Natural Heritage Existing Conditions Report

Six Properties within the Tullamore Secondary Plan Area

Town of Caledon

Prepared for:
Riepma Consultants, Inc.

Prepared by:
Azimuth Environmental
Consulting, Inc.

March 2024

AEC 22-265

AZIMUTH ENVIRONMENTAL CONSULTING, INC.
Environmental Assessments & Approvals

March 20, 2024 AEC 22-065

Riepma Consultants Inc.
Clarance Riepma
220 Kempenfelt Dr.
Barrie ON L4M 1C4

Re: **Natural Heritage Existing Conditions Report**
Six Properties within the Tullamore Secondary Plan Area, Town of Caledon

Dear Mr. Riepma:
Azimuth Environmental Consulting, Inc. was retained to provide an Existing Natural Heritage Conditions report for six (6) properties located within the Tullamore Secondary Plan Area including:

- 12151 Airport Road;
- 6186 Mayfield Road;
- 6230 Mayfield Road;
- 6206 Mayfield Road;
- 12117 Airport Road; and
- 6086 Mayfield Road.

The purpose of this report is to provide the Toronto and Region Conservation Authority and other review agencies with an understanding of natural environmental conditions of the site. This report also documents the natural environmental features present within the properties and adjacent lands with regard to Species at Risk and their habitats.

Should you have any questions or require additional information please do not hesitate to contact the undersigned.

Yours truly,
AZIMUTH ENVIRONMENTAL CONSULTING, INC.

Lisa Moran, B.Sc.Env.
Terrestrial Ecologist

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1.0 INTRODUCTION

Azimuth Environmental Consulting, Inc. (Azimuth) was retained by five (5) landowner groups, c/o Riepma Consultants Inc. to undertake a Natural Heritage Existing Conditions report for six (6) properties located within the Tullamore Secondary Plan Area, Town of Caledon (Town), Region of Peel (Region). Properties included in this study include:

- 12151 Airport Road;
- 6186 Mayfield Road;
- 6230 Mayfield Road;
- 6206 Mayfield Road;
- 12117 Airport Road; and
- 6086 Mayfield Road.

A map illustrating the limits of the properties in their regional context is shown on Figure 1.

This purpose of this report is to identify the candidate Key Natural Heritage Features (KNHFs) present within the study area and identify potential constraints to development. A review of background information in combination with a detailed field program was undertaken in 2022 to identify significant natural heritage features and functions. This report also examines potential for Species at Risk (SAR) protected under the *Endangered Species Act,* 2007 (ESA) within the study area.

For the purposes of this Natural Heritage Existing Conditions and Constraints Analysis the study area comprises the six (6) properties as shown on Figures 1-2 and adjacent lands (within approximately 120 metres (m) of the properties). Natural features in the overall planning area beyond the defined study area limits are discussed where applicable throughout this report.

Once a development concept for the properties is available, this report will be updated to include an impact assessment of the identified KNHFs and functions in order to provide a comprehensive Environmental Impact Study (EIS).

2.0 PLANNING CONTEXT

2.1 Provincial Planning Policy (2020)

The Provincial Policy Statement (PPS) (MMAH, 2020a) outlines policies related to natural heritage features (Section 2.1) and water resources (Section 2.2). Ontario's *Planning Act*, (1990) requires that planning decisions shall be consistent with the PPS.

The study area for this assessment is located entirely within **Ecoregion 6E**. According to the PPS development and site alteration shall not be permitted in:

- *Significant wetlands* in Ecoregions 5E, 6E and 7E; and,
- *Significant coastal wetlands*.

Similarly, Section 2.1.5 of the PPS states that, unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions, development and site alteration shall not be permitted within:

a) *significant wetlands* in the Canadian Shield north of Ecoregions 5E, 6E; and 7E;
b) *significant woodlands* in Ecoregions 6E; and 7E;
c) *significant valleylands* in Ecoregions 6E; and 7E;
d) *significant wildlife habitat*;
e) *significant areas of natural and scientific interest*; and,
f) *coastal wetlands* in Ecoregions 5E, 6E; and 7E that are not subject to policy 2.1.4(b).

It is ultimately the responsibility of the Province and/or the Municipality to designate areas identified within Section 2.1.4 and 2.1.5 of the PPS as "significant".

Section 2.1.6 of the PPS states that development and site alteration is not permitted in fish habitat except in accordance with federal and provincial requirements.

Section 2.1.7 of the PPS states that development and site alteration shall not be permitted in the habitat of Threatened and Endangered species, except in accordance with provincial and federal requirements.

Furthermore, under Section 2.1.8 of the PPS, no development or site alteration will be permitted on lands adjacent to natural heritage features and areas identified in policies 2.1.4, 2.1.5 and 2.1.6 unless the ecological function of the adjacent lands has been evaluated and it has been demonstrated there will be no negative impacts on the natural features and their ecological functions.

2.2 Growth Plan for the Greater Golden Horseshoe

The property is within the Tullamore Secondary Plan Area (*i.e.* Settlement with Undelineated; Appendix A) by the Grown Plan for the Greater Golden Horseshoe ("Growth Plan"; MMAH, 2020b). The Natural Heritage System for the Growth Plan excludes lands within settlement area boundaries that were approved and in effect as of July 1, 2017. Nonetheless, within settlement areas, the municipality:

a) will continue to protect any other natural heritage features and areas in a manner that is consistent with the PPS; and
b) may continue to protect any other natural heritage system or identify new systems in a manner consistent with the PPS.

2.3 Endangered Species Act, 2007

Ontario's ESA provides regulatory protection to Endangered and Threatened species prohibiting harassment, harm and/or killing of individuals and destruction of their habitats. Habitat is broadly characterized within the ESA as the area prescribed by a regulation as the habitat of the species or an area on which the species depends, directly or indirectly, to carry out its life processes including reproduction, rearing of young, hibernation, migration or feeding.

The various schedules of the ESA included under O. Reg. 230/08 identify SAR in Ontario. These include species listed as Extirpated, Endangered, Threatened and Special Concern. As noted above, only species listed as Endangered and Threatened receive protection from harm and destruction to habitat on which they depend.

2.4 Region of Peel

According to the Region's Official Plan, the properties are part of the Rural System (See Schedule D: Regional Structure), Prime Agricultural Area (See Schedule B: Prime Agricultural Area) and do not contain any Core Areas of the Region's Greenland System (Appendix A).

2.5 Town of Caledon

The properties are within the Tullamore Secondary Plan Area as per the Town's Schedule A: Land Use Plan (Appendix A). According to Schedule N: Tullamore Land Use Area, the lands are designated Prestige Industrial, General Industrial, Highway Commercial and Environmental Policy Area. The Environmental Policy Area appears to align with a watercourse (tributary of Salt Creek) that traverses, in part, through the properties. Salt Creek traverses through adjacent lands to the east (Appendix A).

2.6 Toronto and Region Conservation Authority

The study area is located within the jurisdiction of the Toronto and Region Conservation Authority (TRCA). The study area includes lands subject to O. Reg. 166/06 – "Regulation of Development Interference with Wetlands and Alterations to Shorelines and Watercourses" by the TRCA (Appendix B). Under Regulation 166/06, the TRCA requires that approvals be obtained for any proposed development or site alteration within areas regulated under a Conservation Authority's jurisdiction.

Properties at 6186 and 6230 Mayfield Road currently have violations under Section 28 of the Conservation Authorities Act due to unauthorized alteration of a watercourse. The applicant has been advised that the outstanding violation should be addressed prior to the TRCA issuing any new planning or permitting approvals for the site.

An on-site meeting was held on October 26, 2021 with TRCA and Town staff. Subsequent to the meeting an e-mail was issued (Nick Cascone, TRCA, October 29, 2021) outlining the potential actions that would be required to address the outstanding violation (Appendix B).

2.7 Federal *Fisheries Act*

The *Fisheries Act* includes protections for fish and fish habitat in the form of standards, codes of practice, and guidelines for projects near water. The *Fisheries Act* provides protection against the "death of fish, other than by fishing", (Section 34.4(1)) and the "harmful alteration, disruption or destruction of fish habitat", (Section 35(1)), otherwise known as HADD. In cases where impacts to fish and fish habitat cannot be avoided, and the project does not fall within waterbodies where Fisheries and Oceans Canada (DFO) review is not required, proponents are asked to submit a request for review to their Fish and Fish Habitat Protection Program regional office to determine approval requirements. All projects are encouraged to avoid causing the death of fish and a HADD of fish habitat, using measures to protect fish and fish habitat that include standards and codes of practice for common works, undertakings and activities

3.0 STUDY APPROACH

A combination of a background information and field data were used to fulfill the objectives of this EIS. Azimuth undertook the following activities for this study:

- Conducted field surveys to document existing natural heritage features, functions, and species. Surveys included:
    - Evaluate/map vegetation communities based on Ecological Land Classification methods (June 17, 2022);
    - One (1) vascular plant inventory within the Study Area (June 17, 2022);
    - Headwater Drainage Feature/Fish Assessment of aquatic features in the study area (March 22, April 29 and August 11, 2022);
    - Two (2) evening frog call surveys to confirm presence or absence of amphibian habitat within the Study Area (April 25 and May 25, 2022);
    - Two (2) dawn breeding bird surveys (June 8 and June 17 2022);
    - Two (2) evening acoustic and visual exit survey for SAR bats at the existing residential home at 6186 Mayfield Road (June 13 and July 7, 2022);
    - Record incidental wildlife observations during site visits;

- Completed a SAR habitat assessment using field data collected by Azimuth and other data available and/or provided by agencies to confirm environmental constraints, and approval requirements under the ESA; and,
- Assessed the potential direct and indirect impacts of the proposed development on the natural heritage features and functions identified on or adjacent to the development parcel.

The above were provided to the TRCA as a Terms of Reference for the field program and impact assessment on April 7, 2022. A response was received on April 26, 2022 (Nick Cascone, Planner) confirming that the scope of the program undertaken was acceptable as provided (Appendix B). Azimuth deviated from the TRCA approved Terms of Reference due to lack of potentially suitable habitat for breeding amphibians and grassland birds. For these reasons, only two (2) evening amphibian and two (2) dawn breeding bird surveys were undertaken.

3.1 Background Data

A review of background documents provided information on site characteristics, habitat, wildlife, rare species and communities, and general cultural/historic aspects of the study area. This included a review of the following:

- MNRF's Natural Heritage Information Center (NHIC; MNRF, 2022);
    - Make-A-Map: Natural Heritage Areas application
- Atlas of the Breeding Birds of Ontario (OBBA; Cadman *et al*., 2007);
- Ontario Reptile and Amphibian Atlas (2020);
- MECP's Species at Risk Ontario list (2022);
- Air photos available for the Project Area (Google, VuMap); and,
- Atlas of the Mammals of Ontario (Dobbyn, 1994).

3.2 Vegetation Community Mapping and Surveys

Prior to undertaking the field studies, an initial classification of vegetation communities was undertaken using recent air photo imagery for an area encompassing the study area. Vegetation community boundaries were then checked in the field on June 17, 2022 during the growing season when the emergent ground cover vegetation layer was present. Vegetation community types were classified using ELC protocols.

The site visit was undertaken by a qualified ecologist with existing knowledge related to rare, Threatened and Endangered plant species with potential to occur in the area. The site assessment was focused during ELC work to ensure that appropriate effort was made to detect any federally or provincially designated species, notably SAR as identified under the ESA.

A detailed survey including a screening for Butternut (*Juglans cinerea*; Endangered) and Black Ash (*Fraxinus nigra*; Endangered) was also conducted within the study area.

3.3 Wildlife Surveys

Wildlife species utilizing the study area were identified from direct observation, auditory signs, and through interpretation of other signs (tracks, scats, vocalizations, *etc.*) as a matter of course while conducting field surveys.

3.3.1 Species at Risk

The SAR screening undertaken for the scope of this assignment includes an assessment of SAR with potential to occur in the overall planning area, compared with potential habitat features identified within the study area. Habitat requirements and appropriate designations (Endangered, Threatened, or Special Concern) are outlined in Table 1.

3.3.2 Breeding Birds

The study area does not offer potentially suitable habitat for grassland birds, particularly SAR grassland birds as confirmed during Azimuth's 2022 field investigations. Therefore, only two (2) dawn breeding bird surveys were completed which deviates from the TRCA approved Terms of Reference. Two dawn breeding bird surveys were conducted within the study area on June 8 and June 17, 2022 guided by point count methodology presented in Appendix D of the OBBA Guide for Participants (2001). All surveys were conducted no earlier than one half hour before sunrise and were completed prior to 10:00a.m. Surveys were completed under suitable weather conditions (*i.e.* no precipitation and light winds (Beaufort wind scale ≤3)), with an observation period of 10 minutes carried out at the point count station shown on Figure 2.

3.3.3 Amphibian Breeding

Azimuth conducted two evening calling amphibian surveys on April 25 and May 25, 2022 to assess amphibian breeding within and adjacent to the development parcel in accordance with the Great Lakes Marsh Monitoring Program (Bird Studies Canada, 2008) protocol. In accordance with the protocol, amphibian surveys were completed during the period between 30 minutes after sunset and midnight, on evenings with winds Beaufort <4. Surveys occurred during early (April 15-30) and middle (May 15-31) spring periods on evenings with minimum temperatures of 5°C and 10°C respectively. A third evening amphibian survey was deemed not to be required due to the lack of suitable habitat (i.e. standing water) that persists into the season. The locations of survey stations are illustrated on Figure 2.

3.3.4 Bats and Bat Habitat

Several bat species including (but not limited to) Little Brown Myotis may utilize anthropogenic structures (such as old residential structures with attic space) as roosting habitat for the purposes of maternity colony roosting and day roosting during the late spring and summer seasons.

Two bat exit surveys were completed due to the presence of potentially suitable roosting habitat in the existing residential structures located at 6186 and 6206 Mayfield Road In accordance with the MNRF Technical Note for Species at Risk Bats (MNRF, 2015a) on June 13 and July 7, 2022 to determine if maternity colonies of SAR bats were present within the structures.

During the June 13th survey, two (2) Azimuth ecologists were positioned on opposite corners so that each side of each house was observable, allowing for the effective screening of possible exit gaps in the siding and roofline. Two (2) stationary ultrasonic acoustic bat recorders (Song Meter SM3BAT Bioacoustics Recorder with SMM_U1 microphone, by Wildlife Acoustics, Inc.) were deployed around the structures, one (1) on the north east corner of 6206 Mayfield Rd, and one centralized between the two houses, facing 6186 Mayfield Rd. At least one (1) ultrasonic phone microphone attachment (Echo Meter Touch 2 Pro, by Wildlife Acoustics, Inc.) was used during each survey to aid in detecting bat activity. These surveys were conducted for a minimum length of one hour, from one half hour before sunset to one half hour after sunset, (8:32 PM – 9:32 PM, sunset at 9:02 PM on June 13th, 2022; 8:33PM-9:33PM, sunset at 9:03PM on July 7th, 2022). The surveys were completed during suitable weather conditions on warm/mild evenings (Temperature above 10 °C) with low winds and no precipitation.

3.4 Fish and Fish Habitat

Fish habitat assessments were completed in the spring and summer of 2022. Qualitative data were gathered through a visual assessment of all drainage features on site. The objective of the assessments was to assess the aquatic habitat features on site and assess the potential for fish habitat within the drainage features. Specifically, flow permanence, spawning and nursery habitat, unique forms of fish habitat, and the overall integrity/availability of the habitat on the property were investigated. In addition to the completed fish habitat assessments, a Headwater Drainage Feature (HDF) Assessment (Azimuth, 2022) was completed for the property following the *Evaluation, Classification and Management of Headwater Drainage Features Guidelines (*TRCA and CVC*,* 2014*).* The HDF Assessment was completed to identify the function and value of drainage features within the larger context of the watershed. The full HDF Assessment is provided as an appendix to this report (Appendix C).

4.0 EXISTING CONDITIONS

4.1 Land Use

Previous earthworks has resulted in a large portion of these lands are being utilized for industrial usage (*i.e.* trucking operations). Two residential homes are located at 6186 and 6206 Mayfield Road. The remainder of the lands is highly disturbed meadow communities that were formerly agricultural and/or treed lands. Several drainage features/watercourses have been identified as traversing through the study area.

Adjacent lands to the east and west are currently agricultural, although designated Prestige Industrial, General Industrial and Highway Commercial as per the Tullamore Land Use Area (Schedule N, Appendix A). Lands to the north are currently being used for industrial purposes and to the south (south of Mayfield) are residential and disturbed/fallow lands.

4.2 Terrestrial Resources

4.2.1 Vegetation

The limits of all ELC communities identified within the study area are illustrated in Figure 2. A complete list of vascular plant species identified within the development parcel limits is presented in Table 2, and summary descriptions of vegetation communities within the development parcel are presented in Table 3.

A total of 116 vascular plant species were identified within the development parcel limits, 44 of which (38%) are considered native to Ontario. This relatively low proportion of native species is reflective of anthropogenic influenced communities within the study area (Figure 2).

None of the vegetation communities or species documented are of federal or provincial conservation concern (MNRF, 2022).

4.2.1.1 Rare and Uncommon Plants

There are no elements of occurrence (EO_ID) within the study area for provincially Endangered or Threatened, or provincially rare vegetation species according to the NHIC database (MNRF, 2022).

No plant species considered Endangered or Threatened were identified during the site investigation, including Butternut or Black Ash trees. Further, no provincially rare (S1-S3) species were observed during the field program.

Two TRCA rare (L3 – Regional Species of Conservation Concern) were documented within the study area including Pointed Broom Sedge (*Carex spicata*) and White Spruce (*Picea glauca*).

4.2.2 Wildlife

4.2.2.1 Mammals

There was no evidence of any mammalian species observed throughout the course of the field program. It is expected that the following mammals could conceivably be encountered within the study area: small mammal species (various mice, voles, and shrews), Coyote, Eastern Gray Squirrel, Eastern Cottontail, Groundhog, Striped Skunk, Raccoon, Red Fox and White-tailed Deer.

4.2.2.2 Amphibians (Herpetofauna)

One amphibian species was identified during the evening calling amphibian surveys Leopard Frog (2 individuals). Detailed results of the amphibian breeding survey program are presented in Table 4.

4.2.2.3 Birds

Twenty-seven (27) bird species were recorded during dawn breeding bird surveys, the majority of which are typical of urban/semi-urban landscapes open scrub habitats (Table 5). One (1) additional bird was identified incidentally during the remainder of the field program, also documented on Table 5. Barn Swallow (Special Concern) was observed during the 1st breeding bird survey.

4.3 Species at Risk

The SAR assessment (Table 1) fully considers SAR with potential to occur in the planning area. Based on this assessment in combination with vegetation communities and other environmental features observed during the site investigation, the following species are considered below in this report:

- **Threatened or Endangered**: Little Brown Myotis, Northern Myotis, Redside Dace and Tri-colored Bat

Only species designated Threatened or Endangered receive individual and habitat protection under Section 9 and Section 10 of the ESA. Special Concern species are further discussed in the context of Significant Wildlife Habitat (Habitat for Special Concern and Rare Wildlife Species) below.

4.3.1 Little Brown Myotis, Northern Myotis, Tri-colored Bat

Several bat species including (but not limited to) Little Brown Myotis and Tri-colored Bat may utilize anthropogenic structures (such as old residential structures with attic space) as roosting habitat for the purposes of maternity colony roosting and day roosting during the late spring and summer seasons.

Two bat exit surveys were completed due to the presence of potentially suitable roosting habitat in the existing residential structures located at 6186 and 6206 Mayfield Road. The existing houses located at this location were two storeys tall with probable attic space and slightly aged siding, with a few potential access points in the siding and roof line which could be used by bats. The structures were occupied with tenants. Azimuth determined exit surveys should be conducted on these structures to determine the likelihood of use by roosting bats.

In accordance with provincial protocols for screening anthropogenic structures (MNRF, 2015a), the bat exit surveys were conducted on two evenings, one on June 13th, 2022, and one on July 7th, 2022, which focused on the structures mentioned above. The focus of the surveys was to determine if maternity colonies of SAR bats were likely to be present within the structures.

No SAR bats were detected by the ecologists to be exiting structures, or the wildlife acoustic recorders during either survey therefore SAR bats will not be considered within the Impact Assessment when the full EIS is prepared. Mitigation recommendations related to the timing of vegetation removals have been made in order to avoid potential incidental contravention of Ontario's ESA.

4.3.2 Redside Dace

Redside Dace (Endangered) are typically found in slow moving lotic environments (creeks <10m in width and headwater systems) with overhanging vegetation, cool water temperatures, coarse substrate, and high water clarity (MNRF, 2016). Riffles and deep pools are both used by this species. Redside Dace are listed as Endangered under the ESA (under which it receives individual and habitat protection) and the federal Species at Risk Act (SARA)(under which is receives individual protection).

DFO aquatic SAR mapping indicates the watercourse (Salt Creek – a tributary of the Little Rouge River) to the east of the property hosts Redside Dace (DFO, 2022). In addition, correspondence from MNRF confirmed that Salt Creek downstream of the study area is designated as regulated Redside Dace Habitat, and that the watercourse on site is located upstream of the regulated Redside Dace habitat and may be considered a

contributing feature (Appendix D). While no additional information was available from MNRF on Salt Creek, according to the Humber River State of the Watershed Report – Aquatic System (TRCA, 2008), the West Humber River downstream of the property was found to have Redside Dace during sampling in 2004. Overall, the West Humber River is known to support a small, confined population of Redside Dace (TRCA, 2008).

4.4 Wetlands

Wetlands within the study area are not identified as provincially or locally Significant Wetland, or similar designation on municipal or provincial mapping resources (Appendix D).

Two wetland communities approximately 0.17ha and 0.12ha in size have been identified within the study area and are associated with the riparian areas of the watercourse (Figure 2).

Additional wetland inclusions (*i.e.* distinct ELC communities too small to be mapped) occur within the study area. In Azimuth's experience, anthropogenic wetlands formed as an unintentional result of earthworks function provide low habitat complexity and species diversity, limited functionality as wildlife habitat, and are not associated with any degree of significance or environmental protection. For these reasons, the wetland inclusions associated with the MEMM3 (MASM1-1a through MASM1-1f; Figure 2) will not be considered candidates for significance for the purposes of this assessment.

4.5 Candidate Significant Woodland

There are no woodlands within the study area (Figure 2). Although categorized under the "forest" community series per ELC methodology, the unit is linear (approximately 1-2 trees wide), and does not qualify as a "woodland" according to provincial standards.

4.6 Candidate Significant Valleyland

No portion of the study area is identified as Significant Valleyland, nor assigned a similar designation on municipal or provincial mapping resources.

There are no valleyland features located within the study area according standards presented in the Natural Heritage Reference Manual (NHRM; OMNR, 2010), principally due to the lack of permanent or intermittent watercourses that constitute a defining component of a valleyland feature. No portion of the study area fulfills the well-defined valley morphology and landform prominence required to be considered Candidate Significant Valleyland.

4.7 Candidate Significant Wildlife Habitat

An assessment of the potential for Significant Wildlife Habitat (SWH) within study area was conducted, using the criteria outlined within the Significant Wildlife Habitat Technical Guide (OMNR, 2000) and the accompanying the Ecoregion 6E Criteria Schedules (MNRF, 2015b). An assessment of Candidate Significant Wildlife Habitat categories relative to documented vegetation communities and habitats within the development parcel is presented in Table 6. There are no Candidate SWH types determined or have potential to be present within the study area based on the results of the field program.

4.8 Areas of Natural and Scientific Interest

There are no Areas of Natural and Scientific Interest located within the study area according to Township, County (Appendix D), or Provincial mapping resources.

4.9 Fish and Fish Habitat

Azimuth completed fish habitat assessments in conjunction with the HDF assessments on March 22, 2022 (early spring visit), April 29, 2022 (mid/late spring visit), and August 11, 2022 (mid/late summer visit). The drainage features identified within the Study Area are considered to be headwater features within the Salt Creek watershed, which is a part of the larger West Humber River system. A total of three drainage features (*i.e.*, H1, H2, and H3) were identified on the property, each with varying segments as outlined in the HDF assessment completed by Azimuth in 2022 (Appendix C). A summary of the three drainage features is provided below, and each drainage feature is shown on Figure 2:

H1 Drainage Feature

The H1 drainage feature is the largest feature on the property, and originates at the northern extent of the property near an existing stormwater management (SWM) pond. The SWM pond was outside of the Study Area and could not be assessed, but the feature appears to drain onto the property from the north, and enters a grassed swale/thicket area. No defined feature or substrate sorting was observed in this area, which indicates the feature in this location is likely ephemeral. Further south, the feature enters a straightened channel with altered riparian lands on each side (concrete blocks and soil fill). The channel is restricted through a narrow (~8m) cattail swale with no natural banks or defined channel bottom. Two Corrugated Steel Pipe (CSP) culverts convey flow underneath an access road that connects the parking lots on either side of the channel. The CSP culverts are perched approximately 10 centimetres (cm) at their outlets. As the H1 channel approaches the eastern edge of the property, the channel enters a hedgerow and flows south. The channel continues south where it crosses Mayfield Road via a CSP and continues downstream into a drainage ditch in a residential subdivision. During the

late spring and summer site visits, the H1 drainage feature was predominantly dry, with sections holding shallow water. The Mayfield Road CSP was embedded and had water depths greater than 10cm, which could act as a refuge for fish during low flow conditions. A majority of the H1 channel had no defined banks or channel form, or had poorly defined/non-continuous banks. Dense cattails were present throughout the feature in sections, and portions of the hedgerow segment were overgrown with terrestrial grasses, which indicate ephemeral or intermittent flows. The width of the feature was less than 0.5m along portions of the hedgerow. Other than the Mayfield Road CSP, all other segments of H1 are considered indirect fish habitat, and function as either intermittent or ephemeral features. The Mayfield Road CSP likely functions as poor seasonal fish habitat for tolerant baitfish.

H2 Drainage Feature

The H2 drainage feature is a small feature on the property that originates to the east of a parking lot on the property. H2 drains east for approximately 100m though a sparse meadow field before turning south and flowing into the H1 drainage feature 50m further downstream. Overall, H2 is approximately 150m long, and predominantly collects drainage from the parking lot to the east. The feature is poorly defined with no prominent banks/channel bottom and no substrate sorting. Sparse cattails are present along the drainage path swale. The feature has been impacted from changes further upstream (*i.e.*, the parking lot construction) which has altered the flow regime and increased sediment transport into the feature. H2 was completely dry during the summer field visit and would be considered an ephemeral feature that functions as poor indirect fish habitat. Limited value to downstream fish habitat is likely provided from H2, as a majority of the runoff received from upland areas comes from the parking lot area and exposed soils from fill added to the riparian lands.

H3 Drainage Feature

Similar to the H2 drainage feature, H3 is a small drainage feature on the property that originates to the east of a parking lot. H3 consists of two short (50m) channel features that flow southeast before connecting and flowing underneath Mayfield Road via a CSP culvert. H3 collects drainage from the parking lot to the east. The south branch was incised 0.3m with exposed soil banks, and the north branch was poorly defined and flows overtop grassed lands with no defined channel banks. Both features had water present during all three field assessments, but were shallow (less than 5cm) with no refuge pools. At the Mayfield Road crossing, the channel enters a roadside ditch on the south side which was covered in dense cattails. The H3 drainage features are considered indirect fish habitat based on their small size, shallow water depth, and altered nature from the upland development. Similar to the H2 feature, H3 has been impacted from changes

upstream (*i.e.*, the parking lot construction) which has altered the flow regime and overall form and function of the drainage feature.

Overall, no evidence of direct fish habitat was observed throughout the assessed property and associated drainage features. Based on available online MNRF Aquatic Resources Area (ARA) data (MNRF, 2019), the unnamed watercourse downstream of the property and Salt Creek both have warmwater thermal classifications. The Mayfield Road culvert at the downstream (south) end of the assessed property (south of H1) may function as seasonal direct warmwater fish habitat, as the culvert may serve as a refuge pool for small bodied fish, but no direct fish habitat functions were noted on the property. All of the features were dry or had shallow (<5cm) standing water present during the late spring and summer field visits. No refuge pools were noted in any of the assessed features that could host fish year round, and no fish were observed during any of the site visits. Therefore, the drainage features were characterized as indirect warmwater fish habitat.

Approximately 1.4 kilometres (km) downstream (southeast) of the property, the drainage features enter Salt Creek, which is confirmed regulated Redside Dace habitat. As per the Guidance for Development Activities in Redside Dace Protected Habitat (MNRF, 2016) and the ESA, indirect fish habitat can still be considered "habitat" for Redside Dace ESA if it meets the following criteria:

> v. *a stream, permanent or intermittent headwater drainage feature, groundwater discharge area or wetland that augments or maintains the baseflow, coarse sediment supply or surface water quality of a part of a stream or other watercourse described in subparagraph i or ii, provided the part of the stream or watercourse has an average bankfull width of 7.5 metres or less.*

Subsections i and ii referenced above are as follows:

> i. *any part of a stream or other watercourse that is being used by a redside dace*
> ii. *any part of a stream or other watercourse that was used by a redside dace at any time during the previous 20 years and that provides suitable conditions for a redside dace to carry out its life processes,*

The drainage features on the assessed property would be expected to contribute base flow and sediment to Salt Creek downstream, and would therefore be considered contributing Redside Dace habitat.

5.0 NATURAL HERITAGE FEATURES AND FUNCTIONS

The results of Azimuth's field studies combined with review of background information indicate the potential for the following candidate KNHFs within the study area:

- Habitat for Threatened or Endangered Species:
    - Redside Dace (contributing habitat)
- Other Wetlands; and,
- Watercourses and Fish Habitat.

6.0 PROPOSED DEVELOPMENT

Currently, there is no development concept available for the site. It is our understanding that the future development concept for the properties will include the development of an industrial use subdivision with an internal road network. Options are being explored to re-locate and consolidate the watercourse (s) into a single Environmental Protection corridor. A complete EIS will be prepared once a development concept is available.

7.0 NATURAL HERITAGE CONSIDERATIONS

When developing the concept plan for these properties, the following natural heritage items will require consideration.

7.1 Habitat for Threatened or Endangered Species

Impacts with regards to the ESA and Habitat of Threatened or Endangered species are covered under Section 9 and 10 of the ESA. Section 9 deals directly with killing, harming, or harassing living members of a species while Section 10 covers destruction or damage to habitat of Threatened or Endangered species. The following Threatened or Endangered species are confirmed to occur within the limits of the study area:

- Redside Dace (contributing habitat)

7.1.1 Redside Dace

As described above, the drainage features on the assessed property would be expected to contribute base flow and sediment to Salt Creek downstream, and would therefore be considered contributing Redside Dace habitat under the ESA. Any proposed alterations to the drainage features on site should maintain and/or improve the quantity and quality of water flowing off site to mitigate potential impacts to receiving Redside Dace regulated habitat downstream.

7.2 Other Wetlands

As identified on Figure 2, wetland has been identified as riparian areas along the watercourses and as small inclusions within the MEMM3 vegetation unit (Figure 2). Consideration should be given to the creation of wetland conditions within the Environmental Protection corridor that may be proposed as part of this development (*i.e.* along the protected portions of the watercourse). TRCA's Guideline for Determining Ecosystem Compensation (2018) can be used as a guideline in concert with consultation with TRCA to determine how much compensation is required.

7.3 Watercourses and Fish Habitat

All drainage features on the property are considered indirect fish habitat, but are directly connected to fish bearing watercourses downstream. Therefore, they are afforded protection under the Federal *Fisheries Act* and have applicable in-water timing windows. Given the warmwater thermal classification for watercourses downstream of the property, a warmwater in-water timing window should be appropriate for any in-water works within the drainage features (*i.e.*, no in-water work is permitted from March 15-July 15 of any given year).

8.0 PRELIMINARY RECOMMENDATIONS

8.1 Species at Risk

It should be noted that the absence of a protected species within the study area does not indicate that they will never occur within the area. Given the dynamic character of the natural environment, there is a constant variation in habitat use. Care should be taken in the interpretation of presence of species of concern including those listed under the ESA. Changes to policy, or the natural environment, could result in shifts, removal, or addition of new areas to the list of areas currently considered candidate KNHFs. This report is intended as a point in time assessment of the potential to impact SAR; not to provide long term "clearance" for SAR. While there is no expectation that the assessment should change significantly, it is the responsibility of the proponent to ensure that they are not in contravention of the ESA at the time that site works are undertaken.

8.1.1 Redside Dace

Altering or removing the drainage features on site would require works within contributing Redside Dace habitat, which is protected under the ESA. At this time, it is anticipated that an Overall Benefit Permit would be required to complete these works as per Clause 17(2)(c) of the ESA. An Overall Benefit Permit is for projects where the main purpose is not protection or recovery of the species. ESA permit requirements would need to be confirmed once design plans have advanced in subsequent detail design stages.

8.2 Environmental Protection Corridor

A planting plan composed of a variety of native species should be prepared for the Environmental Protection corridor with consideration for including TRCA rare species, Pointed Broom Sedge and White Spruce. Riparian plantings in the Environmental Protection corridor along the drainage feature should be selected to provide shade and bank stability within the channel to help regulate water temperatures and limits scouring/erosion during periods of elevated flow. Should in-water works be proposed that require alterations to the existing drainage features, natural channel design principles should be used in the design of the channel alterations (*i.e.,* use natural cobble substrate, create a riffle/run/pool morphology, etc.).

8.3 Stormwater Management Ponds

It is our understanding that Stormwater Management Ponds (SMWPs) may be constructed at the south end of the Study Area along Mayfield Road. SWMPs typically generate warmwater discharge due to the large surface area exposed to the sun and stagnant water. Design considerations for these SWMPs to limit their impact on receiving watercourses are listed below:

- Incorporation of a bottom-draw outlet would allow for cooler water to be discharged from the bottom of the pond.
- Lengthen the outlet channel where possible and plant shade trees/shrubs along the outlet channel to promote cooling of the water before it enters the main channel.
- Plant riparian trees around the pond where possible to promote shading of the pond surface.
- Install a flow diffuser or energy dissipation device at the pond outlet location to reduce scouring and sedimentation downstream.

8.4 Migratory Breeding Birds and Bats

Activities involving the removal of vegetation should be restricted from occurring during the breeding season. Migratory birds, nests, and eggs are protected by the *Migratory Birds Convention Act*, 1994 (MBCA) and the *Fish and Wildlife Conservation Act,* 1997 (FWCA). Environment Canada outlines dates when activities in any region have potential to impact nests at the Environment Canada Website (http://www.ec.gc.ca/paom-itmb/default.asp?lang=En&n=4F39A78F-1#_03). In Zones C1 and C2 vegetation clearing should be avoided between **April 1 through August 31** of any given year. If work requires that vegetation clearing is required between these dates screening by an ecologist with knowledge of bird species present in the area could be undertaken to ensure that the vegetation has been confirmed to be free of nests prior to clearing.

Activities involving individual tree removal, particularly any trees >25cm Diameter Breast Height, should be avoided between **April 1 through September 30** of any given year, during the active period for bat species that may utilities trees for maternity and day roosting purposes. It is anticipated that adherence to this timing restriction will avoid impacts to individual SAR bats, therefore remaining in compliance with Section 9 of the ESA affording individual protection to Endangered species.

8.5 Sediment and Erosion Controls

Diligent application of Erosion & Sediment Controls (ESCs) is recommended for all future construction activities to minimize the extent of accidental or unavoidable impacts to adjacent vegetation communities and wildlife habitat. Prior to the commencement of site works, silt fencing should be applied along the length of directly adjacent natural or naturalized features, and routine inspection/maintenance of the silt fencing should occur throughout construction. It is recommended that erosion and sediment controls be maintained until vegetation is re-established post-construction.

8.6 Operations

All material storage and maintenance activities required during future construction should be conducted at least 30m away from identified natural heritage features to prevent accidental spillage of deleterious substances that may harm natural environments.

Snow fencing or equivalent should be installed at the limit of the work area to prevent the accidental intrusion of machinery operations into adjacent undisturbed natural areas.

8.7 Fish and Fish Habitat

The following recommendations are intended to protect both indirect fish habitat in the Study Area and direct fish habitat downstream:

- All in-water work should be completed during the applicable in-water timing window for warmwater systems (*i.e.*, no in-water work is permitted from March 15-July 15 of any given year.
- Diligent application and maintenance of ESC measures should be completed as per Section 8.5 above. A site-wide ESC Plan should be developed for construction activities during development.
- If dewatering is required, outlet hoses should be directed to a filter bag placed on well vegetated soils a minimum of 30m from any watercourse or drainage feature.
- The extent of site disturbance and the duration of in-water work should be minimized to the extent possible to mitigate impacts to fish habitat;

- All machinery maintenance/refueling is to be completed a minimum distance of 30m from the drainage features to prevent accidental spillage of deleterious substances.
- The contractor shall have a fully stocked spill kit on site at all times, and is required to have a contaminant and spill management plan in place prior to the initiation of works. In the event of a spill, the contractor must report it immediately to the Spills Action Centre (SAC) at 1-800-268-6060.

8.8 DFO Permitting

All drainage features on the property are considered indirect fish habitat, but are directly connected to fish bearing watercourses downstream. Therefore, they are afforded protection under the Federal *Fisheries Act.* Should works be proposed that could result in the "harmful alteration, disruption or destruction of fish habitat", (Section 35(1)), the proposed works would need to be submitted to DFO for a request for review to their Fish and Fish Habitat Protection Program regional office to determine approval requirements. A request for review is completed at the Detail Design stage where minimum 90% completion design drawings are typically required to accompany the DFO request for review submission package. At this stage, Azimuth has had no formal consultation with DFO. Harmful alteration, disruption or destruction of fish habitat could include, but not be limited to, infilling a channel, realigning a channel, removing riparian vegetation, altering flows, placing structures in-water, *etc*.

9.0 CONCLUSIONS

Based upon our analysis, it is concluded that several natural heritage features exist within the study area including Species at Risk (Redside Dace – contributing habitat), wetland and watercourses/fish habitat (indirect warmwater). Considerations detailed throughout this report, with particular regard for recommendations detailed in Section 8 above, will be required when developing the concept plan for the site.

10.0 REFERENCES

Azimuth Environmental Consulting, Inc. (Azimuth). 2022. Headwater Drainage Feature Assessment Tullamore Secondary Plan Area (Airport Road/Mayfield Road)

Bird Studies Canada. 2008. Marsh Monitoring Program Participant's Handbook for Surveying Amphibians. Bird Studies Canada, Environment Canada - Canadian Wildlife Service, U.S. Environmental Protection Agency. 16 pp.

Cadman, M.D., D.A. Sutherland, G.G. Beck, D. Lepage, and A.R. Couturier (eds.). 2007. Atlas of the Breeding Birds of Ontario (OBBA). 2001-2005. Bird Studies Canada, Environment Canada, Ontario Field Ornithologies, Ontario Ministry of Natural Resources and Ontario Nature, Toronto, xxii + 706pp.

Dobbyn, J. 1994. Atlas of the Mammals of Ontario. Federation of Ontario Naturalists.

Endangered Species Act, Ontario. 2007. An Act to protect species at risk and to make related changes to other Acts. Bill 184 Chapter 6, Statutes of Ontario 2007.

Fish and Wildlife Conservation Act, Ontario. 1997. S.O. 1997, c.41

Fisheries and Oceans Canada (DFO). 2022. Aquatic Species at Risk Mapping. https://www.dfo-mpo.gc.ca/species-especes/sara-lep/map-carte/index-eng.html. Accessed September 2022.

Government of Canada. 1985. *Federal Fisheries Act.* (http://laws-lois.justice.gc.ca/eng/acts/f-14/)

Government of Canada. 2014. *Migratory Birds Convention Act*. (http://laws-lois.justice.gc.ca/eng/acts/M-7.01/)

Lee, H.T., W.D. Bakowsky, J. Riley, J. Bowles, M. Puddister, P. Uhlig and S. McMurray. 1998, 2008. Ecological Land Classification for Southern Ontario. First Approximation and its Application. Ontario Ministry of Natural Resources, Southcentral Sciences Section, Science Development and Transfer Branch. SCSS Field Guide FG-02.

Ministry of the Environment, Conservation and Parks. 2022. Species at Risk in Ontario List. (https://www.ontario.ca/page/species-risk) Accessed September 2022.

Ministry of Municipal Affairs and Housing (MMAH). 2020a. Provincial Policy Statement.

Ministry of Municipal Affairs and Housing (MMAH). 2020b. A Place to Grow: Growth Plan for the Greater Golden Horseshoe.

Ministry of Natural Resources (OMNR). 2000. Significant Wildlife Habitat Technical Guide. Ontario Ministry of Natural Resources, Fish & Wildlife Branch, Wildlife Section. Peterborough, ON.

Ministry of Natural Resources. 2010. Natural Heritage Reference Manual for Policy 2.3 of the provincial policy statement, 2005 (2nd Ed.). Ontario Ministry of Natural Resources, Toronto, ON.

Ministry of Natural Resources and Forestry (MNRF). 2015a. Technical Note Species at Risk (SAR) Bats. Region. 37 pp.

Ministry of Natural Resources and Forestry (MNRF). 2015b. Significant Wildlife Habitat criterion schedules for Ecoregion 6E. MNRF Regional Operations Division & Northeast Region Resources Section. 39pp.

Ministry of Natural Resources and Forestry (MNRF). 2016. Guidance for Development Activities in Redside Dace Protected Habitat. Version 1.2.

Ministry of Natural Resources and Forestry (MNRF) 2019. Aquatic resource area line segment, online database. Retrieved on October 7, 2022, from https://geohub.lio.gov.on.ca/datasets/lio::aquatic-resource-area-line-segment/explore?location=43.791063%2C-79.758132%2C13.89

Ministry of Natural Resources and Forestry (MNRF). 2022. Natural Heritage Information Centre (NHIC) internet web page. Government of Ontario, Ministry of Natural Resources (https://www.ontario.ca/page/natural-heritage-information-centre). Accessed September 2022.

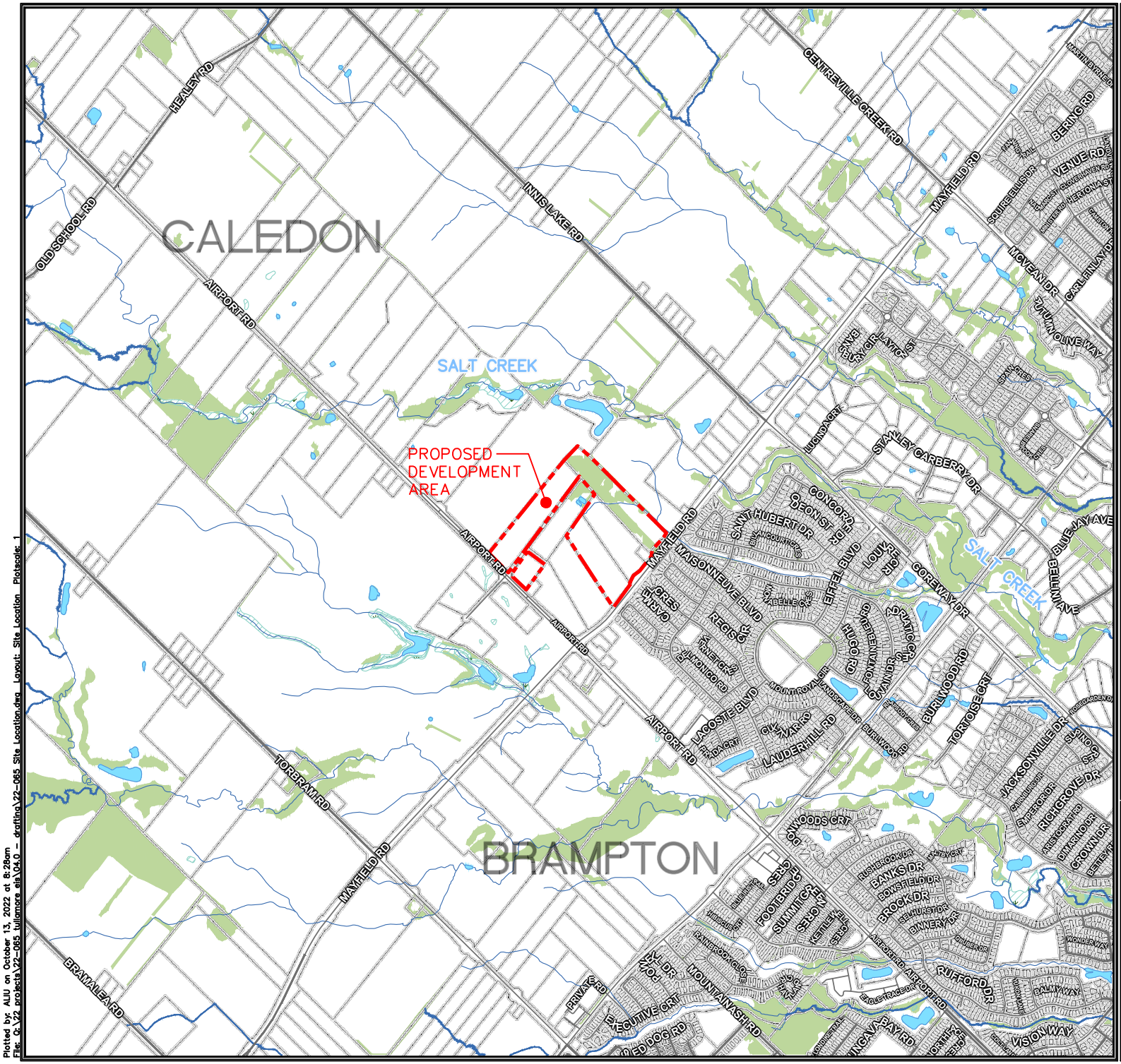
Ontario Nature. 2020. Ontario Reptile and Amphibian Atlas Program (https://ontarionature.org/programs/citizen-science/reptile-amphibian-atlas/). Accessed September 2022.

Toronto Region Conservation Authority. 2008. Humber River State of the Watershed Report – Aquatic System.

Toronto and Region Conservation Authority (TRCA) and Credit Valley Conservation (CVC). July 2013 (Finalized January 2014). Evaluation, Classification and Management of Headwater Drainage Features Guideline.

Town of Caledon (Town). 2018. Town of Caledon Official Plan. Consolidated April 2018.

Region of Peel (Region). 2021. Official Plan. Office Consolidation September 2021.



LEGEND:

STUDY AREA BOUNDARY

REGIONAL MAP

SCALE 1:250000

0 625 1250

HORIZONTAL SCALE 1:25000

AZIMUTH ENVIRONMENTAL CONSULTING, INC.

ENVIRONMENTAL ASSESSMENTS & APPROVALS

SITE LOCATION

PART OF LOT 1, CONCESSION 1
CALEDON, ON

DATE ISSUED: *OCTOBER 2022*	Figure No.
CREATED BY: *A.L.*	
PROJECT NO.: *22-065*	1
REFERENCE: *REGION OF PEEL*	

Plotted by: ALU on October 13, 2022 at 8:28am
File: O:\22 projects\22-065 tullamore eia\04.0 - drafting\22-065 Site Location.dwg Layout: Site Location Plotscale: 1

PERDUE COURT

AIRPORT ROAD

MAYFIELD ROAD

MEGM3

CVR_2

MEGM3 CVC_2

THDM2-6c (incl.)

EXISTING SWMP

MASM1-1

THDM2-6b (incl.)

MASM1-1g (incl.)

EXISTING BERM

TWIN CSP CULVERTS

FODM11

CVC_2

CVR_2

MASM1-1

MASM1-1c (incl.)

H2

H1

MASM1-1b (incl.)

MEMM3

MASM1-1f (incl.)

MEMM3

MASM1-1e (incl.)

MASM1-1a (incl.)

CVR_4

MASM1-1d (incl.)

H3

#6186 & #6206 MAYFIELD RD

EXISTING SWMP

SALT CREEK

REDSIDE DACE (END) OCCUPIED HABITAT

SALT CREEK

REDSIDE DACE (END) OCCUPIED HABITAT

LEGEND:

- PROPOSED DEVELOPMENT AREA
- WATERCOURSE (NDMNRF, 2021)
- INDIRECT FISH HABITAT – REDSIDE DACE (END) CONTRIBUTING HABITAT
- UNEVALUATED WETLAND (NDMNRF, 2021)

ELC VEGETATION COMMUNITIES:

CVC_2	LIGHT INDUSTRIAL
CVR_4	RURAL PROPERTY
FODM11	NATURALIZED DECIDUOUS HEDGEROW
MEGM3	DRY-FRESH GRAMINOID MEADOW
MEMM3	MIXED MEADOW
THDM2-6	BUCKTHORN DECIDUOUS THICKET

ELC WETLAND COMMUNITIES:

MASM1-1	CATTAIL MINERAL SHALLOW MARSH
incl.	*INDICATES AN INCLUSION*

- BREEDING BIRD POINT COUNT STATION
- AMPHIBIAN SURVEY STATION

LOCATION PLAN

0 100.00 200.0

HORIZONTAL SCALE 1:4000

AZIMUTH ENVIRONMENTAL CONSULTING, INC.
ENVIRONMENTAL ASSESSMENTS & APPROVALS

ENVIRONMENTAL FEATURES

PART OF LOT 1, CONCESSION 1
CALEDON, ON

DATE ISSUED:	*OCTOBER 2022*	Figure No. 2
CREATED BY:	*A.L.*	
PROJECT NO.:	*22-065*	
REFERENCE:	*TOWN OF CALEDON*	

Plotted by: ALU on October 14, 2022 at 10:17am
File: Q:\22 projects\22-065 tullamore ela\04.0 - drafting\22-065_ELC.dwg Layout: Environmental Features Plotscale: 1

Table 1: Species at Risk Habitat Summary and Assessment, Natural Heritage Existing Conditions Report (Tullamore) **AEC22-065**

Common Name	Species Name	ESA	SARA	Key Habitats Used By Species[1]	Initial Assessment
Bank Swallow	*Riparia riparia*	THR	THR	Nests in burrows excavated in natural and human-made settings with vertical sand and silt faces. Commonly found in sand or gravel pits, road cuts, lakeshore bluffs, and along riverbanks (COSEWIC, 2013a). ESA Protection: Species and general habitat protection	Berm present along the eastern portion of the study area which appeared to provide potentially suitable habitat towards the north end of the berm (i.e. exposed vertical face). The berm was searched in June and there was no evidence of active or historic use by Bank Swallows. The species was not observed during Azimuth's 2022 dawn breeding bird surveys.
Barn Swallow	*Hirundo rustica*	SC	THR	Ledges and walls of man-made structures such as buildings, barns, boathouses, garages, culverts and bridges. Also nest in caves, holes, crevices and cliff ledges (COSEWIC, 2011a). ESA Protection: Species and general habitat protection	Although the species was observed during Azimuth's 2022 dawn breeding bird surveys, no nesting habitat was documented within the study area. No nests were observed on the residential structures located within the study area. Potentially suitable habitat for Barn Swallow therefore likely only related to potential foraging habitat.
Black Ash	*Fraxinus nigra*	END	No Status	Facultative wetland tree species frequently found in floodplain forests, swamps, seepage areas, shoreline margins and fens. Occupied sites are generally seasonally-flooded (COSEWIC, 2018). ESA Protection: Species and general habitat protection (ESA protections take effect January 27, 2024)	There were no Black Ash observed during Azimuth's 2022 field program including a detailed vegetation assessment.
Bobolink	*Dolichonyx oryzivorus*	THR	THR	Nests primarily in forage crops (*e.g.* hayfields and pastures) dominated by a variety of species such as clover, Timothy, Kentucky Bluegrass, tall grass, and broadleaved plants. Also occurs in wet prairie, graminoid peatlands, and abandoned fields dominated by tall grasses. Does not generally occupy fields of row crops (*e.g*. corn, soybeans, wheat) or short-grass prairie. Sensitive to habitat size and has lower reproductive success in small habitat fragments (COSEWIC, 2010a). ESA Protection: Species and general habitat protection	Key habitat requirements (*e.g.,* large hayfields, grasslands, pastures) are not found within the study area. The species was not observed during Azimuth's 2022 dawn breeding bird surveys.
Butternut	*Juglans cinerea*	END	END	Commonly found in riparian habitats, but is also found in rich, moist, well-drained loams, and well-drained gravels. Butternut is intolerant of shade (COSEWIC, 2003a). ESA Protection: Species and general habitat protection	There were no Butternut observed during Azimuth's 2022 field program including a detailed vegetation assessment.
Chimney Swift	*Chaetura pelagica*	THR	THR	Nests primarily in chimneys though some populations (*i.e*. in rural northern areas) may nest in cavity trees (COSEWIC, 2007a). Recent changes in chimney design may be a significant factor in recent declines in numbers (Cadman *et al*., 2007). ESA Protection: Species and general habitat protection	Wildlife exclusion caps are present on the two residential homes within the study area. No potentially suitable habitat for the species. Species not documented during Azimuth's 2022 field program which including both early morning and evening surveys.
Common Nighthawk	*Chordeiles minor*	SC	THR	Open habitats including sand dunes, beaches recently logged/burned over areas, forest clearings, short grass prairies, pastures, open forests, bogs, marshes, lakeshores, gravel roads, mine tailings, quarries, and other open relatively clear areas (COSEWIC, 2007b). ESA Protection: N/A	Key habitat requirements (*e.g.,* forest clearings, pastures, marshes etc.) are not found within the study area. Species not documented during Azimuth's 2022 field program which included evening survey programs.
Eastern Meadowlark	*Sturnella magna*	THR	THR	Most common in grassland, pastures, savannahs, as well as anthropogenic grassland habitats, including hayfields, weedy meadows, young orchards, golf courses, restored surface mines, *etc* . Occasionally nest in row crop fields such as corn and soybean, but there are considered low-quality habitat. Large tracts of grassland are preferred over smaller fragments and the minimum area required is estimated at 5ha (COSEWIC, 2011b). ESA Protection: Species and general habitat protection	Key habitat requirements (*e.g.* , large hayfields, grasslands, pastures) are not found within the study area. The species was not observed during Azimuth's 2022 dawn breeding bird surveys.
Eastern Musk Turtle	*Sternotherus oderatus*	SC	SC	Inhabit littoral zones of waterways such as rivers, lakes, bays, streams, ponds, canals, and swamps with slow to no current and soft bottoms. During the active season they prefer shallow water (<2m) with abundant vegetation. Most are found close to shore and do not venture onto land except to nest or access adjacent wetlands (COSEWIC, 2012a). ESA Protection: N/A	Key habitat requirements generally not present within the study area. The small wetland habitats are isolated features within a highly disturbed landscape and amount of open standing water is minimal (no standing water present into June). These wetlands would not be considered ideal for the species. Based on this information, there is no expectation that Eastern Musk Turtle would occur within the study area.
Eastern Ribbonsnake	*Thamnophis sauritus*	SC	SC	Found in wetland habitats with both flowing and standing water such as marshes, bogs, fens, ponds, lake shorelines and wet meadows. Most sightings occur near the water's edge (COSEWIC, 2012b). ESA Protection: N/A	Key habitat requirements generally not present within the study area. The small wetland habitats are isolated features within a highly disturbed landscape and amount of open standing water is minimal (no standing water present into June). These wetlands would not be considered ideal for the species. Based on this information, there is no expectation that Eastern Ribbonsnake would occur within the study area.
Eastern Small-footed Myotis	*Myotis Lleibii*	END	END	Generally occurs in mountainous or rocky regions as well as in buildings, on the face of rock bluffs and beneath slabs of rock and stones. Hibernation is typically confined to caves and old mines (Best and Jennings, 1997). ESA Protection: Species and general habitat protection	Potentially suitable summer roosting/maternity habitat could be assocaited with the structures present within the study area. The species was not observed during bat exit surveys.
Eastern Wood-pewee	*Contopus virens*	SC	SC	Mostly in mature and intermediate-age deciduous and mixed forests having an open understory. It is often associated with forests dominated by Sugar Maple and oak. Usually associated with forest clearings and edges within the vicinity of its nest (COSEWIC, 2012c). ESA Protection: N/A	There are no suitable habitat (i.e forested lands) within the study area. The species was not observed during Azimuth's 2022 dawn breeding bird surveys.
Grasshopper Sparrow *pratensis* subspecies	*Ammodramus savannarum pratensis*	SC	SC	Typically breeds in large human-created grasslands (≥5 ha), such as pastures and hayfields, and natural prairies, such as alvars, characterized by well-drained, often poor soil dominated by low, sparse perennial herbaceous vegetation (COSEWIC, 2013b). ESA Protection: N/A	Key habitat requirements (*e.g.* , large hayfields, grasslands, pastures) are not found within the study area. The species was not observed during Azimuth's 2022 dawn breeding bird surveys.
Jefferson Salamander	*Ambystoma jeffersonianum*	END	END	Deciduous or mixed upland forests containing, or adjacent to, suitable breeding ponds. Breeding ponds are normally ephemeral, or vernal, woodland pools that dry in late summer. Terrestrial habitat is in mature woodlands that have small mammal burrows or rock fissures that enable adults to over-winter underground below the frost line (COSEWIC, 2010b). ESA Protection: Species and regulated habitat protection	No potentially suitable habitat is present within the study area therefore, the species would not be expected to occur .
Little Brown Myotis	*Myotis lucifugus*	END	END	Forests and regularly aging human structures as maternity roost sites. Regularly associated with attics of older buildings and barns for summer maternity roost colonies. Overwintering sites are characteristically mines or caves (MNRF, 2014) (COSEWIC, 2013c). ESA Protection: Species and general habitat protection	Potentially suitable summer roosting/maternity habitat could be assocaited with the structures present within the study area. The species was not observed during bat exit surveys.

Common Name	Species Name	ESA	SARA	Key Habitats Used By Species[1]	Initial Assessment
Monarch	*Danaus plexippus*	SC	SC	Breeding habitat is confined to sites where milkweeds, the sole food of caterpillars, grow. Milkweeds grow in a variety of environments, including meadows in farmlands, along roadsides and in ditches, open wetlands, dry sandy areas, short and tall grass prairie, river banks, irrigation ditches, arid valleys, and south-facing hills (COSEWIC, 2010c). ESA Protection: N/A	Key habitat requirements (*e.g.,* areas with abundance of milkweed) are not found within the study area. The species was not observed during Azimuth's 2022 field investigations.
Northern Myotis	*Myotis septentrionalis*	END	END	Maternity roost sites are generally located within deciduous and mixed forests and focused in snags including loose bark and cavities of trees. Overwintering sites are characteristically mines or caves (COSEWIC, 2013c). ESA Protection: Species and general habitat protection	No potentially suitable habitat is present within the study area therefore, the species would not be expected to occur .
Red-headed Woodpecker	*Melanerpes erythrocephalus*	END	END	Occurs in open deciduous forests, particularly those dominated by oak and beech, groves of dead trees, floodplain forests, orchards, cemeteries, savannas and savanna-like grasslands. Although the species occupies a range of habitat types, key habitat is characteristically composed of woodlands where tall trees are of large crcumference (i.e.mature cover) and are at a low density. A high density of snag trees is also an indicator of key habitat types (COSEWIC, 2007c). ESA Protection: Species and general habitat protection.	Key habitat requirements (*e.g.,* open oak-beech deciduous forests) are not found within the study area. The species was not observed during Azimuth's 2022 dawn breeding bird surveys.
Redside Dace	*Clinostomus elongatus*	END	END	Found in pools and slow-flowing sections of relatively small, clear headwater streams with both pool and riffle habitats and a moderate to high gradient. These streams typically flow through meadows, pasture or shrub overstory, and have abundant overhanging riparian vegetation (COSEWIC, 2007d). ESA Protection: Species and general habitat protection.	**Key habitat requirements (*e.g.,* slow-flowing tributaries through meadows) are found on the property and may provide indirect habitat for the species. There are NHIC records of the species in the area and is considered further in main text.**
Snapping Turtle	*Chelydra serpentina*	SC	SC	Habitat is characterized by slow-moving water with a soft mud bottom and dense aquatic vegetation. Often located in ponds, sloughs, shallow bays or river edges and slow streams, or areas combining several of these wetland habitats (COSEWIC, 2008). ESA Protection: N/A	Key habitat requirements generally not present within the study area. The small wetland habitats are isolated features within a highly disturbed landscape and amount of open standing water is minimal (no standing water present into June). These wetlands would not be considered ideal for the species. Based on this information, there is no expectation that Snapping Turtle would occur within the study area.
Tri-colored Bat	*Perimyotis subflavus*	END	END	Maternity roost sites include forests and modified landscapes (barns or human-made structures). Overwintering sites include mines and caves (COSEWIC, 2013c). ESA Protection: Species and general habitat protection	Key habitat requirements (*e.g.,* anthropogenic strucutres with attics) are found on the property. The species was not detected during bat exit surveys.
Wood Thrush	*Hylocichla mustelina*	SC	THR	Found in moist, deciduous hardwood or mixed stands, often previously disturbed, with a dense deciduous undergrowth and with tall trees for singing perches (COSEWIC, 2012d). ESA Protection: N/A	There are no suitable habitat (*e.g* forested lands) within the study area. The species was not observed during Azimuth's 2022 dawn breeding bird surveys.

[1] Habitat as outlined within the MNRF's Species at Risk in Ontario website files (https://www.ontario.ca/environment-and-energy/species-risk-ontario-list), or Species Specific COSEWIC Reports referenced in this document.

Species at Risk in Ontario List (June 13, 2017)
Best, T., and J. Jennings. 1997. Mammalian Species, *Myotis leibii* . The American Society of Mammalogists. No. 547, pp. 1-6, 5 figs.
Cadman, M., D. Sutherland, G. Beck, D. Lepage and A. Couturier. 2007. Atlas of the Breeding Birds of Ontario 2001-2005. Bird Studies Canada, Environment Canada, Ontario Field
COSEWIC. 2003. COSEWIC assessment and status report on the Butternut *Juglans cinerea* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 32 pp.
COSEWIC. 2007a. COSEWIC assessment and update status report on the Chimney Swift *Chaetura pelagic* a in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 49 pp.
COSEWIC. 2007b. COSEWIC assessment and status report on the Common Nighthawk *Chordeiles minor* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 35 pp.
COSEWIC. 2007c. COSEWIC assessment and status report on the Red-headed Woodpecker *Melanerpes erythrocephalu* s in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 27 pp.
COSEWIC. 2007d. COSEWIC assessment and update status report on the Redside Dace *Clinostomus elongates* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 59 pp.
COSEWIC. 2008. COSEWIC assessment and status report on the Snapping Turtle *Chelydra serpentina* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 47 pp.
COSEWIC. 2010a. COSEWIC assessment and update status report on the Bobolink *Dolichonyx oryzivorus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 42 pp.
COSEWIC. 2010b. COSEWIC assessment and update status report on the Jefferson Salamander *Ambystoma jeffersonianum* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 38 pp.
COSEWIC. 2010c. COSEWIC assessment and status report on the Monarch *Danaus plexippus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 43 pp.
COSEWIC. 2011a. COSEWIC assessment and update status report on the Barn Swallow *Hirundo rustica* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. ix + 37 pp.
COSEWIC. 2011b. COSEWIC assessment and update status report on the Eastern Meadowlark *Sturnella magna* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. x + 40 pp.
COSEWIC. 2012a. COSEWIC assessment and status report on the Eastern Musk Turtle *Sternotherus odoratus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xiii + 68 pp
COSEWIC. 2012b COSEWIC assessment and status report on the Eastern Ribbonsnake *Thamnophis sauritus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xii + 39 pp.
COSEWIC. 2012c. COSEWIC assessment and status report on the Eastern Wood-pewee *Contopus virens* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. x + 39 pp.
COSEWIC. 2012d. COSEWIC assessment and status report on the Wood Thrush *Hylocichla mustelina* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. ix + 46 pp.
COSEWIC. 2013a. COSEWIC assessment and update status report on the Bank Swallow *Riparia riparia* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. ix + 48 pp.

COSEWIC. 2013b. COSEWIC assessment and status report on the Grasshopper Sparrow pratensis subspecies *Ammodramus savannarum pratensis* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. ix + 36 pp.
COSEWIC. 2013c. COSEWIC assessment and update status report on the Little Brown Myotis *Myotis lucifugus* , Northern Myotis *Myotis septentrionalis* and Tri-colored Bat *Perimyotis subfalvus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xxiv + 93 pp.

COSEWIC. 2018. COSEWIC assessment and status report on the Black Ash *Fraxinus nigra* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xii + 95 pp.
Ministry of the Environment, Conservation and Parks (MECP). 2022. Species at Risk in Ontario (https://www.ontario.ca/page/species-risk-ontario)
Ministry of Natural Resources and Forestry (MNRF). 2014. Eastern Small-footed Bat. Queen's Printer for Ontario. https://www.ontario.ca/environment-and-energy/eastern-small-footed-bat

Table 2: Vascular Plant List, Natural Heritage Existing Conditions Report (Tullamore) Surveyor: D. Stuart **AEC22-065**

			Vegetation Communities[2]				Conservation Rankings[3]			Regional[4]
FAMILY[1]	**SCIENTIFIC NAME[1]**	**COMMON NAME[1]**	**FODM11**	**MASM1-1**	**MEGM3**	**MEMM3**	**GRANK**	**SRANK**	**TRACK**	**TRCA**
Aceraceae	*Acer negundo*	Manitoba Maple				X	G5	S5	N	L+?
Amaranthaceae	*Amaranthus retroflexus*	Redroot Amaranth				X	G5	SE5	N	L+
Anacardiaceae	*Rhus typhina*	Staghorn Sumac				X	G5	S5	N	L5
Apiaceae	*Daucus carota*	Wild Carrot	X	X	X	X	GNR	SE5	N	L+
Apocynaceae	*Asclepias syriaca*	Common Milkweed			X	X	G5	S5	N	L5
Asteraceae	*Achillea millefolium*	Common Yarrow	X				G5	SE5?	N	L+
Asteraceae	*Ambrosia artemisiifolia*	Common Ragweed				X	G5	S5	N	L5
Asteraceae	*Arctium minus*	Common Burdock				X	GNR	SE5	N	L+
Asteraceae	*Artemisia biennis*	Biennial Wormwood	X				G5	SE5	N	L+
Asteraceae	*Bidens frondosa*	Devil's Beggarticks		X		X	G5	S5	N	L5
Asteraceae	*Carduus nutans ssp. nutans*	Nodding Thistle				X	GNRTNR	SE5	N	L+
Asteraceae	*Cichorium intybus*	Wild Chicory			X	X	GNR	SE5	N	L+
Asteraceae	*Cirsium arvense*	Canada Thistle		X	X	X	G5	SE5	N	L+
Asteraceae	*Cirsium vulgare*	Bull Thistle	X			X	GNR	SE5	N	L+
Asteraceae	*Erigeron annuus*	Annual Fleabane	X		X	X	G5	S5	N	L5
Asteraceae	*Eutrochium maculatum var. maculatum*	Spotted Joe Pye Weed				X	G5T5	S5	N	L5
Asteraceae	*Inula helenium*	Elecampane	X	X		X	GNR	SE5	N	L+
Asteraceae	*Lactuca serriola*	Prickly Lettuce				X	GNR	SE5	N	L+
Asteraceae	*Leucanthemum vulgare*	Oxeye Daisy	X		X	X	GNR	SE5	N	L+
Asteraceae	*Matricaria chamomilla*	Wild Chamomile				X	GNR	SE3	N	L+
Asteraceae	*Pilosella piloselloides ssp. praealta*	King Devil Hawkweed	X				GNR	SE1	N	L+
Asteraceae	*Solidago canadensis var. canadensis*	Canada Goldenrod	X	X	X	X	G5T5	S5	N	L5
Asteraceae	*Sonchus arvensis ssp. arvensis*	Glandular Sow-thistle		X	X	X	GNRTNR	SE5	N	L+
Asteraceae	*Symphyotrichum lanceolatum ssp. lanceolatum*	Eastern Panicled Aster	X	X	X	X	G5T5	S5	P	L4
Asteraceae	*Symphyotrichum novae-angliae*	New England Aster	X		X	X	G5	S5	N	L5
Asteraceae	*Symphyotrichum puniceum*	Purple-stemmed Aster		X			G5	S5	N	L5
Asteraceae	*Taraxacum officinale*	Common Dandelion			X	X	G5	SE5	N	L+
Asteraceae	*Tragopogon dubius*	Yellow Goatsbeard			X		GNR	SE5	N	L+
Boraginaceae	*Echium vulgare*	Common Viper's Bugloss	X				GNR	SE5	N	L+
Brassicaceae	*Alliaria petiolata*	Garlic Mustard				X	GNR	SE5	N	L+
Brassicaceae	*Brassica rapa*	Field Mustard		X	X	X	GNR	SE5	N	L+
Brassicaceae	*Erysimum cheiranthoides*	Wormseed Wallflower	X			X	G5	S5?	N	L+

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FAMILY[1]	**SCIENTIFIC NAME[1]**	**COMMON NAME[1]**	**FODM11**	**MASM1-1**	**MEGM3**	**MEMM3**	**GRANK**	**SRANK**	**TRACK**	**TRCA**
Brassicaceae	*Lepidium campestre*	Field Peppergrass				X	GNR	SE5	N	L+
Brassicaceae	*Thlaspi arvense*	Field Pennycress			X	X	GNR	SE5	N	L+
Caprifoliaceae	*Lonicera tatarica*	Tatarian Honeysuckle	X			X	GNR	SE5	N	L+
Caryophyllaceae	*Cerastium arvense ssp. arvense*	Field Chickweed			X	X	G5T5	SE2	N	L+
Caryophyllaceae	*Dianthus armeria*	Deptford Pink		X			GNR	SE5	N	L+
Chenopodiaceae	*Chenopodium album*	Common Lamb's-quarters				X	G5	SE5	N	L+
Clusiaceae	*Hypericum perforatum*	Common St. John's-wort			X	X	GNR	SE5	N	L+
Convolvulaceae	*Convolvulus arvensis*	Field Bindweed			X	X	GNR	SE5	N	L+
Cornaceae	*Cornus sericea*	Red-osier Dogwood				X	G5	S5	N	L5
Cupressaceae	*Juniperus virginiana*	Eastern Red Cedar				X	G5	S5	N	L5
Cyperaceae	*Carex bebbii*	Bebb's Sedge		X		X	G5	S5	N	L5
Cyperaceae	*Carex granularis*	Limestone Meadow Sedge			X		G5	S5	N	L5
Cyperaceae	*Carex projecta*	Necklace Sedge				X	G5	S5	N	L4
Cyperaceae	*Carex scoparia*	Pointed Broom Sedge	X			X	G5	S5	N	L3
Cyperaceae	*Carex spicata*	Spiked Sedge			X		GNR	SE5	N	L+
Cyperaceae	*Carex vulpinoidea*	Fox Sedge		X		X	G5	S5	N	L5
Cyperaceae	*Scirpus cyperinus*	Common Woolly Bulrush				X	G5	S5	N	L4
Euphorbiaceae	*Euphorbia esula*	Leafy Spurge		X			GNRTNR	SE		
Fabaceae	*Lotus corniculatus*	Garden Bird's-foot Trefoil	X	X	X	X	GNR	SE5	N	L+
Fabaceae	*Medicago lupulina*	Black Medick	X		X	X	GNR	SE5	N	L+
Fabaceae	*Medicago sativa*	Alfalfa			X	X	GNR	SE5	N	
Fabaceae	*Melilotus albus*	White Sweet-clover	X	X	X	X	G5	SE5	N	L+
Fabaceae	*Melilotus officinalis*	Yellow Sweet-clover				X	GNR	SE5	N	L+
Fabaceae	*Trifolium hybridum*	Alsike Clover	X		X	X	GNR	SE5	N	L+
Fabaceae	*Trifolium pratense*	Red Clover				X	GNR	SE5	N	L+
Fabaceae	*Trifolium repens*	White Clover			X	X	GNR	SE5	N	L+
Fabaceae	*Vicia cracca*	Tufted Vetch	X	X	X	X	GNR	SE5	N	L+
Fagaceae	*Quercus macrocarpa*	Bur Oak	X	X		X	G5	S5	N	L4
Fagaceae	*Quercus rubra*	Northern Red Oak			X		G5	S5	N	L4
Iridaceae	*Sisyrinchium montanum var. montanum*	Strict Blue-eyed-grass			X		G5T5	S5	N	L4
Juncaceae	*Juncus effusus*	Soft Rush				X	G5	S5	N	L5
Liliaceae	*Hemerocallis fulva*	Orange Daylily			X	X	GNA	SE5	N	L+
Lythraceae	*Lythrum salicaria*	Purple Loosestrife		X		X	G5	SE5	N	L+

Table 2: Vascular Plant List, Natural Heritage Existing Conditions Report (Tullamore) Surveyor: D. Stuart **AEC22-065**

			Vegetation Communities[2]				Conservation Rankings[3]			Regional[4]
FAMILY[1]	**SCIENTIFIC NAME[1]**	**COMMON NAME[1]**	**FODM11**	**MASM1-1**	**MEGM3**	**MEMM3**	**GRANK**	**SRANK**	**TRACK**	**TRCA**
Moraceae	*Morus alba*	White Mulberry			X		GNR	SE5	N	L+
Oleaceae	*Fraxinus americana*	White Ash	X			X	G4	S4	N	L5
Pinaceae	*Picea glauca*	White Spruce				X	G5	S5	N	L3
Pinaceae	*Pinus sylvestris var. sylvestris*	Scots Pine				X	GNRTNR	SE5	N	L+
Plantaginaceae	*Plantago major*	Common Plantain				X	G5	SE5	N	L+
Poaceae	*Agrostis gigantea*	Redtop			X	X	G4G5	SE5	N	L+
Poaceae	*Agrostis stolonifera*	Creeping Bentgrass		X			G5	SE5	N	L+?
Poaceae	*Bromus inermis*	Smooth Brome	X	X	X	X	G5T5	SE5	N	L+
Poaceae	*Dactylis glomerata*	Orchard Grass			X		GNR	SE5	N	L+
Poaceae	*Digitaria sanguinalis*	Hairy Crabgrass				X	G5	SE5	N	L+
Poaceae	*Elymus repens*	Quackgrass			X	X	GNR	SE5	N	L+
Poaceae	*Festuca rubra ssp. rubra*	Red Fescue			X	X	G5T5	SE5	N	L+
Poaceae	*Glyceria striata var. striata*	Fowl Mannagrass				X	G5T5	S5	N	L5
Poaceae	*Hordeum jubatum ssp. jubatum*	Foxtail Barley				X	G5T5	S5?	N	L+
Poaceae	*Lolium multiflorum*	Annual Ryegrass	X	X	X		GNRTNR	SE1?	N	
Poaceae	*Phalaris arundinacea*	Reed Canarygrass		X	X	X	G5	S5	N	L+?
Poaceae	*Phleum pratense*	Common Timothy	X		X	X	GNR	SE5	N	L+
Poaceae	*Phragmites australis ssp. australis*	European Reed		X	X	X	G5T5	SE5	N	L+
Poaceae	*Poa compressa*	Canada Bluegrass				X	GNR	SE5	N	L+
Poaceae	*Poa pratensis ssp. pratensis*	Kentucky Bluegrass	X	X	X	X	G5T5	SE5	N	L+
Poaceae	*Setaria viridis*	Green Foxtail			X		GNR	SE5	N	L+
Polygonaceae	*Persicaria maculosa*	Spotted Lady's-thumb				X	G3G5	SE5	N	L+
Polygonaceae	*Polygonum aviculare ssp. aviculare*	Prostrate Knotweed				X	G5TNR	SE5	N	L+
Polygonaceae	*Rumex crispus*	Curled Dock		X	X	X	GNR	SE5	N	L+
Portulacaceae	*Portulaca oleracea*	Common Purslane				X	GU	SE5	N	L+
Ranunculaceae	*Ranunculus acris*	Common Buttercup	X	X			G5	SE5	N	L+
Ranunculaceae	*Ranunculus repens*	Creeping Buttercup		X		X	GNR	SE5	N	L+
Rhamnaceae	*Rhamnus cathartica*	European Buckthorn	X	X	X	X	GNR	SE5	N	L+
Rosaceae	*Crataegus sp.*	a Hawthorn	X				N/A	N/A	N/A	
Rosaceae	*Fragaria virginiana*	Wild Strawberry				X	G5	S5	N	L5
Rosaceae	*Geum canadense*	Canada Avens	X				G5	S5	N	L5
Rosaceae	*Malus pumila*	Common Apple	X			X	G5	SE4	N	L+
Rosaceae	*Potentilla recta*	Sulphur Cinquefoil	X		X		GNR	SE5	N	L+

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			Vegetation Communities[2]				Conservation Rankings[3]			Regional[4]
FAMILY[1]	**SCIENTIFIC NAME[1]**	**COMMON NAME[1]**	**FODM11**	**MASM1-1**	**MEGM3**	**MEMM3**	**GRANK**	**SRANK**	**TRACK**	**TRCA**
Rosaceae	*Prunus virginiana*	Chokecherry	X			X	G5	S5	N	L5
Rosaceae	*Rubus idaeus ssp. strigosus*	North American Red Raspberry				X	G5T5	S5	N	L5
Rosaceae	*Rubus occidentalis*	Black Raspberry	X				G5	S5	N	L5
Rubiaceae	*Galium mollugo*	Smooth Bedstraw				X	GNR	SE5	N	L+
Rubiaceae	*Galium palustre*	Common Marsh Bedstraw		X			G5	S5	N	L5
Salicaceae	*Populus deltoides ssp. deltoides*	Eastern Cottonwood				X	G5T5	S5	N	L5
Salicaceae	*Salix eriocephala*	Cottony Willow				X	G5	S5	N	L5
Salicaceae	*Salix euxina*	Crack Willow				X	GNR	SE	N	
Salicaceae	*Salix interior*	Sandbar Willow				X	G5	S5	N	L5
Scrophulariaceae	*Linaria vulgaris*	Butter-and-eggs				X	GNR	SE5	N	L+
Scrophulariaceae	*Verbascum thapsus*	Common Mullein	X			X	GNR	SE5	N	L+
Solanaceae	*Solanum dulcamara*	Bittersweet Nightshade	X	X			GNR	SE5	N	L+
Tiliaceae	*Tilia americana*	Basswood	X				G5	S5	N	L5
Typhaceae	*Typha angustifolia*	Narrow-leaved Cattail	X	X	X	X	G5	SE5	N	L+
Typhaceae	*Typha latifolia*	Broad-leaved Cattail	X	X		X	G5	S5	N	L4
Ulmaceae	*Ulmus americana*	White Elm		X		X	G4	S5	N	L5
Vitaceae	*Parthenocissus vitacea*	Thicket Creeper				X	G5	S5	N	L5
Vitaceae	*Vitis riparia*	Riverbank Grape	X			X	G5	S5	N	L5

[1] Nomenclature based on Ministry of Natural Resources and Forestry (MNRF) Natural Heritage Information Centre (NHIC, 2022)

[2] ELC Codes based on Ecological Land Classification for Southern Ontario manual (Lee et al., 1998, 2008)

[3] Conservation Rankings: From Ontario Ministry of Natural Resources and Forestry, Natural Heritage Information Centre (https://www.ontario.ca/page/natural-heritage-information-centre)

[4] TRCA Flora Species. June 2021 Ranks.

Table 3: Summary of Vegetation Communities, Natural Heritage Existing Conditions Report (Tullamore)

Unit	Description
FO (FOREST)	Tree cover >60%.
Deciduous Forest (FOD)	Deciduous tree species >75% of canopy cover.
FODM11 (Naturalized Deciduous Hedgerow)	This community features a dense (>60%) emergent canopy along a linear north-south axis, demarcating the boundary between the subject property and agricultural fields to the east. Although categorized under the "forest" community series per ELC methodology, the unit is linear (approximately 1-2 trees wide), and does not qualify as a "woodland" according to provincial standards. The deciduous hedgerow unit consists of a moderately dense (25-60%) canopy and subcanopy layer comprising mostly Bur Oak (*Quercus macrocarpa*) with minor Basswood (*Tilia americana*) associates. The understory layer is dense (>60%) and comprises dense Common Buckthorn (*Rhamnus cathartica*) with Hawthorn (*Crataegus spp.*), Tartarian Honeysuckle (*Lonicera tatarica*), and Basswood associates. Ground cover is dense (>60%) and includes Smooth Brome (*Bromus inermis)*, Canada Goldenrod (*Solidago candensis*), Cow Vetch (*Vicia cracca*), and Alsike Clover (*Trifolium hybridum*) in descending order of density.
CU (CULTURAL)	Community resulting from, or maintained by, cultural or anthropogenic-based disturbances.
Meadow (ME)	Tree and shrub cover <25%. Open herbaceous communities, cover varying from scattered and patchy to continuous meadow; areas with cultural legacy typically dominated by invasive plant species.
MEMM3 (Dry-Fresh Mixed Meadow Ecosite)	This community features no emergent canopy or subcanopy vegetation. A very sparse (<<10%) shrub layer comprises Common Buckthorn with minor Scotch Pine (*Pinus sylvestris*), Crack Willow (*Salix euxina*), and Chokecherry (*Prunus virginiana*) associates. Ground layer is dense and comprises a mix of graminoid and forb species (25-75% each), consisting of Canada Thistle (*Cirsium arvense*), Field Mustard (*Brassica rapa*), Canada Goldenrod, Reed Canary Grass (*Phalaris arundinacea*), Wild Chamomile (*Matricaria chamomilla*), Cow Vetch, Alsike Clover, and Garden Bird`s-foot Trefoil (*Lotus corniculatus*). Several minor inclusions were documented within this vegetation community, including MASM1-1a through MASM1-1g (Cattail Mineral Shallow Marsh), and THDM2-6a through THDM2-6c (Buckthorn Deciduous Shrub Thicket)(Figure 2). Vascular plant species identified within these inclusions were documented within the primary MEMM3 vegetation unit.
MEGM3 (Dry-Fresh Graminoid Meadow Ecosite)	This community features no emergent canopy or subcanopy vegetation, with the exception of a minor planted row of Bur Oak along Davis Lane. Ground layer is dense and dominated by graminoid species (>75% each), comprising Smooth Brome with Cow Vetch, Reed Canary Grass, Canada Thistle, Red Fescue (*Festuca rubra*) and Redtop (*Agrostis gigantea*) associates.
WETLAND	Water table seasonally or permanently at, near, or above substrate surface; flooded bedrock or hydric mineral or organic (organic >40cm) substrates; standing water, pools or vernal pooling >20% of ground coverage; wetland plant indicator species (OWES) cover >50%; mean wetness score of a site for native species =>0; moisture regime typically <5;

Table 3: Summary of Vegetation Communities, Natural Heritage Existing Conditions Report (Tullamore)

Unit	Description
Marsh (MA)	Tree and shrub cover ≤25%, dominated by emergent hydrophytic macrophytes
MASM1-1 (Cattail Mineral Shallow Marsh Type)	Species less tolerant of prolonged flooding; species restricted to facultative and obligate wetland plants. This community features no woody vegetation in canopy, subcanopy, or understory layers, and is dominated by emergent macrophyte wetland vegetation. Ground cover is dense (>60%) and comprises Broad-leaved Cattail (*Typha latifolia*), European Reed (*Phragmites australis ssp. australis*), Narrow-leaved Cattail (*Typha angustifolia*), and Purple Loosestrife (*Lythrum salicaria*) in descending order of density.

Table 4: Amphibian Breeding Summary, Natural Heritage Existing Conditions Report (Tullamore)

Observer: Dan Stuart

			Species								
Date	**Sampling Station(s)***	**Start Time**	**Wood Frog**	**Spring Peeper**	**Chorus Frog**	**Northern Leopard Frog**	**American Toad**	**Green Frog**	**Gray Treefrog**	**Pickerel Frog**	**Nothing Heard**
25-Apr-22	1	23:37									X
	2	23:45									X
	3	23:53				1-2					
25-May-22	1	23:30									X
	2	23:40									X
	3	23:47									X

**see mapping* ** format: call code - estimated # of individuals*

Weather Conditions

Date	**Air Temperature (^{o}C)**	**Wind (Beaufort/ Direction)**	**Cloud Cover**	**Precipitation**
07-Apr-21	10	B3	100%	nil
19-May-21	16	B3	100%	nil

[1] Call Code Levels

0 = none heard
1 = males could be individually counted
2 = calls overlap but numbers could be estimated
3 = overlapping calls, not possible to estimate numbers involved in chorus.

Table 5: Breeding Bird Survey, Natural Heritage Existing Conditions Report (Tullamore) **AEC22-065**

			Location[1,2]														Conservation Rankings[3]				
			1		2		3		4		5		6		Adjacent Lands	Incidental					
FAMILY	SCIENTIFIC NAME	COMMON NAME	Visit 1	Visit 2	Visit 1	Visit 2	Visit 1	Visit 2	Visit 1	Visit 2	Visit 1	Visit 2	Visit 1	Visit 2			GRANK	SRANK	ESA	SARA	TRACK
Anatidae	*Anas fulvigula*	Mottled Duck						P,S,FO									G4	SNA			N
Anatidae	*Branta canadensis*	Canada Goose					FO,C										G5	S5			N
Bombycillidae	*Bombycilla cedrorum*	Cedar Waxwing		C						C,FO							G5	S5			N
Cardinalidae	*Cardinalis cardinalis*	Northern Cardinal														✓	G5	S5			N
Charadriidae	*Charadrius vociferus*	Killdeer		C,FO	H,C	A	A		A				FO,C		A		G5	S4B			N
Columbidae	*Zenaida macroura*	Mourning Dove	C,H	FO					S,H		S/FO	P		P,FO	S/FO		G5	S5			N
Corvidae	*Corvus brachyrhynchos*	American Crow				C		C							C		G5	S5			N
Corvidae	*Cyanocitta cristata*	Blue Jay					C			C	C						G5	S5			N
Fringillidae	*Haemorhous mexicanus*	House Finch						S							S		G5	SNA			N
Fringillidae	*Spinus tristis*	American Goldfinch			S	S,C,FO	C,FO	C,FO			C/FO	C,FO	C	C,FO	C,FO		G5	S5			N
Hirundinidae	*Hirundo rustica*	Barn Swallow					X		FO,C								G5	S4B	SC	THR	Y
Hirundinidae	*Stelgidopteryx serripennis*	Northern Rough-winged Swallow				X						X					G5	S4B			N
Hirundinidae	*Tachycineta bicolor*	Tree Swallow		X			X						FO,C				G5	S4S5B			N
Icteridae	*Agelaius phoeniceus*	Red-winged Blackbird	T,P	P,T,S	S	C	P,T,A	P,A,T,S	T,S	P,S		S,C	S	H	S		G5	S5			N
Icteridae	*Molothrus ater*	Brown-headed Cowbird	C,H		P,FO	C	C		C	C				C			G5	S5			N
Icteridae	*Quiscalus quiscula*	Common Grackle		FO,C											C		G5	S5			N
Laridae	*Larus delawarensis*	Ring-billed Gull	FO,C				FO		FO,C				FO,C				G5	S5			N
Laridae	*Sterna hirundo*	Common Tern						S									G5	S4B	NAR		N
Parulidae	*Geothlypis trichas*	Common Yellowthroat				S											G5	S5B,S3N			N
Passerellidae	*Melospiza georgiana*	Swamp Sparrow					S		S								G5	S5B,S4N			N
Passerellidae	*Melospiza melodia*	Song Sparrow	S	S	S	S	S	S	S	S	S		S	S	S		G5	S5			N
Passerellidae	*Passerculus sandwichensis*	Savannah Sparrow												S			G5	S5B,S3N			N
Passerellidae	*Spizella passerina*	Chipping Sparrow											S				G5	S5B,S3N			N
Passeridae	*Passer domesticus*	House Sparrow						C		C		C		C	C		G5	SNA			N
Scolopacidae	*Actitis macularius*	Spotted Sandpiper		P,DD													G5	S5B			N
Sturnidae	*Sturnus vulgaris*	European Starling	T,A	C	T,C		C	X,C	C	C		X	C,H	FO,C			G5	SNA			N
Turdidae	*Turdus migratorius*	American Robin	S		S		S						S	S	S		G5	S5			N
Tyrannidae	*Empidonax traillii*	Willow Flycatcher	S					S	S								G5	S4B			N

[1] **Visit 1**: June 8th 2022, Observer: Dan Stuart, Tempurature16°C, Cloud Cover 40% , Wind: B1, Precipitation: Nil, Search Time 08:20 to 09:39; **Visit 2**: June 17th 2022, Observer: Dan Stuart, Tempurature 22°C, Cloud Cover 0% , Wind: B3, Precipitation: Nil, Search Time 08:23 to 09:40;

[2] Breeding Bird Evidence Codes: X - Species observed, C - Call heard, FO - Flyover (Species presence); H - Species observed in its breeding season in suitable nesting habitat, S - Singing male (Possible Breeding); P - Pair observed , T - Territorial behaviour, A - Agitated behaviour or anxiety calls of adult, V - Visiting a probably nest site, N - Nest building or excavation of nest hole (Probable Breeding); DD - Distraction display or injury feigning, NU - Used Nest or egg shells, FY - Recently fledged young, AE - Adult leaving or entering nest sites, FS - Adult carrying fecal sac, CF - Adult carrying food for young, NE - Nest containing eggs, NY - Nest with young seen or heard (Confirmed Breeding).

[3] Conservation Rankings: From Ontario Ministry of Natural Resources and Forestry, Natural Heritage Information Centre (https://www.ontario.ca/page/natural-heritage-information-centre)

Significant Wildlife Habitat Criteria Schedule for Ecoregion 6E

Table 6: Significant Wildlife Habitat Assessment, Natural Heritage Existing Conditions Report (Tullamore)

Seasonal Concentrations of Areas of Animals

Wildlife Habitat	Wildlife Species	Candidate SWH		Confirmed SWH	Assessment
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Waterfowl Stopover and Staging Areas (Terrestrial) **Rationale:** Habitat important to migrating waterfowl.	American Black Duck Wood Duck Green-winged Teal Blue-winged Teal Mallard Northern Pintail Northern Shoveler American Wigeon Gadwall	CUM1 CUT1 Plus evidence of annual spring flooding from melt water or run-off within these Ecosites.	Fields with sheet water during Spring (mid-March to May). • Fields flooding during spring melt and run-off provide important invertebrate foraging habitat for migrating waterfowl. • Agricultural fields with waste grains are commonly used by waterfowl, these are not considered SWH unless they have spring sheet water available. Information Sources • Anecdotal information from the landowner, adjacent landowners or local naturalist clubs may be good information in determining occurrence. • Reports and other information available from Conservation Authorities • Sites documented through waterfowl planning processes (*e.g.* EHJV implementation plan) • Field Naturalist Clubs • Ducks Unlimited Canada • Natural Heritage Information Centre (NHIC) Waterfowl Concentration Area	Studies carried out and verified presence of an annual concentration of any listed species, evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects" • Any mixed species aggregations of 100 or more individuals required. • The flooded field ecosite habitat plus a 100-300m radius area, dependant on local site conditions and adjacent land use is the significant wildlife habitat. • Annual use of habitat is documented from information sources or field studies (annual use can be based on studies or determined by past surveys with species numbers and dates). • SWHMiST Index #7 provides development effects and mitigation measures.	Although disturbed meadow habitat is present, Azimuth's 2022 field investigations did not reveal the presence of any sheet water during spring. No suitable habitat present within the study area that would offer potentially suitable habitat for waterfowl stopover/staging.
Waterfowl Stopover and Staging Areas (Aquatic) **Rationale:** Important for local and migrant waterfowl populations during the spring or fall migration or both periods combined. Sites identified are usually only one of a few in the eco-district.	Canada Goose Cackling Goose Snow Goose American Black Duck Northern Pintail Northern Shoveler American Wigeon Gadwall Green-winged Teal Blue-winged Teal Hooded Merganser Common Merganser Lesser Scaup Greater Scaup Long-tailed Duck Surf Scoter White-winged Scoter Black Scoter Ring-necked duck Common Goldeneye Bufflehead Redhead Ruddy Duck Red-breasted Merganser Brant	MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 SWD1 SWD2 SWD3 SWD4 SWD5 SWD6 SWD7	• Ponds, marshes, lakes, bays, coastal inlets, and watercourses used during migration. Sewage treatment ponds and storm water ponds do not qualify as a SWH, however a reservoir managed as a large wetland or pond/lake does qualify. • These habitats have an abundant food supply (mostly aquatic invertebrates and vegetation in shallow water). Information Sources • Environment Canada • Naturalist clubs often are aware of staging/stopover areas • OMNRF Wetland Evaluations indicate presence of locally and regionally significant waterfowl staging. • Sites documented through waterfowl planning processes (*e.g.* EHJV implementation plan) • Ducks Unlimited projects • Element occurrence specification by Nature Serve: http://www.natureserve.org • Natural Heritage Information Centre (NHIC) Waterfowl Concentration Areas	Studies carried out and verified presence of: • Aggregations of 100 or more of listed species for 7 days, results in > 700 waterfowl use days. • Areas with annual staging of ruddy ducks, canvasbacks, and redheads are SWH. • The combined area of the ELC ecosites and a 100m radius area is the SWH. • Wetland area and shorelines associated with sites identified within the SWHTG Appendix K are significant wildlife habitat. • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects". • Annual Use of Habitat is Documented from Information Sources or Field Studies (Annual can be based on completed studies or determined from past surveys with species numbers and dates recorded). • SWHMiST Index #7 provides development effects and mitigation measures.	Although marsh ecosites are present on the property and one of the listed wildlife species was detected (Canada Goose), the defining criteria necessary to confirm SWH function are not met.

Wildlife Habitat	Wildlife Species	Candidate SWH		Confirmed SWH	Assessment
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
	Canvasback Ruddy Duck				
Shorebird Migratory Stopover Area **<u>Rationale:</u>** High quality shorebird stopover habitat is extremely rare and typically has a long history of use.	Greater Yellowlegs Lesser Yellowlegs Marbled Godwit Hudsonian Godwit Black-bellied Plover American Golden-Plover Semipalmated Plover Solitary Sandpiper Spotted Sandpiper Semipalmated Sandpiper Pectoral Sandpiper White-rumped Sandpiper Baird's Sandpiper Least Sandpiper Purple Sandpiper Stilt Sandpiper Short-billed Dowitcher Red-necked Phalarope Whimbrel Ruddy Turnstone Sanderling Dunlin	BBO1 BBO2 BBS1 BBS2 BBT1 BBT2 SDO1 SDS2 SDT1 MAM1 MAM2 MAM3 MAM4 MAM5	• Shorelines of lakes, rivers and wetlands, including beach areas, bars and seasonally flooded, muddy and un-vegetated shoreline habitats. • Great Lakes coastal shorelines, including groynes and other forms of armour rock lakeshores, are extremely important for migratory shorebirds in May to mid-June and early July to October. • Sewage treatment ponds and storm water ponds do not qualify as a SWH. <u>Information Sources</u> • Western hemisphere shorebird reserve network • Canadian Wildlife Service (CWS) Ontario Shorebird Survey • Bird Studies Canada • Ontario Nature • Local birders and naturalist clubs • Natural Heritage Information Center (NHIC) Shorebird Migratory Concentration Area	Studies confirming: • Presence of 3 or more of listed species and > 1000 shorebird use days during spring or fall migration period. (shorebird use days are the accumulated number of shorebirds counted per day over the course of the fall or spring migration period) • Whimbrel stop briefly (<24hrs) during spring migration, any site with >100 Whimbrel used for 3 years or more is significant. • The area of significant shorebird habitat includes the mapped ELC shoreline ecosites plus a 100m radius area. • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects". • SWHMiST Index #8 provides development effects and mitigation measures.	No suitable habitat present within the study area that would offer potentially suitable habitat for shorebird stopover.
Raptor Wintering Area **<u>Rationale:</u>** Sites used by multiple species of individuals and used annually are most significant	Rough-legged Hawk Red-tailed Hawk Northern Harrier American Kestrel Snowy Owl **<u>Special Concern:</u>** Short-eared Owl Bald Eagle	<u>Hawks/Owls:</u> Combination of ELC Community Series; need to have present one Community Series from each land class; Forest: FOD, FOM, FOC. Upland: CUM; CUT; CUS; CUW. <u>Bald Eagle:</u> Forest community Series: FOD, FOM, FOC, SWD, SWM or SWC on shoreline areas adjacent to large rivers or adjacent to lakes with open water (hunting area).	• The habitat provides a combination of fields and woodlands that provide roosting, foraging and resting habitats for wintering raptors. • Raptor wintering sites (hawk/owl) need to be > 20 ha with a combination of forest and upland. • Least disturbed sites, idle/fallow or lightly grazed field/meadow (>15ha) with adjacent woodlands. • Field area of the habitat is to be windswept with limited snow depth or accumulation. • Eagle sites have open water, large trees and snags available for roosting. <u>Information Sources:</u> • OMNRF Ecologist or Biologist Field Naturalist Clubs • Natural Heritage Information Center (NHIC) Raptor Winter Concentration Area • Data from Bird Studies Canada • Results of Christmas Bird Counts Reports and other information available from Conservation Authorities.	Studies confirm the use of these habitats by: • One or more Short-eared Owls or; One or more Bald Eagles or; At least 10 individuals and two of the listed hawk/owl species. • To be significant a site must be used regularly (3 in 5 years) for a minimum of 20 days by the above number of birds. • The habitat area for an Eagle winter site is the shoreline forest ecosites directly adjacent to the prime hunting area. • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects". • SWHMiST Index #10 and #11 provides development effects and mitigation measures.	Study area does not provide the combination of field/woodland habitat to provide raptor wintering function. No suitable habitat present within the study area.

Wildlife Habitat	Wildlife Species	Candidate SWH		Confirmed SWH	Assessment
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Bat Hibernacula **Rationale:** Bat hibernacula are rare habitats in all Ontario landscapes.	Big Brown Bat Tri-coloured Bat	Bat Hibernacula may be found in these ecosites: CCR1 CCR2 CCA1 CCA2 (Note: buildings are not considered to be SWH)	• Hibernacula may be found in caves, mine shafts, underground foundations and Karsts. • Active mine sites should not be considered as SWH • The locations of bat hibernacula are relatively poorly known. Information Sources • OMNRF for possible locations and contact for local experts • Natural Heritage Information Center (NHIC) Bat Hibernaculum Ministry of Northern • Development and Mines for location of mine shafts. • Clubs that explore caves (*e.g.* Sierra Club) • University Biology Departments with bat experts.	• All sites with confirmed hibernating bats are SWH. • The habitat area includes a 200m radius around the entrance of the hibernaculum, for most development types and 1000m for wind farms • Studies are to be conducted during the peak swarming period (Aug. – Sept.). Surveys should be conducted following methods outlined in the "Bats and Bat Habitats: Guidelines for Wind Power Projects. • SWHMiST Index #1 provides development effects and mitigation measures.	No caves, mine shafts, underground foundations and karsts. No suitable habitat within study area.
Bat Maternity Colonies **Rationale:** Known locations of forested bat maternity colonies are extremely rare in all Ontario landscapes.	Big Brown Bat Silver-haired Bat	Maternity colonies considered SWH are found in forested Ecosites. All ELC Ecosites in ELC Community Series: FOD FOM SWD SWM	• Maternity colonies can be found in tree cavities, vegetation and often in buildings (buildings are not considered to be SWH). • Maternity roosts are not found in caves and mines in Ontario. • Maternity colonies located in Mature deciduous or mixed forest stands with >10/ha large diameter (>25cm dbh) wildlife trees. • Female Bats prefer wildlife tree (snags) in early stages of decay, class 1-3 or class 1 or 2. • Silver-haired Bats prefer older mixed or deciduous forest and form maternity colonies in tree cavities and small hollows. Older forest areas with at least 21 snags/ha are preferred. Information Sources • OMNRF for possible locations and contact for local experts • University Biology Departments with bat experts.	• Maternity Colonies with confirmed use by; ○ >10 Big Brown Bats ○ >5 Adult Female Silver-haired Bats • The area of the habitat includes the entire woodland or a forest stand ELC Ecosite or an Ecoelement containing the maternity colonies. • Evaluation methods for maternity colonies should be conducted following methods outlined in the "Bats and Bat Habitats: Guidelines for Wind Power Projects". • SWHMiST Index #12 provides development effects and mitigation measures.	There are no forest habitat present on the property. The FODM11 community (Figure 2) is a Naturalized Deciduous Hedgerow, therefore does not offer potentially suitable habitat for this Significant Wildlife Habitat function.
Turtle Wintering Areas **Rationale:** Generally sites are the only known sites in the area. Sites with the highest number of individuals are most significant.	Midland Painted Turtle **Special Concern:** Northern Map Turtle Snapping Turtle	Snapping and Midland Painted Turtles; ELC Community Classes; SW, MA, OA and SA, ELC Community Series; FEO and BOO Northern Map Turtle; Open Water areas such as deeper rivers or streams and lakes with current can also be used as over-wintering habitat.	• For most turtles, wintering areas are in the same general area as their core habitat. Water has to be deep enough not to freeze and have soft mud substrates. • Over-wintering sites are permanent water bodies, large wetlands, and bogs or fens with adequate Dissolved Oxygen. • Man-made ponds such as sewage lagoons or storm water ponds should not be considered SWH. Information Sources • EIS studies carried out by Conservation Authorities. • Local field naturalists and experts, as well as university herpetologists may also know where to find some of these sites. • OMNRF Ecologist or Biologist • Field Naturalist clubs	• Presence of 5 over-wintering Midland Painted Turtles is significant. • One or more Northern Map Turtle or Snapping Turtle over-wintering within a wetland is significant. • The mapped ELC ecosite area with the over wintering turtles is the SWH. If the hibernation site is within a stream or river, the deep-water pool where the turtles are over wintering is the SWH. • Over wintering areas may be identified by searching for congregations (Basking Areas) of turtles on warm, sunny days during the fall (Sept. – Oct.) or spring (Mar. – May) • Congregation of turtles is more common where wintering areas are limited and therefore significant • SWHMiST Index #28 provides development effects	Although riparian wetland is present within the study area, the wetland conditions within study area is not considered suitable for overwintering turtles as they only contained some standing water in the early spring but were mostly dry by late May. Therefore, the documented wetland areas are not permanent, large and do not appear to be of sufficient depth for wintering. Therefore, the study area does not offer potentially suitable habitat associated with this Significant Wildlife Habitat Function.

Wildlife Habitat	Wildlife Species	Candidate SWH		Confirmed SWH	Assessment
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
			• Natural Heritage Information Center (NHIC)	and mitigation measures for turtle wintering habitat.	
Reptile Hibernaculum **Rationale:** Generally sites are the only known sites in the area. Sites with the highest number of individuals are most significant.	**Snakes:** Eastern Gartersnake Northern Watersnake Northern Red-bellied Snake Northern Brownsnake Smooth Green Snake Northern Ring-necked Snake **Special Concern:** Milksnake Eastern Ribbonsnake **Lizard:** **Special Concern** (Southern Shield population)**:** Five-lined Skink	For all snakes, habitat may be found in any ecosite other than very wet ones. Talus, Rock Barren, Crevice, Cave, and Alvar sites may be directly related to these habitats. Observations or congregations of snakes on sunny warm days in the spring or fall is a good indicator. For Five-lined Skink, ELC Community Series of FOD and FOM and Ecosites: FOC1 FOC3	• For snakes, hibernation takes place in sites located below frost lines in burrows, rock crevices and other natural or naturalized locations. The existence of features that go below frost line; such as rock piles or slopes, old stone fences, and abandoned crumbling foundations assist in identifying candidate SWH. • Areas of broken and fissured rock are particularly valuable since they provide access to subterranean sites below the frost line. • Wetlands can also be important over-wintering habitat in conifer or shrub swamps and swales, poor fens, or depressions in bedrock terrain with sparse trees or shrubs with sphagnum moss or sedge hummock ground cover. • Five-lined skink prefer mixed forests with rock outcrop openings providing cover rock overlaying granite bedrock with fissures. Information Sources • In spring, local residents or landowners may have observed the emergence of snakes on their property (*e.g.* old dug wells). • Reports and other information available from Conservation Authorities. • Field Naturalists clubs • University herpetologists • Natural Heritage Information Center (NHIC) • OMNRF ecologist or biologist may be aware of locations of wintering skinks	Studies confirming: • Presence of snake hibernacula used by a minimum of five individuals of a snake sp. or; individuals of two or more snake spp. • Congregations of a minimum of five individuals of a snake sp. or; individuals of two or more snake spp. near potential hibernacula (*e.g.* foundation or rocky slope) on sunny warm days in Spring (Apr/May) and Fall (Sept/Oct) • Note: If there are Special Concern Species present, then site is SWH • Note: Sites for hibernation possess specific habitat parameters (*e.g.* temperature, humidity, *etc.*) and consequently are used annually, often by many of the same individuals of a local population (i.e. strong hibernation site fidelity). Other critical life processes (*e.g.* mating) often take place in close proximity to hibernacula. The feature in which the hibernacula is located plus a 30 m radius area is the SWH. • SWHMiST Index #13 provides development effects and mitigation measures for snake hibernacula. • Presence of any active hibernaculum for skink is significant. • SWHMiST Index #37 provides development effects and mitigation measures for five-lined skink wintering habitat.	No features were identified on the property that could provide suitable reptile hibernaculum. No potentially suitable habitat within study area.
Colonially -Nesting Bird Breeding Habitat (Bank and Cliff) **Rationale:** Historical use and number of nests in a colony make this habitat significant. An identified colony can be very important to local populations. All swallow population are declining in Ontario.	Cliff Swallow Northern Rough-winged Swallow (this species is not colonial but can be found in Cliff Swallow colonies)	Eroding banks, sandy hills, borrow pits, steep slopes, and sand piles. Cliff faces, bridge abutments, silos, barns. Habitat found in the following ecosites: CUM1 CUT1 CUS1 BLO1 BLS1 BLT1 CLO1 CLS1 CLT1	• Any site or areas with exposed soil banks, undisturbed or naturally eroding that is not a licensed/permitted aggregate area. • Does not include man-made structures (bridges or buildings) or recently (2 years) disturbed soil areas, such as berms, embankments, soil or aggregate stockpiles. • Does not include a licensed/permitted Mineral Aggregate Operation. Information Sources • Reports and other information available from Conservation Authorities. • Ontario Breeding Bird Atlas • Bird Studies Canada; *NatureCounts* http://www.birdscanada.org/birdmon/ • Field Naturalist Clubs.	Studies confirming: • Presence of 1 or more nesting sites with 8or more cliff swallow pairs and/or rough-winged swallow pairs during the breeding season. • A colony identified as SWH will include a 50m radius habitat area from the peripheral nests. • Field surveys to observe and count swallow nests are to be completed during the breeding season. Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”. • SWHMiST Index #4 provides development effects and mitigation measures.	The berm located within the western portion of the study area has an exposed vertical face (Figure 2). However, this area was visually surveyed in June and there was no evidence of any swallow activity. No Bank, Cliff or Northern Rough-winged Swallows were observed during Azimuth’s 2022 dawn breeding bird surveys. No suitable habitat within the study area.

Wildlife Habitat	Wildlife Species	Candidate SWH		Confirmed SWH	Assessment
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Colonially-Nesting Bird Breeding Habitat (Tree/Shrubs) **Rationale:** Large colonies are important to local bird population, typically sites are only known colony in area and are used annually.	Great Blue Heron Black-crowned Night-Heron Great Egret Green Heron	SWM2 SWM3 SWM5 SWM6 SWD1 SWD2 SWD3 SWD4 SWD5 SWD6 SWD7 FET1	• Nests in live or dead standing trees in wetlands, lakes, islands, and peninsulas. Shrubs and occasionally emergent vegetation may also be used. • Most nests in trees are 11 to 15 m from ground, near the top of the tree. Information Sources • Ontario Breeding Bird Atlas, colonial nest records. • Ontario Heronry Inventory 1991 available from Bird Studies Canada or NHIC (OMNRF). • Natural Heritage Information Center (NHIC) Mixed Wader Nesting Colony • Aerial photographs can help identify large heronries. • Reports and other information available from CAs. • MNRF District Offices • Local naturalist clubs	Studies confirming: • Presence of 5 or more active nests of Great Blue Heron or other listed species. • The habitat extends from the edge of the colony and a minimum 300m radius or extent of the Forest Ecosite containing the colony or any island <15.0ha with a colony is the SWH. • Confirmation of active heronries are to be achieved through site visits conducted during the nesting season (April to August) or by evidence such as the presence of fresh guano, dead young and/or eggshells. • SWHMiST Index #5 provides development effects and mitigation measures.	No suitable habitat within study area. No heron or egret nests observed within the study area.
Colonially-Nesting Bird Breeding Habitat (Ground) **Rationale:** Colonies are important to local bird population, typically sites are only known colony in area and are used annually.	Herring Gull Great Black-backed Gull Little Gull Ring-billed Gull Common Tern Caspian Tern Brewer's Blackbird	Any rocky island or peninsula (natural or artificial) within a lake or large river (two-lined on a 1;50,000 NTS map). Close proximity to watercourses in open fields or pastures with scattered trees or shrubs (Brewer's Blackbird) MAM1 – 6; MAS1 – 3; CUM CUT CUS	• Nesting colonies of gulls and terns are on islands or peninsulas associated with open water or in marshy areas. • Brewers Blackbird colonies are found loosely on the ground in low bushes in close proximity to streams and irrigation ditches within farmlands. Information Sources • Ontario Breeding Bird Atlas , rare/colonial species records. • Canadian Wildlife Service • Reports and other information available from CAs. • Natural Heritage Information Center (NHIC) Colonial Waterbird Nesting Area • MNRF District Offices • Field Naturalist clubs	Studies confirming: • Presence of > 25 active nests for Herring Gulls or Ring-billed Gulls, >5 active nests for Common Tern or >2 active nests for Caspian Tern. • Presence of 5 or more pairs for Brewer's Blackbird. • Any active nesting colony of one or more Little Gull, and Great Black-backed Gull is significant. • The edge of the colony and a minimum 150m radius area of habitat, or the extent of the ELC ecosites containing the colony or any island <3.0ha with a colony is the SWH. • Studies would be done during May/June when actively nesting. Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects". • SWHMiST Index #6 provides development effects and mitigation measures.	Not a rocky island/peninsula or on a lake/large river. No suitable habitat within study area.

Wildlife Habitat	Wildlife Species	Candidate SWH		Confirmed SWH	Assessment
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Migratory Butterfly Stopover Areas **Rationale:** Butterfly stopover areas are extremely rare habitats and are biologically important for butterfly species that migrate south for the winter.	Painted Lady Red Admiral Special Concern Monarch	Combination of ELC Community Series; need to have present one Community Series from each land class: Field: CUM CUT CUS Forest: FOC FOD FOM CUP Anecdotally, a candidate site for butterfly stopover will have a history of butterflies being observed.	A butterfly stopover area will be a minimum of 10 ha in size with a combination of field and forest habitat present, and will be located within 5 km of Lake Ontario. • The habitat is typically a combination of field and forest, and provides the butterflies with a location to rest prior to their long migration south. • The habitat should not be disturbed, fields/meadows with an abundance of preferred nectar plants and woodland edge providing shelter are requirements for this habitat. • Staging areas usually provide protection from the elements and are often spits of land or areas with the shortest distance to cross the Great Lakes. Information Sources • OMNRF (NHIC) • Agriculture Canada in Ottawa may have list of butterfly experts. • Field Naturalist Clubs • Toronto Entomologists Association • Conservation Authorities	Studies confirm: • The presence of Monarch Use Days (MUD) during fall migration (Aug/Oct). MUD is based on the number of days a site is used by Monarchs, multiplied by the number of individuals using the site. Numbers of butterflies can range from 100-500/day, significant variation can occur between years and multiple years of sampling should occur. • Observational studies are to be completed and need to be done frequently during the migration period to estimate MUD. • MUD of >5000 **or** >3000 with the presence of Painted Ladies or Red Admiral's is to be considered significant. • SWHMiST Index #16 provides development effects and mitigation measures.	The study area is not located within 5km of Lake Ontario nor is it of sufficient size to be considered significant. No suitable habitat present within study area.
Landbird Migratory Stopover Areas **Rationale:** Sites with a high diversity of species as well as high numbers are most significant.	All migratory songbirds. Canadian Wildlife Service Ontario website. All migratory songbirds. Canadian Wildlife Service Ontario website:	All Ecosites associated with these ELC Community Series; FOC FOM FOD SWC SWM SWD	Woodlots need to be >10 ha in size and within 5 km of Lake Ontario. • If multiple woodlands are located along the shoreline those Woodlands <2km from Lake Ontario are more significant. • Sites have a variety of habitats; forest, grassland and wetland complexes. • The largest sites are more significant. • Woodlots and forest fragments are important habitats to migrating birds, these features located along the shore and located within 5km of Lake Ontario are Candidate SWH . Information Sources • Bird Studies Canada • Ontario Nature • Local birders and naturalist club • Ontario Important Bird Areas (IBA) Program	Studies confirm: • Use of the habitat by >200 birds/day and with >35 spp with at least 10 bird spp. recorded on at least 5 different survey dates. This abundance and diversity of migrant bird species is considered above average and significant. • Studies should be completed during spring (Apr./May) and fall (Aug/Oct) migration using standardized assessment techniques. Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects". • SWHMiST Index #9 provides development effects.	Not located within 5km of Lake Ontario. No suitable habitat present within the study area.

Wildlife Habitat	Wildlife Species	Candidate SWH		Confirmed SWH	Assessment
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Deer Yarding Areas **<u>Rationale:</u>** Winter habitat for deer is considered to be the main limiting factor for northern deer populations. In winter, deer congregate in "yards" to survive severe winter conditions. Deer yards typically have a long history of annual use by deer, yards typically represent 10-15% of an areas summer range.	White-tailed Deer	Note: OMNRF to determine this habitat. ELC Community Series providing a thermal cover component for a deer yard would include; FOM, FOC, SWM and SWC. Or these ELC Ecosites; CUP2 CUP3 FOD3 CUT	• Deer yarding areas or winter concentration areas (yards) are areas deer move to in response to the onset of winter snow and cold. This is a behavioural response and deer will establish traditional use areas. The yard is composed of two areas referred to as Stratum I and Stratum II. Stratum II covers the entire winter yard area and is usually a mixed or deciduous forest with plenty of browse available for food. Agricultural lands can also be included in this area. Deer move to these areas in early winter and generally, when snow depths reach 20 cm, most of the deer will have moved here. If the snow is light and fluffy, deer may continue to use this area until 30 cm snow depth. In mild winters, deer may remain in the Stratum II area the entire winter. • The Core of a deer yard (Stratum I) is located within the Stratum II area and is critical for deer survival in areas where winters become severe. It is primarily composed of coniferous trees (pine, hemlock, cedar, spruce) with a canopy cover of more than 60%. • OMNRF determines deer yards following methods outlined in "Selected Wildlife and Habitat Features: Inventory Manual". • Woodlots with high densities of deer due to artificial feeding are not significant.	No Studies Required: • Snow depth and temperature are the greatest influence on deer use of winter yards. Snow depths > 40cm for more than 60 days in a typically winter are minimum criteria for a deer yard to be considered as SWH. • Deer Yards are mapped by OMNRF District offices. Locations of Core or Stratum 1 and Stratum 2 Deer yards considered significant by OMNRF will be available at local MNRF offices or via Land Information Ontario (LIO). • Field investigations that record deer tracks in winter are done to confirm use (best done from an aircraft). Preferably, this is done over a series of winters to establish the boundary of the Stratum I and Stratum II yard in an "average" winter. MNRF will complete these field investigations. • If a SWH is determined for Deer Wintering Area or if a proposed development is within Stratum II yarding area then Movement Corridors are to be considered as outlined in Table 1.4.1 of this Schedule. • SWHMiST Index #2 provides development effects and mitigation measures.	Preferred forest or swamp ecosites not on the property. See Deer Winter Congregation Area assessment below.
Deer Winter Congregation Areas **<u>Rationale:</u>** Deer movement during winter in the southern areas of Ecoregion 6E are not constrained by snow depth, however deer will annually congregate in large numbers in suitable woodlands to reduce or avoid the impacts of winter conditions.	White-tailed Deer	All Forested Ecosites with these ELC Community Series; FOC FOM FOD SWC SWM SWD Conifer plantations much smaller than 50 ha may also be used.	• Woodlots will typically be >100 ha in size. Woodlots <100ha may be considered as significant based on MNRF studies or assessment. • Deer movement during winter in the southern areas of Ecoregion 6E are not constrained by snow depth, however deer will annually congregate in large numbers in suitable woodlands . • If deer are constrained by snow depth refer to the Deer Yarding Area habitat within Table 1.1 of this Schedule. • Large woodlots > 100ha and up to 1500 ha are known to be used annually by densities of deer that range from 0.1-1.5 deer/ha. • Woodlots with high densities of deer due to artificial feeding are not significant. <u>Information Sources</u> • MNRF District Offices • LIO/NRVIS	Studies confirm: • Deer management is an MNRF responsibility, deer winter congregation areas considered significant will be mapped by MNRF. • Use of the woodlot by white-tailed deer will be determined by MNRF, all woodlots exceeding the area criteria are significant, unless determined not to be significant by MNRF. • Studies should be completed during winter (Jan/Feb) when >20cm of snow is on the ground using aerial survey techniques, ground or road surveys. or a pellet count deer density survey. • If a SWH is determined for Deer Wintering Area or if a proposed development is within Stratum II yarding area then Movement Corridors are to be considered as outlined in Table 1.4.1 of this Schedule. • SWHMiST Index #2 provides development effects	No woodlands present within the study area. No suitable habitat within study area.

Wildlife Habitat	Wildlife Species	Candidate SWH		Confirmed SWH	Assessment
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
				and mitigation measures.	

Rare Vegetation Communities

Rare Vegetation Community	Candidate SWH			Confirmed SWH	Assessment
	ELC Ecosite Code	Habitat Description	Detailed Information and Sources	Defining Criteria	
Cliffs and Talus Slopes **Rationale:** Cliffs and Talus Slopes are extremely rare habitats in Ontario.	Any ELC Ecosite within Community Series: TAO TAS TAT CLO CLS CLT	A Cliff is vertical to near vertical bedrock >3m in height. A Talus Slope is rock rubble at the base of a cliff made up of coarse rocky debris.	Most cliff and talus slopes occur along the Niagara Escarpment. Information Sources • The Niagara Escarpment Commission has detailed information on location of these habitats. • OMNRF District • Natural Heritage Information Center (NHIC) has location information available on their website • Field Naturalist clubs • Conservation Authorities	• Confirm any ELC Vegetation Type for Cliffs or Talus Slopes • SWHMiST Index #21 provides development effects and mitigation measures.	No cliffs or talus slopes.
Sand Barren **Rationale;** Sand barrens are rare in Ontario and support rare species. Most Sand Barrens have been lost due to cottage development and forestry	ELC Ecosites: SBO1 SBS1 SBT1 Vegetation cover varies from patchy and barren to continuous meadow (SBO1), thicket-like (SBS1), or more closed and treed (SBT1). Tree cover always ≤ 60%.	Sand Barrens typically are exposed sand, generally sparsely vegetated and caused by lack of moisture, periodic fires and erosion. Usually located within other types of natural habitat such as forest or savannah. Vegetation can vary from patchy and barren to tree covered, but less than 60%.	A sand barren area >0.5ha in size. Information Sources • MNRF Districts • Natural Heritage Information Center (NHIC) has location information available on their website. • Field Naturalist clubs • Conservation Authorities	• Confirm any ELC Vegetation Type for Sand Barrens • Site must not be dominated by exotic or introduced species (<50% vegetative cover are exotic sp.) • SWHMiST Index #20 provides development effects and mitigation measures.	No sand barrens.
Alvar **Rationale;** Alvars are extremely rare habitats in Ecoregion 6E. Most alvars in Ontario are in Ecoregions 6E and 7E. Alvars in 6E are small and highly localized just north of the Palaeozoic-Precambrian contact.	ALO1 ALS1 ALT1 FOC1 FOC2 CUM2 CUS2 CUT2-1 CUW2 **Five Alvar Species:** 1) *Carex crawei* 2) *Panicum philadelphicum* 3) *Eleocharis compressa* 4) *Scutellaria parvula* 5) *Trichostema brachiatum* These indicator species are very specific to Alvars within Ecoregion 6E.	An alvar is typically a level, mostly unfractured calcareous bedrock feature with a mosaic of rock pavements and bedrock overlain by a thin veneer of soil. The hydrology of alvars is complex, with alternating periods of inundation and drought. Vegetation cover varies from sparse lichen-moss associations to grasslands and shrublands and comprising a number of characteristic or indicator plants. Undisturbed alvars can be phyto- and zoogeographically diverse, supporting many uncommon or are relict plant and animal species. Vegetation cover varies from patchy to barren with a less than 60% tree cover.	An Alvar site > 0.5 ha in size. Information Sources • Alvars of Ontario (2000), Federation of Ontario Naturalists. • Ontario Nature – Conserving Great Lakes Alvars. • Natural Heritage Information Center (NHIC) has location information available on their website • OMNRF Districts • Field Naturalist clubs • Conservation Authorities	• Field studies that identify four of the five **Alvar Indicator Species** at a Candidate Alvar site is Significant. • Site must not be dominated by exotic or introduced species (<50% vegetative cover are exotic sp.). • The alvar must be in excellent condition and fit in with surrounding landscape with few conflicting land uses. • SWHMiST Index #17 provides development effects and mitigation measures.	No alvar.

Rare Vegetation Community	Candidate SWH			Confirmed SWH	Assessment
	ELC Ecosite Code	Habitat Description	Detailed Information and Sources	Defining Criteria	
Old Growth Forest **Rationale;** Due to historic logging practices, extensive old growth forest is rare in the Ecoregion. Interior habitat provided by old growth forests is required by many wildlife species.	Forest Community Series: FOD FOC FOM SWD SWC SWM	Old Growth forests are characterized by heavy mortality or turnover of over-storey trees resulting in a mosaic of gaps that encourage development of a multi-layered canopy and an abundance of snags and downed woody debris.	Woodland areas 30 ha or greater in size or with at least 10 ha interior habitat assuming 100 m buffer at edge of forest. Information Sources • OMNRF Forest Resource Inventory mapping • OMNRF Districts. • Field Naturalist clubs • Conservation Authorities • Sustainable Forestry Licence (SFL) companies will possibly know locations through field operations. • Municipal forestry departments	Field Studies will determine: • If dominant trees species are >140 years old, then the area containing these trees is Significant Wildlife Habitat. • The forested area containing the old growth characteristics will have experienced no recognizable forestry activities (cut stumps will not be present). • The area of forest ecosites combined or an eco-element within an ecosite that contains the old growth characteristics is the SWH. • Determine ELC vegetation types for the forest area containing the old growth characteristics. • SWHMiST Index #23 provides development effects and mitigation measures.	No old growth forest within the study area.
Savannah **Rationale:** Savannahs are extremely rare habitats in Ontario.	TPS1 TPS2 TPW1 TPW2 CUS2	A Savannah is a tallgrass prairie habitat that has tree cover between 25 – 60%.	No minimum size to site. Site must be restored or a natural site. Remnant sites such as railway right of ways are not considered to be SWH. Information Sources • Natural Heritage Information Center (NHIC) has location information available on their website • OMNRF Districts • Field Naturalist clubs • Conservation Authorities	Field studies confirm one or more of the Savannah indicator species listed in Appendix N should be present. Note: Savannah plant spp. list from Ecoregion 6E should be used. • Area of the ELC Ecosite is the SWH. • Site must not be dominated by exotic or introduced species (<50% vegetative cover are exotic sp.). • SWHMiST Index #18 provides development effects and mitigation measures.	No savannah.
Tallgrass Prairie **Rationale:** Tallgrass Prairies are extremely rare habitats in Ontario.	TPO1 TPO2	A Tallgrass Prairie has ground cover dominated by prairie grasses. An open Tallgrass Prairie habitat has < 25% tree cover.	No minimum size to site. Site must be restored or a natural site. Remnant sites such as railway right of ways are not considered to be SWH. Information Sources • Natural Heritage Information Center (NHIC) has location information available on their website • OMNRF Districts • Field Naturalist clubs • Conservation Authorities	Field studies confirm one or more of the Prairie indicator species listed in Appendix N should be present. Note: Prairie plant spp. list from Ecoregion 6E should be used. • Area of the ELC Ecosite is the SWH. • Site must not be dominated by exotic or introduced species (<50% vegetative cover are exotic sp.). • SWHMiST Index #19 provides development effects and mitigation measures.	No tallgrass prairie.
Other Rare Vegetation Communities **Rationale:** Plant communities that often contain rare species which depend on the habitat for survival.	Provincially Rare S1, S2 and S3 vegetation communities are listed in Appendix M of the SWHTG. Any ELC Ecosite Code that has a possible ELC Vegetation Type that is Provincially Rare is Candidate SWH.	Rare Vegetation Communities may include beaches, fens, forest, marsh, barrens, dunes and swamps.	ELC Ecosite codes that have the potential to be a rare ELC Vegetation Type as outlined in appendix M The OMNRF/NHIC will have up to date listing for rare vegetation communities. Information Sources • Natural Heritage Information Center (NHIC) has location information available on their website • OMNRF Districts • Field Naturalist clubs • Conservation Authorities	Field studies should confirm if an ELC Vegetation Type is a rare vegetation community based on listing within Appendix M of SWHTG. • Area of the ELC Vegetation Type polygon is the SWH. • SWHMiST Index #37 provides development effects and mitigation measures.	Vegetation communities within the study area are heavily influenced by current land use and historical modifications. No rare vegetation communities within study area.

Specialized Habitat for Wildlife

Wildlife Habitat	Wildlife Species	Candidate SHW		Confirmed SHW	Assessment
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Waterfowl Nesting Area **Rationale;** Important to local waterfowl populations, sites with greatest number of species and highest number of individuals are significant.	American Black Duck Northern Pintail Northern Shoveler Gadwall Blue-winged Teal Green-winged Teal Wood Duck Hooded Merganser Mallard	All upland habitats located adjacent to these wetland ELC Ecosites are Candidate SWH: MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 SWT1 SWT2 SWD1 SWD2 SWD3 SWD4 **Note: includes adjacency to Provincially Significant Wetlands**	A waterfowl nesting area extends 120 m from a wetland (> 0.5 ha) or a wetland (>0.5ha) and any small wetlands (0.5ha) within 120m or a cluster of 3 or more small (<0.5 ha) wetlands within 120 m of each individual wetland where waterfowl nesting is known to occur. • Upland areas should be at least 120 m wide so that predators such as racoons, skunks, and foxes have difficulty finding nests. • Wood Ducks and Hooded Mergansers utilize large diameter trees (>40cm dbh) in woodlands for cavity nest sites. Information Sources • Ducks Unlimited staff may know the locations of particularly productive nesting sites. • OMNRF Wetland Evaluations for indication of significant waterfowl nesting habitat. • Reports and other information available from Conservation Authorities.	Studies confirmed: • Presence of 3 or more nesting pairs for listed species excluding Mallards, or; • Presence of 10 or more nesting pairs for listed species including Mallards. • Any active nesting site of an American Black Duck is considered significant. • Nesting studies should be completed during the spring breeding season (April - June). Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”. • A field study confirming waterfowl nesting habitat will determine the boundary of the waterfowl nesting habitat for the SWH, this may be greater or less than 120 m from the wetland and will provide enough habitat for waterfowl to successfully nest. • SWHMiST Index #25 provides development effects and mitigation measures.	No suitable upland habitat conducive to waterfowl nesting within the study area.
Bald Eagle and Osprey Nesting, Foraging and Perching Habitat **Rationale;** Nest sites are fairly uncommon in Eco-region 6E and are used annually by these species. Many suitable nesting locations may be lost due to increasing shoreline development pressures and scarcity of habitat.	Osprey **Special Concern** Bald Eagle	ELC Forest Community Series: FOD, FOM, FOC, SWD, SWM and SWC directly adjacent to riparian areas – rivers, lakes, ponds and wetlands	Nests are associated with lakes, ponds, rivers or wetlands along forested shorelines, islands, or on structures over water. • Osprey nests are usually at the top a tree whereas Bald Eagle nests are typically in super canopy trees in a notch within the tree’s canopy. • Nests located on man-made objects are not to be included as SWH (*e.g.* telephone poles and constructed nesting platforms). Information Sources • Natural Heritage Information Center (NHIC) compiles all known nesting sites for Bald Eagles in Ontario. • MNRF values information (LIO/NRVIS) will list known nesting locations. Note: data from NRVIS is provided as a point and does not represent all the habitat. • Nature Counts, Ontario Nest Records Scheme data. • OMNRF Districts • Check the Ontario Breeding Bird Atlas or Rare Breeding Birds in Ontario for species documented • Reports and other information available from Conservation Authorities. • Field Naturalists clubs	Studies confirm the use of these nests by: • One or more active Osprey or Bald Eagle nests in an area. • Some species have more than one nest in a given area and priority is given to the primary nest with alternate nests included within the area of the SWH. • For an Osprey, the active nest and a 300 m radius around the nest or the contiguous woodland stand is the SWH, maintaining undisturbed shorelines with large trees within this area is important. • For a Bald Eagle the active nest and a 400-800 m radius around the nest is the SWH. Area of the habitat from 400-800m is dependent on site lines from the nest to the development and inclusion of perching and foraging habitat. • To be significant a site must be used annually. When found inactive, the site must be known to be inactive for > 3 years or suspected of not being used for >5 years before being considered not significant. • Observational studies to determine nest site use, perching sites and foraging areas need to be done from mid March to mid August. • Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”. • SWHMiST Index #26 provides development effects and mitigation measures.	No forested communities present within the study area. No suitable habitat for the species, and listed species/nests not observed. As a result, the property would not be expected to provide the habitat function.

Wildlife Habitat	Wildlife Species	Candidate SHW		Confirmed SWH	Assessment
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Woodland Raptor Nesting Habitat **<u>Rationale:</u>** Nests sites for these species are rarely identified; these area sensitive habitats and are often used annually by these species.	Northern Goshawk Cooper's Hawk Sharp-shinned Hawk Red-shouldered Hawk Barred Owl Broad-winged Hawk	May be found in all forested ELC Ecosites. May also be found in SWC, SWM, SWD and CUP3	All natural or conifer plantation woodland/forest stands >30ha with >10ha of interior habitat. Interior habitat determined with a 200m buffer • Stick nests found in a variety of intermediate-aged to mature conifer, deciduous or mixed forests within tops or crotches of trees. Species such as Coopers Hawk nest along forest edges sometimes on peninsulas or small off-shore islands. • In disturbed sites, nests may be used again, or a new nest will be in close proximity to old nest. <u>Information Sources</u> • OMNRF Districts. • Check the Ontario Breeding Bird Atlas or Rare Breeding Birds in Ontario for species documented. • Check data from Bird Studies Canada. • Reports and other information available from Conservation Authorities.	Studies confirm: • Presence of 1 or more active nests from species list is considered significant. • Red-shouldered Hawk and Northern Goshawk – A 400m radius around the nest or 28 ha area of habitat is the SWH . (The 28 ha habitat area would be applied where optimal habitat is irregularly shaped around the nest). • Barred Owl – A 200m radius around the nest is the SWH. • Broad-winged Hawk and Coopers Hawk– A 100m radius around the nest is the SWH. • Sharp-Shinned Hawk – A 50m radius around the nest is the SWH. • Conduct field investigations from mid-March to end of May. The use of call broadcasts can help in locating territorial. (courting/nesting) raptors and facilitate the discovery of nests by narrowing down the search area. • SWHMiST Index #27 provides development effects and mitigation measures.	Study area does not provide the combination of habitat features required to be considered significant. No suitable habitat present within the study area.
Turtle Nesting Areas **<u>Rationale;</u>** These habitats are rare and when identified will often be the only breeding site for local populations of turtles.	Midland Painted Turtle <u>Special Concern Species</u> Northern Map Turtle Snapping Turtle	Exposed mineral soil (sand or gravel) areas adjacent (<100m) or within the following ELC Ecosites: MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 BOO1 FEO1	• Best nesting habitat for turtles are close to water and away from roads and sites less prone to loss of eggs by predation from skunks, raccoons or other animals. • For an area to function as a turtle-nesting area, it must provide sand and gravel that turtles are able to dig in and are located in open, sunny areas. Nesting areas on the sides of municipal or provincial road embankments and shoulders are not SWH. • Sand and gravel beaches adjacent to undisturbed shallow weedy areas of marshes, lakes, and rivers are most frequently used. <u>Information Sources</u> • Use Ontario Soil Survey reports and maps to help find suitable substrate for nesting turtles (well-drained sands and fine gravels). • Check the Ontario Herpetofaunal Summary Atlas records or other similar atlases for uncommon turtles; location information may help to find potential nesting habitat for them. • Natural Heritage Information Center (NHIC) • Field Naturalist clubs	Studies confirm: • Presence of 5 or more nesting Midland Painted Turtles. • One or more Northern Map Turtle or Snapping Turtle nesting is a SWH. • The area or collection of sites within an area of exposed mineral soils where the turtles nest, plus a radius of 30-100m around the nesting area dependant on slope, riparian vegetation and adjacent land use is the SWH. • Travel routes from wetland to nesting area are to be considered within the SWH as part of the 30-100m area of habitat. • Field investigations should be conducted in prime nesting season typically late spring to early summer. Observational studies observing the turtles nesting is a recommended method. • SWHMiST Index #28 provides development effects and mitigation measures for turtle nesting habitat.	Wetlands within the study area do not provide potentially suitable habitat for turtles due to their overall small size and lack of standing water. Furthermore, any exposed mineral soils are associated with the existing industrial land use (i.e. trucking) and do not represent potentially suitable habitat for nesting turtles.

Wildlife Habitat	Wildlife Species	Candidate SHW		Confirmed SWH	Assessment
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Seeps and Springs **<u>Rationale;</u>** Seeps/Springs are typical of headwater areas and are often at the source of coldwater streams.	Wild Turkey Ruffed Grouse Spruce Grouse White-tailed Deer Salamander spp.	Seeps/Springs are areas where ground water comes to the surface. Often they are found within headwater areas within forested habitats. Any forested Ecosite within the headwater areas of a stream could have seeps/springs.	Any forested area (with <25% meadow/field/pasture) within the headwaters of a stream or river system. • Seeps and springs are important feeding and drinking areas especially in the winter will typically support a variety of plant and animal species. <u>Information Sources</u> • Topographical Map • Thermography • Hydrological surveys conducted by Conservation Authorities and MOE. • Field Naturalists clubs and landowners. • Municipalities and Conservation Authorities may have drainage maps and headwater areas mapped.	Field Studies confirm: • Presence of a site with 2 or more seeps/springs should be considered SWH. • The area of a ELC forest ecosite or an ecoelement within ecosite containing the seeps/springs is the SWH. The protection of the recharge area considering the slope, vegetation, height of trees and groundwater condition need to be considered in delineation the habitat. • SWHMiST Index #30 provides development effects and mitigation measures.	No seeps and springs documented during Azimuth's field investigations. No forested habitat on the property. No potential SWH function.
Amphibian Breeding Habitat (Woodland). **<u>Rationale:</u>** These habitats are extremely important to amphibian biodiversity within a landscape and often represent the only breeding habitat for local amphibian populations.	Eastern Newt Blue-spotted Salamander Spotted Salamander Gray Treefrog Spring Peeper Western Chorus Frog Wood Frog	All Ecosites associated with these ELC Community Series; FOC FOM FOD SWC SWM SWD Breeding pools within the woodland or the shortest distance from forest habitat are more significant because they are more likely to be used due to reduced risk to migrating amphibians.	• Presence of a wetland, pond or woodland pool (including vernal pools) >500m^2 (about 25m diameter) within or adjacent (within 120m) to a woodland (no minimum size). Some small wetlands may not be mapped and may be important breeding pools for amphibians. • Woodlands with permanent ponds or those containing water in most years until mid-July are more likely to be used as breeding habitat. <u>Information Sources</u> • Ontario Herpetofaunal Summary Atlas (or other similar atlases) for records. • Local landowners may also provide assistance as they may hear spring-time choruses of amphibians on their property. • OMNRF District • OMNRF wetland evaluations • Field Naturalist clubs • Canadian Wildlife Service • Amphibian Road Call Survey • Ontario Vernal Pool Association: http://www.ontariovernalpools.org	Studies confirm; • Presence of breeding population of 1 or more of the listed newt/salamander species or 2 or more of the listed frog species with at least 20 individuals (adults or eggs masses) or 2 or more of the listed frog species with Call Level Codes of 3. • A combination of observational study and call count surveys will be required during the spring (March-June) when amphibians are concentrated around suitable breeding habitat within or near the woodland/wetlands. • The habitat is the wetland area plus a 230m radius of woodland area. If a wetland area is adjacent to a woodland, a travel corridor connecting the wetland to the woodland is to be included in the habitat. • SWHMiST Index #14 provides development effects and mitigation measures.	Results of the evening calling amphibian surveys do not meet the criteria for confirmed SWH function for amphibian breeding habitat (woodland) on the property.

Wildlife Habitat	Wildlife Species	Candidate SHW		Confirmed SWH	Assessment
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Amphibian Breeding Habitat (Wetlands) **Rationale;** Wetlands supporting breeding for these amphibian species are extremely important and fairly rare within Central Ontario landscapes.	Eastern Newt American Toad Spotted Salamander Four-toed Salamander Blue-spotted Salamander Gray Treefrog Western Chorus Frog Northern Leopard Frog Pickerel Frog Green Frog Mink Frog Bullfrog	ELC Community Classes SW, MA, FE, BO, OA and SA. Typically these wetland ecosites will be isolated (>120m) from woodland ecosites, however larger wetlands containing predominantly aquatic species (*e.g.* Bull Frog) may be adjacent to woodlands.	• Wetlands>500m^2 (about 25m diameter), supporting high species diversity are significant; some small or ephemeral habitats may not be identified on MNRF mapping and could be important amphibian breeding habitats. • Presence of shrubs and logs increase significance of pond for some amphibian species because of available structure for calling, foraging, escape and concealment from predators. • Bullfrogs require permanent water bodies with abundant emergent vegetation. Information Sources • Ontario Herpetofaunal Summary Atlas (or other similar atlases) • Canadian Wildlife Service Amphibian Road Surveys and Backyard Amphibian Call Count. • OMNRF Districts and wetland evaluations • Reports and other information available from Conservation Authorities	Studies confirm: • Presence of breeding population of 1 or more of the listed newt/salamander species or 2 or more of the listed frog/toad species with at least 20 individuals (adults or eggs masses) or 2 or more of the listed frog/toad species with Call Level Codes of 3. **or;** Wetland with confirmed breeding Bullfrogs are significant. • The ELC ecosite wetland area and the shoreline are the SWH. • A combination of observational study and call count surveys will be required during the spring (March-June) when amphibians are concentrated around suitable breeding habitat within or near the wetlands. • If a SWH is determined for Amphibian Breeding Habitat (Wetlands) then Movement Corridors are to be considered as outlined in Table 1.4.1 of this Schedule. • SWHMiST Index #15 provides development effects and mitigation measures.	Results of the evening calling amphibian surveys do not meet the criteria for confirmed SWH function for amphibian breeding habitat (wetland) on the property.
Woodland Area-Sensitive Bird Breeding Habitat **Rationale:** Large, natural blocks of mature woodland habitat within the settled areas of Southern Ontario are important habitats for area sensitive interior forest song birds.	Yellow-bellied Sapsucker Red-breasted Nuthatch Veery Blue-headed Vireo Northern Parula Black-throated Green Warbler Blackburnian Warbler Black-throated Blue Warbler Ovenbird Scarlet Tanager Winter Wren **Special Concern:** Cerulean Warbler Canada Warbler	All Ecosites associated with these ELC Community Series; FOC FOM FOD SWC SWM SWD	Habitats where interior forest breeding birds are breeding, typically large mature (>60 yrs old) forest stands or woodlots >30 ha. • Interior forest habitat is at least 200 m from forest edge habitat. Information Sources • Local bird clubs. • Canadian Wildlife Service (CWS) for the location of forest bird monitoring. • Bird Studies Canada conducted a 3-year study of 287 woodlands to determine the effects of forest fragmentation on forest birds and to determine what forests were of greatest value to interior species. • Reports and other information available from Conservation Authorities.	Studies confirm: • Presence of nesting or breeding pairs of 3 or more of the listed wildlife species. • Note: any site with breeding Cerulean Warblers or Canada Warblers is to be considered SWH. • Conduct field investigations in spring and early summer when birds are singing and defending their territories. • Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”. • SWHMiST Index #34 provides development effects and mitigation measures.	No woodland is present within the study area.

Habitat for Species of Conservation Concern (Not including Endangered or Threatened Species)

Wildlife Habitat	Wildlife Species	Candidate SHW		Confirmed SWH	Assessment
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Marsh Breeding Bird Habitat **Rationale;** Wetlands for these bird species are typically productive and fairly rare in Southern Ontario landscapes.	American Bittern Virginia Rail Sora Common Moorhen American Coot Pied-billed Grebe Marsh Wren Sedge Wren Common Loon Sandhill Crane Green Heron Trumpeter Swan **Special Concern:** Black Tern Yellow Rail	MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 SAS1 SAM1 SAF1 FEO1 BOO1 For Green Heron: All SW, MA and CUM1 sites.	• Nesting occurs in wetlands. • All wetland habitat is to be considered as long as there is shallow water with emergent aquatic vegetation present. • For Green Heron, habitat is at the edge of water such as sluggish streams, ponds and marshes sheltered by shrubs and trees. Less frequently, it may be found in upland shrubs or forest a considerable distance from water. Information Sources • OMNRF District and wetland evaluations. • Field Naturalist clubs • Natural Heritage Information Center (NHIC) Records. • Reports and other information available from Conservation Authorities. • Ontario Breeding Bird Atlas	Studies confirm: • Presence of 5 or more nesting pairs of Sedge Wren or Marsh Wren or 1 pair of Sandhill Cranes; **or** breeding by any combination of 5 or more of the listed species. • Note: any wetland with breeding of 1 or more Black Terns, Trumpeter Swan, Green Heron or Yellow Rail is SWH. • Area of the ELC ecosite is the SWH. • Breeding surveys should be done in May/June when these species are actively nesting in wetland habitats. • Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”. • SWHMiST Index #35 provides development effects and mitigation measures.	The study area does not provide habitat for marsh breeding birds. None of the listed species were observed within the study area. No suitable habitat within the study area.
Open Country Bird Breeding Habitat Sources Defining Criteria **Rationale;** This wildlife habitat is declining throughout Ontario and North America. Species such as the Upland Sandpiper have declined significantly the past 40 years based on CWS (2004) trend records.	Upland Sandpiper Grasshopper Sparrow Vesper Sparrow Northern Harrier Savannah Sparrow **Special Concern** Short-eared Owl	CUM1 CUM2	Large grassland areas (includes natural and cultural fields and meadows) >30 ha. • Grasslands not Class 1 or 2 agricultural lands, and not being actively used for farming (i.e. no row cropping or intensive hay or livestock pasturing in the last 5 years). • Grassland sites considered significant should have a history of longevity, either abandoned fields, mature hayfields and pasturelands that are at least 5 years or older. • The Indicator bird species are area sensitive requiring larger grassland areas than the common grassland species. Information Sources • Agricultural land classification maps, Ministry of Agriculture. • Local bird clubs. • Ontario Breeding Bird Atlas • Reports and other information available from Conservation Authorities.	Field Studies confirm: • Presence of nesting or breeding of 2 or more of the listed species. • A field with 1 or more breeding Short-eared Owls is to be considered SWH. • The area of SWH is the contiguous ELC ecosite field areas. • Conduct field investigations of the most likely areas in spring and early summer when birds are singing and defending their territories. • Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”. • SWHMiST Index #32 provides development effects and mitigation measures.	The study area does not provide habitat for grassland birds. No suitable habitat within the study area.
Shrub/Early Successional Bird Breeding Habitat **Rationale;** This wildlife habitat is declining throughout Ontario and North America. The Brown Thrasher has declined significantly over the past 40 years based on CWS (2004) trend records.	Indicator Spp: Brown Thrasher Clay-coloured Sparrow Common Spp. Field Sparrow Black-billed Cuckoo Eastern Towhee Willow Flycatcher **Special Concern:** Yellow-breasted Chat Golden-winged Warbler	CUT1 CUT2 CUS1 CUS2 CUW1 CUW2 Patches of shrub ecosites can be complexed into a larger habitat for some bird species	Large field areas succeeding to shrub and thicket habitats>10ha in size. • Shrub land or early successional fields, not class 1 or 2 agricultural lands, not being actively used for farming (*i.e.* no row-cropping, haying or live-stock pasturing in the last 5 years). • Shrub thicket habitats (>10 ha) are most likely to support and sustain a diversity of these species. • Shrub and thicket habitat sites considered significant should have a history of longevity, either abandoned fields or pasturelands. Information Sources • Agricultural land classification maps, Ministry of Agriculture. • Local bird clubs • Ontario Breeding Bird Atlas • Reports and other information available from Conservation Authorities.	Field Studies confirm: • Presence of nesting or breeding of 1 of the indicator species and at least 2 of the common species. • A habitat with breeding Yellow-breasted Chat or Golden-winged Warbler is to be considered as Significant Wildlife Habitat. • The area of the SWH is the contiguous ELC ecosite field/thicket area. • Conduct field investigations of the most likely areas in spring and early summer when birds are singing and defending their territories. • Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”. • SWHMiST Index #33 provides development effects and mitigation measures.	The study area does not provide habitat for shrub/early successional birds. No suitable habitat within the study area.

Wildlife Habitat	Wildlife Species	Candidate SHW		Confirmed SWH	Assessment
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Terrestrial Crayfish **Rationale:** Terrestrial Crayfish are only found within SW Ontario in Canada and their habitats are very rare.	Chimney or Digger Crayfish; (*Fallicambarus fodiens*) Devil Crayfish or Meadow Crayfish; (*Cambarus Diogenes*)	MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 MAS1 MAS2 MAS3 SWD SWT SWM CUM1 with inclusions of above meadow marsh or swamp ecosites can be used by terrestrial crayfish.	Wet meadow and edges of shallow marshes (no minimum size) should be surveyed for terrestrial crayfish. • Constructs burrows in marshes, mudflats, meadows, the ground can't be too moist. Can often be found far from water. • Both species are a semi-terrestrial burrower which spends most of its life within burrows consisting of a network of tunnels. Usually the soil is not too moist so that the tunnel is well formed. Information Sources • Information sources from "Conservation Status of Freshwater Crayfishes" by Dr. Premek Hamr for the WWF and CNF March 1998.	Studies Confirm: • Presence of 1 or more individuals of species listed or their chimneys (burrows) in suitable meadow marsh, swamp or moist terrestrial sites. • Area of ELC ecosite or an ecoelement area of meadow marsh or swamp within the larger ecosite area is the SWH. • Surveys should be done April to August in temporary or permanent water. Note the presence of burrows or chimneys are often the only indicator of presence, observance or collection of individuals is very difficult. • SWHMiST Index #36 provides development effects and mitigation measures.	No crayfish chimneys were documented during Azimuth's field investigations.
Special Concern and Rare Wildlife Species **Rationale:** These species are quite rare or have experienced significant population declines in Ontario.	All Special Concern and Provincially Rare (S1-S3, SH) plant and animal species. Lists of these species are tracked by the Natural Heritage Information Centre.	All plant and animal element occurrences (EO) within a 1 or 10km grid. Older element occurrences were recorded prior to GPS being available, therefore location information may lack accuracy.	When an element occurrence is identified within a 1 or 10 km grid for a Special Concern or provincially Rare species; linking candidate habitat on the site needs to be completed to ELC Ecosites Information Sources • Natural Heritage Information Centre (NHIC) will have Special Concern and Provincially Rare (S1-S3, SH) species lists with element occurrences data. • NHIC Website "Get Information" : http://nhic.mnr.gov.on.ca • Ontario Breeding Bird Atlas • Expert advice should be sought as many of the rare spp. have little information available about their requirements.	Studies Confirm: • Assessment/inventory of the site for the identified special concern or rare species needs to be completed during the time of year when the species is present or easily identifiable. • The area of the habitat to the finest ELC scale that protects the habitat form and function is the SWH, this must be delineated through detailed field studies. The habitat needs be easily mapped and cover an important life stage component for a species *e.g.* specific nesting habitat or foraging habitat. • SWHMiST Index #37 provides development effects and mitigation measures.	Barn Swallow was observed during Azimuth's breeding bird surveys (Table 4). There were no Barn Swallow nests observed on the residential homes present within the study area. Due to lack of nesting habitat for the species, Barn Swallow will not be considered further . No additional Special Concern or provincially rare species documented during Azimuth's 2022 field investigations. Habitat features within the study area do not offer potentially suitable habitat for any special concern or rare species.

Animal Movement Corridors

Wildlife Habitat	Wildlife Species	Candidate SHW		Confirmed SWH	Assessment
		ELC Ecosite	Habitat Criteria and Information Sources	Defining Criteria	
Amphibian Movement Corridors **Rationale;** Movement corridors for amphibians moving from their terrestrial habitat to breeding habitat can be extremely important for local populations.	Eastern Newt American Toad Spotted Salamander Four-toed Salamander Blue-spotted Salamander Gray Treefrog Western Chorus Frog Northern Leopard Frog Pickerel Frog Green Frog Mink Frog Bullfrog	Corridors may be found in all ecosites associated with water. • Corridors will be determined based on identifying the significant breeding habitat for these species in Table 1.1	Movement corridors between breeding habitat and summer habitat. • Movement corridors must be determined when Amphibian breeding habitat is confirmed as SWH from Table 1.2.2 (**Amphibian Breeding Habitat –Wetland)** of this Schedule. Information Sources • MNRF District Office • Natural Heritage Information Center (NHIC) • Reports and other information available from Conservation Authorities. • Field Naturalist Clubs	• Field Studies must be conducted at the time of year when species are expected to be migrating or entering breeding sites. • Corridors should consist of native vegetation, with several layers of vegetation. • Corridors unbroken by roads, waterways or bodies, and undeveloped areas are most significant. • Corridors should have at least 15m of vegetation on both sides of waterway or be up to 200m wide of woodland habitat and with gaps <20m. • Shorter corridors are more significant than longer corridors, however amphibians must be able to get to and from their summer and breeding habitat. • SWHMiST Index #40 provides development effects and mitigation measures.	No amphibian breeding function that would be considered SWH. No potential amphibian movement corridor function within study area.
Deer Movement Corridors **Rationale:** Corridors important for all species to be able to access seasonally important life-cycle habitats or to access new habitat for dispersing individuals by minimizing their vulnerability while travelling.	White-tailed Deer	Corridors may be found in all forested ecosites. A Project Proposal in Stratum II Deer Wintering Area has potential to contain corridors.	Movement corridor must be determined when **Deer Wintering Habitat** is confirmed as SWH from Table 1.1 of this schedule. • A deer wintering habitat identified by the OMNRF as SWH in Table 1.1 of this Schedule will have corridors that the deer use during fall migration and spring dispersion. • Corridors typically follow riparian areas, woodlots, areas of physical geography (ravines, or ridges). Information Sources • MNRF District Office • Natural Heritage Information Center (NHIC). • Reports and other information available from Conservation Authorities. • Field Naturalist Clubs	• Studies must be conducted at the time of year when deer are migrating or moving to and from winter concentration areas. • Corridors that lead to a deer wintering habitat should be unbroken by roads and residential areas. • Corridors should be at least 200m wide with gaps <20m and if following riparian area with at least 15m of vegetation on both sides of waterway. • Shorter corridors are more significant than longer corridors. • SWHMiST Index #39 provides development effects and mitigation measures.	No deer wintering habitat present. Habitat criteria not met; habitat function not expected to occur.

Exceptions for EcoRegion 6E

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

APPENDICES

Appendix A: Municipal Information
Appendix B: TRCA Information
Appendix C: Headwater Drainage Feature Assessment
Appendix D: Provincial and Federal Information

APPENDIX A

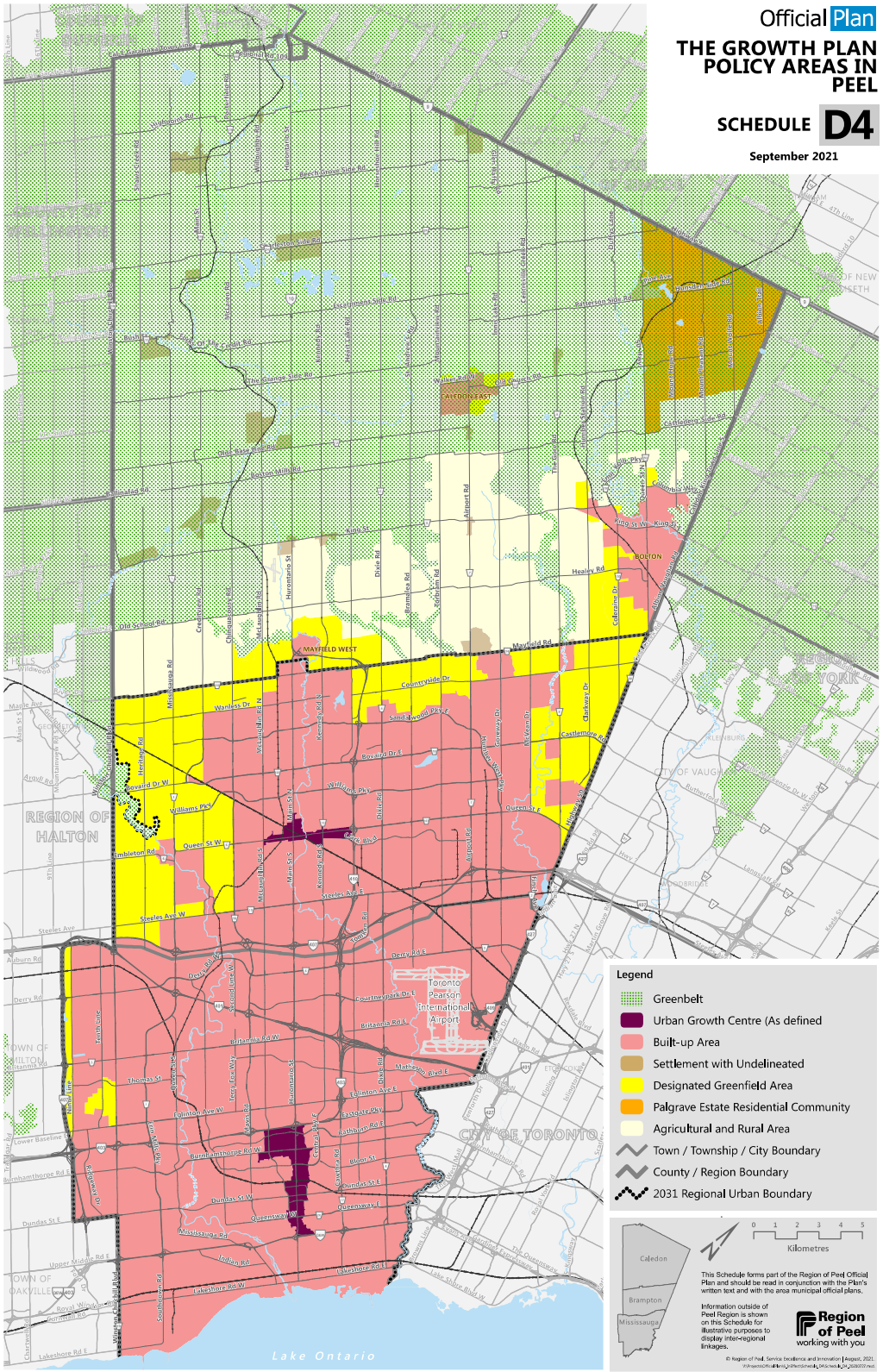
Municipal Information

Official Plan

THE GROWTH PLAN POLICY AREAS IN PEEL

SCHEDULE D4

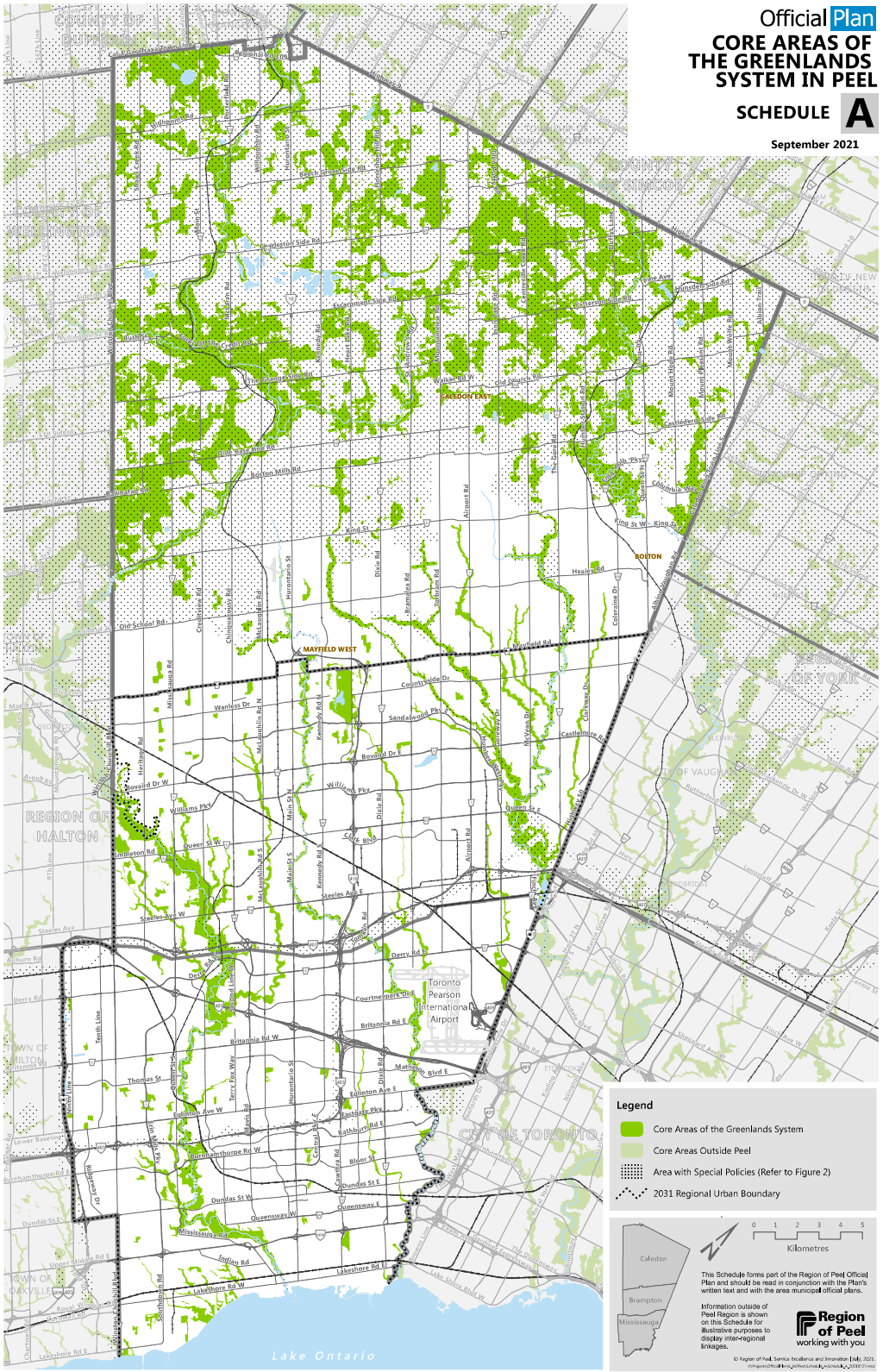
September 2021



This Schedule forms part of the Region of Peel Official Plan and should be read in conjunction with the Plan's written text and with the area municipal official plans.

Information outside of Peel Region is shown on this Schedule for illustrative purposes to display inter-regional linkages.

Region of Peel
working with you


Official Plan
CORE AREAS OF THE GREENLANDS SYSTEM IN PEEL
SCHEDULE A
September 2021
CALEDON EAST
BOLTON
MAYFIELD WEST
REGION OF HALTON
CITY OF TORONTO
REGION OF YORK
Toronto Pearson International Airport
Lake Ontario
Legend
Core Areas of the Greenlands System
Core Areas Outside Peel
Area with Special Policies (Refer to Figure 2)
2031 Regional Urban Boundary
Caledon
Brampton
Mississauga
0 1 2 3 4 5
Kilometres
This Schedule forms part of the Region of Peel Official Plan and should be read in conjunction with the Plan's written text and with the area municipal official plans.
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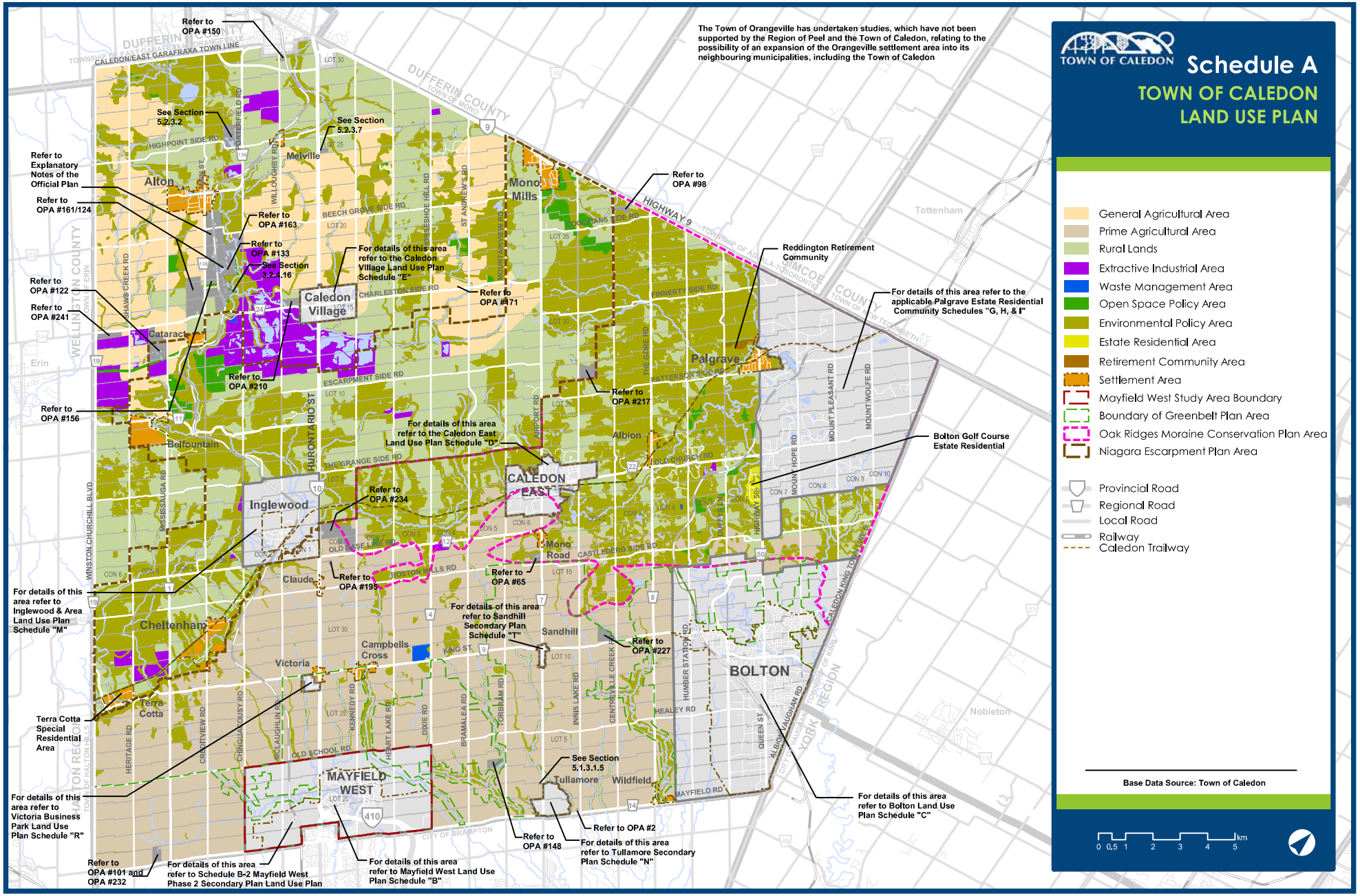
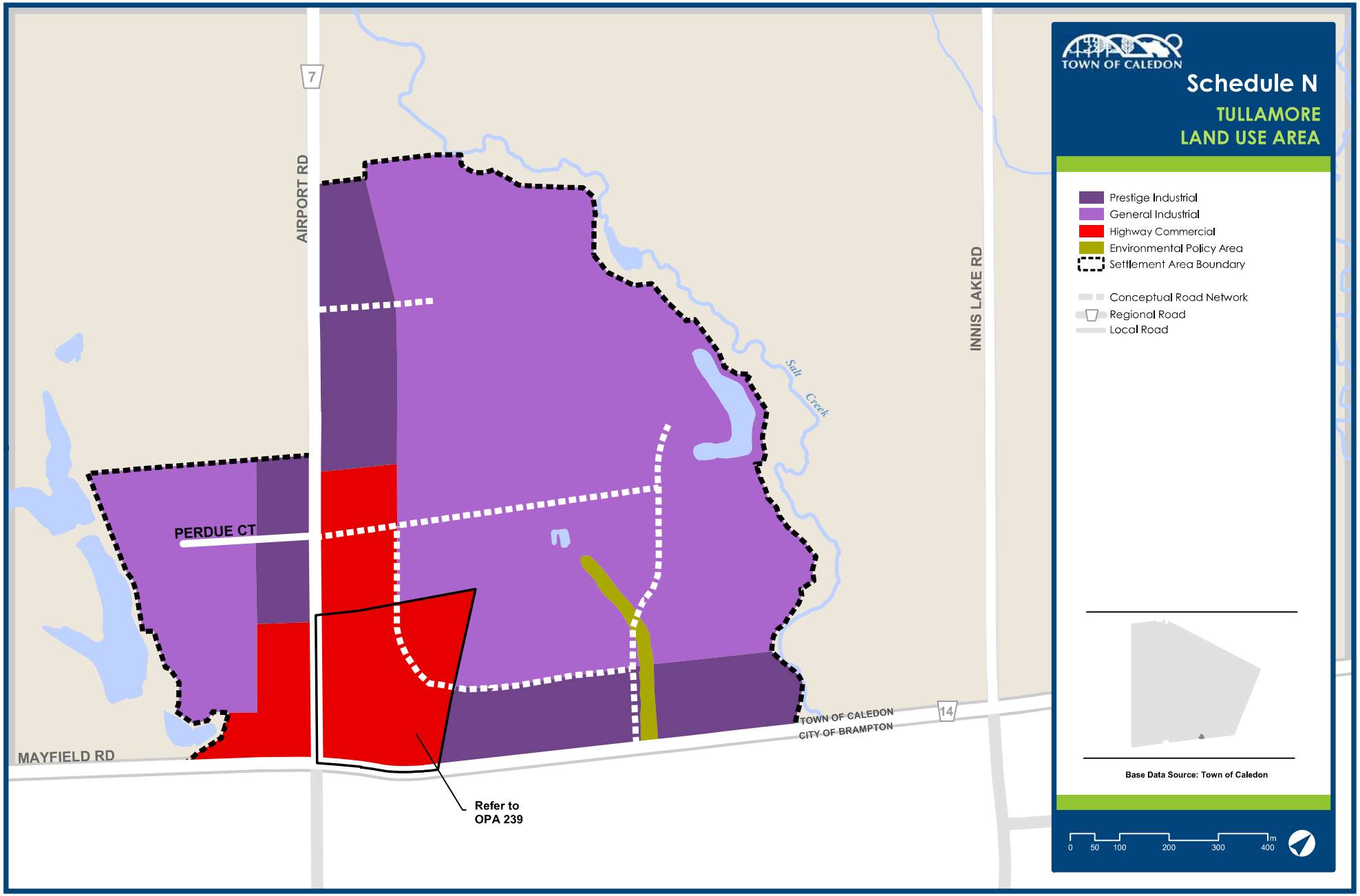
Region of Peel
working with you



April 2018 Office Consolidation



April 2018 Office Consolidation

SAVED: 2 April 2018

FILE: S:\POLICY SECTION\GIS\official_plan\mxd\9-april_2018

SAVED BY: bloverock

APPENDIX B

TRCA Information

Map Layers

TRCA Conceptual Regulated Area

Parcel Boundary

Appendix B: TRCA Regulated Lands (Information obtained from TRCA website: www.trca.ca) Note: Properties contained within red circle drawn on map.

Lisa Moran

To: Clare Riepma
Subject: Options for Resolving Outstanding Violation - 6230 and 6186 Mayfield Road

---

From: Nick Cascone <Nick.Cascone@trca.ca>
Sent: October 29, 2021 1:37 PM
To: Clare Riepma <riepma@riepma.ca>
Cc: 'Bicky Dhugga' <bicky@RZCDLAW.COM>; Chris MCGowan <chris@mandmcarriers.com>; Paul Nowak <Paul.Nowak@trca.ca>; Kyle Munro <Kyle.Munro@caledon.ca>
Subject: Options for Resolving Outstanding Violation - 6230 and 6186 Mayfield Road

Hello Clare,
Thanks again for having us out on site earlier this week. Further to the discussion we held, provided below is additional information on the two options for addressing the outstanding violation charged to the site. As a point of clarification to preface the options, please note that the TRCA regulates the stream corridor traversing the subject lands. The stream corridor does not have a drainage area large enough to warrant floodplain mapping, nor does it contain defined slopes. As such, TRCA regulates 15 metres from the meander belt (on either side) of the feature. Further, in accordance with TRCA's Living City Policies, any development and/or site alteration occurring within TRCA's Regulated Area requires a 10 metre buffer from the outermost limit of the stream corridor (i.e the meander belt).

In addition to the above, thank for providing me with the environmental work completed for the site in 2016. Based on my review of this work, it appears that a realignment of the subject stream corridor is contemplated. Is this realignment still being proposed? If so, we must take that into consideration as part of resolving the outstanding violation. We do not want to implement restoration works for the corridor if it is be relocated only a few years down the line. I do recall you mentioning that there are currently no plan to relocate the watercourse, however, please confirm this is still the case.

If the watercourse is to be maintained in-situ, the options for addressing the outstanding violation are discussed below:

Option 1 – Full Removal of Fill within TRCA's Regulated Area and Full Restoration within Feature and Buffer (No Permit Required):
This option involves the complete removal of unauthorized fill from within TRCA's Regulated Area and full restoration within the feature(s) and buffer area. The following materials will be required for this option:

- In order to establish the historic limit of natural features and hazards on the site, the following study will be necessary:
    - Delineation/Confirmation of the meander belt using TRCA's Belt Width Delineation Procedures: https://trcaca.s3.ca-central-1.amazonaws.com/app/uploads/2021/10/20103125/Belt-Width-Delineation-Procedures.pdf
- Once the meander belt limit has been determined, it should be plotted/identified on an existing conditions plan. The plan should also include TRCA's Regulated Area (15 metres from the meander belt) as well as setback/buffer area (10 metres from the meander belt).
- The existing conditions plan should also clearly identify the location, volume and depth of fill within TRCA's Regulated Area for the purposes of restoring the area back to a pre-violation condition. Please note that we are flexible as to how this is determined, but boreholes may ultimately be required if an accurate assessment as to the amount of fill cannot be obtained through other means.
- Once the historic limit of the stream corridor is established and the extent of fill confirmed, a grading plan will be required to demonstrate the removal of fill and culverts from within TRCA's Regulated Area and how the historic feature/hazard limits will be re-established.

- A restoration plan is necessary to restore the stream corridor and 10 metre buffer areas. The restoration plan must be completed by a qualified environmental consultant and should include the following:
    - Native trees and shrubs, as well as a native seed mix to stabilize the soils;
    - Restoration should achieve 80% cover within the feature and buffer;
    - While 5 metre area between the 10 metre buffer and TRCA's Regulated Area (15 metres) does not require ecological restoration, it should be stabilized with seed and/or sod.
- An Erosion and Sediment Control (ESC) plan is required in accordance with TRCA's guideline: https://sustainabletechnologies.ca/app/uploads/2020/01/ESC-Guide-for-Urban-Construction_FINAL.pdf

With this option, a TRCA permit pursuant to Ontario Regulation 166/06 will not be required as we will be putting the feature back to an original state, with no unauthorized fill remaining within TRCA's Regulated Area. TRCA staff will be required to review the above noted materials and provide sign-off on the proposed restoration solution. The Enforcement Officer (Paul) will help to supervise site works and can clear the violation once they have been completed in accordance with the approved plan.

Option 2 – Partial Removal of Fill and Full Restoration within Feature and Buffer (Permit Required):
If your client would like to keep fill within TRCA's Regulated Area (i.e. in the 5 metres between the buffer and extent of Regulated Area) or propose a minor alteration to the original limit of the natural features/hazards (subject to approval), a permit will be required. For this option, the following materials will be necessary:

- All materials listed within Option 1. However, in this scenario, the grading plan will also include the area of fill/works that is to remain. Please note that any fill remaining within TRCA's Regulated Area must be clean.
- A TRCA permit application. Additional information pertaining to TRCA's permitting process will be provided if this option is selected. However, I would like to note that the permit application will carry a review fee of $21,000 (Standard Review fee of $10,500, plus a violation charge of 200%.) TRCA's fee schedule can be viewed here: https://trca.ca/app/uploads/2021/06/Development-Permitting-Fee-Schedule-2021-06-01-r1.pdf).

Please note that the above options are specific to resolving TRCA's violation and does not include direction on how to address the municipality's concerns/issues. It is recommended that you confirm with the municipality to ensure their requirements are also being addressed to resolve the issue. In addition, please note that the violation is a matter that should be addressed as soon as possible to ensure further degradation of the feature does not occur. TRCA will not be in a position to wait until submission of a Draft Plan of Subdivision to have the issue addressed.

Please let me know if you have any questions about the above.

Regards,

Nick Cascone, M.Sc.Pl
Planner
Development Planning and Permits | Development and Engineering Services

T: (416) 661-6600 x5936
E: nick.cascone@trca.ca
A: 101 Exchange Avenue, Vaughan, ON, L4K 5R6 | trca.ca

Toronto and Region Conservation Authority

Please note that TRCA's Offices are presently closed to visitors. The plan input and review function continues during the Coronavirus pandemic. In order to reduce the potential of transmission, TRCA requests that development planning and permit applications and materials be submitted digitally in PDF format. Paper submissions are discouraged and may result in extended timeframes for review.

All digital submissions and documents can be submitted to the following e-mail addresses:

Enquiries/ applications within Peel Region municipalities – peelplan@trca.ca
Enquiries/ applications within York Region municipalities – yorkplan@trca.ca

We thank you for your cooperation as we respond to the current situation.

Lisa Moran

From: Nick Cascone [Nick.Cascone@trca.ca]
Sent: April 26, 2022 2:10 PM
To: Michael Gillespie
Cc: Lisa Moran
Subject: RE: 12151 Airport Road, 6230 Mayfield Road & 6186 Mayfield Road - Azimuth EIS Terms of Reference

Hello Michael,
TRCA ecology staff have reviewed your ToR and have no concerns with the scope of work.
Thanks,

Nick Cascone, M.Sc.Pl
Planner
Development Planning and Permits | Development and Engineering Services

T: (416) 661-6600 x5936
E: nick.cascone@trca.ca
A: 101 Exchange Avenue, Vaughan, ON, L4K 5R6 | trca.ca

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Enquiries/ applications within York Region municipalities – yorkplan@trca.ca

We thank you for your cooperation as we respond to the current situation.

From: Michael Gillespie <mgillespie@azimuthenvironmental.com>
Sent: Thursday, April 07, 2022 2:47 PM
To: Nick Cascone <Nick.Cascone@trca.ca>
Cc: Lisa Moran <Lisa@Azimuthenvironmental.Com>
Subject: 12151 Airport Road, 6230 Mayfield Road & 6186 Mayfield Road - Azimuth EIS Terms of Reference

Good afternoon,

Azimuth Environmental Consulting, Inc. (Azimuth) has been retained by Airport 12151 Inc., 6230 Mayfield Inc. and 2652876 Ontario Inc. to complete an Environmental Impact Study (EIS) of a subset of lands in the Tullamore Secondary Plan Area at Part Lot 1, Concession 1 in the Geographic Township of Albion, Town of Caledon, Regional Municipality of Peel. As shown on the attached Figure 1, the EIS would include an assessment of the following properties (the "Study Area"):

- 12151 Airport Road;
- 6230 Mayfield Road; and,
- 6186 Mayfield Road.

Background mapping indicates the property contains woodland and a regulated watercourse (Figures 2-3). It is our understanding that the proponents intend to complete a commercial, industrial and business development on the subject lands.

Azimuth proposes the following scope of work for the EIS:

- Investigate background data to assess natural heritage features and functions attributed to lands in and surrounding the proposed development;
- Consult with the Ministry of Environment, Conservation and Parks (MECP) and/or the Ministry of Northern Development, Mines, Natural Resources and Forestry (MNRF) to acquire background information related to potential Species at Risk (SAR) and fish/fish habitat for the property and surrounding area;
- Consult with MECP to discuss requirements for development on the property;
- Complete the following field work in spring/summer 2022:
    - Evaluate/map vegetation communities based on Ecological Land Classification methods (spring/summer 2022);
    - One (1) vascular plant inventory within the Study Area (spring/summer 2022);
    - Headwater Drainage Feature/Fish Assessment of aquatic features in the study area (spring/summer 2022; *initiated*);
    - Three (3) evening frog call surveys to confirm presence or absence of amphibian habitat within the Study Area (April-June 2022);
    - Three (3) dawn breeding bird surveys (June/July 2022);
    - Two (2) evening acoustic and visual exit survey for SAR bats at the existing residential home at 6186 Mayfield Road (June-July 2022);
    - Record incidental wildlife observations during site visits;
- Complete a SAR habitat assessment using field data collected by Azimuth staff during the field surveys;
- Assess the potential direct, and indirect ecological impacts of the proposed development on the sensitive or significant environmental features as described; and,
- Prepare an EIS report. The EIS will describe existing conditions, provide relevant mapping and include information on impact mitigation/offsetting/enhancement to address major environmental concerns identified.

If you could please confirm that the above scope is appropriate, it would be appreciated.

We would also like to take this opportunity to request any natural heritage background information from the TRCA that may be helpful in completing the EIS.

Please feel free to contact us if you would like to discuss any aspects of the project.

Regards,

Mike Gillespie, B.Sc.Env.,
Fisheries Ecologist

Azimuth Environmental Consulting, Inc
642 Welham Road
Barrie, ON L4N 9A1

Phone: (705) 721 - 8451 ext. 203
Cell: (705) 795 - 7101
Fax: (705) 721 - 8926
www.azimuthenvironmental.com

Providing services in hydrogeology, terrestrial and aquatic ecology & environmental engineering

APPENDIX C

Headwater Drainage Feature Assessment

Headwater Drainage Feature Assessment

Tullamore Secondary Plan Area

Town of Caledon

Prepared for:
Riepma Consultants, Inc.

Prepared by:
Azimuth Environmental
Consulting, Inc.

March 2024

AEC 22-065

AZIMUTH ENVIRONMENTAL CONSULTING, INC.

Environmental Assessments & Approvals

March 20, 2024 AEC 22-065

Clarence Riepma
220 Kempenfelt Dr.
Barrie, Ontario,
L4M 1C4

Re: **Headwater Drainage Feature Assessment, Tullamore Secondary Plan Area, Town of Caledon**

Dear Mr. Riepma,

Azimuth Environmental Consulting, Inc. (Azimuth) was retained by Riepma Consultants, Inc. to complete a Headwater Drainage Feature (HDF) assessment for the property described above. It is our understanding that the HDF assessment is required to assist with approvals for a commercial site plan development.

A total of 10 HDFs were assessed during the field investigations. Five HDFs were observed to have water present during all three field investigation. Therefore, based on the CVC/TRCA HDF Guidelines (2014), these five HDFs are considered to have 'Important' hydrological functions and are to have a management recommendation of 'Protection'. The remaining five drainage features were all assigned a management recommendation of 'Mitigation' as these features had either 'Valued' or 'Contributing' hydrology, but none had fish habitat, terrestrial habitat, or riparian vegetation that would be characterize them as 'Conservation' or 'Protection'.

642 Welham Road, Barrie, Ontario L4N 9A1
telephone: (705) 721-8451 • fax: (705) 721-8926 • info@azimuthenvironmental.com • www.azimuthenvironmental.com

Should you have any questions or require additional information please do not hesitate to contact the undersigned.

Regards,

AZIMUTH ENVIRONMENTAL CONSULTING, INC.

Roger Holmes, M.Sc.,
Senior Aquatic Ecologist/Environmental Site Inspector

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1.0 INTRODUCTION

Azimuth Environmental Consulting, Inc. (Azimuth) was retained by Riepma Consultants, Inc. to complete a Headwater Drainage Feature (HDF) assessment for the Tullamore Secondary Plan Area (Airport Road/Mayfield Road) in the Town of Caledon. It is our understanding that this HDF assessment was required to assist with approvals for a commercial site plan development.

1.1 Purpose of Headwater Drainage Feature Assessment

The purpose of this HDF assessment was to identify the function and value of drainage features within the larger context of the watershed. Concerns over HDFs have been raised by Conservation Authorities (CAs) due to rural and urban development/activities that can degrade or eliminate HDFs. Individual and cumulative impacts to HDFs can result in changes to water quality and quantity, recharge/infiltration, and the overall health of the local HDFs and downstream habitats of the larger watershed (Dodds and Oaks, 2008). HDFs are poorly understood and are typically underestimated due to their small size, which makes them vulnerable to impacts resulting from urban and rural development (Greenwood et al., 2012; Miltner and Rankin, 1998). Therefore, a HDF assessment is intended to understand the type and function of individual drainage features and is required to assist with approvals for a commercial-industrial development.

2.0 STUDY APPROACH AND METHODOLOGY

The following HDF assessment uses the Evaluation, Classification and Management of Headwater Drainage Features Guidelines (2014), which were developed by the Credit Valley Conservation (CVC) Authority and the Toronto and Region Conservation Authority (TRCA). These guidelines were developed out of necessity to understand the form and function of HDF's and to assist with maintaining healthy watersheds during the development of lands. The guidelines are broken down into three sections (evaluation, classification, and management) to give practitioners an understanding of the importance of individual HDFs (e.g., flow storage and conveyance, fish habitat, amphibian habitat, sediment and nutrient regulation, etc.). The following was completed to determine the form and function of the HDFs on the assessed property:

- Desktop review of drainage locations on the property to determine the extent of hydrological features and sampling effort required to assess all drainage segments as per the CVC/TRCA guidelines;
- Early spring site visit to determine flow conditions and feature type during freshet, and to identify the scope for future field work;

- Mid/late spring field visit to determine flow conditions, feature type, and fish presence during high flow conditions; and,
- Mid/late summer field visit to determine flow conditions, feature type, and fish permanence during low flow conditions.

3.0 EXISTING CONDITIONS

A total of 10 HDFs were assessed during the field investigations. Site visits to assess the HDFs were completed on March 22, 2022 (early spring visit), April 29, 2022 (mid/late spring visit), and August 11, 2022 (mid/late summer visit). A summary of the findings for each individual classification section is presented below. Representative photographs of each individual HDF is provided in **Appendix A**, and the HDF Summary Data Sheet is provided in **Appendix B**.

3.1 Hydrology Classification

During the early spring field survey, water was present at all 10 drainage features, with surface flow noted in all the HDFs assessed. During the mid/late spring visit, a mix of flow conditions were observed, ranging from HDFs that were dry (SC-H2-Seg 2) to HDFs that still had substantial surface flow (SC-H1-Seg 1). During the mid/late summer visit, all 10 drainage features were either dry or had standing water present. No visible flow was observed in any drainage feature during the mid/late summer visit, but standing water was present in multiple features (SC-H1-Seg 1, SC-H1-Seg 3, SC-H3-Seg 1, and SC-H3-Seg 2). Due to the recent development upslope of SC-H3-Seg 1 and SC-H3-Seg 2, the standing water in these features was assumed to be a result of the land/drainage alterations (parking lot drainage), and that water being present was not anticipated to be a result of natural hydrological conditions. The standing water observed during the late summer site visit was shallow had not flow, and was contained within isolated scoured segments of the drainage channel.

3.2 Riparian Classification

The riparian classifications remained the same during the three site visits. Riparian vegetation was marginal/poor throughout a majority of the drainage features. The actively cropped farm field to the east of SC-H1-Seg 1, SC-H1-Seg 2, and SC-H1-Seg 3 limited the overall function/width of riparian and feature vegetation. Development activities on the property also altered/minimized the extent of riparian vegetation along a majority of the other features.

3.3 Fish and Fish Habitat Classification

No evidence of direct fish habitat was observed throughout the assessed property and associated drainage features. The Mayfield Road culvert at the downstream (south) end of the assessed property (south of SC-H1-Seg 1) may function as seasonal direct fish habitat, as the culvert may serve as a refuge pool for small bodied fish, but no direct fish habitat functions were noted on the property. All of the features were dry or had shallow (<5cm) standing water present during the late spring field visit. No refuge pools were noted in any of the assessed HDFs that could host fish year round, and no fish were observed during any of the site visits. Therefore, a majority of the drainage features were characterized as indirect fish habitat. Two drainage features (SC-H1-Seg 6 and SC-H2-Seg 2) were characterized as 'not fish habitat' as defined features were not observed at these HDFs, and any overland/contributing flows would be expected to be minimal/non-existent for a majority of the year.

3.4 Terrestrial Habitat Classification

All terrestrial habitats in proximity to the drainage features were classified as having a limited or contributing function. Overall, terrestrial habitat on the property was limited to a few small hedgerows and narrow treed corridors, with limited function as movement corridors. Development on the property and nearby agricultural activity has limited the extent of natural terrestrial habitat along a majority of the drainage features. In addition, the presence of existing urban development, commercial development, and agricultural fields surrounding the assessed property limits the overall function in regards to terrestrial habitat and movement corridors.

4.0 MANAGEMENT RECOMMENDATIONS

HDF management recommendations are summarized in **Table 1** below based on the field surveys completed. All drainage features in the study area are shown on **Figure 2** with their management recommendations. The HDF management recommendations are based on the CVC/TRCA HDF Guidelines (2014) and the CVC/TRCA flow chart which provides direction on management options (flow chart provided in **Figure 3** below).

Table 1. Tullamore Headwater Drainage Feature Assessment Summary

HDF Segment Code	Step 1		Step 2	Step 3	Step 4	Management Recommendation
	Hydrology	Modifiers	Riparian	Fish and Fish Habitat	Terrestrial Habitat	
SC-H1-Seg 1	Important	-	Important	Valued	Contributing	Protection
SC-H1-Seg 2	Valued	Agriculture	Important	Contributing	Contributing	Protection
SC-H1-Seg 3	Important	Agriculture	Important	Contributing	Contributing	Protection
SC-H1-Seg 4	Valued	Development	Limited	Contributing	Limited	Mitigation
SC-H1-Seg 5	Valued	Development	Limited	Contributing	Limited	Mitigation
SC-H1-Seg 6	Contributing	-	Limited	Contributing	Contributing	Mitigation
SC-H2-Seg 1	Contributing	Development	Limited	N/A	Limited	Mitigation
SC-H2-Seg 2	Contributing	Development	Limited	N/A	Limited	Mitigation
SC-H3-Seg 1	Valued	Development	Valued	Contributing	Limited	Mitigation
SC-H3-Seg 2	Valued	Development	Valued	Contributing	Limited	Mitigation

The hydrology of SC-H3-Seg 1 and SC-H3-Seg 2 has been altered from recent development in the area, which appears to have infilled a portion of the drainage feature to the west of the assessed area where a parking lot is located. Drainage from the parking lot area appears to flow into both of these drainage features, although a direct source of the upstream flows could not be found. Regardless, both of these features were wet and/or had flowing water during all three field investigations, most notably during the late summer visit. Therefore, based on the CVC/TRCA HDF Guidelines (2014), they are considered to have 'Important' hydrological functions and are to have a management recommendation of 'Protection'.

Similarly, SC-H1-Seg 3 also had water present during all three field investigations, and is therefore considered to have 'Important' hydrological functions and a management recommendation of 'Protection'. Downstream of SC-H1-Seg 3, SC-H1-Seg 2 was dry during the late summer site visit and was originally given a management recommendation of 'Conservation'. However, based on the CVC/TRCA HDF Guidelines (2014), in the event that a lower level of protection is identified for a segment downstream of a segment with a higher level of protection, the more conservative approach shall be adopted for both segments and the downstream segment should be reclassified to match the upstream

segment. Therefore, the management recommendation for SC-H1-Seg 2 was changed to 'Protection' as well, similar to SC-H1-Seg 3.

For the remaining five drainage features, they were all assigned a management recommendation of 'Mitigation'. All of these features had either 'Valued' or 'Contributing' hydrology, but had no fish habitat, terrestrial habitat, or riparian vegetation that would be characterize them as 'Conservation' or 'Protection'.

Each management recommendation in the CVC/TRCA HDF Guidelines (2014) has a set development criteria for HDFs. For reference, these development criteria are as follows:

Protection – Important Functions: e.g. swamps with amphibian breeding habitat; perennial headwater drainage features; seeps and springs; SAR habitat; permanent fish habitat with woody riparian cover.

- Protect and/or enhance the existing feature and its riparian zone corridor, and groundwater discharge or wetland in-situ;
- Maintain hydroperiod;
- Incorporate shallow groundwater and base flow protection techniques such as infiltration treatment;
- Use natural channel design techniques or wetland design to restore and enhance existing habitat features, if necessary; realignment not generally permitted;
- Design and locate the stormwater management system (e.g. extended detention outfalls) are to be designed and located to avoid impacts (i.e. sediment, temperature) to the feature.

Conservation – Valued Functions: e.g. seasonal fish habitat with woody riparian cover; marshes with amphibian breeding habitat; or general amphibian habitat with woody riparian cover.

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

Mitigation – Contributing Functions: e.g. contributing fish habitat with meadow vegetation or limited cover.

- Replicate or enhance functions through enhanced lot level conveyance measures, such as well-vegetated swales (herbaceous, shrub and tree material) to mimic online wet vegetation pockets, or replicate through constructed wetland features connected to downstream;
- Replicate on-site flow and outlet flows at the top end of system to maintain feature functions with vegetated swales, bioswales, etc. If catchment drainage has been previously removed due to diversion of stormwater flows, restore lost functions through enhanced lot level controls (i.e. restore original catchment using clean roof drainage); and,
- Replicate functions by lot level conveyance measures (e.g. vegetated swales) connected to the natural heritage system, as feasible and/or Low Impact Development (LID) stormwater options (refer to Conservation Authority Water Management Guidelines for details).

Recharge Protection – Recharge Functions: e.g. features with no flow with sandy or gravelly soils

- Maintain overall water balance by providing mitigation measures to infiltrate clean stormwater, unless the area qualifies as an Area of High Aquifer Vulnerability under the Oak Ridges Moraine Conservation Plan (ORMCP) or Significant Recharge Areas under the Source Water Protection Act. These areas will be subject to specific policies under their respective legislation; and,
- Terrestrial features may need to be assessed separately through an Environmental Impact Study to determine whether there are other terrestrial functions associated with them

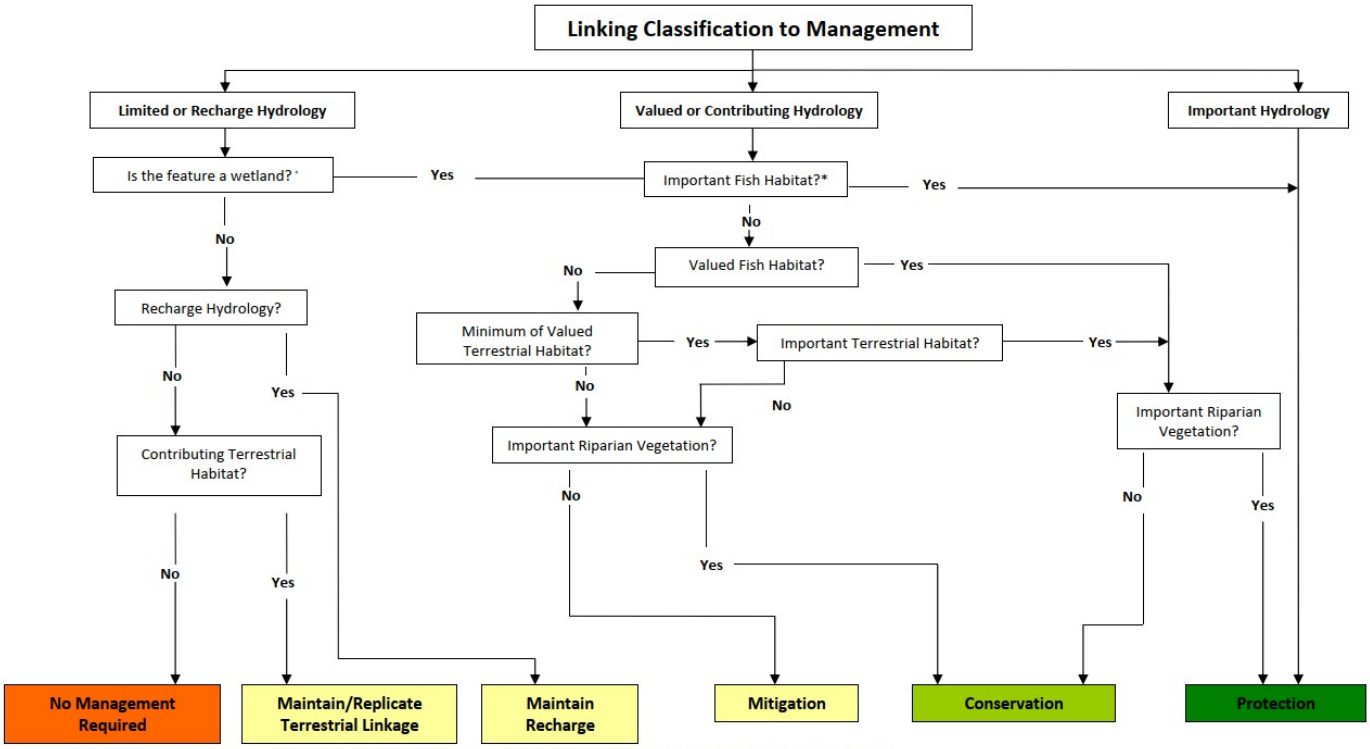
Maintain or Replicate Terrestrial Linkage – Terrestrial Functions: e.g. features with no flow with woody riparian vegetation and connects two other natural features identified for protection.

- Maintain the corridor between the other features through in-situ protection or if the other features require protection, replicate and enhance the corridor elsewhere; and,
- If the feature is wider than 20 m, it may need to be assessed separately through an Environmental Impact Study to determine whether there are other terrestrial functions associated with it.

No Management Required – Limited Functions: e.g. features with no or minimal flow; cropped land or no riparian vegetation; no fish or fish habitat; and no amphibian habitat.

- The feature that was identified during desktop pre-screening has been field verified to confirm that no feature and/or functions associated with headwater drainage features are present on the ground and/or there is no connection downstream. These features are generally characterized by lack of flow, evidence of cultivation, furrowing, presence of a seasonal crop, and lack of natural vegetation. No management recommendations required.

Figure 3: Management Recommendations Flow Chart from CVC/TRCA HDF Guidelines



*Other Conservation Authority policies or other legislation with respect to wetlands, watercourses and/or species at risk need to be assessed in the context of this key.
+Note that headwater wetlands are considered to be HDFs in the context of this guideline.

Figure 2: Flow chart providing direction on management options

Source: CVC/TRCA HDF Guidelines (2014)

5.0 CONCLUSIONS

Of the 10 HDFs that were assessed during the field investigations, three assigned a management recommendation of 'Protection' as per the CVC/TRCA HDF Guidelines (2014). The remaining seven drainage features were all assigned a management recommendation of 'Mitigation' as these features had either 'Valued' or 'Contributing' hydrology, but none had fish habitat, terrestrial habitat, or riparian vegetation that would be characterize them as 'Conservation' or 'Protection'.

Overall, it should be noted that previous development activities on the property have altered the form and function of many HDFs assessed in this report. The CVC/TRCA HDF Guidelines (2014) states that "an HDF has been altered and/or eliminated without a permit under a conservation authority's Section 28 Regulation, a "No Management Required" category will not be assigned, and restoration of the HDF may be required." The HDF assessment presented in this report assessed the drainage features based on their current state during the field investigations. The timing and extent of the previous development activities on the property are unknown, and any further development in proximity to these HDFs may alter site characteristics presented in this report.

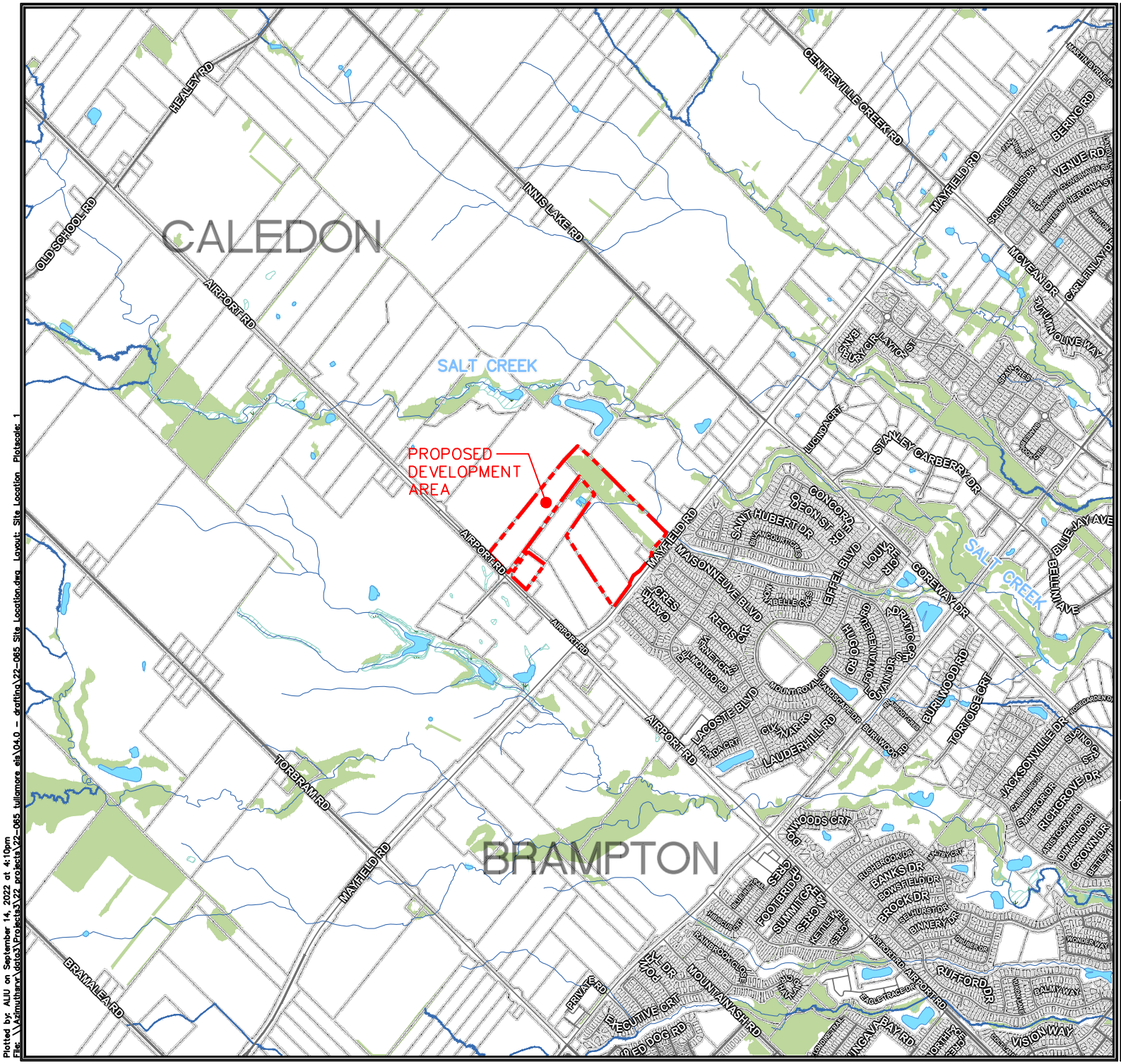
6.0 REFERENCES

Dodds, W. K., & Oakes, R. M. (2008). Headwater influences on downstream water quality. *Environmental Management, 41*(3), 367-377.

Evaluation, Classification and Management of Headwater Drainage Features Guidelines. Toronto and Region Conservation Authority and Credit Valley Conservation, TRCA Approval July 2013 (Finalized January 2014).

Greenwood, M. J., Harding, J. S., Niyogi, D. K., & McIntosh, A. R. (2012). Improving the effectiveness of riparian management for aquatic invertebrates in a degraded agricultural landscape: Stream size and land-use legacies. *Journal of Applied Ecology, 49*(1), 213-222.

Miltner, R., & Rankin, E. (1998). Primary nutrients and the biotic integrity of rivers and streams. *Freshwater Biology, 40*(1), 145-158.



LEGEND:

STUDY AREA BOUNDARY

REGIONAL MAP

SCALE 1: 250000

0 625 1250

HORIZONTAL SCALE 1: 25000

AZIMUTH ENVIRONMENTAL CONSULTING, INC.

ENVIRONMENTAL ASSESSMENTS & APPROVALS

SITE LOCATION

PART OF LOT 1, CONCESSION 1
CALEDON, ON

DATE ISSUED: *SEPTEMBER 2022*	Figure No.
CREATED BY: *A.L.*	
PROJECT NO.: *22-065*	1
REFERENCE: *REGION OF PEEL*	

Plotted by: ALU on September 14, 2022 at 4:10pm
File: \\Azimuthsrv-data\Projects\22 projects\22-065 tullamore ela\04.0 - drafting\22-065 Site Location.dwg Layout: Site Location Plotscale: 1

LEGEND:

- PROPOSED DEVELOPMENT AREA
- CULVERT LOCATION

HEADWATER DRAINAGE FEATURES:

- MITIGATION
- PROTECTION

TABLE OF MANAGEMENT RECOMMENDATIONS

DRAINAGE FEATURE SEGMENT CODE	MANAGEMENT RECOMMENDATION
SC-H1-Seg 1	PROTECTION
SC-H1-Seg 2	CONSERVATION
SC-H1-Seg 3	CONSERVATION
SC-H1-Seg 4	MITIGATION
SC-H1-Seg 5	MITIGATION
SC-H1-Seg 6	MITIGATION
SC-H2-Seg 1	MITIGATION
SC-H2-Seg 2	MITIGATION
SC-H3-Seg 1	PROTECTION
SC-H3-Seg 2	PROTECTION

LOCATION PLAN

0 100.00 200.0

HORIZONTAL SCALE 1:4000

AZIMUTH ENVIRONMENTAL CONSULTING, INC.
ENVIRONMENTAL ASSESSMENTS & APPROVALS

HEADWATER DRAINAGE FEATURE ASSESSMENT

PART OF LOT 1, CONCESSION 1 CALEDON, ON

DATE ISSUED:	*SEPTEMBER 2023*	Figure No. 2
CREATED BY:	*A.L.*	
PROJECT NO.:	*22-065*	
REFERENCE:	*TOWN OF CALEDON*	

APPENDICES

Appendix A: Site Photographs
Appendix B: HDF Summary Sheet

APPENDIX A

Appendix A: Site Photographs

Photographs

SC-H1-Seg 1 (March 20, 2022)

Segment ID: SC-H1-Seg 1
Hydrology: Important
Modifier: N/A
Riparian: Important
Fish Habitat: Valued
Terrestrial Habitat: Contributing
Mgmt Rec.: Protection
Notes: Short (20m) segment immediately north of Mayfield Road within treed area.

SC-H1-Seg 2 (April 29, 2022)

Segment ID: SC-H1-Seg 2
Hydrology: Valued
Modifier: Agriculture
Riparian: Important
Fish Habitat: Contributing
Terrestrial Habitat: Contributing
Mgmt Rec.: Protection
Notes: Small channel through grassed meadow segment. Originally assigned 'Conservation' management recommendation, but was changed to 'Protection' due to SC-H1-Seg 3 upstream.

SC-H1-Seg 3 (August 11, 2022)

Segment ID: SC-H1-Seg 3
Hydrology: Important
Modifier: Agriculture
Riparian: Important
Fish Habitat: Contributing
Terrestrial Habitat: Contributing
Mgmt Rec.: Protection
Notes: Short (20m) segment in treed hedgerow with standing water present during late summer site visit.

SC-H1-Seg 4 (August 11, 2022)

Segment ID: SC-H1-Seg 4
Hydrology: Valued
Modifier: Development
Riparian: Limited
Fish Habitat: Contributing
Terrestrial Habitat: Limited
Mgmt Rec.: Mitigation
Notes: Dense cattail swale with no natural riparian/terrestrial vegetation. Development on both sides of feature.

SC-H1-Seg 5 (August 11, 2022)

Segment ID: SC-H1-Seg 5
Hydrology: Valued
Modifier: Development
Riparian: Limited
Fish Habitat: Contributing
Terrestrial Habitat: Limited
Mgmt Rec.: Mitigation
Notes: Dense cattail swale with no natural riparian/terrestrial vegetation. Development on both sides of feature. Separated from SC-H1-Seg 4 by twin CSP culverts.

SC-H1-Seg 6 (August 11, 2022)

Segment ID: SC-H1-Seg 6
Hydrology: Contributing
Modifier: N/A
Riparian: Limited
Fish Habitat: Contributing
Terrestrial Habitat: Contributing
Mgmt Rec.: Mitigation
Notes: Poorly defined swale in scrubland area. No substrate sorting or aquatic vegetation observed.

SC-H2-Seg 1 (August 11, 2022)

Segment ID: SC-H2-Seg 1
Hydrology: Contributing
Modifier: Development
Riparian: Limited
Fish Habitat: N/A
Terrestrial Habitat: Limited
Mgmt Rec.: Mitigation
Notes: Poorly defined swale in meadow area. Upstream segment altered by development in feature (truck parking lot).

SC-H2-Seg 2 (August 11, 2022)

Segment ID: SC-H2-Seg 2
Hydrology: Contributing
Modifier: Development
Riparian: Limited
Fish Habitat: N/A
Terrestrial Habitat: Limited
Mgmt Rec.: Mitigation
Notes: Poorly defined swale in meadow area. Upstream segment altered by development in feature (truck parking lot).

SC-H3-Seg 1 (August 11, 2022)

Segment ID: SC-H3-Seg 1
Hydrology: Valued
Modifier: Development
Riparian: Valued
Fish Habitat: Contributing
Terrestrial Habitat: Limited
Mgmt Rec.: Mitigation
Notes: Narrow swale feature with cattails present. Standing water present in feature during late summer site visit. Upstream segment altered by development in feature (parking lot).

SC-H3-Seg 2 (August 11, 2022)

Segment ID: SC-H3-Seg 2
Hydrology: Valued
Modifier: Development
Riparian: Valued
Fish Habitat: Contributing
Terrestrial Habitat: Limited
Mgmt Rec.: Mitigation
Notes: Narrow channel feature with cattails present. Standing water present in feature during late summer site visit. Upstream segment altered by development in feature (parking lot).

APPENDIX B

Appendix B: HDF Summary Sheet

Headwater Drainage Feature Segment Data

Site/Segment details										Hydrology Functions						Riparian Functions							Feature Dimensions						
Date (yyyy/mm/dd)	Feature Code (from Map)	Investigators	Consultant/Agency	Assessment Direction	Site Visit	Flow Influence	Segment Code	Waypoint Data Type	Waypoint ID	Feature Type	Feature type modifier	Flow Condition	Sediment adjacent	Sediment Valley	Sediment Deposition	Feature Veg	0m - 1.5m	1.5m-10m	10m-30m	0m - 1.5m	1.5m-10m	10m-30m	Width Method MT	Feature width (m)	Bankfull width (m)	Channel depth (mm)	Photo # up	Photo # down	Easting
2022-03-22	SC-H1	Mike Gillespie	Azimuth Environmental Consulting, Inc.	NA	1	Freshet	SC-H1-Seg 1	UTM 17	NA	1	NA	4	1	7	Yes	1	6	4	4	6	4	4	2	3.6	3.6	350			
2022-03-22	SC-H1	Mike Gillespie	Azimuth Environmental Consulting, Inc.	NA	1	Freshet	SC-H1-Seg 2	UTM 17	NA	1	NA	5	1	1	No	4	4	4	4	4	3	3	2	1.95	1.95	160			
2022-03-22	SC-H1	Mike Gillespie	Azimuth Environmental Consulting, Inc.	NA	1	Freshet	SC-H1-Seg 3	UTM 17	NA	1	NA	4	NA	NA	NA	7	7	7	4	5	3	3	NA	NA	NA	NA			
2022-03-22	SC-H1	Mike Gillespie	Azimuth Environmental Consulting, Inc.	NA	1	Freshet	SC-H1-Seg 4	UTM 17	NA	6	NA	5	1	1	No	4	4	4	1	4	5	3	2	2.8	2.7	290			
2022-03-22	SC-H1	Mike Gillespie	Azimuth Environmental Consulting, Inc.	NA	1	Freshet	SC-H1-Seg 5	UTM 17	NA	6	NA	4	1	1	No	7	4	1	1	1	1	1	3	8	8	45			
2022-03-22	SC-H1	Mike Gillespie	Azimuth Environmental Consulting, Inc.	NA	1	Freshet	SC-H1-Seg 6	UTM 17	NA	4	NA	5	1	1	No	4	1	1	1	4	5	4	3	1	NA	20			
2022-03-22	SC-H2	Mike Gillespie	Azimuth Environmental Consulting, Inc.	NA	1	Freshet	SC-H2-Seg 1	UTM 17	NA	4	NA	4	1	2	Yes	1	4	4	4	4	4	4	3	3.5	NA	130			
2022-03-22	SC-H2	Mike Gillespie	Azimuth Environmental Consulting, Inc.	NA	1	Freshet	SC-H2-Seg 2	UTM 17	NA	4	NA	4	1	2	Yes	1	4	4	4	4	4	4	4	0.1	NA	30			
2022-03-22	SC-H3	Mike Gillespie	Azimuth Environmental Consulting, Inc.	NA	1	Freshet	SC-H3-Seg 1	UTM 17	NA	1	NA	4	1	1	No	7	4	4	4	4	4	4	3	0.7	0.7	90			
2022-03-22	SC-H3	Mike Gillespie	Azimuth Environmental Consulting, Inc.	NA	1	Freshet	SC-H3-Seg 2	UTM 17	NA	2	NA	4	1	1	No	4	4	4	1	4	4	4	3	1	NA	225			
2022-04-29	SC-H1	Mike Gillespie	Azimuth Environmental Consulting, Inc.	NA	2	Spate	SC-H1-Seg 1	UTM 17	NA	1	NA	5	1	1	No	1	6	4	4	6	4	4	2	2.3	2.3	0.35			
2022-04-29	SC-H1	Mike Gillespie	Azimuth Environmental Consulting, Inc.	NA	2	Spate	SC-H1-Seg 2	UTM 17	NA	1	NA	4	1	1	No	4	4	4	4	4	3	3	2	2	2	250			
2022-04-29	SC-H1	Mike Gillespie	Azimuth Environmental Consulting, Inc.	NA	2	Spate	SC-H1-Seg 3	UTM 17	NA	1	NA	4	NA	NA	NA	7	7	7	4	5	3	3	NA	NA	NA	NA			
2022-04-29	SC-H1	Mike Gillespie	Azimuth Environmental Consulting, Inc.	NA	2	Spate	SC-H1-Seg 4	UTM 17	NA	6	NA	3	1	1	No	4	4	4	1	4	5	3	2	2.76	2.76	290			
2022-04-29	SC-H1	Mike Gillespie	Azimuth Environmental Consulting, Inc.	NA	2	Spate	SC-H1-Seg 5	UTM 17	NA	6	NA	2	1	1	No	7	4	1	1	1	1	1	4	8	8	NA			
2022-04-29	SC-H1	Mike Gillespie	Azimuth Environmental Consulting, Inc.	NA	2	Spate	SC-H1-Seg 6	UTM 17	NA	4	NA	4	1	1	No	4	1	1	1	4	5	4	1	1	NA	NA			
2022-04-29	SC-H2	Mike Gillespie	Azimuth Environmental Consulting, Inc.	NA	2	Spate	SC-H2-Seg 1	UTM 17	NA	4	NA	2	1	1	No	1	4	4	4	4	4	4	4	0.1	NA	30			
2022-04-29	SC-H2	Mike Gillespie	Azimuth Environmental Consulting, Inc.	NA	2	Spate	SC-H2-Seg 2	UTM 17	NA	4	NA	1	1	1	No	1	4	4	4	4	4	4	NA	NA	NA	NA			
2022-04-29	SC-H3	Mike Gillespie	Azimuth Environmental Consulting, Inc.	NA	2	Spate	SC-H3-Seg 1	UTM 17	NA	1	NA	3	1	1	No	7	4	4	4	4	4	4	3	0.78	0.78	0.5			
2022-04-29	SC-H3	Mike Gillespie	Azimuth Environmental Consulting, Inc.	NA	2	Spate	SC-H3-Seg 2	UTM 17	NA	2	NA	2	1	1	No	4	4	4	1	4	4	4	3	1	NA	NA			
2022-08-11	SC-H1	Roger Holmes	Azimuth Environmental Consulting, Inc.	NA	3	Baseflow	SC-H1-Seg 1	UTM 17	NA	1	NA	2	1	1	Yes	1	6	4	4	6	4	4	2	2.5	2.5	0.35			
2022-08-11	SC-H1	Roger Holmes	Azimuth Environmental Consulting, Inc.	NA	3	Baseflow	SC-H1-Seg 2	UTM 17	NA	1	NA	1	1	1	No	4	4	4	4	4	3	3	2	2	0.2	20			
2022-08-11	SC-H1	Roger Holmes	Azimuth Environmental Consulting, Inc.	NA	3	Baseflow	SC-H1-Seg 3	UTM 17	NA	1	Ag	2	1	6	No	7	7	7	4	5	3	3	4	5	NA	NA			
2022-08-11	SC-H1	Roger Holmes	Azimuth Environmental Consulting, Inc.	NA	3	Baseflow	SC-H1-Seg 4	UTM 17	NA	6	NA	1	2	6	Yes	4	4	4	1	4	5	3	4	2	2.76	290			
2022-08-11	SC-H1	Roger Holmes	Azimuth Environmental Consulting, Inc.	NA	3	Baseflow	SC-H1-Seg 5	UTM 17	NA	6	NA	1	2	6	Yes	7	4	1	1	1	1	1	4	8	NA	NA			
2022-08-11	SC-H1	Roger Holmes	Azimuth Environmental Consulting, Inc.	NA	3	Baseflow	SC-H1-Seg 6	UTM 17	NA	4	NA	1	1	1	No	4	1	1	1	4	5	4	4	2	NA	NA			
2022-08-11	SC-H2	Roger Holmes	Azimuth Environmental Consulting, Inc.	NA	3	Baseflow	SC-H2-Seg 1	UTM 17	NA	4	NA	2	2	6	No	1	4	4	4	4	4	4	4	3	NA	NA			
2022-08-11	SC-H2	Roger Holmes	Azimuth Environmental Consulting, Inc.	NA	3	Baseflow	SC-H2-Seg 2	UTM 17	NA	4	NA	1	2	6	No	1	4	4	4	4	4	4	4	0.5	NA	NA			
2022-08-11	SC-H3	Roger Holmes	Azimuth Environmental Consulting, Inc.	NA	3	Baseflow	SC-H3-Seg 1	UTM 17	NA	1	NA	2	1	6	Yes	7	4	4	4	4	4	4	4	0.6	0.78	0.5			
2022-08-11	SC-H3	Roger Holmes	Azimuth Environmental Consulting, Inc.	NA	3	Baseflow	SC-H3-Seg 2	UTM 17	NA	2	NA	2	1	6	Yes	4	4	4	1	4	4	4	4	0.3	0.3	0.1			

			Flow Measurements - Details		Point Feature Data											
Northing		Segment Code	Wetted Width (m)	Flow - flow meter	Visual Estimate	Point Feature Type	Left/Right Bank	Bank Seepage Length	Watercress Surface Area	Perch Height - note "0" if not perched	Jump Height	Culvert Type	Flow Condition - same as Hydrology function	Water Temperature (°C)	Channel Hardening Material	Fish and Fish Habitat	Comments
		SC-H1-Seg 1	2.39	Flow meter - 0.09 m/s												indirect	Mayfield Road CSP inlet (2.35m wide x 1.40m high) No fish observed.
		SC-H1-Seg 2	0.97	Flow meter - 0.85 m/s												indirect	Channel still defined but lots of vegetation in channel
		SC-H1-Seg 3	NA	NA												indirect	Dense cattails. Feature is on adjacent property and could not be fully assessed.
		SC-H1-Seg 4	1.1	Flow meter - 0.67 m/s												indirect	
		SC-H1-Seg 5	5	Flow meter - 0.13 m/s		K				5.5 cm		twin CSP	4	2.2		indirect	Twin 600 mm CSP culvert. No fish observed. cattail dominated channel
		SC-H1-Seg 6	1	Flow meter - 0.7 m/s												indirect	
		SC-H2-Seg 1	3.5	Flow meter - 0.06 m/s												none	Silt fence and earthworks force downstream flow path to the south towards H1
		SC-H2-Seg 2	0.1	Flow meter - 0.03 m/s												none	seepage entering cattail dominated channel from SW, from adjacent truck park
		SC-H3-Seg 1	0.5	Flow meter - 0.06 m/s												indirect	
		SC-H3-Seg 2	NA	Flow meter - 0.03 m/s												indirect	
		SC-H1-Seg 1	1.15		<0.01											indirect	No fish observed
		SC-H1-Seg 2	0.18		<0.01											indirect	
		SC-H1-Seg 3	NA		<0.01											indirect	
		SC-H1-Seg 4	2		<0.01											indirect	
		SC-H1-Seg 5	2.5		<0.01											indirect	
		SC-H1-Seg 6	1		NA											indirect	
		SC-H2-Seg 1	NA		NA											none	
		SC-H2-Seg 2	NA		NA											none	
		SC-H3-Seg 1	0.35		NA											indirect	
		SC-H3-Seg 2	0.47		NA											indirect	
		SC-H1-Seg 1	0.5		NA											indirect	Channel partially dry, no flow. Small treed patch on north side of Mayfield.
		SC-H1-Seg 2	NA		NA											indirect	Dry grassed ditch feature through meadow lands, poorly defined banks with no substrate sorting and grasses throughout channel.
		SC-H1-Seg 3	NA		NA											indirect	Small reach in forested hedgerow with pocket of water. No flow observed.
		SC-H1-Seg 4	NA		NA											indirect	Dry cattail swale with pockets of water at culvert outlet. Partailyl constrained by riparian infilling and concrete blocks.
		SC-H1-Seg 5	NA		NA											indirect	Dry cattail swale. Partailyl constrained by riparian infilling and concrete blocks.
		SC-H1-Seg 6	NA		NA											indirect	Dry meadow/thicket lands, no defined feature. No evidence of overland flow. No aquatic plants.
		SC-H2-Seg 1	NA		NA											none	Majority of feature dry. No defined banks, no substrate sorting, patches of cattails along edge of feature, originates from truck lot to the west.
		SC-H2-Seg 2	NA		NA											none	Small (10m) drainage feature from truck lot that drains into Seg 1, no defined feature, appears to be a rill that collects flow during rain events.
		SC-H3-Seg 1	0.3		NA											indirect	Poorly defined drainage channel that collects overland flow from parking lot to the west. Standing water with no flow observed.
		SC-H3-Seg 2	0.1		NA											indirect	Poorly defined drainage channel that collects overland flow from parking lot to the west. Standing water with no flow observed.

APPENDIX D

Provincial and Federal Information

Ontario

Ministry of Natural Resources and Forestry

Make-a-Map: Natural Heritage Areas

Tullamore EIS

Map created:9/27/2022

Notes:

Mapped wetlands and woodlands

Legend

- Assessment Parcel
- Ecoregion
- ANSI
- Earth Science Provincially Significant/sciences de la terre d'importance provinciale
- Earth Science Regionally Significant/sciences de la terre d'importance régionale
- Life Science Provincially Significant/sciences de la vie d'importance provinciale
- Life Science Regionally Significant/sciences de la vie d'importance régionale
- Evaluated Wetland
- Provincially Significant/considérée d'importance provinciale
- Non-Provincially Significant/non considérée d'importance provinciale
- Unevaluated Wetland
- Woodland
- Conservation Reserve
- Provincial Park
- Natural Heritage System

0.3 0 0.17 0.3 Kilometres

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

Southern Region
Aurora District Office
50 Bloomington Road West
Aurora, ON L4G 0L8

Ontario

Ministry of Natural Resources and Forestry

Ministere des Richesses Naturelles et des Forêts

December 15, 2014

Melissa Fuller
Terrestrial Ecologist
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Re: Construction of Access Roads for Future Residential Area
Municipal Class Environmental Assessment
Northeast Corner of Airport Road and Mayfield Road
Caledon, ON

Dear Ms. Fuller,

In your email dated December 4, 2014 you requested information on natural heritage features and element occurrences occurring on or adjacent to the above mentioned location. There are a number of Species at Risk recorded from your study area and the immediate vicinity.

Redside Dace	END	Eastern Meadowlark	THR
Bobolink	THR		

Please note that the watercourse on site, is located upstream of regulated Redside Dace habitat and therefore may be considered a contributing feature, which is protected under the *Endangered Species Act (ESA) 2007*. Salt Creek, located adjacent to the site, is designated as regulated Redside Dace habitat.

These species may receive protection under the *ESA 2007* and thus, an approval from MNRF may be required if the work you are proposing could cause harm to these species or their habitat. If the Species at Risk in Ontario List is amended, additional species may be listed and protected under the *ESA 2007* or the status and protection levels of currently listed species may change. Please provide additional information on your proposal to our office, and we will assess it to determine whether an authorization under the *ESA 2007* is required for the works to proceed.

There are no natural heritage features recorded for your area.

Absence of information provided by MNRF for a given geographic area, or lack of current information for a given area or element, does not categorically mean the absence of sensitive species or features. Many areas in Ontario have never been surveyed and new plant and animal species records are still being discovered for many localities. For these reasons, the MNRF cannot provide a definitive statement on the presence, absence or condition of biological elements in any part of Ontario.

This species at risk information is highly sensitive and is not intended for any person or project unrelated to this undertaking. Please do not include any specific information in reports that will be available for public record. As you complete your fieldwork in these areas, please report all information related to any species at risk to our office. This will assist with updating our database and facilitate early consultation regarding your project.

If you have any questions or comments, please do not hesitate to contact me at 905-713-7344 or ESA.Aurora@ontario.ca (Attention: Brittany Ferguson).

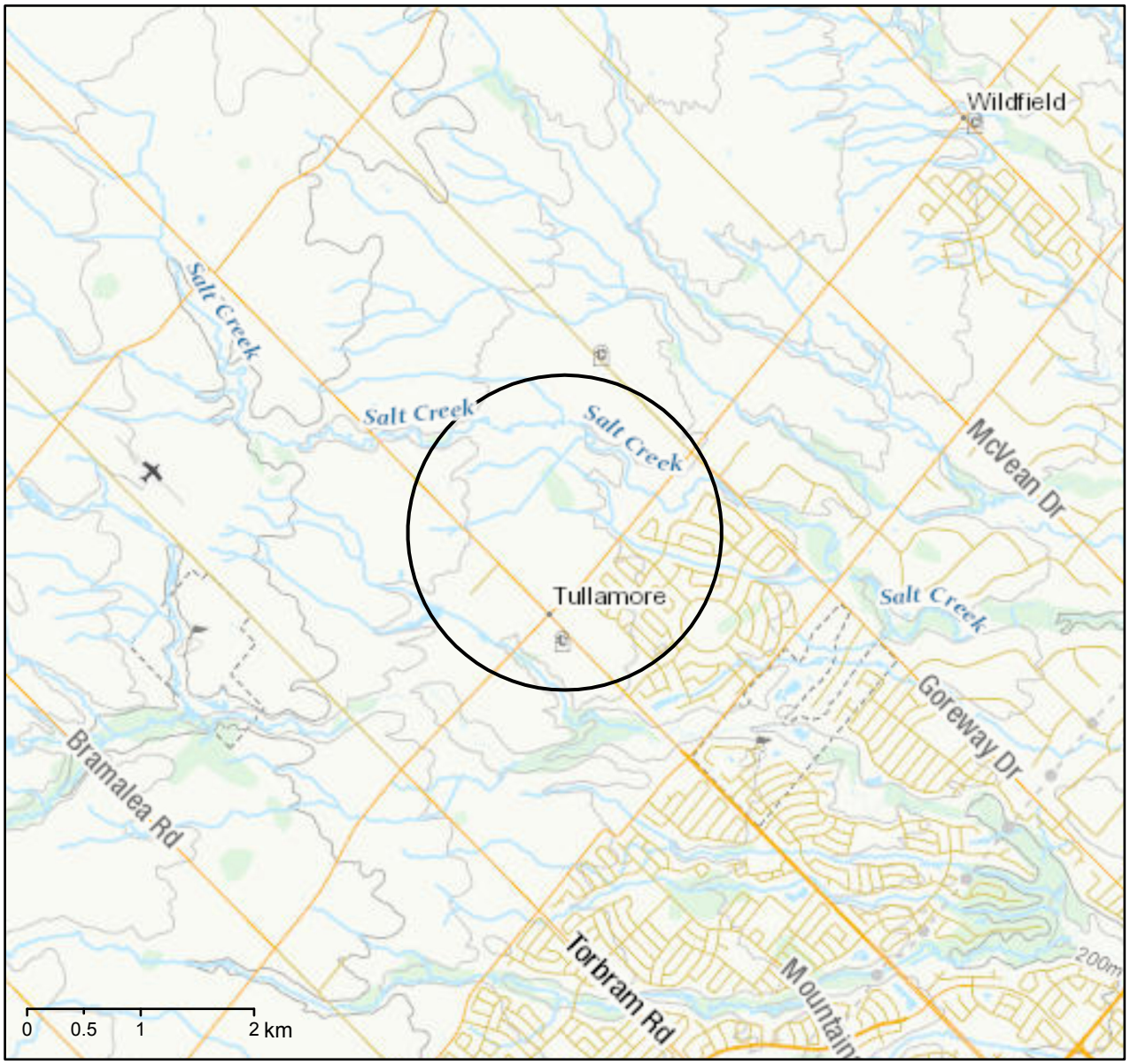
Sincerely,

Brittany Ferguson
Fish and Wildlife Technical Specialist
Ontario Ministry of Natural Resources and Forestry, Aurora District

Fisheries and Oceans Canada | Pêches et Océans Canada

Aquatic Species at Risk Report

Canada



One or more aquatic species listed under the Species at Risk Act are found (or potentially found) within the coloured areas.

- Critical Habitat
- Extirpated, Endangered, or Threatened
- Special Concern

How to use this information:

1. The map and species list are intended to provide a general overview of aquatic species at risk and their critical habitat that may occur within the mapped area.

2. To assess your project go to: www.dfo-mpo.gc.ca/pnw-ppe/index-eng.html

If you encounter an aquatic species at risk in an area that is not currently mapped, please notify your regional Fisheries Protection Program office to ensure that you are compliant with the Species at Risk Act.
The official source of information for species at risk is the Species at Risk Public Registry www.sararegistry.gc.ca

To protect fish and fish habitat, including aquatic species at risk, their residences, and their critical habitat, efforts should be made to avoid, mitigate and/or offset harm. Following the measures to avoid harm will help you comply with the Fisheries Act and the Species at Risk Act.

Critical habitat for these species is found within the outlined area

Critical habitat is identified in recovery strategies or action plans for species listed under Schedule 1 of the Species at Risk Act as extirpated, endangered or threatened.

Name	Where Found	Species Status
	No critical habitat	

Species found (or potentially found) within the outlined area

Name	Where Found	Species Status
Redside Dace	Salt Creek (Crique)	Endangered