Environmental Impact Study

Shadow Creek Subdivision

Township of Severn

Prepared for:
LIV Communities

Prepared by:
Azimuth Environmental
Consulting, Inc.

January 2022

AEC 21-098

AZIMUTH ENVIRONMENTAL CONSULTING, INC.
Environmental Assessments & Approvals

January 24, 2022 AEC 21-098

LIV Communities
c/o Sam Badawi, Land Development Manager
1005 Skyview Drive, Suite 301
Burlington, Ontario L7P 5B1

Re: **Environmental Impact Study for Shadow Creek Subdivision - (Part of the West ½ of Lots 3 & 4, and Part of the East ½ of Lots 4 & 5) on Menoke Beach Road, Township of Severn**

Dear Mr. Badawi:

Azimuth Environmental Consulting, Inc. was retained to prepare an Environmental Impact Study for a proposed residential subdivision development at the location described above. The purpose of this report is to provide the Township of Severn with an understanding of natural environmental conditions and potential impacts related to the proposed development on natural heritage features and functions of the property and adjacent lands.

This report also documents natural environmental features present on the property and/or adjacent lands with regard to Species at Risk and their habitats. At this time, the assessment concludes that the proposed development can be achieved without impacts to Species at Risk. Consultation with the Ministry of the Environment, Conservation and Parks is recommended regarding Barn Swallows and SAR bats in relation to potential use of anthropogenic structures on the property.

Furthermore, the report documents fish habitat conditions on and surrounding the property. Permanent direct, seasonal direct and indirect fish habitat was identified. The project includes the proposal to alter watercourses that function as indirect fish habitat, and may involve work in/adjacent to direct fish habitat. Further design review, and submission of site works to Fisheries and Oceans Canada for *Fisheries Act* permitting will be required under at a future design stage.

Should you have any questions please do not hesitate to contact the undersigned.

Yours truly,
AZIMUTH ENVIRONMENTAL CONSULTING, INC.

Dr. Scott Tarof, Ph.D. (Biology)
Terrestrial Ecologist

Michael Gillespie, B.Sc.Env.
Fisheries Ecologist

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1.0 INTRODUCTION

Azimuth Environmental Consulting, Inc. (Azimuth) was retained by LIV Communities (proponent) to prepare an Environmental Impact Study (EIS) for the proposed Shadow Creek Subdivision development on part of the west half of Lots 3 and 4, and part of the east half of Lots 4 and 5 in the community of Westshore, Township of Severn (Township), Simcoe County (County) (Figure 1). The property is approximately 45.6 hectares (ha) in size. It is our understanding that an EIS is required to satisfy municipal requirements. The study area is outside the jurisdiction of a provincial conservation authority.

The purpose of this EIS is to identify candidate Natural Heritage Features and Functions (NHFFs) present in the study area and address potential impacts of the proposed development to those NHFFs. A review of background information, combined with field surveys, was undertaken in winter 2021 and spring/summer 2021 to identify NHFFs. The report also examines potential for Species at Risk (SAR) and SAR habitat protected under the *Endangered Species Act*, 2007 (ESA). The potential for negative impacts to identified NHFFs resulting from the proposed development is considered and recommendations for avoidance and mitigation are provided.

For the purposes of this EIS, the study area comprises the property, as shown on attached Figures, and adjacent lands [within approximately 120 metres (m) of the property]. Natural features in the overall planning area beyond the defined study area limits are discussed where applicable throughout the report.

2.0 PLANNING CONTEXT

2.1 Provincial Planning Policy (2020)

The Provincial Policy Statement (PPS) (MMAH, 2020) 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 in 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 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 and 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 ecological functions.

2.2 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 on 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.

2.3 County of Simcoe

According to Schedule 5.1 of the County OP (2016), the property is in a Settlement Area (Appendix A). Development may be approved in settlement areas in accordance with policy Section 3.5.9.

The property and adjacent lands do not occur in the vicinity of mapped Greenlands, Provincially Significant Wetlands (PSWs), Locally Significant Wetlands or an Area of Natural and Scientific Interest (ANSI) – Provincial or Regional (Schedule 5.1, Schedule 5.2.2 and Schedule 5.2.3; Appendix A). The property and adjacent lands are in the vicinity of mapped watercourses (Schedule 5.2.2, Appendix A). Simcoe County mapping (2021) illustrates watercourses, unevaluated wetlands and woodland (Appendix A).

2.4 Township of Severn

The property is designated by the Township's OP (2010) as Rural (Schedule A; Appendix A) and Settlement Living Area (Schedule A3 - Westshore; Appendix A). (Schedule B2; Appendix A).

The property and adjacent lands do not occur in the vicinity of a mapped Provincial Wildlife Management Area, Waterfowl Staging Area, Waterfowl Nursery Area or Deer Wintering Area (Schedule F, Appendix A).

2.5 Federal *Fisheries Act*

On August 28, 2019, provisions of the new *Fisheries Act* came into force that included new 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, the project does not fall within waterbodies where Fisheries and Oceans Canada (DFO) review is not required or the scope of the project is not entirely covered under standards and codes of practice, proponents are asked to submit a request for review to their Fish and Fish Habitat Protection Program regional office. If death of fish, or HADD of fish habitat have the potential to occur, the project may require an authorization from the Minister of Fisheries, Oceans and the Canadian Coast Guard as per Paragraph 34.4(2)(b) or 35(2)(b) of the *Fisheries Act Regulations*. 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 background information and field data were used to fulfill the objectives of this EIS and complete the approved Terms of Reference (TOR). Azimuth undertook the following activities for this study:

- Confirmed the TOR with the Township and the Township's peer reviewer to ensure the scope of work is acceptable to agencies;
- Evaluated/mapped vegetation communities using Ecological Land Classification (ELC) methods for Southern Ontario. Two ELC surveys (spring, summer) were combined with herbaceous and woody vascular plant inventories with regard for SAR plants, including Butternut trees (Endangered);
- Completed three evening calling amphibian surveys using the Bird Studies Canada Marsh Monitoring Program protocol (mid-late April, May and June);
- Conducted three dawn breeding bird surveys using protocols of the Ontario Breeding Bird Atlas and Canadian Wildlife Service. Three dawn bird surveys are recommended because SAR grassland birds occur in the area;
- During two of the dawn bird surveys, Azimuth's ecologist completed Bird Studies Canada Marsh Breeding Bird surveys (June);
- Detailed mapping of bat "snag" trees to assess the presence of SAR bat roosting habitat on the property in woodland areas where development is being considered (March to mid-April during leaf-off conditions);
- Conducted acoustic monitoring surveys following the protocol outlined in Step 4 of the Ministry of Natural Resources and Forestry (MNRF) Technical Note to determine presence/absence of SAR bats in the woodland on the property. Information collected during the detailed bat snag survey assists in selecting locations for acoustic monitor deployment. Acoustic monitoring surveys were completed over 10 consecutive evenings between June 1 and June 30, 2021 to determine if endangered bat species are present. Six acoustic monitors were deemed sufficient to provide adequate woodland coverage;
- Analyzed acoustic data collected and provided an email summary of the findings to the client and discuss survey results. Consultation with the Ministry of the Environment, Conservation and Parks (MECP) regarding SAR bats and/or bat habitat, as required, was considered during the discussion following completion of project fieldwork to help determine requirements to complete the EIS report, as per the Site Plan upon which the impact assessment will be based;
- Mapped/delineated woodland and wetland boundaries on the property by collecting Global Positioning System (GPS) coordinates (May);
- Recorded wildlife observations while on the property for the above-mentioned surveys;

- Conducted a fisheries habitat assessment of watercourses and drainage features on the property, as well as conditions along the northeast property boundary (early-late March, April-May, August). This assessment included a review of available online sources and agency consultation to obtain fisheries background information, including thermal regime and potential aquatic SAR; and,
- Completed fish sampling in drainage features on the property (spring 2021) to characterize the fish community and inform fish habitat sensitivities, with an MNRF [now the Ministry of Northern Development, Mines, Natural Resources and Forestry (NDMNRF)] Licence to Collect Fish.

The above fieldwork scope was provided to the Township as a Terms of Reference (TOR) on March 24, 2021. A response was received from the Township (based on input from the Township's peer reviewer) on October 14, 2021 (Katie Mandeville, Senior Planner) confirming the fieldwork scope was acceptable (Appendix A). Amendments to the TOR were made by the peer reviewer and incorporated into the TOR where appropriate. The Township's peer reviewer noted that determination of whether or not a tree inventory would be required would be made once the EIS had been reviewed by the in the context of the submitted Site Plan.

Wetlands on the property were not suitable to provide habitat for overwintering turtles (See Section 7.4.2 below), therefore turtle emergence surveys were not undertaken as a component of the field program. The Township's peer reviewer recommended consultation with the MECP regarding possible need (and scope thereof) for SAR basking turtle surveys in 2022. Based on information presented in this report, it is Azimuth's opinion that further MECP consultation is not necessary given the absence of suitable turtle habitat in proximity to the proposed development footprint, thereby avoiding impacts (should SAR turtle species be confirmed). As such, 2022 SAR turtle surveys are not warranted.

3.1 Background Data

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

- NDMNRF Natural Heritage Information Center (NHIC; NDMNRF, 2021a);
    - Make-A-Map: Natural Heritage Areas application
- Atlas of the Breeding Birds of Ontario (OBBA; Cadman *et al.*, 2007);
- Ontario Reptile and Amphibian Atlas (2021);
- MECP's SAR Ontario list (2021);

- Government of Canada's Species at Risk Public Registry (2021a);
- DFO Aquatic SAR interactive mapping (2021);
- Toporama interactive mapping (2021b);
- Land Information Ontario (LIO) mapping (2021b);
- Aerial photographs available for the study area (Google Earth Pro, VuMap);
- Atlas of the Mammals of Ontario (Dobbyn, 1994);
- MNRF Fish ON-Line interactive mapping (2019);
- Simcoe County interactive mapping (2021);
- County OP (2016); and,
- Township OP (2010).

3.2 Vegetation Community Mapping and Surveys

Prior to undertaking the detailed field studies, an initial classification of habitats was undertaken using recent air photo imagery for an area encompassing the study area. Vegetation community types and boundaries were then classified and confirmed in the field using Ecological Land Classification (ELC) methods (Lee 2008, Lee *et al.* 1998) based on field surveys on May 20, June 22, July 26 and August 13, 2021 during the growing season. The ELC classification included characterization of vegetation communities, as well as boundary delineation of wetlands on the property by flagging wetland edges and collecting GPS coordinates on May 20 and June 22, 2021.

To describe vascular plant species composition, a two-season plant inventory was conducted to compile a list of species by ELC vegetation community. Property visits were undertaken by a qualified ecologist with existing knowledge related to rare, Threatened and Endangered plant species with potential to occur in the area. The 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 by provincial and federal legislation. The plant inventory included consideration for SAR plants that could potentially be on the property, including Butternut (*Juglans cinerea*; Endangered) which is protected under the ESA.

In regards to woodlands on the property, vegetation community mapping included flagging and delineating woodland drip line edges associated with the property on May 20 and June 22, 2021. As per the Township OP, to evaluate whether or not woodland in the study area was “Significant Woodland”, the definition of a Significant Woodland from the PPS (MMAH, 2020) was used in conjunction with criteria in the Natural Heritage Reference Manual (NHRM) (OMNR, 2010). Size of the woodland was estimated using the aerial extent of the feature in Google Earth Pro and compared against NHRM criteria. Woodland openings, indentations and road openings were considered in the calculation of woodland size as per the NHRM.

3.2.1 Butternut Health Assessment

Azimuth's ecologist evaluated trees on the property during completion of vegetation surveys to identify the presence of Butternut. Where Butternut was identified, the assessment included completion of a Butternut Health Assessment of each identified tree on August 13, 2021 following the Ontario Ministry of Natural Resources and Forestry (OMNRF) Butternut Health Assessor's Field Guide protocol (OMNRF, 2015).

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 terrestrial field surveys on the dates noted below.

3.3.1 Species at Risk

The SAR screening was undertaken for the scope of this assignment that included an assessment of SAR with potential to occur at the County scale. The County list was modified based on habitat features in the area and species ranges. The assessment included SAR occurrence records from the NHIC database (Appendix B). Habitat requirements and appropriate designations (Endangered, Threatened or Special Concern) are outlined in Table 1. The SAR assessment followed the MECP guidance document - Client's Guide to Preliminary Screening for SAR (MECP, 2019).

Anthropogenic structures on the property (*e.g.*, barns) were not screened for SAR.

3.3.2 Breeding Birds

Two dawn breeding bird surveys were conducted in the study area at five point count stations on June 11 and June 22, 2021 (Figure 2A), guided by point count methodology presented in the OBBA Guide for Participants (OBBA, 2001). All surveys were conducted no earlier than one half hour before sunrise and were completed prior to 10:00am. Surveys were completed under suitable weather conditions [*i.e.*, light winds (Beaufort wind scale ≤3)]. There was an intermittent light shower during the June 11 survey, but birds remained active so data collection was not compromised. Point counts were five minutes in duration and otherwise followed the protocol of the Ontario Breeding Bird Atlas Guide for Participants (OBBA, 2001). Survey station locations conferred coverage of the property, vegetation communities and adjacent lands. Breeding evidence was assessed using OBBA (2001) criteria. All birds seen or heard were identified to species and counted. The third dawn breeding bird survey was deemed to be unnecessary because SAR grassland birds were not detected in the study area during the first two surveys, and suitable habitat conditions (*i.e.*, meadows) were not observed.

Morning marsh bird surveys were completed using call playback surveys employing methods of the Marsh Monitoring Program (Bird Studies Canada, 2008) at two point count stations to provide coverage of potentially suitable wetland habitat associated with the property (Figure 2A). Each survey was comprised of three components: five minute pre-playback; playback and five minute post-playback. The surveys were completed on June 11 and June 22, 2021 in accordance with the Ontario Marsh Monitoring Program (Bird Studies Canada, 2008). Bird species included in the playback were Virginia Rail (*Rallus limicola*), Sora (*Porzana carolina*), Least Bittern (*Ixobrychus exilis*), American Coot (*Fulica americana*) and Pied-billed Grebe (*Podilymbus podiceps*). Breeding evidence was assessed based on the criteria of the OBBA (2001).

3.3.3 Amphibians and Reptiles (Herpetofauna)

Three evening calling amphibian surveys were conducted at a total of five survey stations (Figure 2A) to assess amphibian breeding on and/or adjacent to the property in accordance with the Great Lakes Marsh Monitoring Program (Bird Studies Canada, 2008) protocol. In accordance with the protocol, the surveys were completed during the period between 30min after sunset and midnight, on an evening with winds Beaufort <4. Stations provided appropriate coverage of wetlands on the property plus adjacent wetland habitat. The early-spring survey was conducted on April 27, 2021 [survey stations #1 to #3; minimum (min.) temperature of 5°C]. The mid-spring survey was completed on May 20, 2021 (survey stations #1 to #5; min. temperature of 10°C). The late-spring survey was completed on June 19, 2021 (survey stations #1 to #5; min. temperature of 15°C). The two additional survey stations (#4 and #5) were added for the mid- and late-spring surveys due to greater traffic noise from Highway 11. Surveys were five minutes in duration. Any observations for reptiles (*e.g.*, snakes, turtles) were undertaken as a matter of course during fieldwork.

A control site wetland was used for the early-spring survey located in the City of Barrie on the south side of Tiffin Street between Dunlop Street West and Ferndale Drive. For mid-and late-spring surveys, two wetland control sites were used that were located on Amigo Drive and Menoke Beach Road, respectively, in the Township of Severn (approximately 125m southeast and west of the property) (Control Site #1 and Control Site #2 in the vicinity of the study area, Figure 2A). These two local amphibian calling control sites were used to strengthen data collection, while considering traffic noise that hindered (to some degree) call detection. The purpose of the control sites was to determine whether or not calling conditions were suitable. Although air temperatures were marginally below 17ºC, the level of calling on June 19 (see Section 2.2) was high, making the confidence in sample collection also high. Surveys were conducted from a landscape perspective, and all amphibians seen or heard were identified to species and counted.

3.3.4 Bats and Bat Habitat

Several bat species [including Endangered bats Little Brown Myotis (*Myotis lucifugus*), Northern Myotis (*Myotis septentrionalis*) and Tri-colored Bat (*Perimyotis subflavus*)] may use large trees preferably ≥25 centimetres (cm) diameter at breast height (DBH) in early stages of decay. These trees are described as "snag" trees – those having cracks, splits, holes, *etc.* that could feasibly provide access for roosting bats. During the preliminary field visit on February 26, 2021, it was noted that suitable snag trees that could potentially be used by bats to establish maternity and/or day roosts during the summer period were present on the property. Consequently, on April 26, 2021, Azimuth conducted a detailed bat snag survey during the leaf-off season to identify and map the location of individual candidate bat snag trees and clusters of snag trees on the property. The survey involved a systematic search of all trees on the property for presence of candidate snag trees. For each candidate bat snag tree, GPS coordinates were recorded (Figure 2B).

A total of six acoustic monitors were deployed on May 31, 2021. Acoustic monitors were placed throughout the woodlands proximal to the eastern property boundary [monitor #1 (southern region) - monitor #6 (northern region), see Figure 2B]. Monitors were positioned in areas of clusters of candidate bat snag trees, while also considering that bats (if present) generally prefer to forage near woodland edges and/or in woodland gaps. Monitors were checked, and the data collected were downloaded, mid-way through the acoustic survey period (June 4, 2021) and at the end of the survey. Monitors were retrieved on June 10, 2021.

The acoustic monitors were left in situ for 10 consecutive nights. Agency guidelines require that acoustic monitoring be conducted for a minimum of 10 nights, with at least 10 nights in June (MECP email correspondence). Monitors were programmed to record bat echolocation calls from 30 minutes before sunset to 30 minutes after sunrise. Acoustic data were collected using Wildlife Acoustics SM3BAT bioacoustic monitors; each monitor was connected to an SMM-U1 ultrasonic microphone. Acoustic data were analyzed using Kaleidoscope V5.1.9g software by Wildlife Acoustics. Identification of SAR bat species was based on a combination of auto-classification by the software, and subsequent manual analysis of call characteristics for confirmation. Auto-classification threshold criteria were set at ≥ 16 pulses and ≥ 60% match ratio to identify the best quality calls for analysis and species confirmations.

3.4 Fish and Fish Habitat

Watercourses and drainage features in the study area were assessed on March 23, May 20 and August 4, 2021. Site evaluations were aimed at understanding the location of

drainage occurrences, watercourse form and function, and assessing potential fish habitat functions.

A Licence to Collect Fish was sought from the NDMNRF, and was received on April 23, 2021 to complete fish sampling in watercourses with potential to host fish, and assist in classification of fish habitat limits on the property. Spot sampling using a backpack electrofisher was completed on May 20, 2021 as shown on Figure 2C to better establish the presence/absence of fish and fish community composition.

A background fisheries information request was sent to NDMNRF on June 1, 2021, with a response received on August 31, 2021.

Background information requests related to aquatic SAR was sent to MECP and NDMNRF on November 30 and December 7, 2021, respectively. Responses were received on December 7 and December 13, 2021 (Appendix B).

4.0 EXISTING CONDITIONS

4.1 Land Use

The property borders Menoke Beach Road on the south side and Highway 11 on the west side in the Westshore community, approximately six kilometres (km) north of Orillia, Ontario (Figure 1). The property is in a residential area and consists of a Wheat (*Triticum aestivum*) field traversed by several drainage features, wetlands and woodlands (Figure 2A). Topography on the property is generally flat, with some regions of the property sloping gently eastward toward Shadow Creek, an unnamed creek, and Lake Couchiching (Figure 1 and Figure 2A). Anthropogenic structures on the property include three barns and one silo (Figure 2A).

Adjacent lands consist of residential and commercial land uses to the north, south and east. Lands on the west side of Highway 11 are a combination of residential and agricultural.

4.2 Terrestrial Resources

4.2.1 Vegetation

The limits of the eight ELC communities identified in the study area are illustrated on Figure 2A. A complete list of vascular plant species identified is presented in Table 2, and summary descriptions of ELC vegetation communities are in Table 3. Appendix C provides a terrestrial photographic record of the study area.

Much of the property occurs as a Wheat field (OAGM1) (Figure 2A). Wetland habitat traversing the Wheat field region of the property occurs as four relatively narrow wetland areas, each associated with a drainage feature (Aquatic Site #4, #5, #8 and #11). Three of these wetland areas (two in the southern region of the property, one in the northern region of the property) are Reed Canary Grass Graminoid Mineral Meadow Marsh ELC polygons (MAMM1-3) that run in an east-west orientation. These three wetland polygons extend toward the eastern property boundary, and were ploughed in fall 2021 to accommodate archaeological surveys.

The forked wetland associated with Aquatic Site #8 was not ploughed, and is comprised of a central MAMM1-3 community fringed by Silver Maple Mineral Deciduous Swamp (SWDM3-2) along the southern side of the MAMM1-3 polygon (Figure 2A, Table 3). The northwestern edge of this wetland feature, as well as the western outer edge, consists of an upland Dry-Fresh Black Walnut Deciduous Woodland community (WODM4-4).

Toward the eastern property boundary, vegetation communities are dominated by mature trees with Fresh-Moist Poplar Deciduous Forest (FODM8-1) and Fresh-Moist Lowland Deciduous Forest (FODM7) ELC polygons (Figure 2A). Forest areas transition into an SWDM3-2 community as topography continues sloping gently toward Shadow Creek. An agricultural building/Fresh-Moist Mixed Meadow (IAGM1/MEMM4) is present along the western property boundary adjacent to Highway 11. Narrow Fresh-Moist Deciduous Thicket (THDM5) and Poplar Mineral Deciduous Swamp (SWDM4-5) communities occur along the southern property boundary.

Adjacent lands to the east are unevaluated wetlands, as per LIO data. The SWDM4-5 poplar swamp community continues south of the property toward Amigo Drive (Figure 2A). Agricultural lands (row crop) occur west of Highway 11 and southwest of Menoke Beach Road (Figure 2A).

A total of 239 vascular plant species were identified in the study area, 187 (78%) of which are considered native to Ontario (Table 2) (*i.e.*, 22% of the plant species are non-native). The only SAR vegetation species observed was Butternut (see Section 4.2.2 below). None of the vegetation communities or species documented are of federal or provincial conservation concern, and none are considered rare provincially (*i.e.*, S1-S3) (NHIC, 2021a).

4.2.2 Butternut

Five Category 1 (non-retainable) Butternut trees and one (1) Category 2 (retainable) Butternut tree were identified during the plant inventory (Figure 2A). All were living

specimens. The Category 1 Butternut trees are in the WODM4-4 vegetation community. The Category 2 Butternut is in the FODM7 vegetation community where the central wetland (associated with Aquatic Site #8) transitions to deciduous forest toward the eastern property boundary. A 50m habitat buffer is shown around this Category 2 Butternut tree (Figure 2A). One standing dead Butternut tree was found, located in the northern fork of the central wetland associated with Aquatic Site #8. As a non-living specimen, this tree is not considered further in the assessment.

A draft Butternut Health Assessment report was completed and submitted to the client on August 26, 2021. The report has not been submitted to the MECP. The location of the Category 2 tree has potential implications on the development precinct. At the request of the project team, it will be re-evaluated in 2022. Should the designation change from Category 2, the Butternut Health Assessment and impact evaluation will be amended accordingly.

4.2.3 Wildlife

4.2.3.1 Mammals

Evidence of three mammalian species was observed on the property, and included Beaver (*Castor canadiensis*; dam), White-tailed Deer (*Odocoileus virginianus*; tracks) and Eastern Gray Squirrel (*Sciurus carolinensis*). Given the study area proximity to large natural areas at the landscape scale, including the Lake Couchiching shoreline, it is expected that the following mammals could conceivably be encountered in the study area: small mammal species (various mice, voles and shrews); Eastern Chipmunk (*Tamias striatus*); Striped Skunk (*Mephitis mephitis*); Porcupine (*Erethizon dorsatum*); Eastern Coyote (*Canis latrans*); Red Fox (*Vulpes vulpes*); Groundhog (*Marmota monax*); Eastern Cottontail (*Sylvilagus floridanus*); Red Squirrel (*Sciurus vulgaris*) and Raccoon (*Procyon lotor*).

4.2.3.2 Birds

A total of 29 bird species were detected on the property and/or on adjacent lands during the dawn breeding bird surveys (Table 4). Eight additional bird species were identified incidentally during the remainder of the field program (Table 4). Eastern Wood-pewee (*Contopus virens*) (Special Concern) was identified as a possible breeder on the property. No Threatened or Endangered bird species were detected in the study area.
No marsh breeding birds were heard in the study area during either marsh birds survey.

4.2.3.3 Amphibians and Reptiles (Herpetofauna)

Evening calling amphibian species were detected in association with the property. Data from control sites indicate that conditions for evening calling amphibians were suitable

for calling on the evenings when surveys were completed. No salamanders, newts or reptiles were observed over the course of the field program. Results of evening amphibian calling surveys are presented in Table A.

Table A. Evening Calling Amphibians Heard on the Property

Time of Survey	Station No.	Species Calling on Property
Early-Spring (April)	1	3 Spring Peepers (*Pseudacris crucifer*)
	2	No species detected
	3	No species detected
	4	(Not surveyed)
	5	(Not surveyed)
	Control Site in Barrie	Spring Peepers (full chorus)
		1 Wood Frog (*Lithobates sylvaticus*)
	Control Site #1 Near Property	(Not surveyed)
	Control Site #2 Near Property	(Not surveyed)
Mid-Spring (May)	1	No species detected
	2	No species detected
	3	No species detected
	4	3 American Toads (*Anaxyrus americanus*)
	5	2 Green Frogs (*Lithobates clamitans*)
		7 American Toads
	Control Site in Barrie	(Not surveyed)
	Control Site #1 Near Property	6 Spring Peepers
		6 Gray Treefrogs (*Dryophytes versicolor*)
		2 American Toads
	Control Site #2 Near Property	(Not surveyed)
Late-Spring (June)	1	No species detected
	2	No species detected
	3	No species detected
	4	3 Gray Treefrogs
	5	6 Green Frogs
	Control Site in Barrie	(Not surveyed)
	Control Site #1 Near Property	No species detected

Time of Survey	Station No.	Species Calling on Property
	Control Site #2 Near Property	5 Green Frogs

See Figure 2A for locations of survey stations.

4.2.4 Bats and Bat Habitat

Detailed mapping of candidate bat snags revealed 134 candidate bat snag trees with characteristics suitable for use by bats (Figure 2B). The bat snag trees identified are associated with SWDM3-2, FODM-7, FODM8-1 and SWDM4-5 ELC polygons proximal to the eastern property boundary (Figure 2B). Mature deciduous trees having snag characteristics rendering the trees suitable for use by maternity and/or day roosting bats varied in Decay Class and quality (Figure 2B), with 24/134 (18%) of snag trees classified as high quality due to the size, number and height of snag characteristics observed.

Acoustic data confirmed the presence of three SAR bat species using treed habitat on the property: Little Brown Myotis; Northern Myotis and Tri-colored Bat (Table B). In Table B, each bat "pass" recorded is not necessarily a different individual. Based on acoustic data analyzed, bat activity was generally higher in the middle and northern regions of the woodland associated with the eastern property boundary (*i.e.*, the area of acoustic monitors #4-6) compared to the more southern regions towards Amigo Drive (*i.e.*, the area of acoustic monitors #1-3).

Table B. Species at Risk Bats Present on the Property Based on Acoustic Data

Monitor No.	SAR Bat Species	No. of Bat Passes
1	Little Brown Myotis	≥114
	Northern Myotis	0*
	Tri-colored Bat	0*
2	Little Brown Myotis	≥95
	Northern Myotis	0*
	Tri-colored Bat	0*
3	Little Brown Myotis	0*
	Northern Myotis	≥49
	Tri-colored Bat	0*
4	Little Brown Myotis	≥963
	Northern Myotis	0*
	Tri-colored Bat	0*
5	Little Brown Myotis	≥270

Monitor No.	SAR Bat Species	No. of Bat Passes
	Northern Myotis	0*
	Tri-colored Bat	≥3
6	Little Brown Myotis**	≥3,581
	Northern Myotis**	≥3,581
	Tri-colored Bat	0*

See Figure 2B for acoustic monitor locations.
*Calls inconclusive so could not confirm species presence; species treated as absent.
**Calls identified to *Genus* level; number of bat passes reported combined for both species.

For non-SAR bats that receive consideration under provincial SWH criteria (see Section 4.7 below), Big Brown Bat (*Eptesicus fuscus*)/Silver-haired Bat (*Lasionycteris noctivagans*) were detected by acoustic monitors #1 (at least 1,117 passes), #4 (at least 22 passes), #5 (at least 324 passes) and #6 (at least 71 passes). No bats with SWH consideration were recorded at acoustic monitors #2 or #3. Hoary Bat (*Lasiurus cinereus*) and Eastern Red Bat (*Lasiurus borealis*) were also detected on the property; however, these two species are non-SAR and do not receive SWH consideration.

4.3 Species at Risk

The SAR assessment (Table 1) considers SAR and SAR habitat with potential to occur in the study area, in accordance with field data, known SAR for Simcoe County (Endangered, Threatened or Special Concern) and NHIC records (see Appendix B for NHIC data). Based on this assessment, in combination with vegetation communities and other environmental features observed during the investigation, the following species are considered below in this report:

- **Threatened or Endangered**;
  - Butternut;
  - Little Brown Myotis;
  - Northern Myotis;
  - Tri-colored Bat;
- **Special Concern**;
  - Eastern Wood-pewee; and,
  - Snapping Turtle.

Barns on the property could conceivably be used as habitat by Barn Swallows and/or SAR bats (see Section 8.2 below). No SAR turtles were observed on the property during the 2021 field program, nor was evidence of turtle nesting (*e.g.*, depredated nests, egg shells) found. Habitat on the majority of the property was not considered suitable for

SAR turtles. Agricultural areas on the property that could conceivably be used for nesting by SAR turtles had a clay-like substrate rather than a sandy/gravelly substrate. An area downstream of Aquatic Site #11 near the eastern property boundary could potentially be used by Snapping Turtles (*Chelydra serpentina*), and therefore, is treated as present in the impact assessment below.

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

4.4 Wetlands

Background mapping (NHIC, VuMap) combined with field study indicate the presence of wetlands on the property (Appendix B). Wetlands on the property are considered "unevaluated" by the NDMNRF and will be treated as "Other Wetlands" for the purposes of this assessment.

4.5 Significant Woodland

Woodlands in the study area are not identified as Significant Woodland on County or Township OP schedules (Appendix A). The woodlands in the study area are part of a larger continuous woodland block that extends up to Bayou Road to the north and northeast, Shadow Creek Road to the east, Amigo Drive to the south and Highway 11 to the west (Figure 2A). The overall size of the woodland feature was estimated to be 45.6ha. Based on the Significant Woodland Assessment criteria used from the NHRM, woodlands on the property should not be considered Significant Woodland (Table 5) for the purposes of this assessment.

4.6 Significant Valleyland

No portion of the study area is identified as Significant Valleyland nor assigned a similar designation on Township, County (Appendix A), or provincial mapping resources (NHIC, 2021a; Appendix B). As per direction in the Natural Heritage Reference Manual (OMNR, 2010), watercourses on the property do not fulfill the well-defined valley morphology and landform prominence criteria, and therefore are not designated Candidate Significant Valleyland.

4.7 Significant Wildlife Habitat

An assessment of the potential for SWH in the study area was conducted using criteria outlined within MNRF's Significant Wildlife Habitat Technical Guide (2000) and the accompanying the Ecoregion 6E Criteria Schedules (MNRF, 2015). Assessment of Candidate SWH categories relative to documented vegetation communities and habitats

in the study area is presented in Table 6. The following SWH types was determined to be present, or have potential to occur, based on results of the field program:

- Bat Maternity Colonies (on property and adjacent lands);
- Turtle Wintering Areas (potential – adjacent lands);
- Turtle Nesting Areas (potential – adjacent lands);
- Seeps and Springs (on property and adjacent lands);
- Terrestrial Crayfish (on property lands);
- Special Concern and Rare Wildlife Species;
    - Eastern Wood-pewee (on property); and,
    - Snapping Turtle (on property – potential).

These candidate SWH types are discussed below in the context of SWH function.

4.8 Areas of Natural and Scientific Interest

No portion of the study area is identified as ANSI on Township, County (Appendix A), or Provincial mapping resources (NHIC, 2021a; Appendix B).

4.9 Fish and Fish Habitat

The study area is located within the Lake Couchiching Subwatershed of the Black-Severn River Watershed (SGBLS, 2015). Seven watercourses are reflected in background mapping for the study area: five originate in agricultural land to the west the property (west of Highway 11), which flow to the east on or directly north of the property, and two form/flow in proximity to the east property boundary, which flow from the south and north, respectively. Nine non-permanent drainage features were also identified on the property through field evaluation. All drainage ultimately discharges to Lake Couchiching approximately 250m to 550m to the east of the property.

All sixteen watercourses/drainage features were assigned "Aquatic Site Numbers", which are referred to below and shown on Figure 2C. Photographs of aquatic features are included in Appendix D (along with a photograph location figure). Summaries of aquatic habitat conditions for each watercourse are provided below and summarized on Table C.

4.9.1 Aquatic Site #1 – Unnamed Creek

Site Conditions

An unnamed creek flows from south to north to the east of the property (Figure 2C). Desktop mapping indicates the creek receives flow from multiple branches to the west of Highway 11, which combine into a single channel in proximity to Menoke Beach Road/Amigo Drive. The creek enters a wetland corridor that extends to the property on

the north side of Amigo Drive. Along the property, the creek receives drainage from Aquatic Sites #3-9 on the property as described below.

The main channel of the unnamed creek is permanently flowing and defined, and displays considerable habitat heterogeneity between upstream and downstream reaches adjacent to the property. To the south (upstream), the channel is relatively small (approximately 2.0 wide/0.5m deep), highly shaded from overstory vegetation and contains sparse aquatic vegetation/Watercress (*Nasturtium* sp.). It lacks deep pools or overhanging banks. Substrate consists of silt, detritus, leaf litter, and muck (with sparse gravel). Abundant woody debris and sticks associated with beaver activity were observed. The creek contained visible flow during each site visit, with water temperatures of 6.1°C (air temperature = 7°C) and 16.6°C (air temperature = 19°C) during March and May visits, respectively.

In the upstream portion of the creek, a beaver dam crosses its channel as indicated on Figure 2C (Photograph 1, Appendix D). Significant spring inundation into the floodplain was observed adjacent to the creek both upstream and downstream of the dam. Spring flooding appears to be a function of not only back-flooding associated with the beaver dam, but also from flow inputs from drainage features on the property (described below).

Downstream, the creek channel becomes progressively wider (15-22m) and deeper towards the confluence with Aquatic Site #2 (Shadow Creek). Riparian shading is fairly limited (<25%) in the location. This segment contains dense submergent aquatic vegetation and floating mats of filamentous algae. Logs and large woody debris are abundant in the channel. An old beaver lodge was noted at one location on the west bank (Figure 2C). Although the creek has a hydraulic connection to Aquatic Site #2 (Shadow Creek; described below), and, ultimately, Lake Couchiching, flows appeared stagnant in the downstream section of Aquatic Site #1. This appears to be largely a function of high lake water levels and back-flooding. No fish were observed in the creek at this location, although slightly turbid conditions were not optimal for observation.

Areas of inundation in the floodplain of the creek were also noted in the lower segment in the spring, with Watercress present.

Fish Habitat

An unidentified minnow species was observed within the upstream portion of Aquatic Site #1. In-stream cover and refuge habitat in this section is sparse. A lack of aquatic vegetation and coarse substrate is expected to provide unsuitable spawning habitat for many larger sportfish species known to occur in Lake Couchiching. The fish community within the upper portion is expected to be primarily limited to baitfish species.

Downstream conditions are suitable for a variety of coolwater and warmwater fish species found in Lake Couchiching. This portion of Aquatic Site #1 supports feeding, spawning and refuge functions for both sportfish and baitfish species, particularly those species that favour broad stagnant channels with high macrophyte coverage.

Both upstream and downstream, seasonally-flooded areas adjacent to the creek in the spring provide suitable conditions for Northern Pike (*Esox lucius*) access. Although emergent vegetation species (sedges/grasses) most preferred by Northern Pike for spawning were not noted within flooded areas, and spawning activities were not observed during early spring site evaluation, the floodplain of the creek supports potential spawning functions for this species.

The channel of Aquatic Site #1 is considered to provide permanent direct fish habitat for a cool/warm fish community (Table C). Areas beyond the creek channel up to the 2-year flood elevation (as shown on Figure 2C) are considered to provide seasonal direct fish habitat. Aquatic Site #1 is protected under the *Fisheries Act*).

4.9.2 Aquatic Site #2 - Shadow Creek

Site Conditions

Aquatic Site #2 is Shadow Creek at the east property boundary, which flows from the northeast onto the property (Figure 2C). Desktop mapping indicates the creek originates approximately 3km to the north, on the northwest side of Highway 11 (Simcoe County, 2021). The creek discharges to larger lagoon channels directly connected to Lake Couchiching surrounding lots on Westshore Crescent (Figure 2C). They outlet at two locations to the Lake, and both are considered to be part of Shadow Creek. Aquatic Site #2 receives flow inputs from Aquatic Sites #10-#15 on the property and Aquatic Site #16 directly north of the property as described below.

Aquatic Site #2 has a wide, defined channel (approximately 7-15m wide upstream, 15-25m wide in downstream outlet channels as estimated from aerial photographs) with moderate to abundant woody debris, and dense floating and submergent vegetation. Water levels are permanently inundated from Lake Couchiching, and the creek was to be stagnant during all site visits. Shading from riparian vegetation is high to the north, and much reduced to the south. A water temperature of 22.0^{o}C (air temperature = 23^{o}C) was recorded during the May site visit.

Flooding was observed west of the creek within the SWDM3-2 on the property (Figure 2C). Areas of inundation were directly connected to the creek during site visits in March and May. Watercress was abundant within the floodplain of the creek, as well as other aquatic vegetation summarized in Table C.

Fish Habitat

Slightly turbid conditions in Aquatic Site #2 impacted the ability to observe and positively identify fish; however, Centrarchids (Pumpkinseed and Bluegill) were abundant within the channel. Juvenile Yellow Perch, and unidentified minnow species, were also observed in the upstream section of the creek on the property. Aquatic habitat in the creek channel supports refuge, feeding and spawning functions for a variety of cool/warmwater species found in Lake Couchiching.

Given the many observed connections from standing water adjacent to the creek to the creek itself in the spring, and the presence of flooded aquatic vegetation in the floodplain, the floodplain of Aquatic Site #2 is considered to provide seasonal habitat suitable for Northern Pike (*Esox lucius*) spawning.

The defined channel of Aquatic Site #2 provides permanent direct fish habitat for a cool/warm fish community, while areas beyond the channel, extending to the 2-year flood elevation on the property (as shown on Figure 2C), are considered to provide seasonal direct fish habitat (Table C). Both are protected under the Federal *Fisheries Act*.

There are no records of aquatic SAR for Shadow Creek, or aquatic features on the property or within the study area. DFO mapping indicates there is a historic record(s) of Grass Pickerel (*Esox americanus vermiculatus*; Special Concern) in Lake Couchiching (DFO, 2019); however, the COSEWIC Assessment and Status Report on the Grass Pickerel suggests this is an unverified field record from 1972 (Crossman & Holm, 2005). This record, valid or otherwise, was confirmed by MECP in an information request (Appendix B). NDMNRF confirmed in a separate information request that recent sampling efforts since 2000 have not resulted in the capture of this species (Appendix B). As a result, Grass Pickerel is not considered further in Azimuth's assessment.

4.9.3 Aquatic Sites #3, #6-7, #9-10, and #12-15 – Ephemeral Drainage Features

Site Conditions

The abovementioned sites, shown on Figure 2C and summarized in Table C, are drainage features that convey localized runoff, and do not sustain flows beyond short periods after snowmelt/heavy rainfall. These features lack defined channels, or obvious depressions, aside from occasional minor rilling. With the exception of Aquatic Site #3, these areas are located on actively cultivated farm field. Later in the growing season, they are typically characterized by reduced/stunted crop growth.

Fish Habitat

Based on site conditions at Aquatic Sites #3, #9, #10 and #12-#15, there is no potential for fish to occur in these features and hydroperiods are not sufficiently long for them

qualify as indirect fish habitat. As such, these ephemeral features are not considered fish habitat.

Aquatic Sites #6 and #7 connect directly to channels in the SWMD3-2, and have direct seasonal/permanent connections to Aquatic Site #1 (Figure 2C). These downstream channels are considered direct fish habitat. As a result, Aquatic Sites #6 and #7 are considered to provide flow contribution functions to downstream direct fish habitat, and are considered indirect fish habitat (Table C).

4.9.4 Aquatic Sites #4-5, #8 and #11 – Intermittent/Permanent Watercourses

Site Conditions

The abovementioned sites traverse the property from west to east (Figure 2C) and have larger drainage areas than the sites described in Section 4.9.3. Site conditions/functions are summarized in Table C. Upstream, these sites consist of wide Reed Canary Grass (*Phalaris arundinacea*) dominated swales with diffuse flow. Downstream, they transition to narrower defined channels with more concentrated flow with a direct connection to Aquatic Sites #1 and #2 (Figure 2C).

Hydroperiods for Aquatic Sites #4 and #5 are considered intermittent. Trickle flow was noted at Aquatic Sites #8 and #11 in August; as a result, they are considered permanently flowing. The north arm of Aquatic Site #8 also contained dense beds of Watercress and Marsh Marigold (*Caltha palustris*), indicating an area of potential groundwater seepage (Figure 2C).

Channel areas at the downstream end of Aquatic Sites #4 and #5 within the SWDM3-2 community by Aquatic Site #1 also held water intermittently.

The downstream ends of Aquatic Sites #8 and #11 contained permanent standing water, with visible flow only observed during spring evaluation.

Fish Habitat

Channels areas at the downstream end of Aquatic Sites #4 and #5, and flooded areas around them, could potentially be used seasonally by fish. The downstream portions of these sites, and the area extending from the channels to the limits of the 2-year flood line (Figure 2C), are considered to provide seasonal direct fish habitat (Table C). Upstream swale segments are considered indirect fish habitat.

The downstream ends of Aquatic Sites #8 and #11 were sampled via backpack electrofisher in May. Warmwater generalist species, including Central Mudminnow (*Umbra limi*), Brown Bullhead (*Ameiurus nebulosus*) and Pumpkinseed (*Lepomis*

gibbosus), were documented. These channels are permanently connected to Aquatic Sites #1 and #2, and provide permanent direct fish habitat (Table C). Flooded areas beyond these channels up to the 2-year flood elevation provide potential seasonal direct fish habitat. Upstream swale segments for each feature are considered indirect fish habitat.

4.9.5 Aquatic Site #16 – Permanent Watercourse (*off property*)

Site Conditions

Aquatic Site #16 is located directly north of the property and was viewed from the Highway 11 culvert outlet and by its confluence with Shadow Creek (Figure 2C). Flow was noted at the Highway 11 culvert during all three site visits, with trickle flow noted in August. A dense bed of Watercress is present at the culvert outlet, and the channel downstream had dense cattails. The channel downstream transitions to an open, defined channel (approximately 2.0m wide x 0.10m deep) without emergent vegetation.

Fish Habitat

The upper portion of Aquatic Site #16 is considered indirect fish habitat, while the lower reach is direct fish habitat (Table C).

Table C: Summary of Aquatic Sites in Study Area Based on Azimuth's 2021 Field Survey Program

Aquatic Site #	Photo #	Fish Habitat	Fish Habitat Quality	Flow Permanency	Thermal Regime	Substrate	Vegetation	Fish Community
1 (Unnamed Creek)	1-3	Permanent & Seasonal Direct	Moderate/High	Permanent	Cool/Warm	Silt, detritus, leaf litter, muck, gravel (sparse)	In creek: Algae, Common Duckweed, watercress (appears to be In flooded areas of creek: Algae, Arrowhead Common Duckweed, Jewelweed, watercress, Water Plantain	• Documented at site: unidentified minnow sp. • Documented in area: Bluegill, Brook Stickleback, Brown Bullhead, Central Mudminnow, Pumpkinseed, Yellow Perch • Potential for: coolwater/warmwater fish species found in Lake Couchiching, including Bowfin, Common Carp, Muskellunge, Northern Pike
2 (Shadow Creek)	4-8	Permanent & Seasonal Direct	Moderate/High	Permanent	Cool/Warm	Silt, detritus, leaf litter, muck	In creek: Canada Waterweed, Common Duckweed, milfoil sp., Sago Pondweed, Slender Leaved Pondweed, Yellow Pond Lily, White Water Lily In flooded areas of creek: Arrowhead, Common Duckweed, Spotted Jewelweed, Marsh Marigold, watercress	• Documented at site: Bluegill, Pumpkinseed, unidentified minnow sp., Yellow Perch • Documented in area: Brook Stickleback, Brown Bullhead, Central Mudminnow • Potential for: Coolwater/warmwater fish species found in Lake Couchiching, including Bowfin, Common Carp, Muskellunge, Northern Pike
3	9	Not Fish Habitat	N/A	Ephemeral	N/A	Leaf litter	Shrub vegetation, including Red-osier Dogwood	N/A
4	–	*Upstream*: Indirect	*Upstream*: Low	*Upstream*: Intermittent	*Upstream*: Unknown	*Upstream*: Muck	*Upstream*: Reed Canary Grass, Red-osier Dogwood	*Upstream*: N/A
	10	*Downstream*: Seasonal Direct	*Downstream*: Moderate	*Downstream*: Intermittent	*Downstream*: Unknown	*Downstream*: Leaf litter, muck, detritus	*Downstream*: Cattail	*Downstream*: • Potential for: Northern Pike
5	11	*Upstream*:	*Upstream*:	*Upstream*:	*Upstream*:	*Upstream*:	*Upstream*:	*Upstream*:

Aquatic Site #	Photo #	Fish Habitat	Fish Habitat Quality	Flow Permanency	Thermal Regime	Substrate	Vegetation	Fish Community
		Indirect	Low	Intermittent	Unknown	Muck, gravel/sand (at Menoke Beach Road culvert outlet)	Algae, cattail, Spotted Jewelweed Reed Canary Grass, Red-osier Dogwood	N/A
	_	*Downstream*: Seasonal Direct	*Downstream*: Moderate	*Downstream*: Intermittent	*Downstream*: Unknown	*Downstream*: Leaf litter, muck, detritus	*Downstream*:	*Downstream*: • Potential for: Northern Pike
6	_	*Upstream*: Indirect	*Upstream*: Low	*Upstream*: Ephemeral	*Upstream*: Unknown	*Upstream*: Native soil on farm field (	*Upstream*: None (crops later in growing season)	*Upstream*: N/A
	12	*Downstream*: Seasonal Direct	*Downstream*: Moderate	*Downstream*: Intermittent	*Downstream*: Unknown	*Downstream*: Leaf litter, muck, detritus	*Downstream*: Common Duckweed, Grass sp., Spotted Jewelweed, watercress	*Downstream*: • Potential for: Northern Pike
7	_	*Upstream*: Indirect	*Upstream*: Low	*Upstream*: Ephemeral	*Upstream*: Unknown	*Upstream*: Native soil on farm field	*Upstream*: None (crops later in growing season)	Upstream: N/A
	13	*Downstream*: Permanent & Seasonal Direct	*Downstream*: Moderate	*Downstream*: Permanent	*Downstream*: Unknown	*Downstream*: Leaf litter, muck, detritus	*Downstream*: Common Duckweed, Grass sp., Jewelweed, watercress	*Downstream*: • Potential for: Northern Pike, and smaller fish species documented in study area/found in Lake Couchiching
8	14	*Upstream*: Indirect	*Upstream*: Low	*Upstream*: Permanent	*Upstream*: Unknown	*Upstream*: Organics/muck	*Upstream*: Cattail, Jewelweed, Marsh Marigold, Reed Canary Grass, watercress	Upstream: N/A
	15-16	*Downstream*: Permanent & Seasonal Direct	*Downstream*: Moderate	*Downstream*: Permanent	*Downstream*: Cool/Warm	*Downstream*: Silt, muck, detritus, leaf litter	*Downstream*: Common Duckweed, watercress	*Downstream*: • Documented at site: Brown Bullhead, Central Mudminnow, Pumpkinseed • Potential for: Northern Pike, and other smaller fish species documented in study area/found in Lake Couchiching
9	17	Not Fish Habitat	N/A	Ephemeral	N/A	Native soil on farm field (silt, sand, clay)	None (crops later in season)	N/A
10	18	Not Fish	N/A	Ephemeral	N/A	Native soil on farm	None (crops later in	N/A

Aquatic Site #	Photo #	Fish Habitat	Fish Habitat Quality	Flow Permanency	Thermal Regime	Substrate	Vegetation	Fish Community
		Habitat				field (silt, sand, clay)	season)	
11	19	*Upstream*: Indirect	*Upstream*: Low	*Upstream*: Permanent	*Upstream*:	*Upstream*: Muck	*Upstream*: Algae, cattail, Reed Canary Grass, watercress	*Upstream*: N/A
	20	*Downstream*: Permanent & Seasonal Direct	*Downstream*: Moderate	*Downstream*: Permanent	*Downstream*: Cool/Warm	*Downstream*: Muck, silt, detritus	*Downstream*: Algae, Common Duckweed, horsetail sp., milfoil sp., White Water Lily (dense floating & submerged aquatic vegetation)	*Downstream*: • Documented at site: Bluegill, Brook Stickleback, Brown Bullhead, Brook Stickleback, Central Mudminnow, Pumpkinseed • Potential for: Northern Pike, and other fish species documented in study area/found in Lake Couchiching
12	21	Not Fish Habitat	N/A	Ephemeral	N/A	Native soil on farm field (silt, sand, clay)	None (crops later in season), except for one small section of Reed Canary Grass in IAGM1/MEMM4	N/A
13	22	Not Fish Habitat	N/A	Ephemeral	N/A	Native soil on farm field (silt, sand, clay)	None (crops later in season)	N/A
14	23	Not Fish Habitat	N/A	Ephemeral	N/A	Native soil on farm field (silt, sand, clay)	None (crops later in season)	N/A
15	24	Not Fish Habitat	N/A	Ephemeral	N/A	Native soil on farm field (silt, sand, clay)	None (crops later in season)	N/A
16	25	*Upstream*: Indirect	*Upstream*: Low	*Upstream*: Permanent	*Upstream*: Unknown	*Upstream*: Sand	*Upstream*: Watercress, cattails	Upstream: N/A
	–	*Downstream*: Permanent & Seasonal Direct	*Downstream*: Moderate	*Downstream*: Permanent hydraulic connection to Aquatic Site #1	*Downstream*: Unknown	*Downstream*: Sand, silt, rubble	*Downstream*: Common Duckweed, Slender Leaved Pondweed, watercress, Yellow Pond Lily	*Downstream*: • Documented at site: Bluegill, Pumpkinseed • Potential for: smaller fish species documented in area/found in Lake Couchiching

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 NHFFs in the study area:

- Habitat for Threatened or Endangered Species;
    - Butternut;
    - Little Brown Myotis;
    - Northern Myotis;
    - Tri-colored Bat;
- Other Wetlands;
- Woodlands (Non-Significant);
- Candidate Significant Wildlife Habitat;
    - Bat Maternity Colonies (on property and adjacent lands);
    - Turtle Wintering Areas (potential – adjacent lands);
    - Turtle Nesting Areas (potential – adjacent lands);
    - Seeps and Springs (on property and adjacent lands);
    - Terrestrial Crayfish (on property);
    - Special Concern and Rare Wildlife Species;
        - Eastern Wood-pewee (on property);
        - Snapping Turtle (on property – potential); and,
- Fish Habitat (permanent direct, seasonal direct and indirect).

6.0 PROPOSED DEVELOPMENT

The proposed development involves construction of the Shadow Creek Subdivision on a ~45.6ha property (Figure 3 and Figure 4, see also Appendix E). The subdivision is proposed as including 319 single detached dwellings (Lots #1-319) and 215 townhouses (Blocks #1-31). Five Environmental Protection Area Blocks are proposed (Blocks #32, #34-35, #41, and #45; 13.84ha total or 30% of the property area), in addition to seven Open Space Blocks (Blocks #33, #36-40 and #42; 1.10ha total or 2% of the property area). The footprint for Stormwater Management Pond (SWMP) Block #43 would be within the adjacent 15m woodland buffer; SWMP Block #44 would be outside the woodland buffer. Proposed townhouse Blocks #20 and #29-31 requires demolition of three barns and one silo in the IAGM1/MEMM4 ELC polygon adjacent to Highway 11.

As outlined in the draft Functional Servicing and Stormwater Management Report by C.F. Crozier and Associates Inc. (Crozier; Crozier, 2022) the proposed development includes construction of Street "A" to Street "K" and three 1.22m x 0.91m box culvert

crossings (Crossings #1-3) for Street "C" and Street "F" (Figure 3 and Figure 4, Appendix E).

The proposed development has provision for a 0.15ha private waterfront access (*e.g.*, canoe or kayak) for residents (Block #46 on Figure 3). Waterfront access in Block #46 would be accessible from the northeast side of SWMP Block #44, and would involve a small-footprint pedestrian-style access through a portion of the FODM7 woodland and SWDM3-2 wetland. Confirmation of the specific location and design of the access in Block #46 would be confirmed during detailed design, but it is Azimuth's understanding that vegetation/tree removals would not encompass the entire block, and would only be to the extent needed to accommodate a raised boardwalk. The development would include full municipal servicing (Crozier, 2022), details of which are to be confirmed at detailed design.

Preliminary geotechnical investigation has been completed by Soil-Mat Engineers and Consultants Limited (SMEC) (SMEC, 2021). The development includes a SWMP in each of Block #43 and Block #44 near the eastern property boundary, and a pumping station in Block #47 in the southeastern portion of the property (Crozier, 2022; see also Figure 3 and Appendix E). Crozier (2022) concludes that the SWMPs will meet required criteria in terms of stormwater quantity, quality and erosion control, and that stormwater quantity controls (up to and including the 100-year storm event) will match pre-development conditions. The development will maintain pre-development flow rates into direct fish habitat (Crozier, 2022). Details regarding SWMP and pumping station designs, and methods for maintaining pre-development flow rates (*e.g.*, directing clean roof and rear lot drainage or clean water from SWMPs to wetlands/direct fish habitat), are expected to be available in future design stages (Crozier, 2022).

7.0 IMPACT ASSESSMENT

This impact assessment is prepared having regard for the construction footprint of the proposed development lands and associated grading limits, as described above and illustrated on Figure 3 and Figure 4 (see also Appendix E).

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. Section 10 covers destruction or damage to habitat of Threatened or Endangered species. According to the PPS, development and site alteration shall not be permitted in habitat of Threatened or Endangered species, except in accordance with provincial and federal requirements.

The following Threatened or Endangered species are confirmed to occur either in the study area or adjacent to the study area:

- Butternut;
- Little Brown Myotis;
- Northern Myotis; and,
- Tri-colored Bat.

7.1.1 Butternut

One Category 2 (retainable) Butternut tree was identified in the FODM7 vegetation community next to the central wetland (Figure 2A). As per the Site Plan (Figure 3, Appendix E), development will not encroachment on the FODM7 vegetation community. Since the proposed development will not pose direct impacts to this Butternut tree, there are no direct impacts anticipated. The Block #43 SWMP, as per the Site Plan, will represent an encroachment of approximately 10% into the 50m Butternut tree habitat buffer. Since approximately 90% of the buffer around this tree will remain post-development (*i.e.*, the majority of the area representative of suitable habitat for potential seedling establishment), the buffer encroachment is not anticipated to pose an impact to seedling establishment. Provided the mitigation measures recommended in Section 8.0 are followed, direct or indirect impacts to the species can be avoided, and the potential for indirect impacts to Butternut are considered mitigable.

Five Category 1 Butternut trees were found in the WODM4-4 vegetation community (Figure 2A). According to the Site Plan, one living and one standing dead Butternut tree will need to be removed to accommodate construction of Street 'C' (Figure 3). Since these Butternut trees were classified as non-retainable (or dead) during the August 13, 2021 Butternut Health Assessment, their removal would not be considered a negative impact, nor would their removal be considered a contravention of the ESA. Nonetheless, the Butternut Health Assessment report will be submitted to the MECP in 2022, and to ensure compliance, the 30-day MECP review period applies before any of the Butternut trees can be removed.

7.1.2 Little Brown Myotis, Northern Myotis and Tri-colored Bat

Detailed bat snag mapping indicated the presence of suitable SAR bat habitat in the SWDM3-2 vegetation community in the eastern region of the property (Figure 2B). Acoustic monitoring results indicated presence of three species of Endangered bats (Little Brown Myotis, Northern Myotis and Tri-colored Bat), confirming use of the habitat. There appeared to be a higher proportion of SAR bat activity in the northeastern region of the SWDM3-2 community (acoustic monitors #4-6) compared with the southeastern region of the community (acoustic monitors #1-3) (Figure 2A). In evaluating the

footprint of the development, land alterations are not proposed in SAR bat habitat with exception of one small area in Block #46 (discussed below). Given the retainment of woodland habitat, combined with mitigation (for Block #46), it is anticipated that there will be no direct impact to habitat for SAR bats.

The Site Plan (Figure 3, Appendix E) shows a 0.15ha Block #46 in the SWDM3-2 and FODM7 ELC polygons along the eastern property boundary, a portion of which is intended to contain a raised boardwalk waterfront access. Two bat snag trees were identified within this 0.15ha block: one high quality and one low quality Decay Class 2 snag. These two bat snag trees represent a small fraction of the 0.15ha block area. Although the specific location and design of the waterfront access footprint within the block will not be known until detailed design, the amount (ha) of direct habitat impact cannot be confirmed until later design stages. It is expected that access can likely be installed without direct impact to the two bat snag trees or SAR bats and SAR bat habitat. In addition, Block #46 is located in an area where the width of the two ELC polygons is relatively narrow compared with other portions of the polygon, reducing the overall amount of habitat loss to accommodate the access.

Provided that mitigation measures recommended in Section 8.0 below are followed, the potential for indirect impacts to SAR bats and SAR bat habitat is considered mitigable and will thereby avoid direct or indirect impacts to the species.

7.2 Other Wetlands

Two areas of unevaluated wetland habitat (MAMM1-3) in the southern region of the property, and one MAMM1-3 wetland area in the northern region of the property were identified during the field program. These three wetland features have an estimated combined area of 0.86ha and are associated with drainage features (Aquatic Site #4, #5 and #11, respectively, Figure 2A). It is understood that these three wetland/watercourse features were modified during completion of archaeological work (by others) and will ultimately be eliminated for residential lots. Removals represent a direct impact to wetlands totaling 0.86ha.

The development proposes to retain the majority of the central, forked wetland feature associated with Aquatic Site #8. Lot #23-26, #92-110, #111-118, #120-145 (Figure 3) would be located outside this central wetland and associated 15m buffer (Figure 3). The Site Plan indicates the proposal to construct numerous new roads, as described in Section 6.0 above. Street “F” and Street “C” are proposed to cross the central wetland associated with Aquatic Site #8 (Figure 3). Street “F” will cross the wetland, and will result in the

loss of approximately 0.12ha based on footprint impacts spanning the 60m long and 20m wide Right of Way (ROW).

Street "C" is proposed to cross the same wetland, closer to Highway 11 as shown on Figure 3. The proposed road will be approximately 20m long with a 20m wide ROW and will result in the loss of approximately 0.04ha of wetland. The southern portion of Street "C" that will encroach into the central wetland buffer would represent a loss of approximately 0.03ha (4.17%) of buffer.

In summary, construction of Street "F" and Street "C" will result in a total loss of approximately 0.16ha (8.43%) of the central wetland feature. This estimate assumes Street "F" and Street "C" will be in the same location and orientation as shown on the Site Plan, which would be confirmed during future design stages. Construction of Street "C" would also represent a 4.17% loss of the central wetland buffer. Wetland vegetation removals would represent a direct impact to the wetland. New crossings will require new culverts to be designed in future design stages, therefore all footprint impacts will require updating to confirm both permanent and temporary disturbances to wetland features.

Loss of 8.43% of wetland vegetation and 4.17% of the associated wetland buffer to accommodate Street "F" and Street "C" would be considered relatively small and would not be anticipated to have an appreciable impact on the remaining overall wetland or its ecological function.

The specific location and design details pertaining to the size of the Block #46 waterfront access footprint within the 0.15ha block will require confirmation in future design stages. At this time and based on the understanding that the access footprint will consist of a raised boardwalk, the access footprint would involve a small fraction of the SWDM3-2 wetland habitat associated with the block. While this loss would represent a direct wetland impact, its size is anticipated to be minimal with mitigation, and would not be anticipated to affect overall wetland function.

Construction of Street "G" would require encroachment of approximately 0.06ha (18.75%) into the 0.32ha of wetland buffer along the eastern property boundary. This loss of 18.75% of the wetland buffer would represent a direct impact to the overall buffer as a result of the proposed development, and removal of the buffer associated with the remaining wetland feature associated with Aquatic Site #9. Provided that mitigation measures recommended in Section 8.0 below are followed, the potential for indirect impacts to wetlands is considered negligible. The SWMPs will be designed to incorporate two naturalized wetland areas (0.16ha and 0.05ha, respectively; total =

0.21ha) to contribute to wetland loss compensation (Crozier, 2022); details are expected at future design stages.

7.3 Woodlands (Non-Significant)

Woodlands on the property were determined to not be considered Significant Woodlands, as per criteria outlined in the NHRM. The Site Plan shows Street "C" will encroach into the 0.69ha WODM4-4 woodland and its associated buffer (Figure 3). The portion of Street "C" that will encroach into this woodland feature would be approximately 30m long with a 20m wide ROW. Construction of this road would result in a loss of approximately 0.06ha (8.70%) of the woodland. Construction would also result in a loss of approximately 0.05ha (6.94%) of the feature's buffer. These estimates assume that Street "C" will be in the same location and orientation as shown on the Site Plan, which would be confirmed during future design stages. Woodland vegetation removals will represent a direct impact to the woodland.

Loss of 8.70% of woodland vegetation and 6.94% of woodland buffer to accommodate Street 'C' would be considered a relatively low level of impact that is not anticipated to have an appreciable impact on the remaining woodland feature, other woodlands on the property or their ecological function. The extent of loss would not be expected to impact feature function. The area proposed for woodland loss in relation to Street "C" is not in an area of SAR or SAR habitat.

Block #46 waterfront access would involve loss of a small fraction of the 2.08ha of FODM7 woodland along the eastern property boundary. Although this habitat loss would represent direct woodland habitat impact, the scale of the impact would be considered minimal. The specific location and design details pertaining to the size of the Block #46 waterfront access footprint will require re-evaluation in future design stages.

The SWMP Block #43 footprint is proposed to occupy the adjacent FODM7 woodland buffer. The SWMP would pose a loss of 0.31ha of the 1.50ha of FODM7 and FODM8 woodland buffer area along the eastern property boundary, representing a direct impact to the buffer. This impact would be 20.55% of the overall woodland buffer in this region of the property. Provided that mitigation measures recommended in Section 8.0 below are followed, the potential for indirect impacts to woodlands and the associated woodland buffer areas on the property are considered acceptable.

7.4 Candidate Significant Wildlife Habitat

According to the PPS, development and site alteration are not permitted in SWH in Ecoregion 6E, unless it can be demonstrated there will be no negative impacts upon the feature and its ecological function.

7.4.1 Bat Maternity Colonies

As described in Section 4.2.4, Big Brown Bat/Silver-haired Bat occur in the southeastern region of the property (Figure 2B). Consequently, SWH related to bat maternity colony habitat function was identified (Table 6). Please see Section 7.1.2 for an impact assessment regarding SAR bats and SAR bat habitat since the impacts described above in relation to SAR bats/bat habitat would also apply to SWH for bats. The proposed development would not compromise SWH function in regards to bat maternity colonies because the habitat will remain post-development.

7.4.2 Turtle Wintering Areas

Turtle wintering habitat was not observed on the property during the field program. In the absence of this habitat function, it is unlikely that turtles would use the property as an overwintering area (Table 6).

Shadow Creek could conceivably be used by turtles for overwintering on adjacent lands. Two Midland Painted Turtles were observed in the spring at the confluence of Aquatic Site #11 and Shadow Creek. Shadow Creek and the downstream end of Aquatic Site #11 have permanent flow and are sufficiently deep to avoid freezing completely, and substrates are likely suitable (Figure 2A, Table 6). The downstream end of Aquatic Site #1 proximal to the eastern property boundary is relatively wide and deep, and has soft substrate that may potentially be suitable habitat for overwintering turtles (although no turtles were observed).

Since the proposed development will not involve construction activities on adjacent lands or in the confluence areas noted above near the property boundary (Aquatic Site #1 or Aquatic Site #11), there would be no expectation for direct impacts to potential turtle overwintering habitat (Figure 3 and Figure 4). Except for Block #46, the development will be approximately 50-100m away from the shoreline of Shadow Creek or the unnamed creek. In regards to the proposed waterfront access in Block #46, the scale of construction to build the access would not be anticipated to impact potential turtle overwintering habitat associated with Shadow Creek, providing mitigation recommendations are followed. Provided that mitigation measures recommended in Section 8.0 below are followed to avoid direct or indirect impacts to the potential habitat

function, the potential for indirect impacts to overwintering habitat in Shadow Creek is considered mitigable.

7.4.3 Turtle Nesting Areas

Suitable nesting habitat for turtles was not observed on the property, nor was evidence of turtle nesting found in the development precinct (Table 6). The OAGM1 vegetation community on the property is cultivated and planted (wheat) each spring so it is unlikely that turtles would use the property as a nesting area. Consequently, it is unlikely that the proposed development would pose a direct impact to turtle nesting habitat function on the property.

On May 20, 2021, two Midland Painted Turtles were observed at the confluence of Aquatic Site #11 and Shadow Creek near the eastern property boundary (Table 6). This observation suggests that it is possible that the species may conceivably have nested in the study area; however, confirmatory SWH function was not verified. Since the proposed development precinct will not involve construction activities proximal to the eastern property boundary (Block #46 excepted), the development will be approximately 100m away from the one area where the turtles were observed, and the habitat in which the turtles were observed will remain post-development (Figure 3 and Figure 4). Consequently, there would be no expectation for direct impacts to potential turtle nesting areas. In regards to the proposed waterfront access in Block #46, the scale of construction would not be anticipated to impact potential turtle nesting habitat associated with Shadow Creek, providing mitigation recommendations are followed. Provided that mitigation measures recommended in Section 8.0 below are followed, the potential for indirect impacts is considered mitigable and will thereby avoid direct or indirect impacts to the potential habitat function.

7.4.4 Seeps

A diffuse area of seep habitat was observed on the property in the area of FODM7 and SWDM3-2 vegetation communities east of the central wetland polygon associated with Aquatic Site #8 (*i.e.*, in the general vicinity of the Category 2 Butternut tree/buffer). This area of diffuse seep activity is outside of the proposed development footprint (Figure 3, Table 6). Since the proposed development will not involve encroachment into this habitat area, there would be no expectation for direct impact. Provided that mitigation measures recommended in Section 8.0 below are followed, the potential for indirect impact to the diffuse seep area is considered mitigable and will thereby avoid direct or indirect impacts to seeps.

In regards to the WODM4-4 vegetation community associated with the northwestern fringe of the central wetland, field observations suggested the potential for an additional area with seep-like conditions. This area, labeled "Potential Seep" habitat on Figure 3 has the potential to be impacted by construction of Street "C". Opportunities for mitigation are recommended in Section 8.0 below.

7.4.5 Terrestrial Crayfish

During the spring/summer field surveys in 2021, terrestrial crayfish chimneys were observed on the property approximately 50-100m west of the eastern property boundary in association with the SWDM3-2 vegetation community (Figure 2A, Table 6). No individual terrestrial crayfish were observed. Since the proposed development will not involve encroachment into this feature, there would be no expectation for direct impact to habitat of terrestrial crayfish (Figure 3). No chimneys were observed in Block #46. Provided that mitigation measures recommended in Section 8.0 below are followed, the potential for indirect impacts to terrestrial crayfish is considered mitigable and will thereby avoid direct or indirect impacts to the potential habitat function.

7.4.6 Special Concern and Rare Wildlife Species

Eastern Wood-pewee

Eastern Wood-pewee (Special Concern) was detected on the property during dawn breeding bird surveys in the FODM7 woodland feature northeast of dawn breeding bird survey station #2 and the WODM4-4 woodland feature east of dawn breeding bird survey station #3 (Figure 2A). Eastern Wood-pewee are commonly found throughout Ontario. The proposed development will not encroach into the FODM7 woodland, so there would be no expectation of direct impacts for Eastern Wood-pewee in this area of the property (Figure 3).

The WODM4-4 woodland has an estimated area of 0.69ha. Construction of Street 'C' and the associated culvert crossing would result in a loss of approximately 0.06ha of this woodland (Figure 3). The loss of trees would represent a direct impact to the feature, commensurate with 8.70% WODM4-4 vegetation loss. Since approximately 91% of this woodland feature will be retained post-development, the proposed development would not be considered to result in loss of woodland feature function. It follows that habitat function for Eastern Wood-pewee would not be expected to be impacted in regards to Street 'C'.

Snapping Turtle

Habitat for Snapping Turtle (Special Concern) could potentially be associated with an area downstream of Aquatic Site #11 in the SWDM3-2 ELC community proximal to the

eastern property boundary, although no Snapping Turtles were observed. Since the proposed development footprint would not encroach into this area of the property, there would be no impact to potential Snapping Turtle habitat (Figure 4). Provided that mitigation measures recommended in Section 8.0 below are followed, the potential for indirect impacts to potential habitat for the species is considered mitigable and will thereby avoid direct or indirect impacts to the potential habitat function.

7.5 Fish Habitat

The PPS states that development and site alteration are not permitted in fish habitat except in accordance with provincial and federal requirements.

With the exception of fish habitat within Block #46 (described below), all identified direct fish habitat on/directly east of the property will be suitably buffered through the application of a 20m buffer from the 2-year flood (seasonal fish habitat) limits identified on Figure 2C and Figure 4. In most areas, this buffer is contained within woodland/wetland buffers. When factoring in all natural heritage feature setbacks, housing development will be situated, on average, 35m from the limits of seasonal fish habitat. This translates, in most areas, to greater setbacks to identified permanent direct fish habitat, including Shadow Creek and the downstream end of Aquatic Site #11.

Block #43 will encroach beyond the woodland drip line, but is expected to remain outside of the fish habitat buffer (Figure 4; Appendix E). A small loss of woodland vegetation in proximity to the fish habitat buffer will occur. The northeast section of Block #44, and Block #46, will encroach into fish, wetland and woodland buffers (Figure 3 and Figure 4; Appendix E). Losses to riparian vegetation within and adjacent to fish habitat are anticipated in this area of encroachment. The extent of vegetation clearing required for the proposed SWMP and waterfront access trail is unknown at this time. Trail construction will occur within regulated seasonal direct fish habitat, and has the potential to result in permanent impacts if not suitably mitigated through trail design and construction practices. This includes potential impacts to spawning functions associated with the floodplain if permanent losses to aquatic vegetation in the floodplain occur. There is also the potential for impacts to permanent direct fish habitat in Shadow Creek if creek bank erosion results from community use. The crossing designs should account for these potential impacts, and incorporate suitable mitigation measures to minimize both direct and indirect impacts accordingly.

The upstream segments of Aquatic Site #8 (on property) and #16 (off property), representing indirect (contributing) fish habitat, will be suitably buffered from development on the property through the application of 15m buffer as shown on Figure 4.

Upstream segments of Aquatic Sites #4, #5 and #11, also representing indirect fish habitat, are proposed to be piped post-development, which will require in-water work to complete. It is anticipated that flows in each feature will be piped directly to the eastern natural heritage feature buffers shown on Figure 4 (although specific outlet points are, at this time, unknown). Piping of these sites will result in a loss of riparian (meadow) vegetation, and permanent alterations from open channel to enclosed piped. This may lead to permanent reductions in allochthonous matter contributions to fish-bearing waters downstream.

The upstream segments of Aquatic Sites #6 and #7 providing indirect fish habitat will be removed post-development as a result of the Block #43 SWMP. The SWM Plan for the development will be required to maintain flow quantity and quality to downstream direct fish habitat in Aquatic Sites #6 and #7 to maintain existing hydraulic conditions.

Similarly, project designs for *all* indirect fish habitat alteration/removal proposed on the property are to ensure flow quantity and quality is maintained to all areas of direct fish habitat downstream. The alteration/removal of these features is anticipated to require permitting under the *Fisheries Act* as described below.

In- and near-water work is anticipated to be required for two Street 'C' (Crossings #1 and #2; Crozier, 2022) and one Street 'F' (Crossing #3; Crozier, 2022) crossings of Aquatic Site #8 (Figure 4; Appendix E). These crossings will be sized to accommodate two lanes of traffic in addition to fill slopes. The three crossings are anticipated to involve the removal of riparian vegetation (woodland and meadow for Street 'C', and meadow vegetation for Street 'F'), and will result in the permanent alteration of indirect fish habitat on the property (modifying the channel from open reach to enclosed culvert). While footprint impacts of the new culverts have not been confirmed at this time, it is recognized that a new culvert can be designed to avoid losses of and adverse impacts to fish habitat, while maintaining fluvial and hydrological processes/functions. Best Management Practices (BMPs) for watercourse crossings in indirect fishing habitat include proper embedment and natural substrate to maintain fluvial functions, prevent streambed erosion, and ensure sufficient capacity in culverts to convey and maintain 2-year return period channel flows. Consideration of shifting the footprint of Street 'C' to avoid the potential seep identified on Figure 2A and Figure 4 is recommended. Efforts should be taken to avoid potential impacts to groundwater as a result of culvert installation. Riparian vegetation surrounding each crossing should be restored to the extent possible after construction. Permitting considerations for new crossing installation are discussed below.

Discharge of post-development runoff to watercourses requires stormwater quantity and quality controls be provided to protect fish habitat and match, or improve, discharge beyond pre-development conditions. Drainage from new paved surfaces will require some form of treatment to adhere to water quality and quantity criteria for discharge to watercourses. The Functional Servicing and Stormwater Management Report (Crozier, 2022) indicates stormwater quantity (up to the 100-year storm event) and quality controls will be implemented on the property in accordance with MECP and Township requirements. SWMPs in Blocks #43 and #44 are expected to achieve "enhanced" water quality targets for stormwater outputs (Figure 4; Appendix E). In addition to these SWMPs, it is recommended that the SWM Plan consider standard LIDs for discharge, such as the installation of measures like infiltration galleries or oil-grit separators (or similar structures) to control site runoff, and remove suspended sediment/deleterious substances before discharge to a waterbody. It is noted in Azimuth's Preliminary Hydrogeological Assessment for the property, however, that LID's involving infiltration/below-ground installation may not be feasible given the high groundwater conditions on the site (Azimuth, 2022).

The SWMP in Block #44 is anticipated to convey drainage towards Aquatic Site #2 (Shadow Creek), while the SWMP in Block #44 is anticipated to outlet in proximity to Aquatic Site #8 (Crozier, 2022; Figure 4). It is understood that both outlets will be installed at/above the 25-year flood elevation (Crozier, 2022). Outlet designs will require review by a fisheries ecologist in detailed design phases to confirm potential impacts, and ensure appropriate mitigation measures are applied.

Provided stormwater requirements described above are achieved for development on the property, and standard mitigation and buffer enhancement measures are incorporated into project design and implemented during construction (described below), fish habitat buffers proposed on the property are considered sufficient to protect the form and function of cool/warm direct fish habitat (seasonal and permanent), including potential spawning functions in the floodplains of Aquatic Sites #1 and #2, and indirect fish habitat to be retained post-development.

All in- and near-water work on the property requires further review by a fisheries ecologist upon the advancement of site designs to fully assess potential permanent and temporary impacts to fish and fish habitat in the study area. Site works requiring further review include:

- Waterfront access trail in Block 46;
- SWMPs in Blocks 44 and 43 and outlet designs;

- Alteration of Aquatic Sites #4, #5 and #11 through piping;
- Removal of upstream (indirect) segments of Aquatic Sites #6 and #7 on the property; and,
- Road crossings (three) at Aquatic Site #8.

It is expected that the 'screening' of all in- and near-water work through detailed design review will identify additional strategies for avoidance and mitigation of potential impacts to fisheries resources. Strategies for mitigation should follow a series of DFO standards and codes of practice for common works, undertakings and activities, and any unmitigable impacts should be identified. There will, at a minimum, be residual impacts associated with the piping/removal of indirect fish habitat on the property and the installation of new crossing structures within indirect fish habitat. Project details outlining footprint impacts and construction staging methodology with mitigation will require review in future design stages, and at that time, it is expected that such works (and any other site works identified as resulting in unmitigable impacts to fish and fish habitat) will require submission to DFO in for the form of a Request for Review. Approval from DFO under the *Fisheries Act* is anticipated to be required prior to construction.

Any in-water work required for development on the property is required to adhere to fisheries timing restrictions as mandated by the NDMNRF. NDMNRF has confirmed a restricted timing window of March 15 to July 15 is appropriate for the protection of coolwater/warmwater species in fish habitat on/adjacent to the property (Appendix B).

Work in and around water has the potential for negative impacts to aquatic features and biota during construction. Encroachment into vegetation communities containing watercourses on the property with machinery, for example, has the potential to cause disturbances and water quality impacts to local and downstream fish habitat from sediment, or other deleterious substances should spills occur. Grading, excavation and stockpiling also have the potential to result in sediment-laden runoff. These potential impacts to fish habitat are, however, considered predictable and mitigable provided standard BMPs for working around water are implemented and followed during all construction stages. BMPs include ensuring that erosion and sediment controls (ESCs) are installed and properly maintained along watercourses, construction works are inspected regularly (particularly following rain events) and in-water work occurs 'in the dry' (*i.e.,* isolated from flow). Potential temporary impacts will need to be confirmed upon the advancement of site designs. General recommendations for in- and near-water work are provided in Section 8.0 below.

8.0 RECOMMENDATIONS

8.1 Species at Risk

It should be noted that absence of a protected species in the study area does not indicate that they will never occur. Given the dynamic character of the natural environment, there is 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 NHFFs. 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 property works are undertaken. A review of the assessment provided in this report by a qualified person should be sufficient to provide appropriate advice at the time of the onset of future site works.

According to MECP guidelines, the window during which vegetation/tree removals should not occur to avoid potential impacts to SAR bats and/or SAR bat habitat protected under the ESA is April 1 to September 30. Habitat for SAR bats was found to be present on the property. To ensure protection measures for bats, vegetation/tree removals should be avoided between **April 1 and September 30** accordingly.

If work requires that vegetation/tree clearing is required between April 1 and September 30, screening by an ecologist with knowledge of SAR bat habitat is recommended to ensure that the vegetation/trees have been confirmed to be free of SAR bat habitat prior to clearing.

Prior to demolition of agricultural buildings to accommodate construction of townhouse Blocks #29-31, Azimuth recommends the structures be inspected for possible nesting by SAR Barn Swallows (*Hirundo rustica*). Bat exit surveys should also be completed. These surveys should be conducted prior to development by professional ecologists with the appropriate expertise.

8.1.1 Worker Training

Worker training would assist construction workers in identification of SAR with potential to occur in the area (*e.g.*, Butternut, Endangered bats). Workers should be instructed to stop work and contact the MECP immediately if any SAR are encountered in the work area. Individuals working on the property should ensure that SAR are not harmed during construction or killed by heavy machinery, vehicles or other equipment.

The contractor should educate all site personnel to ensure that, if identified, the SAR are not wantonly injured or killed, and to ensure that damage to features which could constitute habitat is avoided. Information should be conveyed through a SAR expert and include:

- Species habitat and identification;
- Requirements under the ESA including avoidance of harm to the species and damage to relevant habitat;
- Appropriate action to take if the species is encountered;
- How to record sightings and encounters; and,
- That care should be taken when undertaking construction activities to avoid harming the species or damaging/destroying habitat.

The expert should be a qualified biologist who specializes in ecology/biology or SAR.

8.2 Migratory Breeding Birds

Activities involving the removal of vegetation/trees should be restricted from occurring during the migratory breeding bird 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 a region have potential to impact bird nests at the Environment Canada Website (https://www.canada.ca/en/environment-climate-change/services/avoiding-harm-migratory-birds/general-nesting-periods.html). In Zones C1 and C2, vegetation/tree clearing should be avoided between **April 1 and August 31** of a given year to avoid impacts to migratory birds. If work requires that vegetation/tree clearing is required between April 1 and August 31, screening by an ecologist with knowledge of breeding bird species present in the area is recommended to ensure that the vegetation/trees have been confirmed to be free of nests prior to clearing.

8.3 Erosion and Sediment Controls

Runoff due to construction can contribute significant sediment loads to receiving natural heritage features, including watercourses. Thus, effective ESC measures at construction sites are crucial mitigating sediment impacts to these features. A detailed ESC Plan identifying natural heritage protection measures for all stages of construction will be required in future design stages. The following BMPs are recommended:

- Prior to the commencement of property works (including tree removals), silt fencing (and other ESCs as needed) should be applied along the length of the central wetland (and its 15m buffer), woodland/wetland features and fish habitat

(and the outermost associated buffer) proximal to the eastern property boundary and natural or naturalized features on adjacent lands;

- All installed ESCs should be regularly monitored to ensure they are functioning as intended. If deficiencies are identified, they should be rectified in a timely manner. Ongoing monitoring/maintenance is to occur until soils are stabilized and the site is deemed to be stable after construction;
- Materials storage on the property (*i.e.*, soil stockpiles) is to be located over 30m from natural heritage features, including wetland/watercourses, and is to be contained with ESCs. Soil stockpiles are to be sloped appropriately to mitigate the potential for nesting by Bank Swallows (*Riparia riparia*);
- Minimize vegetation removal, where possible, within the development area;
- Bare areas should be stabilized with topsoil and seed or sod as soon as possible following construction;
- Timing of construction should coincide with dryer periods to further minimize the potential for transport of sediment and other deleterious substances into adjacent watercourses and natural features;
- All machinery and equipment must have regard for surrounding natural heritage features; and,
- At no time should machinery enter a watercourse/fish habitat without a Mitigation Plan in place.

8.4 Operations

All staging, refueling and maintenance activities required during construction should be conducted at least 30m away from retained woodlands, wetlands and fish habitat to prevent accidental spillage of deleterious substances that may harm natural environments.

The contractor is required to have a Contaminant and Spill Management Plan in place prior to initiation of works. This should include keeping an emergency spill kit on site at all times. In the event of a spill, the contractor must report it immediately to the Spills Action Centre (SAC) at 1-800-268-6060.

As per Section 8.3, silt fencing is to be installed to prevent accidental intrusion of machinery operations into adjacent undisturbed natural areas outside of designated work areas.

8.5 Private Waterfront Access

The private waterfront access in Block #46 is recommended to be a raised boardwalk-style. The boardwalk should be positioned such that no bat snag trees need to be removed. Boardwalk construction is also discussed in Section 8.7 below.

Construction of the private waterfront access east of Aquatic Site #11 would require work within 30m of Shadow Creek. Monthly inspection of ESCs should occur throughout construction in this area by a professional ecologist with wildlife expertise to monitor for potential impacts to turtle overwintering and nesting SWH and/or possible turtles.

8.6 Habitat Restoration and Wildlife Passage

Wetland and woodland plantings (native plants and trees, respectively, known to occur in the MAMM1-3, WODM4-4, FODM7, FODM8 and/or SWDM3-2 ELC polygons) are recommended to be installed proximal to wetland, woodland and watercourses on the property, particularly within unvegetated sections of buffers to enhance buffer functions. Consideration of woodland plantings would help compensate for loss of woodland habitat in Block #46. Species selections should be based on the plant inventory (Table 2). Addition of woodland and/or wetland plantings proximal to the new Street 'C' and Street 'F' culvert crossings would help mitigate habitat loss impacts, stabilize exposed soil and provide habitat enhancement opportunity post-construction. It is recommended that Open Space Block areas be naturalized with native tree and shrub plantings as habitat restoration efforts on the property. Temporary or permanent impacts to wetlands required to facilitate archaeological work should be considered for remediation under the *Ontario Heritage Act* (1990), if required. The two naturalized wetland areas proposed for integration into SWMPs (Crozier, 2022) are recommended to include native wetland plantings consistent with species typical of MAMM1-3 wetlands on the property.

As outlined in Section 8.3, vegetation/tree removals should be minimized in woodland, wetland and deciduous thicket areas to the extent possible. Any roadside ROW hedgerows along Menoke Beach Road are recommended for retainment, if possible, to provide a buffer between the proposed development and adjacent lands.

Integration of a wildlife passage into the two Street 'C' culvert crossing designs and Street 'F' crossing design is recommended to help restore and maintain habitat connectivity between the wetland/woodland corridor and Shadow Creek post-development. It is understood that an embedded box culvert design will be used (Crozier, 2022). The wildlife passage is recommended to accommodate use primarily by turtles and amphibians. Future wildlife passage engineering designs should ensure appropriate BMP provisions (*e.g.*, openness ratio). If possible, consideration of shifting the footprint of Street 'C' approximately 20m to the west would reduce the risk of impact to the potential seep area immediately east of Block #35 without increasing the extent of impact to the wetland (Figure 3).

8.7 Fish and Fish Habitat

Any project activity proposed in or near water should comply with the fish and fish habitat protection provisions of the *Fisheries Act,* incorporating measures to avoid causing the death of fish or HADD. Mitigation strategies for avoiding or reducing risk to fish and fish habitat are directly associated with factors such as maintaining riparian vegetation or minimizing disturbances to the extent possible, ensuring proper sediment control (see Section 8.3 above), preventing entry of deleterious substances in water, and ensuring that site disturbances are restored post-construction through implementation of a Planting and Restoration Plan. Considerations for working around fish habitat on the property are as follows:

8.7.1 In-Water Work – General Requirements

- Any proposal for in-water work requires the re-evaluation of development impacts of future design details to confirm impacts, mitigation requirements, and permitting well in advance of construction (see Section 8.7.6);
- Fisheries timing restrictions apply to any work in or near water. NDMNRF has confirmed in-water work should be avoided between March 15 to July 15 for the protection of coolwater/warmwater fish habitat/biota (Appendix B);
- All in-water construction is to occur in the dry and in isolation of flow. Cofferdam installation and bypass flow management, if required, should follow DFO's *Temporary cofferdams and diversion channels* interim COP (DFO, 2020a). If a temporary bypass pipe is used, it should be completed in accordance with the *Temporary Flow Passage System – Culvert in Watercourse* Ontario Provincial Standard Drawing 221.010 (OPS, 2021);
- Downstream flow quantity and quality is to be maintained at all times during and after construction;
- If in-water work is required in direct fish habitat, fish salvage should be completed by a qualified Fisheries Ecologist in isolated work areas prior to dewatering. All fish salvage requires a License to Collect Fish for Scientific Purposes from NDMNRF;
- All dewatering required within an isolated work area is to discharge water into a filter bag (*i.e.,* envirobag or equivalent). Filter bags should be placed a minimum of 30m from fish habitat on stable, vegetated ground to allow fines to settle out of the water. Monitoring of dewatering operations should occur throughout the construction process to ensure water is free of fines before entering the watercourses;
- Any works requiring stone placement in fish habitat are to ensure stone/gravel is pre-washed, and free of fine sediment. If required, rounded riverstone should be used versus angular rip rap in areas of direct fish habitat;

- Given the layout of the site, it is anticipated that temporary stream crossings over indirect fish habitat may be required during construction. If required, such crossings are required to adhere to DFO's *Temporary stream crossings* interim COP (DFO, 2020b) for all fish habitat. Machinery access is not permitted in areas identified as direct (seasonal or permanent) fish habitat; and,
- All areas of channel bed disturbance should be restored using appropriately sized waterbody material to support fish habitat functions. Areas of riparian vegetation disturbance are to be fully restored post-construction using a fast-growing cover crop and native seed mix, combined with native tree/shrub plantings.

8.7.2 Private Waterfront Access

- As per Section 8.5, a boardwalk design is recommended for the proposed waterfront access trail to Shadow Creek. This design should be constructed by hand, without the use of large machinery within Block 46;
- Trail width and length is to be minimized to the extent possible, with all efforts taken to minimize not only tree removal, but the removal of watercress and other low-level vegetation the Shadow Creek floodplain;
- Trail construction should occur in accordance with all above-mentioned timing windows, and during dry conditions; and,
- It is unknown if the proposed canoe/kayak launch will require alterations to the west bank of Shadow Creek. However, efforts should be taken to prevent bank erosion in this area, and avoid sensitive fish habitat in Shadow Creek. A qualified Ecologist should assist the design team in determining a suitable footprint for the trail and launch point to minimize impacts to natural heritage features and fish habitat.

8.7.3 Stormwater Management Pond Outlets

- Any outlets to identified fish habitat from stormwater elements on the property are to incorporate measures to prevent outlet scour/erosion; and,
- SWMP outlet designs are to be reviewed when available to fully assess potential impacts, identify mitigation measures and confirm potential *Fisheries Act* permitting requirements.

8.7.4 Enclosure of Watercourses

- For indirect fish habitat features being piped, appropriate measures to prevent scour/erosion at their outlets should be implemented in project designs;
- Pipes are to be appropriately sized to account for elevated flow events (during/after rain/snowmelt), and prevent inlet/outlet erosion; and,

- Enclosure of watercourses need re-evaluation of impacts based on future design stages, and approvals from DFO (see Section 8.7.6).

8.7.5 Removal of Indirect Fish Habitat

- For Aquatic Sites #6 and #7, upstream segments on the property identified as providing indirect fish habitat are the sole conveyance pathways to downstream direct fish habitat. As these segments will be removed, the overall SWM Plan for the property is required to maintain flow quantity and quality to downstream portions of both Aquatic Site #6 and #7.

8.7.6 Road Crossings

- Any proposal to construct in-water for purpose of new culverts at road crossings will require submission to DFO for review and permitting (see Section 8.7.6);
- Culvert lengths are to be minimized to the extent possible to reduce the enclosure to fish habitat and impacts to riparian vegetation;
- Measures to minimize erosion and maintain fluvial processes at each crossing should be incorporated into culvert designs. An open-bottomed or embedded culvert design should be used; and,
- The Street 'C' footprint should avoid the potential seep to the extent possible during design, and efforts should be taken to minimize impacts to aquatic vegetation in this area during construction.

8.7.7 *Fisheries Act* Permitting

As described above, all in- and near-water work is to be screened under DFO's Projects Near Water review process to order to identify *Fisheries Act* permitting requirements. The proposal to pipe/remove areas of indirect fish habitat, and install three new road crossings, will require preparation and submission of a DFO Request for Review.

Typically, a crossing in indirect fish habitat is considered approvable under a Letter of Advice provided habitat is maintained at the site, and measures to protect fish and fish habitat and standards BMPs can be implemented. Given that the required submission to DFO would include the permanent piping/removal of surface features, and could possibly include additional site works on the property (depending on the outcome of future *Fisheries Act* screenings), it is unknown if project works are approvable under a LOA, or if DFO will require submission of an Offsetting Plan and Request to Authorization report to DFO.

8.8 SAR Permitting

No permitting under the ESA is expected to be required at this time, based on the proposed Site Plan. Provided no SAR bat snag trees are removed (*e.g.*, in Block #46), a permit related to SAR bats would not be anticipated. Whether or not ESA permitting may be required pertaining to demolition of the three barns and one silo (*i.e.*, Barn Swallows, Endangered bats) would be determined once the appropriate species-specific SAR surveys are completed. Natural heritage review of the private waterfront access, new culvert road crossings, wildlife passages, SWMP designs and other site works will be required to evaluate all development operations proposed in proximity to SAR and wildlife functions on the property. If the proponent wishes to have the one Category 2 Butternut tree removed, or works are proposed within the habitat buffer for the species in a manner deemed to harm the tree, its removal would require registration with the MECP and consideration of pursuing a permit under the ESA or paying into the MECP's Species Conservation Fund.

9.0 CONCLUSIONS

Based on our analysis, it is concluded that environmental conditions on the property (*e.g.*, woodlands, SAR) may not be limiting to the proposed development through incorporation of the environmental protection measures described in Section 8.0, pending information provided and evaluated from a natural heritage perspective during detailed design.

Pending consideration for the above, at this time our findings are summarized as follows and based on the information available:

- The proposed site alteration is consistent with policies/legislation of the ESA, Township of Severn OP and County of Simcoe OP. The proposed site alteration is consistent with the policies of the PPS; ecological functions of Candidate SWH will be retained post-development;

- Azimuth's impact assessment has given full consideration to the habitat requirements of all SAR assumed and/or documented to occur in the study area. Results indicate the proposed development will not result in negative direct or indirect impacts to habitat of SAR (pending results of possible additional surveys for Barn Swallows, bats and Category 2 Butternut as described above), providing conformance is demonstrated to mitigation measures described in Section 8.0. This conclusion is contingent on confirmation of no impacts to possible Barn Swallow nesting and/or SAR bat roosting habitat (if determined to be present based on future surveys) in the agricultural buildings targeted for demolition;

- When the Butternut Health Assessment report is submitted to the MECP in 2022, the 30-day MECP review period will apply before any Butternut trees can be removed. If, upon re-assessment in summer 2022, the Category 2 tree scores as Category 2, the MECP will require a Registration under the ESA;

- The proposed works are not expected to impact negatively the ecological functions of Candidate SWH outlined in Section 5.0 if the appropriate mitigation measures outlined in Section 8.0 are followed;

- Ecological functions of the wetlands that remain post-construction are not expected to be impacted as a result of the proposed works if the appropriate mitigation measures described in Section 8.0 are followed during construction, and underground piping of identified drainage features is designed and implemented in accordance with relevant policies and legislation. Installation of the new culverts incorporating wildlife passages will help enhance habitat connectivity on the property; and,

- Buffers to seasonal and permanent direct fish habitat on the east side of the property are considered sufficiently large to maintain the form and function of that habitat, provided stormwater controls maintain runoff quantity and quality post-development. The proposed development involves in- and near-water work, and the alteration of fish habitat through the enclosure/removal of drainage features and installation of new road crossings. All proposed in and near water work will require further detailed fisheries review to fully assess fish and fish habitat impacts, and establish permitting requirements under the *Fisheries Act*.

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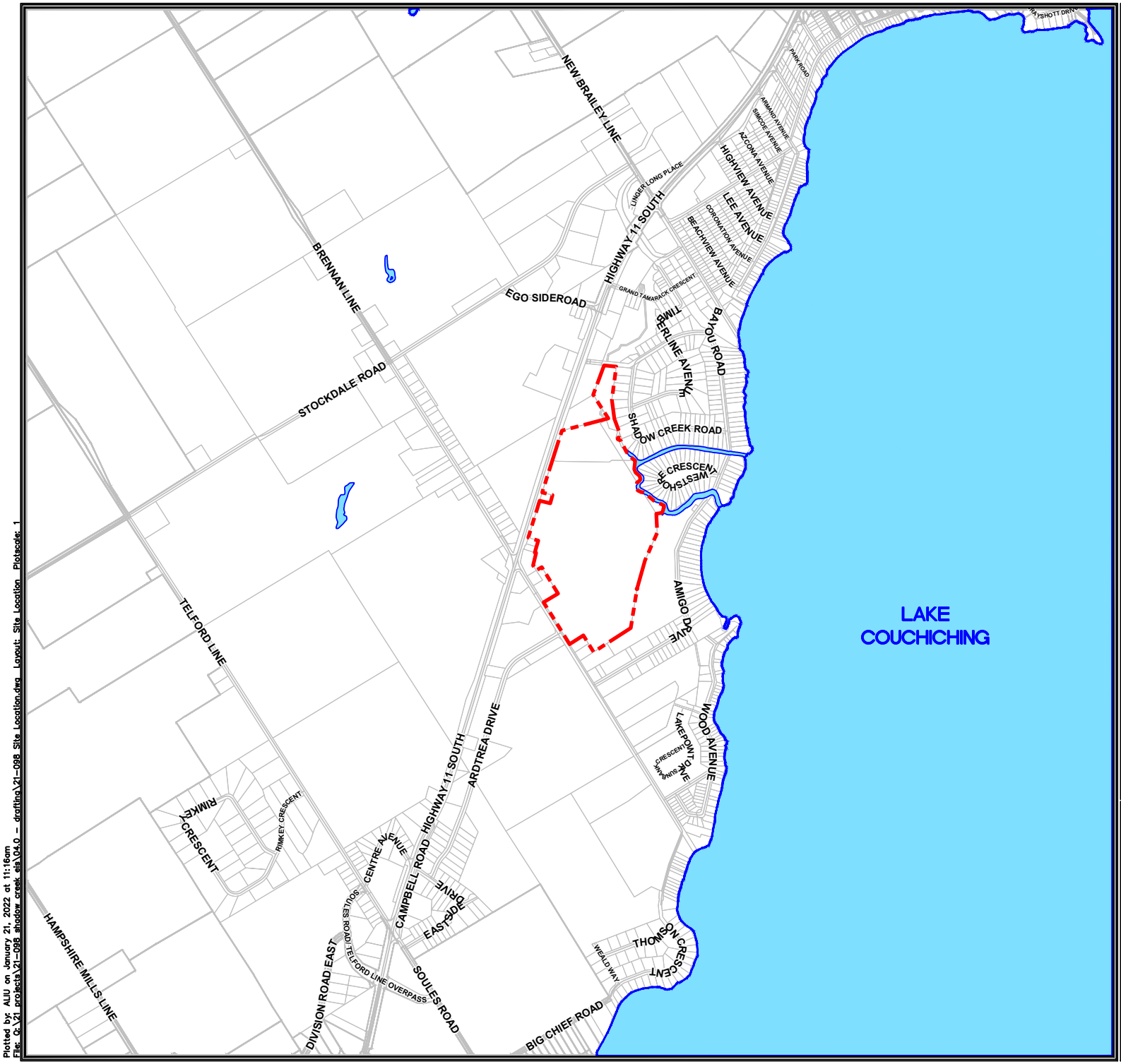

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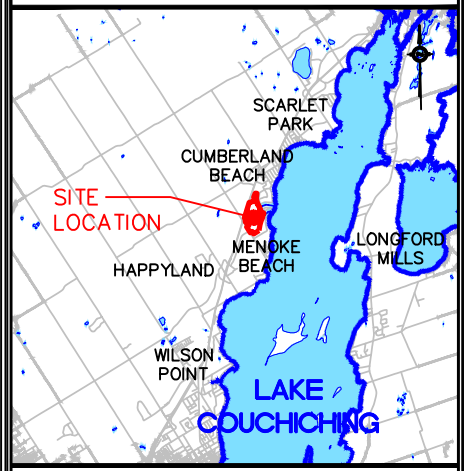

REGIONAL MAP

SCALE 1:250000

0 625 1250

HORIZONTAL SCALE 1:25000

AZIMUTH ENVIRONMENTAL CONSULTING, INC.

ENVIRONMENTAL ASSESSMENTS & APPROVALS

SITE LOCATION

MENOKE BEACH ROAD
SEVERN, ON

DATE ISSUED: *JANUARY 2022*	Figure No.
CREATED BY: *A.L.*	
PROJECT NO.: *21-098*	1
REFERENCE: *SIMCOE COUNTY*	

Plotted by: ALU on January 21, 2022 at 11:16am
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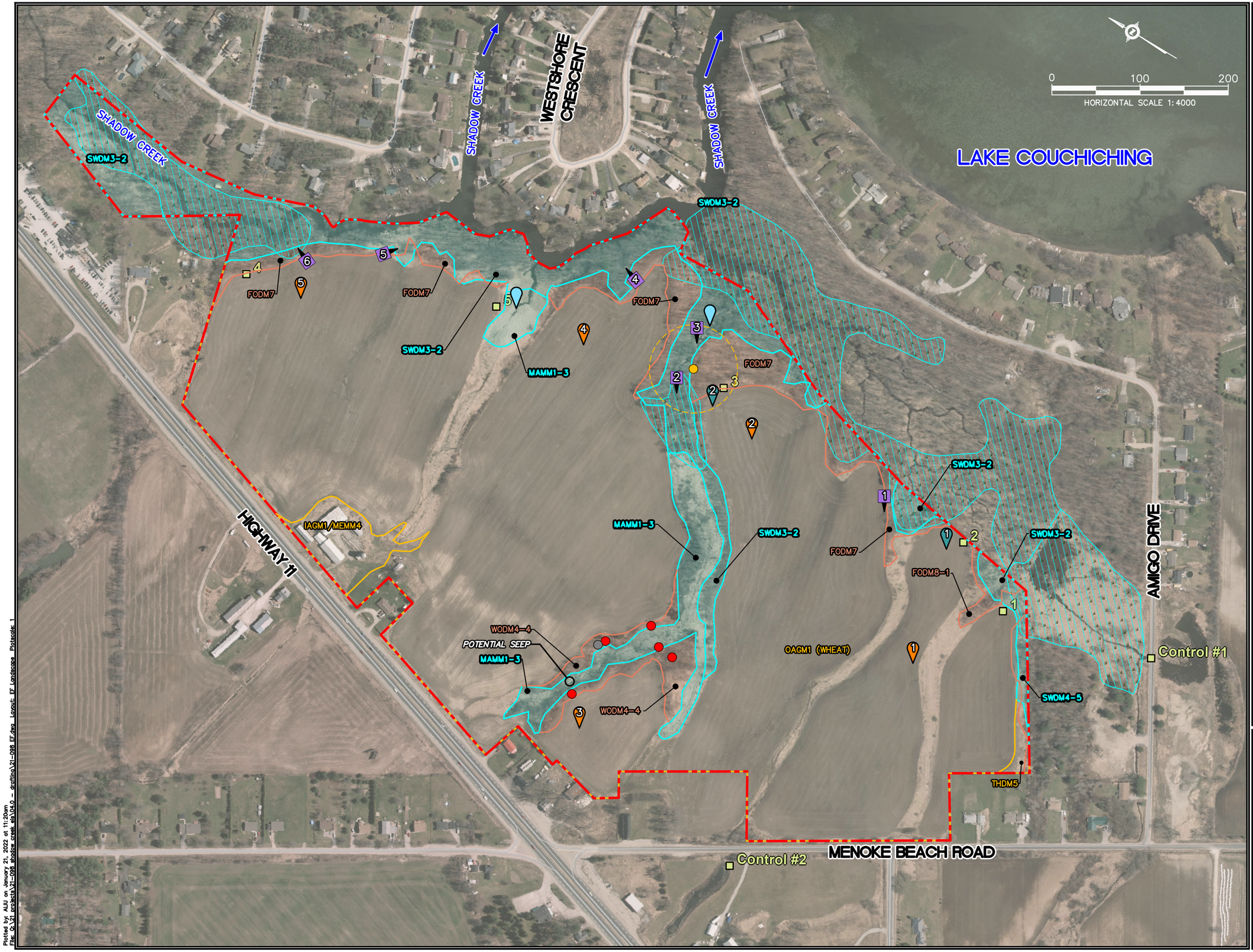


LEGEND:

- APPROX. PROPERTY BOUNDARY
- UNEVALUATED WETLAND (ONTARIO MNR, 2021)
- WETLAND AREA (DELINEATED BY AEC, AUG. 2021)
- WETLAND EDGE (AEC, AUG. 2021)
- WOODLAND DRIP LINE (DELINEATED BY AEC, AUG. 2021)

POINT COUNT STATIONS:

- DAWN BREEDING BIRD SURVEY STATION
- MARSH BIRD SURVEY STATION
- FISH SAMPLING LOCATION
- EVENING CALLING AMPHIBIAN SURVEY STATION
- BAT ACOUSTIC MONITOR LOCATION

BUTTERNUT TREE SYMBOLOGY:

- BUTTERNUT TREE – CATEGORY 1
- BUTTERNUT TREE – CATEGORY 2
- BUTTERNUT TREE – DEAD
- 50m BUTTERNUT TREE BUFFER – CATEGORY 2

ELC VEGETATION COMMUNITIES:

FODM7	FRESH–MOIST LOWLAND DECIDUOUS FOREST
FODM8–1	FRESH–MOIST POPLAR DECIDUOUS FOREST
IAGM1	AGRICULTURAL BUILDING
MAMM1–3	REED–CANARY GRASS GRAMINOID MINERAL MEADOW MARSH
MEMM4	FRESH–MOIST MIXED MEADOW
OAGM1(WHEAT)	ANNUAL ROW CROP (WHEAT)
SWDM3–2	SILVER MAPLE MINERAL DECIDUOUS SWAMP
SWDM4–5	POPLAR MINERAL DECIDUOUS SWAMP
THDM5	FRESH–MOIST DECIDUOUS THICKET
WODM4–4	DRY–FRESH BLACK WALNUT DECIDUOUS WOODLAND

AZIMUTH ENVIRONMENTAL CONSULTING, INC.

TERRESTRIAL FEATURES

MENOKE BEACH ROAD
SEVERN, ON

DATE ISSUED:	JANUARY 2022	Figure No. 2A
CREATED BY:	A.L.	
PROJECT NO.:	21-098	
REFERENCE:	SIMCOE COUNTY	

LEGEND:

- APPROX. PROPERTY BOUNDARY
- WETLAND AREA (DELINEATED BY AEC, AUG. 2021)
- WETLAND EDGE (AEC, AUG. 2021)
- WOODLAND DRIP LINE (DELINEATED BY AEC, AUG. 2021)

BAT SNAG CLASSIFICATION:

- CIRCLED – HIGH QUALITY
- UNCIRCLED – LOW QUALITY
- HEALTHY
- DECAY CLASS 1
- DECAY CLASS 2
- DECAY CLASS 3
- DECAY CLASS 4
- DECAY CLASS 5
- DECAY CLASS 6

ELC VEGETATION COMMUNITIES:

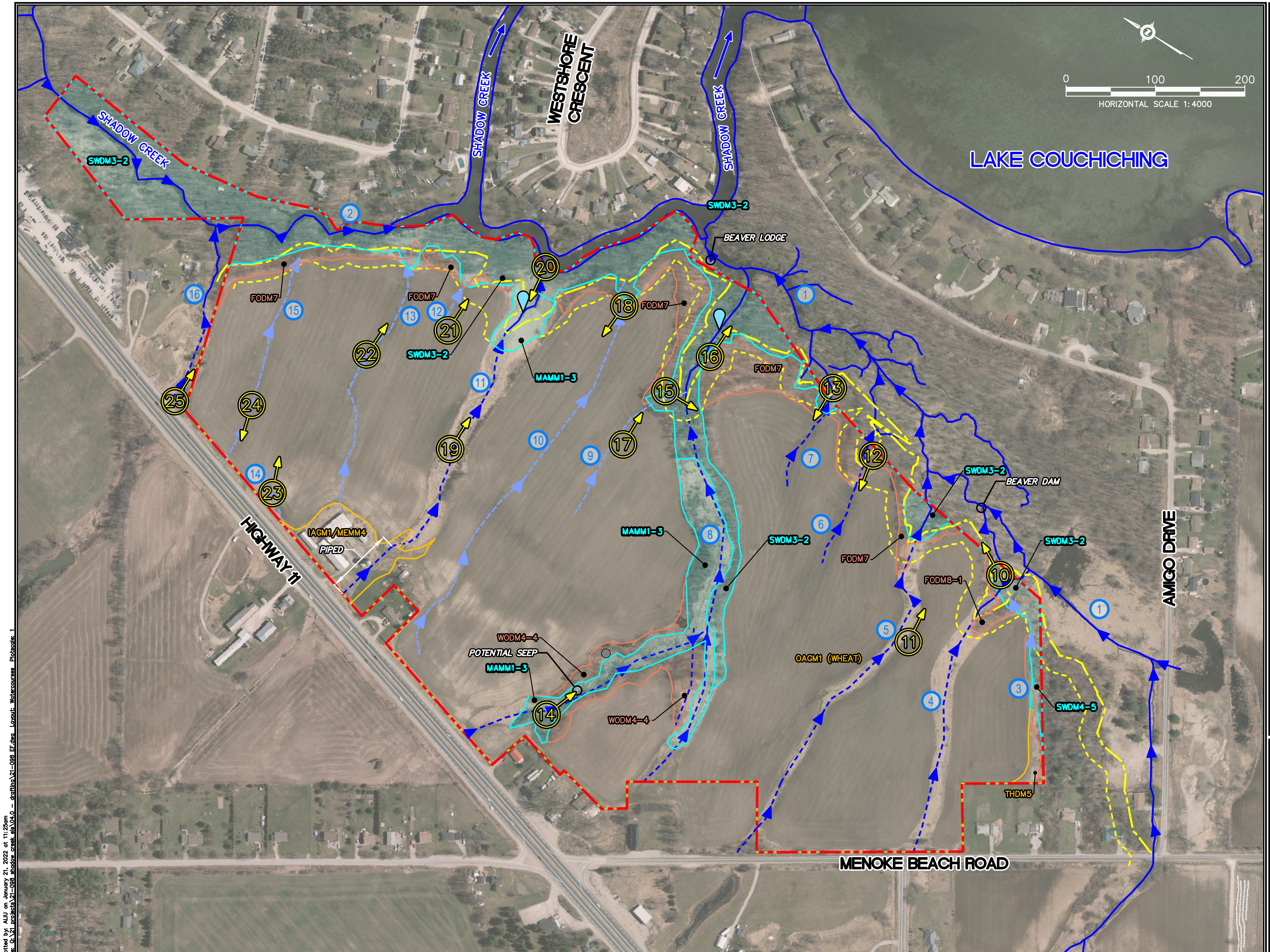
FODM7	FRESH–MOIST LOWLAND DECIDUOUS FOREST
FODM8–1	FRESH–MOIST POPLAR DECIDUOUS FOREST
IAGM1	AGRICULTURAL BUILDING
MAMM1–3	REED–CANARY GRASS GRAMINOID MINERAL MEADOW MARSH
MEMM4	FRESH–MOIST MIXED MEADOW
OAGM1(WHEAT)	ANNUAL ROW CROP (WHEAT)
SWDM3–2	SILVER MAPLE MINERAL DECIDUOUS SWAMP
SWDM4–5	POPLAR MINERAL DECIDUOUS SWAMP
THDM5	FRESH–MOIST DECIDUOUS THICKET
WODM4–4	DRY–FRESH BLACK WALNUT DECIDUOUS WOODLAND

AZIMUTH ENVIRONMENTAL CONSULTING, INC.

BAT SNAG MAPPING

MENOKE BEACH ROAD
SEVERN, ON

DATE ISSUED:	JANUARY 2022	Figure No.
CREATED BY:	A.L.	2B
PROJECT NO.:	21-098	
REFERENCE:	SIMCOE COUNTY	



LEGEND:

- APPROX. PROPERTY BOUNDARY
- DIRECT FISH HABITAT
- INDIRECT FISH HABITAT
- 2-YEAR FLOOD LINE (Crozier, 2021)
- FISH HABITAT BUFFER
- NOT FISH HABITAT
- AQUATIC SITE NUMBER
- WETLAND AREA (DELINEATED BY AEC, AUG. 2021)
- WETLAND EDGE (AEC, AUG. 2021)
- WOODLAND DRIP LINE (DELINEATED BY AEC, AUG. 2021)

ELC VEGETATION COMMUNITIES:

FODM7	FRESH-MOIST LOWLAND DECIDUOUS FOREST
FODM8-1	FRESH-MOIST POPLAR DECIDUOUS FOREST
IAGM1	AGRICULTURAL BUILDING
MAMM1-3	REED-CANARY GRASS GRAMINOID MINERAL MEADOW MARSH
MEMM4	FRESH-MOIST MIXED MEADOW
OAGM1(WHEAT)	ANNUAL ROW CROP (WHEAT)
SWDM3-2	SILVER MAPLE MINERAL DECIDUOUS SWAMP
SWDM4-5	POPLAR MINERAL DECIDUOUS SWAMP
THDM5	FRESH-MOIST DECIDUOUS THICKET
WODM4-4	DRY-FRESH BLACK WALNUT DECIDUOUS WOODLAND

- AQUATIC PHOTO STATION

AZIMUTH ENVIRONMENTAL CONSULTING, INC.

FISHERIES FEATURES & AQUATIC PHOTO LOCATIONS

MENOKE BEACH ROAD
SEVERN, ON

DATE ISSUED:	JANUARY 2022	Figure No.
CREATED BY:	A.L.	2C
PROJECT NO.:	21-098	
REFERENCE:	SIMCOE COUNTY	

Plotted by: ALIU on January 21, 2022 at 11:25am
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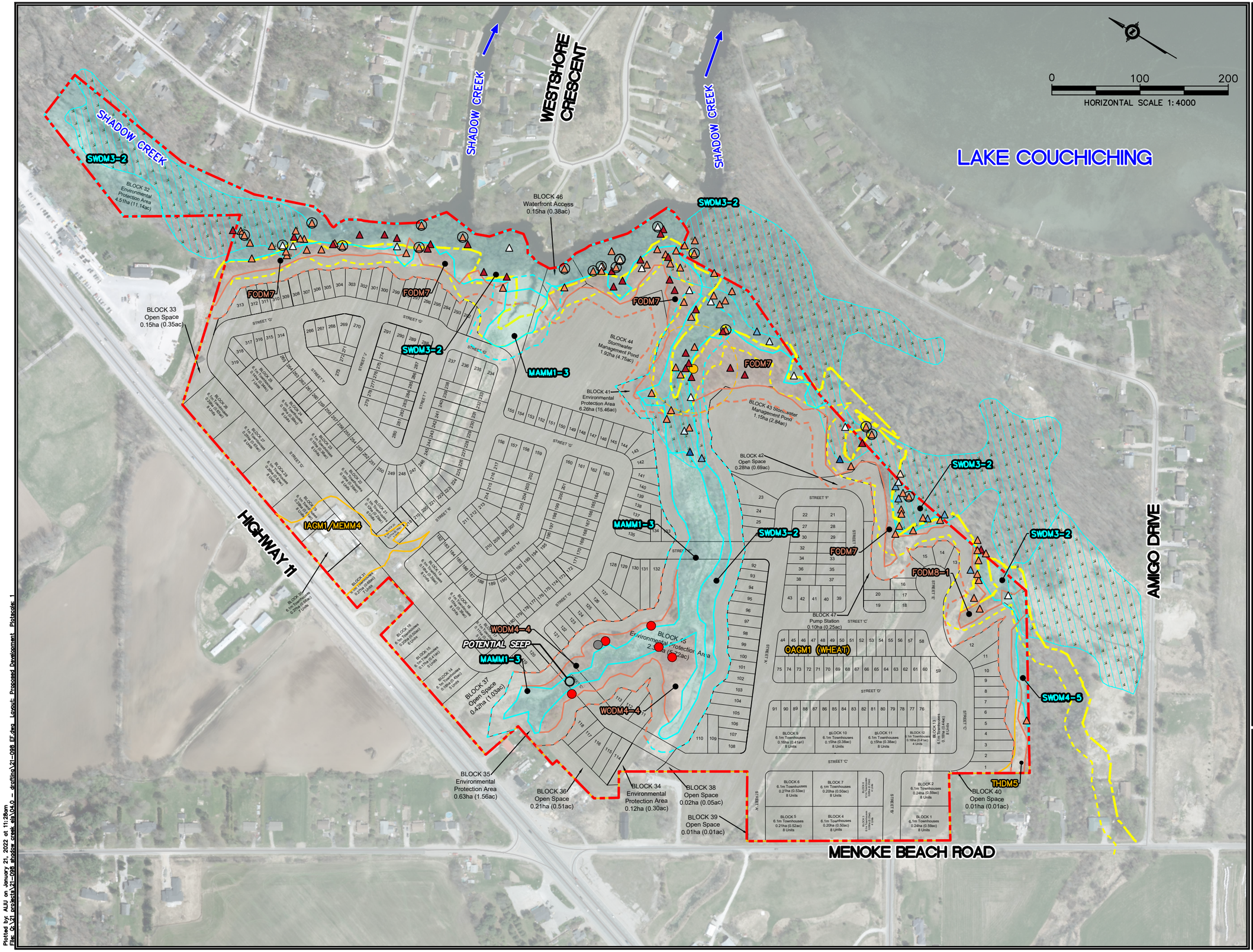

LEGEND:

- APPROX. PROPERTY BOUNDARY
- 2-YEAR FLOOD LINE (Crozier, 2021)
- FLOOD LINE BUFFER
- UNEVALUATED WETLAND (ONTARIO MNR, 2021)
- WETLAND AREA (DELINEATED BY AEC, AUG. 2021)
- WETLAND EDGE (AEC, AUG. 2021)
- 15m WETLAND BUFFER
- 15m WOODLAND BUFFER
- WOODLAND DRIP LINE (DELINEATED BY AEC, AUG. 2021)

BUTTERNUT TREE SYMBOLOGY:

- BUTTERNUT TREE – CATEGORY 1
- BUTTERNUT TREE – CATEGORY 2
- BUTTERNUT TREE – DEAD
- 50m BUTTERNUT TREE BUFFER – CATEGORY 2

BAT SNAG CLASSIFICATION:

- CIRCLED – HIGH QUALITY
- UNCIRCLED – LOW QUALITY
- HEALTHY
- DECAY CLASS 1
- DECAY CLASS 2
- DECAY CLASS 3
- DECAY CLASS 4
- DECAY CLASS 5
- DECAY CLASS 6

ELC VEGETATION COMMUNITIES:

FODM7	FRESH-MOIST LOWLAND DECIDUOUS FOREST
FODM8-1	FRESH-MOIST POPLAR DECIDUOUS FOREST
IAGM1	AGRICULTURAL BUILDING
MAMM1-3	REED-CANARY GRASS GRAMINOID MINERAL MEADOW MARSH
MEMM4	FRESH-MOIST MIXED MEADOW
OAGM1(WHEAT)	ANNUAL ROW CROP (WHEAT)
SWDM3-2	SILVER MAPLE MINERAL DECIDUOUS SWAMP
SWDM4-5	POPLAR MINERAL DECIDUOUS SWAMP
THDM5	FRESH-MOIST DECIDUOUS THICKET
WODM4-4	DRY-FRESH BLACK WALNUT DECIDUOUS WOODLAND

NOTES:

1. WETLAND BUFFER NOT SHOWN WHEN SUPERCEDED BY WOODLAND BUFFER.

AZIMUTH ENVIRONMENTAL CONSULTING, INC.

PROPOSED DEVELOPMENT & TERRESTRIAL FEATURES

MENOKE BEACH ROAD
SEVERN, ON

DATE ISSUED:	JANUARY 2022	Figure No. 3
CREATED BY:	A.L.	
PROJECT NO.:	21-098	
REFERENCE:	SIMCOE COUNTY	

Plotted by: ALU on: January 21, 2022 at 11:28am
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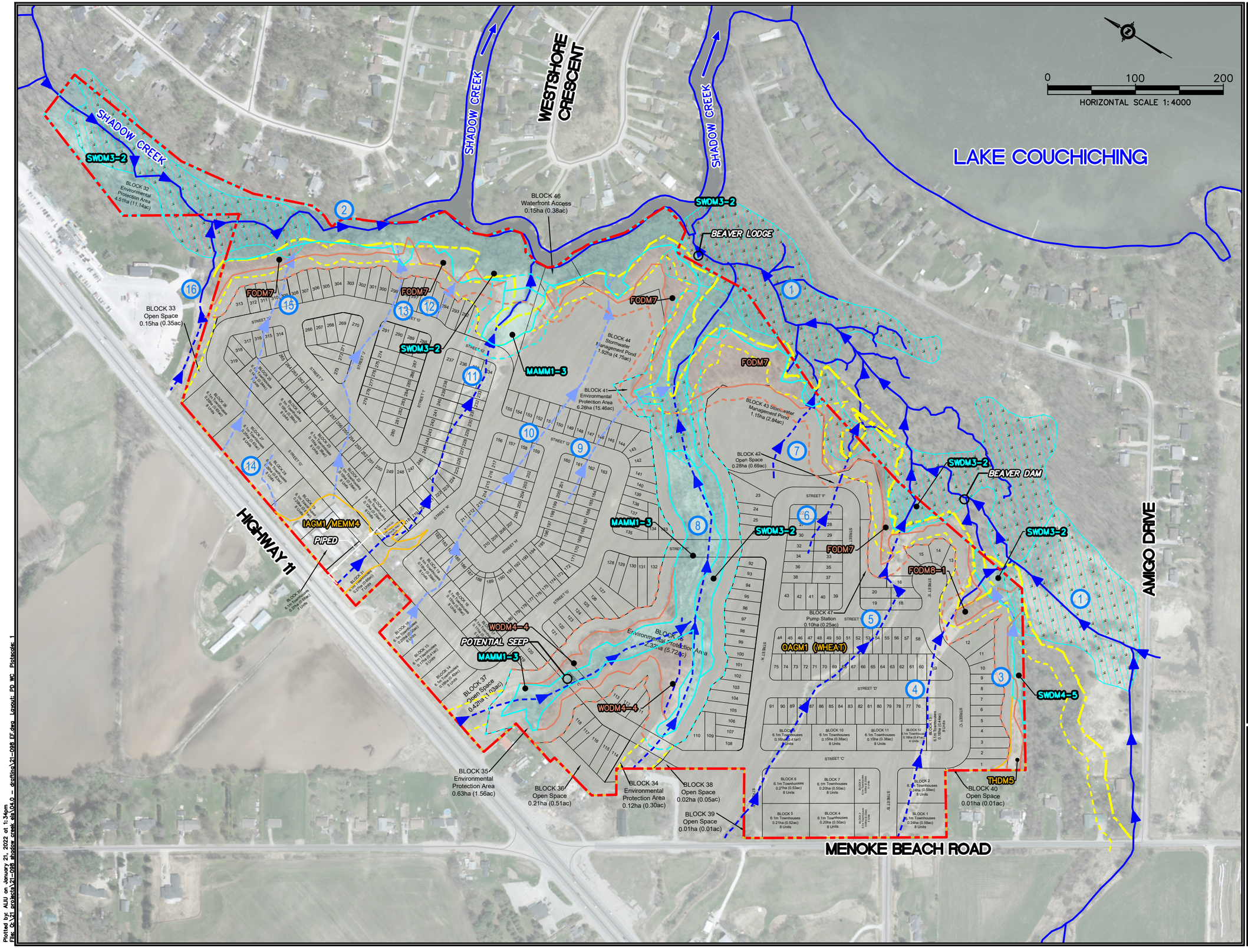

LEGEND:

- APPROX. PROPERTY BOUNDARY
- DIRECT FISH HABITAT
- INDIRECT FISH HABITAT
- 2-YEAR FLOOD LINE (Crozier, 2021)
- FISH HABITAT BUFFER
- NOT FISH HABITAT
- (#) AQUATIC SITE NUMBER
- UNEVALUATED WETLAND (ONTARIO MNR, 2021)
- WETLAND AREA (DELINEATED BY AEC, AUG. 2021)
- WETLAND EDGE (AEC, AUG. 2021)
- 15m WETLAND BUFFER
- 15m WOODLAND BUFFER
- WOODLAND DRIP LINE (DELINEATED BY AEC, AUG. 2021)

ELC VEGETATION COMMUNITIES:

FODM7	FRESH-MOIST LOWLAND DECIDUOUS FOREST
FODM8-1	FRESH-MOIST POPLAR DECIDUOUS FOREST
IAGM1	AGRICULTURAL BUILDING
MAMM1-3	REED-CANARY GRASS GRAMINOID MINERAL MEADOW MARSH
MEMM4	FRESH-MOIST MIXED MEADOW
OAGM1(WHEAT)	ANNUAL ROW CROP (WHEAT)
SWDM3-2	SILVER MAPLE MINERAL DECIDUOUS SWAMP
SWDM4-5	POPLAR MINERAL DECIDUOUS SWAMP
THDM5	FRESH-MOIST DECIDUOUS THICKET
WODM4-4	DRY-FRESH BLACK WALNUT DECIDUOUS WOODLAND

NOTES:

1. FISH HABITAT BUFFERS NOT SHOWN WHEN SUPERCEDED BY WETLAND BUFFERS.
2. WETLAND BUFFER NOT SHOWN WHEN SUPERCEDED BY WOODLAND BUFFER.

AZIMUTH ENVIRONMENTAL CONSULTING, INC.

PROPOSED DEVELOPMENT & FISHERIES FEATURES

MENOKE BEACH ROAD SEVERN, ON

DATE ISSUED:	JANUARY 2022	Figure No. 4
CREATED BY:	A.L.	
PROJECT NO.:	21-098	
REFERENCE:	SIMCOE COUNTY	

Common Name	Species Name	ESA	SARA	Key Habitats Used By Species[1]	Initial Assessment
Bald Eagle	*Haliaeetus leucocephalus*	SC	No status	Nests are typically found near the shoreline of lakes or large rivers, often on forested islands (Cadman *et al.*, 2007). ESA Protection: N/A	Property not associated with shorelines of lakes or large rivers. Property does not contain forested islands. Key habitat requirements are not found on the property. Species could conceivably be associated with the Lake Couchiching shoreline, but Lake Couchiching is beyond the study area (approximately 250-300m east of the property). The species would not be expected to occur, and not observed during surveys.
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, 2013c). ESA Protection: Species and general habitat protection	Key habitat requirements (*e.g.*, excavated vertical sand/silt stockpile faces) are not found on the property. Property not associated with sand or gravel pits *etc*. The species would not be expected to occur, and not observed during surveys.
Barn Swallow	*Hirundo rustica*	THR	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, 2011d). ESA Protection: Species and general habitat protection	The species was not detected during the field program, but three old barns and one silo occur on the property. Since the structures have the potential to possibly be occupied by Barn Swallows, it is recommended that they be sureveyed prior to development. The church on adjacent lands in the study area appeared to be in good condition.
Black Tern	*Chlidonias niger*	SC	No status	Colonial nesters typically found within marshes. Its preferred nesting habitat is a hemi-marsh (*i.e*. a wetland with 50:50 open water and emergent vegetation). Nests are usually built on an upturned cattail root, floating vegetation mat or patch of mud (Cadman *et al*., 2007). ESA Protection: N/A	Key habitat requirements (*e.g.*, hemi-marshes with abundant cattails) are not found on the property or adjacent lands. The species was not observed on the property or adjacent lands. Marsh habitat west of Menoke Beach Road is small and does not have the required 50:50 ratio of open water and emergent aquatic vegetation. Marsh habitat south of the property boundary (including south of Amigo Drive) also does not have the 50:50 ratio. The species was not found during surveys, nor would be expected to occur.
Blanding's Turtle	*Emydoidea blandingii*	THR	END	Blanding's Turtles are a primarily aquatic species that prefer wetland habitats, lakes, ponds, slow-moving streams, etc., however they may utilize upland areas to search for suitable basking and nesting sites. In general, preferred wetland sites are eutrophic and characterized by clear, shallow water, with organic substrates and high density of aquatic vegetation (COSEWIC, 2005a). ESA Protection: Species and general habitat protection	Key habitat requirements for the species (*e.g.*, open wetlands with abundant open water with some emergent aquatic vegetation, lakes, ponds) are not found on or adjacent to the property. A small open marsh south of Amigo Drive is beyond the study area (approx. 175m to the south) and generally considered to not be high quality habitat for the species and there are no known NHIC records in the area (Appendix B). The species would not be expected to occur on the property.
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, 2010b). ESA Protection: Species and general habitat protection	Key habitat requirements for the species (*e.g.*, hayfields, pastures, tall grass fields) are not found on the property. The species would not be expected to occur on the property. Although adjacent lands contain may suitable hayfield habitat, the species was not detected during dawn breeding bird surveys, and there are no NHIC records in the search area (Appendix B).
Broad Beech Fern	*Phygopteris hexagonoptera*	SC	SC	Rich soils in deciduous forests, such as Maple-Beech forests (MNRF, 2016). ESA Protection: N/A	Property and adjacent lands do not meet the key habitat requirements. The species would not be expected to occur. Not observed on the property.
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, 2003). ESA Protection: Species and general habitat protection	**Suitable riparian woodland habitat present on the property and adjacent lands. Species was found on the property. Considered further in main text.**
Canada Warbler	*Cardellina canadensis*	SC	THR	Wet, mixed deciduous-coniferous forests with a well developed shrub layer. Shrub marshes, Red-Maple stands, cedar stands, Black Spruce swamps, larch and riparian woodlands along rivers and lakes (COSEWIC, 2008b). ESA Protection: N/A	Key habitat requirements for the species (*e.g.,* wet, mixed deciduous-coniferous forest with well-developed understory) are not found on the property or adjacent lands. The species would not be expected to occur on the property, and was not observed during surveys.
Cerulean Warbler	*Dendroica cerulea*	THR	END	Associated with large tracts of mature deciduous forest with tall trees and an open understory. Found in both wet bottomland forests and upland areas (COSEWIC, 2010a). ESA Protection: Species and general habitat protection	Key habitat requirements for the species (*e.g.,* large areas of mature deciduous forest) are not found on the property or adjacent lands. The species would not be expected to occur on the property, and was not observed during surveys.
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, 2007g). 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	Anthropogenic structures with chimneys not present on property. A church on adjacent lands off Menoke Beach Road has a chimney, but the flue opening is too small for the species (<1.0079m^2, Bird Studies Canada, 2012). Species not expected to occur.
Common Five-lined Skink (Southern Shield population)	*Plestiodon fasciatus*	SC	SC	Southern Shield population - rocky outcrops embedded in a matrix of coniferous and deciduous forest, and individuals in these populations seek refuge under rocks overlaid on open bedrock (COSEWIC, 2007a). ESA Protection: N/A	Key habitat requirements for the species (*e.g.,* rocky outcrops in coniferous and deciduous forest with open bedrock) are not found on the property or adjacent lands. The species would not be expected to occur.
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, 2007d). ESA Protection: N/A	Key habitat requirements for the species (*e.g.,* sand dunes, beaches, recently logged/burned areas, short grass prairies, *etc*.) are not found on the property or adjacent lands. Pasture land may conceivably occur further west but considered beyond the study area. Species not expected to occur.
Eastern Hog-nosed Snake	*Heterodon platirhinos*	THR	THR	Habitat features include: well-drained soil; loose or sandy soil; open vegetative cover; brushland or forest edge; proximity to water; and climatic conditions typical of the eastern deciduous forest biome. In the Georgian Bay region, open grass, sand, human-impacted and forest habitats over rock, wetland, and aquatic habitats are preferable (COSEWIC, 2007b). ESA Protection: Species and general habitat protection	Key habitat requirements combination for the species (*e.g.,* deciduous forest areas with brushy forest edge, sandy soil, proximity to water) are not found on the property or adjacent lands. Species not expected to occur.
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, 2011c). ESA Protection: Species and general habitat protection	Key habitat requirements for the species (*e.g.*, hayfields, pastures, tall grass fields) are not found on the property. The species would not be expected to occur on the property. Although adjacent lands contain may suitable hayfield habitat, the species was not detected during dawn breeding bird surveys, and there are no NHIC records in the search area (Appendix B).
Eastern Musk Turtle	*Sternotherus oderatus*	SC	THR	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 not present on the property (drainage features on-property heavily vegetated). In regards to Shadow Creek on adjacent lands, the water is very murky and has no emergent aquatic vegetation, so the feature would not be considered suitable. No NHIC records in the area (Appendix B). Species would not be expected to occur.

Common Name	Species Name	ESA	SARA	Key Habitats Used By Species[1]	Initial Assessment
Eastern Ribbonsnake	*Thamnophis sauritus*	SC	THR	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, 2012c). ESA Protection: N/A	Key habitat requirements generally not present on the property. Wetland fingers that traverse the property are heavily vegetated impeding water flow and the amount of open standing water is minimal. These wetland areas would not be considered ideal for the species. Wetland habitat associated with the eastern property boundary is treed and does not meet aquatic requirements. No NHIC records in the area (Appendix B). Species would not be expected to occur.
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	Key roosting habitat requirements (*e.g* ., rocky areas, bluffs, old suitable anthropogenic structures, caves, old mines) for the species not found on the property or adjacent lands. Hibernation habitat not present. The species would not be expected to occur.
Eastern Whip-poor-will	*Antrostomus vociferus*	THR	THR	Semi-open forests or patchy forests with clearings, such as barrens or forests that are regenerating following major disturbances, are preferred nesting habitats (COSEWIC, 2009a). ESA Protection: Species and general habitat protection	Key habitat requirements for the species (*e.g.,* semi-open forest areas with successional forest canopy gaps) are not found on the property or adjacent lands. Species not expected to occur.
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, 2012d). ESA Protection: N/A	**A key habitat requirement (*e.g* ., intermediate-age deciduous forests with open understory) is present on the property and adjacent lands. Species detected during dawn breeding bird surveys. Considered further in main text.**
Golden-winged Warbler	*Vermivora chrysoptera*	SC	THR	Areas of early successional scrub surrounded by mature forests including dry uplands, swamp forests, and marshes (COSEWIC, 2006a). ESA Protection: N/A	Key habitat requirements for the species (*e.g.,* early successional scrub along forest edges or swamps) are not found on the property or adjacent lands. Swamp habitat in eastern region of property is not associated with scrub habitat characterisrtic of the species. Species not expected to occur.
Grass Pickerel	*Esox americanus vermiculatus*	SC	SC	Warm, slow moving streams, isolated pools of such streams, and shallow bays of lakes (COSEWIC, 2005b). ESA Protection: N/A	Key habitat requirements for the species (*e.g.,* warm, slow-moving streams) are not found on or adjacent to the property. Shadow Creek tends to be more of a warm-cool system. There is one record of Grass Pickerel for Lake Couchiching (NHIC, DFO; Appendix B), but the Committee on the Status of Endangered Wildlife in Canada Assessment and Status Report on the Grass Pickerel (Crossman and Holm, 2005) suggests this is an unverified field record from 1972. Species not expected to occur. Not considered further in our assessment.
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, 2013d). ESA Protection: N/A	Key habitat requirements (*e.g* ., large anthropogenic grasslands) do not occur on the property or adjacent lands. The species was not observed during breeding bird surveys and would not be expected to occur.
Henslow's Sparrow	*Ammodramus henslowii*	END	END	Requires grassland habitat and occurs more frequently and at higher densities in large patches of suitable habitat. Nests in tallgrass prairie, wet meadow, and marsh habitats as well as agricultural grasslands, lightly grazed pasture and grasslands on reclaimed surface mines (COSEWIC, 2011a). ESA Protection: Species and general habitat protection	Key habitat requirements (*e.g* ., large grassland areas, tallgrass prairies) not present on or adjacent to the property. Species not expected to occur and was not detected during dawn breeding bird surveys.
King Rail	*Rallus elegans*	END	END	Wide variety of freshwater marsh habitat types with cattails. Large marshes, especially those that contain a range of water level conditions and a mosaic of habitats, are preferred (COSEWIC, 2011b). ESA Protection: Species and general habitat protection	Key habitat requirements (*e.g* ., large, freshwater marshes with cattails, diverse water levels and habitat mosaics) not present on or adjacent to the property. Species not expected to occur and was not detected during surveys.
Lake Sturgeon (Great Lakes - Upper St. Lawrence populations)	*Acipenser fulvescens*	THR	THR	Generally found in the shallow areas of lakes or larger rivers, moving into smaller rivers to spawn. Usually found at depths of 5 -10 m and are in areas where water velocity does not exceed 70 cm/sec (COSEWIC, 2006b). ESA Protection: Species and general habitat protection	NHIC records for 1km grid square 17PK2750 indicate species is present in the area, but Lake Couchiching is 250-300m away from the property. Species not expected to occur in study area. Not considered further in assessment.
Least Bittern	*Ixobrychus exilis*	THR	THR	Breed strictly in marshes of emergents (usually cattails) that have relatively stable water levels and interspersed areas of open water (COSEWIC, 2009b). ESA Protection: Species and general habitat protection	Although marsh habitat (with some cattails) is present in wetland fingers on the property, water levels fluctuate and are generally not associated with areas of open water due to the marhes being heavily vegetated. Dense, extensive cattails not present in study area. Species not detected on the property during surveys.
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, 2013b). ESA Protection: Species and general habitat protection	**Key habitat requirements (*e.g* ., forests with large mature trees suitable for roosting) for the species occur on the property. Bat snags found during detailed bat snag mapping. Species identified during bat acoustic monitoring; considered further in main text. Barns on the property could potentially be used by roosting bats, and are recommended for survey prior to development.**
Loggerhead Shrike	*Lanius ludovicianus*	END	END (*migrans* subspecies)	Breeding habitat characterized by open areas dominated by grasses and/or forbs, interspersed with scattered shrubs or small trees and bare ground. Suitable habitat includes pasture, old fields, prairie, savannah, pinyon-juniper woodland, shrub-steppe and alvar (COSEWIC, 2014a). ESA Protection: Species and general habitat protection	Key habitat requirements (*e.g.* , open grassland areas with scattered shrubs/small trees and bare ground) for breeding not present on or adjacent to the property. Other possible habitat areas, such as old fields, occur on adjacent lands. Species not found during the field program.
Louisiana Waterthrush	*Parkesia motacilla*	THR	SC	Occupies specialized habitat, showing a strong preferences for nesting and wintering along relatively pristine headwater streams and wetlands situated in large tracts of mature forest. Prefers running water, but also inhabits heavily wooded swamps and vernal or semi-permanent pools (COSEWIC, 2015a). ESA Protection: N/A	Key habitat requirements (*e.g.* , pristine headwater streams and wetlands in large mature forests) not present on or adjacent to the property. Habitat requirements are specialized. Species not found on the property during field surveys, and not expected to occur.
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 milkweed) not present on property. Milkweed has the potential to occur in adjacent fields. Species not found on the property.
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, 2013b). ESA Protection: Species and general habitat protection	**Key habitat requirements (*e.g* ., areas with large mature trees suitable for roosting) for the species occur on the property. Bat snags identified and the species identified during bat acoustic monitoring; considered further in main text. Barns on the property could potentially be used by roosting bats, and are recommended for survey prior to development.**
Northern Map Turtle	*Grapetemys geographica*	SC	SC	Inhabits rivers and lakes where it basks on emergent rocks, banks, logs and fallen trees. Prefer shallow, soft-bottomed aquatic habitats with exposed objects for basking (COSEWIC, 2012c). ESA Protection: N/A	Key habitat requirements (*e.g.* , rivers, lakes with basking habitat) not present on or adjacent to the property. Species would not be expected to occur in study area.

Common Name	Species Name	ESA	SARA	Key Habitats Used By Species[1]	Initial Assessment
Olive-sided Flycatcher	*Contopus cooperi*	SC	THR	Natural forest openings, forest edges near natural openings (such as wetlands) or open to semi-open forest stands. Occasionally human made openings (such as clear cuts). Presence of tall snags and residual live trees is essential (COSEWIC, 2007e). ESA Protection: N/A	Key habitat requirements (*e.g.* , forests with natural openings, edges near openings, open to semi-open forest habitat) not present on or adjacent to the property. Species would not be expected to occur in study area; not detected during breeding bird surveys.
Red-headed Woodpecker	*Melanerpes erythrocephalus*	SC	THR	Occurs in open deciduous forests, particularly those dominated by oak and beech, grasslands, forest edges, orchards, pastures along rivers and roads, urban parks, golf courses, cemeteries, beaver ponds and timber stands that have been treated with herbicides (COSEWIC, 2007f). ESA Protection: N/A	Key habitat requirements (*e.g.* , open oak-beech deciduous forests, orchards) not present on the property or adjacent lands. Species would not be expected to occur on the property. Some pasture areas occur along roads in the general area, but species not detected during surveys on or adjacent.
Redside Dace	*Clinostomus elongatus*	END	SC	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, 2007c). ESA Protection: Species and general habitat protection.	Suitable stream habitat with riffles and pools not present in study area. No expectation of species occurring.
Short-eared Owl	*Asio flammeus*	SC	SC	A wide variety of unforested habitats are used, including grasslands, fallow pastures, and occasionally fields planted with row-crops (COSEWIC, 2008c). ESA Protection: N/A	Suitable habitat not present on the property. No expectation of species occurring on property. Fallow pasture land may occur on adjacent lands, but species not observed during surveys.
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, 2008a). ESA Protection: N/A	**Key habitat requirements (*e.g* ., slow-moving water with soft mud substrate and dense aquatic vegetation, ponds, river edges) not present on majority of the property. Wetland finger areas heavily vegetated with minimal open water. One area downstream of Aquatic Site #11 near property boundary may potentiall be used by the species. Suitable loose sand/gravel areas for nesting not observed on the property, although turtle nesting could conceivably occur along unplanted perimeter of the OAGM1 ELC polygon. Shadow Creek adjacent to the property has stagnant/very slow-moving water and virtually no emergent vegetation. NHIC data indicate species records in 1km grid squares 17PK2650, 17PK2649, 17PK2648 and 17PK2750, but species not observed during the field program. Considered further in main text.**
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, 2013b). ESA Protection: Species and general habitat protection	**Key habitat requirements (*e.g* ., forests with large mature trees suitable for roosting) for the species occur on the property. Species identified during bat acoustic monitoring; considered further in main text. Barns on the property could potentially be used by roosting bats, and are recommended for survey prior to development.**
West Virginia White	*Pieris virginiensis*	SC	No status	This species lives in moist, deciduous woodlands and requires a suppy of toothwort, a small, spring-blooming plant that is a member of the mustard family, since it is the only food source for the larvae (MNRF, 2014). ESA Protection: N/A	Suitable moist deciduous forests not present in study area. No expectation of species occurring.
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, 2012e). ESA Protection: N/A	Key habitat requirements (*e.g* ., large deciduous/mixed forests with dense understory) not found on or adjacent to the property. Adjacent woodland areas generally considered too young to meet habitat requirements and dense understory lacking. The species would not be expected to occur, and was not detected during breeding bird surveys or other surveys.
Yellow Rail	*Coturnicops noveboracensis*	SC	SC	Nest in wet marshy areas of short grass-like vegetation. The habitat must remain wet throughout the breeding season (COSEWIC, 2009c). ESA Protection: N/A	Key habitat requirements (*e.g.* , wet marsh habitat with short grass-like vegetation) not present in study area. Species would not be expected to occur, and not observed during field program.

[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
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. 2005a. COSEWIC assessment and update status report on the Blanding's Turtle *Enydoidea blandingii* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa.viii +40 pp.
COSEWIC. 2005b. COSEWIC assessment and status report on the Grass Pickerel *Esox americanus vermiculatus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 27 pp.
COSEWIC 2006a. COSEWIC assessment and status report on the Golden-winged Warbler *Vermivora chrysoptera* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 30 pp.
COSEWIC. 2006b. COSEWIC assessment and update status report on the Lake Sturgeon *Acipenser fulvescen* s in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 107 pp.
COSEWIC 2007a. COSEWIC assessment and update status report on the Five-lined Skink *Eumeces fasciatus* (Carolinian population and Great Lakes/St. Lawrence population) in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 50 pp.
COSEWIC. 2007b. COSEWIC assessment and update status report on the Eastern Hog-nosed Snake *Heterodon platirhinos* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. viii + 36 pp.
COSEWIC. 2007c. 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. 2007d. 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. 2007e. COSEWIC assessment and status report on the Olive-sided Flycatcher *Contopus cooperi* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 25 pp.
COSEWIC. 2007f. 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. 2007g. 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. 2007h. COSEWIC assessment and update status report on the Wood Turtle *Glyptemys insculpta* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 42 pp.
COSEWIC. 2008a. 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. 2008b. COSEWIC assessment and status report on the Canada Warbler *Wilsonia Canadensis* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 35 pp.
COSEWIC. 2008c. COSEWIC assessment and update status report on the Short-eared Owl *Asio flammeus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 24 pp.
COSEWIC. 2009a. COSEWIC assessment and update status report on the Whip-poor-will *Caprimulgus vociferus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 28 pp.
COSEWIC. 2009b. COSEWIC assessment and update status report on the Least Bittern *Ixobrychus exilis* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 36 pp.
COSEWIC. 2009c. COSEWIC assessment and status report on the Yellow Rail *Coturnicops noveboracensis* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 32 pp.
COSEWIC. 2010a. COSEWIC assessment and update status report on the Cerulean Warbler *Dendroica cerulea* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. x + 40 pp.
COSEWIC. 2010b. 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. 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. 2010d. COSEWIC assessment and status report on the Rusty-patched Bumble Bee *Bombus affinis* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 34 pp.
COSEWIC. 2010e. 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. 2011a. COSEWIC assessment and update status report on the Henslow's Sparrow *Ammodramus henslowii* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. x + 37 pp.
COSEWIC. 2011b. COSEWIC assessment and update status report on the King Rail *Rallus elegan* s in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. x + 32 pp.
COSEWIC. 2011c. 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. 2011d. 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. 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
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			[2] ELC Codes - Corresponding to Figure 2								[1] Conservation Rank Information		
Family	**[1] Scientific Name**	**[1] Common Name**	**IAGM1/MEMM4**	**THDM5**	**WODM4-4**	**FODM7**	**FODM8-1**	**MAMM1-3**	**SWDM3-2**	**SWDM4-5**	**S-Rank**	**G-Rank**	**SARO**
Aceraceae	*Acer negundo*	Manitoba Maple	x	x				x			S5	G5	
Aceraceae	*Acer rubrum*	Red Maple							x		S5	G5	
Aceraceae	*Acer saccharinum*	Silver Maple	x		x	x	x	x	x	x	S5	G5	
Aceraceae	*Acer saccharum*	Sugar Maple			x	x				x	S5	G5	
Aceraceae	*Acer spicatum*	Mountain Maple							x		S5	G5	
Aceraceae	*Acer x freemanii*	(Acer rubrum X Acer saccharinum)				x	x		x	x	0	GNA	
Alismataceae	*Alisma triviale*	Northern Water-plantain							x		S5	G5	
Amaranthaceae	*Amaranthus retroflexus*	Redroot Amaranth				x					SE5	G5	
Anacardiaceae	*Rhus typhina*	Staghorn Sumac			x				x		S5	G5	
Anacardiaceae	*Toxicodendron radicans var. rydbergii*	Western Poison Ivy				x					S5	G5	
Apiaceae	*Cicuta bulbifera*	Bulbous Water-hemlock							x		S5	G5	
Apiaceae	*Cicuta maculata*	Spotted Water-hemlock						x	x		S5	G5	
Apiaceae	*Daucus carota*	Wild Carrot	x				x				SE5	GNR	
Apiaceae	*Sium suave*	Common Water-parsnip							x		S5	G5	
Apocynaceae	*Apocynum androsaemifolium*	Spreading Dogbane				x					S5	G5	
Apocynaceae	*Asclepias incarnata*	Swamp Milkweed						x			S5	G5	
Apocynaceae	*Asclepias syriaca*	Common Milkweed	x		x						S5	G5	
Aquifoliaceae	*Ilex verticillata*	Common Winterberry							x		S5	G5	
Araceae	*Arisaema triphyllum*	Jack-in-the-pulpit				x	x		x		S5	G5	
Araceae	*Calla palustris*	Wild Calla							x		S5	G5	
Araliaceae	*Aralia nudicaulis*	Wild Sarsaparilla				x			x		S5	G5	
Asteraceae	*Ambrosia artemisiifolia*	Common Ragweed						x			S5	G5	
Asteraceae	*Bidens frondosa*	Devil's Beggarticks							x		S5	G5	
Asteraceae	*Cichorium intybus*	Wild Chicory	x								SE5	GNR	
Asteraceae	*Doellingeria umbellata*	Flat-top White Aster		x						x	S5	G5	
Asteraceae	*Erigeron annuus*	Annual Fleabane	x			x	x				S5	G5	
Asteraceae	*Erigeron canadensis*	Canada Horseweed	x		x						S5	G5	
Asteraceae	*Erigeron philadelphicus*	Philadelphia Fleabane						x			S5	G5	
Asteraceae	*Euthamia graminifolia*	Grass-leaved Goldenrod	x				x	x	x	x	S5	G5	
Asteraceae	*Eutrochium maculatum var. maculatum*	Spotted Joe Pye Weed						x			S5	G5T5	
Asteraceae	*Gnaphalium uliginosum*	Low Cudweed				x			x		SE5	G5	
Asteraceae	*Lactuca serriola*	Prickly Lettuce							x		SE5	GNR	
Asteraceae	*Lactuca sp.*	Lettuce species			x	x					-	-	-
Asteraceae	*Leucanthemum vulgare*	Oxeye Daisy	x		x						SE5	GNR	
Asteraceae	*Nabalus altissimus*	Tall Rattlesnakeroot				x			x		S5	G5	
Asteraceae	*Solidago altissima*	Tall Goldenrod	x	x	x		x	x		x	S5	G5	

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Asteraceae	*Solidago canadensis*	Canada Goldenrod	x	x	x		x			x	S5	G5	
Asteraceae	*Solidago gigantea*	Giant Goldenrod		x			x	x			S5	G5	
Asteraceae	*Solidago rugosa*	Rough-stemmed Goldenrod			x	x	x			x	S5	G5	
Asteraceae	*Sonchus arvensis*	Field Sow-thistle	x					x			SE5	GNR	
Asteraceae	*Symphyotrichum ciliolatum*	Lindley's Aster			x						S5	G5	
Asteraceae	*Symphyotrichum lanceolatum*	Panicled Aster			x	x		x	x	x	S5	G5	
Asteraceae	*Symphyotrichum lateriflorum*	Calico Aster				x					S5	G5	
Asteraceae	*Symphyotrichum novae-angliae*	New England Aster	x							x	S5	G5	
Asteraceae	*Symphyotrichum puniceum*	Purple-stemmed Aster						x	x	x	S5	G5	
Asteraceae	*Symphyotrichum urophyllum*	Arrow-leaved Aster			x					x	S4	G4G5	
Asteraceae	*Taraxacum officinale*	Common Dandelion	x	x			x	x		x	SE5	G5	
Balsaminaceae	*Impatiens capensis*	Spotted Jewelweed		x	x	x	x	x	x		S5	G5	
Berberidaceae	*Podophyllum peltatum*	May-apple				x			x		S5	G5	
Betulaceae	*Alnus incana ssp. rugosa*	Speckled Alder				x		x	x		S5	G5T5	
Betulaceae	*Betula alleghaniensis*	Yellow Birch				x		x	x		S5	G5	
Betulaceae	*Betula papyrifera*	Paper Birch			x	x	x	x	x	x	S5	G5	
Betulaceae	*Ostrya virginiana*	Eastern Hop-hornbeam				x					S5	G5	
Boraginaceae	*Myosotis laxa*	Small Forget-me-not						x	x		S5	G5	
Boraginaceae	*Myosotis scorpioides*	True Forget-me-not							x		SE5	G5	
Brassicaceae	*Barbarea vulgaris*	Bitter Wintercress			x			x			SE5	GNR	
Brassicaceae	*Nasturtium microphyllum*	Small-leaved Watercress						x	x		SE5	GNR	
Brassicaceae	*Nasturtium sp.*	Watercress							x		SE5	GNR	
Brassicaceae	*Thlaspi arvense*	Field Pennycress				x					SE5	GNR	
Caprifoliaceae	*Lonicera x bella*	(Lonicera morrowii X Lonicera tatarica)			x						0	GNA	
Caprifoliaceae	*Sambucus canadensis*	Common Elderberry							x		S5	G5T5	
Caprifoliaceae	*Viburnum lentago*	Nannyberry		x	x	x	x	x	x	x	S5	G5	
Caprifoliaceae	*Viburnum opulus*	Cranberry Viburnum		x	x		x		x	x	S5	G5	
Caryophyllaceae	*Cerastium fontanum*	Common Mouse-ear Chickweed	x				x				SE5	GNR	
Chenopodiaceae	*Chenopodium album*	Common Lamb's-quarters	x						x		SE5	G5	
Cornaceae	*Cornus alternifolia*	Alternate-leaved Dogwood	x	x	x	x		x	x		S5	G5	
Cornaceae	*Cornus obliqua*	Silky Dogwood							x		S5	G5	
Cornaceae	*Cornus sericea*	Red-osier Dogwood		x	x		x	x	x	x	S5	G5	
Crassulaceae	*Hylotelephium telephium*	Garden Stonecrop					x				SE2	GNR	
Cupressaceae	*Thuja occidentalis*	Eastern White Cedar			x	x			x		S5	G5	
Cyperaceae	*Carex arctata*	Drooping Woodland Sedge			x						S5	G5	
Cyperaceae	*Carex bebbii*	Bebb's Sedge				x		x	x		S5	G5	

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Cyperaceae	*Carex blanda*	Woodland Sedge				x			x		S5	G5	
Cyperaceae	*Carex crinita*	Fringed Sedge						x	x		S5	G5	
Cyperaceae	*Carex gracillima*	Graceful Sedge		x	x	x	x	x	x	x	S5	G5	
Cyperaceae	*Carex interior*	Inland Sedge							x		S5	G5	
Cyperaceae	*Carex intumescens*	Bladder Sedge				x			x		S5	G5	
Cyperaceae	*Carex lacustris*	Lake Sedge						x	x		S5	G5	
Cyperaceae	*Carex lupulina*	Hop Sedge							x		S5	G5	
Cyperaceae	*Carex pedunculata*	Long-stalked Sedge				x					S5	G5	
Cyperaceae	*Carex rosea*	Rosy Sedge				x					S5	G5	
Cyperaceae	*Carex tuckermanii*	Tuckerman's Sedge							x		S5	G5	
Cyperaceae	*Carex vulpinoidea*	Fox Sedge						x			S5	G5	
Cyperaceae	*Cyperus esculentus*	Perennial Yellow Flatsedge						x			S5	G5	
Cyperaceae	*Scirpus atrovirens*	Dark-green Bulrush						x	x		S5	G5	
Cyperaceae	*Scirpus cyperinus*	Common Woolly Bulrush						x			S5	G5	
Dennstaedtiaceae	*Pteridium aquilinum*	Bracken Fern			x						S5	G5	
Dryopteridaceae	*Athyrium filix-femina var. angustum*	Northeastern Lady Fern		x	x	x	x	x			S5	G5T5	
Dryopteridaceae	*Dryopteris carthusiana*	Spinulose Wood Fern				x			x		S5	G5	
Dryopteridaceae	*Dryopteris intermedia*	Evergreen Wood Fern				x					S5	G5	
Dryopteridaceae	*Matteuccia struthiopteris*	Ostrich Fern				x			x		S5	G5	
Dryopteridaceae	*Onoclea sensibilis*	Sensitive Fern		x	x	x	x	x	x	x	S5	G5	
Dryopteridaceae	*Polystichum acrostichoides*	Christmas Fern				x					S5	G5	
Equisetaceae	*Equisetum arvense*	Field Horsetail	x	x		x	x	x	x	x	S5	G5	
Equisetaceae	*Equisetum fluviatile*	Water Horsetail						x			S5	G5	
Equisetaceae	*Equisetum hyemale*	Common Scouring-rush				x			x		S5	G5	
Equisetaceae	*Equisetum sylvaticum*	Woodland Horsetail			x			x			S5	G5	
Euphorbiaceae	*Acalypha rhomboidea*	Common Three-seeded Mercury				x		x			S5	G5	
Fabaceae	*Melilotus albus*	White Sweet-clover	x								SE5	G5	
Fabaceae	*Trifolium hybridum*	Alsike Clover	x		x						SE5	GNR	
Fabaceae	*Trifolium pratense*	Red Clover	x	x							SE5	GNR	
Fabaceae	*Trifolium repens*	White Clover	x					x			SE5	GNR	
Fabaceae	*Vicia cracca*	Tufted Vetch			x					x	SE5	GNR	
Fagaceae	*Fagus grandifolia*	American Beech				x					S4	G5	
Fagaceae	*Quercus rubra*	Northern Red Oak				x	x		x		S5	G5	
Grossulariaceae	*Ribes americanum*	American Black Currant						x	x		S5	G5	
Grossulariaceae	*Ribes cynosbati*	Eastern Prickly Gooseberry			x						S5	G5	
Grossulariaceae	*Ribes triste*	Swamp Red Currant					x		x	x	S5	G5	

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Hydrocharitaceae	*Hydrocharis morsus-ranae*	European Frog-bit							x		SE5	GNR	
Hydrophyllaceae	*Hydrophyllum virginianum*	Virginia Waterleaf			x		x		x		S5	G5	
Iridaceae	*Iris versicolor*	Harlequin Blue Flag							x		S5	G5	
Juglandaceae	*Juglans cinerea*	Butternut			x	x		x			S2?	G3	END
Juglandaceae	*Juglans nigra*	Black Walnut			x	x		x	x		S4?	G5	
Juncaceae	*Juncus effusus*	Soft Rush						x	x		S5	G5	
Juncaceae	*Juncus tenuis*	Path Rush			x						S5	GNR	
Lamiaceae	*Clinopodium vulgare*	Wild Basil			x						S5	G5	
Lamiaceae	*Galeopsis tetrahit*	Common Hemp-nettle				x		x			SE	GNR	
Lamiaceae	*Lycopus europaeus*	European Water-horehound							x		SE5	GNR	
Lamiaceae	*Lycopus uniflorus*	Northern Water-horehound							x		S5	G5	
Lamiaceae	*Mentha canadensis*	Canada Mint						x			S5	G5	
Lamiaceae	*Scutellaria galericulata*	Marsh Skullcap						x	x		S5	G5	
Lemnaceae	*Lemna minor*	Small Duckweed							x		S5	G5	
Lemnaceae	*Wolffia borealis*	Northern Watermeal						x	x		S5	G5	
Lemnaceae	*Wolffia columbiana*	Columbia Watermeal						x	x		S5	G5	
Liliaceae	*Clintonia borealis*	Yellow Clintonia				x					S5	G5	
Liliaceae	*Erythronium americanum*	Yellow Trout-lily				x					S5	G5	
Liliaceae	*Maianthemum canadense*	Wild Lily-of-the-valley				x			x		S5	G5	
Liliaceae	*Maianthemum racemosum*	Large False Solomon's Seal				x					S5	G5T5	
Liliaceae	*Polygonatum pubescens*	Hairy Solomon's Seal				x					S5	G5	
Liliaceae	*Trillium erectum*	Red Trillium				x			x		S5	G5	
Liliaceae	*Trillium grandiflorum*	White Trillium				x					S5	G5	
Liliaceae	*Trillium sp.*	Trillium species						x			-	-	-
Myricaceae	*Myrica gale*	Sweet Gale							x		S5	G5	
Nymphaeaceae	*Nymphaea odorata*	Fragrant Water-lily							x		S5	G5	
Oleaceae	*Fraxinus americana*	White Ash			x						S4	G5	
Oleaceae	*Fraxinus nigra*	Black Ash			x			x	x		S4	G5	
Oleaceae	*Fraxinus pennsylvanica*	Red Ash		x	x	x	x	x	x	x	S4	G5	
Onagraceae	*Circaea alpina*	Small Enchanter's Nightshade							x		S5	G5	
Onagraceae	*Circaea canadensis*	Broad-leaved Enchanter's Nightshade		x	x	x			x	x	S5	G5	
Onagraceae	*Epilobium coloratum*	Purple-veined Willowherb						x	x		S5	G5	
Onagraceae	*Epilobium hirsutum*	Hairy Willowherb							x		SE5	GNR	
Onagraceae	*Epilobium parviflorum*	Small-flowered Hairy Willowherb	x					x	x		SE4	GNR	
Onagraceae	*Ludwigia palustris*	Marsh Seedbox							x		S5	G5	
Onagraceae	*Oenothera biennis*	Common Evening-primrose			x	x	x				S5	G5	

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Orchidaceae	*Epipactis helleborine*	Broad-leaved Helleborine				x					SE5	GNR	
Osmundaceae	*Claytosmunda claytoniana*	Interrupted Fern					x				S5	G5	
Osmundaceae	*Osmunda regalis*	Royal Fern				x			x		S5	G5	
Osmundaceae	*Osmundastrum cinnamomeum*	Cinnamon Fern							x		S5	G5	
Oxalidaceae	*Oxalis stricta*	Upright Yellow Wood-sorrel			x						SE5	G5	
Phytolaccaceae	*Phytolacca americana*	Common Pokeweed			x	x					S4	G5	
Pinaceae	*Picea abies*	Norway Spruce			x	x					SE3	G5	
Pinaceae	*Pinus strobus*	Eastern White Pine			x	x					S5	G5	
Pinaceae	*Pinus sylvestris*	Scots Pine				x					SE5	GNR	
Pinaceae	*Tsuga canadensis*	Eastern Hemlock							x		S5	G5	
Plantaginaceae	*Plantago major*	Common Plantain						x			SE5	G5	
Poaceae	*Agrostis gigantea*	Redtop	x					x			SE5	G4G5	
Poaceae	*Agrostis stolonifera*	Creeping Bentgrass					x				SE5	G5	
Poaceae	*Brachyelytrum aristosum*	Northern Shorthusk				x					S5?	G5	
Poaceae	*Bromus inermis*	Smooth Brome	x		x						SE5	G5T5	
Poaceae	*Dactylis glomerata*	Orchard Grass	x		x						SE5	GNR	
Poaceae	*Digitaria sanguinalis*	Hairy Crabgrass	x						x		SE5	G5	
Poaceae	*Echinochloa crus-galli*	Large Barnyard Grass	x					x			SE5	GNR	
Poaceae	*Elymus hystrix*	Bottlebrush Grass				x			x		S5	G5	
Poaceae	*Elymus virginicus*	Virginia Wildrye							x		S5	G5	
Poaceae	*Glyceria grandis*	Tall Mannagrass						x			S5	G5	
Poaceae	*Glyceria striata*	Fowl Mannagrass						x	x	x	S5	G5	
Poaceae	*Leersia oryzoides*	Rice Cutgrass						x	x		S5	G5	
Poaceae	*Lolium arundinaceum*	Tall Ryegrass	x		x						SE5	GNR	
Poaceae	*Muhlenbergia mexicana*	Mexican Muhly						x			S5	G5	
Poaceae	*Panicum capillare*	Common Panicgrass						x	x		S5	G5	
Poaceae	*Phalaris arundinacea*	Reed Canarygrass	x	x	x	x	x	x	x	x	S5	G5	
Poaceae	*Phleum pratense*	Common Timothy	x								SE5	GNR	
Poaceae	*Phragmites australis*	Common Reed						x			SU	G5	
Poaceae	*Poa palustris*	Fowl Bluegrass						x			S5	G5	
Poaceae	*Poa pratensis*	Kentucky Bluegrass	x					x			S5	G5	
Poaceae	*Setaria viridis*	Green Foxtail	x					x			SE5	GNR	
Polygonaceae	*Fallopia convolvulus*	Eurasian Black Bindweed							x		SE5	GNR	
Polygonaceae	*Persicaria maculosa*	Spotted Lady's-thumb						x			SE5	G3G5	
Polygonaceae	*Rumex britannica*	Greater Water Dock							x		S5	G5	
Polygonaceae	*Rumex crispus*	Curled Dock						x			SE5	GNR	

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Primulaceae	*Lysimachia ciliata*	Fringed Yellow Loosestrife							x		S5	G5	
Primulaceae	*Lysimachia nummularia*	Creeping Yellow Loosestrife							x		SE5	GNR	
Pyrolaceae	*Pyrola elliptica*	Shinleaf				x				x	S5	G5	
Ranunculaceae	*Actaea pachypoda*	White Baneberry				x					S5	G5	
Ranunculaceae	*Caltha palustris*	Yellow Marsh Marigold							x		S5	G5	
Ranunculaceae	*Ranunculus acris*	Common Buttercup	x	x		x	x	x			SE5	G5	
Ranunculaceae	*Ranunculus flabellaris*	Yellow Water Buttercup							x		S4	G5	
Ranunculaceae	*Ranunculus sceleratus*	Cursed Buttercup						x			S5	G5	
Ranunculaceae	*Thalictrum pubescens*	Tall Meadow-rue			x	x		x	x		S5	G5	
Rhamnaceae	*Rhamnus cathartica*	European Buckthorn	x	x	x	x				x	SE5	GNR	
Rosaceae	*Agrimonia gryposepala*	Hooked Agrimony				x			x		S5	G5	
Rosaceae	*Amelanchier sp.*	Serviceberry species				x					-	-	-
Rosaceae	*Comarum palustre*	Marsh Cinquefoil						x	x		S5	G5	
Rosaceae	*Crataegus sp.*	Hawthorn species		x	x		x	x			-	-	-
Rosaceae	*Fragaria virginiana*	Wild Strawberry	x	x	x		x				S5	G5	
Rosaceae	*Geum aleppicum*	Yellow Avens					x	x	x		S5	G5	
Rosaceae	*Geum canadense*	Canada Avens		x						x	S5	G5	
Rosaceae	*Geum sp.*	Avens species			x						-	-	-
Rosaceae	*Malus pumila*	Common Apple		x	x		x		x	x	SE4	G5	
Rosaceae	*Potentilla norvegica*	Rough Cinquefoil	x				x				S5	G5	
Rosaceae	*Prunus pensylvanica*	Pin Cherry					x			x	S5	G5	
Rosaceae	*Prunus serotina*	Black Cherry			x	x	x		x		S5	G5	
Rosaceae	*Prunus virginiana*	Chokecherry		x	x	x	x	x	x	x	S5	G5	
Rosaceae	*Rosa palustris*	Swamp Rose						x			S5	G5	
Rosaceae	*Rubus allegheniensis*	Allegheny Blackberry	x		x	x			x		S5	G5	
Rosaceae	*Rubus idaeus ssp. strigosus*	North American Red Raspberry	x		x	x		x	x		S5	G5T5	
Rosaceae	*Rubus occidentalis*	Black Raspberry			x		x	x		x	S5	G5	
Rosaceae	*Rubus pubescens*	Dwarf Raspberry					x	x	x		S5	G5	
Rosaceae	*Sorbus aucuparia*	European Mountain-ash			x	x	x				SE4	G5	
Rosaceae	*Spiraea alba*	White Meadowsweet			x			x	x		S5	G5	
Rubiaceae	*Galium mollugo*	Smooth Bedstraw	x			x					SE5	GNR	
Rubiaceae	*Galium palustre*	Common Marsh Bedstraw						x		x	S5	G5	
Salicaceae	*Populus balsamifera*	Balsam Poplar		x	x		x	x		x	S5	G5	
Salicaceae	*Populus tremuloides*	Trembling Aspen		x	x		x	x		x	S5	G5	
Salicaceae	*Populus x canadensis*	(Populus deltoides X Populus nigra)			x						0	GNA	
Salicaceae	*Salix bebbiana*	Bebb's Willow		x	x			x		x	S5	G5	

			[2] ELC Codes - Corresponding to Figure 2								[1] Conservation Rank Information		
Family	**[1] Scientific Name**	**[1] Common Name**	**IAGM1/MEMM4**	**THDM5**	**WODM4-4**	**FODM7**	**FODM8-1**	**MAMM1-3**	**SWDM3-2**	**SWDM4-5**	**S-Rank**	**G-Rank**	**SARO**
Salicaceae	*Salix discolor*	Pussy Willow		x	x			x		x	S5	G5	
Salicaceae	*Salix eriocephala*	Cottony Willow		x							S5	G5	
Salicaceae	*Salix nigra*	Black Willow							x		S4	G5	
Salicaceae	*Salix petiolaris*	Meadow Willow		x				x			S5	G5	
Salicaceae	*Salix spp.*	Willow species		x			x	x			-	-	-
Saxifragaceae	*Tiarella cordifolia*	Heart-leaved Foamflower				x			x		S5	G5	
Scrophulariaceae	*Chelone glabra*	White Turtlehead							x		S5	G5	
Scrophulariaceae	*Mimulus ringens*	Square-stemmed Monkeyflower							x		S5	G5	
Scrophulariaceae	*Verbascum thapsus*	Common Mullein				x					SE5	GNR	
Solanaceae	*Physalis heterophylla*	Clammy Ground-cherry			x						S4	G5	
Solanaceae	*Solanum dulcamara*	Bittersweet Nightshade	x					x	x		SE5	GNR	
Taxaceae	*Taxus canadensis*	Canada Yew							x		S4	G5	
Thelypteridaceae	*Parathelypteris noveboracensis*	New York Fern				x			x		S4S5	G5	
Thelypteridaceae	*Thelypteris palustris*	Marsh Fern							x		S5	G5	
Tiliaceae	*Tilia americana*	Basswood			x	x	x	x	x		S5	G5	
Typhaceae	*Typha angustifolia*	Narrow-leaved Cattail						x			SE5	G5	
Typhaceae	*Typha latifolia*	Broad-leaved Cattail						x	x		S5	G5	
Ulmaceae	*Ulmus americana*	White Elm			x	x		x	x		S5	G4	
Urticaceae	*Boehmeria cylindrica*	Small-spike False Nettle							x		S5	G5	
Urticaceae	*Pilea pumila*	Dwarf Clearweed							x		S5	G5	
Verbenaceae	*Verbena hastata*	Blue Vervain						x			S5	G5	
Vitaceae	*Parthenocissus vitacea*	Thicket Creeper	x	x	x	x	x	x	x		S5	G5	
Vitaceae	*Vitis riparia*	Riverbank Grape	x		x	x			x		S5	G5	

[1] Nomenclature and Conservation Rankings based on Ministry of Natural Resources and Forestry (MNRF) Natural Heritage Information Centre (NHIC, 2021)
S-Rank = Sub-national/provincial scale (from 1-5), S1 - Extremely Rare, S2 - Very Rare, S3 - Rare to Uncommon, S4 - Common, S5 - Very Common, E = Exotic/Non-native.
G-Rank = Global scale (from 1 - "Critically Imperiled" to 5 - "Secure" or common), G1 - Critically Imperiled, G2 - Imperiled, G3 - Vulnerable, G4 - Apparently Secure, G5 - Secure.
[2] ELC Codes based on Ecological Land Classification for Southern Ontario manual (Lee et al. 1998, and 2008 update).

Ecological Land Classification[1]				
System	**Community Class**	**Ecosite/Vegetation Type**	**Composition[2]**	**Ground Cover[2]**
Terrestrial	Meadow	IAGM1/MEMM4, Agricultural Buildings/Fresh - Moist Mixed Meadow	This community is a young, disturbed meadow resulting from overgrown open land surrounding old farm buildings. Canopy generally absent, with few scattered taller Maples. Subcanopy also generally abstent, consisting of a few scattered scrubby Maples as well as vines (including Riverbank Grape and Thicket Creeper) climbing trees and buildings.	Understory and ground layers typical of open overgrown agricultural space on fresh to fresh-moist ground. Species include a mixture of grasses (Smooth Brome, Reed Canary Grass, Orchard Grass, Common Timothy and others) and forbs (including Tall Goldenrod, Canada Goldenrod, Grass-leaved Goldenrod, White Sweet-clover, Red Clover, Common Dandelion and others) and vines (including Riverbank Grape and Thicket Creeper).
Terrestrial	Thicket	THDM5, Fresh - Moist Deciduous Thicket	This community is a small old field edge at the far southern corner of the subject property, which is slowly increasing in shrub cover. Community is fresh-moist in nature, being at the edge of a swamp (this swamp located south of the property boundary), but overall characteristics and shrub assemblage were determined to be terrestrial. Canopy relatively sparse, with cover mostly associated with woodland edge, composed largely of Red Ash. Subcanopy relatively dense, composed of an assemblage of shrub Willows, Red Ash, Common Apple, Poplars and Nannyberry.	Understory relatively dense, including a mixture of Red-osier Dogwood, Red Ash, Chokecherry and Balsam Poplar. Ground layer dense, composed of a mixture of Reed Canary Grass, Field Horsetail, Wild Strawberry, Sensitive Fern, Goldenrods and White Avens.
Terrestrial	Woodland	WODM4-4, Dry - Fresh Black Walnut Deciduous Woodland	This vegetation community is a dry-fresh woodland growing along the west edges of the largest riparian corridor on the subject property, occupying elevated land between the low riparian marshes and the upper active agricultural lands. The woodland is generally elevated at least 1-2m above the riparian marshes, and in some locations transitions abruptly from woodland to marsh due to steep banks. The northeast edge of this polygon includes higher proportions of poplars. Generally, the canopy is patchy to somewhat dense (<60% cover), composed largely of Black Walnut with lesser elements of Basswood, Ash and Poplars. Subcanopy is also somewhat dense overall, composed largely of Riverbank Grape, Thicket Creeper, Chokecherry, Black Walnut and Basswood.	Ground cover generally composed of a mixture of common open and semi-shade species. Understory dense, composed of Smooth Brome, Raspberry, Chokecherry, Riverbank Grape and Thicket Creeper. Ground cover somewhat dense, composed of Thicket Creeper, grasses, Avens, Broad-leaved Enchanter's Nightshade, scattered Spotted Jewelweed (with higher proportions where directly adjacent to marsh) and numerous other species.

Ecological Land Classification[1]				
System	**Community Class**	**Ecosite/Vegetation Type**	**Composition[2]**	**Ground Cover[2]**
Terrestrial	Forest	FODM7, Fresh – Moist Lowland Deciduous Forest	This community is a variable fresh-moist forest community distributed along the east edge of the subject property, occupying the terrestrial treed fringe between active farmland and the large SWDM3-2 swamp community. The vegetation community appears to be younger compared to the SWDM3-2, however composition is not uniform. Some areas of this community (particularly forest near the largest east-west riparian corridor) exhibit a rich ground layer locally high in spring ephemerals. Canopy dense, varying between Ash and Maple dominance, with cover generally composed of Maples (including Silver Maple and Sugar Maple) and/or Red Ash, with lesser elements of Basswood, American Beech, Yellow Birch, Oak and others. Subcanopy relatively dense, composed of varying degrees of Maple and Red Ash, with lesser varying elements of White Elm, Birch, Eastern Hop-hornbeam, Cherry and American Beech.	Understory somewhat sparse to somewhat dense, composed largely of Ash and Chokecherry with elements of Raspberry, Tall Meadow-rue, Spotted Jewelweed and others. Ground layer dense, variable along its length, composed largely of ferns (including Sensitive Fern, Northeastern Lady Fern, Wood Ferns and Christmas Fern), Broad-leaved Enchanter's Nightshade, Wild Lily-of-the-valley, Wild Sarsaparilla, Jack-in-the-pulpit, Trillium, Yellow Trout Lily, Tall Rattlesnakeroot, Western Poison Ivy and many others.
Terrestrial	Forest	FODM8-1, Fresh – Moist Poplar Deciduous Forest	Community is a relatively young upland treed community adjacent to the SWDM3-2 swamp and MAMM1-3 riparian corridor. Canopy dense, composed of Trembling Aspen, with lesser elements of Paper Birch and Balsam Poplar. Subcanopy somewhat dense, composed generally of varying degrees of Cherry, Poplar, Ash, Birch, Willow and Basswood.	Understory somewhat dense, composed largely of Poplar and Cherry. Ground cover dense, composed largely of Reed Canary Grass and Field Horsetail with lesser elements of Sensitive Fern, Spotted Jewelweed and Goldenrods (including Tall Goldenrod and Canada Goldenrod).
Wetland	Marsh	MAMM1-3, Reed-canary Grass Graminoid Mineral Meadow Marsh	This meadow marsh is a riparian vegetation community which follows drainage features on the subject property. Community is present along a series of four (4) east-west oriented drainage features that cross the property. Generally speaking, soils are mineral in nature, however organic horizons are present in some localized pockets. Small inclusions of Speckled Alder Thicket Swamp and Trembling Aspen/Balsam Poplar Treed Swamp are present along the edges of the largest drainage feature (in its east half as well as the far northwest corner); woody stem coverage overall is minimal. Canopy generally negligible. Subcanopy layer occasionally and somewhat sparsely represented, often densest at edges near banks, most consistently composed of Willows and Red-osier Dogwood.	Understory overwhelmingly dominated by Reed canary Grass throughout, with few localized inclusions dominated by sedges, cattails or forbs. Lesser elements of Willowherb, Red-osier Dogwood and Spotted Jewelweed scattered throughout. Ground layer somewhat dense but crowded and generally not diverse in most areas, dominated by shorter Reed Canary Grass, with scattered Field Horsetail throughout. Other lesser elements occasional to rare.

Ecological Land Classification[1]				
System	**Community Class**	**Ecosite/Vegetation Type**	**Composition[2]**	**Ground Cover[2]**
Wetland	Swamp	SWDM3-2, Silver Maple Mineral Deciduous Swamp	Polygon is a large, mature deciduous swamp occupying the variously flooded lowlands surrounding Shadow Creek and several of its tributaries. This polygon is distributed across the whole eastern edge of the subject property, occurring both on- and off-property. The swamp is rich in vegetative diversity and varied microtopography, grades from seasonally flooded areas to some areas with near-permanent flooding, and includes relatively large/old trees compared to the rest of the subject property. A young inclusion of Poplar Treed Swamp and Speckled Alder Thicket Swamp extends west from this community following the south edge of the largest MAMM1-3 feature mapped on the subject property. Canopy is dense throughout, dominated by Silver Maple with lesser elements of Red Ash, interspersed with occasional Birch and Basswood. Subcanopy somewhat dense, composed of Silver Maple with lesser elements of Red Ash, interspersed with Birch, Eastern White Cedar, Black Ash and others.	Understory somewhat dense, variable, frequently composed of Reed Canary Grass, Ash saplings, Common Winterberry, *Carex* sedges (including Lake Sedge), Tall Meadow-rue, Royal Fern and others. Ground Layer dense and diverse, typically composed of Sensitive Fern, Marsh Fern, Small-spiked False Nettle, *Carex* sedges, Spotted Jewelweed, Dwarf Raspberry and others.
Wetland	Swamp	SWDM4-5, Poplar Mineral Deciduous Swamp	This community is a relatively young, disturbed swamp dominated by Balsam Poplar, located at the south edge of the subject property. It abuts a larger, slightly older Ash swamp as well as a Reed Canary Grass meadow marsh (both south of the property), however these communities do not occur on the subject lands and were not evaluated in detail. A Willow thicket swamp inclusion occurs at the east end of this polygon. Canopy somewhat dense, composed largely of Balsam Poplar with lesser elements of Maple and Ash. Subcanopy dense, dominated by Balsam Poplar with lesser elements of Willow, Trembling Aspen and Paper Birch.	Understory relatively sparse, composed of Balsam Poplar, Willow and Red Ash. Ground layer dense, dominated by Sensitive Fern, Field Horsetail, Marsh Bedstraw, Fowl Mannagrass and Reed Canary Grass.

[1] ELC Codes based on Ecological Land Classification for Southern Ontario manual (Lee et al. 1998, and 2008 update)
[2] Nomenclature based on NDMNRF Natural Heritage Information Centre (NHIC, 2021)

Table 4: Dawn Breeding Birds Survey, Shadow Creek (Menoke Phase 3), 2021 **AEC21-098**

			Location[1,2]										Conservation Rankings[3]				
			1		2		3		4		5		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			GRANK	SRANK	SARO	SARA	TRACK
Alcedinidae	*Megaceryle alcyon*	Belted Kingfisher												√	G5	S5B, S4N			N
Anatidae	*Anas platurhynchos*	Mallard Duck											X	√	G5	S5			N
Anatidae	*Branta canadensis*	Canada Goose					C							√	G5	S5			N
Anatidae	*Lophodytes cucullatus*	Hooded Merganser											X	√	G5	S5			N
Bombycillidae	*Bombycilla cedrorum*	Cedar Waxwing	C		S				S						G5	S5B			N
Cardinalidae	*Cardinalis cardinalis*	Northern Cardinal	S					C							G5	S5			N
Charadriidae	*Charadrius vociferus*	Killdeer												√	G5	S4B			N
Columbidae	*Zenaida macroura*	Mourning Dove												√	G5	S5			N
Corvidae	*Corvus brachyrhynchos*	American Crow		C										√	G5	S5B			N
Corvidae	*Cyanocitta cristata*	Blue Jay					X								G5	S5			N
Fringillidae	*Spinus tristis*	American Goldfinch	S	S,C			S	S,C			S,C	S			G5	S5B			N
Icteridae	*Agelaius phoeniceus*	Red-winged Blackbird	C	S,C	S,C	C	S,C	S,C	C	S,C	C	S,C		√	G5	S4			N
Icteridae	*Icterus galbula*	Baltimore Oriole	S				S	S			S				G5	S4B			N
Icteridae	*Molothrus ater*	Brown-headed Cowbird		S											G5	S4B			N
Laridae	*Larus spp.*	Gulls (various)											X	√	G5	S5			N
Mimidae	*Dumetella carolinensis*	Gray Catbird	S												G5	S4B			N
Paridae	*Poecile atricapillus*	Black-capped Chickadee	C	S,C	S,C									√	G5	S5			N
Parulidae	*Geothlypis trichas*	Common Yellowthroat	S,C	S	S,C	S	S	S,C	S	S	S	S		√	G5	S5B			N
Parulidae	*Quiscalus quiscula*	Common Grackle												√	G5	S5			N
Parulidae	*Setophaga pensylvanica*	Chestnut-sided Warbler						S							G5	S5B			N
Parulidae	*Setophaga petechia*	Yellow Warbler	S		S		S		S			S			G5	S5B			N
Parulidae	*Setophaga petechia*	Yellow Warbler												√	G5	S5B			N
Parulidae	*Setophaga pinus*	Pine Warbler	C												G5	S5B			N
Parulidae	*Setophaga ruticilla*	American Redstart	C		S		S	S	S	S				√	G5	S5B			N
Passerellidae	*Melospiza melodia*	Song Sparrow	S,C	S	S	S,C	S	S,C	S	S,C	S	S,C		√	G5	S5B			N
Passerellidae	*Spizella passerina*	Chipping Sparrow		S		S									G5	S5B			N
Picidae	*Dryobates villosus*	Hairy Woodpecker												√	G5	S5			N
Picidae	*Dryocopus pileatus*	Pileated Woodpecker												√	G5	S5			N
Sittidae	*Sitta carolinensis*	White-breasted Nuthatch												√	G5	S5			N
Troglodytidae	*Troglodytes aedon*	House Wren	S	S	S		S		S					√	G5	S5B			N
Turdidae	*Turdus migratorius*	American Robin	S	S	S	C				S		S,C		√	G5	S5B			N
Tyrannidae	*Contopus virens*	Eastern Wood-pewee			S		S							√	G5	S4B	SC	SC	Y
Tyrannidae	*Myiarchus crinitus*	Great Crested Flycatcher	S	S	S										G5	S4B			N
Tyrannidae	*Tyrannus tyrannus*	Eastern Kingbird	S		S	S		S			S				G5	S4B			N
Vireonidae	*Vireo gilvus*	Warbling Vireo			S			S	S						G5	S5B			N
Vireonidae	*Vireo olivaceus*	Red-eyed Vireo	S	S	S	S	S		S		S	S			G5	S5B			N

Table 4: Dawn Breeding Birds Survey, Shadow Creek (Menoke Phase 3), 2021 **AEC21-098**

			Location[1,2]										Conservation Rankings[3]				
			1		2		3		4		5		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			GRANK	SRANK	SARO	SARA	TRACK

[1] **Visit 1**: June 11, 2021, Observer: S.Tarof, Tempurature 17ºC, Cloud Cover 90% , Wind: B1, Precipitation: Light Shower, Search Time 06:18 to 07:59; **Visit 2**: June 22, 2021, Observer: S.Tarof, Tempurature 9ºC, Cloud Cover 100% , Wind: B2, Precipitation: Nil, Search Time 07:13 to 09:02

[2] Breeding Bird Evidence Codes: X/√ - Species observed or heard, 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, Natural Heritage Information Centre (http://nhic.mnr.gov.on.ca/nhic_.cfm)
S-Rank = Sub-national/provincial scale (from 1-5), S1 - Extremely Rare, S2 - Very Rare, S3 - Rare to Uncommon, S4 - Common, S5 - Very Common.
G-Rank = Global scale (from 1 - "Critically Imperiled" to 5 - "Secure" or common), G1 - Critically Imperiled, G2 - Imperiled, G3 - Vulnerable, G4 - Apparently Secure, G5 - Secure.
B = Breeding Populations, N = Non-breeding Populations; M = Migratory Populations; SARO: EXT - Extirpated, END - Endangered, THR - Threatened, SC - Special Concern, NA - Not Applicable (i.e., not native to Ontario), Blank - Not at Risk in Ontario.

Table 5: Significant Woodland Assessment, Shadow Creek (Menoke Phase 3), 2021

CRITERIA	STANDARDS	ASSESSMENT
1. Woodland Size Criteria		
• Size refers to the aerial (spatial) extent of the woodland (irrespective of ownership) • Woodland areas are considered to be generally continuous even if intersected by narrow gaps 20m or less in width between crown edges. • Size value is related to the scarcity of woodland in the landscape derived on a municipal basis with consideration of the differences in woodland coverage among physical sub-units (*e.g.*, watersheds, biophysical regions). • Size criteria should also account for differences in landscape-level physiography (*e.g.*, moraines, clay planes) and community vegetation types.	Where woodlands cover: • Is less than about 5% of land cover, woodlands 2ha in size or larger should be considered significant • Is about 5-15% of land cover, woodlands 4ha in size or larger should be considered significant • Is about 15-30% of land cover, woodlands 20ha in size or larger should be considered significant • Is about 30-60% of land cover, woodlands 50ha in size or larger should be considered significant • Occupies more than 60% of the land, a minimum size is not suggested, and other factors should be considered	• The amount of woodland cover for the Township of Severn is 56.5% of the total land cover (MNRF, 2013; MMAH, 2012). At the scale of the Township's planning area, it follows that 30-60% of the land cover is woodland. For the woodland to be considered significant, its size needs to be 50ha or greater. The size of the woodland feature associated with the property is approximately 45.63ha. Consequently, the woodland does not meet the Woodland Size Criteria and should not be considered Significant Woodland.
2. Ecological Function Criteria		
a. Woodland Interior		
• Interior Habitat more than 100m from the edge (as measured from the limits of a continuous woodland as defined above) is important for some species. • For purposes of this criterion, a maintained public road would create an edge even if the opening was not wider than 20m and did not create a separate woodland.	Woodlands should be considered significant if they have: • Any interior habitat where woodlands cover less than about 15% of the land cover • 2 ha or more of interior habitat where woodlands cover about 15-30% of the land cover • 8 ha or more of interior habitat where woodlands cover about 30-60% of the land cover • 20 ha or more of interior habitat where woodlands cover about 60% of the land cover	• For woodland cover of 30-60%, the woodland needs to have 8ha or more of interior habitat. Consequently, the woodland does not meet this Ecological Function Criterion and should not be considered Significant Woodland.
b. Proximity to Other Woodlands or Other Habitats		
• Woodlands that overlap, abut or are close to other significant natural heritage features or areas could be considered more valuable or significant than those that are not. • Patches close to each other are of greater mutual benefit and value to wildlife.	Woodlands should be considered significant if: • A portion of the woodland is located within a specific distance (*e.g.*, 30m) of a significant natural feature or fish habitat likely receiving ecological benefit from the woodland and the entire woodland meets the minimum area threshold (*e.g.*, 0.5-20ha, depending on circumstance)	• A portion of the woodland feature is within 30m of a wetland and within 30m of fish habitat that receives ecological benefit from the woodland, but the woodland does not meet the minimum area threshold. Consequently, the woodland does not meet this Ecological Function Criterion and should not be considered Significant Woodland.
c. Linkages		
• Linkages are important connections providing for movement between habitats. • Woodlands that are located between other significant features or areas can be considered to perform an important linkage function as "stepping stones" for movement between habitats.	Woodlands should be considered significant if they: • Are located within a defined natural heritage system or provide a connecting link between two other significant features, each of which is within a specified distance (*e.g.*, 120m) and meets minimum area thresholds (*e.g.*, 1-20ha, depending on circumstance)	• The woodland is not located within a defined natural heritage system, but does provide ecological linkage between wetlands and designated fish habitat. The woodland also may provide movement corridor function among habitats for wildlife in the area, but does not meet the minimum area threshold. Consequently, the woodland does not meet this Ecological Function Criterion and should not be considered Significant Woodland.
d. Water Protection		
• Source water protection is important. • Natural hydrological processes should be maintained.	Woodlands should be considered significant if they: • Are located within a sensitive or threatened watershed or a specific distance (*e.g.*, 50m or top of valley bank if greater) or a sensitive groundwater discharge, sensitive recharge, sensitive headwater area, watercourse or fish habitat and meet minimum area thresholds (*e.g.*, 0.5-10ha, depending on circumstance)	• The woodland is located in a sensitive watershed area (*e.g.*, fish habitat and proximal to Lake Couchiching) and is within sensitive fish habitat but does not meet the minimum area threshold. Consequently, the woodland does not meet this Ecological Function Criterion and should not be considered Significant Woodland.

CRITERIA	STANDARDS	ASSESSMENT
e. Woodland Diversity		
• Certain woodland species have had major reductions in representation on the landscape and may need special consideration. • More native diversity is more valuable than less diversity.	Woodlands should be considered significant if they have: • A naturally occurring composition of native forest species that have declined significantly south and east of the Canadian Shield and meet minimum area thresholds (*e.g.*, 1-20ha, depending on circumstance) • A high native diversity through a combination of composition and terrain (*e.g.*, a woodland extending from a hilltop to a valley bottom or to opposite slopes) and meet minimum area thresholds (*e.g.*, 2-20ha, depending on circumstance)	• The woodland contains Butternut, an Endangered tree species that is undergoing significant decline. The woodland also contains ash species, which are undergoing significant decline due to Emerald Ash Borer activity. However, the woodland does not meet the minimum area threshold. Consequently, the woodland does not meet this Ecological Function Criterion and should not be considered Significant Woodland.
3. Uncommon Characteristics Criteria		
• Woodlands that are uncommon in terms of species composition, cover type, age or structure should be protected. • Older woodlands (*i.e.*, woodlands greater than 100 years old) are particularly valuable for several reasons, including their contributions to genetic, species and ecosystem diversity.	Woodlands should be considered significant if they have: • A unique species composition or the site is represented by less than 5% overall in woodland area and meets minimum area thresholds (*e.g.*, 0.5ha, depending on circumstance) • A vegetation community with a provincial ranking of S1, S2 or S3 (as ranked by the NHIC and meet minimum area thresholds (*e.g.*, 0.5ha, depending on circumstance) • Habitat (*e.g.*, with 10 individual stems or 100m^2 of leaf coverage) of a rare, uncommon or restricted woodland plant species and meet minimum area thresholds (*e.g.*, 0.5ha, depending on circumstance): vascular plant species for which the NHIC's Southern Ontario Coefficient of Conservatism is 8, 9 or 10; tree species of restricted distribution such as sassafras or rock elm; species existing only in a limited number of sites within the planning area • Characteristics of older woodlands or woodlands with larger tree size structure in native species and meet minimum area thresholds (*e.g.*, 1-10ha, depending on circumstance): older woodlands could be defined as having 10 or more trees/ha greater than 100 years old; larger tree size structure could be defined as 10 or more trees/ha at least 50cm in diameter, or a basal area of 8 or more m^2/ha in trees that are at least 40cm in diameter	• Based on tree DBH data collected as part of the detailed bat snag mapping, it is unlikely that the woodland meets the criteria for being considered an older woodland. The woodland also does not meet the minimum area threshold. Consequently, the woodland does not meet Uncommon Characteristics Criteria and should not be considered Significant Woodland.
4. Economic and Social Function Values Criteria		
• Woodlands that have high economic or social values through particular site characteristics or deliberate management should be protected.	Woodlands should be considered significant if they have: • High productivity in terms of economically viable products together with continuous native natural attributes and meet minimum area thresholds (*e.g.*, 2-20ha, depending on circumstance) • A high value in special services such as air-quality improvement or recreation at a sustainable level that is compatible with long-term retention and meet minimum area thresholds (*e.g.*, 0.2-10ha, depending on circumstance) • Important identified appreciation, education, cultural or historical value and meet minimum area thresholds (*e.g.*, 0.2-10ha, depending on circumstance)	• It is Azimuth's understanding that the woodland does not compel consideration as providing significant economic or social functions.

Ministry of Natural Resources (OMNR). 2010. Natural Heritage Reference Manual for Natural Heritage Policies of the Provincial Policy Statement, 2005 (2nd Ed.). Ontario Ministry of Natural Resources, Toronto, ON.

Table 6. Significant Wildlife Habitat Criteria Schedule for Ecoregion 6E, Shadow Creek (Menoke Phase 3), 2021

Table 1.1 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.	The wildlife habitat is not present on or adjacent to the property. The property is not associated with CUM or CUT fields that flood in spring. The property would not be expected to provide habitat function as a waterfowl stopover and staging area (terrestrial).
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 Canvasback Ruddy Duck	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 SWD ELC ecosites are present on and adjacent to the property and two of the listed wildlife species were detected (Canada Goose, Hooded Merganser), 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	
Shorebird Migratory Stopover Area **Rationale:** 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. Information Sources • 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.	Although the study area contains shoreline of Shadow Creek, the feature would not be considered to meet candidate SWH function criteria due to its smaller size. While the MAM1 ecosite is present, suitable conditions (*e.g.*, mud flats) not present. Listed species not observed. The property and adjacent lands would not be expected to provide habitat function for shorebirds.
Raptor Wintering Area **Rationale:** 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 **Special Concern:** Short-eared Owl Bald Eagle	Hawks/Owls: 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. Bald Eagle: 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. Information Sources: • 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/upland forest habitat to provide raptor wintering function. Upland forest areas in study area relatively small. 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 in 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.	**FOD and SWD forested ecosites are available in the study area. Bat snag mapping confirmed presence of suitable bat snags, and acoustic monitoring confirmed the presence of the listed species.** **Acoustic data suggest that the two listed species occur in the numbers indicated to confirm habitat function. Considered further in main text.**
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 • Natural Heritage Information Center (NHIC)	• 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 and mitigation measures for turtle wintering habitat.	**Habitat on the property is not considered suitable for overwintering turtles.** **Watercourses on adjacent lands (*i.e.*, downstream end of Watercourse Site #11 confluence at Shadow Creek, and downstream end of Watercourse Site #1 confluence at unnamed creek) are connected hydrologically to Lake Couchiching, dependent on lake water levels and considered permanent. Thus, candidate habitat function may potentially occur in the study area (but not on the property). Two Midland Painted Turtles were observed during the field program at the confluence of Watercourse Site #11 and Shadow Creek. Since five or more Midland Painted Turtles**

Wildlife Habitat	Wildlife Species	Candidate SWH		Confirmed SWH	Assessment
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
					are required to confirm habitat function for the species, turtle overwintering function is not confirmed for the species – but there is potential candidate function. Considered further in main text.
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 suitable habitat in study area. The study area would not be expected to provide reptile hibernaculum habitat function.
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	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	• 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*	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.	No exposed/eroding soil banks associated with study area. No suitable habitat in the study area. The study area would not be expected to provide the habitat function.

Wildlife Habitat	Wildlife Species	Candidate SWH		Confirmed SWH	Assessment
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
swallow population are declining in Ontario.		CLO1 CLS1 CLT1	http://www.birdscanada.org/birdmon/ • Field Naturalist Clubs.		
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.	The property and adjacent lands contain an SWD ecosite; many trees in this ELC polygon would meet the height criterion. Although candidate SWH function criteria are met, SWH function not confirmed. Occupied or vacant heron nests not observed.
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 in 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 **<u>Rationale:</u>** Butterfly stopover areas are extremely rare habitats and are biologically important for butterfly species that migrate south for the winter.	Painted Lady Red Admiral <u>Special Concern</u> Monarch	Combination of ELC Community Series; need to have present one Community Series from each land class: <u>Field:</u> CUM CUT CUS <u>Forest:</u> 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. <u>Information Sources</u> • 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.	Property is not located within 5km of Lake Ontario. No suitable habitat present within study area.
Landbird Migratory Stopover Areas **<u>Rationale:</u>** 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 . <u>Information Sources</u> • 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.

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 or adjacent lands. Other ELC ecosites listed not on the property. See also 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	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>	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	No woodlands of sufficient size to be considered for this potential SWH function.

Wildlife Habitat	Wildlife Species	Candidate SWH		Confirmed SWH	Assessment
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
of winter conditions.			• MNRF District Offices • LIO/NRVIS	Schedule. • SWHMiST Index #2 provides development effects and mitigation measures.	

Table 1.2.1 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 known old growth forest in 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 in the study area are influenced by adjacent land use and development. No rare vegetation communities in study area.

1.2.2 Specialized Habitat for Wildlife

Wildlife Habitat	Wildlife Species	Candidate SHW		Confirmed SWH	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.	Although SWD ELC community is present in study area, there is not suitable habitat conducive to waterfowl nesting in the study area that meets size criteria. The study area would not be expected to provide the habitat function.
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.	FOD and SWD vegetation communities occur in study area, but they are not adjacent to suitable aquatic habitats (*e.g.*, lakes, ponds, rivers, wetlands with open water areas). No suitable habitat for the species, and listed species/nests not observed. Candidate habitat criteria not met. 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. Forested areas do not meet size or interior habitat criteria. Candidate habitat criteria not met. As a result, the property would not be expected to provide the habitat function.
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.	**Preferred ELC ecosites not present on the property. Two Midland Painted Turtles observed on May 20, 2021 at the confluence of Watercourse Site #11 and Shadow Creek, supporting potential candidate habitat function in study area (although the turtles were not nesting at the time of the early spring observation). Unknown whether or not the turtles nested in study area. Confirmed criteria for habitat function not met. Considered further in main text.**

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.	**Areas of apparent groundwater surface pooling observed on the property during spring field investigations in the FODM7 and SWDM3-2 ELC polygon areas east of the narrow section of the central wetland polygon. Observations consistent with seeps/springs. Criteria for confirmed SWH function met. Considered further in main text.** **Potential seeps observed at the west end of the central wetland finger north of dawn breeding bird survey station #3.**
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 SHW	Assessment
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Amphibian Breeding Habitat (Wetlands) **<u>Rationale;</u>** 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. <u>Information Sources</u> • Ontario Herpetofaunal Summary Atlas (or other similar atlases) • Canadian Wildlife Service Amphibian Road Surveys and Backyard Amphibian Call Count. • OMNRF Districts and wetland evaluations • Reports and other information available from 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 **<u>Rationale:</u>** 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. <u>Information Sources</u> • 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 meeting habitat criteria is present in the study area. Candidate SWH criteria are not met. The study area would not be expected to provide the SWH function.

1.3 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.	MAM1 ELC ecosite present in study area, but listed species not observed during dawn or marsh bird surveys. Criteria not met.
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. Vegetation communities listed not present, nor were the listed species detected during field program. Habitat criteria not met; habitat function not expected to occur.
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 suitable habitat for shrub/early successional birds. CUT (THD)is present but not of sufficient size (>10ha). Habitat criteria not met; habitat function not expected to occur.

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. <u>Information Sources</u> • Information sources from "Conservation Status of Freshwater Crayfishes" by Dr. Premek Hamr for the WWF and CNF March 1998.	Studies Confirm: • Presence of 1 or more individuals of species listed or their chimneys (burrows) in suitable 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.	**Crayfish chimneys (but no crayfish) were documented during Azimuth's field investigations in association with the central wetland finger – within the SWDM3-2 area, approximately 50-100m west of property boundary. SHW function criteria met. Considered further in main text.**
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 <u>Information Sources</u> • 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.	**One Special Concern bird species was detected in the field: Eastern Wood-pewee was heard in the FODM7. Potential habitat for Snapping Turtle may occur downstream of Aquatic Site #11 near the eastern property boundary. Species considered further in main text.** Although one Monarch Butterfly was observed in the WODM4-4 woodland fringe community in the northern edge of the central wetland finger on the property, there was not an abundance of Common Milkweed observed in/near this vegetation community nor in the study area overall. Given the low number of individuals (one) and absence of widespread suitable habitat for the species, Monarch Butterfly is not considered further in the assessment.

1.4 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.	SWH function for breeding (wetland) not met. No potential amphibian movement corridor function in 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.

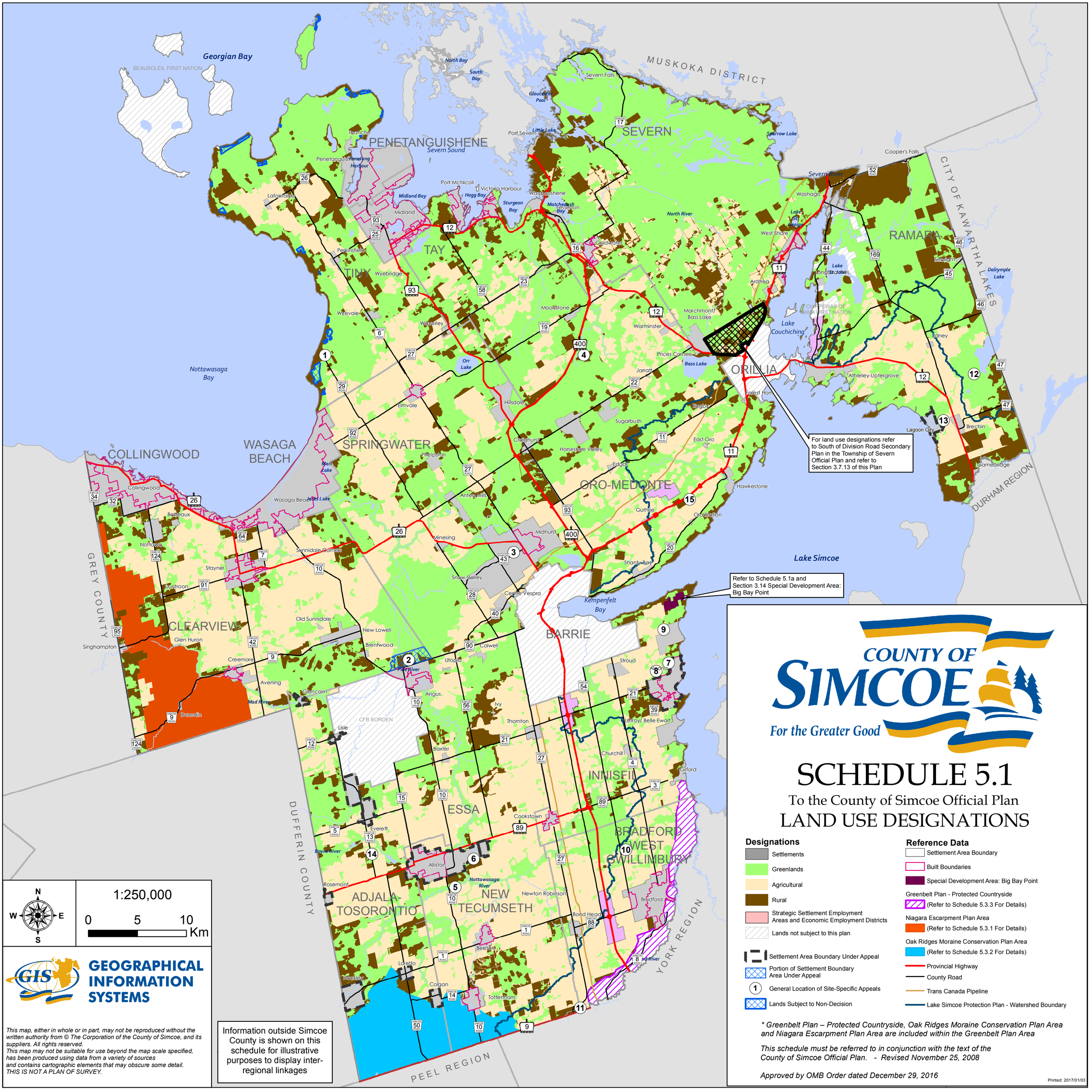
1.5 Exceptions for EcoRegion 6E

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 and Regional Background Information



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GEOGRAPHICAL INFORMATION SYSTEMS

Information outside Simcoe County is shown on this schedule for illustrative purposes to display inter-regional linkages

COUNTY OF SIMCOE

For the Greater Good

SCHEDULE 5.1

To the County of Simcoe Official Plan

LAND USE DESIGNATIONS

Designations

- Settlements
- Greenlands
- Agricultural
- Rural
- Strategic Settlement Employment Areas and Economic Employment Districts
- Lands not subject to this plan
- Settlement Area Boundary Under Appeal
- Portion of Settlement Boundary Area Under Appeal
- (1) General Location of Site-Specific Appeals
- Lands Subject to Non-Decision

Reference Data

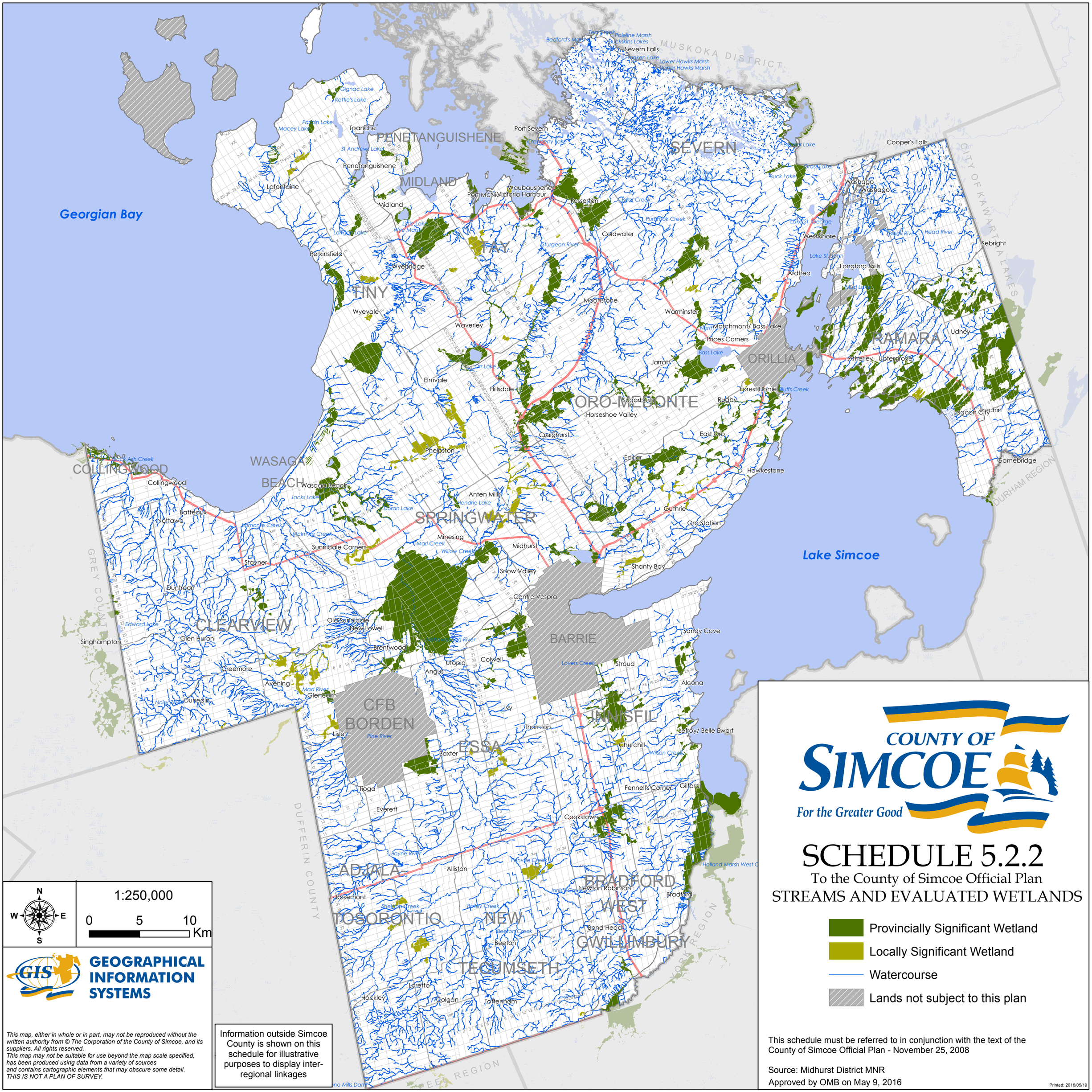
- Settlement Area Boundary
- Built Boundaries
- Special Development Area: Big Bay Point
- Greenbelt Plan - Protected Countryside (Refer to Schedule 5.3.3 For Details)
- Niagara Escarpment Plan Area (Refer to Schedule 5.3.1 For Details)
- Oak Ridges Moraine Conservation Plan Area (Refer to Schedule 5.3.2 For Details)
- Provincial Highway
- County Road
- Trans Canada Pipeline
- Lake Simcoe Protection Plan - Watershed Boundary

** Greenbelt Plan – Protected Countryside, Oak Ridges Moraine Conservation Plan Area and Niagara Escarpment Plan Area are included within the Greenbelt Plan Area*

This schedule must be referred to in conjunction with the text of the County of Simcoe Official Plan. - Revised November 25, 2008

Approved by OMB Order dated December 29, 2016

Printed: 2017/01/03



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GIS GEOGRAPHICAL INFORMATION SYSTEMS

Information outside Simcoe County is shown on this schedule for illustrative purposes to display inter-regional linkages

COUNTY OF SIMCOE
For the Greater Good

SCHEDULE 5.2.2

To the County of Simcoe Official Plan

STREAMS AND EVALUATED WETLANDS

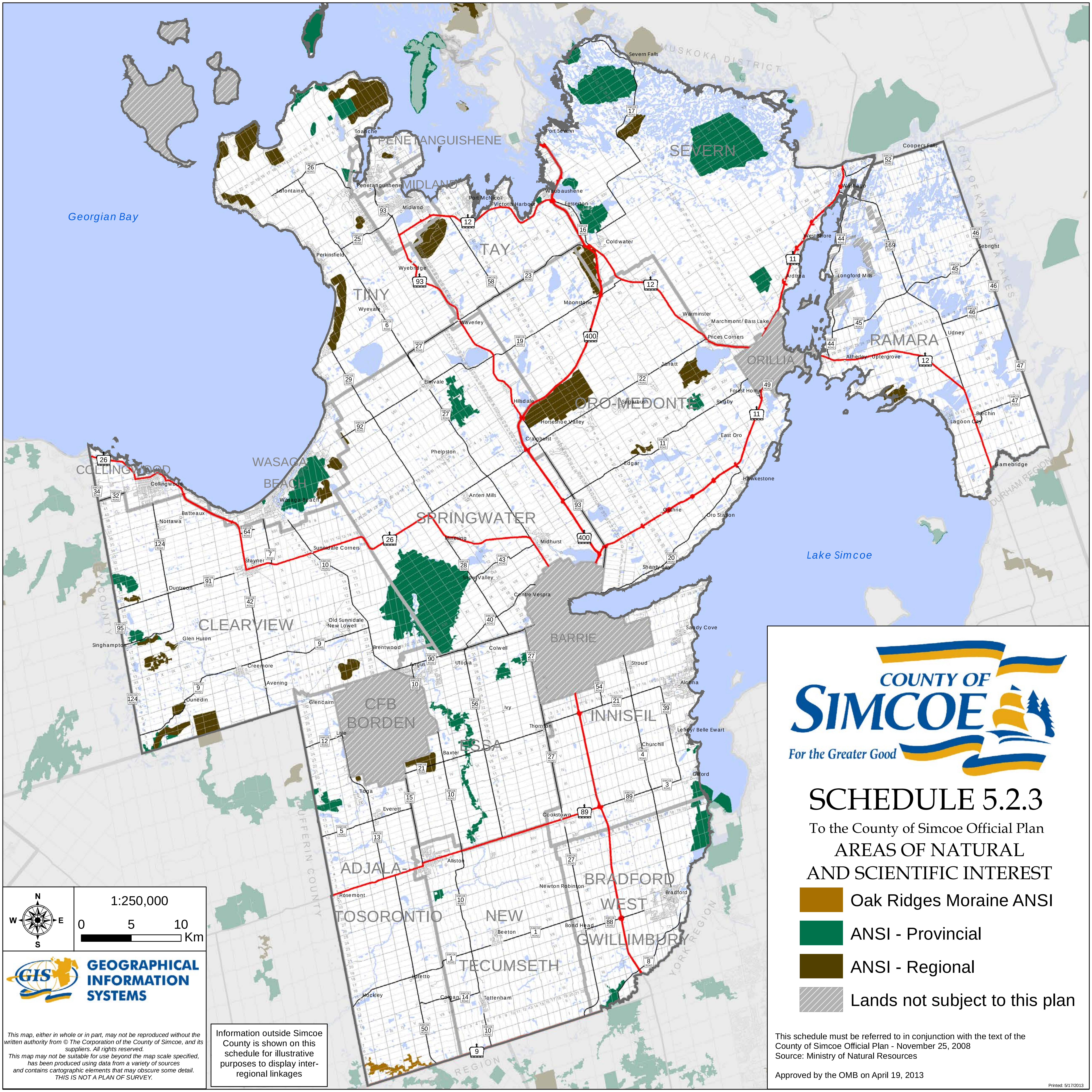
- Provincially Significant Wetland
- Locally Significant Wetland
- Watercourse
- Lands not subject to this plan

This schedule must be referred to in conjunction with the text of the County of Simcoe Official Plan - November 25, 2008

Source: Midhurst District MNR

Approved by OMB on May 9, 2016

Printed: 2016/05/19



SCHEDULE 5.2.3

To the County of Simcoe Official Plan

AREAS OF NATURAL AND SCIENTIFIC INTEREST

- Oak Ridges Moraine ANSI
- ANSI - Provincial
- ANSI - Regional
- Lands not subject to this plan

COUNTY OF SIMCOE
For the Greater Good

This schedule must be referred to in conjunction with the text of the County of Simcoe Official Plan - November 25, 2008
Source: Ministry of Natural Resources

Approved by the OMB on April 19, 2013

Printed: 5/17/2013

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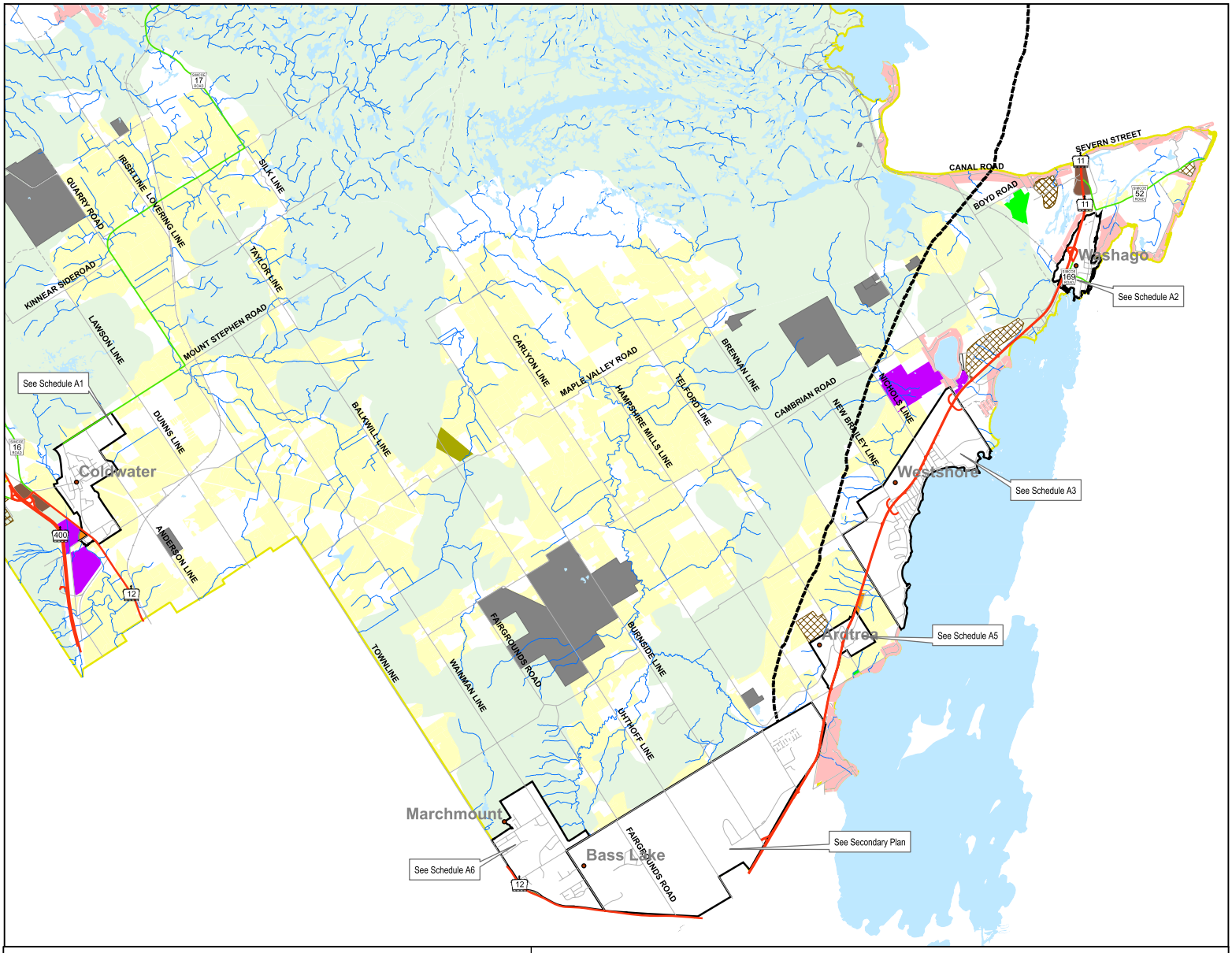
GEOGRAPHICAL INFORMATION SYSTEMS

Information outside Simcoe County is shown on this schedule for illustrative purposes to display inter-regional linkages



Township of Severn
Schedule A South
Land Use

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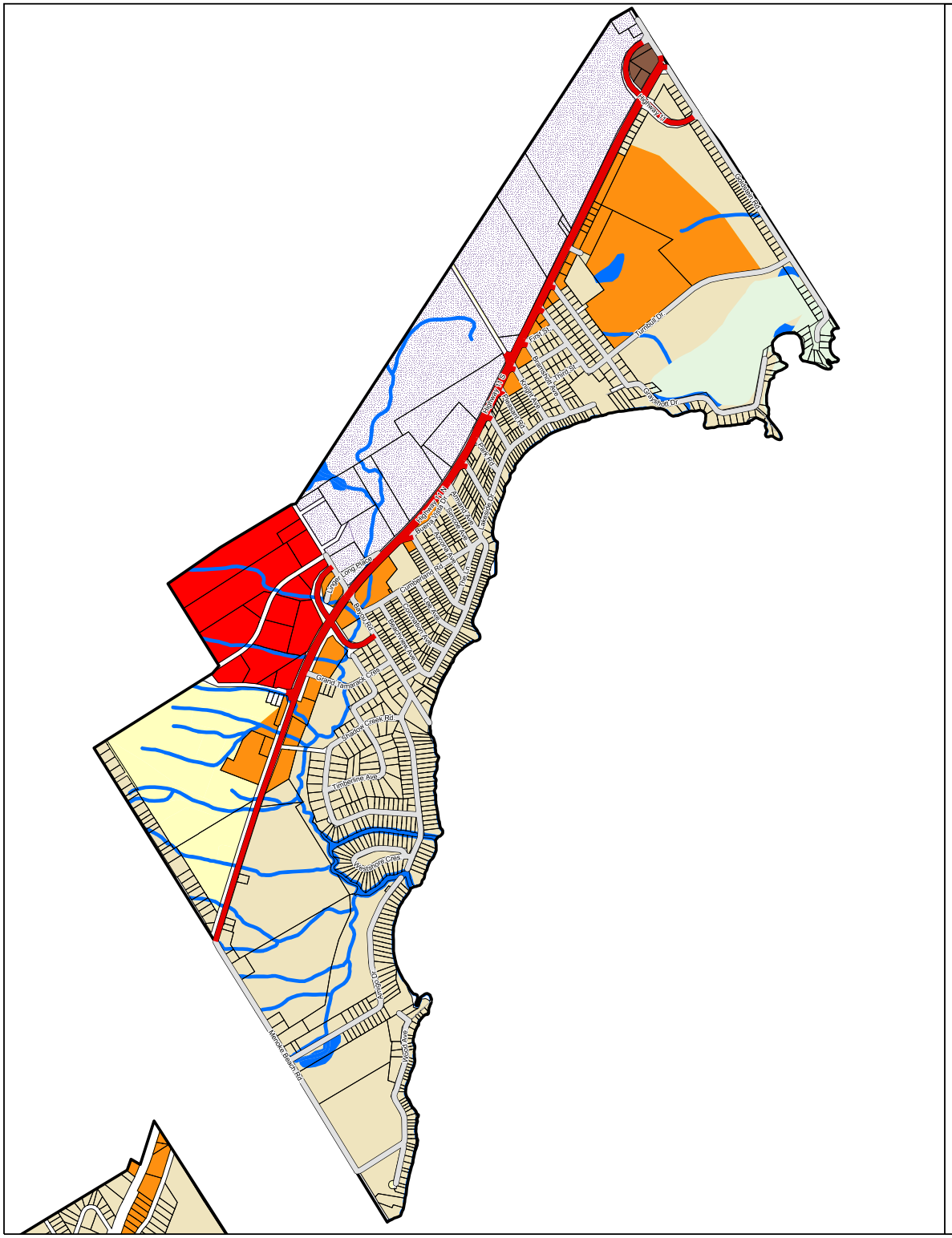
- PROVINCIAL HIGHWAY
- COUNTY ROAD
- LOCAL ROAD
- PRIVATE ROAD
- Railway
- Trans Canada Pipeline
- Lakes
- Settlement Boundary
- Country Residential
- Settlement Employment Area
- Highway Employment
- Settlement Living Area
- Major Recreation Area
- Resort Commercial
- Rural
- Shoreline Residential
- Settlement Employment SP Area
- Settlement Living SP Area
- Licensed Pit or Quarry
- Environmental Protection Area
- Greenland
- Linkages
- Aggriculture Land
- Municipal Border

* SP = Special Policy



Township of Severn
Schedule A3
West Shore Settlement Area

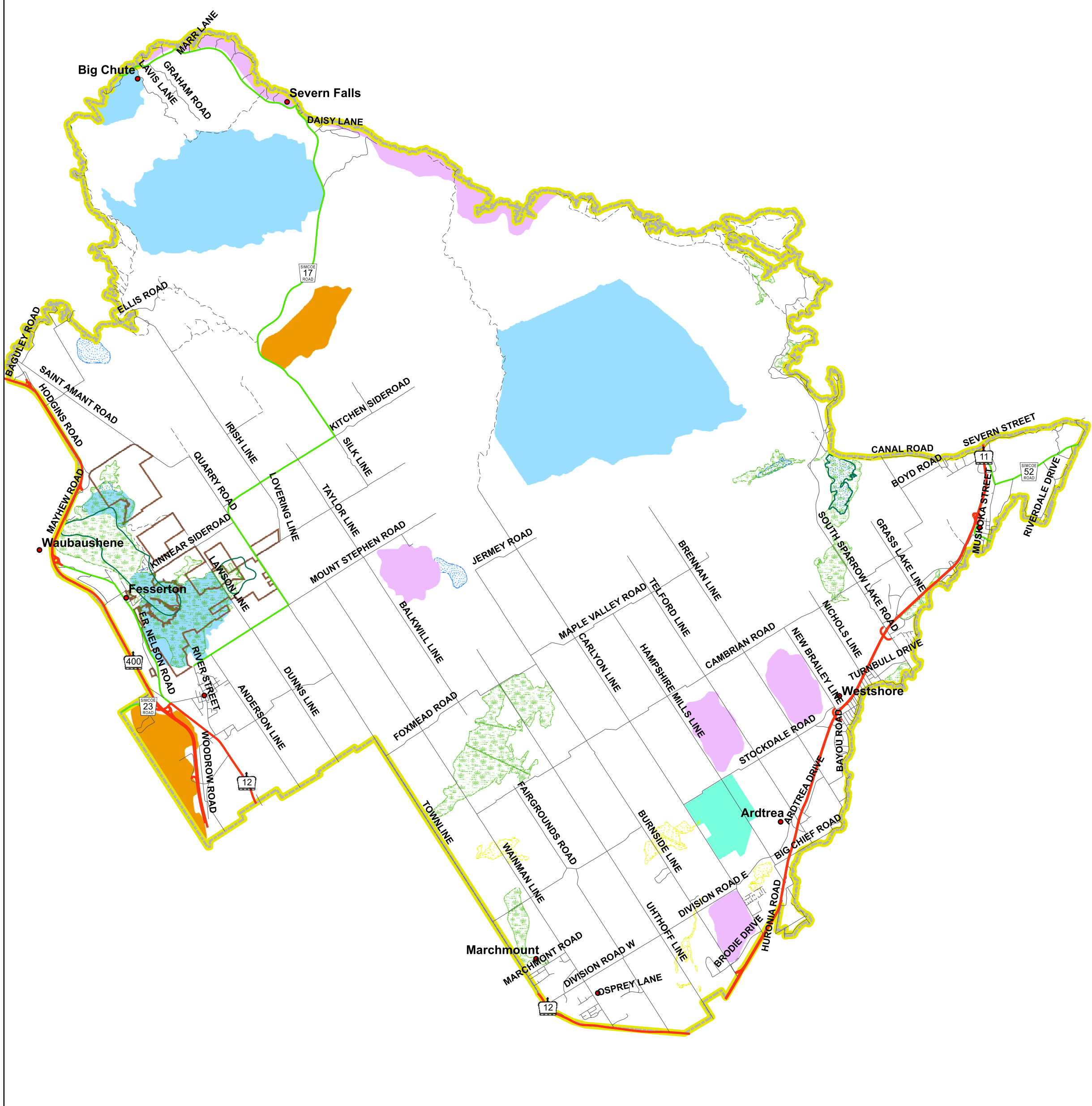
0 250 500 Meters

Legend

- PROVINCIAL HIGHWAY
- COUNTY ROAD
- LOCAL ROAD
- PRIVATE ROAD
- Settlement Boundary
- Country Residential
- Settlement Employment Area
- Highway Employment
- Settlement Living Area
- Major Recreation Area
- Resort Commercial
- Rural
- Shoreline Residential
- Settlement Employment SP Area
- Settlement Living SP Area
- Environmental Protection Area
- Greenland
- Agricultural Land

*** SP = Special Policy**

Township of Severn
Schedule F
Environmentally Sensitve Areas



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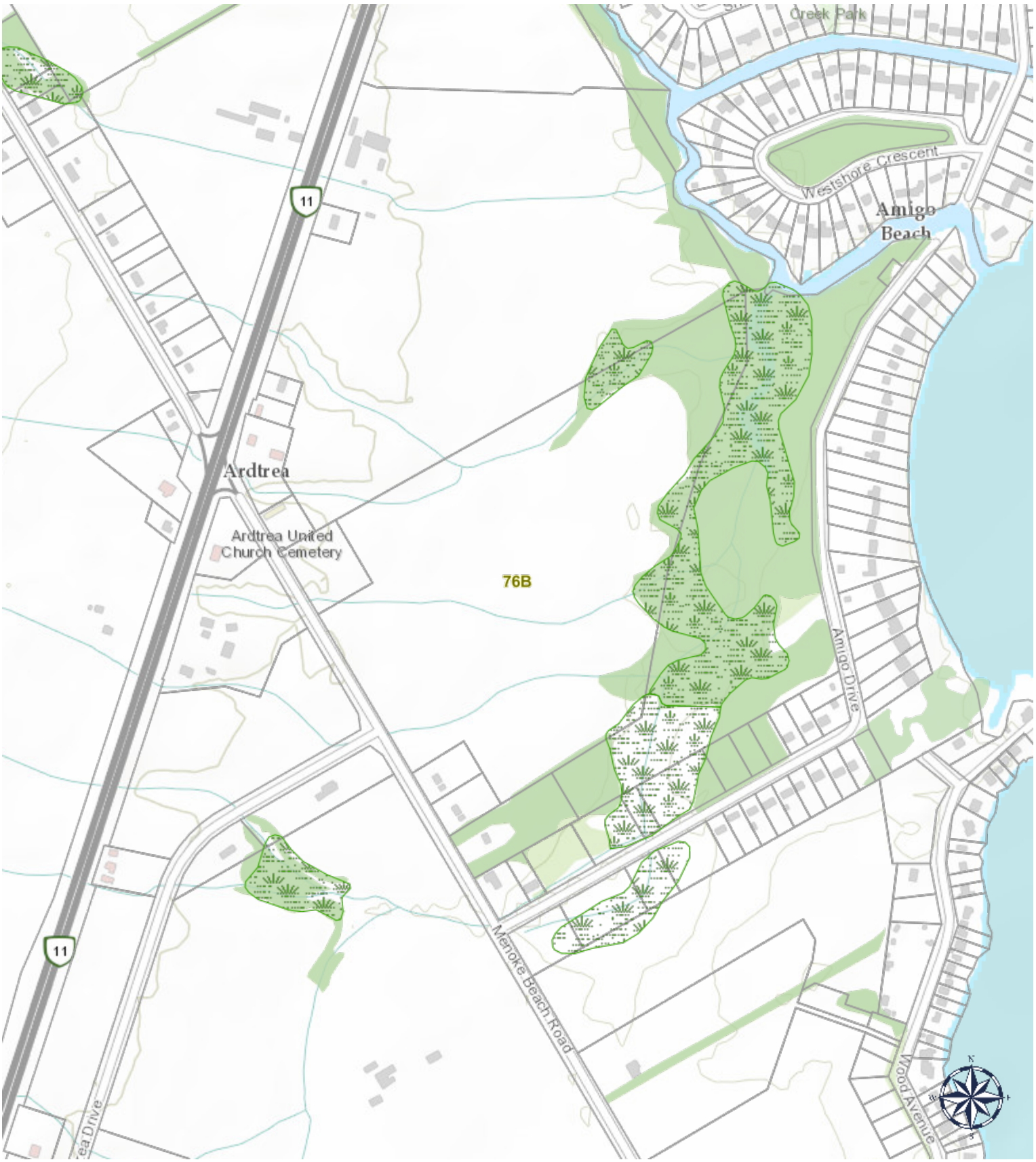
Legend

- PROVINCIAL HIGHWAY
- COUNTY ROAD
- LOCAL ROAD
- PRIVATE ROAD
- Municipal Border
- ANSI Provincial Life Science
- ANSI Provincial Earth Science
- ANSI Regional Life Science
- ANSI Regional Earth Science
- Provincial Wildlife Management Area
- Waterfowl Staging Area
- Waterfowl Nursery Area
- Deer Wintering Area
- Local Wetlands
- Provincial Wetlands

21-098 Shadow Creek Subdivision



0 100 200 300m

1 : 9,028

Nov 25, 2021

Scott Tarof

From: Katie Mandeville [kmandeville@severn.ca]
Sent: Thursday, October 14, 2021 4:39 PM
To: Scott Tarof; Drew West
Cc: Eldon Theodore; Sam Badawi; Andrea Woodrow; Natalie Parsons
Subject: Menoke Beach Road Phase 3 - EIS TOR & Tree Inventory

Hi Scott & Drew,

The Township has received comments from Bev Wicks at RiverStone who will act as the Township's Peer Reviewer for the Phase 3 Menoke Beach Road Shadow Creek Development Property - Part of Lots 3, 4, & 5, Concession 9, Township of Severn.

In response to the **Tree Inventory** proposal the Township offers the following comments:
The Township does not have a tree compensation by-law / program therefore the need for a complete tree inventory is not required as part of the submission however one may be required for portions of the proposed development down the road.
The following comments from the Peer Reviewer apply:

- The woodlands need to be delineated and assessed for significance.
- Wandering transects need to be undertaken to look for Butternut. These efforts should be part of the EIS that is required.
- The EIS should then inform the development plan that is put forward, hopefully avoiding and maintaining the significant treed areas. Once there is a development plan, we can better understand the areas where tree inventories might be useful.
    - The locations for detailed tree inventory and preservation plans should be based on (future) development footprints, servicing, grading limits, and water management. This will include an understanding of the tree/forest health and how best to protect areas to be retained from negative impacts.

EIS Terms of Reference

Specific notes/comments from Peer Reviewer included in red below, absence of red or general comments signifies an agreement with proposal which is copy and pasted below in the black text:

- Confirm the Terms of Reference (TOR) with the Township of Severn (Township) and Peer Review ~~Severn Sound Environmental Association (SSEA)~~ to ensure the scope of work is acceptable to agencies;
- Evaluate/map vegetation communities using Ecological Land Classification (ELC) methods for Southern Ontario. Two ELC surveys (spring, summer) would be combined with herbaceous and woody vascular plant inventories with regard for SAR plants, including Butternut trees (Endangered).
- Complete three evening calling amphibian surveys using the Bird Studies Canada Marsh Monitoring Program protocol (mid-late April, May and June);
- Conduct three dawn breeding bird surveys using protocols of the Ontario Breeding Bird Atlas and Canadian Wildlife Service. Three dawn bird surveys are recommended because SAR grassland birds occur in the area;
- During two of the dawn bird surveys, Azimuth's ecologist would complete Bird Studies Canada Marsh Breeding Bird surveys (June);
- Turtle surveys (5) required if suitable wetlands are present

- Detailed mapping of bat 'snag' trees to assess the presence of SAR bat roosting habitat on the property in woodland areas where development is being considered (March to mid-April during leaf-off conditions);
- Map/delineate woodland and wetland boundaries on the property by collecting Global Positioning System (GPS) coordinates (May); Wetland boundaries should delineated during the growing season (June 15-end of September)
- Record wildlife observations while on the property for the above-mentioned surveys;
- Conduct a fisheries habitat assessment of drainage features on the property and possible headwater drainage characteristics, as well as near-shore conditions along the northeast property boundary (early-late March, April-May, June-July). This assessment would include a review of available online sources and agency consultation to obtain fisheries background information, including thermal regime and potential aquatic SAR;
- Complete fish sampling in drainage features on the property (Summer 2021) to characterize the fish community and inform fish habitat sensitivities, with an MNRF License to Collect Fish and MNRF post-sampling report.
- Complete a SAR assessment following the Ministry of Environment Conservation and Park (MECP) guidance document - Client's Guide to Preliminary Screening for SAR (May 2019);
- Complete a SWH assessment
- Complete a policy assessment for applicable environmental policy/legislation in the context of the NHF's identified and the development plan.
- Review one (1) Conceptual Site Plan for the proposed development (provided by others);
- Write a Letter Report that summarizes in written text the NHFFs on the property and adjacent lands. The Letter Report would include an impact assessment possible mitigation/avoidance measures based on review of the Conceptual Site Plan; and
- Discuss the Letter Report with the client and determine requirements for completion of the EIS.

Thanks,
Katie

Katie Mandeville, BA, BURPl, RPP, MCIP
Senior Planner
Township of Severn
705-325-2315 x238
severn.ca

Scott Tarof

From: Scott Tarof
Sent: Thursday, November 25, 2021 1:42 PM
To: 'Katie Mandeville'
Subject: 21-098 Shadw Creek/Menoke Phase 3 (Part of Lots 3, 4, & 5, Concession 9, Township of Severn) - EIS Report Preparation Terms of Reference Confirmation
Attachments: Google Earth Aerial_for LIO Search 210224.pdf

Hi Katie.

Azimuth submitted the field program scope for the above development to the Township for Terms of Reference (TOR) review on March 24, 2021; a response was received on October 14, 2021. A Site Plan is now available, so Azimuth has prepared the scope of work for the impact assessment and preparation of the EIS report.

If the Township could please review the following EIS impact assessment and report preparation TOR we would appreciate it. A Figure showing the location of the property is attached.

- Consult with the Ministry of Natural Resources and Forestry (MNRF) regarding fisheries timing windows;
- As advised by the Township's peer reviewer, consult with the Ministry of the Environment, Conservation and Parks (MECP) regarding the possible need (and scope thereof) for basking turtle surveys in spring 2022;
- Complete analysis of SAR bat data;
- Complete an assessment of potential Species at Risk (SAR) and their habitat on the property and/or adjacent lands, as per MECP protocols and species habitat requirements;
- Assess the potential for SWH function associated with the property and/or adjacent lands based on provincial criteria;
- Complete a Significant Woodland Assessment, as per provincial criteria;
- Review one (1) version of the current Site Plan to be submitted to review agencies from the natural heritage perspective. Note: changes to the Site Plan may necessitate additional review effort and revisions to the impact assessment, which would constitute a scope change;
- Review the following preliminary reports (provided by others) for reference in the EIS (Functional Servicing, Stormwater Management, Geotechnical; if available at the time of preparing the EIS);
- Upon provision of the current Site Plan, assess the potential direct and indirect impacts of the proposed development on natural heritage features and functions identified on and/or adjacent to the property, including possible impacts to fish habitat, wetlands, woodlands, SAR and SWH;
- Prepare one (1) version of a draft EIS report (PDF) for client review prior to finalizing for agency submission. The EIS report would provide an appropriate planning context, summarize fieldwork methods and results, assess potential direct and indirect impacts of the proposed development on natural heritage features and functions, recommend feature buffers and mitigation/avoidance measures, and identify approval requirements (as necessary). Figures showing natural heritage features would be presented on high quality aerial imagery with Site Plan and floodplain mapping overlays (PDF and CAD files provided by others).

Please let Azimuth know if the above reporting TOR is acceptable.

Thank you.

Warm regards,

Dr. Scott Tarof (Ph.D. Biology)
Terrestrial Ecologist
Certified Ontario MNRF Wetland Evaluator
Contract Faculty (Biology, Physical Geography), York University

Due to COVID-19, our staff are working remotely. Our offices are closed to the public but I can be reached on my cell or email. I look forward to talking with you.

Azimuth Environmental Consulting, Inc.
642 Welham Road, Barrie, ON, L4N 9A1
ph: (705) 721-8451 ext 230
cell: (705) 715-7105
starof@azimuthenvironmental.com
www.azimuthenvironmental.com

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

APPENDIX B

Provincial and Federal Background and Correspondence

Ontario

Ministry of Natural Resources and Forestry

Make-a-Map: Natural Heritage Areas

21-098 Shadow Creek - NHIC SAR Search Map

Map created:9/16/2021

Notes:

Azimuth Environmental Consulting, Inc.

Legend

- NHIC 1 Km Grid
- 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
- Conservation Reserve
- Provincial Park
- Natural Heritage System

1.3 0 0.65 1.3 Kilometres

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

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

NHIC Data

To work further with this data select the content and copy it into your own word or excel documents.

OGF ID	Element Type	Common Name	Scientific Name	SRank	SARO Status	COSEWIC Status	ATLAS NAD83 IDENT	COMMENTS
1024994	WILDLIFE CONCENTRATION AREA	Colonial Waterbird Nesting Area		SNR			17PK2650	
1024994	SPECIES	Snapping Turtle	Chelydra serpentina		SC	SC	17PK2650	
1024903	WILDLIFE CONCENTRATION AREA	Colonial Waterbird Nesting Area		SNR			17PK2649	
1024903	SPECIES	Midland Painted Turtle	Chrysemys picta marginata			SC	17PK2649	
1024903	SPECIES	Snapping Turtle	Chelydra serpentina		SC	SC	17PK2649	
1024902	WILDLIFE CONCENTRATION AREA	Colonial Waterbird Nesting Area		SNR			17PK2648	
1024902	SPECIES	Midland Painted Turtle	Chrysemys picta marginata			SC	17PK2648	
1024902	SPECIES	Snapping Turtle	Chelydra serpentina		SC	SC	17PK2648	
1025004	WILDLIFE CONCENTRATION AREA	Colonial Waterbird Nesting Area		SNR			17PK2750	
1025004	SPECIES	Lake Sturgeon (Great Lakes - Upper St. Lawrence River population)	Acipenser fulvescens pop. 3		THR	THR	17PK2750	
1025004	SPECIES	Snapping Turtle	Chelydra serpentina		SC	SC	17PK2750	
1024913	WILDLIFE CONCENTRATION AREA	Colonial Waterbird Nesting Area		SNR			17PK2749	

OGF ID	Element Type	Common Name	Scientific Name	SRank	SARO Status	COSEWIC Status	ATLAS NAD83 IDENT	COMMENTS
1024913	SPECIES	Lake Sturgeon (Great Lakes - Upper St. Lawrence River population)	Acipenser fulvescens pop. 3		THR	THR	17PK2749	
1024913	SPECIES	Midland Painted Turtle	Chrysemys picta marginata			SC	17PK2749	
1024913	SPECIES	Grass Pickerel	Esox americanus		SC	SC	17PK2749	
1024912	WILDLIFE CONCENTRATION AREA	Colonial Waterbird Nesting Area		SNR			17PK2748	
1024912	SPECIES	Lake Sturgeon (Great Lakes - Upper St. Lawrence River population)	Acipenser fulvescens pop. 3		THR	THR	17PK2748	
1024912	SPECIES	Grass Pickerel	Esox americanus		SC	SC	17PK2748	

Ontario

Ministry of Natural Resources and Forestry

Make-a-Map: Natural Heritage Areas

Enter map title

Map created: 2/24/2021

Notes: 21-098 Shadow Creek Subdivision

Legend

- Assessment Parcel
- Woodland
- Conservation Reserve
- Provincial Park
- Natural Heritage System
- Ecoregion

Wetland

- Provincially Significant Wetland Evaluated
- Non - Provincially Significant Wetland Evaluated
- Unevaluated Wetland

Area of Natural Heritage & Scientific Interest (ANSI)

- Provincially Significant Life Science ANSI
- Provincially Significant Earth Science ANSI

Greenbelt Plan

- Boundary
- Greenbelt External Connections

Land Use Designations

- Protected Countryside
- Greenbelt Towns and Villages
- Greenbelt Hamlets
- Urban River Valley
- Greenbelt Specialty Crop Area

Niagara Escarpment Plan (NEP)

- Boundary
- Parks and Open Space System

Land Use Designations

- Escarpment Natural Area
- Escarpment Protection Area
- Escarpment Rural Area
- Mineral Resource Extraction Area
- Escarpment Recreation Area
- Urban Area
- Minor Urban Centre

Oak Ridges Moraine Conservation Plan (ORM)

- Boundary

Land Use Designations

- Natural Core Area
- Natural Linkage Area
- Countryside Area
- Rural Settlement
- Palgrave Estates Residential Community
- Settlement Area

0.7 0 0.33 0.7 Kilometers

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This map may not display all features listed in the legend because the feature layer was not turned on at the time the map was made; the features do not exist in the geographic range; or features have not been mapped. Absence of a feature in the map does not mean they do not exist in this area.

21-098 Shadow Creek Subdivision

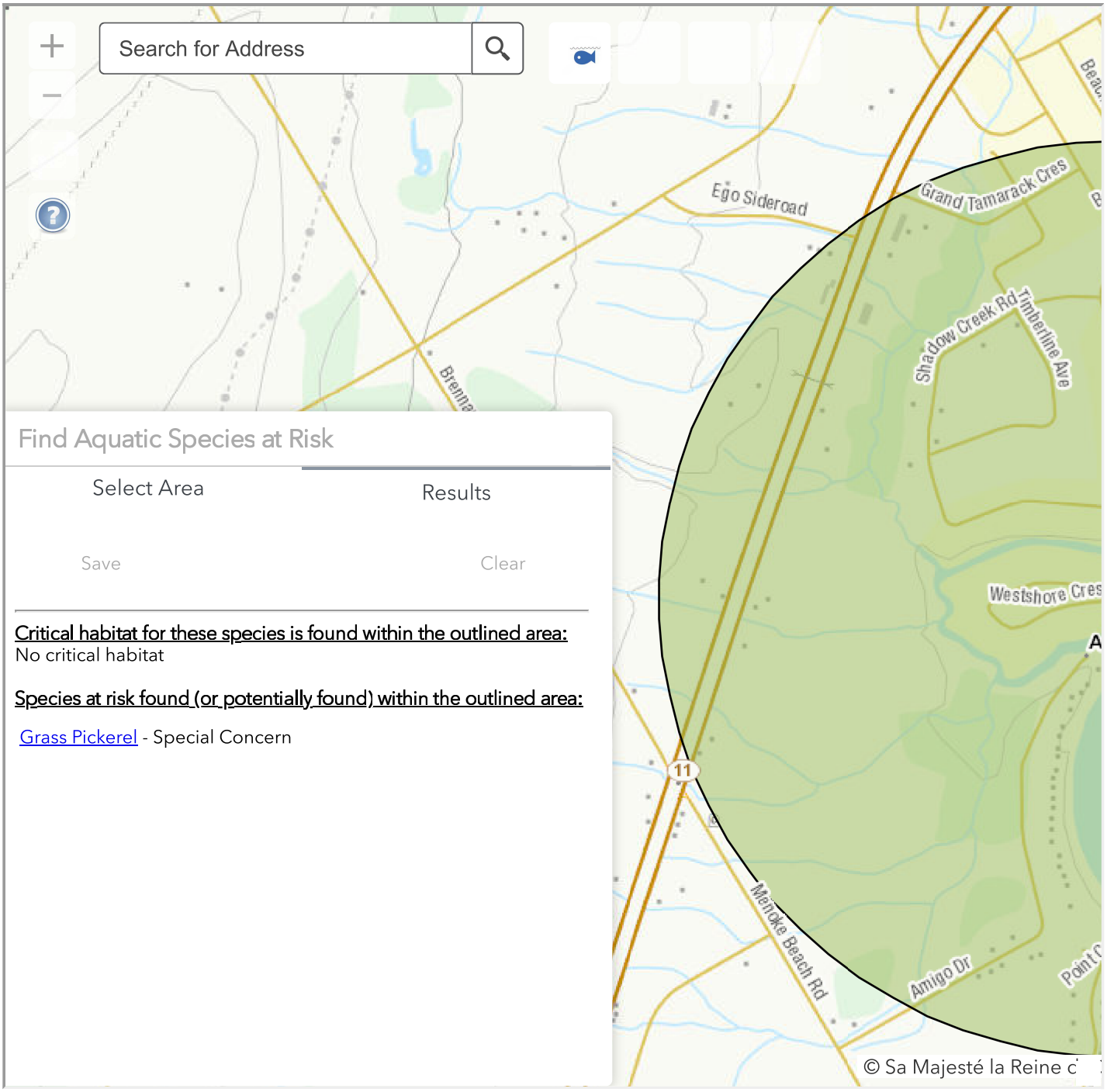
provided by:
FIRST BASE SOLUTIONS
GEOSPATIAL EXPERTS

Aquatic species at risk map

We've compiled critical habitat and distribution data for aquatic species listed under the Species at Risk Act (SARA). This map is intended to provide an overview of the distribution of aquatic species at risk and the presence of their critical habitat within Canadian waters. The official source of information is the Species at Risk Public Registry.

If you encounter an aquatic species at risk in an area that isn't currently mapped, please notify your regional Fisheries Protection Program office to ensure that you're compliant with SARA.

▶ **Information and legend**



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Date modified:
2019-08-23

Ministry of Natural Resources and Forestry
Fish ON-Line

français

Purchase a Licence

Create Stocking List

Search By

Information

Lake Couchiching

Waterbody | Regulations | Fish | Stocking | Survey

Fish Species Found in Waterbody

MNRF
Species observed or confirmed by MNRF. This list may contain historical records

Species	Last Observation Date
Black Crappie	-
Bowfin	-
Brown Bullhead	18-MAY-91
Burbot	-
Channel Catfish	-
Common Carp	18-MAY-91
Lake Trout	-
Lake Whitefish	-
Largemouth Bass	18-MAY-91
Muskellunge	-
Northern Pike	-
Pumpkinseed	18-MAY-91
Rainbow Smelt	-
Rock Bass	18-MAY-91
Smallmouth Bass	-
Walleye	-
White Sucker	-
Yellow Perch	-

Public
Species reported by the public (unconfirmed)

Report a Species

Scott Tarof

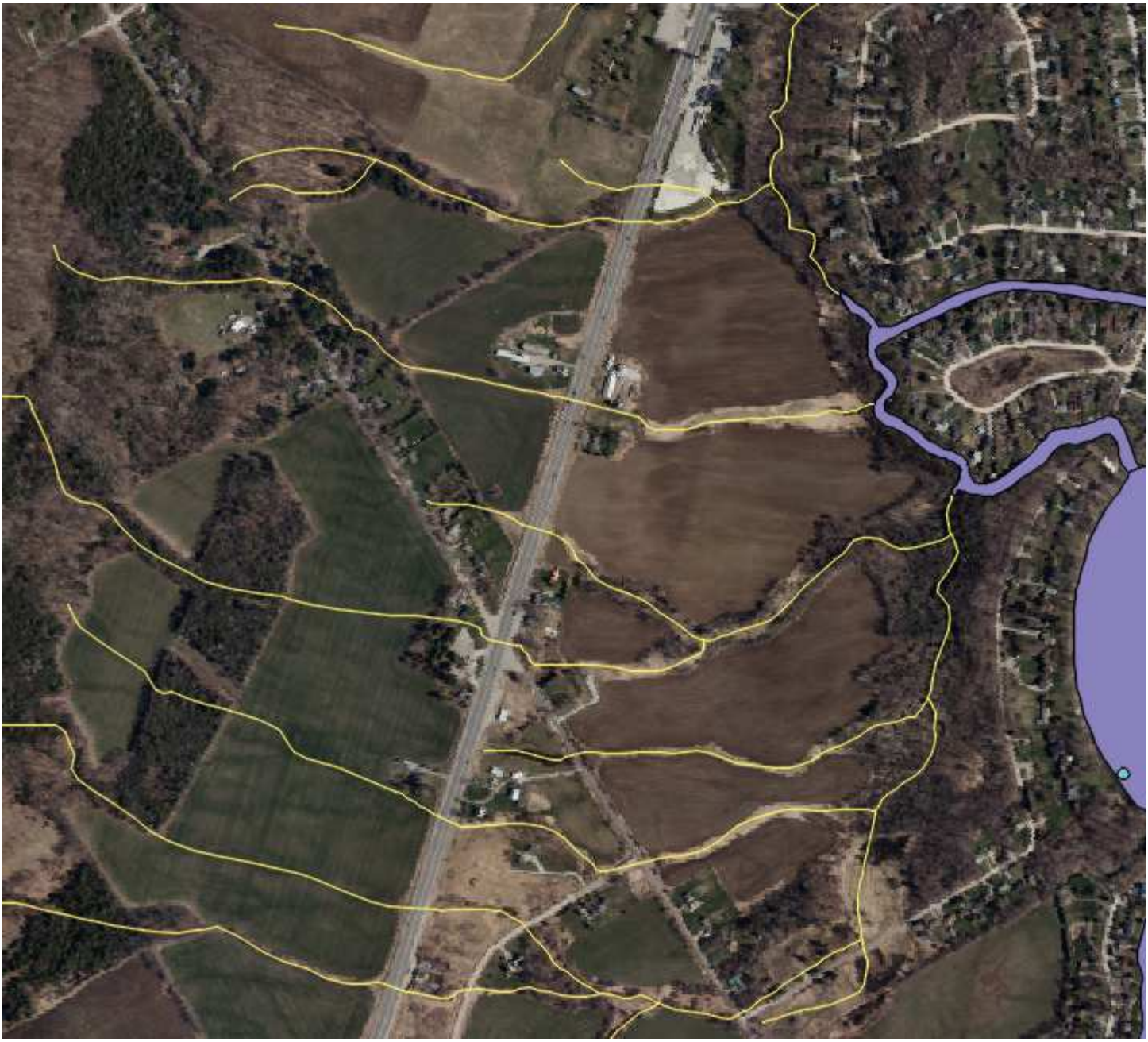
From: Jesse McCartney
Sent: Wednesday, February 24, 2021 2:36 PM
To: Scott Tarof
Subject: RE: 21-098 LIO Search
Attachments: image001.png

Nothing for the small Watercourse lines.

Lake Couchiching
Thermal Regime: Cool

Species Present:
lake trout, creek chub, walleye, central mudminnow, pugnose minnow, black bullhead, Carps and Minnows, blackchin shiner, blacknose shiner, spottail shiner, rosyface shiner, spotfin shiner, sand shiner, rainbow smelt, yellow perch, logperch, northern redb

The northern light blue ARA Point in the watercourse around Westshore Crescent
Species Present:
Banded Killifish,Blackchin Shiner,Blacknose Shiner,Bluntnose Minnow,Emerald Shiner,Iowa Darter,Rock Bass



From: Scott Tarof
Sent: February 24, 2021 2:19 PM
To: Jesse McCartney
Subject: 21-098 LIO Search

Hi Jesse.

Could you please do an LIO search for the approximate property boundary outlined in red in the attached Word document? The subject property is just north of 3735 Menoke Beach Road in Severn Township, a project you have worked on with me (for geographic reference).

M:\Projects3\21 Projects\21-098 Shadow Creek EIS\02.0 - Project Management\02.2 - Background Information\Background Mapping\Google Earth Aerial_for LIO Search 210224.docx

Thank you.

Warm regards,

Dr. Scott Tarof (PhD Biology)
Terrestrial Ecologist
Certified Ontario MNRF Wetland Evaluator
Contract Faculty (Biology, Physical Geography), York University

Due to COVID-19, our staff are working remotely. Our offices are closed to the public but I can be reached on my cell or email. I look forward to talking with you.

Azimuth Environmental Consulting, Inc.
642 Welham Road, Barrie, ON, L4N 9A1
ph: (705) 721-8451 ext 230
cell: (705) 715-7105
starof@azimuthenvironmental.com
www.azimuthenvironmental.com

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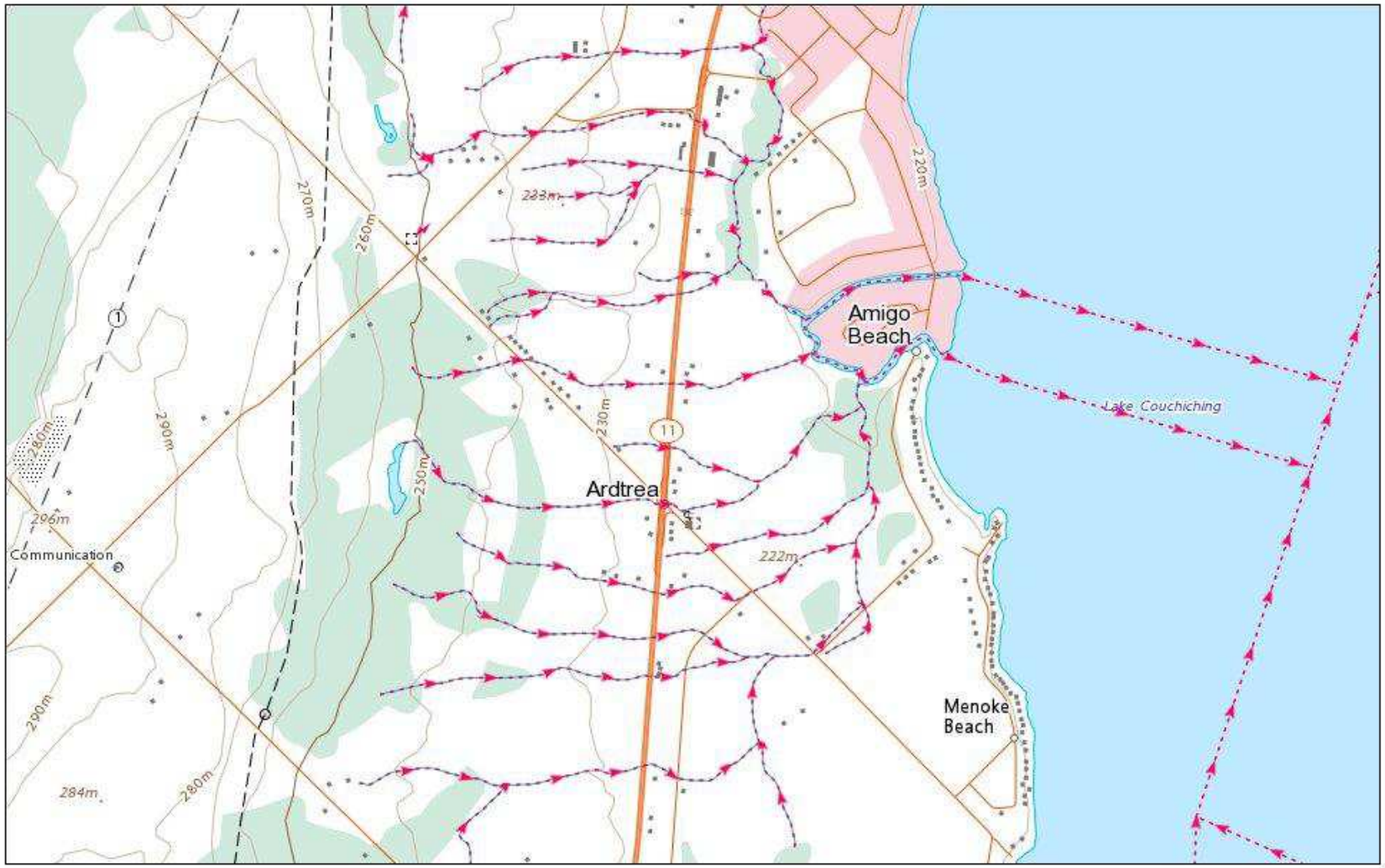
Toporama



February 24, 2021

1:17,500

0 0.15 0.3 0.6 mi

0 0.225 0.45 0.9 km

Natural Resources Canada | Ressources naturelles Canada

Canada

Michael Gillespie

From: Species at Risk (MECP) [SAROntario@ontario.ca]
Sent: Tuesday, December 7, 2021 4:21 PM
To: Michael Gillespie
Subject: MECP SARB Response- Aquatic Species at Risk Information Request

Hi Michael,

I had a look in my database and can confirm that the record of the Grass Pickerel (*Esox americanus*) is from June 13, 1972 but don't have any additional details other then the source is the Department of Fisheries and Oceans (DFO). Given that the source of the observation is DFO I would recommend getting in contact with them to obtain more information. The source information also states that it is "DFO Fish Database record (ID21667)" so that may be of some help.

You may also wish to reach out to Ministry of Northern Development, Mines, Natural Resources and Forestry (MDMNRF) as they administer the protections for Special Concern species via Fish and Wildlife Conservation Act (FWCA). Only species listed as threatened and endangered are provided protection under the Endangered Species Act and as such these are the only species we (Species at Risk Branch) typically deal with.

With that being said I had a quick look at Fish On-line and our Aquatic Resources Area layer and didn't see Grass Pickerel listed in either. This would suggest to me that MDMNRF doesn't consider Grass Pickerel as occurring in Lake Couchiching. However, it would be best to confirm that with MDMNRF as they remain responsible for Special Concern species.

Cheers,

Shamus Snell
A/ Management Biologist
Species at Risk Branch
Ministry of Environment, Conservation and Parks
Email: shamus.snell@ontario.ca

From: Michael Gillespie <mgillespie@azimuthenvironmental.com>
Sent: November 30, 2021 2:27 PM
To: Species at Risk (MECP) <SAROntario@ontario.ca>
Subject: RE: Pt Lots 3-5, Concession 9, Township of Severn, Simcoe County - Aquatic Species at Risk Information Request

My apologies, please find attached the figures referenced below.

Thank you,

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

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---

From: Michael Gillespie
Sent: Tuesday, November 30, 2021 1:54 PM
To: 'SAROntario@ontario.ca'
Subject: Pt Lots 3-5, Concession 9, Township of Severn, Simcoe County - Aquatic Species at Risk Information Request

Good afternoon,

Azimuth Environmental Consulting, Inc. (Azimuth) has been retained to complete an Environmental Impact Study (EIS) for the abovementioned property in the Township of Severn (Figure 1). As shown on the attached Figures 2-3, that property is located south of Highway 11, east of Menoke Beach Road and north of Amigo Drive. A watercourse known as Shadow Creek is partially located within the northeastern section of the property, and outlets to Lake Couchiching approximately 500m east of the property. This watercourse provides habitat for a cool/warm fish community, including species like Northern Pike.

In Lake Couchiching, there is a record(s) of Grass Pickerel (*Esox americanus vermiculatus*; Figure 3). However, the Committee on the Status of Endangered Wildlife in Canada Assessment and Status Report on the Grass Pickerel (Crossman & Holm, 2005) suggests this is an unverified field record from 1972. Azimuth is seeking MECP confirmation of this record, and requests any additional information MECP may have for this species for Lake Couchiching, including if there are any known populations in proximity to the property Azimuth is assessing.

Thank you,

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
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Figure 1 – General Project Location

+

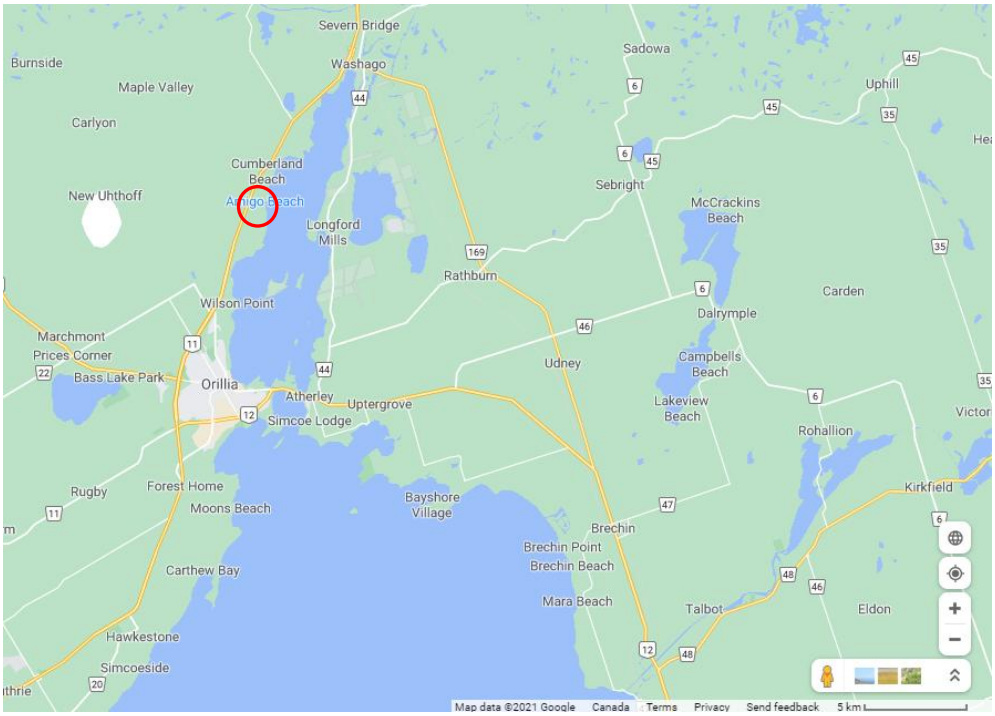
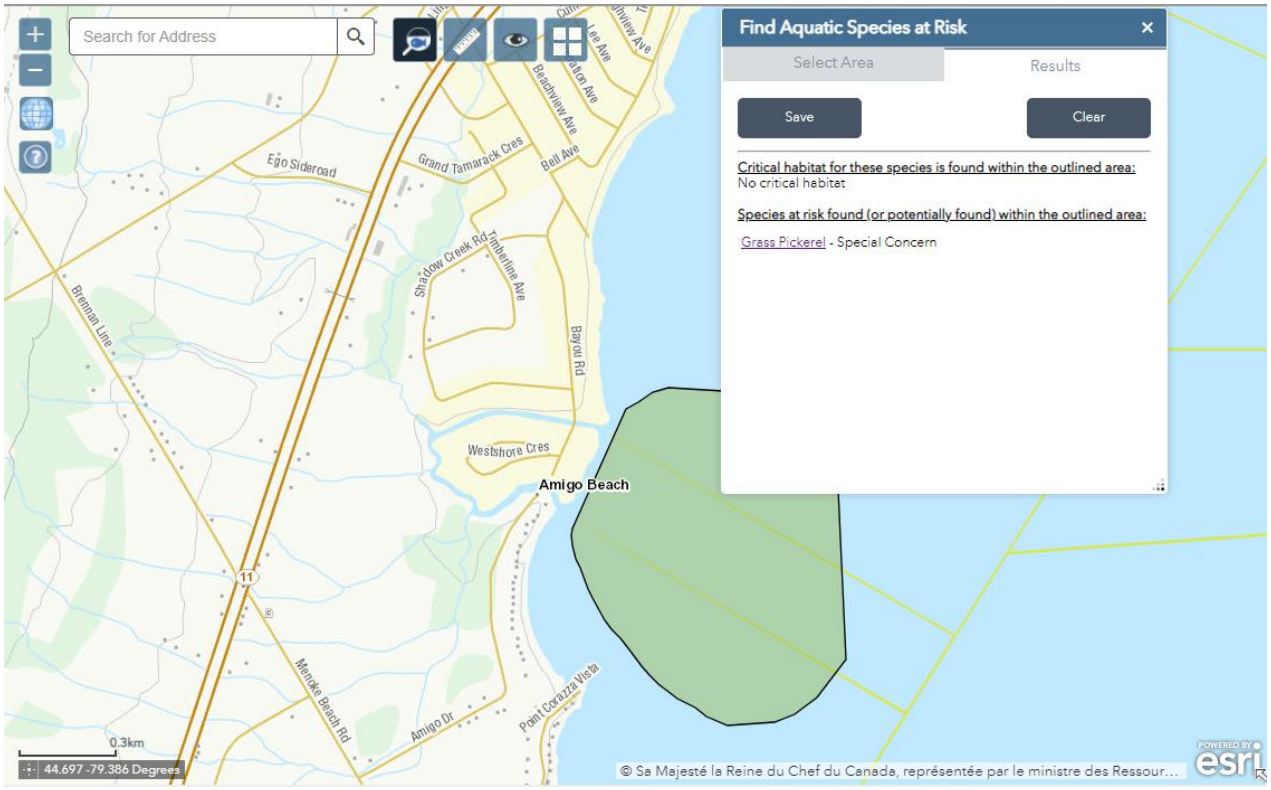


Figure 2 – Property Location (red) and Watercourse Mapping

Figure 3 – Fisheries and Oceans Canada Aquatic Species at Risk Mapping (DFO, 2019)



Michael Gillespie

From: Fortini, Natosha (NDMNRF) [Natosha.Fortini@ontario.ca]
Sent: Monday, December 13, 2021 12:45 PM
To: Michael Gillespie
Cc: Gaudon, Justin (NDMNRF)
Subject: RE: Licence to Collect Fish for Scientific Purposes #1097911 MCR & Information Request

Hi Michael,

Here is some additional information from my colleague on grass pickerel in Lake Couchiching:

"So MNR did a fair bit of trap netting on Couchiching during the early part of the Lake Simcoe Muskie Restoration Program (mid 2000's) and I don't recall ever getting a grass pickerel there (we did get a small handful however on Gloucester Pool) or have heard of any captured there since either through sampling or by recreational anglers.
I wouldn't question the 1972 record by DFO and wouldn't rule out that there could be one or two still around in Couchiching (given it's connected via the Trent to G Pool and G Bay) but I would think it's highly unlikely in my opinion"

Hope this helps,

Natosha

Natosha Fortini (she/her) Listen to how my name is pronounced here
Management Biologist | Aurora District | Ontario Ministry of Northern Development, Mines, Natural Resources and Forestry | 50 Bloomington Rd. W., Aurora, ON, L4G 0L8 | P: 289-380-6181| F: 905.713.7361 | natosha.fortini@ontario.ca

Ontario

From: Fortini, Natosha (NDMNRF)
Sent: December 13, 2021 12:01 PM
To: Michael Gillespie <mgillespie@azimuthenvironmental.com>
Cc: Gaudon, Justin (NDMNRF) <Justin.Gaudon@ontario.ca>
Subject: RE: Licence to Collect Fish for Scientific Purposes #1097911 MCR & Information Request

Hi Michael,

Regarding the record of Grass Pickerel: I searched our database and did not find any mention of grass pickerel in any sampling that has been conducted on Lake Couchiching. Given that the record comes from DFO, you may want to contact them directly for more information. I sent your query to a colleague of mine who has been with MNRF for a number of decades and is very familiar with Lake Couchiching. I haven't heard back yet but I will send you any additional information he provides once he responds.

Timing window: Given the information you provided, NDMNRF would be supportive of a restricted in-water work period between March 15 and July 15th.

Sincerely,

Natosha

Natosha Fortini (she/her) Listen to how my name is pronounced here

Management Biologist | Aurora District | Ontario Ministry of Northern Development, Mines, Natural Resources and Forestry | 50 Bloomington Rd. W., Aurora, ON, L4G 0L8 | P: 289-380-6181| F: 905.713.7361 | natosha.fortini@ontario.ca

Ontario

From: Michael Gillespie <mgillespie@azimuthenvironmental.com>
Sent: December 7, 2021 4:50 PM
To: Fortini, Natosha (NDMNRF) <Natosha.Fortini@ontario.ca>
Cc: Gaudon, Justin (NDMNRF) <Justin.Gaudon@ontario.ca>
Subject: RE: Licence to Collect Fish for Scientific Purposes #1097911 MCR & Information Request

Good afternoon,

I contacted you previously for background fisheries information related to the property south of Highway 11, east of Menoke Beach Road and north of Amigo Drive (Pt Lots 3-5, Concession 9; UTM: 17T 627055m E, 4949750m N) in the Township of Severn for background fisheries information (please see below). Thank you for your response.

I recently contacted MECP for a similar information request for Azimuth's EIS as Grass Pickerel (*Esox americanus vermiculatus*) is shown on DFO aquatic Species at Risk mapping for Lake Couchiching. I have attached MECP's response and the figures sent to MECP. The Committee on the Status of Endangered Wildlife in Canada Assessment and Status Report on the Grass Pickerel (Crossman & Holm, 2005) suggests this is an unverified field record from 1972. Does MNRF possess any information on this species in Lake Couchiching?

Furthermore, based on site conditions observed, and fish species observed in Shadow Creek/captured on the property during electrofishing fish sampling under MNRF Licence to Collect Fish for Scientific Purposes #1097911 (Brown Bullhead, Central Mudminnow and Pumpkinseed, with the potential for Northern Pike), Azimuth believes Shadow Creek provides conditions suitable for a cool/warm fish community. For potential future in-work occurring on the property (which will be screened under the *Fisheries Act* to determine permitting requirements), Azimuth is seeking NDMNRF confirmation that a March 15 to July 15 window is appropriate for the protection of this fish community.

Thanks in advance for your time,

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

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From: Fortini, Natosha (MNRF) [mailto:Natosha.Fortini@ontario.ca]
Sent: Tuesday, August 31, 2021 9:38 AM
To: Michael Gillespie
Cc: Gaudon, Justin (MNRF)
Subject: RE: Licence to Collect Fish for Scientific Purposes #1097911 MCR & Information Request

Hi Mike,

Thank you for the additional information.

Unfortunately, I don't have much information other than what can be found in GeoHub (but the watercourse name is Shadow Creek) . The thermal regime is unknown. We have one fish survey data point (although old) at the mouth of the watercourse where it outlets into Lake Couchiching, which has the following species listed:
Banded Killifish,Blackchin Shiner,Blacknose Shiner,Bluntnose Minnow,Emerald Shiner,Iowa Darter,Rock Bass

Given the lack of info, and depending on the nature of the proposed works, I would suggest completing some fish sampling to get a better idea of the fish community and thermal regime that exists within your study area. A License to Collect Fish for Scientific Purposes would be required so, should you wish to proceed with sampling, please submit your application directly to midhurstinfo@ontario.ca.

Regarding your Lake Couchiching boundary question, our mapping would indicate that this is actually one watercourse with two outlets into the lake. Orthophotography appears to support this. Our Lands and Waters Technical Specialist suggested that the existing Lake Couchiching shoreline is followed as the boundary.

Hope this sufficiently answers your questions. Feel free to reach out should anything else arise.

Sincerely,

Natosha

Natosha Fortini
Management Biologist | Aurora District | Ontario Ministry of Northern Development, Mines, Natural Resources and Forestry | 50 Bloomington Rd. W., Aurora, ON, L4G 0L8 | P: 289-380-6181| F: 905.713.7361 | natosha.fortini@ontario.ca

Ontario

From: Michael Gillespie <mgillespie@azimuthenvironmental.com>
Sent: August 30, 2021 10:57 AM
To: Fortini, Natosha (MNRF) <Natosha.Fortini@ontario.ca>
Subject: RE: Licence to Collect Fish for Scientific Purposes #1097911 MCR & Information Request

Good morning Natosha,

I was hoping to confirm fisheries information for the following watercourses/areas:

Watercourse 1 (believed to be Shadow Creek, flows from north to south): 17 T 627028.29 m E, 4949976.16 m N

Watercourse 2 (flows from south to north): 17T 627246 m E, 4949488 m N

Confirmation of the area between: 17T 627120 m E, 4949846 m N to 17T 627253 m E, 4949619 m N (looking to confirm if MNRF considers this area to be a continuation of Watercourse 1, which would mean this watercourse outlets at two locations to Lake Couchiching, or if MNRF considers this to be part of Lake Couchiching).

Any information you have, including watercourse names, fish data or thermal classifications would be very much appreciated for our project.

Thanks for your time!

Regards,

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

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

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From: Fortini, Natosha (MNRF) [mailto:Natosha.Fortini@ontario.ca]
Sent: Monday, August 30, 2021 10:46 AM
To: Michael Gillespie
Subject: RE: Licence to Collect Fish for Scientific Purposes #1097911 MCR & Information Request

Hi Mike,

Can you please provide UTM coordinates for the watercourses in question?

Thank you,

Natosha

Natosha Fortini
Management Biologist | Aurora District | Ontario Ministry of Northern Development, Mines, Natural Resources and Forestry | 50 Bloomington Rd. W., Aurora, ON, L4G 0L8 | P: 289-380-6181| F: 905.713.7361 | natosha.fortini@ontario.ca

Ontario

From: Michael Gillespie <mgillespie@azimuthenvironmental.com>
Sent: August 27, 2021 2:35 PM
To: MIDHURSTINFO (MNRF) <MIDHURSTINFO@ontario.ca>
Subject: FW: Licence to Collect Fish for Scientific Purposes #1097911 MCR & Information Request

Good afternoon,

I wanted to follow up with my email sent on June 1st requesting fisheries information for watercourses surrounding the property at Pt Lots 3-5, Concession 9 in the Township of Severn. Does MNRF possess any fisheries information (watercourse name, thermal regime, or sampling information) for the watercourses shown on the figure below? Moreover, where does MNRF consider the Lake Couchiching shoreline to start (ie, immediately east of the property, or east of Bayou Road)?

Thank you very much in advance for your time.

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

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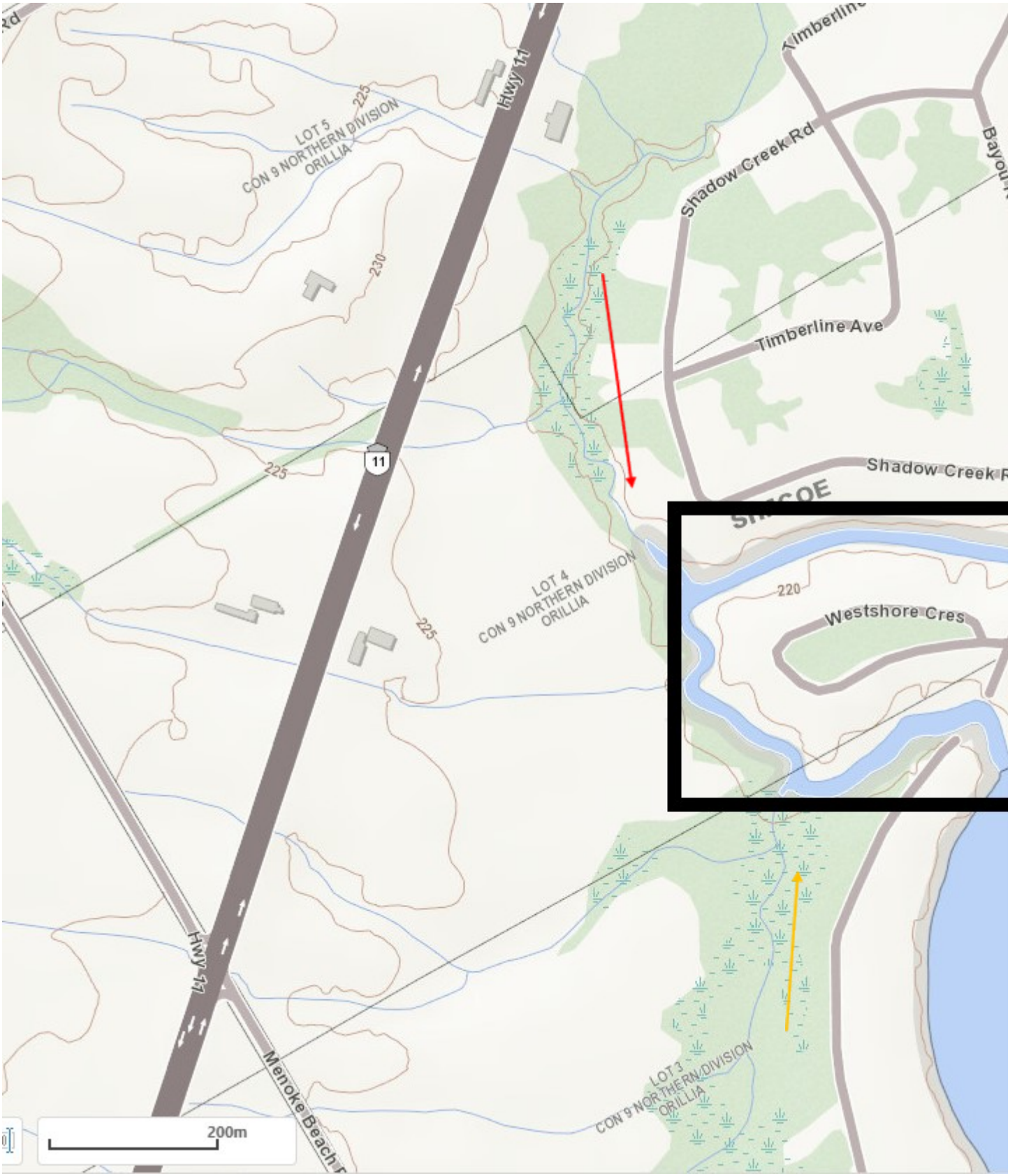
---

From: Michael Gillespie
Sent: Tuesday, June 1, 2021 10:46 AM
To: 'MIDHURSTINFO (MNRF)'
Subject: Licence to Collect Fish for Scientific Purposes #1097911 MCR & Information Request

Good morning,

Please find attached the Mandatory Collection Report for fish sampling completed under Licence to Collect Fish for Scientific Purposes #1097911. Warmwater fish species were found at the lower ends of two drainage features on the property (Pt Lots 3-5, Concession 9) in the Township of Severn.

In addition to the fish sampling completed, Azimuth has completed a review of online sources for fish information, including the Land Information Ontario database. No 'fish dots' were found for the feature that appears to be known locally as 'Shadow Creek' (flowing from north to south along the property; red arrow in figure below), or the watercourse feature flowing from south to north along/adjacent to the property (orange arrow in figure below). Does MNRF possess any information on watercourse name, thermal regime, or additional fish sampling information not yet available in the LIO for either watercourse? Moreover, does MNRF agree with the assertion that the area shown in the black box below represents Lake Couchiching (as online mapping appears to depict), versus a continuation of those watercourses?



Thank you very much in advance for your time.

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

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---

From: MIDHURSTINFO (MNRF) [mailto:MIDHURSTINFO@ontario.ca]
Sent: Friday, April 23, 2021 10:41 AM
To: Michael Gillespie
Subject: Licence to Collect Fish for Scientific Purposes #1097911

Dear Mike,

Please find attached the following:

- Cover Letter, Licence to Collect Fish for Scientific Purposes #1097911, Schedule A – Licence Conditions
- Mandatory Report Forms
- Report Field Definitions
- Best Management Practices – Aquatic Invasive Species BMP
- Best Management Practices – VHS
- Blank Application (for future use)
- Transfer of VHS Risk Assessment Questionnaire (**only** to be completed if moving live fish and/or equipment to areas outside the VHS Management Zone)
- VHS Map

Please sign the Licence and the Conditions page immediately and scan/email a signed copy of the Licence and Conditions to midhurstinfo@ontario.ca.

A new Mandatory Report form has been created and included in this email. Please use this form and not previous versions. These can now be emailed directly to midhurstinfo@ontario.ca.

When completing the report, please ensure that all mandatory fields are completed. In addition to those indicated with an * , please provide information for “Sampling Date” and “Gear Type”. Although not indicated as mandatory on the form, this information is required.

If you have any questions, please send an email to midhurstinfo@ontario.ca.

Thanks,

Shari Haak
Resources Clerk | Midhurst District | Owen Sound Field Office
Ministry of Natural Resources and Forestry

☎ 226-974-2967 | shari.haak@ontario.ca

APPENDIX C

Terrestrial Photographic Record

Photograph 1. OAGM1 wheat crop with FODM8-1 woodland to the left and SWDM4-5 community in background [facing south (May 20, 2021)].

Photograph 2. Inside the SWDM3-2 community with the FODM7 community in background toward the wheat field [facing west (August 13, 2021)].

Photograph 3. Shadow Creek in the SWDM3-2 vegetation community [facing east (August 13, 2021)].

Photograph 4. MAMM1-3 central wetland finger community [facing northeast (August 13, 2021)].

Photograph 5. Terrestrial crayfish chimney in the SWDM3-2 vegetation community (August 13, 2021).

Photograph 6. The one Category #2 (retainable) Butternut tree located in the FODM7 vegetation community (August 13, 2021).

APPENDIX D

Aquatic Photographic Record

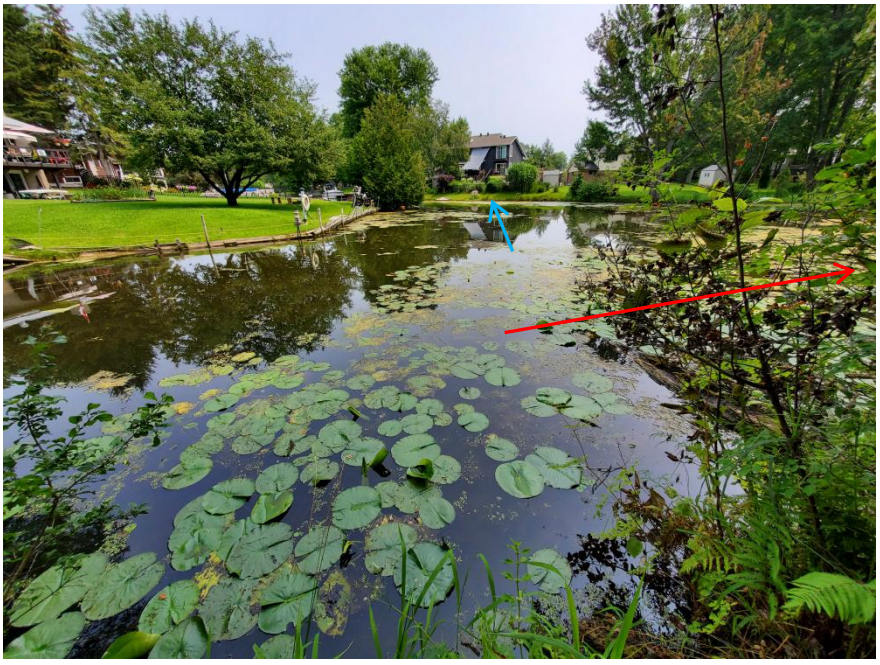
Photograph 1. Aquatic Site #1 (Unnamed Creek): Main channel with beaver dam just west of property boundary (facing upstream/south; May 20, 2021).

Photograph 2. Aquatic Site #1 (Unnamed Creek): Main channel downstream of beaver dam just west of property boundary (facing upstream/south; May 20, 2021).

Photograph 3. Aquatic Site #1 (Unnamed Creek): Main channel just upstream of confluence with Site #2 (Shadow Creek) (facing upstream/south; May 20, 2021).

Photograph 4. Aquatic Site #2 (Shadow Creek): Main channel of creek (facing downstream/south; May 20, 2021).

Photograph 5. Aquatic Site #2 (Shadow Creek): Main channel of creek (facing upstream/north; August 4, 2021).



Photograph 6. Aquatic Site #2 (Shadow Creek): Main channel of creek, including northernmost outlet channel (blue arrow) to Lake Couchiching (facing downstream/southeast; August 4, 2021)

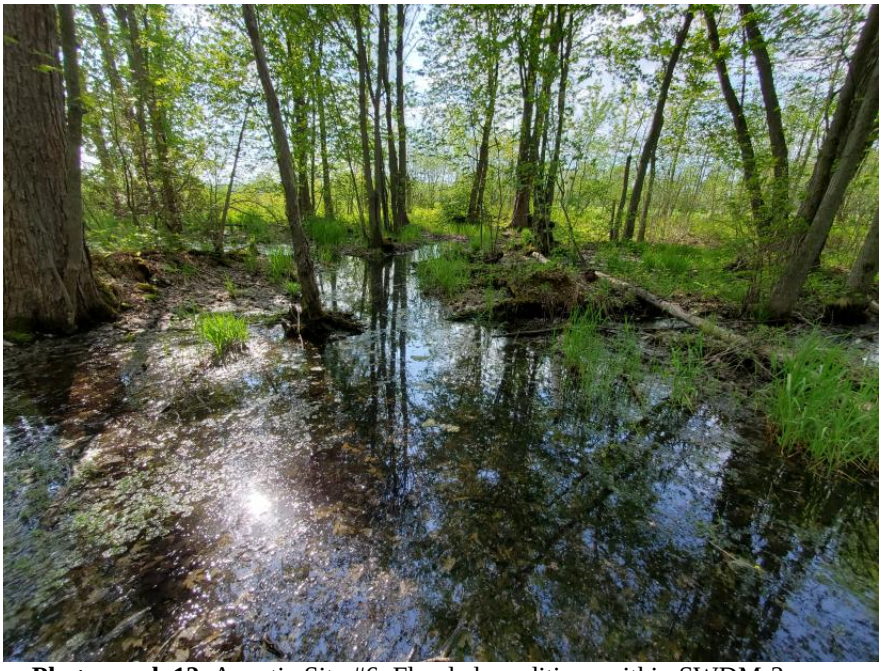
Photograph 7. Aquatic Site #2 (Shadow Creek): Floodplain of Shadow Creek (facing northwest; May 20, 2021).

Photograph 8. Aquatic Site #2 (Shadow Creek): Floodplain of Shadow Creek (facing west; May 20, 2021).

Photograph 9. Aquatic Site #3: Ephemeral drainage in feature (facing downstream/northeast; March 23, 2021).

Photograph 10. Aquatic Site #4: Flooded conditions within SWDM-3 (facing downstream/northeast; March 23, 2021).

Photograph 11. Aquatic Site #5: Diffuse flow within wetland vegetation (facing downstream/northeast; May 20, 2021).



Photograph 12. Aquatic Site #6: Flooded conditions within SWDM-3 (facing upstream/west; May 20, 2021).

Photograph 13. Aquatic Site #7: Channel just downstream of property boundary with direct connection to Site #1 (Unnamed Creek) (facing upstream/west; May 20, 2021).

Photograph 14. Aquatic Site #8: North branch of site with abundant watercress (potential seep) (facing downstream/southeast; May 20, 2021).

Photograph 15. Aquatic Site #8: Flooded area within SWD3-2 (facing south; May 20, 2021).

Photograph 16. Aquatic Site #8: Channel downstream of flooded conditions (Photograph 15). Fish sampling completed in this location (facing downstream/east; May 20, 2021).

Photograph 17. Aquatic Site #9: Early spring runoff on property, diffusely entering SWDM3-2 (facing downstream/east; March 23, 2021).

Photograph 18. Aquatic Site #10: Early spring runoff (and drainage feature pathway) on property, diffusely entering SWDM3-2 (facing upstream/west; March 23, 2021).

Photograph 19. Aquatic Site #11: Diffuse flow within wetland vegetation (facing downstream/east; May 20, 2021).

Photograph 20. Aquatic Site #11: Downstream end of site. Fish sampling completed here (facing upstream/northwest; May 20, 2021).

Photograph 21. Aquatic Site #12 : Ephemeral drainage pathway on property (facing downstream/east; March 23, 2021).

Photograph 22. Aquatic Site #13: Ephemeral drainage pathway on property (facing downstream/east; March 23, 2021).

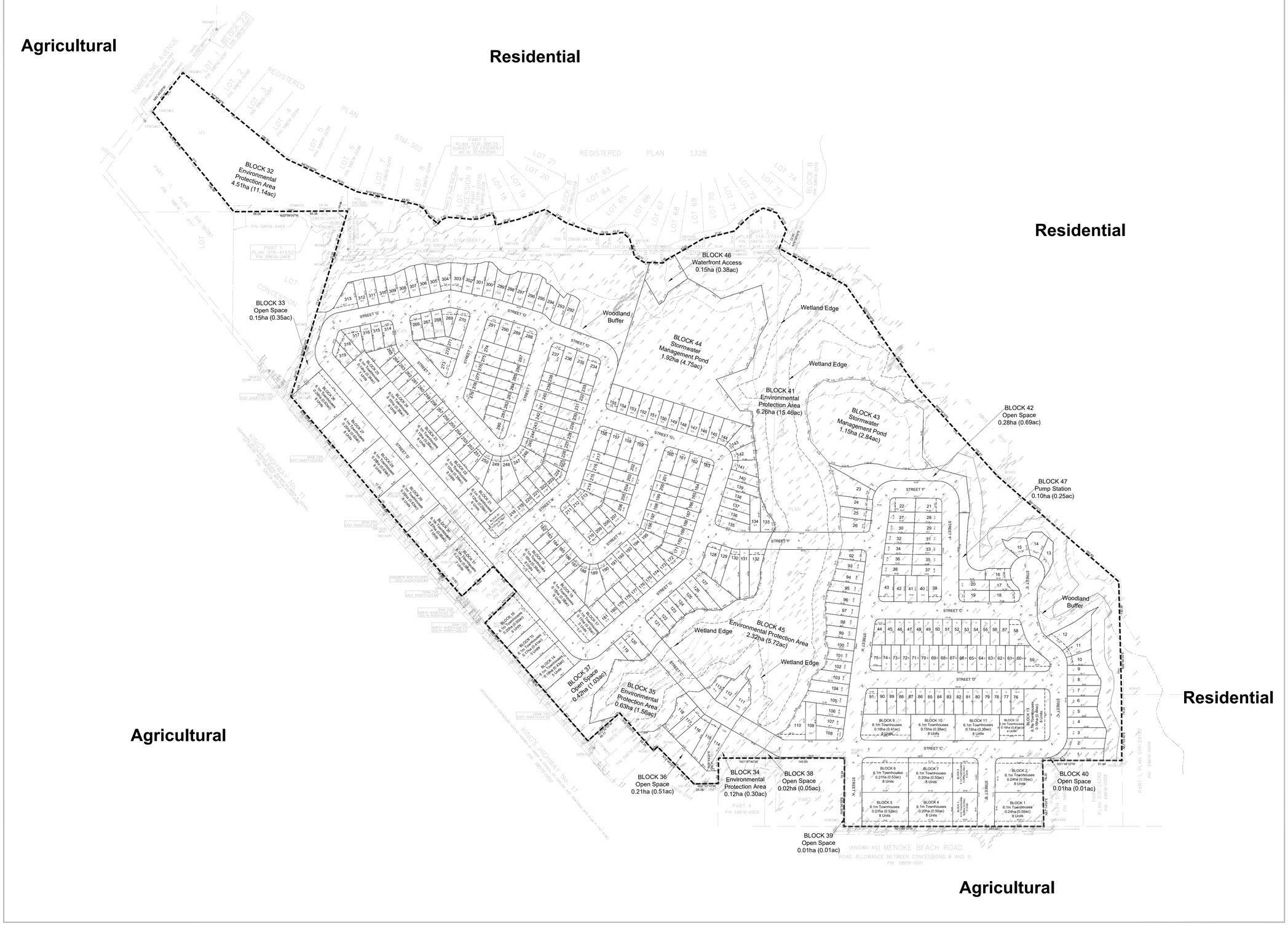
Photograph 23. Aquatic Site #14: Ephemeral drainage pathway on property (facing downstream/northeast; March 23, 2021).

Photograph 24. Aquatic Site #15: Ephemeral drainage pathway on property (facing upstream/west; March 23, 2021).

Photograph 25. Aquatic Site #16: Densely vegetated conditions in watercourse just north of property (facing downstream/east from Highway 11; May 20, 2021).

APPENDIX E

Proposed Draft Plan of Subdivision



Legal Description

PART OF LOTS 3, 4, AND 5
CONCESSION 9 (NORTH DIVISION)
(GEOGRAPHIC TOWNSHIP OF NORTH ORILLIA)
NOW IN THE
TOWNSHIP OF SEVERN
COUNTY OF SIMCOE

Owner's Certificate

I HEREBY AUTHORIZE MACNAUGHTON HERMSEN BRITTON CLARKSON PLANNING LIMITED TO SUBMIT THIS PLAN FOR APPROVAL.

DATE: _____

_____
LIV Communities

Surveyor's Certificate

I HEREBY CERTIFY THAT THE BOUNDARIES OF THE LAND TO BE SUBDIVIDED ON THIS PLAN AND THEIR RELATIONSHIP TO THE ADJACENT LANDS ARE ACCURATELY AND CORRECTLY SHOWN.

DATE: _____

_____
PIER DE ROSA- O.L.S.
J.D. BARNES LIMITED

Revision No.	Date	Issued / Revision	By

Additional Information Required Under Section 51(17) of the Planning Act R.S.O. 1990, c.P.13 as Amended

A. As Shown
D. Residential, Parkland
G. As Shown
J. As Shown
L. As Shown
B. As Shown
E. As Shown
H. Municipal Water Supply (Piped)
K. All Services As Required
C. As Shown
F. As Shown
I. Tioga Loamy Sand
Lovering Silty Clay Loam
Alliston Sandy Loam

KEY PLAN

SUBJECT LANDS

NOT TO SCALE

County Signing Block

APPROVED IN ACCORDANCE WITH SECTION 51(31) OF THE PLANNING ACT RSO, 1990, CHAPTER P.13, AS AMENDED

THIS _____ DAY OF _____, 20____

_____
DIRECTOR OF PLANNING, DEVELOPMENT AND TOURISM
COUNTY OF SIMCOE

Area Schedule

Description	Lots/Blocks	Units	Area
11m (36') Single Detached	9-11, 44-91, 130-132, 135-140, 164-229, 232-233, 238-239, 242-265, 271-287	170	6.36 ha (15.70 ac)
12.2m (40') Single Detached	1-8, 12-43, 92-129, 133-134, 141-163, 230-231, 234-237, 240-241, 266-270, 288-318	149	6.94 ha (17.14 ac)
6.1m (20') Townhouses	Block 1-31	215	5.51 ha (13.62 ac)
Open Space	Block 33, 36, 37, 38, 39, 40, 42		1.07 ha (2.63 ac)
Pump Station	Block 47		0.10 ha (0.25 ac)
Environmental Protection Area	Block 32, 34, 35, 41, 45		13.83 ha (34.18 ac)
Stormwater Management Pond	Block 43, 44		3.07 ha (7.59 ac)
Waterfront Access	Block 46		0.15 ha (0.38 ac)
Street A-K			8.42 ha (20.80 ac)
Total		534	45.45 ha (112.31 ac)

MHBC
PLANNING
URBAN DESIGN
& LANDSCAPE
ARCHITECTURE
230-7050 WESTON ROAD WOODBRIDGE, ON, L4L 8G7 | P: 905 761 5588 F: 905 761 5589 | WWW.MHBCPLAN.COM

Stamp

Date	November 9, 2021
File No.	15226X
Plan Scale	1:2000 (Arch D)
Drawn By	T.H.
Checked By	E.T.
Other	

Project

8743 Highway 11
Draft Plan of Subdivision

File Name
DRAFT PLAN OF SUBDIVISION

Dwg No. 1 of 1

Scale Bar

0 25 50 100 200

MEASUREMENTS SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048

N:\15226\X – MBR Phase III – Shadow Creek, Severn\1 – MHBC Documents\Draft Plan\CAD\15226X- Draft Plan of Subdivision- 03 January 2022.dwg