy to deter predators. This display includes rolling onto their back with their mouth gaping open and tongue hanging out, regurgitating food or defecating and emitting a foul smell. It is very difficult to determine if this species is actually dead without manipulating the snake and carefully inspecting it. If you flip the snake onto its belly, it will often roll back over and continue to play dead.

7.4 Temporary storage of dead animals

a) Place the dead animal in a plastic resealable bag or container with a tight lid that will not leak. Always use a thick container with a secure lid for Massasauga rattlesnakes.

b) Do not place anything else in the container with the animal.

c) Label the container with “dead SAR for transport to MNR” as well as the date, location and name of the observer.

d) Place the bag or container in a freezer as soon as possible. If a freezer is not immediately available, place it in a cool place, preferably a cooler with ice packs.

e) If the animal cannot be delivered to MNR on the same day that it was found, place it in a freezer until it can be delivered to MNR.

8 Appendices

Appendix I - Definitions

Species at Risk (SAR) Notification/Contact Schedule:
A contact list provided by the Ministry of Natural Resources District Office to be used when immediate guidance is required concerning species at risk (SAR) encounters. This list will include Ministry of Natural Resources staff as well as local veterinarians and wildlife custodians.

Species at Risk (SAR) Encounter Reporting Form:
A reporting form provided by Ministry of Natural Resources that must be completed any time that a species at risk (SAR) is encountered.

Qualified Member:
An individual who has received training by, in consultation with, or in a manner approved by Ministry of Natural Resources to capture, handle, move and relocate species at risk (SAR).

Appendix II - References

Ontario Ministry of Natural Resources, Parry Sound and Sudbury District. *Draft Turtle and Snake Capture and Relocation Protocol For Hwy 69/400 ESA Authorization Requirements.*
Revised January 19, 2011.

Parks Canada. *The Eastern Massasauga Rattlesnake Stewardship Guide: A Resource and Field Guide for Living with Rattlesnakes in Ontario*, Parks Canada, pp 84.

Karch, Mandy. 2008. *Standard Turtle Handling Practices and Protocols*. Prepared for the Ontario Ministry of Natural Resources and the Ontario Multi-species Turtles At Risk Recovery Team. 2008.

Unless otherwise noted, all photographs are credited to Jason Mortlock.

Appendix III - Equipment and Materials Checklist

The following materials must be acquired and maintained on each job site, and are required for the handling, capture, temporary safe keeping and transport of species at risk:

All Species (including for dead animals)

- ❑ Thermometer
- ❑ Plastic resealable bag or plastic kitchen-style container with a tight lid with label “dead SAR for transport to MNR”
- ❑ Permanent, water-resistant marker for labelling bag or container with additional information, such as the date and location
- ❑ Latex gloves or thick work gloves that can be washed
- ❑ SAR Notification/Contact Schedule (from MNR District Office – see Appendix IV)
- ❑ SAR Encounter Reporting Form (See Appendix V)

Additional Materials for Turtles

- ❑ Large plastic bin or bucket and lid with air holes, with both sides of the container and lid marked “live animal”
- ❑ Cloth/burlap bag with both sides marked “live animal”
- ❑ Broom or broom handle with small paint brush roller attached to end

Additional Materials for Snakes

- ❑ Pail, large garbage can or bucket with air holes in the lid, with side of the container and lid marked “live animal”
- ❑ A cloth snake bag (e.g., pillowcase) for non-venomous species only, marked “live animal”

For Massasaugas:

- ❑ Pail, large garbage can or bucket (1 metre deep) with air holes in the lid, with side of the container and lid marked “caution rattlesnake”
- ❑ Broom or broom handle with small paint brush roller holder attached to end

Additional Protective Gear to be Worn When Working in or near Massasauga Habitat

- ❑ High-ankle hiking or rubber boots
- ❑ Thick pants (jeans) or baggy pants
- ❑ Leather work gloves

Additional Material for Skinks

- ❑ Plastic kitchen-style container and lid with air holes, marked “live animal”

Additional Materials for Amphibians (Salamanders, Newts, Mudpuppies, Frogs, Toads)

- ❑ Pail, bucket or large plastic bin with a lid that has air holes (for frogs), both side of container and lid marked “live animal”
- ❑ Plastic kitchen-style container and lid with air holes, marked “live animal”
- ❑ Paper towels (to be moistened and put in plastic kitchen-style container)
- ❑ Net (optional)

Additional Materials for Birds

- ❑ Sturdy cardboard box or large plastic bin and lid with air holes, with both sides of box/container and lid marked “live animal”
- ❑ Sheet or blanket large enough to cover a large bird
- ❑ Safety glasses
- ❑ Digital camera (optional)

Appendix IV - SAR Notification/Contact Schedule

Appendix V - SAR Encounter Reporting Form