

Environmental Impact Study

063076 County Road 3, Marsville

Part Lot 5, Concession 14
Township of East Garafraxa
County of Dufferin

(Compiled from previous reports)
January 19, 2026

Prepared for:
Marsville Estates Inc. (Sunray Living Inc.)

By:
Cotyledon Environmental Consulting
Under Contract to Watters Environmental Group



The Banded Woolly Bear caterpillar is the larva of the Isabella Tiger Moth. Folklore holds that the relative amounts of brown and black hair on a larva indicate the severity of the coming winter.

We don't inherit this world from our parents we borrow it from our children.

1.0 Executive Summary

This EIS report compiles information from three previous environmental assessments on the Marsville Sunray property. This report was created with two purposes in mind: 1) to support the fulfillment of conditions associated with the Draft Approved Plan of Subdivision, and 2) to support the County OPA, Township OPA and Township ZBA applications seeking expansion of the residential permissions over the incompatible employment lands on the Subject Property.

The Property is not in the Oak Ridges Moraine, The Greenbelt, the Frontenac Biosphere Reserve or the Niagara Escarpment Planning areas. In both the Dufferin County Official Plan and the East Garafraxa Official Plan the Property is entirely within the Marsville Community Settlement Area, an area specifically planned for future residential development.

None of the planning authorities recognize the Woodland, the Wetland, or the Stream on the Property as part of a local or regional Natural Heritage System.

The Woodland on the Property is not a Significant Woodland, and the Wetland is not a Significant Wetland, as defined by the Provincial Planning Statement, the municipal planning authorities, or environmental regulatory agencies.

The Woodland is ELC classified as a Dry-fresh Sugar Maple-White Ash Deciduous Forest (FOD5M-8). It is a remnant of the original forest cover in the region. It is an upland, all aged, deciduous forest dominated by Sugar Maple. The average tree age is about 45 years. It has been repeatedly hygraded, resulting in a high percentage of defects and disease in the remaining trees. The basal area is 29.1 m²/ha, the mean DBH is 24.4 cm and the stocking is 494 stems/ha.

The Wetland is very small (0.07 ha). If it were to be ELC classified it would approximate a Jewelweed Forb Mineral Meadow Marsh (MAMM2-1). Without question it would not score high enough in the OWES evaluation to be considered as provincially or regionally significant. It is compliant with the GRCA policy as a developable wetland. In fact, it doesn't meet the technical criteria for a wetland in the Conservation Authority Act or O. Reg. 41/24.

There is no direct or indirect fish habitat on the Property. The intermittent Stream on the Property doesn't meet the O. Reg. 41/24 definition of a watercourse. It carries the spring freshet flow across the Property into the Brauwer Drain at County Road 3. The Stream will be replaced by a 1.23 ha bypass channel.

A 1.74 ha SWM pond will manage the flow from the Stream and the surface water drainage from the development. Through direct planting the SWM pond and the bypass channel will be about 2.97 ha of riparian and wetland habitat, which is about 42 times

larger than currently exists on the Property (i.e., 1.23 ha bypass channel + 1.74 ha SWM pond = 2.97 ha vs 0.07 ha current wetland). The SWM pond will be designed as a wet pond, which could provide habitat for colonial waterbirds. The vegetated shoreline of the SWM pond and the bypass channel will provide habitat for wetland birds and bats. No open water, shoreline, or riparian habitat currently exists on the Property, so this represents a significant ecological enhancement.

The bypass channel and the SWM pond should provide amphibian and reptile breeding habitat that currently doesn't exist on the Property.

Six species at risk were confirmed to be present on the Property - Eastern Wood Pewee, Monarch Butterfly, Eastern Red Bat, Silver-haired Bat, Little Brown Myotis and Hoary Bat. Providing vegetation removal is conducted in the winter between November 1 and March 31 there will be no Section 9 contravention of the Endangered Species Act. The majority of the Woodland will be maintained so there is no Section 10 ESA violation. Post development mitigation will substantially enhance the foraging and roosting habitat of these species at risk.

The proposed development is compliant with provincial, regional and municipal environmental planning policies, does not threaten species at risk, or pose a risk of flooding, erosion or pollution. A GRCA permit will be required to develop in a Regulated Area, and a permit may be required to remove a wetland.

2.0 Disclaimer and Limitations

This study was conducted by Cotyledon Environmental Consulting (CEC), subcontracted by Watters Environmental Group Inc. (Watters), with the authorization of Sunray Living Inc. (Sunray). This report, and the data obtained to produce the report, are the Property of Sunray. An electronic copy of this report, and all related data and field notes, are retained by CEC and Watters for usual project management and accounting purposes. However, neither the report nor the accompanying files will be given to anyone without the written approval of Sunray.

I am pleased to provide this report – *Environmental Impact Study. 063076 County Road 3, Marsville. Part Lot 5, Concession 14. Township of East Garafraxa. County of Dufferin. January 19, 2026.* It represents observations obtained from 11 site visits over five years and information compiled from three previous environmental assessment reports prepared by CEC.

The study area for this EIS is the Sunray Property at 063076 County Road 3, plus 120 m in all directions. Throughout this report the study property is simply referred to as “the Property”.

CEC conducted the field work and prepared this Environmental Impact Study using accepted industry standards and practices to the best of our professional ability as outlined in Section 8.0 Scope of Work/Terms of Reference. Other than the deliverables committed to in Section 8.0, CEC makes no other warranties regarding the provided services, work, or reports.

Throughout the onsite investigations and report preparation, CEC endeavoured to comply with all relevant legislation, regulations, policies, and guidelines that we are aware of. However, the report is not intended to constitute a legal opinion. All legal matters should be discussed with a qualified legal practitioner.

These limitations do not in any way impede the ability to address the objectives or the scope of work, rather they set reasonable expectations regarding the detail to which the natural environment on the Property was characterized.



Dave McLaughlin. BScF, MScF
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Cotyledon Environmental Consulting
Member: International Society of Arboriculture (Ontario)

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7.0 Background

This Environmental Impact Study (EIS) has been prepared from observations during 11 site visits over five years and information compiled from three previous environmental assessment reports prepared by CEC for this Property. The many site visits and multiple reports were to address iterative reviews and comments by regulatory agencies, as the Marsville Estates project changed in scope and design several times from its initiation in early 2020. The three previous CEC environmental reports are:

- 1) Baseline Ecological Assessment of 63076 County Road 3, Marsville. Part Lot 5, Concession 14. Township of East Garafraxa. County of Dufferin. April 6, 2020.
- 2) Amended Baseline Ecological Assessment of 063076 County Road 3, Marsville. Part Lot 5, Concession 14. Township of East Garafraxa. County of Dufferin. Original: April 6, 2020. Amended: September 16, 2020. Final: January 13, 2021.
- 3) Appendix Report: Spring 2021. Additional Work to Address Comments from the Grand River Conservation Authority and the Municipality of East Garafraxa. June 17, 2021.

The dates and work conducted during the 11 site visits are summarized in Table 1.

Table 1: Dates and work conducted during the 11 sites visits.

Date	Work Conducted
February 6, 2020	Trees & shrubs survey. Observed, birds, animals. Observed wetland & stream conditions
March 13, 2020	Trees & shrubs survey. Observed, birds, animals. Observed wetland & stream conditions
July 13, 2020	Trees, shrubs & ground vegetation survey. Observed, birds, animals. Observed wetland & stream conditions.
August 25, 2020	Trees, shrubs & ground vegetation survey. Observed, birds, animals. Observed wetland & stream conditions
May 2, 2021	Trees, shrubs & ground vegetation survey. Observed, birds, animals. Observed wetland & stream conditions. 1 st Amphibian Call Survey. Establish & measure 4 Forest Resource Inventory Plots.
May 17, 2021	Trees, shrubs & ground vegetation survey. Observed, birds, animals. Observed wetland & stream conditions. 2 nd Amphibian Call Survey.
May 24, 2021	Trees, shrubs & ground vegetation survey. Observed, birds, animals. Observed wetland & stream conditions.
May 27, 2021	Trees, shrubs & ground vegetation survey. Observed, birds, animals. Observed wetland & stream conditions. 1 st Breeding Bird Survey.
June 1, 2021	Trees, shrubs & ground vegetation survey. Observed, birds, animals. Observed wetland & stream conditions. 2 nd Breeding Bird Survey. Set out Acoustic Bat Survey equipment.
June 7, 2021	Trees, shrubs & ground vegetation survey. Observed, birds, animals. Observed wetland & stream conditions.
June 13, 2021	Trees, shrubs & ground vegetation survey. Observed, birds, animals. Observed wetland & stream conditions. Collect Acoustic Bat Survey equipment.

8.0 Scope of Work

The Marsville Estates development has been underway since early 2020. In April 2024 the Ontario Land Tribunal approved the Draft Plan of Subdivision and Zoning By-law Amendment. CEC was asked to compile the previous ecological observations and reports into an updated EIS in support of 1) fulfilling conditions associated with the OLT Draft Approved Plan of Subdivision, and 2) in support the County OPA, Township OPA and Township ZBA applications seeking expansion of the residential permissions over the incompatible employment lands on the Subject Property to facilitate removal of the 'Employment' designation and expansion of the residential permissions accordingly.

The production of this EIS required considerable restructuring of content of the three earlier reports to reflect the revised Draft Plan of Subdivision, recent changes to the Conservation Authority Act and the Grand River Conservation Authority Regulations, replacement of the 2020 Provincial Policy Statement with the new 2024 Provincial Planning Statement, the repeal of the Growth Plan for the Greater Golden Horseshoe, the amendment to the Endangered Species Act, the introduction of the new Species Conservation Act, and other changes included in Bill 5 (Protect Ontario by Unleashing Our Economy Act, 2025).

The EIS report follows the Grand River Conservation Authority (GRCA) Environmental Impact Study Guidelines and Submission Standards for Wetlands (2005). The GRCA has an EIS checklist, reproduced as Table 2. The EIS includes the following components:

- The study site (size and location, topography, soils and geomorphology, drainage).
- The proposed development.
- Review of the regulatory framework (provincial policy, GRCA, Dufferin County Official Plan, Township of East Garafraxa Official Plan)
- Natural Heritage Features and Ecological Landscape Classification, Description and Significance (wetland, screening for Significant Wetland, woodland, screening for Significant Woodland, watercourse, Headwater Drainage Feature Assessment, agricultural field).
- Flora and Fauna Inventories, 3-season multi-year incidental observations (vegetation, birds, Breeding Bird Survey, mammals, amphibians and reptiles, Amphibian Call Survey, bats, Acoustic Bat Survey, fish habitat and DFO Self Assessment, Butterflies and Moths).
- Screening for Species at Risk.

- Screening for Significant Wildlife Habitat.
- Compliance.
- Impacts assessment
- Mitigation (Construction Mitigation, Natural Environment Mitigation).

The flora and fauna inventories were conducted through incidental observations over three seasons and three years, referencing online data such as iNaturalist, eBird Canada and the Ontario Geohub. In addition, protocol-specific surveys were conducted, specifically a Breeding Bird Survey, Amphibian Call Survey, and an Acoustic Bat Survey. All Natural Heritage and Landscape Features were identified, classified by the Ecological Landscape Classification system, and assessed for their ecological significance.

A Functional Servicing Report, a Hydrogeological Study and a Water Balance Report, if required, will be provided by another consultant.

Table 2: Grand River Conservation Authority Environmental Impact Study check list framed the Scope of Work.

Check first box if sufficient information is available; Check second box if to be addressed by current EIS)

☐ ☐ Natural Heritage Designations and Zoning:		
☒ ☐ Provincially Significant Wetland ☒ ☐ Non-provincially Significant Wetland ☐ ☒ Unevaluated Wetland ☐ ☒ Threatened or Endangered Species Habitat ☐ ☒ Significant Woodland ☐ ☒ Significant Valleyland	☐ ☒ Significant Wildlife Habitat ☒ ☐ Significant Areas of Natural and Scientific Interest (ANSI) ☐ ☒ Fish Habitat ☐ ☒ Other Designations (e.g. ESA, ESPA, Core Greenlands, etc.)	
☐ ☐ Geology, Hydrology, and Hydrogeology:		
☒ ☐ Sub-watershed or Wetland Catchment Boundary ☐ ☒ Geomorphology & Topographic Features ☐ ☒ Soils (surface and subsurface) Specify timing of any field studies to be done:	☐ ☒ Surface Drainage Pattern, including all permanent and intermittent watercourses ☒ ☐ Groundwater Recharge/Discharge Areas ☒ ☐ Hydrogeologic Conditions ☒ Winter, ☒ Spring, ☒ Summer, ☐ Fall	
☐ ☐ Natural Hazard Lands:		
☒ ☐ Surveyed Flood Plain ☒ ☐ Valley Lands	☐ ☒ Erosion Hazards ☒ ☐ Poorly Drained Soils	
☐ ☐ Biological Inventory:		
☒ ☐ Wetland Evaluation (see OMNR 1993) ☒ ☐ Wetland Boundary Delineation (see OMNR 1993) ☐ ☒ Ecological Land Classification (see Lee et al. 1998) ☐ ☒ Wildlife Inventory (see OMNR 1999)	Taxonomic Group: ☒ Amphibians..... ☒ Reptiles..... ☒ Birds..... ☒ Plants ☒ Mammals..... ☒ Rare Species or Subspecies..... Specify:	Inventory Date: ☐ March, ☐ April, ☒ May, ☒ June ☒ June, ☒ July, ☒ August, ☐ September ☒ May, ☒ June, ☒ July, ☒ August Specify: 3 season survey Specify: 3 season survey Specify: 3 season survey
Complete this section if field work is required	☐ ☒ Significant Wildlife Habitat (see OMNR 2000): ☒ Critical Habitat for Species At Risk ☒ Waterfowl Habitat ☒ Colonial Bird Nesting Area ☒ Snake Hibernaculum ☒ Bat Hibernaculum ☒ Winter Deer Yard	☒ Raptor Perching/Feeding/Nesting Area ☒ Forest with springs, seeps, or hummocky topography ☒ Interior Forest ☒ Ephemeral (Vernal) Pond ☒ Cavity Trees
Complete this section if existing information is available		

9.0 The Property

The Property address is 063076 County Road 3, Marsville. It is Part Lot 5, Concession 14, Township of East Garafraxa, County of Dufferin. Figure 1 illustrates the regional location of the Property. Figure 2 illustrates the local orientation of the Property.

The Property is flat table land. It is mostly an active agricultural field. There are no residences, structures, roads, paths, or infrastructure on the Property. There are the ruins of what was likely a sugar shack in the woodland south of the wetland. Only a few concrete edges and some small pieces of rusted metal remain.

There are no driveways or roads that directly access the Property. It is best accessed via a covered culvert at the northwest corner of the Property that exits south from County Road 3. This is used by the current (rental) farmer to bring equipment onto the agricultural field. This access point is located at:

- 43° 49' 57.22" N and 80° 13' 02.19" W.

There is a second access point that appears to be used to move agricultural equipment between adjacent fields, located at the southwest corner of the Property at:

- 43° 49' 49.97" N and 80° 12' 46.87" W.

The Property is roughly rectangular in shape and is at the southwest corner of County Road 3 and County Road 24. It is about 26.5 ha (65.4 ac) in size, of which 23.2 ha (57.4 ac, or 87.5%) is active agricultural field. There is a small 3.2 ha (7.8 ac) woodland that covers about 12.2% of the Property, and a small 0.07 ha (0.18 ac) unevaluated wetland that is about 0.3% of the Property.

The Property is about 0.6 km east-northeast of the village of Marsville, about 10.5 km southeast of Grand Valley, about 12.3 km southwest of Orangeville and about 12.8 km north-northwest of Erin.

In 2019 the agricultural field was planted to corn. It was planted to winter wheat in 2020 and soybeans in 2021. CEC has not been on the Property after the summer of 2021, although it is our understanding that the agricultural field was annually cropped.

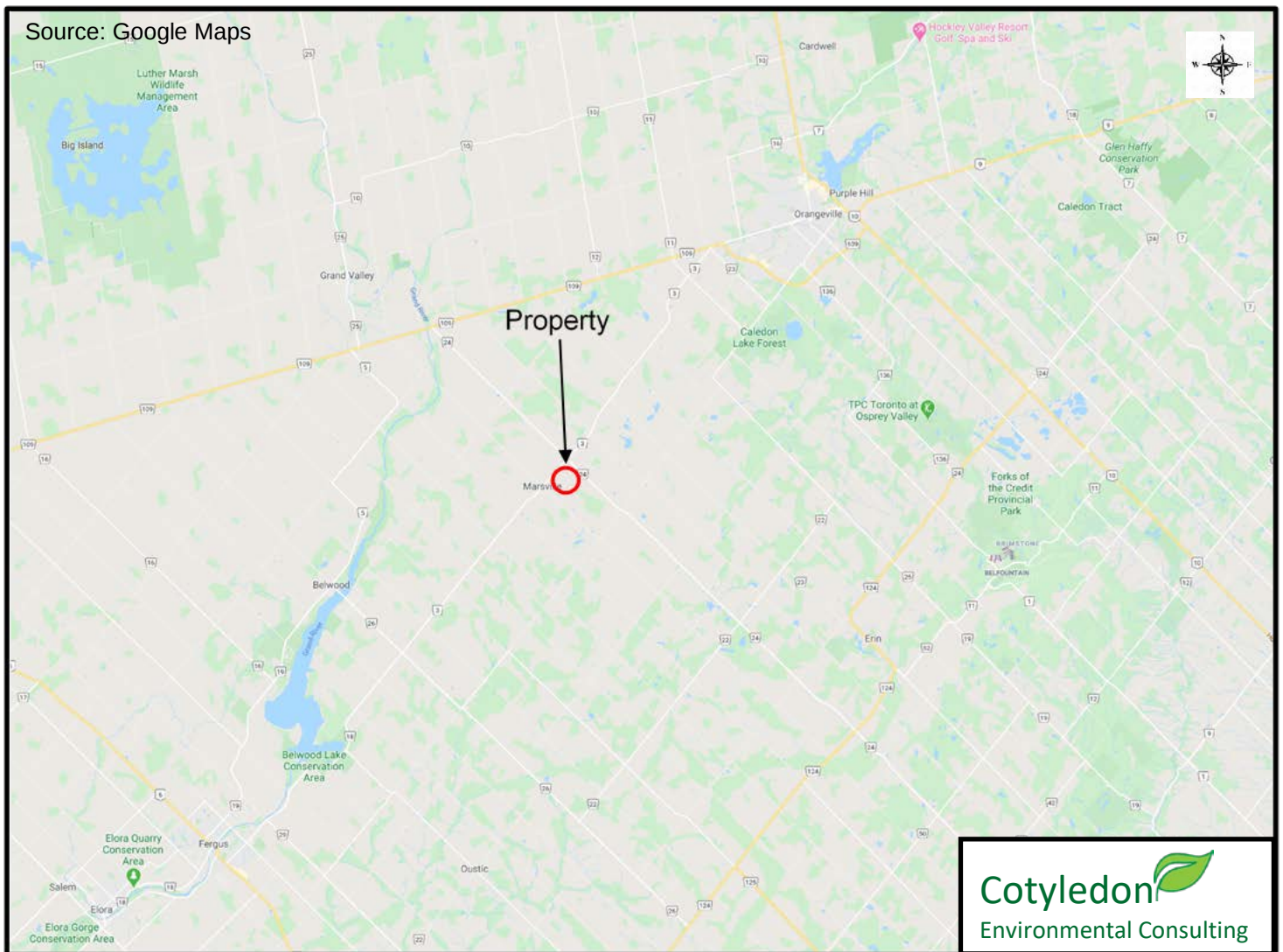


Figure 1: Regional location of the Property.

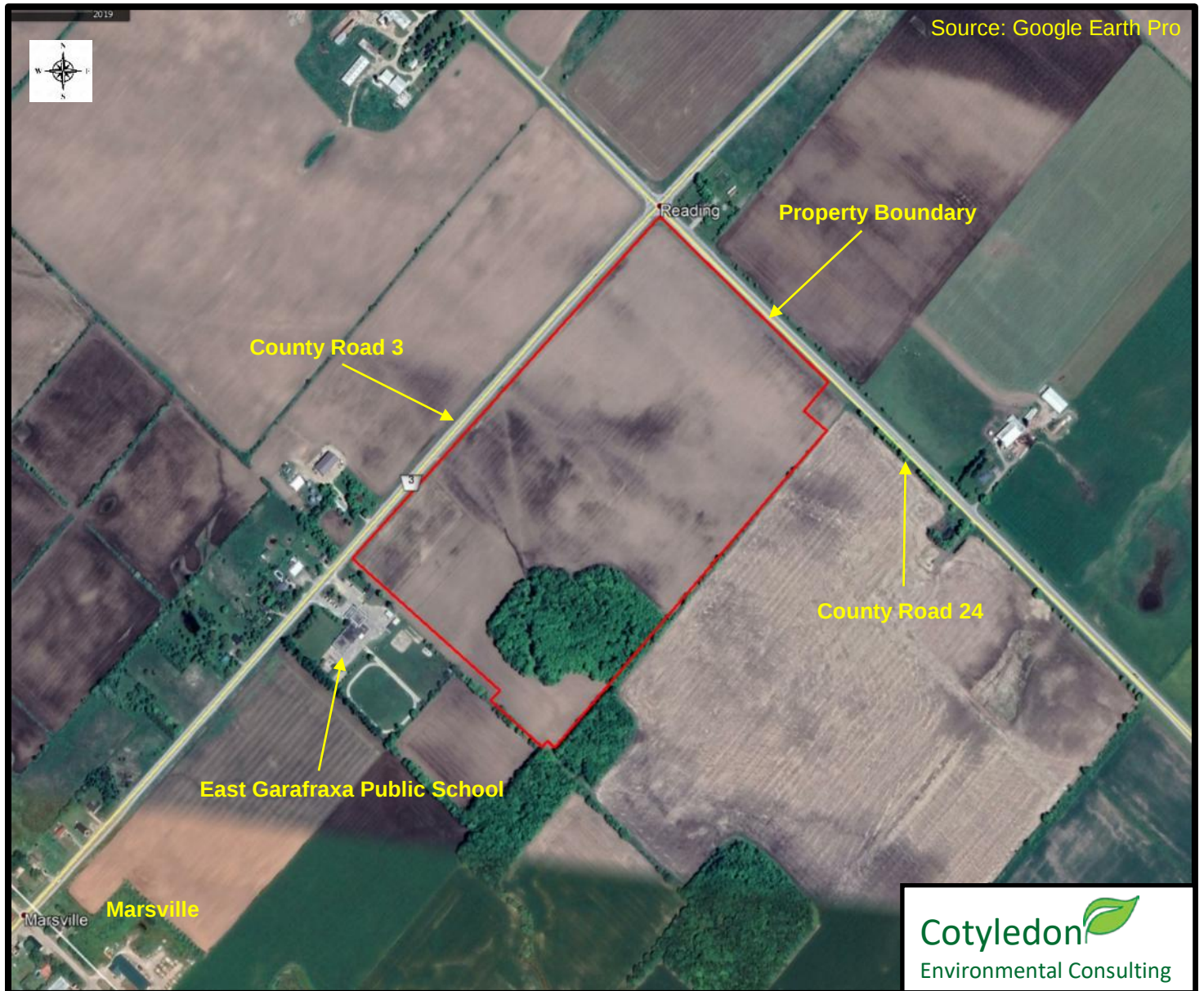


Figure 2: Local position of the Property.

10.0 Topography, Soils and Drainage

The Property is a local height of land that sits just northwest of the divide between the Grand River and the Credit River watersheds. The Property is entirely within the Butler Creek sub-watershed. Butler Creek is an upper tributary of the Grand River. The topographic features and direction of surface water flow on the Property are illustrated in Figure 3.

The Property is flat table land. There are no valleys, hills, ridges, tops of bank, permanent streams or permanent open water, dynamic beaches or flood plains. The direction of surface water flow off the Property is generally northerly into the Brauwer Drain, which is immediately north of County Road 3. The Brauwer Drain is an agricultural drain system that flows about 2 km into the upper reaches of Butler Creek.

The maximum elevation is 492.2 m at the south-central edge of the Property. The Property slopes gently northwesterly to a minimum elevation of 485.7 m at the north-central edge of the Property in the vicinity of the culvert under County Road 3 that flows into the adjacent Brauwer Drain.

An intermittent stream rises in a small depression about 500 m southwest of the Property and flows northerly, entering the Property at the southwest corner. It passes through the woodlot and across the cultivated field where it passes under County Road 3 via a culvert and flows into the adjacent Brauwer Drain, and then downstream to Butler Creek. The characteristics of the intermittent stream on the Property are discussed in more detail in Sections 13.3 and 13.3.1.

The Property is underlain by bedrock of the Middle and Lower Silurian Sandstone/Shale Guelph formation, which is overlain by about 60 m of glacial till. There are no bedrock outcrops on the Property, or anywhere in the local vicinity.

On January 7, 2020, Alston Geotechnical Consultants Inc. dug five test pits across the Property to a depth of 4 m. All five test pits are very similar with respect to soil type and physiography. Harriston and Listowell loam topsoil ranged in depth from 200 to 400 mm and was underlain by weakly plastic sandy silt with seams and lenses of sandy soil. The sandy seams produced water. In three of the five test pits water was struck at 1.2 to 1.5 m. The remaining two pits remained dry to 4 m. Based on these test pits the Property should be considered to have a shallow to relatively shallow water table.



Figure 3: Topographic features and direction of surface water flow.

11.0 Proposed Development

Marsville Estates obtained approval for their original Draft Plan of Subdivision and Zoning By-law Amendment applications through the Ontario Land Tribunal (OLT-22-004307) to create 58 residential estate lots totaling 14.97 ha. A storm water retention pond (1.74 ha) will be located adjacent to the south side County Road 3. A swale bypass channel to accommodate and safely contain the seasonal spring flow of the intermittent stream will be constructed (1.23 ha). The bypass channel will be built along the path of the intermittent stream. Roads A, B and C will be about 3.12 ha. A 5.44 ha parcel of land on the east side of the Property will be reserved for future employment opportunities. The Draft Approved Plan of Subdivision is illustrated in Figure 4(a).

Marsville Estates is herewith submitting two Official Plan Amendment applications against both the Dufferin County Official Plan and the Township of East Garafraxa Official Plan as well as a Zoning By-law Amendment. The intent of the *Planning Act* applications herewith are to facilitate the removal of the incompatible Employment Area on the Subject Lands and extending the residential permissions to create 20 additional residential lots. Please refer to the proposed development plan in Figure 4(b).

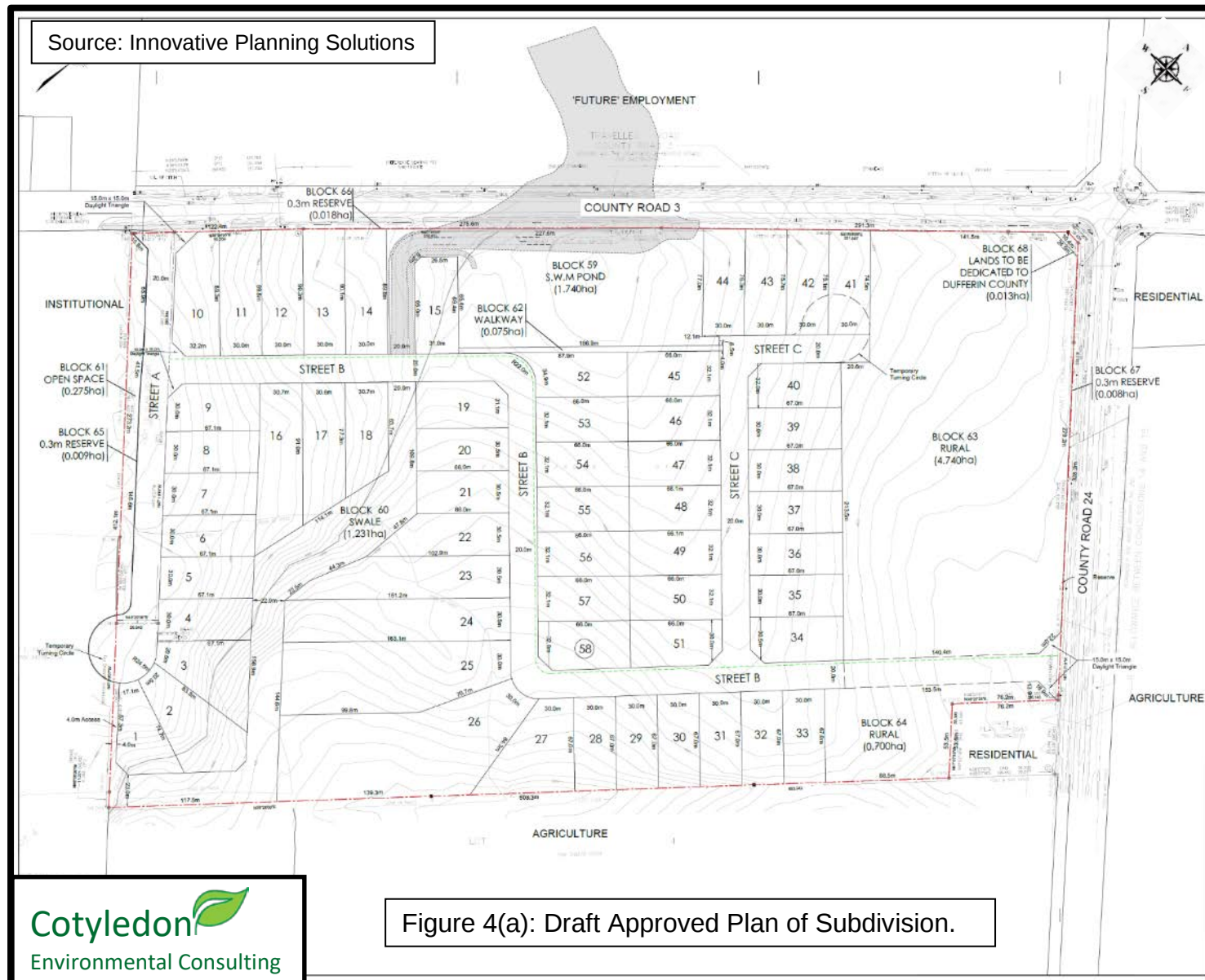


Figure 4(a): Draft Approved Plan of Subdivision.

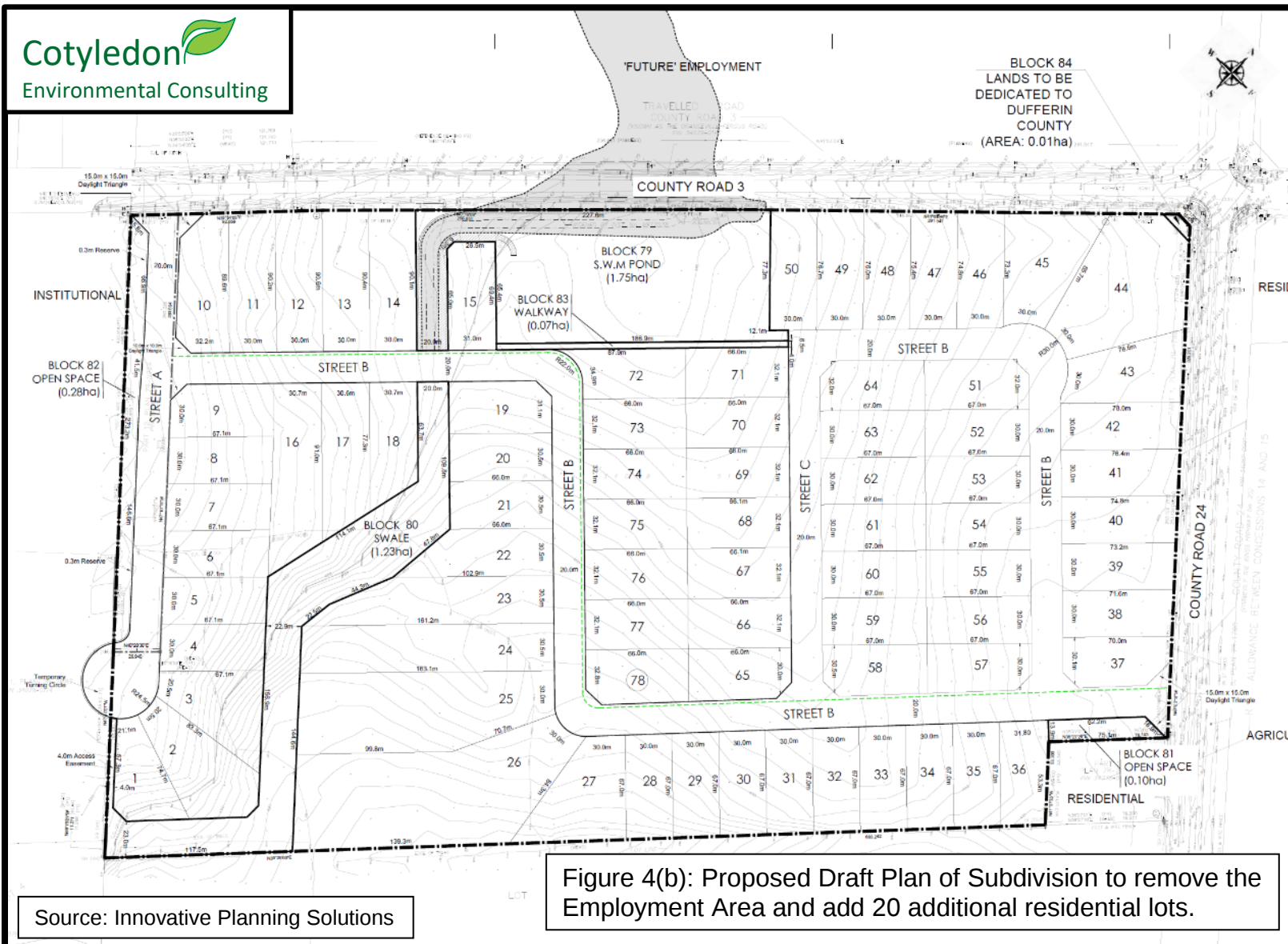


Figure 4(b): Proposed Draft Plan of Subdivision to remove the Employment Area and add 20 additional residential lots.

12.0 Regulatory Framework

12.1 Eco-Regions

The Property is in the Mixedwood Plains Ecozone, the Lake Simcoe-Rideau Ecoregion 6E, and the Stratford Ecodistrict 6E-1. Regionally, about 80% of the Stratford Ecodistrict is agricultural (cropland and pasture), less than 20% remains as natural or naturalized (forests, wetlands, prairie/meadow), and about 2% is developed and urbanized infrastructure.

The Property is in the Huron-Ontario Forest District of the Great Lakes-St. Lawrence Forest Region. Because of the long history of settlement and agriculture, extensive forest tracts no longer exist in this area of Ontario. The small, predominantly Sugar Maple deciduous woodland on the Property is a remnant of the original diverse hardwood forests of the area. The woodland is further discussed in Sections 16.5 and 16.5.1.

12.2 Provincial Planning Zones

The Property is not in the Lake Simcoe Protection Plan, the Greenbelt, a Greenbelt Specialty Crop Area, the Oak Ridges Moraine, the Frontenac Arch Biosphere Reserve or the Niagara Escarpment Planning Areas. It is in the Greater Golden Horseshoe Growth Plan Area. The relevant regulatory planning authorities for the Property and this EIS are the Provincial Planning Statement (2024), the Ontario Ministry of Environment, Conservation and Parks, the GRCA, the Dufferin County Official Plan, and the Township of East Garafraxa Official Plan.

12.3 Provincial Planning Statement (2024)

Subsequent to the completion of the first three ecological reports prepared by CEC for this Property the Provincial Policy Statement (2014) and the Growth Plan for the Greater Golden Horseshoe (2020) were replaced by the Provincial Planning Statement (2024), which was promulgated on October 20, 2024. Approved by the Lieutenant Governor in Council, Order in Council No. 1099/2024, the Provincial Planning

Statement was issued under section 3 of the Planning Act. The preamble on the government website describes the Provincial Planning Statement as follows:

It is a single, streamlined land use planning framework for Ontario designed to guide development and help meet the province's housing goals by providing municipalities with more flexibility. Key changes include a focus on residential intensification, modified policies regarding employment areas, and different approaches to environmental and heritage protections.

The policies of the Provincial Planning Statement represent minimum standards. Planning authorities may go beyond these minimum standards to address issues of importance to a specific community.

Section 4.1 of the Provincial Planning Statement refers to the protection of Natural Heritage Features and Natural Heritage Systems. It states that natural features shall be protected for the long term and identifies development guidelines.

4.1.4 Development and site alteration shall not be permitted in:

- a) significant wetlands in Ecoregions 5E, 6E and 7E and,*
- b) significant coastal wetlands.*

4.1.5 Development and site alteration shall not be permitted in:

- a) significant wetlands in the Canadian Shield north of Ecoregions 5E, 6E and 7E,*
- b) significant woodlands in Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Mary's River),*
- c) significant valleylands in Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Mary's River),*
- 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 4.1.4(b), unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions.*

4.1.6 Development and site alteration shall not be permitted in fish habitat except in accordance with provincial and federal requirements.

4.1.7 Development and site alteration shall not be permitted in habitat of endangered species and threatened species, except in accordance with provincial and federal requirements.

4.1.8 Development and site alteration shall not be permitted on adjacent lands to the natural heritage features and areas identified in policies 4.1.4, 4.1.5 and 4.1.6

unless the ecological function of the adjacent lands has been evaluated and it has been demonstrated that there will be no negative impacts on the natural features or on their ecological functions.

5.2.1 Planning authorities shall, in collaboration with conservation authorities where they exist, identify hazardous lands and hazardous sites and manage development in these areas, in accordance with provincial guidance.

*5.2.2 Development shall generally be directed to areas outside of:
b) hazardous lands adjacent to river, stream and small inland lake systems which are impacted by flooding hazards and/or erosion hazards;*

*5.2.3 Development and site alteration shall not be permitted within:
c) areas that would be rendered inaccessible to people and vehicles during times of flooding hazards, erosion hazards and/or dynamic beach hazards, unless it has been demonstrated that the site has safe access appropriate for the nature of the development and the natural hazard;*

5.2.8 ... development and site alteration may be permitted in those portions of hazardous lands and hazardous sites where the effects and risk to public safety are minor, could be mitigated in accordance with provincial standards, and where all of the following are demonstrated and achieved:

- a) development and site alteration is carried out in accordance with floodproofing standards, protection works standards, and access standards;*
- b) vehicles and people have a way of safely entering and exiting the area during times of flooding, erosion and other emergencies;*
- c) new hazards are not created and existing hazards are not aggravated; and*
- d) no adverse environmental impacts will result.*

Carte blanche protection is not provided to all natural features. Natural features must meet minimum ecological criteria set out in the Natural Heritage Reference Manual (2010) and be evaluated as *Significant* to be protected.

Significant Wetlands are designated by the MNRF using the Ontario Wetland Evaluation System (OWES). Significant Habitat of Endangered or Threatened Species is accepted if a species is identified on a property through site specific investigations, or on the basis of existing records. Fish habitat is governed by Fisheries and Oceans Canada (DFO), although conservation authorities may act on their behalf.

Of the 11 natural heritage features identified in the Provincial Planning Statement, five may be relevant to the Property, they are:

- Significant Wetlands,

- Significant Woodlands,
- Significant Wildlife Habitat,
- Fish Habitat and
- Habitat of Threatened and Endangered Species.

Impacts on the Natural Heritage System on and near the Property and compliance with Provincial Planning Statement are discussed in Sections 20.0 and 21.0 and Table 19.

12.4 Ontario Ministry of Conservation and Parks – Species at Risk

Subsequent to the completion of the three previous ecological reports prepared by CEC for this Property the provincial government changed the way species at risk are managed. On June 5, 2025 the Province of Ontario enacted the *Protecting Ontario by Unleashing the Economy Act* (Bill 5). This legislation significantly amended the *Endangered Species Act*, which will be replaced by the *Species Conservation Act, 2025* at a future date. New regulations for the SCA were posted for public consultation, which closed November 10, 2025. In the interim, ESA protections still apply. Specifically, species at risk listed in O. Reg. 230/08 still warrant protection relative to their designation.

Key changes in the proposed SCA include the redefinition of *habitat*. In the ESA habitat included all the area required to support the life cycle of the species at risk, such as nests or dens, the local foraging environment, and migratory staging or resting areas. By this definition the habitat of a species at risk requiring protection could be very large, up to many hectares. Under the new SCA habitat is redefined to include only the den or nest required for reproduction or hibernation, removing protection for crucial areas needed for food, breeding, and migration. For bats and birds, the redefined habitat could be a single nesting or roosting tree.

The new SCA prioritizes economic growth and allows the government to balance development against conservation, a shift from the ESA's explicit goals of recovery and stewardship. The new legislation gives the government the power to decide which species get protected, rather than relying solely on independent scientific advice. Ontario will no longer provide provincial protection for migratory birds and aquatic species that are also listed under the federal Species at Risk Act. The SCA introduces a registration-based permitting system that is intended to reduce consultation and allow projects to proceed more quickly. Also, the language regarding "harass" has been removed, which may impact protection for species sensitive to disturbances.

As of the date of this EIS, species at risk are listed in O. Reg. 230/08. If flora and fauna inventories confirm the presence of species at risk on the Property this may restrict the

area where development is allowed, requiring modifications of the proposed Site Plan, or restrict the time during which certain construction processes can occur. Species at Risk are managed by the Ministry of Environment, Conservation and Parks (MECP). An MECP permit may be required if the proposed development may impact species at risk confirmed on the Property.

Species at risk are explored further in Section 18.0 and Table 17.

12.6 Grand River Conservation Authority

The Property falls entirely within the jurisdiction of the GRCA . As illustrated in Figure 5 a small area at the north edge of the Property, about 0.73 ha in size, is GRCA Regulated Area, which is associated with the Butler Creek flood plain.

Based on the GRCA's interactive on-line mapping tool, the following information about the Property was obtained:

- It is in the Butler Creek Sub-watershed of the Grand River Watershed;
- The northern half of the Property is in the Well Head Protection Zone of the Marsville municipal well;
- The entire Property is in an area of Low Aquifer Vulnerability;
- A significant groundwater recharge area just touches the southeast corner of the Property;
- The hydraulic gradient is downward;
- The average annual recharge across the Property is less than 50 mm/year;
- The average annual runoff is about 250 - 400 mm/year.

Key changes to the role of Conservation Authorities were introduced in Ontario through a series of recent legislative and regulatory changes, including amendments to the Conservation Authorities Act, enacted through a series of bills introduced by the province (Bill 139 in 2017, Bill 229 in 2020, Bill 245 in 2021, Bill 23 in 2022 and most recently Bill 5 in 2025). The amendments were intended to clarify the role of

Conservation Authorities and encourage the construction of new housing by simplifying the development approvals process.

In response to these amendments, the government enacted Ontario Regulation 41/24, *Prohibited Activities, Exemptions and Permits* under the CAA. This new regulation, which introduced major changes to the permitting system under the CAA, resulted in a curtailment of the role and authority of Conservation Authorities and increased ministerial powers. O. Reg. 41/24 came into effect on April 1, 2024, replacing the 36 individual regulations that previously governed each of the Conservation Authorities.

In O. Reg. 41/24 Section 1(1) a watercourse is defined as:

watercourse means a defined channel, having a bed and banks or sides, in which a flow of water regularly or continuously occurs; (“cours d’eau”)

And a wetland is defined as:

wetland means land that,

(a) is seasonally or permanently covered by shallow water or has a water table close to or at its surface,

(b) directly contributes to the hydrological function of a watershed through connection with a surface watercourse,

(c) has hydric soils, the formation of which have been caused by the presence of abundant water, and

(d) has vegetation dominated by hydrophytic plants or water tolerant plants, the dominance of which have been favoured by the presence of abundant water. (“terre marécageuse”)

(2) The definition of “wetland” in subsection (1) does not include periodically soaked or wet land used for agricultural purposes which no longer exhibits a wetland characteristic referred to in clause (c) or (d) of that definition.

And in Section 2 (3)

For the purposes of subparagraph 2 v of subsection 28 (1) of the Act, other areas in which development activities are prohibited are the areas within an authority’s area of jurisdiction that are within 30 metres of a wetland.

Prohibited activities in the CAA are the same as the GRCA *Policies for the Administration of the Prohibited Activities, Exemptions and Permits Regulation*, which is O. Reg. 41/24.

28(1) No person shall carry on the following activities, or permit another person to carry on the following activities, in the area of jurisdiction of an authority:

1. Activities to straighten, change, divert or interfere in any way with the existing channel of a river, creek, stream or watercourse or to change or interfere in any way with a wetland.

2. Development activities in areas that are within the authority's area of jurisdiction and are,

i. hazardous lands,

ii. wetlands,

iii. river or stream valleys the limits of which shall be determined in accordance with the regulations,

iv. areas that are adjacent or close to the shoreline of the Great Lakes-St. Lawrence River System or to an inland lake and that may be affected by flooding, erosion or dynamic beach hazards, such areas to be further determined or specified in accordance with the regulations, or

v. other areas in which development should be prohibited or regulated, as may be determined by the regulations. 2017, c. 23, Sched. 4, s. 25; 2022, c. 21, Sched. 2, s. 7 (1).

With respect to the GRCA, potential issues for the Property relate to watercourses, wetlands and Regulated Area.

The GRCA may require a Water Resource Management Report to address potential impacts of the proposed development on the hydrogeology. This is not included in the Scope of Work for this EIS, and if required by the GRCA it will be provided under separate cover by another consultant.

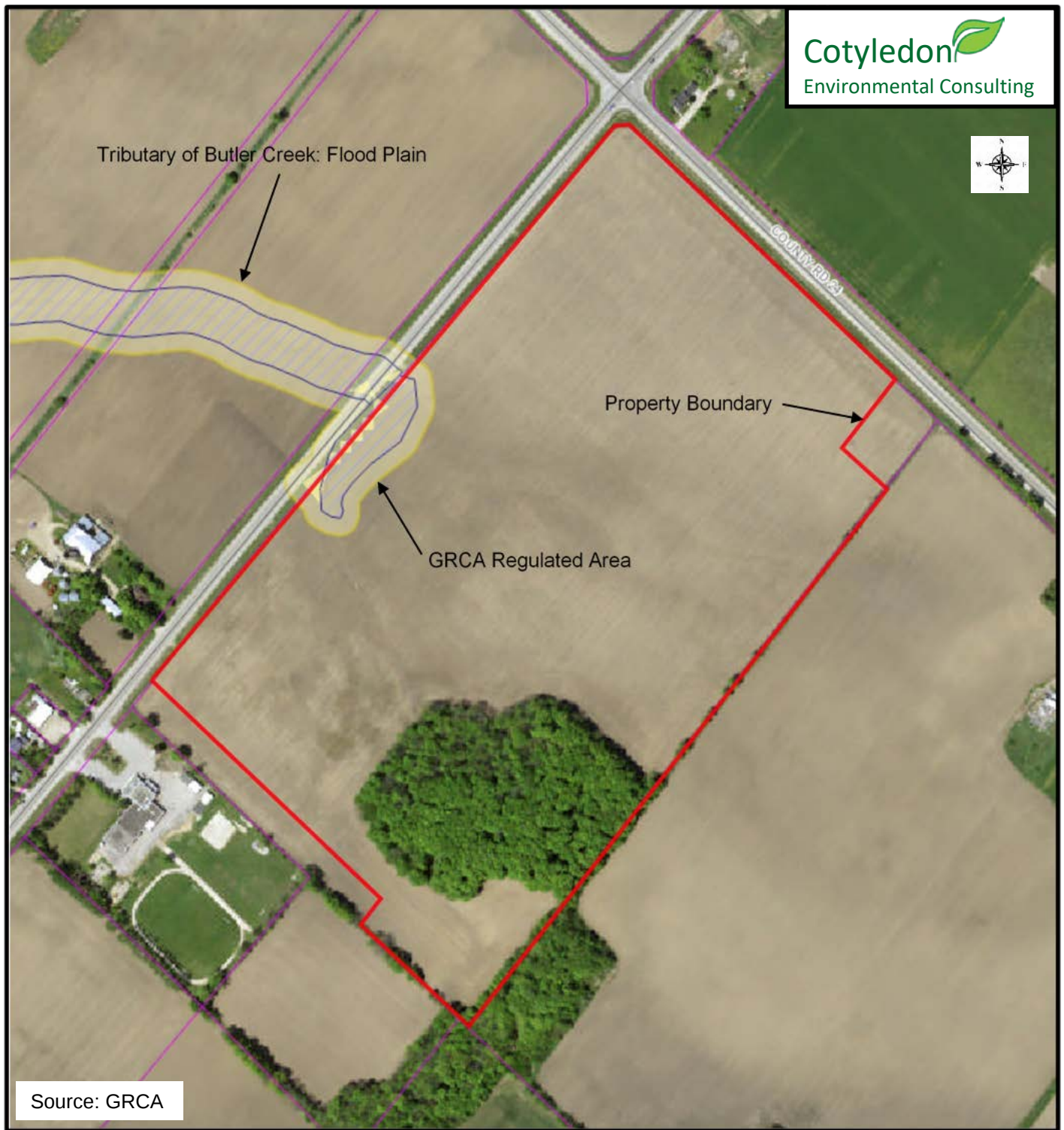


Figure 5: Grand River Conservation Authority Regulated Area on the Property.

12.4 Dufferin County Official Plan

The County's Official Plan was approved by the Ministry of Municipal Affairs and Housing on March 27th, 2015, and consolidated in August 2025. Like most Official Plans Dufferin County parrots the Provincial Planning Statement and conservation authority policies regarding development restrictions. Section 5.3 states:

- a) Development and site alteration will not be permitted in significant wetlands.*
- b) Development and site alteration will not be permitted in
 - i. Significant woodlands;*
 - ii. Significant valleylands;*
 - iii. Significant wildlife habitat; and,*
 - iv. Significant areas of natural and scientific interest, unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions.**
- c) Development and site alteration will not be permitted in fish habitat except in accordance with Provincial and Federal requirements.*
- d) Development and site alteration will not be permitted in habitat of endangered species and threatened species, except in accordance with Provincial and Federal requirements.*

The Dufferin County Official Plan states;

The majority of growth will be directed to the County's Settlement Areas to focus public and private investment in built-up areas and to preserve the agricultural area and conserve the natural heritage features and areas.

... lands which have been designated in an official plan for development over the long-term planning horizon.

Schedule B of the Dufferin County Official Plan has the entire Property in the Marsville-East Garafraxa Community Settlement Area (Figure 6). Therefore, the Property is in an area that is planned for future residential development.

Schedule E, of the Dufferin County Official Plan, which identifies Natural Heritage Features, is illustrated in Figure 7. Figure 7 indicates there is a water course and small woodland on the Property.

Woodlands refers to treed areas that provide environmental and economic benefits, such as erosion prevention, hydrological and nutrient cycling, provision of clean air and the long-term storage of carbon, provision of wildlife habitat, outdoor recreational

opportunities, and the sustainable harvest of a wide range of woodland products. The ecological significance of a woodland is generally proportional to its size, its biological diversity, and whether it is linked to adjacent Natural Heritage Features to provide environmental complexes or wildlife corridors.

The determination of the significance of the wetlands and woodlands on the Property in relation to environmental policy is discussed in Sections 16.4.1 and 16.5.1 respectively.

The Marsville municipal drinking water well is about 800 m southwest of the Property. The well head protection zone, as mapped by the GRCA, extends across the north half of the Property. The well head protection zone is illustrated in Figure 8.

The Dufferin County Official Plan states;

Prior to approval of new or expanded development within well head protection areas ... the proponent shall demonstrate that pre-development groundwater recharge rates will be maintained and/or where possible, improved.

Water resource management is not in the scope of work for this EIS. A Water Resource Management Report, if required, will be prepared as part of the hydrogeological studies of the Property and submitted separately in support of the Plan of Subdivision by another consultant.

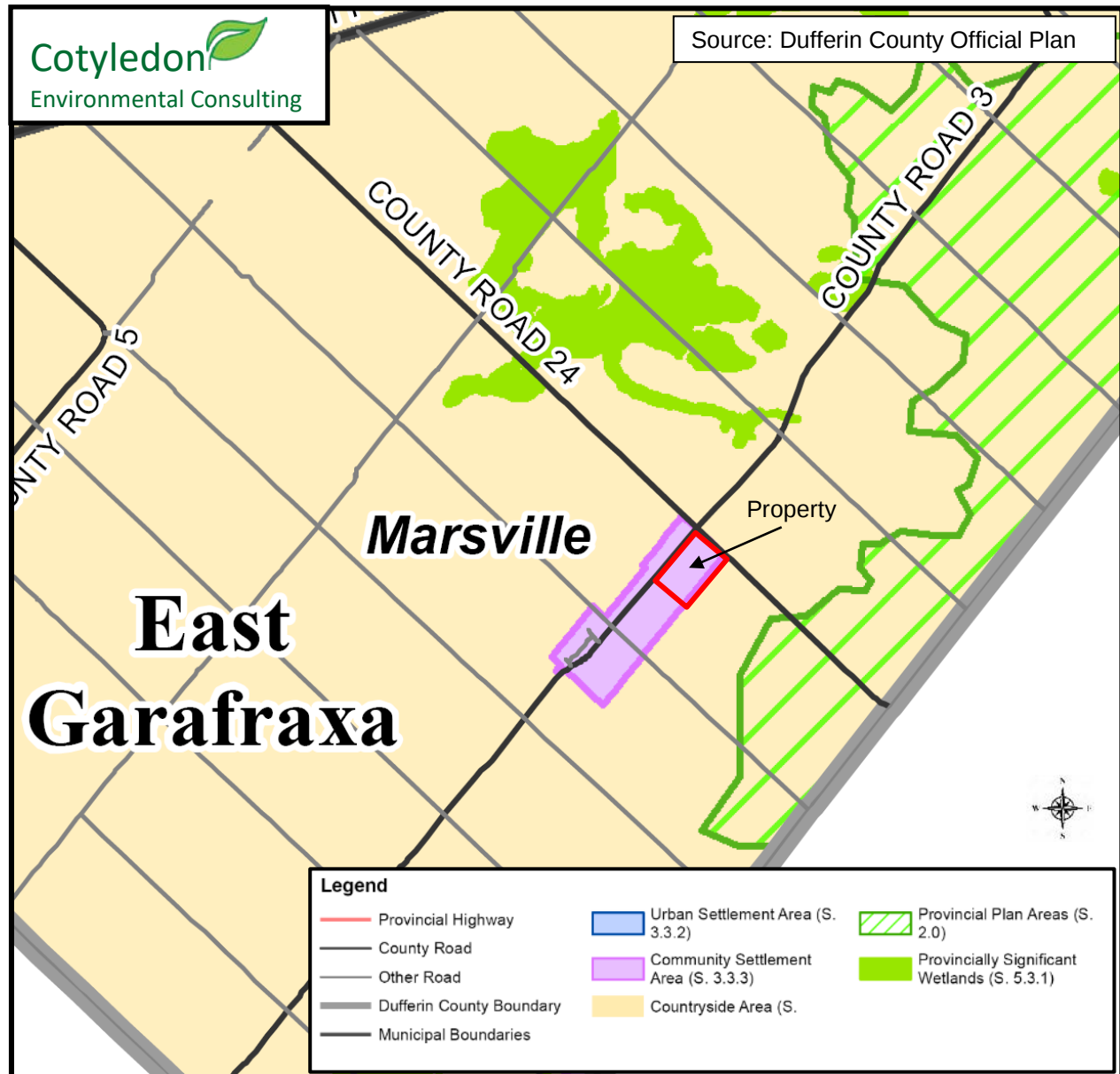


Figure 6: Dufferin County Official Plan Schedule B community structure and land use.

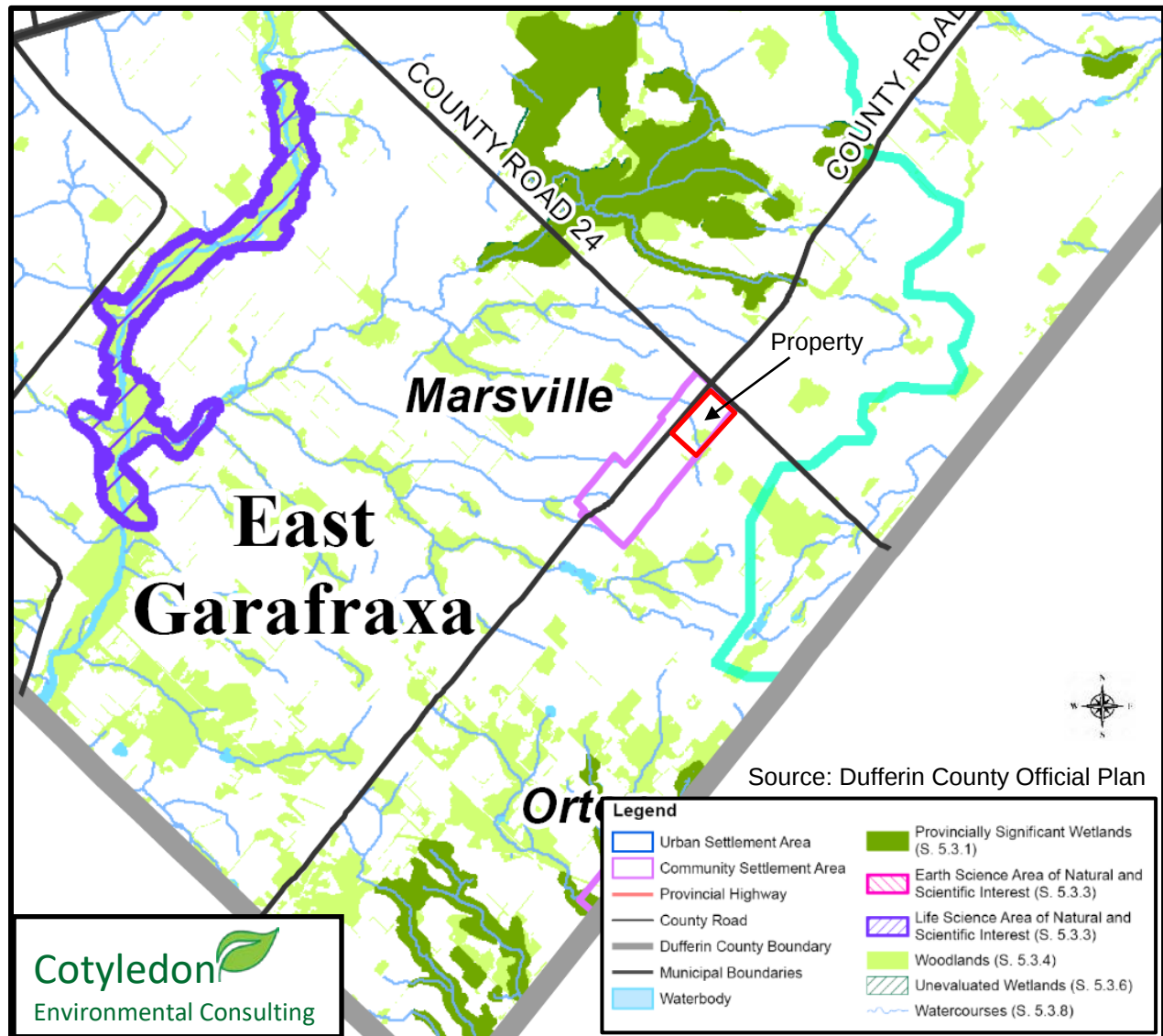


Figure 7: Dufferin County Official Plan Schedule E Natural Heritage Features.

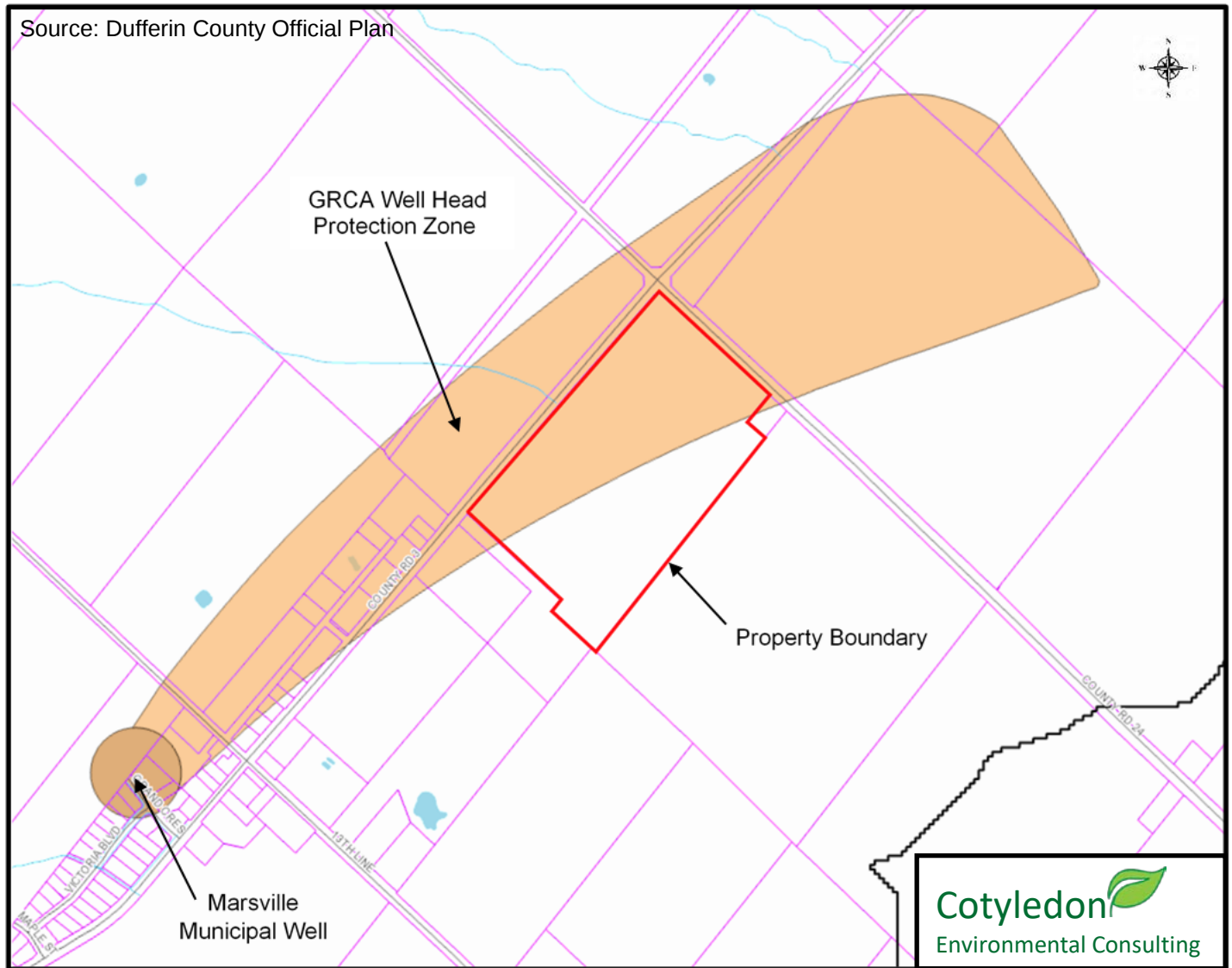


Figure 8: Extent of the Marsville municipal well Wellhead protection zone.

12.5 Township of East Garafraxa Official Plan

The Township of East Garafraxa Official Plan was updated by council in May 2025. The East Garafraxa plan has the entire Property included in the Marsville Community Boundary, which is an area intended for future development (Figure 9). The west approximately $\frac{3}{4}$ of the Property is designated Community Residential and the east $\frac{1}{4}$ is Employment. This is consistent with the proposed development and the current Plan of Subdivision. Figure 9 also identifies a small strip of Environmental Protection at the north edge of the Property immediately adjacent to County Road 3 and the Brauer Drain which corresponds to the GRCA Regulated Area. This feature is further discussed in Section 22.2.2.

Section 5.7.1 of the Official Plan identifies Environmental Protection areas (Natural Heritage Features) where development may be restricted.

The Environmental Protection designation includes lands that are environmentally sensitive and those used for outdoor recreation. The outdoor amenities of the Township include passive parks and trails. The Environmental Protection designation includes:

- a. Areas with physical constraints to development such as poor drainage, organic soils, flood susceptibility, erosion, steep slopes or any other physical condition which is hazardous to potential development;*
- b. Fish habitat;*
- c. Significant portions of the habitat of threatened or endangered species and other areas of significant wildlife habitat;*
- d. Areas of Natural or Scientific Interest (ANSI);*
- e. Environmentally Sensitive Areas (ESA);*
- f. Wetlands;*
- g. Significant woodlands; and*
- h. Valleylands; and*
- i. Rivers, lakes, streams and creeks.*

Schedule B of the East Garafraxa Official Plan (Figure 10) illustrates that there are no Natural Heritage Features on or within 120 m of the Property. The study area is defined as the Property and all adjacent lands within 120 m. This is the normal area of consideration for an EIS. However, for completeness and an abundance of caution, if the EIS is reviewed more widely, particularly through public consultation, questions are occasionally raised about local environmental features more distant from the property, such as popular conservation areas or provincial parks. Table 3 lists the Natural Heritage Features nearest the Property. The closest Natural Heritage Feature is an unevaluated wetland about 465 m S of the Property. The closest provincially significant wetland is 1.0 km NNE. Two ANSIs are between 5 and 7 km distance. The closest Conservation Area is 12.5 km SW and the closest Provincial Park is 15.1 km ESE. There are no known archeological or specialty crop areas on, adjacent to, or in the local vicinity of the property. The proposed development will have no impact on the local Natural Heritage Features because they are too far away.

Schedule B identifies a cold water stream crossing the Property. Unquestionably it is not a cold water stream. This is discussed further in Section 13.3.1.

Section 7.7 requires the protection of watercourses and fish habitat.

...maintenance of existing watercourses in a healthy natural state.

Water resources and vegetation abutting watercourses will be maintained in a clean and healthy condition to protect aquatic life and functions.

The watercourse on the Property and fish habitat are discussed in Section 13.3 and Section 17.6 respectively.

Section 7.9 defines Significant Forest Areas.

Significant Forest Areas include but are not limited to, county Forests, all woodlands 40 ha in size or larger and all forest stands that are in excess of 60 years of age and 4.0 ha in size.

The woodland on the property is described in Sections 16.5 and 16.5.1 and Table 7.

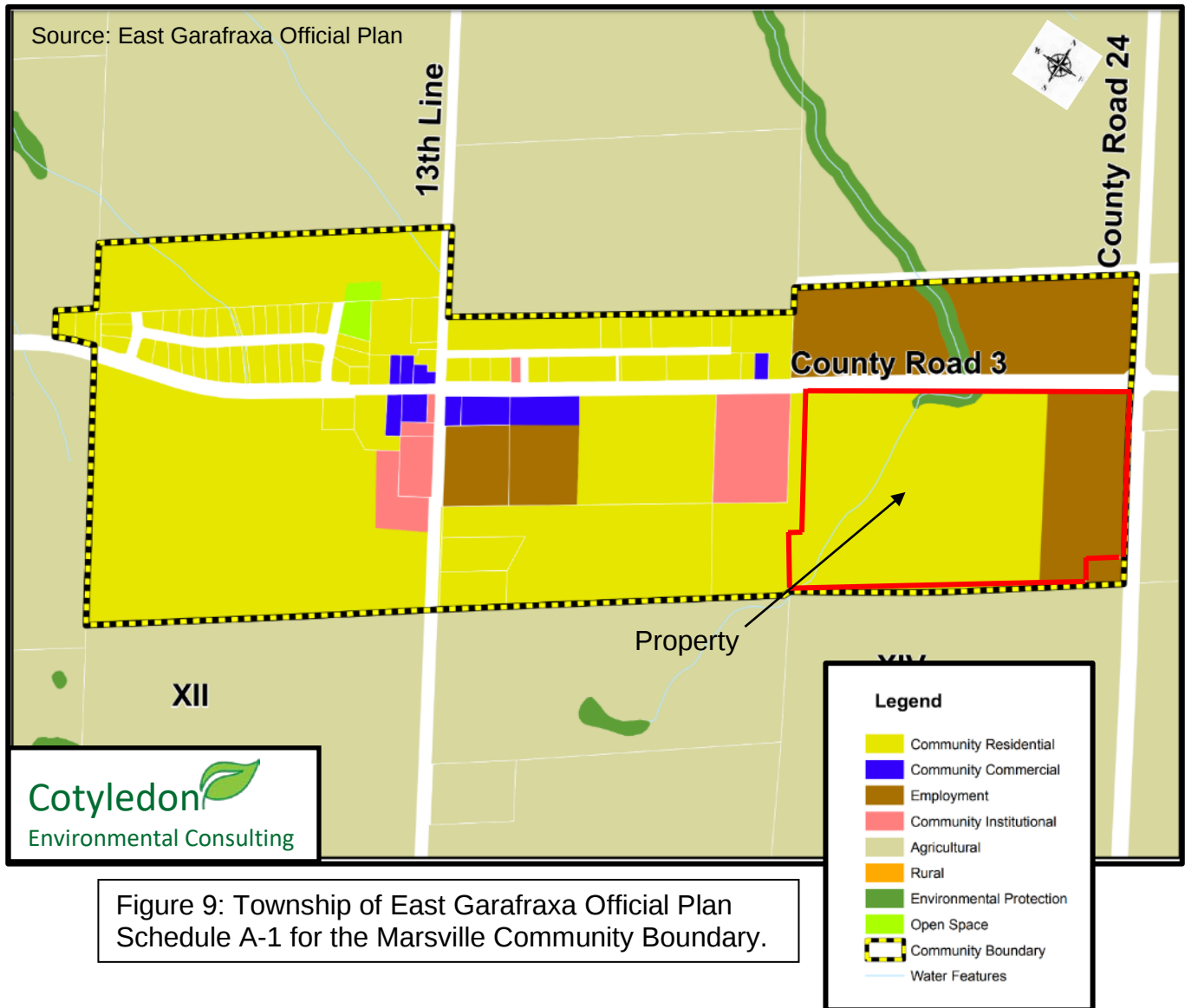
Section 7.10 refers to significant wildlife habitat.

a) Habitat of rare and vulnerable species considered significant wildlife habitat and the significant habitat of threatened and endangered plant and animal species of which are identified by the Ministry of Natural Resources and Forestry shall be protected.

b) No development and site alteration is permitted within the significant habitat of threatened and endangered species. Where development and site alteration are proposed within 120 metres of the significant habitat of threatened and endangered species, Council shall require the submission of an Environmental Impact Assessment Report...

Significant wildlife habitat is discussed in Section 19.0 and Table 18.

If a Water Resource Management Report is required by the Township it will be provided under separate cover by another consultant, as it is not in the Scope of Work for this EIS.



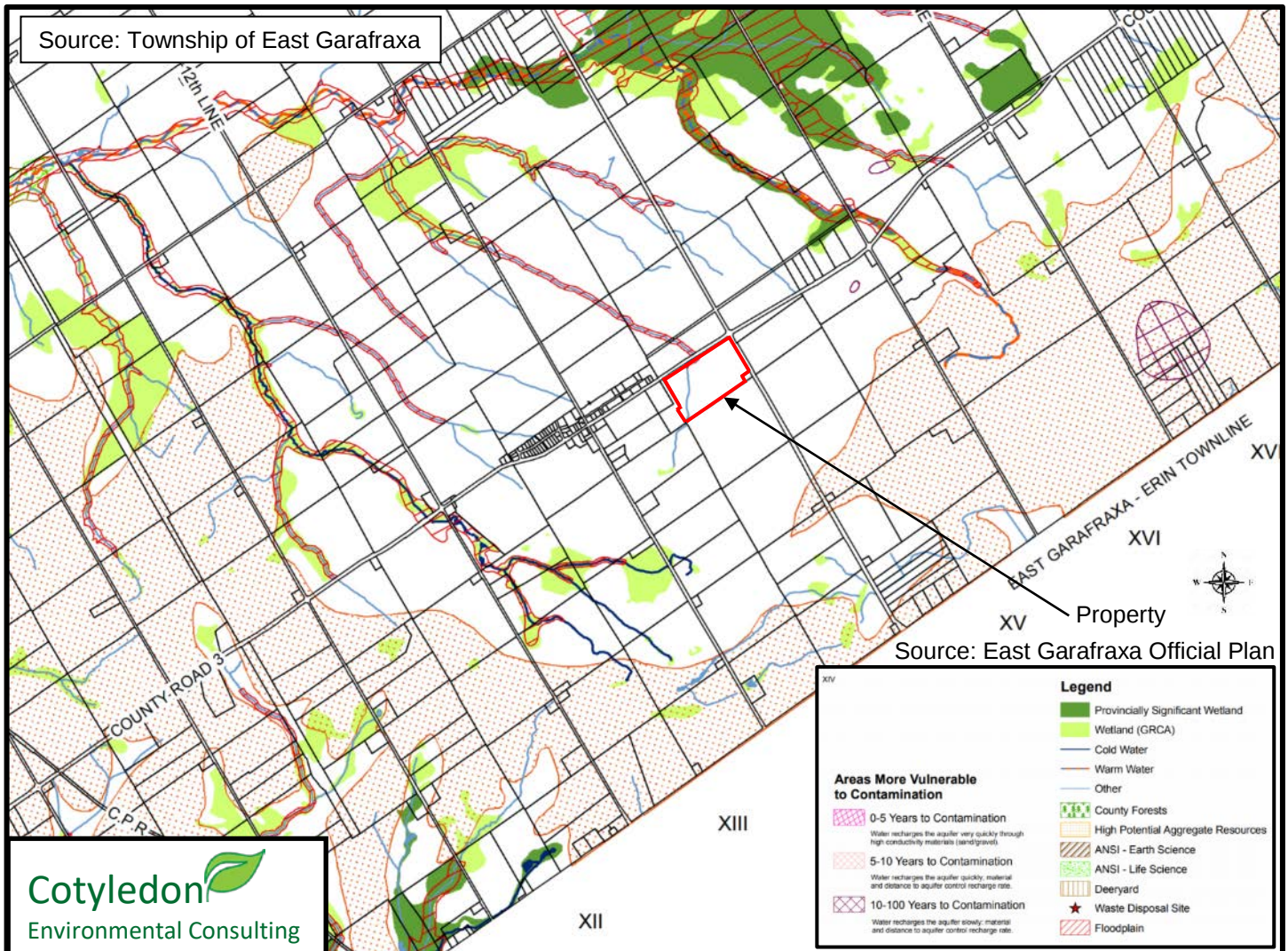


Figure 10: East Garafraxa Official Plan Schedule B illustrates that there are no Natural Heritage Features on or within 120 m of the Property.

Table 3: Natural Heritage Features nearest the Property.

Feature	Distance & Direction
Forks of the Credit Provincial Park	15.1 km ESE
ANSI Hillsburgh Meltwater Channel (Earth Science)	5.4 km SE
ANSI Caledon Lake Forest (Life Science)	7.4 km NE
GRCA Bellwood Lake Conservation Area	12.5 km SW
Provincially Significant Wetland Reading Swamp	1.0 km NNE
Luther Marsh Wildlife Management Area	15.0 km NW
Farmington Conservation Reserve	10.2 km NNE
Unevaluated Wetland	465 m SE
Archeological Site	None known within 30 km
Specialty Crop Areas	None known within 30 km

13.0 Natural Heritage Features, Ecological Landscape Classification, and Description and Significance.

13.1 Landscape Features on the Property

The Property is neither large nor ecologically diverse. It is typical of rural agricultural properties in southern Ontario. The Property is about 26.5 ha (65.4 ac) in size. There are four landscape features on the Property:

1. Active Agricultural Field – 23.2 ha (57.4 ac);
2. Stream – area not calculated;
3. Unevaluated Wetland – 0.07 ha (0.18 ac), and;
4. Woodland – 3.2 ha (7.8 ac).

These four landscape features are summarized in Table 4 and illustrated in Figure 11 and Figure 12.

Three of the four landscape features are possible Natural Heritage Features - the woodland, the stream and the wetland. These features are relatively small and not consistently recognized by the regulatory agencies. For example, the MNR Natural Heritage Information Centre (NHIC) identifies the wetland and the woodland but not the stream in their on-line mapping tools. The GRCA doesn't recognize any of the features, although it refers to the MNR/NHIC mapping for the wetland and the woodland. The Dufferin County Official Plan identifies the woodland and the stream but not the wetland on the Property. The Township of East Garafraxa Official Plan doesn't identify either the woodland or the wetland but it does identify the stream. None of the planning authorities recognize the woodland, the stream or the wetland as part of a local or regional Natural Heritage System.

The local landscape in the vicinity of the Property is predominantly agricultural. The natural landscape is very fractured and the local and regional woodlands and wetlands are generally small and isolated. The distance between the local natural landscape features and the woodland, the stream, and the wetland on the Property are too great to form functioning ecological corridors or linkages, so they cannot be complexed. Other than being small, isolated, ecological refugees, the woodland, the stream, and the wetland on the Property do not directly support the local or regional Natural Heritage System, and as identified in the previous paragraph, none of the planning authorities recognize these three natural features as part of a local or regional Natural Heritage System.

Table 4: The landscape features on the Property.

Landscape Feature	Ecological Land Classification	Area ha (ac)	% of the Property
Agricultural Field	OAGM1	23.2 (57.4)	87.5%
Stream	No ELC	Not Calculated	Not Calculated
Wetland	MAMM2-1	0.07 (0.18)	0.26%
Woodland	FODM5-8	3.2 (7.8)	12.2%
Total		26.5 (65.4)	100%
See Figures 11 and 12 for images of the Property. OAGM1. Open Agriculture Annual Row Crop MAMM2-1. Jewelweed Forb Mineral Meadow Marsh FODM5-8. Dry-fresh Sugar Maple - White Ash Deciduous Forest			

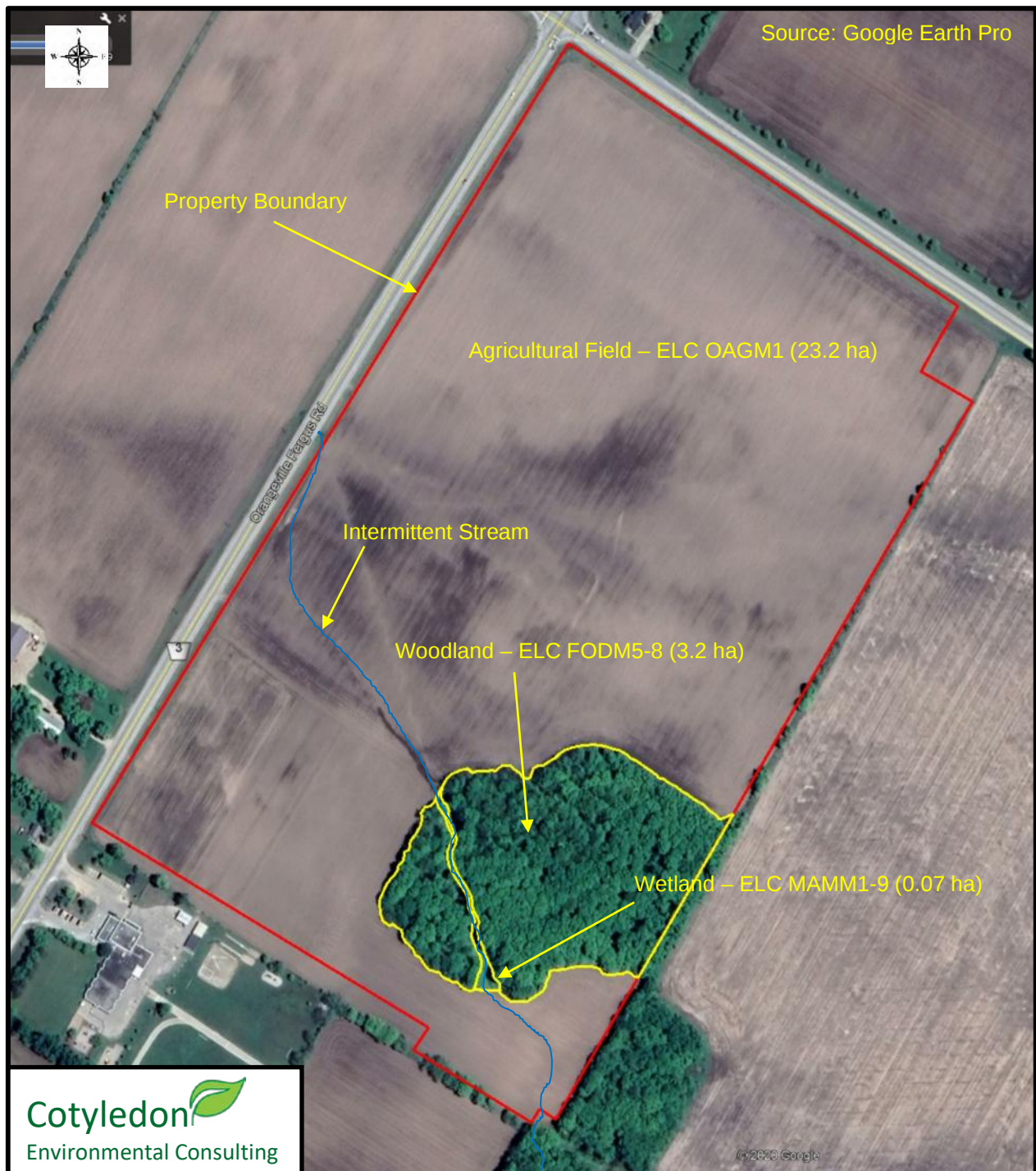


Figure 11: The four landscape features on the Property (wetland, woodland, agricultural field and stream).

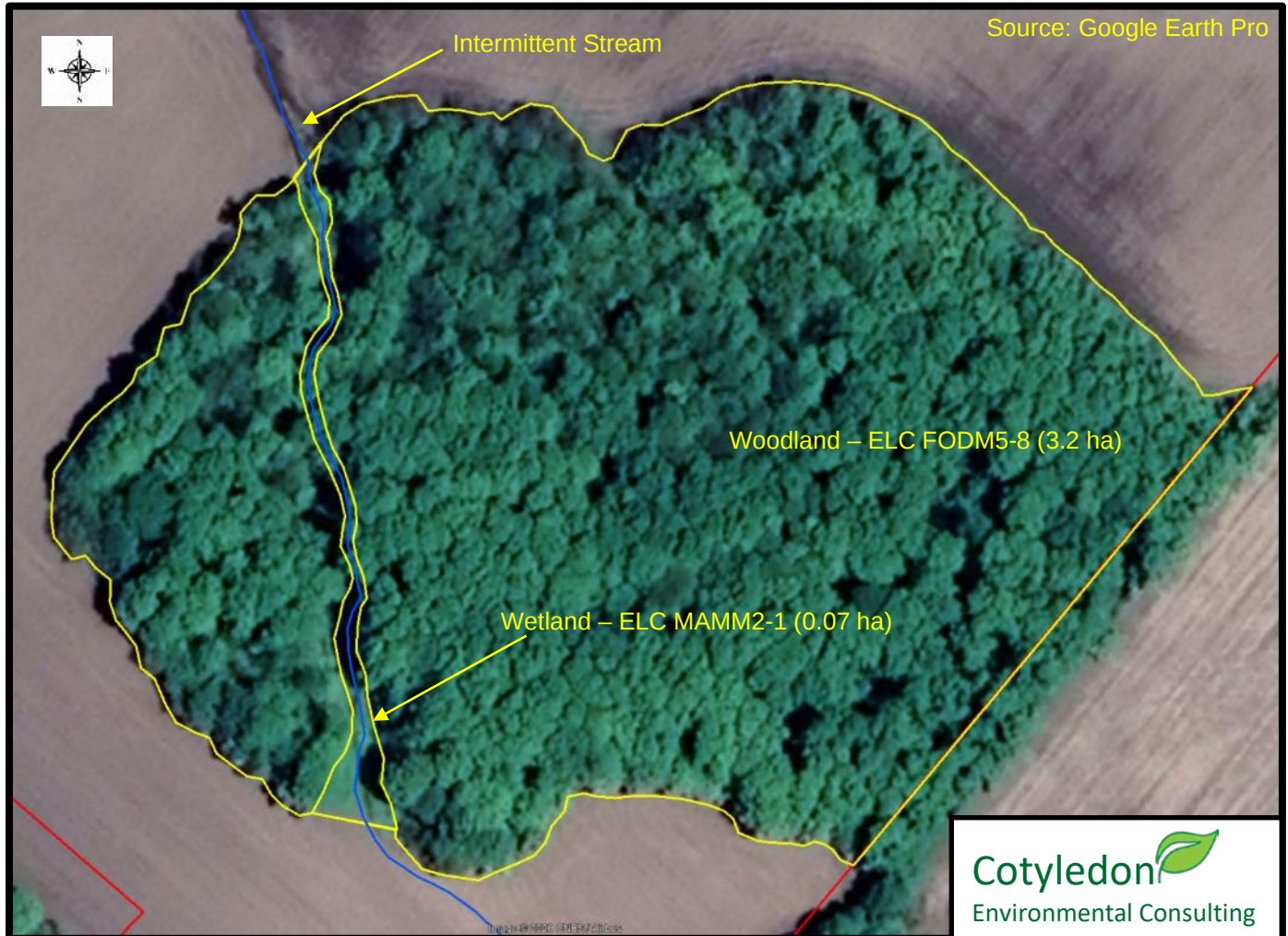


Figure 12: Enlargement of Figure 11 highlighting the extent of the wetland.

13.2 Agricultural Field

The agricultural field is the largest landscape feature, comprising about 87.5% of the Property (23.2 ha/ 57.4 ac). It is an active field, continuously in crop rotation. It was apparent from observations on-site and historical ortho-images that the field has been in agricultural production for many years. It is tile drained, as are many agricultural fields in rural Ontario. In 2019 the field was planted to corn, in 2020 it was planted to winter wheat, and in 2021 it was planted in soybeans. No observations of crop production were made between 2022 and 2025.

The ELC classification for this type of cropland is OAGM1, *Open Agriculture Annual Row Crop*. The agricultural field is illustrated in Photo 1.

The plowing pattern was across the contour rather than parallel the contour. This clearly indicates that the field is flat enough so surface erosion is not a concern, and dry enough to plow and seed without regard to the intermittent stream that bisects the field.

13.2.1 Ecological Significance of the Agricultural Field

No species at risk were observed on or in the vicinity of the field during any of the 11 site visits conducted over 3 seasons and 3 years. Specifically, neither the Bobolink nor the Eastern Meadowlark were observed, even though there are NHIC records of these birds in the area. Crop fields are marginal nesting and foraging habitat for these birds, both species prefer meadows and hayfields.

The agricultural field is not a Natural Heritage Feature and it is not recognized as part of a municipal, regional or provincial Natural Heritage System. There is no ecological restriction to developing this portion of the property, and the proposed residential and employment development is consistent with current municipal planning.



Photo 1: The agricultural field (ELC OAGM1) is the largest landscape feature on the Property (23.2 ha/57.4 acres). It has been continuously cropped. The slight swale from the intermittent stream can be seen as a thin green line through the center of the field.

13.3 Stream

A small intermittent stream enters the southwest corner of the Property (Photo 2), flows northerly across a section of the agricultural field (Photo 3), flows northeasterly through the northwest corner of the woodland (Photo 4), then flows northerly across a large section of the agricultural field (Photo 5), and joins the municipal ditch on the south side of County Road 3 where it empties into the Brauwer Drain via a culvert under County Road 3 (Photo 6).

Figure 13 is a profile of the stream as it crosses the Property. During the March 13, 2020 site visit the Stream channel was walked across the entire Property with a Garmin GPSMap 62c in tracking mode. This site visit was conducted after a substantial winter snowfall followed by a rapid thaw in which virtually all of the snow melted from the landscape. This should represent the stream's peak seasonal surface flow. Based on the depth, width and speed of the water where it entered the small woodland, the flow was estimated at between 0.15 m³/sec and 0.3 m³/sec.

The Stream profile in Figure 13 illustrates that the Stream elevation where it enters the Property is about 491.03 m. This falls to 485.85 m at the culvert by County Road 3, for a total elevation drop of about 5.18 m. The Stream length, as walked along the centre of the channel from the southwest corner of the Property to the culvert, is about 685m. The mean Stream slope is 1.0%, with a maximum slope of 9.3%. Where the Stream flowed through the field it was quite narrow, the flowing water was between about 50 cm to 1 m wide. Where the stream enters the woodland the slope lessens, the flow slackens, and the water spreads out. On March 13, 2020 the standing water along the Stream channel in the woodland varied in width from about 1 m to approximately 10 m, but averaged about 2 or 3 m. The stream could be walked with standard rubber boots, and the ground was firm underfoot, so at its deepest it was no more than 30 cm deep. A seasonally high water table along the Stream where it flows through the woodland impedes root growth which creates a shallow root system, so trees adjacent to the stream path are susceptible to blowdown, as observed in Photo 7.



Photo 2: The stream enters the southwest corner of the Property from an adjacent woodland. This photo was taken in March 2020 and illustrates the maximum flow associated with a rapid snow melt.



Photo 3: The stream flows across the southwest corner of the property. Another early spring photo that illustrates peak spring thaw flow.



Photo 4: The stream cuts through the northwest corner of the small woodland.



Photo 5: (above) The stream flows across the agricultural field during a March 2020 thaw.

Photo 6: (below) The stream flows under County Road 3 via a culvert into the Brauwer Drain.



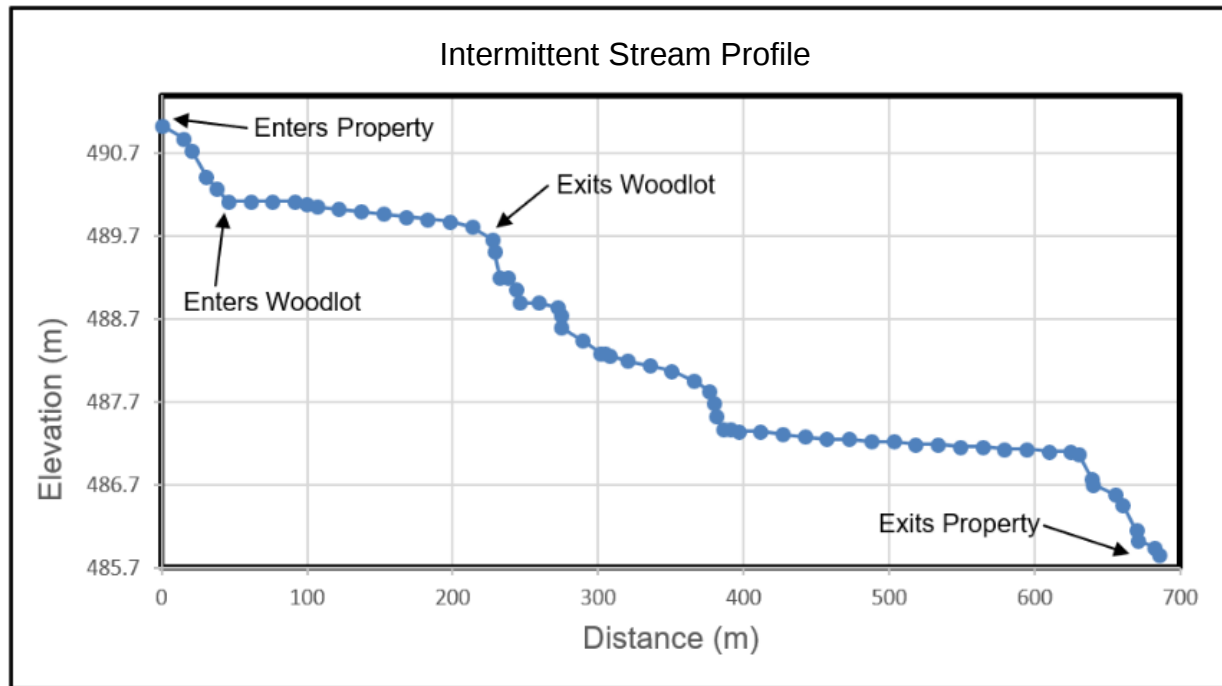


Figure 13: Intermittent stream characteristics¹

Elevation at Property Entrance	491.03 m
Elevation at Property Exit	485.85 m
Total Elevation Drop	5.18 m
Total Length Across Property	685 m
Mean Slope	1.0%
Maximum Slope	9.3%
Approximate Flow Rate	0.15 - 0.3 m ³ /sec
¹ Observations on March 13, 2020 immediately after a rapid spring thaw, using a Garmin <u>GPSmap 62SC</u> in track mode. Flow rate estimated at point where the creek enters the woodlot.	



Photo 7: A high water table and soil saturation limits root depth and trees near the stream edge are susceptible to blowdown.

13.3.1 Ecological Significance of the Stream, Including Fish Habitat

Figure 5 illustrates that a small portion, about 0.73 ha (1.8 acres), of the north edge of the Property adjacent to the culvert that flows under County Road 3 into the Brauwer Drain is designated as a GRCA Regulated Area, or Environmental Protection area. The Regulated Area is defined by the GRCA as part of the Butler Creek flood plain, based on a 30 m setback from the headwater stream. This is an over-extension of the Regulated Area by the GRCA as the small area on the Property south of County Road 3 clearly isn't a flood plain, because;

- 1) there is no defined stream channel in that part of the field,
- 2) the drainage path is in an active agricultural field that has been cultivated for years,
- 3) there is no natural ecological habitat in the area (it is agricultural field and municipal roadway ditch),
- 4) the area is part of a municipal ditch that runs along the south side of County Road 3,
- 5) the area is virtually flat and there is no erosion hazard,
- 6) the only seasonal flooding that occurs is a portion of the municipal ditch and a small area of the agricultural field that flows high during the spring snow melt, the area is otherwise mostly dry, other than rain water collected by the ditch, and
- 7) the Brauwer Drain is not a natural feature, it is a municipal catchment basin that drops vertically into a drainage system for the agricultural field north of the Property.

The stream had standing melt water in some areas of the channel during the February 2020 site visit. It was flowing rapidly with spring meltwater during the March 2020 site visit. It was completely dry along its entire length during the July and August 2020 and 2021 site visits. These conditions are not unique to 2020 and 2021. A flowing stream is not visible on summer ortho-images from previous years, and the Property owner's son, who was present during the February 2020 site visit, confirmed that the stream habitually dries up in the summer. In all years since CEC has assessed the Property (2020 – 2025) the agricultural field was in-crop across the entire field, including the slight swale marking the stream. It was clear the stream dries up sufficiently early in the spring to permit cultivation and crop production. Photos 8 and 9 illustrate the stream north of the woodland and Photos 10 and 11 illustrate the stream in the southwest corner of the Property. Photo 12 illustrates rows of winter wheat seeded the previous fall submerged by the spring meltwater in March 2020. The stream swale dried completely and the wheat grew and was harvested.

The Township of East Garafraxa Official Plan designates the stream as a cold water stream (Figure 10). Without question it is not a cold water stream. It is intermittent, flowing only for a brief time during the spring snow melt. It is completely dry the remainder of the year, permitting annual agricultural row crop production. There is no defined channel and no riparian corridor to provide shade to cool a stream, even if stream flow persisted. There is no direct or indirect fish habitat on the Property, because the stream is intermittent, it dries out completely every year, and the drainage channel is cultivated. There is no permanent standing water. Furthermore, the Brauwer Drain, into which the stream flows, includes a vertical-drop catch basin which feeds into an agricultural tile drainage system under the field immediately north of the Property. Therefore, fish that may be present in the headwaters of Butler Creek can't migrate upstream into the stream on the Property because they can't navigate the drain system and the vertical lift of the Brauwer Drain. Therefore, without question, there is no sustainable fish habitat on the Property. Fish habitat is discussed further in Section 17.6.

To further explore the ecological significance of the stream it was reviewed in relation to the *Evaluation, Classification and Management of Headwater Drainage Features Guideline* (Toronto and Region Conservation Authority and Credit Valley Conservation). The HDF guideline is intended '*to provide direction to practitioners for those features that are not clearly covered by existing policy and legislation*'. It recognizes that headwater features, although usually physically and geographically small and often have seasonal or discontinuous water flow, may not only have ecological value in and of themselves but may also contribute to ecosystem functionality downstream.

Working through the guideline matrix arrives at one of six management outcomes ranging from *No Management Required*, where the feature has minimal ecological value and essentially no development restrictions, to *Protection*, where the feature has substantial ecological value and protection from development is warranted. A figure, clipped from the HDF guideline, is reproduced as Figure 14.

The stream maps out to *No Management Required*. This is the lowest ecological functionality outcome because it has minimal seasonal flow, the stream channel is row-cropped, there is no riparian vegetation buffer, and there is no fish or amphibian habitat.

The stream is not a Natural Heritage Feature because it is intermittent, it is part of an annually cropped agricultural field, it has no defined channel, it has no direct or indirect fish habitat, and it is not a functioning Headwater Drainage Feature. Providing the surface water flow from the annual snow melt can be managed, there is no restriction to development. A GRCA permit may be required for development in a Regulated Area.



Photo 8 (above): The stream flows freely with spring snow melt in March 2020.
Photo 9 (below): The stream is intermittent. It was completely dry in July and August 2020, and every crop season.





Photo 10 (above): March 13, 2020 the flooded stream enters from the southwest corner of the Property.

Photo 11 (below): The same area July 31, 2020 the dry stream channel isn't visible. The stream dries up completely after the spring runoff.





Photo 12: The rows of winter wheat seeded the previous fall are visible under the spring meltwater in the centre of the stream running across the agricultural field in March 2020. The stream channel dried, the wheat grew and was harvested

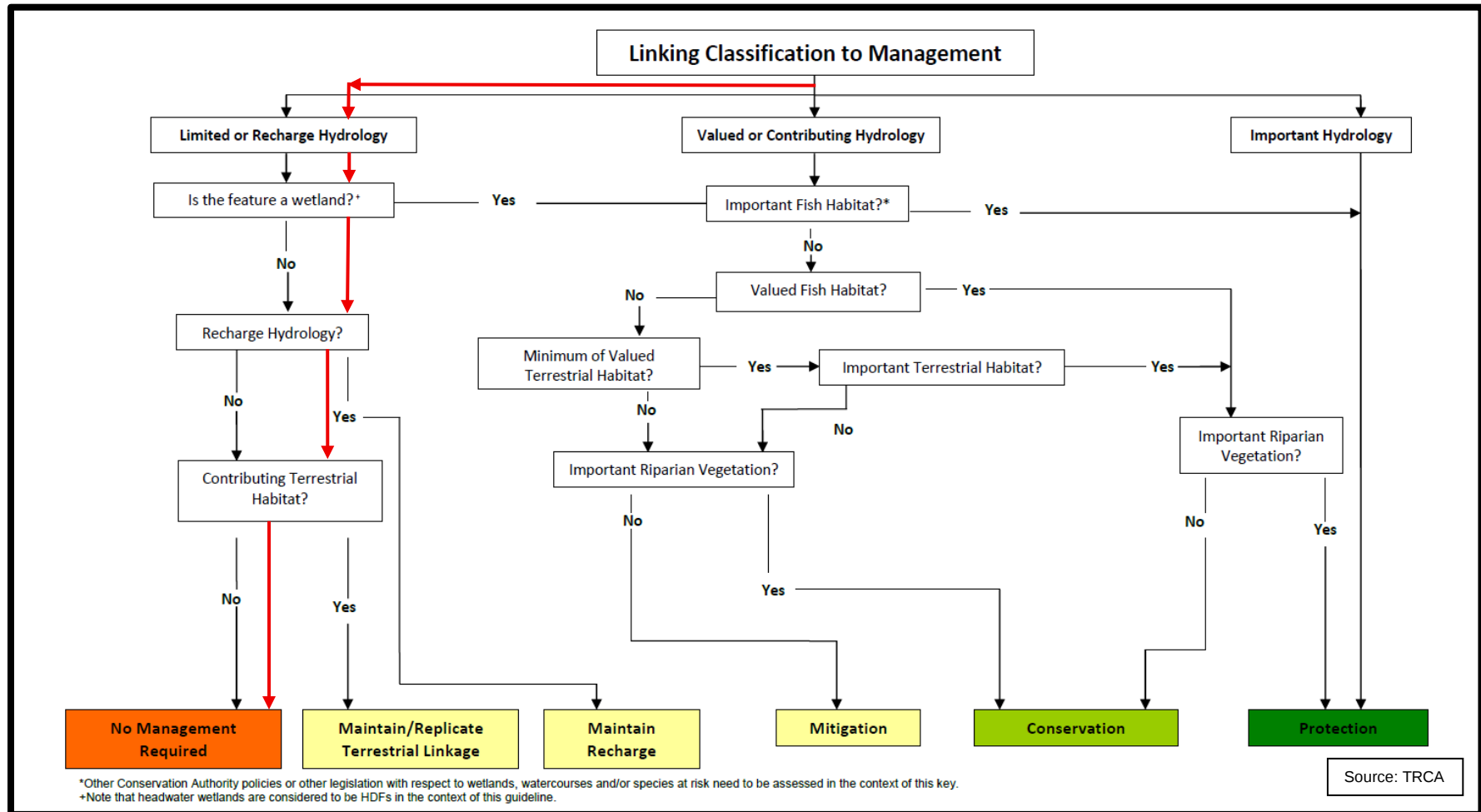


Figure 14: The Headwater Drainage Feature keys out to *No Management Required*.

13.4 Wetland

The wetland area on the Property is very small, just 0.07 ha (0.18 ac) in size, or about 0.26% of the Property. It is really just a widening of the intermittent stream as the seasonal meltwater slows and spreads out where it flows through the northwest corner of the woodland. The edges are very abrupt and well defined. The vegetation in the wetland is dominated by Spotted Jewelweed with lesser components of Manna Grass and Ostrich Fern. Red-osier Dogwood was a common woody shrub along the edges. Normally, ELC classification is not warranted on features less than 0.5 ha in size, but for completeness the wetland approximates a *Jewelweed Forb Mineral Meadow Marsh, MAMM2-1*.

The size and location of the wetland was easy to determine. The edge of the wetland is very abrupt, essentially the extent of the flowing stream during the spring thaw. The perimeter of the wetland was walked during the February and March 2020 site visits with a Garmin GPSMap 62c in tracking mode. The GPS track was transposed on Google Earth Pro ortho-images in both leaf-on and leaf-off condition. The area calculations of the GPS track and the Google Earth Pro images compared very favorably, confirming the size of about 0.07 ha (Figure 12).

Like the stream, the wetland dries completely after the spring season. There was no flowing or standing water anywhere along the wetland's course during multiple June, July and August 2020 and 2021 site visits.

The wetland is illustrated in Photos 13, 14, 15, 16 and 17.

This feature is recognized as a wetland on the on-line NHIC interactive mapping tool, but there is no wetland evaluation file, which means it has not been evaluated. Also, the NHIC map suggests the wetland encompasses most of the area of the woodlot; however, based on site visits, observations, physical, and GIS and GPS measurements, this is clearly not the case as the wetland covers only about 2% of the woodland. The wetland is not identified on the Dufferin County Official Plan, the Township of East Garafraxa Official Plan, or the GRCA natural features maps. The wetland is not recognized as part of the Natural Heritage System in the NHIC database.

In the summer the dry stream bed clearly shows it is a mineral soil base, there is no fibric organic matter accumulation. In July and August the bare soil areas in the wetland the soil was cracked, and turning it over with a spade did not reveal moist soil at a depth of about 20 cm (the spade's length).

In the stream channel is a wetland-like habitat dominated by a few moisture tolerant plants. On the outside edge of the channel is a deciduous forest – there is no riparian transition zone.

By far the predominant plant species in the majority of the wetland was Spotted Jewelweed. In some areas it covered the entire stream channel from forest edge to forest edge. Manna Grass, Sensitive Fern and Ostrich Fern were common secondary species. In the small openings that weren't covered in Jewelweed there was Yellow Flat Sedge, Hairy Willow-herb, Low Cudweed and Bittersweet Nightshade. Red-osier Dogwood, Devil's Beggar-tick and Panicked Aster were common along the wetland edges. In the driest and most open areas where the mineral soil was fully exposed, Ragweed, Lamb's Quarters, Yellow Foxtail and Coltsfoot had seeded in. Because there is no permanent standing water there were no submergent or floating vegetation species.



Photo 13 (above): The physical extent of the wetland is defined by the extent of the flowing meltwater in early spring.
Photo 14 (below): The wetland dries up completely in the summer.





Photo 15 (above): The stream meanders through the woodlot (March 13, 2020).
Photo 16 (below): The same section of the stream is completely dry in the summer (July 31, 2020).





Photo 17: Exposed mineral soil in the widest and deepest area of the small wetland in the woodlot. The stream bed was completely dry throughout July and August 2020 and 2021.

16.4.1 Ecological Significance of the Wetland

Wetlands are normally evaluated in relation to their ecological and social significance using the Ontario Wetland Evaluation System (OWES). The OWES looks at a large number of biological, social, hydrological and special feature wetland components and derives a numerical score to determine the wetland's classification. The minimum score for a wetland to be classified as *Provincially Significant* is 600, or 200 or more in either the biological or special features components. Based on the OWES evaluation criteria and observations during the 11 site visits over 3 seasons and 3 years, without question the wetland would not score high enough to be designated *Provincially Significant* for the following reasons:

- It is very small.
 - Normally wetlands less than 2 ha would not be evaluated;
 - The wetland is only about 0.07 ha, about 3% of the minimum size criterion;
 - Minimum size for individual OWES vegetation community mapping is 0.5 ha;
 - The entire wetland is only 14% of the minimum size criterion.
- It appears on the NHIC database but there is no NHIC wetland evaluation file.
 - Regulatory authorities have never considered the wetland substantial enough to warrant evaluation nor consider it for complexing with local or regional Natural Heritage Features;
 - The Dufferin County Official Plan, the Township of East Garafraxa Official Plan, and the GRCA don't recognize the wetland on their Natural Heritage System maps.
- Based on the plant species, the biodiversity is very low.
 - Of the 23 species of plants identified in the wetland only 10, or 43%, are identified in the OWES Appendix 10 as wetland indicators.
 - It doesn't meet the 50/50 wetland rule, whereby 50% of the plant species should be (OWES) wetland indicator species.
- There is no permanent open water, it flows in the spring with the snowmelt and dries up completely in the summer and fall.
 - There is no water fowl nesting habitat;
 - There is no waterfowl staging of stopover habitat;
 - There is no aquatic mammal habitat;
 - There is no fish habitat;
 - There is no amphibian or reptile breeding habitat;
 - Raptor winter foraging and roosting habitat is questionable.
- It has no meaningful groundwater retention or recharge functions.

- It has no meaningful erosion or flood control functions.
- It is physically and ecologically isolated so it cannot be linked with or complexed with nearby Natural Heritage Features.
- There are no known species at risk dependent on the wetland for foraging or breeding habitat.
- There are no special features or local social or cultural components.
- It is privately owned so there are no recreational or educational opportunities to the public.
- It does not produce any economically valuable products.

Section 28(25) of the Conservation Authority Act has a technical definition of a wetland. It has four components, and they are mutually inclusive, meaning all four criteria must be met.

(a) is seasonally or permanently covered by shallow water or has a water table close to or at its surface. [The wetland meets this criteria because it is seasonally inundated].

(b) directly contributes to the hydrological function of a watershed through connection with a surface watercourse. [The wetland meets this criterion, although only marginally. It is connected to a seasonal stream that only flows during the spring freshet, and the intermittent flow connects to an agricultural drain that in turn connects with the headwaters of Butler Creek].

(c) has hydric soils, the formation of which has been caused by the presence of abundant water, and [The wetland does not meet this criterion. The soils in the wetland are mineral not hydric.]

(d) has vegetation dominated by hydrophytic plants or water tolerant plants, the dominance of which has been favoured by the presence of abundant water. [The wetland does not meet this criterion. It is not dominated by wetland indicator species. It does not meet the 50/50 wetland vegetation rule.]

The wetland on the Property does not meet the definition of a wetland, as stated in the Conservation Authority Act.

The GRCA has wetland policies that identifies conditions under which development is permitted in a wetland.

Development within a naturally-occurring wetland may be permitted where the

wetland is less than 0.5 hectares, [The wetland is only 0.07 ha, or about 14% of the minimum size).

and it can be demonstrated that the wetland is not,

- a) part of a Provincially Significant Wetland, [It is not]*
- b) located within a floodplain or riparian community, [It is not]*
- c) part of a Provincially or municipally designated Natural Heritage Feature, a significant woodland, or hazard land, [It is not]*
- d) a bog, fen, [It is neither]*
- e) fish habitat, [It is not direct or indirect fish habitat]*
- f) significant wildlife habitat, [It is not]*
- g) confirmed habitat for a provincially or regionally significant species as determined by the Ministry of Natural Resources and Forestry or as determined by the municipality, [it is not]*
- h) part of an ecologically functional corridor or linkage between larger wetlands or natural areas, [it is not]*
- i) part of a groundwater recharge area, [it is not] or*
- j) a groundwater discharge area associated with any of the above [it is not].*

It is clear that the wetland on the Property does not any of the 11 criteria. Therefore, it is compliant with GRCA's wetland policies and should be eligible for development.

This information was shared with the MNR in June 2021 for the preparation of one of the earlier ecological assessment reports for the Property. The correspondence is reproduced in Appendix 1. The MNR concluded the wetland is not a Significant Wetland, it does not warrant an OWES evaluation, and it cannot be considered 'complexed' with other local or regional wetland systems.

Based on this assessment there should be no restriction to the development of the wetland, providing the seasonal surface flow can be managed.

16.5 Woodland

The generic definition of a woodland is a landscape where tree crowns cover greater than 60% of the ground. There is no minimum age that defines a woodland, but stocking should range from more than 400 trees per acre for a young, successional forest to about 100 trees per acre for a moderately-aged merchantable forest (Forestry Act, R.S.O.1990).

The woodland on the Property is a remnant of the deciduous forests that once covered the Grand River watershed. It is dominated by Sugar Maple. Secondary species included White Ash, American Beech, Black Cherry, Large-tooth Aspen, and Ironwood. Understory shrubs included Nannyberry, Speckled Alder, Red Elderberry and several Dogwood species. Tree regeneration was predominantly Sugar Maple and White Ash, with young American Beech common around mature Beech that were dead or dying. Young tree saplings and herbaceous ground vegetation were relatively sparse, giving the woodland an open appearance. In some areas it was possible to see almost across the entire woodland. Typical ground flora included Wild Leak, White Baneberry, Wild Sarsaparilla, Jack-in-the-pulpit, Blue Cohosh, Virginia Waterleaf, Solomon's Seal, Rattlesnake Root and Trillium. Based on the forest tree species communities, the understory vegetation, the ground flora and the results of the soil test pits, the woodland's ELC classification is a *Dry-fresh Sugar Maple - White Ash Deciduous Forest Type FODM5-8*. Photos 18 and 19 illustrate the characteristics of the woodland.

The Woodland is small, just 3.2 ha (7.8 acres), or 12.2% of the Property. It is typical of small woodlands on rural properties in southern Ontario. It has likely been used for maple syrup production and periodically harvested for fuelwood. It is clear by the stocking, age and tree condition that it has not recently been professionally managed. Photo 20 illustrates what is possibly the remains of a sugar shack. Photos 21 and 22 illustrate recent harvesting, and the relatively small size of the trees that were cut.

Effective woodlot management includes balancing periodic tree harvest to achieve specific objectives, such as improving or maintaining overall tree health and quality, minimizing the impact of insects and disease, providing wildlife habitat, creating recreational or educational opportunities, or ensuring site or slope stability to prevent soil and stream bank erosion. The woodland on the Property has not been effectively managed - it has been 'hygraded'. This implies that individual, healthier, higher quality trees were habitually harvested and the less healthy, poorer quality trees remained. When less vigorous, poorer quality and diseased trees are left on site the overall prevalence of disease increases and the quality, and therefore the value, of the residual stems decreases. Scars on exposed roots are characteristic of damage caused by impacts from harvesting vehicles or cut logs being dragged too close to standing trees. The resulting wounds are infection courts for wood decay fungi (Photos 23 and 24).

Disease, insects and stress factors are ubiquitous throughout the woodland and include Eutypella Canker, Armillaria Root Rot, Beech Bark Disease, Emerald Ash Borer, Maple Borer, Gypsy Moth, Fall Webworm, Black Knot, physical damage, and wood decay fungi and boring insects.

Eutypella Canker is caused by the fungus *Eutypella parasitica*. It causes a large canker to form, usually on the main trunk and usually 2 m to 4 m from the ground, although the canker can infect larger branches. It occurs predominantly on Sugar Maple. Young trees are usually killed, but because the canker is slow growing, infection on older trees can last for several decades. During that time the trees are weakened and are more susceptible to other secondary decay fungi. Infected trees are significantly physically weakened at the canker site, and if they don't die from the canker or secondary infection, they often break off at the canker site during strong winds. The only practical control measure for Eutypella Canker is the removal of infected trees and burning the wood. Photos 25, 26 and 27 illustrate maple trees on the Property infected with Eutypella Canker. The rate of infection in the woodlot is relatively high, with about 10% of the mature stems infected.

Armillaria Root Rot, also known as Honey Fungus or Shoe-string Root Rot (*Armillaria mellea*), is endemic in eastern tolerant hardwood forests. Normally this fungus is considered a secondary pathogen, infecting diseased or stressed trees. However, when tree vigor is suppressed at the stand level, Armillaria can become a primary pathogen. Photo 28 illustrates the black Armillaria rhizomorphs on a dead maple tree in the woodland.

Ash trees are a common species in the woodland on the Property. Regardless of the Ash species, site or age, the Ash trees in the woodland have been very significantly impacted by the Emerald Ash Borer (*Agrilus planipennis* *Farmaire*). This invasive insect originated in Asia and likely came to North America on wooden shipping crates. It was first identified in Ontario in 2002. Since then, it has spread across south and central Ontario. All Ash species and age classes are susceptible, and mortality of infected trees is almost 100%. Mortality of Ash trees in the woodland has been very substantial. Currently there are no natural control mechanisms for the Emerald Ash Borer, so Ash mortality in the woodland will continue. The only affective control measure is to remove the infected trees and burn them. Infected wood should not be transported off site.

American Beech trees are an important component of the Maple-Beech deciduous forest ecotype in Ontario. Beech trees across the range of Beech in Ontario are threatened by Beech Bark Disease. Beech Bark Disease is the result of an insect-fungus complex caused by a non-native scale insect, the Beech Scale (*Cryptococcus fagisuga*), and a native canker fungi (*Neonectria faginata*). The scale insect is from Europe and was first found in the Maritimes in the 1890s. The scale didn't appear in Ontario until 1985, and the associated disease was confirmed in 1999. Mortality of mature Beech trees is usually greater than 90%. The Beech Scale insect and the canker fungi were observed on Beech trees in the woodland and extensive Beech tree

mortality was evident. Photos 29 and 30 illustrate the scale insect and the erupting canker fungi. Like the Emerald Ash Borer, there is currently no known natural predator of the beech scale, so infection and subsequent mortality is certain to continue on Beech trees on the Property. The only affective control of the spread of Beech Bark Disease is to remove the infected trees and burn them. Infected wood should not be transported off site.

Maple Borer (*Glycobius speciosus*) is a native insect that tunnels just under the bark of Maple trees. Unlike Eutypella Canker that tends to infect trees lower on the main stem, the maple borer usually attacks higher on the tree trunk. If it girdles the tree by tunneling all the way around the stem, the tree will die above the point of infection. Even if it doesn't kill the tree the wood around the wound is weakened and susceptible to infection by secondary decay fungi, and the weakened stem is susceptible to snapping off above the wound during high winds. There were several mature Maple trees with broken tops in the woodlot as a result of Maple Borer damage.

Gypsy Moth (*Lymantria dispar*) is an invasive insect from Europe that was introduced into North America in the 1860s. It has subsequently spread across the northeastern US and southern Canada. The caterpillar is a voracious consumer of deciduous tree foliage, particularly Oak and Maple, but in heavy infestations it will eat almost anything green. In Ontario, Gypsy Moth populations oscillate with peak infestations occurring about every 7 to 11 years. Photo 31 illustrates a female Gypsy Moth laying eggs on a Maple tree in the woodland. Photo 32 illustrates moderate Gypsy Moth defoliation in the upper crown of mature trees in the woodland. Considering the large number of egg masses observed during the February 2020 site visit, defoliation in the woodland was less extensive than anticipated.

In a previous assessment of the Property (*Amended Baseline Ecological Assessment*) the composition, age, and species and age class distribution of the trees in the woodland was estimated based on professional experience and observations during the many site visits. Tree age is a critical characteristic in assessing if the woodland is classified as a Significant Woodland, based on the Provincial Planning Statement and the municipal Official Plan. In order to confirm the accuracy of these earlier estimates, standard forest resource inventory measurements were collected on May 2, 2021.

Four fixed area plots were established. The plot locations are illustrated in Figure 15 and their GPS co-ordinates are provided in Table 5. The Woodland was divided into quarters and one plot was located in each quarter. An oversize screw driver was inserted in the ground as a center-point anchor and a pre-measured rope (37.2 ft, or 11.3 m) was stretched out on a north compass bearing. At the end of the rope the ground and the nearest tree were marked with orange tree marking paint. This process was repeated on the northeast, east, southeast, etc., bearings until a complete circle was marked, which created a fixed area plot 1/10 ac (0.04 ha) in size. All trees 3.5 inches (9 cm) and larger were tallied, which included, species, condition and diameter at breast height (4.5 ft, or 1.4 m). The age of each tree was predicted from MNRF Normal

Growth and Yield tables for tolerant hardwood stands and on-line tree age calculators based on tree diameter. To reduce age bias, three on-line tree age calculators were used and the average age was determined. These diameter-based age predictions were compared to actual tree ring counts of increment cores harvested from a few selected trees.

Table 6 summarizes the woodland characteristics. The woodland was composed of 53% Sugar Maple, 27% White Ash, 9% American Beech, 4% Basswood, 3% Ironwood, 2% Black Cherry and 2% Silver Maple. Figure 16 illustrates the diameter class distribution. Figure 17 illustrates the age class distribution. The age class and diameter class distributions were consistent with a young, all-aged, tolerant hardwood stand that has been consistently hygraded, i.e., the larger, highest quality trees were periodically harvested when they reached merchantable size. The average tree diameter was less than 10 inches (25 cm), and less than 9% of the trees were greater than 16 inches (40 cm). The relatively young age is reflected not only by the small tree diameters but also by the relatively large number of trees - 200 stems/ac (494 stems/ha). These measurements re-affirm the ELC classification FODM5-8 Dry-Fresh Sugar Maple-White Ash Deciduous Forest.

Indicative of the diameter class distribution, the average tree age was 45 years. Less than 31% of the trees were older than 60 years. The basal area was 126.7 ft²/ac (29.1 m²/ha). At 45, the average age was a little less than the 50 years that was estimated in the *Amended Baseline Ecological Assessment*, and the basal area was actually a little greater than estimated (126.7 ft²/ac actual vs 90 ft²/ac estimated).

Increment cores were extracted from three healthy, larger trees - a Sugar Maple, an American Beech, and a Black Cherry - and the rings counted with a digital microscope and compared to the on-line tree age calculator and Normal Yield Tables. The tree age calculators slightly over-predicted the ages of the sampled Cherry tree (49 years predicted vs 41 actual) and the Maple tree (70 years predicted vs 65 actual) and slightly underpredicted the age of the Beech tree (85 years predicted vs 101 actual), for an average estimate vs actual age error of +/-13%. If the maximum measurement error (13%) was added to the average predicted tree age of the woodland, 45 years would be adjusted to 51 years.



Photos 18 and 19. The woodland is a young, all-aged deciduous forest. Stand stocking and basal area are relatively low, and tree saplings and ground flora are relatively thin, giving the woodlot an open appearance.





Photo 20: These ruins may be the remains of a sugar shack used to boil down maple sap to make maple syrup.



Photos 21 and 22: The woodland has been hygraded. Tree cutting has not been recent, and harvested trees were relatively young (small diameter).





Photos 23 and 24: Root scars from past tree harvesting caused by farm equipment, tree skidders, or dragged logs bumping into or running over the root collar.





Photos 25, 26 and 27: Eutypella Canker on Sugar Maple trees caused by the fungus *Eutypella parasitica*. This was common in the woodland. The prevalence is a result of hygrading.



Photo 28: Armillaria Root Rot (*Armillaria mellea*), also called Shoe-string Root Rot or Honey Fungus, rhizomorphs on Sugar Maple. This fungus is commonly found on damaged and weakened trees but can be a primary pathogen on otherwise healthy trees that are environmentally stressed.



Photos 29 and 30: Beech Scale insect *Cryptococcus fagisuga* (top) and the Nectria fungus *Neonectria faginata* (right) that together cause Beech Bark Disease on American Beech trees. Infection was widespread in the woodland.





Photo 31 (above): Female Gypsy Moth laying eggs on a Maple tree. Photo 32 (below): Gypsy Moth defoliation. Considering the large number of egg masses observed in February, defoliation was less severe than expected.



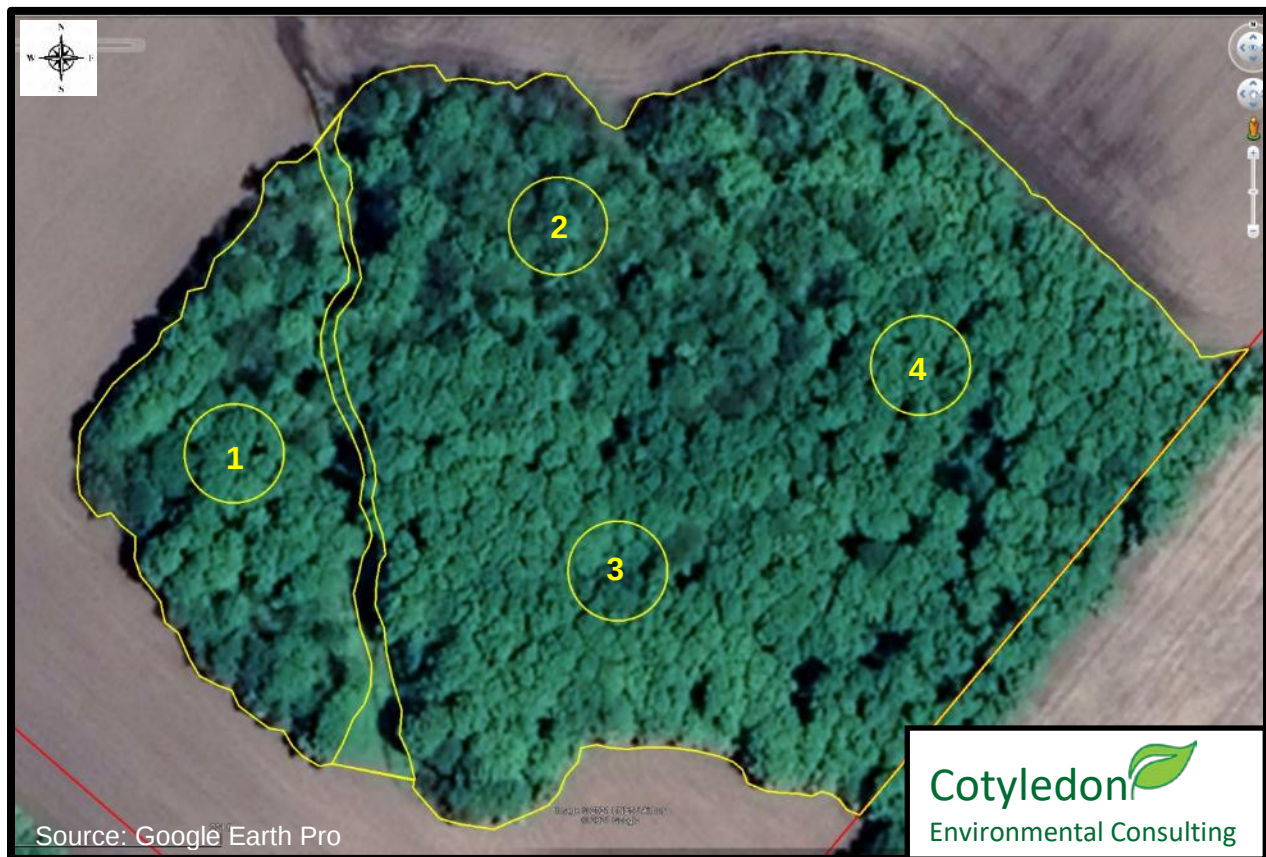


Figure 15: Location of four 1/10th ac forest inventory plots.

Table 5: Location of Forest Inventory Plots – Marsville Woodland.

Plot Number	Co-ordinates	
	North	West
1	43° 49' 52.86"	80° 12' 53.32"
2	43° 49' 54.56"	80° 12' 49.95"
3	43° 49' 52.00"	80° 12' 49.33"
4	43° 49' 53.54"	80° 12' 46.24"
Plots are fixed area 1/10 th ac.		

Table 6: Marsville Woodland Measurements

Tree Species	Basal Area		% Basal Area	Mean DBH		Mean Age	Number of Stems	
	Ft ² /Ac	M ² /Ha		Inches	Cm		Per Ac	Per Ha
American Beech	10.7	2.5	8.5	9.0	22.9	54	20	49
Basswood	4.9	1.1	3.9	9.6	24.3	29	8	19
Black Cherry	2.9	0.7	2.3	8.4	21.2	42	8	19
White Ash	34.4	7.9	27.2	10.2	25.9	41	53	130
Ironwood	4.3	1.0	3.4	7.9	20.0	55	13	31
Silver Maple	1.8	0.4	1.5	11.6	29.5	35	3	6
Sugar Maple	67.5	15.5	53.3	10.5	26.7	58	98	241
Total (Mean)	126.7	29.1	100.0	9.6	24.4	45	200	494

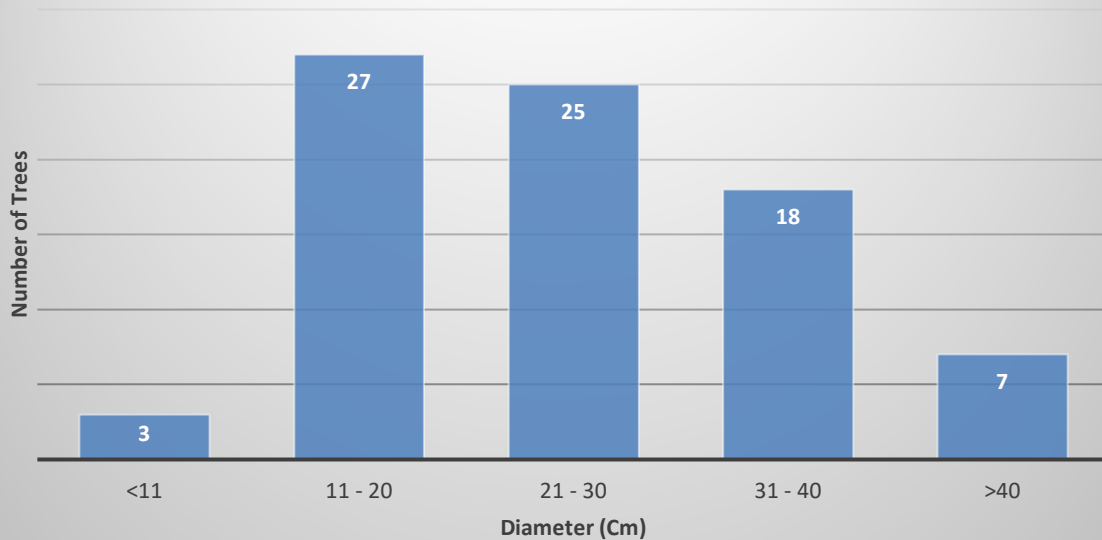
Notes:

Based on 4 1/10th ac fixed area survey plots.

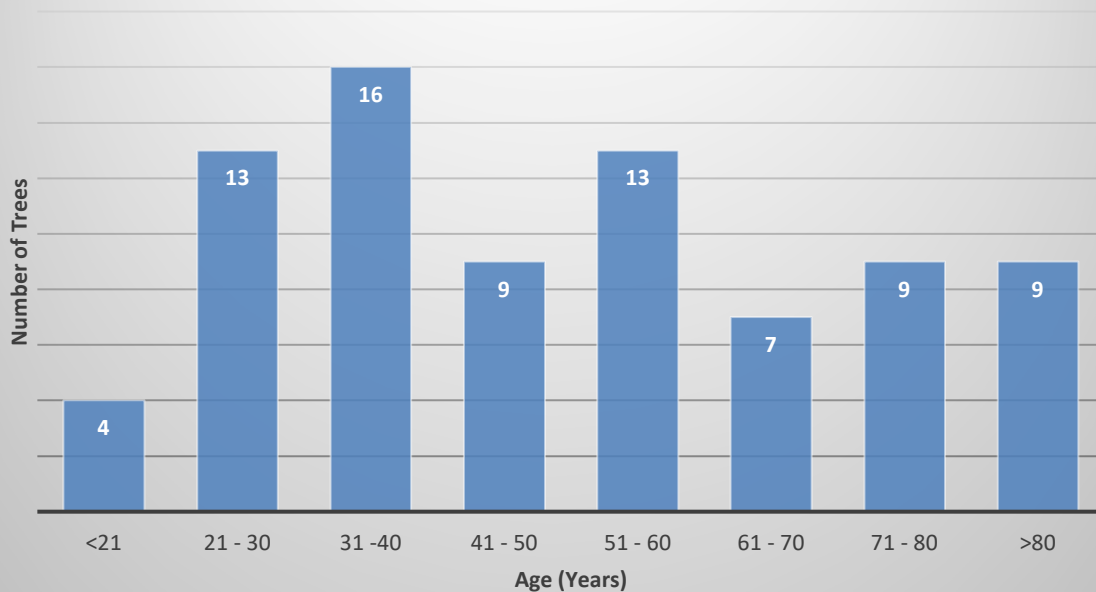
DBH – Diameter Breast Height (4.5 ft / 1.4 m).

Age estimated from Normal Yield Tables and on-line age predictors and compared to increment cores collected from a few selected woodland trees.

**Figure 16: Tree Diameter Class Distribution
Marsville Woodlot. Total of 4 1/10 ac Plots.**



**Figure 17: Tree Age Class Distribution (Years)
Marsville Woodlot. Total of 4 1/10 ac Plots.**



16.5.1 Ecological Significance of the Woodland

Significant Woodlands, as defined by the Provincial Planning Statement and other regulatory and land-use planning agencies, are ecologically important because of their size, species composition, age, stand history, protection of water resources, wildlife habitat, economic value, and their contribution to the environmental functionality of the broader landscape. Smaller, isolated or fragmented woodlands have lower ecological functionality, and therefore a lower ecosystem service value. Larger, connected or contiguous and more biologically diverse woodlands have a greater degree of ecological functionality and therefore a higher ecosystem service value. Municipal planning authorities generally prohibit or restrict development within 120 m of *Significant Woodlands*.

Woodlands are classified as *Significant Woodlands* by the Provincial Planning Statement using eight criteria in the Natural Heritage Reference Manual, including total size, presence and size of interior habitat, proximity to other natural, surface and groundwater features, ecological linkages, unique characteristics, and economic and social values. Table 7 summarizes the classification matrix for the woodland on the Property.

Some of the woodland classification criteria are based on how much of the watershed or planning area is forested. In watersheds with a low forest cover the minimum size for a woodland to be classed as *Significant* is smaller. Conversely, in watersheds with a higher forest cover the minimum size to be *Significant* is larger. Some of the criteria are mutually inclusive, in that they must meet an ecological function *and* a minimum forest area.

The Property is in the Grand River watershed, and in the Township of East Garafraxa. It can also be characterized by the Upper Grand River watershed, which includes the Butler creek watershed, which is the nearest permanent watercourse. The forest cover of the Grand River watershed is 7%. The forest cover of the Township of East Garafraxa is 19%. The forest cover in the Upper Grand River watershed is 15%. If the Grand River watershed is the baseline the classification criteria would be more conservative and smaller woodlands would be considered *Significant*. If the Township of East Garafraxa is the baseline the classification criteria would be less conservative and woodlands would have to be larger to be *Significant*. The Upper Grand River watershed, at 15% forest cover, is more comparable to the Township (19%). To be precautionary all three metrics were compared, although the most appropriate is likely the Upper Grand River watershed because it is the smallest geographically and most closely represents the landscape features of the Property. So that size alone doesn't drive the classification, if just one of the eight criteria are met then the woodland is considered a *Significant Woodland*.

It is clear that, based on this exercise and summarized in Table 7, the woodland on the Property is not a *Significant Woodland* no matter which of the three baselines is considered. Therefore, it would not usually warrant protection by planning authorities that use the Provincial Planning Statement and the Natural Heritage Reference Manual as guidance documents.

The woodland on the Property is physically and ecologically isolated. The Natural Heritage Reference Manual suggests that when assessing woodland significance adjacent woodlands separated by gaps less than 20 m should be considered contiguous and assessed as one woodland. The woodland on the Property is nearby another woodland adjacent to the southwest of the Property. Determining the width of the gap between woodlands can be subjective. For example, the gap may be measured as the distance between the edge of nearby tree crowns based on air photos, or it may be measured as the distance between the trunks of the nearest trees based on on-site measurement. Depending on how the gap is interpreted (e.g. crown to crown or trunk to trunk) the gap between the two woodlands is between about 18 m (tree crowns) and 25 m (tree trunks). It is more precise to measure the distance between adjacent tree trunks on-site than to estimate the distance between tree crowns from air photos, therefore the gap between the two adjacent woodlands was concluded to be greater than 20 m and the adjacent woodlands cannot be considered contiguous.

The East Garafraxa Official Plan states:

*Significant Forest Areas include but are not limited to, County Forests, all woodlands 40 ha in size or larger, and all forest stands that are in excess of 60 years of age **and** 4.0 ha in size.*

... an assessment of forested areas shall be undertaken to determine:

- i) The size of the overall woodland feature;*
- ii) Whether the woodland is dominated by trees in excess of 60 years of age; and,*
- iii) The ecological functions of the woodland including the provision of interior habitat, provision of linkages to, or overlap with other natural heritage features and woodland diversity.*

The woodland on the Property doesn't meet any of these criteria. It is not a County Forest and it is not larger the 40 ha. The average tree age is between 45 and 51 years and it is less than 4.0 ha (it is 3.2 ha) in size. There is no interior forest habitat. The woodland is physically and ecologically isolated, it is not linked to or complexed with any local or regional Natural Heritage Feature and it is not part of any recognized municipal, regional or provincial Natural Heritage System. The woodland on the Property is not a Significant Woodland, as defined by municipal or provincial policy

Table 7: Determining if the Woodland on the Property is a *Significant Woodland*, as defined by the Provincial Planning Statement.¹

NHRM Criteria ¹	Grand River Watershed 7% Forest Cover ²	Township of East Garafraxa 19% Forest Cover ²	Upper Grand River Watershed 15% Forest Cover ²
Woodlot Size on Property = 7.8 acres			
% Forest Cover of Property = 13.3%			
Minimum Total Size (acres) ³ 1) if 5–15% of the land cover is forest, woodlands 9.9 acres or larger considered significant. 2) if 15–30% of the land cover is forest, woodlands 49.4 acres or larger considered significant.	(1) 9.9 acres Needed 7.8 acres Actual Not Significant	(2) 49.4 acres Needed 7.8 acres Actual Not Significant	(1) 9.9 acres Needed 7.8 acres Actual Not Significant
Interior Forest ⁴ 1) if forest cover is less than 15% of the Property, considered significant if there is any interior forest. 2) If 15–30% of the planning area is forest, considered Significant if there is 4.9 ac of interior forest.	(1) Any Interior Forest Needed 0.0 acres Present Not Significant	(2) 4.9 ac Needed 0.0 acres Present Not Significant	(1) Any Interior Forest Needed 0.0 acres Present Not Significant
Proximity Within 30 m of Significant Natural Features or fish habitat and forest meets minimum area of 49.2 ac	No Natural Features or Fish Habitat within 30 m 49.2 ac Needed 7.8 ac Present Not Significant	No Natural Features or Fish Habitat within 30 m 49.2 ac Needed 7.8 ac Present Not Significant	No Natural Features or Fish Habitat within 30 m 49.2 ac Needed 7.8 ac Present Not Significant
Ecological Linkages Within a Defined Natural Heritage System and provides linkage (120 m) to Significant Natural Heritage Feature and forest meets minimum area of 49.2 ac	Not in a Defined Natural Heritage System and No Significant Natural Feature within 120 m 49.2 ac Needed 7.8 ac Present Not Significant	Not in a Defined Natural Heritage System and No Significant Natural Feature within 120 m 49.2 ac Needed 7.8 ac Present Not Significant	Not in a Defined Natural Heritage System and No Significant Natural Feature within 120 m 49.2 ac Needed 7.8 ac Present Not Significant
Water Protection ⁵ Within a sensitive or threatened watershed, sensitive groundwater discharge or recharge area, sensitive headwater area, or fish habitat and forest meets the minimum area of 24.7 ac (10 ha).	Not within sensitive watershed groundwater discharge or recharge area, headwater area, or fish habitat. 24.7 ac Needed 7.8 ac Present Not Significant	Not within sensitive watershed groundwater discharge or recharge area, headwater area, or fish habitat. 24.7 ac Needed 7.8 ac Present Not Significant	Not within sensitive watershed groundwater discharge or recharge area, headwater area, or fish habitat. 24.7 ac Needed 7.8 ac Present Not Significant

Table 7: Determining if the Woodland on the Property is a *Significant Woodland*, as defined by the Provincial Planning Statement.¹

Woodland Diversity Has locally or regionally rare species or a high ecological biodiversity and the woodland meets the Minimum Area Threshold of 49.2 ac (20 ha).	Species at Risk present 49.2 ac Needed 7.8 ac Present Not Significant	Species at Risk present 49.2 ac Needed 7.8 ac Present Not Significant	Species at Risk present 49.2 ac Needed 7.8 ac Present Not Significant
Uncommon Characteristics Community level unique species are present, or there are trees greater than 100 years old or greater than 40 cm diameter and the forest meets the minimum area of 24.7 ac.	Mean tree age 45 years Mean tree DBH 24.4 cm 24.7 ac Needed 7.8 ac Present Not Significant	Mean tree age 45 years Mean tree DBH 24.4 cm 24.7 ac Needed 7.8 ac Present Not Significant	Mean tree age 45 years Mean tree DBH 24.4 cm 24.7 ac Needed 7.8 ac Present Not Significant
Economic & and Social Function Produces high quality economic value, provides local recreational or educational opportunities, or has cultural, historical, archeological or aboriginal importance and the forest meets the minimum area of 24.7 ac	No Economic or Social Function 24.7 ac Needed 7.8 ac Present Not Significant	No Economic or Social Function 24.7 ac Needed 7.8 ac Present Not Significant	No Economic or Social Function 24.7 ac Needed 7.8 ac Present Not Significant
1 - Natural Heritage Reference Manual Provincial Policy Statement. 2 - % Forest Cover of the Watershed and the Township. 3 – Minimum woodland size required varies by % forest cover of the watershed and/or township. 4 – Interior Forest is forest area that is more than 100 m from an edge. 5 – Property is an area of Low Aquifer Vulnerability; the woodland is not in the Marsville Well Head Protection Zone or the Significant Ground Water Recharge Zone.			

17.0 Flora and Fauna Surveys

The flora and fauna on the Property were characterized by a series of protocol-specific and incidental observations conducted over 11 site visits in 3 seasons over 3 years, as detailed in Table 1. A Breeding Bird survey, an Amphibian Call survey and an Acoustic Bat survey were conducted following provincial monitoring protocols. Additional bird, amphibian and bat data, plus inventories of mammals, reptiles, moths, butterflies, insects and fungus were created from repeated multi-season, multi-year incidental observations and reference to the Ontario Geo-hub and iNaturalist data bases.

17.1 Vegetation Survey

There were 20 species of trees and shrubs and 96 species of ground flora observed on the Property. These are summarized in Table 8. The species diversity is typical of a residual woodland on a small agricultural property in southern Ontario with few natural features. These extensive surveys represent a robust inventory of plant species on the Property.

There were no tree, shrub or herbaceous species at risk or species considered rare in the Grand River watershed. Specifically, there were no Butternut, Black Ash, or Flowering Dogwood on the Property.

Table 8: Plants observed on the Property.

Scientific Name	Common Name	SRank	Form	Habitat
Trees and Shrubs				
<i>Acer saccharum</i>	Sugar Maple	S5	Tree	Woodland
<i>Alnus incana</i>	Speckled Alder	S5	Shrub	Wetland
<i>Cornus alternifolia</i>	Alternate-leaved Dogwood	S5	Shrub	Woodland
<i>Cornus racemosa</i>	Grey Dogwood	S5	Shrub	Woodland
<i>Cornus sericea</i>	Red-osier Dogwood	S5	Shrub	Wetland
<i>Fagus grandifolia</i>	American Beech	S4	Tree	Woodland
<i>Fraxinus americana</i>	White Ash	S5	Tree	Woodland
<i>Ostrya virginiana</i>	Ironwood	S5	Tree	Woodland
<i>Populus grandidentata</i>	Large Tooth Aspen	S5	Tree	Woodland
<i>Populus tremuloides</i>	Trembling Aspen	S5	Tree	Woodland
<i>Prunus pensylvanica</i>	Pin Cherry	S5	Tree	Woodland
<i>Prunus serotina</i>	Black Cherry	S5	Tree	Woodland
<i>Prunus virginiana</i>	Chokecherry	S5	Tree	Woodland
<i>Sambucus racemosa</i>	Red Elderberry	S5	Shrub	Woodland
<i>Sorbus aucuparia</i>	European Mountain-ash	NA	Tree	Woodland
<i>Tilia Americana</i>	Basswood	S5	Tree	Woodland
<i>Tsuga canadensis</i>	Eastern Hemlock	S5	Tree	Woodland
<i>Ulmus americana</i>	White Elm	S5	Tree	Woodland
<i>Viburnum lentago</i>	Nannyberry	S5	Shrub	Woodland
<i>Viburnum opulus ssp. Opulus</i>	Cranberry Viburnum	NA	Shrub	Woodland
Ground Flora				
<i>Achillea millefolium</i>	Common Yarrow	S5	Herbaceous	Agricultural Field
<i>Actaea pachypoda</i>	White Baneberry	S5	Herbaceous	Woodland
<i>Agrimonia gryposepala</i>	Hooked Agrimony	S5	Herbaceous	Woodland
<i>Allium canadense</i>	Wild Garlic	S5	Herbaceous	Woodland
<i>Allium tricoccum</i>	Wild Leek	S4	Herbaceous	Woodland
<i>Amaranthus retroflexus</i>	Redroot Amaranth	NA	Herbaceous	Agricultural Field
<i>Ambrosia artemisiifolia</i>	Common Ragweed	S5	Herbaceous	Agricultural Field
<i>Anemone acutiloba</i>	Sharp-lobed Hepatica	S5	Herbaceous	Woodland
<i>Araia nudicaulis</i>	Wild Sarsaparilla	S5	Herbaceous	Woodland
<i>Arctium minus</i>	Common Burdock	NA	Herbaceous	Woodland
<i>Arisaema triphyllum</i>	Jack-in-the-pulpit	S5	Herbaceous	Woodland
<i>Asarum canadense</i>	Canada Wild-ginger	S5	Herbaceous	Woodland
<i>Asclepias syriaca</i>	Common Milkweed	S5	Herbaceous	Agricultural Field
<i>Bidens cernua</i>	Nodding Beggar-tick	S5	Herbaceous	Woodland
<i>Bidens frondosa</i>	Devil's Beggar-tick	S5	Herbaceous	Wetland
<i>Cardamine diphylla</i>	Broad-leaved Toothwort	S5	Herbaceous	Woodland

Table 8: Plants observed on the Property.

Scientific Name	Common Name	SRank	Form	Habitat
<i>Caulophyllum giganteum</i>	Giant Blue Cohosh	S5	Herbaceous	Woodland
<i>Chenopodium album</i>	Common Lamb's-quarters	NA	Herbaceous	Woodland
<i>Cichorium intybus</i>	Chicory	S5	Herbaceous	Agricultural Field
<i>Circaea canadensis</i>	Broad-leaved Enchanter's Nightshade	S5	Herbaceous	Woodland
<i>Cirsium arvense</i>	Canada Thistle	NA	Herbaceous	Woodland
<i>Cirsium vulgare</i>	Bull Thistle	NA	Herbaceous	Woodland
<i>Convallaria majalis</i>	Lilly of the Valley	S5	Herbaceous	Woodland
<i>Cyperus esculentus</i>	Perennial Yellow Flat Sedge	S5	Graminoid	Wetland
<i>Daucus carota</i>	Wild carrot	S5	Herbaceous	Agricultural Field
<i>Dryopteris carthusiana</i>	Spinulose Wood Fern	S5	Herbaceous	Woodland
<i>Echinocystis lobata</i>	Wild Cucumber	S5	Vine	Wetland
<i>Elymus repens</i>	Quack Grass	NA	Graminoid	Woodland
<i>Epilobium parviflorum</i>	Small-flowered Hairy Willow-herb	NA	Herbaceous	Wetland
<i>Epipactis helleborine</i>	Broad-leaved Helleborine	NA	Herbaceous	Woodland
<i>Equisetum arvense</i>	Field Horsetail	S5	Herbaceous	Wetland
<i>Equisetum hyemale</i>	Common Scouring-rush	S5	Herbaceous	Woodland
<i>Erigeron annuus</i>	Annual Fleabane	S5	Herbaceous	Wetland
<i>Euthamia graminifolia</i>	Grass-leaved Goldenrod	S5	Herbaceous	Woodland
<i>Erythronium americanum</i>	Trout Lily	S5	Herbaceous	Woodland
<i>Fragaria vesca</i>	Woodland Strawberry	S5	Herbaceous	Woodland
<i>Geranium robertianum</i>	Herb-Robert	NA	Herbaceous	Woodland
<i>Geum canadense</i>	White Avens	NA	Herbaceous	Woodland
<i>Glyceria</i> sp.	Manna Grass sp.	S4	Graminoid	Wetland
<i>Glyceria maxima</i>	Tall Manna Grass	NA	Graminoid	Wetland
<i>Gnaphalium uliginosum</i>	Low Cudweed	NA	Herbaceous	Wetland
<i>Hesperis matronalis</i>	Dame's Rocket	S5	Herbaceous	Agricultural Field
<i>Hieracium aurantiacum</i>	Orange Hawkweed	S5	Herbaceous	Agricultural Field
<i>Hydrophyllum virginianum</i>	Virginia Waterleaf	S5	Herbaceous	Woodland
<i>Impatiens capensis</i>	Spotted Jewel-weed	S5	Herbaceous	Wetland
<i>Laportea canadensis</i>	Wood Nettle	S5	Herbaceous	Woodland
<i>Lotus corniculatus</i>	Bird's-foot Trefoil	S5	Herbaceous	Agricultural Field
<i>Maianthemum racemosum</i>	Large False Solomon's Seal	S5	Herbaceous	Woodland
<i>Matteuccia struthiopteris</i>	Ostrich Fern	S5	Herbaceous	Woodland
<i>Mentha arvensis</i>	Corn Mint	S5	Herbaceous	Wetland
<i>Myosotis laxa</i>	Tufted Forget-me-not	S5	Herbaceous	Wetland
<i>Nabalus albus</i>	White Rattlesnake Root	S5	Herbaceous	Woodland
<i>Oenothera biennis</i>	Common Evening-primrose	S5	Herbaceous	Woodland
<i>Onoclea sensibilis</i>	Sensitive Fern	S5	Herbaceous	Wetland

Table 8: Plants observed on the Property.

Scientific Name	Common Name	SRank	Form	Habitat
<i>Oxalis stricta</i>	Upright Yellow Wood-sorrel	S5	Herbaceous	Wetland
<i>Parthenocissus quinquefolia</i>	Virginia Creeper	S5	Herbaceous	Woodland
<i>Pastinaca sativa</i>	Wild Parsnip	S5	Herbaceous	Agricultural Field
<i>Persicaria lapathifolia</i>	Pale Smartweed	S5	Herbaceous	Wetland
<i>Phalaris arundinacea</i>	Reed Canary Grass	S5	Graminoid	Woodland
<i>Phleum pratense</i>	Timothy	S5	Herbaceous	Agricultural Field
<i>Phlox divaricate</i>	Wild Blue Phlox	S5	Herbaceous	Woodland
<i>Plantago major</i>	Common Plantain	S5	Herbaceous	Agricultural Field
<i>Polygonatum pubescens</i>	Hairy Solomon's Seal	S5	Herbaceous	Woodland
<i>Polygonum convolvulus</i>	Black Bindweed	S5	Herbaceous	Agricultural Field
<i>Ranunculus acris</i>	Tall Buttercup	S5	Herbaceous	Woodland
<i>Ribes cynosbati</i>	Eastern Prickly Gooseberry	S5	Vine	Woodland
<i>Rubus idaeus</i> ssp. <i>Strigosus</i>	North American Red Raspberry	S5	Vine	Woodland
<i>Rumex obtusifolius</i>	Bitter Dock	NA	Herbaceous	Woodland
<i>Setaria pumila</i>	Yellow Foxtail	NA	Graminoid	Wetland
<i>Sanguinaria canadensis</i>	Bloodroot	S5	Herbaceous	Woodland
<i>Solanum dulcamara</i>	Bittersweet Nightshade	NA	Vine	Wetland
<i>Solanum emulans</i>	Eastern Black Nightshade	S5	Vine	Woodland
<i>Solidago altissima</i>	Tall Goldenrod	S5	Herbaceous	Woodland
<i>Solidago canadensis</i>	Canada Goldenrod	S5	Herbaceous	Agricultural Field
<i>Solidago flexicaulis</i>	Zig-zag Goldenrod	S5	Herbaceous	Woodland
<i>Sonchus arvensis</i>	Field Sow-thistle	S5	Herbaceous	Agricultural Field
<i>Sonchus arvensis</i> ssp. <i>Uliginosus</i>	Smooth Sow-thistle	NA	Herbaceous	Wetland
<i>Spinulum annotinum</i>	Club Moss	S5	Herbaceous	Woodland
<i>Symphyotrichum lanceolatum</i>	Eastern Panicked Aster	S5	Herbaceous	Wetland
<i>Symphyotrichum lateriflorum</i>	Calico Aster	S5	Herbaceous	Woodland
<i>Symphyotrichum novae-angliae</i>	New England Aster	S5	Herbaceous	Woodland
<i>Tanacetum vulgare</i>	Common Tansy	S5	Herbaceous	Agricultural Field
<i>Thalictrum dioicum</i>	Early Meadow-rue	S5	Herbaceous	Woodland
<i>Tiarella cordifolia</i>	Heart-leaved Foamflower	S5	Herbaceous	Woodland
<i>Tragopgon dubius</i>	Goat's Beard	S5	Herbaceous	Agricultural Field
<i>Trifolium pratense</i>	Red Clover	NA	Herbaceous	Wetland
<i>Trillium erectum</i>	Red Trillium	S5	Herbaceous	Woodland
<i>Trillium grandiflorum</i>	White Trillium	S5	Herbaceous	Woodland
<i>Tussilago farfara</i>	Coltsfoot	NA	Herbaceous	Woodland
<i>Urtica dioica</i> ssp. <i>Gracilis</i>	Slender Stinging Nettle	S5	Herbaceous	Wetland
<i>Uvularia grandiflora</i>	Large-flowered Bellwort	S5	Herbaceous	Woodland
<i>Viola canadensis</i>	Canada Violet	S5	Herbaceous	Woodland

Table 8: Plants observed on the Property.

Scientific Name	Common Name	SRank	Form	Habitat
<i>Viola pubescens</i>	Yellow Violet	S5	Herbaceous	Woodland
<i>Verbascum thasus</i>	Common Mullein	S5	Herbaceous	Agricultural Field
<i>Viola sororia</i>	Wooly Blue Violet	S5	Herbaceous	Woodland
<i>Vitis riparia</i>	Riverbank Grape	S5	Vine	Woodland

Surveyed during 11 site visits over 3 years and 3 seasons.

S5 - Secure – Common, widespread, and abundant in the nation or province (includes invasives).

S4 - Apparently Secure – Uncommon but not rare; some cause for long term concern due to declines or other factors.

NA - A conservation status rank is not applicable because the species is not a suitable target for conservation activities, e.g., an agricultural species, a hybrid, or a species of no conservation value.

OWES Wetland Indicator Species.

17.2 Bird Survey

The bird species observed or heard on the Property during the 11 site visits, including the breeding bird survey, are listed in Table 9. There were 34 bird species inventoried, which is typical of a small agricultural property in southern Ontario with few natural features.

Protocols for breeding bird surveys vary between habitat types and agencies, but all follow a basic pattern. The protocol used by Conservation Halton (*Conservation Halton Ecological Monitoring Protocols Version 1.0 February 2017*) was used for the breeding bird survey on the Property. The protocol states the property being surveyed must be visited between May 24 and July 10. The property should be visited twice, with at least 6 days between visits. Observations are made between one hour before sunrise and 10 a.m. Birds are recorded at marked points for periods of 5 minutes (forest edge or non-forest counts) or 10 minutes (forest interior). All bird species heard or seen by one observer, within a 100 m radius, are noted. Weather conditions must be clear to slightly damp but not raining, and winds must be below 15 km/hr. Normally the minimum distance between points is 300 m, but for a small area with considerable road noise, this can be reduced. All habitat types within the survey region should be sampled.

Habitats visited on the Property for the breeding bird survey included woodland, agricultural field, wetland, treed fence line, and adjacent school yard. There is no interior forest in the woodland on the Property. Survey intervals were between 5 and 10 minutes. Near County Road 3 the survey time was greater than 10 minutes, to accommodate the traffic noise. Because of the relatively small size of the property, survey sites were less than 300 m apart.

Visit 1 was May 27, 2021. The time on-site was 4:45 am to 7:15 am. The temperature was 4° C at the start, raising to 6° C at completion. The wind was calm, the sky was clear.

Visit 2 was June 7, 2021. The time on-site was 5:00 am to 7:25 am. The temperature was 21° C at the start and didn't change for the duration of the survey. The wind was very low, there was light cloud cover.

Only one species at risk was observed. The Eastern Wood Pewee is currently listed as *Special Concern* in O. Reg. 230/08. Special Concern is defined as:

The species lives in the wild in Ontario, is not endangered or threatened, but may become threatened or endangered due to a combination of biological characteristics and identified threats.

The Eastern Wood-pewee lives in the mid-canopy layer of forest clearings and edges of deciduous and mixed forests. They are tolerant of forest fragmentation, since they live in both edge habitat and forest interiors. It is most abundant in intermediate-age mature forest stands with little understory vegetation, which is consistent with the character of the woodland on the Property. However, the Eastern Wood-pewee has a rather large nesting territory, between 5 and 20 acres in size. The entire woodland is only 7.8 acres, and no evidence of nesting was observed. It is likely the Eastern Wood-pewee was foraging across the local landscape and is not a nesting resident on the Property.

There is no open water wetland habitat on the Property, so there were no colonial or shoreline waterbirds, such as geese, ducks, grebes, herons, egrets or terns. The exception is the Canada Goose and the Ring-billed Gull, which were both observed flying overhead.

Table 9: Birds observed on the Property.

Scientific Name	Common Name	SRank	Form	Habitat
<i>Agelaius phoeniceus</i>	Red-winged Blackbird	S5	Observed	Wetland
<i>Branta canadensis</i>	Canada Goose	S5	Fly Overhead	Agricultural Field
<i>Buteo jamaicensis</i>	Red-tailed Hawk	S5	Fly Overhead	Agricultural Field
<i>Cardinalis cardinalis</i>	Northern Cardinal	S5	Observed	Woodland
<i>Cathartes aura</i>	Turkey Vulture	S5	Fly Overhead	Agricultural Field
<i>Charadrius vociferous</i>	Killdeer	S5	Observed	Agricultural Field
<i>Colaptes auratus</i>	Northern Flicker	S5	Observed	Agricultural Field
<i>Contopus virens</i>	Eastern Wood-pewee	SC	Heard	Woodland
<i>Corvus brachyrhynchos</i>	American Crow	S5	Heard	Woodland
<i>Cyanocitta cristata</i>	Blue Jay	S5	Observed	Woodland
<i>Dryobates pubescens</i>	Downy Woodpecker	S5	Observed	Woodland
<i>Dryocopus pileatus</i>	Pileated Woodpecker	S5	Observed	Woodland
<i>Falco columbarius</i>	Merlin	S5	Heard	Woodland
<i>Geothlypis philadelphia</i>	Mourning Warbler	S5	Observed	Woodland
<i>Larus delawarensis</i>	Ring-billed Gull	S5	Fly Overhead	Agricultural Field
<i>Meleagris gallopavo</i>	Wild Turkey	S5	Tracks	Agricultural Field
<i>Melospiza melodia</i>	Song Sparrow	S5	Observed	Woodland
<i>Molothrus ater</i>	Brown-headed Cowbird	S5	Observed	Woodland
<i>Myiarchus crinitus</i>	Great Crested Flycatcher	S5	Heard	Woodland
<i>Passer domesticus</i>	House Sparrow	S5	Observed	Agricultural Field
<i>Passerina cyanea</i>	Indigo Bunting	S5	Heard	Woodland
<i>Passerculus sandwichensis</i>	Savannah Sparrow	S5	Observed	Agricultural Field
<i>Picoides villosus</i>	Hairy Woodpecker	S5	Heard	Woodland
<i>Poecile atricapillus</i>	Black-capped Chickadee	S5	Heard	Woodland
<i>Poecetes gramineus</i>	Vesper Sparrow	S5	Heard	Agricultural Field
<i>Quiscalus quiscula</i>	Common Grackle	S5	Observed	Agricultural Field
<i>Spinus tristis</i>	American Goldfinch	S5	Observed	Agricultural Field
<i>Spizella passerina</i>	Chipping Sparrow	S5	Observed	Agricultural Field
<i>Spizella pusilla</i>	Field Sparrow	S5	Observed	Agricultural Field
<i>Stunus vulgaris</i>	European Starling	S5	Observed	Agricultural Field
<i>Troglodytes aedon</i>	House Wren	S5	Observed	Agricultural Field
<i>Turdus migratorius</i>	American Robin	S5	Observed	Agricultural Field
<i>Vireo olivaceus</i>	Red-eyed Vireo	S5	Observed	Woodland
<i>Zenaida macroura</i>	Mourning Dove	S5	Heard	Agricultural Field
Surveyed during 11 site visits over 3 years and 3 seasons, including Breeding Bird Surveys May 27 and June 1, 2021. S5 - Secure – Common, widespread, and abundant in the nation or province (includes invasives). SC - Species at Risk in Ontario, O. Reg. 230/08. Status Special Concern.				

17.3 Mammal Survey

Mammals habituating on a specific property are difficult to confirm, since many species have an extensive range, are nocturnal, or den in structures that may not be obvious on the landscape. Large mammals, such as deer, coyotes, wolves or bears, may range across the entire Township, forage on or transit through many properties, and den in a variety of habitats. Table 10 lists 25 mammals that have been observed in Dufferin County by iNaturalist. The habitat exists on the Property to support 20 of these species, however only 10 were confirmed to be present based on direct observation, footprints or scat. All 20 potential and 10 confirmed mammals are common in rural southern Ontario. There were no species at risk or species rare in the Grand River watershed.

Bats, which are mammals, were not included in the survey. They are discussed separately in Section 17.5.

Species diversity increases with increasing habitat size, and this is particularly true for mammals. The woodland on the Property is small, only 3.2 ha (7.8 ac), and the wetland is even smaller, just 0.07 ha (0.18 ac). At 23.2 ha (57.4 ac), the agricultural field is the largest feature on the Property, and since it is continuously cropped it provides marginal wildlife habitat. Both the woodland and the wetland were quite open and, in most areas, it was possible to see across the entire feature. The openness, and the fact that the natural features are small and were thoroughly walked during 11 site visits in three seasons over three years, suggests that if a significant mammal population was present then individuals, or signs of them, would have been observed.

The woodland and wetland on the Property are small, not particularly biologically diverse, and ecologically and physically isolated. Although they may provide foraging opportunities to local mammals, wildlife populations are not robust.

Table 10: Mammals Observed or Potentially Present on the Property.

Scientific Name ¹	Common Name ¹	SRank	Potential to Exist on the Property ²	Observed on the Property ³
<i>Apodemus sylvaticus</i>	Field Mouse	S5	Yes	Yes
<i>Blarina brevicauda</i>	Northern Short-tailed Shrew	S5	Yes	No
<i>Canis latrans</i>	Coyote	S5	Yes	Yes
<i>Castor canadensis</i>	North American Beaver	S5	No	No
<i>Condylura cristata</i>	Star-nosed Mole	S5	Yes	No
<i>Didelphis virginiana</i>	Virginia Opossum	S5	Yes	No
<i>Erethizon dorsatum</i>	North American Porcupine	S5	Yes	No
<i>Lepus americanus</i>	Snowshoe Hare	S5	Yes	No
<i>Lontra canadensis</i>	North American River Otter	S5	No	No
<i>Marmota monax</i>	Groundhog	S5	Yes	No
<i>Mephitis spp.</i>	Striped Skunk	S5	Yes	Yes
<i>Mustela richardsonii</i>	American Ermine	S5	No	No
<i>Neogale vison</i>	American Mink	S5	No	No
<i>Odocoileus virginianus</i>	White-tailed Deer	S5	Yes	Yes
<i>Ondatra zibethicus</i>	Common Muskrat	S5	No	No
<i>Peromyscus maniculatus</i>	Eastern Deermouse	S5	Yes	No
<i>Procyon lotor</i>	Common Raccoon	S5	Yes	Yes

Table 10: Mammals Observed or Potentially Present on the Property.

Scientific Name ¹	Common Name ¹	SRank	Potential to Exist on the Property ²	Observed on the Property ³
Sciurus carolinensis	Eastern Gray squirrel	S5	Yes	Yes
Sorex cinereus	Masked Shrew	S5	Yes	No
Sorex dispar	Long-tailed Shrew	S5	Yes	No
Sylvilagus floridanus	Eastern Cottontail	S5	Yes	Yes
Tamias striatus	Chipmunk	S5	Yes	Yes
Tamias striatus	Eastern Chipmunk	S5	Yes	Yes
Tamiasciurus hudsonicus	American Red squirrel	S5	Yes	Yes
Zapus hudsonius	Northern Meadow Jumping Mouse	S5	Yes	No

1 – Listed in iNaturalist as present in Dufferin County

2 – Habitat exists on the Property

3 - Observed during 11 site visits over 3 years and 3 seasons, observed, footprints, or scat.

S5 - Secure – Common, widespread, and abundant in the nation or province (includes invasives).

Does not include Bats, which are surveyed separately

17.4 Amphibian Survey (and Reptiles)

In addition to the incidental observations made during 11 site visits over three seasons and three years, an Amphibian Call Survey was conducted. The survey protocol followed the *Marsh Monitoring Program Participant's Handbook For Surveying Amphibians* (2009).

The first call survey was conducted May 2, 2021. The air temperature started at 9° C and fell to 6° C. The sky was clear and the Beaufort Wind Scale was 0 (calm). The Background Noise Code was 1 (slightly affecting sampling, periodic distant cars). Because the woodland and wetland were small the survey duration was only 1 hour and 15 minutes (9:30 pm – 10:45 pm). There were 4 survey points, illustrated in Figure 18 and listed in Table 11:

1. Southwest edge of the wetland where the stream enters the woodland;
2. Approximately the centre of the wetland in the woodland, where the standing water was the widest;
3. Northeast edge of the wetland where the stream exists the woodland;
4. The interior of the woodland where there was a shallow pool of standing water that looked as if it may be a vernal pool (subsequent observations confirmed it was not).

At the time of the May 2, 2021 survey there was very shallow standing water through the wetland. The channel of the ephemeral stream in the field was moist but there was no standing or flowing water. The wetland and the shallow pond area in the woodland (Site 4) were checked earlier in the day. No amphibians were seen in the water, there were no salamander egg masses, and the only insect larvae observed were mosquitos. No amphibians were seen or heard calling after dark during the first survey period.

The second call survey was conducted May 17, 2021. It was a warm evening, following several warm days. The air temperature at the start was 14° C and it remained at that temperature for the 1 hour and 15 minute survey period (9:45 pm – 11:00 pm). The sky was overcast and the Beaufort Wind Scale was 1 (light air movement). The Background Noise Code was 1 (slightly affecting sampling, periodic distant cars). The same four sites were surveyed. During the May 17 survey the wetland was almost dry. There was no flowing water and there were only a few, isolated, very shallow pools. The very shallow, small pool near survey site 4 was completely dry. The ephemeral stream channel in the field was dusty dry. No amphibians were seen earlier in the day throughout the wetland and the woodland pool. There were no salamander egg masses, and the only insect larvae observed were mosquitos. No amphibians were seen or heard calling after dark during the second survey period.

Because there were no amphibians heard during the first two surveys, and because there is no bull frog habitat on the property, the third survey was not warranted.

Photos 33, 34 and 35 illustrate the rapid change in moisture conditions in the wetland where it exits the north side of the woodlot, which was the wettest section of the wetland. On May 2, 2021 (Photo 33) there was shallow standing water along the stream path. The water was only a few cm deep and it spread out to a little more than a metre in width at the widest places. On May 19, 2021 (Photo 34) the same area had no flowing or standing water, although the stream channel in the wetland was moist and muddy. On June 13, 2021 (Photo 35) the same area was completely dry.

There are 13 species of frogs in Ontario. None of these species were observed on the Property during the many site visits or the two amphibian call surveys. There is minimal amphibian foraging habitat and no sustainable amphibian breeding habitat on the Property.

Protocol-specific surveys for turtles, reptiles and salamanders were not conducted.

No turtles were observed during any of the 11 site visits, which is not surprising as there is no sustainable turtle breeding or foraging habitat.

Unlike turtles, snakes are more difficult to observe. There are 16 species of snake in Ontario. No snakes were observed during any of the 11 site visits, but the habitat exists to support at least four common snakes, specifically the Gray Ratsnake, the Eastern Ribbon Snake, the Common Garter Snake and the Butler's Garter Snake.

Salamanders are common in Ontario forests. They live and feed among the duff layer of the forest floor, so they are almost impossible to see through incidental observation. Although none were observed they are almost certainly present in the woodland, but there is no salamander breeding habitat on the Property.



Figure 18: Location of the four Amphibian Call Survey Sites.

Table 11: Location of Amphibian Call Survey Sites.		
Amphibian Call Survey Site	Co-ordinates	
	North	West
1	43° 49' 50.49"	80° 12' 51.89"
2	43° 49' 53.16"	80° 12' 52.10"
3	43° 49' 55.36"	80° 12' 52.43"
4	43° 49' 54.80"	80° 12' 48.32"
Amphibian call surveys conducted May 2 and May 17, 2021.		



Photo 33: May 2, 2021.
The stream as it exists the wetland on the north side of the woodland. There was very shallow standing water.

Photo 34: May 19, 2021. The same area. There is no flowing or standing water. The stream bed is moist and muddy in spots.



Photo 35: June 13, 2021. The same area. There is no standing or flowing water anywhere along the stream channel. The stream bed and the entire wetland is completely dry. There is no amphibian breeding habitat anywhere on the property.

17.5 Acoustic Bat Survey

Bats, like birds, are ubiquitous in Ontario. They are nocturnal and voracious insect eaters. There are eight bat species in Ontario. Since 2013, four bat species have been listed as species at risk (Endangered) under O. Reg. 230/08 of the Endangered Species Act due to rapidly declining populations believed to be associated with White-nose Syndrome, a fungus that infects bats during their winter hibernation. They are the Little Brown Myotis, the Northern Myotis, the Tri-colored Bat and the Eastern Small-footed Myotis. In the 2023 annual report the Committee on the Status of Species at Risk in Ontario recommended three more bat species be placed on the species at risk O. Reg 230/08. They are the Eastern Red Bat, the Hoary Bat and the Silver-haired Bat. Note that as of the date of this EIS the on-line version of O. Reg. 230/08 doesn't list these three additional bat species.

17.5.1 Monitoring Protocol

The methodology employed on the acoustic bat survey was based on Phase III of the Guelph District Ministry of Natural Resources *Survey Protocol for Species at Risk Bats within Treed Habitats, 2017*.

According to the protocol, coniferous, deciduous and mixed wooded ecosites, including treed swamps, that include trees that are at least 10 cm diameter-at-breast height should be considered suitable maternity roost habitat. Recent discussions with the MECP noted that all tree species can be utilized by species at risk bats during their summer activities and should be considered maternity roosting habitat until monitoring studies have been completed and bat absence is determined.

Bats may roost in trees, rock piles and rocky crevices, and occasionally buildings if they can gain access to interior walls and roofs, but they forage in forest openings, corridors, and forest edges, across meadows and over open water. Generally, bat foraging is minimal in forest interiors. Open bodies of water are also utilized by bats as a source of drinking water.

The woodland and wetland on the Property are quite small, so potential bat monitoring sites were limited. Figure 19 and Table 12 identify the location of the four acoustic monitors used for this survey.

Table 12: Location of Song Meter SM4Bat FS Acoustic Monitors.

Bat Monitor	Co-ordinates	
	North	West
1	43° 49' 50.71"	80° 12' 52.17"
2	43° 49' 49.97"	80° 12' 46.70"
3	43° 49' 51.90"	80° 12' 49.42"
4	43° 49' 55.01"	80° 12' 52.42"

Setup June 1, removed June 13 = 12 nights monitoring.
See Figure 19 for location of the 4 bat monitors.



Figure 19: Location of the four Acoustic Bat Monitors.

17.5 2 Monitoring Equipment and Survey Conditions

Four Song Meter SM4BAT FS bioacoustic recorders by Wildlife Acoustics outfitted with external SMM-U2 ultrasonic microphones were attached to trees at four monitoring sites in and around the woodland. The SM4 meters have built in microphones, however the SMM external microphones substantially enhance the recording distance and clarity. The microphones were positioned away from obstructions and slightly away from prevailing winds to maximize bat call recording. Obstacles such as branches and leaves were strategically removed to allow for maximum range of detection. The location of the four acoustic monitors is illustrated in Figure 19 and listed in Table 12. The deployment of the SM4 meters is illustrated in Photos 36, 37 and 38.

The survey protocol states monitoring should occur on evenings between June 1st and June 30th, beginning after dusk and continuing for 5 hours. Nightly surveys should occur during periods of low wind, no rain, and warm temperatures (above 10° C). A minimum of 10 surveys (nights) during suitable weather conditions are required to confirm the absence of species at risk bats. Monitoring conditions were almost optimal for the duration of the survey (Table 13).

The four passive acoustic detectors were deployed on June 1, 2021 and remained in place until June 13, 2021 for a total of 12 consecutive nights, two days longer than the minimum number of survey nights, to account for periods of unsuitable weather. The detectors were programmed to record bat calls beginning at sunset and end at sunrise.

17.5.3 Bat Survey Results

Although three nights experienced precipitation and one night (June 1-2) experienced temperatures below 10° C, bat calls were recorded every survey night. Kaleidoscope Pro software was used to analyze the recorded data obtained by the SM4s.

Automatic identification was applied to each recording using the batch processing feature of the software. Once applied, recordings were manually vetted by visual assessment of calls within a spectrogram. Poor quality recordings, noise recordings and recordings without automatic identification were reviewed, but calls were not assigned to a species unless it was confident to do so.

Recorded files contained search phase calls, approach phase calls, social calls and feeding buzzes. Among these call types, search phase calls were used for manual vetting as this call type is the most distinct between species. Approach phase calls have

greater overlap and are more easily misidentified. Social calls and feeding buzzes present no discernible features that aid in species identification.

Table 14 summarizes the results from both automatic and manual vetting identification. Calls of *Myotis/Perimyotis* species, which are species at risk currently listed in O. Reg. 230/08, are normally quite distinct from non-*Myotis/Perimyotis* species. One of the most unique features of these bat calls is their high frequency range. Typically, the lower range of *Myotis/Perimyotis* calls is around 40 khz, while non-*Myotis/Perimyotis* calls are well below 40 khz. For example, the lower range of Big Brown Bat and Silver-haired Bat calls is typically between 20 and 30 khz. Although distinguishing *Myotis/Perimyotis* calls from non-*Myotis/Perimyotis* calls can be done confidently, identifying to *Myotis/Perimyotis* species level is more complicated because call features often overlap between species. Simply stated, distinguishing between *Myotis/Perimyotis* bats and non-*Myotis/Perimyotis* bats is easy, but identifying specific *Myotis/Perimyotis* bat species is more difficult. When there was uncertainty about the specific *Myotis/Perimyotis* species of a recorded call during the manual vetting process, the identification default was to assign it simply as *Myotis* genus. In other words, it was definitely a *Myotis/Perimyotis* bat, but the specific species of bat could not be confidently determined.

Through automated classification, three Tri-colored Bats, four Eastern Small-footed *Myotis* and 248 Little Brown *Myotis* calls were identified. No Northern *Myotis* calls were identified by the automated classification program. Among the three recordings identified as Tri-colored Bat and four recording files identified as Eastern Small-footed *Myotis* only two files contained calls and call sequences of reasonable quality. However, vetting the identification of the two remaining recordings was still difficult as they contained approach phase calls or were indistinguishable from other *Myotis* species. Therefore, the identification of all seven recordings was manually changed to the *Myotis* genus. Of the *Myotis/Perimyotis* bats only the Little Brown Bat can be confirmed to be present on the Property. The Tri-coloured Bat and the Eastern Small-footed Bat may be present, but this could not be confirmed. And if they are present their numbers are very low – less than 0.2% of the identified recordings.

The most common bat species present on the Property, with 57% of all confirmed recordings, was the Big Brown Bat. The Hoary Bat was the next most common species with 12% of the confirmed recordings. In order of decreasing numbers were the Eastern Red Bat (8%), the Little Brown Bat (8%) and the Silver-haired Bat (7%). The remaining 8% of the recordings could not be confidently delegated to a specific species.

Four of the five bat species confirmed to be present on the Property are species at risk. The Little Brown Bat is currently listed as *Endangered* in O. Reg. 230/08. COSSARO (2023) recently recommended that the Eastern Red Bat, the Hoary Bat and the Silver-haired Bat be added to O. Reg. 230/08 as *Endangered* (although these species are not listed in O. Reg. 230/04 at the time of writing of this EIS).

The woodland on the Property is small (3.2 ha). The forest characteristics, although marginally suitable, are not optimal bat roosting habitat. There are very few potential mast trees, about 17 in the woodland and bats were not observed utilizing these trees during the multiple site visits, so bats roosting on the Property was not confirmed. There is abundant bat habitat (94 ha/233 ac) within about 1 km of the Property, which is well within the distance bats will travel on their nightly forage flights. It is possible some of the bats recorded during the acoustic survey are roosting in nearby forested habitat and foraging across the Property.

The species at risk nature of the five bat species is further discussed in Section 18.



Photo 36: External SMM-U2 ultrasonic microphones attached to the bat meters enhanced the recording distance and clarity.

Photo 37: Song Meter SM4BAT FS bioacoustics recorder by Wildlife Acoustics.



Photo 38: Acoustic recording secured to a tree at Site Bat 3. Sarah Robins is the bat ecologist.

Table 13: Summary of Time and Weather Conditions During the Acoustic Bat Survey.

Date	Sunset	Sunrise	Weather ^A
June 1, 2021 to June 2, 2021	20:56	05:41	17.0° C to 6.6° C ^B (temp at sunset to temp at sunrise) 0 to 23 km/h wind (range) 0.0 mm precipitation
June 2, 2021 to June 3, 2021	20:57	05:40	18.2° C to 14.3° C (temp at sunset to temp at sunrise) 1 to 13 km/h wind (range) 8.4 mm precipitation (between 10pm and 3am)
June 3, 2021 to June 4, 2021	20:58	05:40	19.1° C to 13.7° C (temp at sunset to temp at sunrise) 3 to 6 km/h wind (range) 0.0 mm precipitation
June 4, 2021 to June 5, 2021	20:58	05:40	22.6° C to 18.7° C (temp at sunset to temp at sunrise) 4 to 17 km/h wind (range) 0.0 mm precipitation
June 5, 2021 to June 6, 2021	20:59	05:39	24.6° C to 18.8° C (temp at sunset to temp at sunrise) 4 to 14 km/h wind (range) 0.0 mm precipitation
June 6, 2021 to June 7, 2021	21:00	05:39	23.6° C to 18.7° C (temp at sunset to temp at sunrise) 1 to 6 km/h wind (range) 0.0 mm precipitation
June 7, 2021 to June 8, 2021	21:00	05:39	24.4° C to 20.2° C (temp at sunset to temp at sunrise) 3 to 8 km/h wind (range) 6.8 mm precipitation (between 3am and 5am)
June 8, 2021 to June 9, 2021	21:01	05:38	21.8° C to 17.1° C (temp at sunset to temp at sunrise) 0 to 4 km/h wind (range) 0.2 mm precipitation (between 5am and 6am)
June 9, 2021 to June 10, 2021	21:02	05:38	20.7° C to 15.5° C (temp at sunset to temp at sunrise) 4 to 7 km/h wind (range) 0.0 mm precipitation
June 10, 2021 to June 11, 2021	21:02	05:38	15.7° C to 14.5° C (temp at sunset to temp at sunrise) 5 to 15 km/h wind (range) 0.0 mm precipitation
June 11, 2021 to June 12, 2021	21:03	05:38	17.0° C to 13.1° C (temp at sunset to temp at sunrise) 1 to 9 km/h wind (range) 0.0 mm precipitation
June 12, 2021 to June 13, 2021	21:03	05:38	18.3° C to 15.0° C (temp at sunset to temp at sunrise) 0 to 5 km/h wind (range) 0.0 mm precipitation

A - Data obtained from Environment Canada Guelph Turfgrass weather station (Climate ID: 6143089).

B – Temperatures remained above 10° C until 00.00.

Table 14: Summary of bat species identification.

Bat Species		Monitoring Site ¹ and Number of Recorded Calls				Total Calls
Common Name	Scientific Name	1	2	3	4	
Big Brown Bat	Eptesicus fuscus	269	684	196	543	1,718
Eastern Red Bat ⁴	Lasiurus borealis	2	11	6	5	24
Hoary Bat ⁴	Lasiurus cinereus	37	98	0	241	376
Silver-haired Bat ⁴	Lasinycteris noctivagans	16	136	0	52	204
Little Brown Bat ⁵	Myotis lucifugus	28	136	13	71	248
Myotis genus ^{2, 5}	Myotis	8	86	13	15	122
Unknown ³		45	200	87	88	421
Total		405	1,351	315	1,015	3,086
1 – See Figure 19 for location of the 4 bat monitors. 2 – Definitely a Myotis/Perimyotis but species could not be confidently identified. 3 – Bat species could not be confidently identified. Definitely not a Myotis/Perimyotis species. Acoustic Bat Survey conducted June 1 to June 13, 2021 using a Song Meter SM4 Bat FS with a SMM-U2 ultrasonic microphone. 4 – Recently listed by CSSROat Risk in Ontario						

17.6 Fish Habitat

Fish habitat is also discussed in Section 13.3.1. Based on the stream characteristics there is no direct or indirect fish habitat on the Property. However, the potential for fish habitat was further explored using the DFO Self Assessment Guide, as follows:

Step 1

Consult our guidance on regulatory partnerships if your project:

- *takes place in:*
 - *Nova Scotia*
 - *New Brunswick*
 - *Prince Edward Island*
- *is regulated by the:*
 - *National Energy Board*
 - *Canadian Nuclear Safety Commission*
 - [The Property is not in any of these jurisdictions].

Step 2

Determine if there are aquatic species at risk and/or critical habitat in your area. For information on harmful activities and threats to specific aquatic species at risk, visit the public registry. Check our aquatic species at risk maps to determine where at-risk populations occur in Canada and where their critical habitat is located.

- [There are no aquatic species at risk and/or critical habitat on the Property].

Step 3

Check if your project meets the criteria for project types and waterbodies where our review isn't required.

Related links, Waterbodies where our review isn't required

- *approved marine disposal or dumping sites*
- *tailings impoundment areas as listed in Schedule 2 of the Metal and Diamond Mining Effluent Regulations*
- *artificial waterbodies that aren't connected to a waterbody that contains fish at any time during any given year, such as:*
 - *private ponds*
 - *roadside drainage ditches*
 - [The intermittent stream on the Property drains into the municipal ditch on the south side of County Road 3].
 - *quarries and aggregate pits*
 - *irrigation ponds or channels*
 - *stormwater management ponds*

- o *agricultural drains and drainage ditches*
 - [The intermittent stream on the Property drains into the municipal ditch on the south side of County Road 3, then drains into an agricultural tile drain system, the Brauwer Drain, that eventually drains into the headwaters of Butler Creek about 2 km downstream].
- o *commercial ponds like golf course ponds or stocked fishing ponds*
- *any other waterbody that:*
 - o *doesn't contain fish at any time during any given year and*
 - [The stream on the Property is intermittent. During the 11 site visits during 3 seasons over 3 years on the occasions when the Stream had flowing water no fish were observed.]
 - o *isn't connected to a waterbody that contains fish at any time during any given year*
 - [There is no other water body on the Property. It is connected to the Brauwer Drain, an agricultural drain system that does not contain fish or fish habitat].

The stream, which is the only watercourse on the Property is not direct or indirect fish habitat.

17.7 Butterfly and Moth Survey (insects)

Twenty five species of insects and nine species of fungus were observed (Tables 15 and 16). Most of these were associated with plant pathologies, for example Beach Bark Disease, Emerald Ash Borer, Eutypella Canker and Black Knot on trees, plus a number of common leaf minor and leaf spot infections. All of them are typical of the forest and plant pathology community of eastern tolerant hardwood forests of Ontario.

At two locations along the stream/wetland and the interior woodland 'pool' there were small deposits of tiny shells that were likely Swamp Fingernail Clams (*Musculium partumeium*). In July and August these areas were completely dry, the soil was cracked, and the dead clam shells were scattered on the surface. This species displays a wide range of phenotypic plasticity. They are physiologically adapted to periods of stress, they have an ability to survive and reproduce in a wide variety of habitats, and they not only tolerate anoxia or severe hypoxia in the summer months, but can grow and reproduce during that period. They are often found in stream beds or wetlands that are poorly oxygenated and dry up in the summer. They survive the dry period by burrowing down into the softer sediments, although turning over the surface soil clumps in the dry

Wetland did not reveal moister soil at depth, and no live clams were found. They are so small that they can travel on the feet of birds and mammals, and they can be physically washed down from upstream during high water flow. Typically, the presence of Fingernail Clams indicates the presence of a vernal pond, which provides breeding habitat for amphibians, however in this case that is very unlikely. The areas where they were observed had very shallow seasonal water (less than 10 cm) and no live clams were uncovered at depth. No amphibians were heard or seen at these sites. It is likely that the clams were washed down from further upstream and off-Property, or carried in on birds or animals. There were no physical characteristics or vegetation communities in the woodland or wetland that suggested there were vernal ponds on the Property. Amphibian and salamander egg masses were not observed in shallow standing water during the many site visits.

At least two Monarch butterflies were observed in flight in the woodland, in the wetland, and along the edge of the agricultural field. There may have been more, but it was uncertain if the multiple sightings were the same Monarchs flitting across the Property, or if they were the Queen Butterfly or Viceroy Butterfly that closely resembles the Monarch, particularly when viewed from a distance. The Monarch Butterfly is a species at risk (Special Concern). It is discussed further in Section 18.0.

Table 15: Insects observed on the Property.

Scientific Name	Common Name	SRank	Form	Habitat
<i>Aceria chondriophora</i>	Ash Leaf Wart Gall	NA	Gall	Woodland
<i>Acericecis ocellaris</i>	Maple Eye-spot Gall	NA	Gall	Woodland
<i>Agrilus planipennis</i>	Emerald Ash Borer	NA	Larva	Woodland
<i>Asteromyia carbonifera</i>	Goldenrod Blister Gall	NA	Gall	Woodland
<i>Bombus impatiens</i>	Common Eastern Bumble Bee	S5	Bee	Woodland
<i>Botryosphaeria dothidea</i>	Goldenrod Blister Gall	NA	Gall	Woodland
<i>Colias philodice</i>	Clouded Sulphur	NA	Butterfly	Agricultural Field
<i>Cryptococcus fagisuga</i>	Beech Scale	NA	Larva	Woodland
<i>Danaus plexippus</i>	Monarch	SC	Butterfly	Woodland
<i>Dissosteira Carolina</i>	Carolina Grasshopper	NA	Grasshopper	Agricultural Field
<i>Hyphantria cunea</i>	Fall Webworm Moth	S5	Larva	Woodland
<i>Liriomyza aclepiadis</i>	Leaf Miner of Milkweed	NA	Miner	Woodland
<i>Liriomyza arctii</i>	Leaf Miner of Burdock	NA	Miner	Woodland
<i>Liriomyza impatiens</i>	Leaf Miner of Impatiens	NA	Miner	Woodland
<i>Lymantria dispar</i>	Gypsy Moth	NA	Moth	Woodland
<i>Nemorimyza maculosa</i>	Leaf Blotch Miner of Burdock	NA	Miner	Woodland
<i>Nepticula ulmicola</i>	Leaf Miner of Elm	NA	Miner	Woodland
<i>Parallelodiplosis subtruncata</i>	Dogwood Ring Blister Gall	NA	Gall	Woodland
<i>Pegomya laticornis</i>	Leaf Miner of Burdock	NA	Miner	Woodland
<i>Phymatocera aterrima</i>	Leaf Miner of False Solomon's Seal	NA	Miner	Woodland
<i>Phytomyza affinis</i>	Leaf Miner of Thistle	NA	Miner	Woodland
<i>Pieris rapae</i>	Cabbage White	NA	Butterfly	Agricultural Field
<i>Schizomyia impatiens</i>	Touch-me-not Flower Gall	NA	Gall	Woodland
<i>Sympetrum vicinum</i>	Autumn Meadowhawk	NA	Dragonfly	Wetland
<i>Tetraopes tetraphthalmus</i>	Red Milkweed Beetle	NA	Beetle	Woodland

Surveyed during 11 site visits over 3 years and 3 seasons.

S5 - Secure – Common, widespread, and abundant in the nation or province (includes invasives).

NA - A conservation status rank is not applicable because the species is not a suitable target for conservation activities, e.g., an agricultural species, a hybrid, or a species of no conservation value.

SC - Species at Risk in Ontario, O. Reg. 230/08. Status Special Concern.

Table 16: Fungus observed on the Property.

Scientific Name	Common Name	SRank	Form	Habitat
<i>Apiosporina morbosa</i>	Black Knot	NA	Fruit Body	Woodland
<i>Armillaria mellea</i>	Honey Mushroom	NA	Fruit Body	Woodland
<i>Coleosporium solidaginis</i>	Goldenrod Rust	NA	Rust	Woodland
<i>Eutypella parasitica</i>	Eutypella Maple Canker	NA	Canker	Woodland
<i>Lycoperdon pyriforme</i>	Pear-shaped Puffball	NA	Fruit Body	Woodland
<i>Mycena leaiana</i>	Golden Fairy Helmet	NA	Fruit Body	Woodland
<i>Neonectria faginata</i>	Beech Bark Disease	NA	Fruit Body	Woodland
<i>Polyporus squamosus</i>	Dryad's Saddle	NA	Fruit Body	Woodland
<i>Ramularia rubella</i>	Leaf Spot of Dock	NA	Fruit Body	Woodland
Surveyed during 11 site visits over 3 years and 3 seasons. NA - A conservation status rank is not applicable because the species is not a suitable target for conservation activities, e.g., an agricultural species, a hybrid, or a species of no conservation value.				

18.0 Screening for Species at Risk

The fauna surveys confirmed the presence of six species at risk on the Property – four bats, one bird and one butterfly. They are:

1. Eastern Wood Pewee (*Special Concern*)
2. Eastern Red Bat (*Endangered*)
3. Hoary Bat (*Endangered*)
4. Silver-haired Bat (*Endangered*)
5. Little Brown Bat (*Endangered*)
6. Monarch Butterfly (*Special Concern*)

The Natural Heritage Information Centre (NHIC) database was reviewed to determine if there were records of species at risk on or adjacent to the Property. The NHIC information is summarized in 1 km² grids. Because birds and animals may utilize adjacent land while foraging, nesting or traversing their territory, all the NHIC grids adjacent to the Property were also explored. There are no records of species at risk in NHIC grids that included the Property. The NHIC has records of five species at risk within about 2 km of the Property. They are:

1. Eastern Meadowlark (*Threatened*)
2. Bobolink (*Threatened*)
3. Snapping Turtle (*Special Concern*)
4. Black Ash (*Endangered*)
5. Western Chorus Frog (*NAR S4*)

In addition to the NHIC records, habitat may exist on the Property to support other species at risk if they are present locally or regionally and travel through or forage on site. There are currently more than 240 species of plants, mammals, insects, birds, amphibians, reptiles and mollusks on the O. Reg. 230/08 species at risk list. Their ranges in Ontario and habitats were screened to see if the Property could potentially support these species at risk. In order to be considered, their range had to include the upper tributaries of the Grand River watershed and their habitat had to be consistent with an agricultural field, a small deciduous woodland, a small meadow-marsh wetland and an intermittent stream, which are the four landscape features that are present on the Property. Plants were excluded because they are not mobile and the 11 site visit multi-season and multi-year flora survey was very robust. Similarly, fish were excluded because there is no direct or indirect fish habitat on the Property.

Fifteen additional birds, insects and amphibians exist regionally and may utilize the Property. Table 17 summarizes the screening list. In total there were 26 species at risk - birds, insects, amphibians, reptiles and mammals that exist regionally, have local NHIC records, and may have suitable habitat on the Property. However, only the six species,

identified above, were confirmed to be present on the Property because they were seen or heard during the 11 multi-season and multi-year site visits.

The Eastern Wood-pewee was heard on several occasions, but there was no evidence of nesting, as determined during the Breeding Bird Survey. Nesting habitat is present on the Property, although it is marginal in extent because the woodland is small, only 3.2 ha (7.8 ac). The Eastern the Wood-pewee is territorial during the breeding season, typically requiring between 2 to 8 ha (5 to 20 ac). Because it wasn't heard during the Breeding Bird Survey this bird is likely nesting in nearby larger woodlands and foraging across the property.

Monarch butterflies were seen on several occasions in the summer. There is ample forage material and, although not abundant, there is Milkweed on the property. Milkweed is the only plant Monarchs will lay eggs on and the only plant the emerging larva feed on. Monarch butterflies are likely foraging and nesting on the Property.

The presence on the Property of four bat species was confirmed through acoustic monitoring. The woodland is small and there are only an estimated 17 trees that are candidate mast (roosting) trees because they are the preferred diameter or condition. No bats were observed using these trees, although surveillance timing was not optimal to observe active bats. The Property is better foraging habitat than roosting habitat, and although some bats are likely roosting in the few suitable trees, most of the bats are likely utilizing the nearby and larger forest tracks. There is no open water during most of the non-snow season, so the Property does not provide drinking water for foraging bats. For certain there are no bat hibernacula on the Property

Table 17: Screening for Species at Risk on the Property.

Common Name	Scientific Name	Species Type	Species at Risk Status ¹	Habitat Exists on Property ²	NHIC Record Near the Property ³	Observed on the Property ⁴
American Bumble Bee	<i>Bombus pensylvanicus</i>	Insect	Special Concern	Yes	No	No
Bank Swallow	<i>Riparia riparia</i>	Bird	Threatened	No	No	No
Barn Swallow	<i>Hirundo rustica</i>	Bird	Special Concern	No	No	No
Black Ash	<i>Fraxinus nigra</i>	Tree	Endangered	No	Yes	No
Bobolink	<i>Dolichonyx oryzivorus</i>	Bird	Threatened	No	Yes	No
Cerulean warbler	<i>Setophaga cerulea</i>	Bird	Threatened	No	No	No
Common Nighthawk	<i>Chordeiles minor</i>	Bird	Special Concern	Yes	No	No
Eastern Meadowlark	<i>Sturnella magna</i>	Bird	Threatened	Yes	Yes	No
Eastern Red Bat	<i>Lasiurus borealis</i>	Mammal	Endangered	Yes	No	Yes
Eastern Whip-poor-will	<i>Antrostomus vociferus</i>	Bird	Threatened	Yes	No	No
Eastern Wood Pewee	<i>Contopus virens</i>	Bird	Special Concern	Yes	No	Yes
Grasshopper Sparrow	<i>Ammodramus savannarum</i>	Bird	Special Concern	No	No	No
Henslow's sparrow	<i>Ammodramus henslowii</i>	Bird	Endangered	No	No	No
Hoary Bat	<i>Lasiurus cinereus</i>	Mammal	Endangered	Yes	No	Yes
Jefferson Salamander	<i>Ambystoma jeffersonianum</i>	Amphibian	Endangered	Yes	No	No
Little Brown Myotis (Bat)	<i>Myotis lucifugus</i>	Mammal	Endangered	Yes	No	Yes
Monarch Butterfly	<i>Danaus plexippus</i>	Insect	Special Concern	Yes	No	Yes
Northern dusky salamander	<i>Desmognathus fuscus</i>	Amphibian	Endangered	Yes	No	No
Red-headed woodpecker	<i>Melanerpes erythrocephalus</i>	Bird	Endangered	Yes	No	No
Rusty-patched Bumble Bee	<i>Bombus affinis</i>	Insect	Endangered	Yes	No	No
Silver-haired Bat	<i>Lasionycteris noctivagans</i>	Mammal	Endangered	Yes	No	Yes
Snapping Turtle	<i>Chelydra serpentina</i>	Reptile	Special Concern	No	Yes	No
West Virginia White	<i>Pieris virginensis</i>	Insect	Special Concern	Yes	No	No

Table 17: Screening for Species at Risk on the Property.

Common Name	Scientific Name	Species Type	Species at Risk Status ¹	Habitat Exists on Property ²	NHIC Record Near the Property ³	Observed on the Property ⁴
Western Chorus Frog	<i>Pseudacris triseriata</i>	Amphibian	NAR	No	Yes	No
Yellow-banded Bumble Bee	<i>Bombus terricola</i>	Insect	Special Concern	Yes	No	No
Yellow Breasted Chat	<i>Icteria virens</i>	Bird	Endangered	Yes	No	No

1 – O. Reg. 230/08 (updated to 2023 Committee on the Status of Species at Risk in Ontario annual report).

2 – Habitat required to support the species at risk exists on the Property.

3 – There were no species at risk records on the Property, these are the NHIC grids adjacent to the Property.

4 – Confirmed to be present on the Property by observation or sound.

19.0 Screening for Significant Wildlife Habitat

The evaluation of Significant Wildlife Habitat for the Property was re-visited for this EIS using the more recent (2015) MNR Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E. This guideline includes 35 habitat types that could be considered Significant Wildlife Habitat if certain minimum criteria are met, such as: size of the feature, proximity to nearby significant features, presence of locally rare species or species at-risk, concentration of wildlife, evidence of seasonal staging or breeding, migration staging areas, unique or rare physical features, wildlife movement corridors, and presence of hibernacula. Table 18 summarizes the Property in relation to the MNR Criteria Schedules to determine if the Property, or areas on the Property, could be designated as Significant Wildlife Habitat. Areas designated as Significant Wildlife Habitat may have development restrictions, or require larger setbacks, or permits.

In relation to this Property, of the 35 habitat types in the Criteria Schedule, only one is possible Significant Wildlife Habitat. The small woodland could be considered Significant Wildlife Habitat because of the confirmed presence of six species at risk – Little Brown Myotis, Eastern Red Bat, Silver-haired Bat, Hoary Bat, Monarch Butterfly and Eastern Wood Pewee.

Table 18: Screening for Significant Wildlife Habitat (SWH).

Wildlife Habitat	Wildlife Species	ELC Ecosite	SWH Criteria	SWH Screening Results
1) Seasonal Concentration Areas of Animals				
Waterfowls Stopover and Staging Areas - Terrestrial	American Black Duck, Wood Duck, Green-winged Teal, Blue-winged Teal, Mallard, Northern Pintail, Northern Shoveler, American Wigeon, Gadwall.	CUM1, CUT1	Fields with flooding during spring melt and run-off, Agricultural fields with waste grains. The highest significance should be placed on permanent wetlands and wetlands that have provided habitat for staging waterfowl for many years.	Ecotypes not present. Fields don't flood. Habitat is not present. Wildlife species not present. Not Significant Wildlife Habitat.
Waterfowl Stopover and Staging Areas (Aquatic)	<u>Canada Goose</u> , 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. The permanence of large ponds and open water marshes is important.	Ecotypes not present. Wetland is small and ephemeral with no standing water. Habitat is not present. One wildlife specie was observed (Canada Goose) but only as a flyover. Not Significant Wildlife Habitat.
Shorebird Migratory Stopover Area	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, <u>MAM2</u> , MAM3, MAM4, MAM5.	Shorelines of lakes, rivers and wetlands, including beach areas, bars and seasonally flooded, muddy and un-vegetated shoreline habitats. Natural, permanent sites are generally more significant than artificial sites such as sewage lagoons or temporarily flooded or exposed areas such as mudflats.	One Ecotype (MAMM2-9) but shoreline habitat is not present. Wildlife species not present. Not Significant Wildlife Habitat.
Raptor Wintering Area	Rough-legged Hawk, <u>Red-tailed Hawk</u> , Northern Harrier, American Kestrel, Snowy Owl, Short-eared Owl, Bald Eagle.	<u>FOD</u> , FOM, FOC, CUM, CUT, CUS, CUW, SWD, SWM, SWC.	Combination of fields and woodlands that provide roosting, foraging and resting habitats for wintering raptors. Eagle sites have open water, large trees and snags available for roosting. The best sites should be at least 25 to 30 ha in size, although actively cropped fields are generally not suitable.	One Ecotype is present (FOD), but no open water and trees too small for roosting. Red-tailed Hawk observed flying over the property. No evidence of habituating or breeding on-site. No nests were observed. Woodland much smaller than minimum size (3.2 ha vs 25 ha). Habitat not suitable for wintering.

Table 18: Screening for Significant Wildlife Habitat (SWH).

Wildlife Habitat	Wildlife Species	ELC Ecosite	SWH Criteria	SWH Screening Results
				Not Significant Wildlife Habitat.
Bat Hibernacula	<u>Big Brown Bat</u> , Tri-coloured Bat.	CCR1, CCR2 CCA1, CCA2	Hibernacula may be found in caves, mine shafts, underground foundations and Karsts.	Ecotypes not present. No natural or anthropogenic underground features. Habitat is not present. Bat species (Big Brown Bat) is present on the property as their summer range, but no hibernacula on or near the property. Not Significant Wildlife Habitat.
Bat Maternity Colonies	<u>Big Brown Bat</u> , <u>Silver-haired Bat</u> .	<u>FOD</u> , FOM, SWD, SWM.	Maternity colonies can be found in tree cavities, vegetation and often in buildings, mature deciduous or mixed forest stands with large, old and decaying trees. Forest should be >24.7 ac (10 ha) and have trees >25 cm DBH.	One Ecotypes present (FOD). Woodland on the property is substantially smaller than the minimum required (3.2 ha vs 10 ha), and relatively few large trees (mean DBH >25 cm, only 30% of trees >25 cm). Decaying trees are present because of poor forest management, but roosting habitat is marginal. Both bat species are present on the property. Some bats may be roosting on the property, but better habitat nearby (larger woodland, larger trees). Not Significant Wildlife Habitat.
Turtle Wintering Areas	Midland Painted Turtle, Northern Map Turtle, Snapping Turtle	FEO, BOO.	For most turtles, wintering areas are in the same general area as their core habitat. Water has to be deep enough not to freeze to the bottom and have soft mud substrates. Over-wintering sites are permanent water bodies, large wetlands, and bogs or fens with adequate Dissolved Oxygen. Greatest significance should be assigned to sites that are natural, least disturbed and are closest to their habitat. The most significant sites should have safe movement corridors between the nesting and aquatic habitat.	Ecotypes are not present. There is no permanent deep water on the property. Habitat is not present. No turtles were observed on the property. No suitable wintering habitat. Not Significant Wildlife Habitat.

Table 18: Screening for Significant Wildlife Habitat (SWH).

Wildlife Habitat	Wildlife Species	ELC Ecosite	SWH Criteria	SWH Screening Results
Reptile Hibernaculum	Eastern Gartersnake, Northern Watersnake, Northern, Red-bellied Snake, Northern Brownsnake, Smooth Green Snake, Northern Ring-necked Snake, Milksnake, Eastern Ribbonsnake, Five-lined Skink.	FOD , FOM, FOC1, FOC3.	Sites located below frost lines in burrows, rock crevices and other natural or naturalized locations, such as rock piles, slopes, old stone fences, abandoned crumbling foundations, broken and fissured rock, rock outcrop, cover rock overlaying granite bedrock with fissures.	One Ecotype is present (FOD), but no suitable rocky features. Habitat is not present. None of the species were observed. No suitable winter hibernacula habitat. Not Significant Wildlife Habitat.
Colonial - Nesting Bird Breeding Habitat (Bank and Cliff)	Cliff Swallow, Northern Rough-winged Swallow.	CUM1, CUT1 CUS1, BLO1 BLS1, BLT1 CLO1, CLS1 CLT1	Sites or areas with exposed soil banks, undisturbed or naturally eroding that is not a licensed/permited aggregate area. Natural cliffs, large cervices, caves with large openings and caves, underside of large bridge structures.	Ecotype is present (SWD2), but there is no permanent standing water on the property. Very few trees are tall enough for nesting. Habitat is not present. Wildlife species not present. Not Significant Wildlife Habitat.
Colonially - Nesting Bird Breeding Habitat (Tree/Shrubs)	Great Blue Heron, Black-crowned Night Heron, Great Egret, Green Heron.	SWM2, SWM3, SWM5, SWM6, SWD1, SWD2, SWD3, SWD4, SWD5, SWD6, SWD7, FET1.	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.	Ecotypes are not present. No permanent standing water on the property. Very few trees are tall enough for nesting. Habitat is not present. Wildlife species not present. Not Significant Wildlife Habitat.
Colonial - Nesting Bird Breeding Habitat (Ground)	Herring Gull, Great Black-backed Gull, Little Gull, Ring-billed Gull , Common Tern, Caspian Tern, 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.	Ecotypes are not present. There is no permanent open water or marshy areas on the property. Habitat is not present. One wildlife species present (Ring-billed Gull) observed as flyover. Not Significant Wildlife Habitat.
Migratory Butterfly Stopover Areas	Painted Lady, Red Admiral.	CUM, CUT, CUS, FOC, FOD , FOM, CUP.	A butterfly stopover area will be a minimum of 24.7 ac (10 ha) in size with a combination of field and forest habitat and will be located within 5 km of Lake Ontario and/or Lake Eries. Sites with a variety of habitat types (e.g., forest, grassland) are often more significant than sites with homogeneous habitat. Sites that have been traditionally used for at least 10 years are more significant.	One Ecotype is present (FOD) but the property is not in proximity to Lake Ontario. No record of prolonged butterfly use. Habitat is not present. Wildlife species not present. Not Significant Wildlife Habitat.
Land bird Migratory Stopover Areas	All migratory songbirds.	FOC, FOM, FOD , SWC, SWM, SWD.	Woodlots need to be greater than 24.7 ac (10 ha) in size and within 5 km of Lakes Ontario and Erie. Sites with a variety of habitat types (e.g., forest, grassland) are often more significant than sites with homogeneous habitat. Sites that have been used for many years are more significant.	One Ecotype is present (FOD), but property is not in proximity to Lake Ontario. Woodland doesn't meet minimum size requirement (3.2 ha vs 10 ha). Habitat is not present. Some songbirds present. Not Significant Wildlife Habitat.

Table 18: Screening for Significant Wildlife Habitat (SWH).

Wildlife Habitat	Wildlife Species	ELC Ecosite	SWH Criteria	SWH Screening Results
Deer Yarding Areas	<u>White-tailed Deer.</u>	FOM, FOC, SWM, SWC, CUP2, CUP3, FOD3, CUT.	Deer yarding areas or winter concentration areas (yards) are areas that deer move to in response to the onset of winter snow and cold. The yard is composed of two areas referred to as Stratum 1 and Stratum 2. Stratum 2 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 2 area the entire winter.	Ecotypes are not present. White-tailed Deer are present. No MNR record of Stratum or Stratum 2 deer yard on or in the vicinity of the Property. Habitat is not present. Not Significant Wildlife Habitat.
Deer Winter Congregation Areas	<u>White-tailed Deer</u>	FOC, FOM, <u>FOD</u> , SWC, SWM, SWD	Woodlots will typically be greater than 247 ac (100 ha).	One Ecotype is present (FOD), but forest is substantially smaller than the minimum size requirement (3.2 ha vs 100 ha). White-tailed Deer are present. Habitat is not present.. Not Significant Wildlife Habitat.
2) Rare Vegetation Communities or Specialized Habitat for Wildlife that are Considered Significant Wildlife Habitat.				
Cliffs and Talus Slopes	S1, S2, S3 plant species.	TAO, TAS, TAT, CLO, CLS, CLT.	A Cliff is vertical to near vertical bedrock greater than 3m in height. A Talus Slope is rock rubble at the base of a cliff made up of coarse rocky debris.	Ecotypes are not present. Habitat is not present. Plant species are not present. Not Significant Wildlife Habitat.
Sand Barren	S1, S2, S3 plant species.	SBO1, SBS1, SBT1.	Sand Barrens typically are exposed sand, generally sparsely vegetated and caused by lack of moisture, periodic fires, and erosion.	Ecotypes are not present. Habitat is not present. Plant species are not present. Not Significant Wildlife Habitat.
Alvar	Not Specific	ALO1, ALS1, ALT1, FOC1, FOC2, CUM2, CUS2, CUT2-1, CUW2.	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. An Alvar site is greater than 1.2 ac (0.5 ha) in size.	Ecotypes are not present. Habitat is not present. Plant species are not present. Not Significant Wildlife Habitat.
Old Growth Forest	S1, S2, S3 plant species.	<u>FOD</u> , 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 74 ac (30 ha) or greater in size or with at least 24.7 ac	One Ecotype is present (FOD). No interior forest is present. Total forest size is too small (3.2 ha vs 30 ha). Average tree age is 45 years. No old trees. Habitat is not present. Plant species not present.

Table 18: Screening for Significant Wildlife Habitat (SWH).

Wildlife Habitat	Wildlife Species	ELC Ecosite	SWH Criteria	SWH Screening Results
			(10 ha) interior habitat. Most significant sites will contain numerous trees of at least 140 years old. Stands containing younger trees (e.g., 100 years or older) are significant where older trees no longer exist. More significant sites will have experienced little or no substantial logging or other forestry activities (e.g., no management or only periodic light selection cutting).	Not Significant Wildlife Habitat.
Savannah	S1, S2, S3 plant species.	TPS1, TPS2, TPW1, TPW2, CUS2,	A Savannah is a tallgrass prairie habitat that has tree cover between 25–60%. There is no minimum size.	Ecotypes are not present. Habitat is not present. Plant species not present. Not Significant Wildlife Habitat.
3) Specialized Habitats of Wildlife considered Significant Wildlife Habitat.				
Waterfowl Nesting Area	American Black Duck, Northern Pintail, Northern Shoveler, Gadwall, Blue-winged Teal, Green-winged Teal, Wood Duck, Hooded Merganser, Mallard.	SWH, MAS1, MAS2, MAS3, SAS1, SAM1, SAF1, MAM1, <u>MAM2</u> , MAM3, MAM4, MAM5, MAM6, SWT1, SWT2, SWD1, SWD2, SWD3, SWD4.	A waterfowl nesting area extends 120 m from a wetland, or any small wetlands within 120m, or a cluster of 3 or more small wetlands within 120 m of each other where waterfowl nesting is known to occur. Most significant sites have better habitat (e.g., optimal vegetation structure, stable water levels, abundant cover, and a wetland/water body within 150 m).	One Ecotype is present (MAM2), but there is no wetland water body. Habitat is not present. Wildlife species not present. Not Significant Wildlife Habitat.
Bald Eagle and Osprey Nesting, Foraging and Perching Habitat	Osprey, Bald Eagle.	<u>FOD</u> , FOM, FOC, SWD, SWM, SWC	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.	One Ecotype is present (FOD), but no open water ponds, rivers or permanent wetlands. No old tall trees for nests. Habitat is not present. Osprey and Eagles not present.. Not Significant Wildlife Habitat.
Woodland Raptor Nesting Habitat	Northern Goshawk, Cooper's Hawk, Sharp-shinned Hawk, Red-shouldered Hawk, Barred Owl, Broad-winged Hawk.	All forested Ecosites and SWC, SWM, SWD and CUP3.	All natural or conifer plantation and forest stands >74 ac (30 ha) with >24.7 ac (10 ha) of interior habitat. Interior habitat determined with a 200m buffer.	Forest Ecotype is present (FOD). Woodlands are not large enough (3.2 ha vs 30 ha). No interior forest is present. Habitat is not present. Wildlife species not present. Not Significant Wildlife Habitat
Turtle Nesting Areas	Midland Painted Turtle, Northern Map Turtle, Snapping Turtle	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.	Ecotypes not present. Habitat is not present. Wildlife species not present. Not Significant Wildlife Habitat.

Table 18: Screening for Significant Wildlife Habitat (SWH).

Wildlife Habitat	Wildlife Species	ELC Ecosite	SWH Criteria	SWH Screening Results
Seeps and Springs	<u>Wild Turkey</u> , Ruffed Grouse, Spruce Grouse, <u>White-tailed Deer</u> , Salamander spp.	Any forested Ecosite within headwater areas.	Seeps and Springs are areas where ground water comes to the surface. Any forested area, meadow, field or within the headwaters of a stream or river system. Sites with several seeps/springs (e.g., >5) are most significant. Most significant seeps/springs are present even during very dry summers. Seeps/springs located on south-facing slopes are probably more significant than seeps with other aspects because of their winter value to some wildlife species. Seeps/springs in forest stands and/or headwater areas are generally more significant than those found in other areas. Seeps/spring found in relatively undisturbed areas are generally more significant than those found in areas disturbed by human activities (e.g., off-road vehicle travel).	Forest Ecotype is present (FOD) . No seeps or springs. Stream channel and small Wetland dry up completely after the spring freshet. White-tailed Deer and Wild Turkey are present. Habitat is not present. Not Significant Wildlife Habitat.
Amphibian Breeding Habitat (Woodland).	Eastern Newt, Blue-spotted Salamander, Spotted Salamander, Gray Treefrog, Spring Peeper, Western Chorus Frog, Wood Frog.	FOC, FOM, <u>FOD</u> , SWC, SWM, SWD.	Presence of a wetland, pond or woodland pool, including vernal pools, >500 m ² in size within or adjacent to a woodland.	One Ecotype is present (FOD) but no permanent wetlands or vernal ponds on the property. Habitat is not present. Wildlife species not present. No amphibians recorded during call surveys. Not Significant Wildlife Habitat.
Amphibian Breeding Habitat (Wetlands)	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.	Any wetland ecosites.	Wetlands >500 m ² , supporting high species diversity. Some small or ephemeral habitats may not be identified on MNRF mapping and could be important amphibian breeding habitats.	One Ecotype is present (MAM2) . No suitable open water streams or ponds. Habitat not present. Wildlife species not present. No amphibians recorded during call surveys. Not Significant Wildlife Habitat.
Area-Sensitive Bird Breeding Habitat	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, Cerulean Warbler, Canada Warbler.	FOC, FOM, <u>FOD</u> , SWC, SWM, SWD.	Habitats where interior forest breeding birds are breeding, typically large mature (>60 yrs old) forest stands or woodlots >74 ac (30 ha) with interior forest habitat at least 200 m from forest edge.	One Ecotype is present (FOD) but forest total size does not meet minimum requirements (3.2 ha vs 30 ha). Average tree age is too young (45 years vs >60 years). No interior forest present. Habitat not present. Wildlife species not present. Not Significant Wildlife Habitat

Table 18: Screening for Significant Wildlife Habitat (SWH).

Wildlife Habitat	Wildlife Species	ELC Ecosite	SWH Criteria	SWH Screening Results
4) Habitats of Species of Conservation Concern considered Significant Wildlife Habitat.				
Marsh Breeding Bird Habitat	American Bittern, Virginia Rail, Sora, Common Moorhen, American Coot, Pied-billed Grebe, Marsh Wren, Sedge Wren, Common Loon, Sandhill Crane, Green Heron, Trumpeter Swan.	MAM1, MAM2 , MAM3, MAM4, MAM5, MAM6, SAS1, SAM1, SAF1, FEO1, BOO1, CUM1.	All wetland habitat as long as there is shallow water with emergent aquatic vegetation, sluggish streams, ponds and marshes sheltered by shrubs and trees.	One Ecotype is present (MAM2). No open water stream, ponds or marshes. No emergent aquatic vegetation. Habitat is not present. Wildlife species not present. Not Significant Wildlife Habitat.
Open Country Bird Breeding Habitat	Upland Sandpiper, Grasshopper Sparrow, Vesper Sparrow , Northern Harrier, Savannah Sparrow , Short-eared Owl.	CUM1, CUM2	Large grassland areas, includes natural and cultural fields and meadows, >74 ac (30 ha). Grasslands, not Class 1 or 2 agricultural fields, and not being actively used for farming.	Ecotypes are not present. No grasslands present. Agricultural field is actively farmed and doesn't meet minimum size requirement (23.2 ha vs 30 ha). Habitat not present. Two wildlife species present (Vesper Sparrow and Savannah Sparrow). Not Significant Wildlife Habitat.
Shrub/Early Successional Bird Breeding Habitat	Brown Thrasher, Clay-coloured Sparrow, Field Sparrow , Black-billed Cuckoo, Eastern Towhee, Willow Flycatcher, Yellow-breasted Chat, Golden-winged Warbler.	CUT1, CUT2, CUS1, CUS2, CUW1, CUW2.	Large field areas succeeding to shrub and thicket >24.7 ac (10 ha) in size. Shrub land or early successional fields, not class 1 or 2 agricultural lands, not being actively used for farming.	Ecotypes are not present. Habitat not present. Agricultural field is being actively farmed. One species present (Field Sparrow). Not Significant Wildlife Habitat.
Terrestrial Crayfish	Chimney or Digger Crayfish, Devil Crayfish or Meadow Crayfish.	MAM1, MAM2 , MAM3, MAM4, MAM5, MAM6, MAS1, MAS2, MAS3, SWD, SWT SWM CUM1	Wet meadow and edges of shallow marshes (no minimum size). Constructs burrows in marshes, mudflats, meadows, the ground can't be too moist. Can often be found far from water. Terrestrial Crayfish are only found in SW Ontario and their habitats are very rare.	One Ecotype is present (MAM2) but marsh habitat is not present, and property is likely well out of the known range in Ontario. Habitat not present. Wildlife species not present. Not Significant Wildlife Habitat.
Special Concern and Rare Wildlife Species	All S1, S2, S3 plant and animal species tracked by NHIC.	Any ELC	NHIC records for species at risk on or in the vicinity of the property. Habitats of the rarest species are more significant than those of less rare species. For example, habitats for species ranked S1 and S2 should be considered more significant than habitats for species ranked S3. Species ranked as vulnerable by the MNR should also be considered significant. Sites capable of producing a large number of individuals of a single species of conservation concern are significant. Highly diverse sites that support one or more species of conservation concern are most significant.	Little Brown Myotis (Endangered), Eastern Red Bat (Endangered), Silver-haired Bat (endangered) Hoary Bat (Endangered), Monarch Butterfly (Special Concern), Eastern Wood Pewee (Special Concern) confirmed on the property. Significant Wildlife Habitat is Present.
5) Animal Movement Corridors is present				

Table 18: Screening for Significant Wildlife Habitat (SWH).

Wildlife Habitat	Wildlife Species	ELC Ecosite	SWH Criteria	SWH Screening Results
Amphibian Movement Corridors	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.	Movement corridors between breeding habitat and summer habitat. Movement corridors must be determined when Amphibian breeding habitat is confirmed as SWH. Corridors that provide access to and from the most critical habitats within a species home range are significant. Corridors connecting locally important conservation areas and/or currently unevaluated natural areas in the planning area may be significant, particularly if the adjacent landscape is greatly fragmented by roads, residential development, or agricultural activities. Corridors through natural landscapes are more significant than those through more anthropogenic landscapes.	There is no amphibian breeding habitat on the property. No amphibians were confirmed on the Property. Habitat not present. Not Significant Wildlife Habitat.
Deer Movement Corridors	<u>White-tailed Deer</u>	Corridors may be found in all forested ecosites.	Movement corridor must be determined when Deer Wintering Habitat is confirmed as SWH. Corridors that provide access to and from the most critical habitats within a species home range are significant. Corridors connecting locally important conservation areas and/or currently unevaluated natural areas in the planning area may be significant, particularly if the adjacent landscape is greatly fragmented by roads, residential development, or agricultural activities. Corridors through natural landscapes are more significant than those through more anthropogenic landscapes.	Forest Ecotype is present (FOD). White-tailed Deer are present. No deer wintering habitat is present. No local conservation areas. Habitat is not present. Not Significant Wildlife Habitat.
Extracted from: MMNRF. Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E. January 2015.				

20.0 Impacts of the Proposed Development

Figure 20 illustrates the proposed development, represented by the draft plan of subdivision, as it relates to the natural features on the Property. Sunray proposes to create 78 residential estate lots. There will be three internal roads, one connecting to the south side of County Road 3 at the northwest corner of the Property, another connecting to the west side of County Road 24 on the southeast corner of the Property.

20.1 Stream

The seasonal surface flow that is the intermittent stream will be channelized into an earthen swale that will approximately travel the same path as the stream across the fields and through the wetland in the northwest corner of the woodland. The swale channel will safely convey drainage from the external lands to the south, across the Property, and into the Brauwer Drain, and eventually into Butler Creek. The bypass channel will empty into a 1.7 ha SWM pond adjacent to the south side of County Road 3.

The stream will be completely displaced by the development. Compliance is explained in Section 21.0, Table 19 and mitigation in Section 22.2.1

20.2 Agricultural Field

The agricultural field will be completely displaced by the proposed development. This is consistent with the current land use planning for both the County and the municipality.

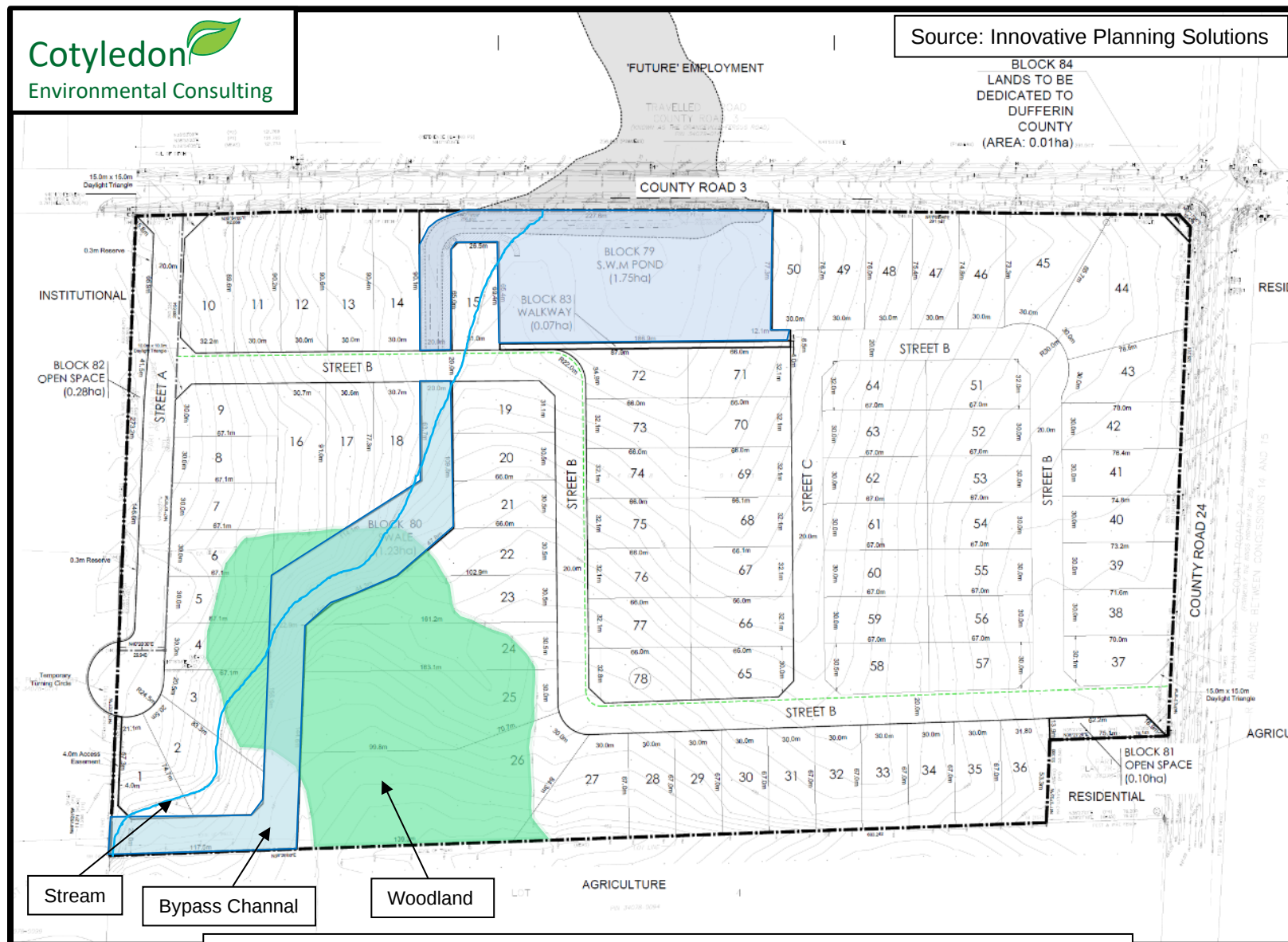
20.3 Wetland

The small Wetland will be completely displaced by the proposed development. The bypass channel that conveys the seasonal flow from south of the Property will run through the northwest corner of the woodland and will entirely displace the wetland.

Compliance and mitigation are further explained in Section 21.0, Table 19 and 22.2.2 respectively.

20.4 Woodland

The proposed development intends to maintain the woodland as treed residential estate lots. A few trees will have to be removed to accommodate the construction of the bypass channel that replaces the stream, but the woodland will largely be maintained in its current configuration. Compliance and mitigation are further explained in Section 21.0, Table 19 and Section s 21.0 and 22.2.3 respectively.



21.0 Compliance

As summarized in Table 19, the proposed development is compliant with provincial, regional and municipal environmental policies and regulations. A GRCA Permit is required to develop in Regulated Area. Also, a GRCA Permit may be required to remove the wetland, even though this feature doesn't meet the technical definition of a wetland and does meet the GRCA criteria as a developable wetland. In order to comply with Section 9 of the Endangered Species Act (injury to a Threatened or Endangered species), trees and shrubs must be removed only during the winter when species at risk bats are not present (November 1 to March 31).

Table 19: Compliance summary.

Enabling Plan, Policy, Authority	Compliance
(1) Lake Simcoe Protection Plan	(1) The Property is not in the Lake Simcoe Protection Plan area.
(2) Greenbelt	(2) The Property is not in the Greenbelt.
(3) Greenbelt Specialty Crop Area	(3) The Property is not in a Greenbelt Specialty Crop area.
(4) Oak Ridges Moraine	(4) The Property is not in the Oak Ridges Moraine.
(5) Frontenac Arch Biosphere Reserve	(5) The Property is not in the Frontenac Arch Biosphere Reserve.
(6) Niagara Escarpment Planning Area	(6) The Property is not in Niagara Escarpment Planning Area.
(7) Growth Plan for the Greater Golden Horseshoe	(7) The GPGGH is no longer a regulatory planning authority. The GPGGH was usurped by the 2024 Provincial Planning Statement.
Provincial Policy Statement (2014) and the Growth Plan for the Greater Golden Horseshoe (2020) were replaced by the Provincial Planning Statement (2024). Section 4.1 of the Provincial Planning Statement refers to the protection of Natural Heritage Features and Natural Heritage Systems. 4.1.4 Development and site alteration shall not be permitted in: (8) a) significant wetlands in Ecoregions 5E, 6E and 7E and, (9) b) significant coastal wetlands. 4.1.5 Development and site alteration shall not be permitted in: (10) a) significant wetlands in the Canadian Shield north of Ecoregions 5E, 6E and 7E, (11) b) significant woodlands in Ecoregions 6E and 7E (excluding	(8) The Wetland on the Property is not a Significant Wetland. (9) There are no significant coastal wetlands on the Property. (10) The Property is not in the Canadian Shield. (11) The Woodland on the Property is not a Significant Woodland.

Table 19: Compliance summary.

Enabling Plan, Policy, Authority	Compliance
islands in Lake Huron and the St. Mary's River), (12) c) significant valleylands in Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Mary's River), (13) d) significant wildlife habitat, (14) e) significant areas of natural and scientific interest, and (15) f) coastal wetlands in Ecoregions 5E, 6E and 7E that are not subject to policy 4.1.4(b), unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions. (16) 4.1.6 Development and site alteration shall not be permitted in fish habitat except in accordance with provincial and federal requirements. (17) 4.1.7 Development and site alteration shall not be permitted in habitat of endangered species and threatened species, except in accordance with provincial and federal requirements. (18) 4.1.8 Development and site alteration shall not be permitted on adjacent lands to the natural heritage features and areas identified in policies 4.1.4, 4.1.5 and 4.1.6 unless the ecological function of the adjacent lands has been evaluated and it has been demonstrated that there will be no negative impacts on the natural features or on their ecological functions. (19) 5.2.1 Planning authorities shall, in collaboration with conservation authorities where they exist, identify hazardous lands and hazardous sites and manage development in these areas, in accordance with	(12) There are no valleylands on the Property. (13) The Woodland on the Property is Significant Wildlife Habitat because of the confirmed presence of species at risk. However, the Woodland will not be impacted by the proposed development. A few trees on the edge of the Woodland will have to be removed to accommodate the construction of the bypass swale. Tree removal will be done in the winter so there will be no impact to the species at risk. (14) There are no ANSIs on or within 120 m of the Property. (15) There are no coastal wetlands on the Property. (16) There is no direct or indirect fish habitat on the Property. (17) See notes (13, 26 and 27). (18) There are no Natural Heritage Features within 120 m of the Property. (19) There are no hazardous lands or hazardous sites on the Property. There is a small area of GRCA Regulated Area adjacent to the south side of County Road 3. This will be managed by a SWM

Table 19: Compliance summary.

Enabling Plan, Policy, Authority	Compliance
provincial guidance. (20) 5.2.2 Development shall generally be directed to areas outside of: b) hazardous lands adjacent to river, stream and small inland lake systems which are impacted by flooding hazards and/or erosion hazards; 5.2.3 Development and site alteration shall not be permitted within: (21) c) areas that would be rendered inaccessible to people and vehicles during times of flooding hazards, erosion hazards and/or dynamic beach hazards, unless it has been demonstrated that the site has safe access appropriate for the nature of the development and the natural hazard; 5.2.8 ... development and site alteration may be permitted in those portions of hazardous lands and hazardous sites where the effects and risk to public safety are minor, could be mitigated in accordance with provincial standards, and where all of the following are demonstrated and achieved: (22) a) development and site alteration is carried out in accordance with floodproofing standards, protection works standards, and access standards; (23) b) vehicles and people have a way of safely entering and exiting the area during times of flooding, erosion and other emergencies; (24) c) new hazards are not created and existing hazards are not aggravated; and (25) d) no adverse environmental impacts will result. Ontario Ministry of the Environment, Conservation and Parks. Endangered Species Act. Species Conservation Act. Section 9 of the Endangered Species Act:	pond. A GRCA Permit will be required to Develop in a Regulated Area. (20) There are no erosion hazards or flooding hazards on the property. Also, see note (19). (21) There are no flooding or erosion hazards on the Property, except as identified in note (19). (22) The Property doesn't require floodproofing, except for the area of the SWM pond, see note (19). (23) Pedestrian and vehicle access doesn't require floodproofing. (24) New hazards will not be created, existing hazards will not be aggravated. (25) No environmental impacts are anticipated.

Table 19: Compliance summary.

Enabling Plan, Policy, Authority	Compliance
(26) No person shall, (a) kill, harm, capture or take a living member of a species that is listed on the Species at Risk in Ontario List as an extirpated, endangered or threatened species; Section 10 of the Endangered Species Act: (27) No person shall damage or destroy the habitat of, (a) a species that is listed on the Species at Risk in Ontario List as an endangered or threatened species;	(26) Six species at risk were confirmed on the Property - Eastern Wood Pewee (Special Concern), Monarch Butterfly (Special Concern), Eastern Red Bat (Endangered), Hoary Bat (Endangered), Silver-haired Bat (Endangered) and Little Brown Bat (Endangered). Section 9 ESA protection is not provided to species designated Special Concern. No species at risk will be harmed. All vegetation removal will take place during the winter when the bats are not present (November 1 to March 31). (27) Section 10 ESA protection is not provided to species designated Special Concern. The habitat of the species at risk is the Woodland. The Woodland will not be impacted by the proposed development. Also see note (13).
Conservation Authority Act. 1990. Section 28(25) is a technical definition of a wetland. It has four components, and they are mutually inclusive, meaning all four criteria must be met. (28) (a) is seasonally or permanently covered by shallow water or has a water table close to or at its surface. (29) (b) directly contributes to the hydrological function of a watershed through connection with a surface watercourse. (30) (c) has hydric soils, the formation of which has been caused by the presence of abundant water, and (31) (d) has vegetation dominated by hydrophytic plants or water tolerant plants, the dominance of which has been favoured by the presence of abundant water.	(28) The Wetland on the Property meets this criterion. It flows in the spring. (29) The Wetland meets this criterion, although only marginally. It connects with an agricultural drain that is connected to Butler's Creek. (30) The Wetland does not meet this criterion. The soils are mineral not hydric. (31) The Wetland does not meet this criterion. It is not dominated by wetland indicator species, it does not meet the 50/50 wetland vegetation rule. Two of the four criteria are not met. The Wetland doesn't meet the Conservation Authority Act definition of a Wetland.
Grand River Conservation Authority. Ontario Regulation 41/24.	

Table 19: Compliance summary.

Enabling Plan, Policy, Authority	Compliance
(32) GRCA Regulated Area. (33) In O. Reg. 41/24 Section 1(1) a watercourse is defined as: watercourse means a defined channel, having a bed and banks or sides, in which a flow of water regularly or continuously occurs; (“cours d’eau”) (34) And a wetland is defined as: wetland means land that, (a) is seasonally or permanently covered by shallow water or has a water table close to or at its surface, (b) directly contributes to the hydrological function of a watershed through connection with a surface watercourse, (c) has hydric soils, the formation of which have been caused by the presence of abundant water, and (d) has vegetation dominated by hydrophytic plants or water tolerant plants, the dominance of which have been favoured by the presence of abundant water. (“terre marécageuse”) 28(1) No person shall carry on the following activities, or permit another person to carry on the following activities, in the area of jurisdiction of an authority: (35) 1. Activities to straighten, change, divert or interfere in any way with the existing channel of a river, creek, stream or watercourse or to change or interfere in any way with a wetland. 2. Development activities in areas that are within the authority’s area of jurisdiction and are, (36) i. hazardous lands, (37) ii. wetlands,	(32) A small area at the north edge of the Property, about 0.73 ha in size is Regulated Area. This feature will be managed with a SWM pond. A GRCA Permit will be required to develop in a Regulated Area. Also, see note (19). (33) The Stream on the Property has no defined channel, does not have a bed, banks or sides and water does not flow regularly or continuously, it only flows with the spring freshet. The Stream does not meet the O. Reg. 41/24 definition of a watercourse. (34) The Wetland on the Property does not meet the O. Reg. 41/24 definition of a wetland. However, the GRCA may require a Permit to remove the Wetland. (35) The Stream on the Property doesn’t meet the definition of a watercourse and the Wetland on the Property doesn’t meet the definition of a wetland. (36) There are no hazardous lands on the Property. (37) There are no Wetlands on the Property.

Table 19: Compliance summary.

Enabling Plan, Policy, Authority	Compliance
(38) iii. river or stream valleys the limits of which shall be determined in accordance with the regulations, (39) iv. areas that are adjacent or close to the shoreline of the Great Lakes-St. Lawrence River System or to an inland lake and that may be affected by flooding, erosion or dynamic beach hazards, such areas to be further determined or specified in accordance with the regulations, or (40) v. other areas in which development should be prohibited or regulated, as may be determined by the regulations. (41) The GRCA requires a Water Resource Management Report to address potential impacts of the proposed development on the hydrogeology.	(38) There are no river stream valleys on the Property. (39) The Property is not close to the shores of the Great Lakes or the St. Lawrence River. (40) No 'other areas' are present on the Property. (41) If a Water Resource Management Report is required it will be provided under separate cover by another consultant.
(42) Development within a naturally-occurring wetland may be permitted where the wetland is less than 0.5 hectares, and it can be demonstrated that the wetland is not, (43) a) part of a Provincially Significant Wetland, (44) b) located within a floodplain or riparian community, (45) c) part of a Provincially or municipally designated natural heritage feature, a significant woodland, or hazard land, (46) d) a bog, fen, (47) e) fish habitat, (48) f) significant wildlife habitat, (49) g) confirmed habitat for a Provincially or regionally significant	(42) The wetland is only 0.07 ha, or about 14% of the minimum size. (43) The Wetland is not part of a Provincially Significant Wetland. (44) The Wetland is not located within a floodplain or riparian community. (45) The Wetland is not part of a Provincially or municipally designated natural heritage feature, a significant woodland, or hazard land. (46) The Wetland is neither a bog nor a fen. (47) The Wetland is neither direct nor indirect fish habitat. (48) The Wetland is not significant wildlife habitat. (49) The Wetland is not habitat for a Provincially or regionally

Table 19: Compliance summary.

Enabling Plan, Policy, Authority	Compliance
species as determined by the Ministry of Natural Resources and Forestry or as determined by the municipality, (50) h) part of an ecologically functional corridor or linkage between larger wetlands or natural areas, (51) i) part of a groundwater recharge area, or (52) j) a groundwater discharge area associated with any of the above	significant species. (50) The Wetland is not part of an ecologically functional corridor or linkage between larger wetlands or natural areas. (51) The Wetland is not part of a groundwater recharge area. (52) The Wetland is not a groundwater discharge area. The Wetland on the Property meets the GRCA criteria of a Developable Wetland.
Dufferin County Official Plan (2025). Section 5.3 states: (53) a) Development and site alteration will not be permitted in significant wetlands. b) Development and site alteration will not be permitted in (54) i. Significant woodlands; (55) ii. Significant valleylands; (56) iii. Significant wildlife habitat; and, (57) iv. Significant areas of natural and scientific interest, unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions. (58) c) Development and site alteration will not be permitted in fish habitat except in accordance with Provincial and Federal requirements. (59) d) Development and site alteration will not be permitted in habitat of endangered species and threatened species, except in accordance with Provincial and Federal requirements.	(53) There are no Significant Wetlands on the Property. (54) There are no Significant Woodlands on the Property. (55) There are no Significant valleylands on the Property. (56) There is Significant wildlife habitat on the Property. See note (13). (57) There are no ANSIs on or within 120 m of the Property. (58) There is no direct or indirect fish habitat on the Property. (59) There are species at risk confirmed on the Property. See notes (26) and (27).

Table 19: Compliance summary.

Enabling Plan, Policy, Authority	Compliance
(60) The majority of growth will be directed to the County's Settlement Areas ... (61) The Marsville municipal drinking water well is about 800 m southwest of the Property. The well head protection zone, as mapped by the GRCA, extends across the north half of the Property. (62) Prior to approval of new or expanded development within well head protection areas ... the proponent shall demonstrate that pre-development groundwater recharge rates will be maintained and/or where possible, improved.	(60) The Property is designated Settlement Area in Schedule B. (61) Private sewage systems are discouraged in wellhead protection zones. At the time of writing this EIS the water treatment system for the future-built homes has not been determined. Residential development is planned for the land across County Road 3. Discussions are underway with the developers and the municipality on how to service the lands. (62) A Water Balance Report is not in the scope of work for this EIS. A Water Balance Report, if required by the municipality, will be prepared by a separate consultant.
Township of East Garafraxa Official Plan. (2025). (63) Land Use Zoning. Section 5.7.1 Environmental Protection Areas (Natural Heritage Features) where development may be restricted. (64) a. Areas with physical constraints to development such as poor drainage, organic soils, flood susceptibility, erosion, steep slopes or any other physical condition which is hazardous to potential development; (65) b. Fish habitat; (66) c. Significant portions of the habitat of threatened or endangered species and other areas of significant wildlife habitat; (67) d. Areas of Natural or Scientific Interest (ANSI); (68) e. Environmentally Sensitive Areas (ESA);	(63) Schedule A-1. The entire Property is included in the Marsville Community Boundary. The west (approximately) $\frac{3}{4}$ of the Property is designated Community Residential. The east $\frac{1}{4}$ is Employment. (64) These features are not present on the Property. (65) There is neither direct nor indirect fish habitat on the Property. (66) There are species at risk and significant wildlife habitat on the Property. See notes (13, 26 and 27). (67) There are no ANSIs on or within 120 m of the Property. (68) There are no ESAs on or within 120 m of the Property.

Table 19: Compliance summary.

Enabling Plan, Policy, Authority	Compliance
(69) f. Wetlands; (70) g. Significant woodlands; and (71) h. Valleylands; and (72) i. Rivers, lakes, streams and creeks. (73) Schedule B identifies a cold water stream crossing the Property. (74) Section 7.7 requires the protection of watercourses and fish habitat. (75) Section 7.9 defines Significant Forest Areas. Section 7.10 refers to significant wildlife habitat. (76) a) Habitat of rare and vulnerable species considered significant wildlife habitat and the significant habitat of threatened and endangered plant and animal species of which are identified by the Ministry of Natural Resources and Forestry shall be protected. (77) b) No development and site alteration is permitted within the significant habitat of threatened and endangered species. Where development and site alteration are proposed within 120 metres of the significant habitat of threatened and endangered species, Council shall require the submission of an Environmental Impact Assessment	(69) The small Wetland on the Property doesn't meet the definition of a wetland in either the Conservation Authority Act or O. Reg. 41/24. (70) East Garafraxa defines a Significant Woodland as being 40 ha in size or larger, and all forest stands that are in excess of 60 years of age and 4.0 ha in size. The Woodland on the Property doesn't meet any of those criteria. The Woodland is not a Significant Woodland. (71) There are no valleylands on the Property (72) The Stream on the Property doesn't meet the GRCA definition of a watercourse. See note (33). (73) The Stream on the Property isn't a cold water stream. See note (33). (74) The Stream on the Property doesn't mee to the GRVA definition of a watercourse (see note 33). There is no direct or indirect fish habitat on the property. (75) There is no Significant Forest on the Property. See note (70). (76) There is Significant Wildlife Habitat on the Property. There are species at risk on the Property. See notes (13, 26 and 27). (77) See notes (13, 26, 27 and 76). In an earlier series of report reviews the municipality requested this EIS.

Table 19: Compliance summary.

Enabling Plan, Policy, Authority	Compliance
Report. (78) Water Resource Management Report.	(78) If Water Balance and Water Resource Management Reports are required they will be provided by another consultant. These reports were not in the scope oof work for this EIS.

22.0 Mitigation

Disturbance of the natural environment is inevitable during major construction projects, such as the development proposed for this property. Ideally, adverse environmental impacts should be avoided, where avoidance is impossible the impacts should be minimized, and where they can't be minimized there should be some sort of mitigating compensation, ecological offset, or post-development restoration. Steps can be taken to mitigate impacts during the construction phase of the proposed development and on the impacts to the natural environment. Section 22.1 discusses mitigation of construction activities and Section 22.2 discusses mitigation to the natural environment.

22.1 Construction Mitigation

The following recommendations are intended to reduce the physical disturbance and contamination of the property and the adjacent area during the construction phase, thereby reducing the likelihood of environmental impacts. Some of the construction phase impacts are unavoidable and transient, such as noise and dust, whereas others, if not managed, could be more serious and long term, such as soil and ground water contamination. Construction mitigation strategies are mostly accepted industry best practices and common sense.

22.1.1 Fuel

Construction equipment requires substantial quantities of fuel.

- Low sulphur fuel should be used in all off road and construction equipment diesel engines.
 - This will reduce the sulphur dioxide emissions from all sources and minimize local airshed contamination.
- On-site fuel storage tanks should be checked daily for leaks.
- All fuel tanks should be surrounded with appropriate containment structures to ensure fuel spills do not migrate off-site or contaminate the soil or groundwater.
- Fuel spill cleanup kits should be readily available to contain accidental fuel spills.
 - All workers should be familiar with a fuel spill containment plan.
- Consider minimizing the number of fuel storage tanks on the construction site.

- o A single centralized fueling station is the most efficient way to minimize potential fuel-related impacts from multiple sites.
- o A concrete pad or a fuel-impermeable poly-barrier placed under the fuel tank will ensure spilled fuel will not contaminate the soil or groundwater.

22.1.2 Soil and Dust Management

The import, export and on-property movement of soil is a major component of most construction projects.

- Only clean, local, fill should be imported (if any is required).
- Specifically, the fill should not contain organic matter that may introduce exotic or invasive plant species that may compete with native vegetation.
- All soil brought onto the property should comply with O. Reg. 153/04 and its end use should comply with the appropriate Table in the Regulation.
 - o Table 2 – Full Depth Generic Site Condition Standards in a Potable Ground Water Condition – Residential/Parkland/Institutional.
- All soil moved off-property should comply with O. Reg. 406/19.
- All soil stockpiled on site should be surrounded with a silt fence to avoid erosion and runoff during precipitation events.
- The site should have water trucks with water sprays to wet soil piles and access roads during dry periods.
 - o This prevents nuisance dust blowing off the construction site and exacerbating local air quality.
 - o Water trucks could also rinse dirty vehicles leaving the site to prevent off-site soil contamination and nuisance soil deposition on local municipal roads.
- All excavation, grading, and soil movement activities should be suspended when average wind speeds exceed 32 kph (20 mph)
 - o To prevent off-site nuisance dust.

22.1.3 Erosion and Sediment Control

Soil runoff during construction can contribute significant sediment loads to receiving watercourses. Effective erosion and sediment control strategies at construction sites are crucial in mitigating off-site impacts. Although the property slope is very gentle, and the risk of surface water flow and erosion is minimal, proper erosion and sedimentation controls should be maintained whenever heavy construction equipment is on site and surface grading is underway. On this property prevention of sedimentation of the agricultural drain on the north side of County Road 3 at the south of the property is important in order to ensure the efficient function of the drain. Also, about 2 kms downstream the drain connects to the headwaters of Butler Creek, which is coldwater fish habitat.

- An Erosion and Sediment Control Plan should be in place, and its effectiveness monitored regularly.
- Heavy-duty silt fence should be installed along the 10 m setback from the wetland that straddles the unnamed stream at the south of the property and all ditches along the access road.
- Straw bales should be placed along the municipal ditch on the south side of County Road 3.
 - This should minimize the possibility of downstream sedimentation.
- Construction should be halted during heavy or severe precipitation events, and silt fencing should be regularly examined for integrity.
- All siltation control devices should be installed prior to the commencement of construction and maintained until soils are stabilized and the construction phase is complete.
- As soon as possible after the completion of the grading the bare soil should be seeded or otherwise planted, or sprayed with water when dry, to avoid erosion and blowing dust.
- Erosion and sediment control features may include silt fences, straw bales, hydroseeding of exposed soils, and mulching, as appropriate for the site being protected and the stage of construction.
- Vehicles exiting the construction site should have their undercarriage and tires rinsed to prevent off-property soil tracking along local municipal roads.

22.1.4 Other

Best management practices should be followed to avoid accidental spills of fuel, oils, lubricants, chemicals, concrete leachate, and sediments into adjacent soil, nearby aquatic habitats, sensitive natural features, and the ground water.

- Insure the proper storage, use, and cleanup of all construction-related chemicals.
- No use of herbicides or other chemical agents for vegetation clearing, use mechanical vegetation management only.
- Ensure heavy loads are sized appropriately and that truck traffic observes seasonal load restrictions and local speed limits.
- Observe and respect local noise bylaws, specifically after-hours and holiday restrictions.
- Engage the local community.
 - o Create a website so the community can be informed about construction activities and timelines – keep it current.
 - o Host a public information session(s) to keep the local community informed (not everyone is on-line and tech-savvy).
 - o Conduct direct mail-drops to the local community with relevant information.

22.2 Natural Environment Mitigation

There are only three natural features on the Property for which mitigation is warranted – the small wetland, the stream, and the woodland.

22.2.1 The Stream

The intermittent stream has no defined channel, does not have a bed, banks or sides and water does not flow regularly or continuously, it only flows with the spring freshet. Therefore, the stream does not meet the O. Reg. 41/24 definition of a watercourse. The

seasonal surface water flow will be managed by a bypass channel that will be constructed approximately along the same course as the stream. The GRCA has a general prohibition on interfering with a watercourse, although realignment, channelization or straightening may be permitted to improve hydraulic characteristics and fluvial processes or to improve aquatic habitat or water quality. A GRCA Permit may be required to re-align and channelize the stream.

The technical drawings of the bypass channel are not available as of the date of this EIS, although the location and dimensions are as depicted in the Plan of Subdivision in Figure 20. The channel will cover 1.23 ha and vary in width from 20.0 m to more than 25 m. Natural channel design principles will be followed to the extent possible. The bypass channel will be designed as a low-flow channel, so there is the potential of slowing the seasonal flow and maintaining water for a longer period of time. The channel is widest (>25 m) where it flows through the corner of the woodland. If water can be held in the spring in this area it could create a vernal pond, which can be amphibian habitat, which doesn't currently exist on the Property.

Tables 20 and 21 list plants that are suitable to be directly planted along the bypass channel. Direct planting is preferable to simply scarifying the site in preparation for natural seeding. Planting stabilizes the slopes and discourages the migration onto the site of less desirable or invasive species. It also hastens the creation of wetland and wildlife habitat.

The intermittent stream has no meander belt or riparian vegetation buffer. Because there is no riparian zone there is no meaningful bird, reptile, amphibian or fish habitat and no effective filtering of surface or ground water anywhere along the stream as it passes through the woodland and agricultural field. Direct planting along the bypass channel will create a vegetated riparian corridor that will extend between 5 and 10 m either side of the centre line of the channel, creating a 20 m meander riparian corridor where none currently exists.

A vegetated riparian corridor and the possibility of surface water retention and wetland habitat along the bypass channel is a substantial ecological enhancement compared to the existing stream.

22.2.2 Regulated Area – Wetland and Storm Water Retention Pond

The small GRCA Regulated Area adjacent to the south side of County Road 3 where the stream crosses the road will be re-developed into a SWM pond. The wetland, which will be removed and replaced with the bypass channel, is 0.07 ha in size. The SWM pond will be 1.74 ha, or about 24 times larger than the wetland. If the new green space

that will contain the bypass channel is included, the post-development land that can be managed as riparian and wetland habitat is about 2.97 ha, or about 42 times larger than currently exists on the Property (i.e., 1.23 ha bypass channel + 1.74 ha SWM pond = 2.97 ha vs 0.07 ha current wetland). The pond will be designed as a wet pond, so depending on the extent of open water that can be maintained it can provide habitat for colonial waterbirds, such as ducks and geese. The vegetated shoreline, directly planted with plants from Tables 20 and 21, could provide habitat for wetland birds, such as Red-winged Blackbird, Rails, and Snipes, and habitat for amphibians, reptiles and other plants and insects associated with wetland and riparian areas. No open water, shoreline, or riparian habitat currently exists on the Property, so this represents a significant ecological enhancement.

A SWM pond is not a 'clean water feature'. The proposed SWM pond will collect seasonal flow from the stream, surface water from the new streets and residential estate lots of the proposed development, and some drainage from the municipal ditch on the south side of County Road 3. Water quality will be impacted by these anthropomorphic sources. While in principle this is true, realistically the degree of water quality impairment is directly related to the intensity of the urbanization of the drainage shed, particularly the amount of vehicular traffic. Understandably, a SWM pond adjacent to a highway in a major urban centre will have poorer water quality than a SWM pond adjacent to a Regional Road in a rural community. In this case, water quality impairment is anticipated to be marginal and a functioning riparian and wetland habitats are expected.

The unevaluated wetland will be removed. This feature does not meet the Conservation Authority Act or O. Reg 41/24 definition of a wetland, and it is consistent with the GRCA policy of a developable wetland. However, a GRCA Permit may be required to remove a wetland.

22.2.3 Woodland, Tree Diseases, and Species at Risk

The woodland on the Property will remain largely intact. Some trees will be removed to accommodate the construction of the bypass channel, which will be slightly larger than the existing wetland that traverses the northwestern section of the woodland.

The Woodland was determined to be Significant Wildlife Habitat because of the confirmed presence of six species at risk – one bird (Eastern Wood Pewee), one butterfly (Monarch Butterfly), and four bats (Little Brown Myotis, Silver-haired Bat, Hoary Bat and the Eastern Red Bat).

22.2.3.1 Tree Diseases

The woodland has not been efficiently managed and as a result many of the common insects and diseases endemic in rural woodlots in southern Ontario are present, specially Gypsy Moth, Emerald Ash Borer, Beech bark Disease, Eutypella Canker, Maple Borer and Armillaria Root Rot.

To limit the spread of these forest insects and diseases, trees cut down during the construction phase should not be moved off-property, or if they are they should be disposed of in a certified landfill. Alternatively, they could be burned on-site. Certainly they should not be processed for firewood and distributed locally. CEC recognizes that these control measures may be of marginal benefit in controlling the spread of these organisms since they are endemic in the rural environment, however, due diligence should be practiced when possible.

22.2.3.2 Special Concern Species at Risk

Two of the six species at risk confirmed to be present on the Property are designated Special Concern – they are the Eastern Wood Pewee and the Monarch Butterfly.

Species designated Special Concern are not afforded protection under Sections 9 (species impact) and 10 (habitat impact) of the ESA, so there is no regulatory requirement to protect these species or their habitat.

The Eastern Wood-pewee was heard during several site visits. No evidence of nesting was observed, and the woodland is marginal nesting habitat. Therefore, it was concluded the bird was likely foraging or traversing the Property. Ample nesting and foraging habitat exists locally, including woodland on the adjacent property to the southwest and across the planning area.

Although the Eastern Wood Pewee has declined in southern Ontario, and hence the Special Concern species at risk status, it is possible that the species has shifted its range further north where there is less survey coverage, and the population in general may not be in decline.

Removal of a few trees on the edge of the woodland will have no impact on this species at risk. Tre removal should be conducted between November 1 and March 31 to prevent interfering with migratory birds and bats.

Although observed flitting through the woodland, this is not typical Monarch butterfly habitat. It prefers meadows and shrub where butterflies can forage on flowering plants and milkweed supports eggs and caterpillars.

Monarch Butterfly populations have crashed in recent decades. What was once a common sight in Ontario fields and meadows is now much rarer. Monarchs are unique in the butterfly community because they have the longest migration of any butterfly (4,000 km), they utilize only one plant species to lay their eggs and feed the emerging larvae (Milkweed), and all of the adult butterflies overwinter in a single area (high mountain pine-oak forests of Angangueo and Michoacán in Mexico). This highly specialized adaptation makes the Monarch butterfly susceptible to catastrophic population collapse.

Not-with-standing the efforts of the Mexican government to preserve and protect the overwintering sites, two developments have significantly impacted Monarch butterflies and contributed to their dramatic decline. The first is the development of herbicide-resistant crops. Before herbicide-resistant crops farmers along the Monarch's long spring migration route had to exercise caution when spraying their crops to prevent crop damage while controlling weeds. As a result, there were sufficient amounts of residual milkweed between crop rows and around the edges of farm fields on which the butterflies could lay their eggs and feed the emerging larvae. With herbicide-resistant crops farmers are much more likely to broadcast spray their crops and substantially reduce the milkweed in and near the fields, and in the process reduce the only nesting and feeding plant the migrating Monarch butterflies utilize.

The second development is the arrival from Eurasia of the invasive Black Swallowwort and Pale Swallowwort, also called Dog-strangling Vine. In addition to forming annoyingly dense mats in forests and fields and being toxic to some livestock and deer, Dog-strangling Vine looks (and senses) enough like the native milkweed that the Monarch butterflies will utilize it for egg laying. However, the emerging larvae cannot eat it, and they subsequently die.

Monarch Watch is dedicated to restoring and preserving Monarch butterfly populations. They provide tips on establishing gardens and greenspaces that enhance butterfly habitat. Managed and natural fields and greenspaces that are suitable monarch habitat can qualify, and be recognized through signage, as a Monarch Waystation to show that the site is contributing to monarch conservation. Waystations can be certified and included in a North America-wide registry.

Using the initiatives provided through Monarch Watch the marginal Monarch habitat lost as a result of the proposed development (Milkweed and other flowering plants) can be easily replaced by direct planting in the post-development landscape. Almost 3 ha of riparian habitat associated with the bypass channel and the SWM pond is available for Monarch habitat restoration. Seeding milkweed and other flowering plants into the riparian corridors and creating Monarch waystations and promoting Monarch

conservation through signage would be a substantial post-development net ecological gain for this species at risk. Through education at the point of sale new property owners can be encouraged to participate in Monarch habitat creation.

22.2.3.3 Threatened and Endangered Species at Risk

The woodland on the property is habitat for the four species of bats designated *Endangered* confirmed to be present on the Property. The planning area has ample habitat to support the species at risk bats, about 93 ha between 500 m and 1 km of the woodland, which is well within the bat's nightly forage range. Although SAR bats are obviously present, the woodland is marginal roosting habitat and no bats were observed accessing possible roosting trees during several late evening and early morning observation periods (breeding bird and amphibian call surveys). Therefore, species at risk bat roosting was not confirmed on the Property.

Impacts to the species at risk bats (Section 9 of the ESA) can be avoided by removing trees during the winter months when the bats are not present. The habitat removal window for species at risk bats is November 1 to March 31.

Furthermore, the post-development plan is to establish 2.97 ha of riparian and wetland habitat, which is potential bat foraging habitat. Bats require open water to drink and insect attracting vegetation in which to forage. The closet farm pond is about 1.4 km southwest. The 1.74 ha SWM pond will create bat drinking water habitat that does not currently exist on the Property. Planting species listed in Tables 20 and 21 along the riparian corridor and around the SWM pond will hasten the establishment of bat foraging habitat.

The removal of a small number of trees to accommodate the construction of the bypass channel would not measurably impact species at risk bat habitat on the Property (no Section 10 ESA violation).

The 1.74 ha SWM pond and the 1.23 ha bypass channel will create bat foraging and drinking water habitat that currently doesn't exist on the Property, which represents a significant net ecological benefit.

Although not required, Sunray could consider establishing bat roosting boxes along the bypass channel and around the SWM pond. This would further enhance bat roosting habitat and contribute to the species at risk recovery strategy. In addition, Sunray could provide educational information at the point of sale about the presence of species at risk in the local environment and solicit the cooperation of estate lot purchasers in hosting bat boxes or establishing Monarch Way Stations.

Table 20: Possible plants to be directly planted along the top of the bypass swale or around the SWM pond.*

Trees

American Mountain Ash (*Sorbus americana*)
Balsam Fir (*Abies balsamea*)
Basswood (*Tilia americana*)
Black Cherry (*Prunus serotina*)
Bur Oak (*Quercus macrocarpa*)
Eastern Hemlock (*Tsuga canadensis*)
Eastern Red Cedar, (*Juniperus virginiana*)
Eastern White Cedar (*Thuja occidentalis*)
Hop-Hornbeam (*Ostrya virginiana*)
Pin Cherry (*Prunus pensylvanica*)
Red Maple (*Acer rubrum*)
Red Oak (*Quercus rubra*)
Red Pine (*Pinus resinosa*)
Sandbar Willow (*Salix exigua*)
Showy Mountain Ash (*Sorbus decora*)
Silver Maple (*Acer saccharinum*)
Staghorn Sumac (*Rhus typhina*)
Sugar Maple (*Acer saccharum*)
Swamp White Oak (*Quercus bicolor*)
Trembling Aspen (*Populus tremuloides*)
White Birch (*Betula papyrifera*)
White Oak (*Quercus alba*)
White Pine (*Pinus strobus*)
White Spruce (*Picea glauca*)
White Willow (*Salix alba*)

Shrubs

Alleghany Serviceberry (*Amelanchier laevis*)
Bearberry (*Arctostaphylos uva-ursi*)
Black Raspberry (*Rubus occidentalis*)
Button Bush (*Cephalanthus occidentalis*)
Dogbane (*Apocynum spp.*)
Downy Serviceberry (*Amelanchier arborea*)
Maple Leaf Viburnum (*Viburnum acerifolium*)
Nannyberry (*Viburnum lentago*)
Ninebark (*Physocarpus opulifolius*)
Red Mulberry (*Morus rubra*)
Red Osier Dogwood (*Cornus stolonifera*)
Shallow Serviceberry (*Amelanchier canadensis*)
Speckled Alder (*Alnus incana*)

Table 20: Possible plants to be directly planted along the top of the bypass swale or around the SWM pond.*

Herbaceous

American Yew (*Taxus canadensis*)
 Aster (*Aster spp.*)
 Bittersweet (*Celastrus scandens*)
 Black-Eyed Susans (*Rudbeckia hirta*)
 Evening Primrose (*Oenothera biennis*)
 Goldenrod (*Solidago spp.*)
 Lupine (*Lupinus perennis*)
New England Aster (*Symphotrichum novae-angliae*)
 Pasture Rose (*Rosa carolina*)
 Rough Blazing Stars (*Liatris aspera*)
 Scarlet Bee Balm *Monarda didyma*)
 Spotted jewelweed (*Impatiens biflora*)
 Sunflower (*Helianthus spp.*)
 Trumpet Creeper (*Campsis radicans*)
 Virginia Creeper (*Parthenocissus vitacea*)
 White Wood Aster (*Eurybia divaricata*)
 Wild Bergamot Wild (*Monarda fistulosa*)
 Winterberry Holly (*Ilex verticillata*)
 Yarrow (*Achillea millefolium*)

*Suggested native plant species, either because they are found elsewhere on the property or they are suitable for this site.

Table 21: Possible plants to be directly planted along the side and bottom slopes of the bypass swale and the SWM pond.*

Ridge – Grade Match, moist to dry site

Alleghany Serviceberry (*Amelanchier laevis*)
 American Mountain Ash (*Sorbus americana*)
 American Yew (*Taxus canadensis*)
 Aster (*Aster spp.*)
 Bittersweet (*Celastrus scandens*)
 Black Cherry (*Prunus serotina*)
 Black Raspberry (*Rubus occidentalis*)
 Black-Eyed Susans (*Rudbeckia hirta*)
 Bur Oak (*Quercus macrocarpa*)
 Dogbane (*Apocynum spp.*)
 Downy Serviceberry (*Amelanchier arborea*)
 Eastern Red Cedar, (*Juniperus virginiana*)
 Eastern White Cedar (*Thuja occidentalis*)
 Evening Primrose (*Oenothera biennis*)
 Goldenrod (*Solidago spp.*)
 Lupine (*Lupinus perennis*)
 Nannyberry (*Viburnum lentago*)
 Ninebark (*Physocarpus opulifolius*)
 Pin Cherry (*Prunus pensylvanica*)
 Red Oak (*Quercus rubra*)
 Red Pine (*Pinus resinosa*)
 Rough Blazing Stars (*Liatris aspera*)
 Staghorn Sumac (*Rhus typhina*)
 Sugar Maple (*Acer saccharum*)
 Sunflower (*Helianthus spp.*)
 Verbena (*Verbena spp.*)
 Virginia Creeper (*Parthenocissus vitacea*)
 White Spruce (*Picea glauca*)
 Wild Bergamot Wild (*Monarda fistulosa*)
 Yarrow (*Achillea millefolium*)

Slope - towards the top of the slope, moist to dry site

Balsam Fir (*Abies balsamea*)
 Button Bush (*Cephalanthus occidentalis*)
 Eastern Hemlock (*Tsuga canadensis*)
 Eastern White Cedar (*Thuja occidentalis*)
 Red Maple (*Acer rubrum*)
 Red Mulberry (*Morus rubra*)
 Red Osier Dogwood (*Cornus stolonifera*)
 Sandbar Willow (*Salix exigua*)

Table 21: Possible plants to be directly planted along the side and bottom slopes of the bypass swale and the SWM pond.*

Scarlet Bee Balm (*Monarda didyma*)
Shallow Serviceberry (*Amelanchier canadensis*)
Spotted jewelweed (*Impatiens biflora*)
Swamp White Oak (*Quercus bicolor*)
Trumpet Creeper (*Campsis radicans*)
White Spruce (*Picea glauca*)
Winterberry Holly (*Ilex verticillata*)

Slope - towards the bottom of the slope, moist to wet site

Eastern White Cedar (*Thuja occidentalis*)
Flat-topped White Aster (*Doellingeria umbellata*)
Red Osier Dogwood (*Cornus stolonifera*)
Silver Maple (*Acer saccharinum*)
Swamp Rose (*Rosa palustris*)
White Cedar (*Thuja occidentalis*)
White Oak (*Quercus alba*)

Adjacent to water's edge, wet site

American speedwell (*Veronica scutellata*, *Veronica anagallis-aquatica*, *Veronica americana*)
Arrow Arum or Tuckahoe (*Peltandra virginica*)
Beggar Ticks (*Bidens tripartita*)
Boneset (*Eupatorium perfoliatum*)
Bottled or Closed Gentian (*Gentiana andrewsii*)
Bur Marigolds (*Bidens laevis*)
Canada Anemone (*Anemone canadensis*)
Canada Holly or Winterberry (*Ilex verticillata*)
Canada Lily (*Lilium canadense*)
Cardinal Flower (*Lobelia cardinalis*)
Cinnamon Fern (*Osmunda cinnamomea*)
False Dragon Head (*Physostegia virginiana*)
Flat topped Aster (*Aster umbellatus*)
Fringed Gentian (*Gentiana crinita*)
Grass of Parnassus (*Parnassia glauca*)
Great Blue Lobelia (*Lobelia siphilitia*)
Green dragon (*Arisaema dracontium*)
Jack-in-the-pulpit (*Arisaema triphyllum*)
Joe Pyeweed (*Eupatorium maculatum*)
Marsh Fern (*Dryopteris thelypteris*)
Marsh Marigold/Cowslip (*Caltha palustris*)
Monkey Flower (*Mimulus ringens*, *Mimulus alatus*)
Narrow-leaved Meadowsweet (*Spiraea alba*)

Table 21: Possible plants to be directly planted along the side and bottom slopes of the bypass swale and the SWM pond.*

Northern Bedstraw (*Galium boreale*)
 Ostrich Fern (*Matteuccia strathiopteris*)
 Panicgrass (*Panicum lanuginosum*)
 Primrose (*Primula mistassinica*)
 Purple Meadow-rue (*Thalictrum dasycarpum*)
 Red Osier Dogwood (*Cornus stolonifera*)
 Reed Canary Grass (*Phalaris arundinacea*)
 Royal Fern (*Osmunda regalis*)
 Sedges (*Cyperaceae* family)
 Skunk Cabbage (*Symplocarpus foetidus*)
 Smartweed (*Polygonum* spp.)
 St. Johnswort (*Hypericum virginicum*, *Hypericum mutilum*)
 Stargrass (*Hypoxis hirsuta*)
Swamp Aster (*Symphyotrichum puniceum*)
 Swamp Milkweed (*Asclepias incarnata*)
 Swamp Rose Mallow (*Hibiscus palustris*)
 Tall Meadow-rue (*Thalictrum polygamum*)
 Turtle Head (*Chelone glabra*)
 Violet (lance-leaved) (*Viola lanceolata*)
 Water Stargrass (*Heteranthera dubia*)
 Wild Calla (*Calla palustris*)
 Yellow-eyed Grasses (*Xyris* spp.)
 Yellow Loosestrife (*Lysimachia terrestris*)
 Rock Elm (*Ulmus thomasi*)
 White Elm (*Ulmus americana*)

Shallow Water, near shore (10 – 15 cm), aquatic
 Arrowheads (*Sagittaria latifolia*, *Sagittaria graminea*, *Sagittaria rigida*)
 Broad-leaved Cattail (*Typha latifolia*)
 Buckbean (*Menyanthes trifoliata*)
 Burreed (*Sparganium*)
 Large Blue Flag (*Iris versicolor*)
 Marsh Cinquefoil (*Potentilla palustris*)
 Pickerel Weed (*Pontederia cordata*)
 Scot Rush Soft (*Juncus effusus*)
 Spikerush (*Eleocharis* spp.)
 Sweetflag (*Acorus calamus*)
 Three Square (*Scirpus americanus*)
 Water Arum (*Calla palustris*)
 Water Plantain (*Alisma triviale*)

Table 21: Possible plants to be directly planted along the side and bottom slopes of the bypass swale and the SWM pond.*

Deeper Water, more distant from shore (50 cm – 150 cm), aquatic

Bladderwort (*Utricularia vulgaris*)
 Bulrush (*Scirpus validus*)
 Canada Waterweed (*Anacharis canadensis*)
 Coontail (*Ceratophyllum demersum*)
 False Loosestrife (*Ludwigia palustris* var. *americana*)
 Pondweeds (*Potamogeton* spp.)
 Water Buttercup (*Ranunculus* spp.)
 Water Weed (*Elodea canadensis*)
 Water-milfoil (*Myriophyllum alterniflorum*)
 White Water Lily (*Nymphaea odorata*)
 Wild Celery or Tape grass (*Vallisneria americana*)
 Yellow Spatterdock (*Nuphar* spp.)

*Suggested native plant species, either because they are found elsewhere on the property or they are suitable for the site. Planting this area will hasten the creation of wetland and wildlife habitat and may compensate for the removal of the small unevaluated Northeast Wetland.

23.0 Summary and Conclusions

This EIS report compiles information from three previous environmental assessments on the Marsville Sunray property. This report was created with two purposes in mind: 1) to support the fulfillment of conditions associated with the Draft Approved Plan of Subdivision and 2) to support the County OPA, the Township OPA and the Township ZBA applications seeking expansion of the residential permissions over the incompatible employment lands on the Subject Property.

The Property is not in the Oak Ridges Moraine, The Greenbelt, the Frontenac Biosphere Reserve or the Niagara Escarpment Planning areas. In both the Dufferin County Official Plan and the East Garafraxa Official Plan the Property is entirely within the Marsville Community Settlement Area, an area specifically planned for future residential development.

None of the planning authorities recognize the Woodland, the Wetland, or the Stream on the Property as part of a local or regional Natural Heritage System.

The Woodland on the Property is not a Significant Woodland, and the Wetland is not a Significant Wetland, as defined by the Provincial Planning Statement, the municipal planning authorities, or environmental regulatory agencies.

The Woodland is ELC classified as a Dry-fresh Sugar Maple-White Ash Deciduous Forest (FOD5M-8). It is a remnant of the original forest cover in the region. It is an upland, all aged, deciduous forest dominated by Sugar Maple. The average tree age is about 45 years. It has been repeatedly hygraded, resulting in a high percentage of defects and disease in the remaining trees. The basal area is 29.1 m²/ha, the mean DBH is 24.4 cm and the stocking is 494 stems/ha.

The Wetland is very small (0.07 ha). If it were to be ELC classified it would approximate a Jewelweed Forb Mineral Meadow Marsh (MAMM2-1). Without question it would not score high enough in the OWES evaluation to be considered as provincially or regionally significant. It is compliant with the GRCA policy as a developable wetland. In fact, it doesn't meet the technical criteria for a wetland in the Conservation Authority Act or O. Reg. 41/24.

There is no direct or indirect fish habitat on the Property. The intermittent Stream on the Property doesn't meet the O. Reg. 41/24 definition of a watercourse. It carries the spring freshet flow across the Property into the Brouer Drain at County Road 3. The Stream will be replaced by a 1.23 ha bypass channel.

A 1.74 ha SWM pond will manage the flow from the Stream and the surface water drainage from the development. Through direct planting the SWM pond and the bypass channel will be about 2.97 ha of riparian and wetland habitat, which is about 42 times

larger than currently exists on the Property (i.e., 1.23 ha bypass channel + 1.74 ha SWM pond = 2.97 ha vs 0.07 ha current wetland). The SWM pond will be designed as a wet pond, which could provide habitat for colonial waterbirds. The vegetated shoreline of the SWM pond and the bypass channel will provide habitat for wetland birds and bats. No open water, shoreline, or riparian habitat currently exists on the Property, so this represents a significant ecological enhancement.

The bypass channel and the SWM pond should provide amphibian and reptile breeding habitat that currently doesn't exist on the Property.

Six species at risk were confirmed to be present on the Property - Eastern Wood Pewee, Monarch Butterfly, Eastern Red Bat, Silver-haired Bat, Little Brown Myotis and Hoary Bat. Providing vegetation removal is conducted in the winter between November 1 and March 31 there will be no Section 9 contravention of the Endangered Species Act. The majority of the Woodland will be maintained so there is no Section 10 ESA violation. Post development mitigation will substantially enhance the foraging and roosting habitat of these species at risk.

The proposed development is compliant with provincial, regional and municipal environmental planning policies, does not threaten species at risk, or pose a risk of flooding, erosion or pollution. A GRCA permit will be required to develop in a Regulated Area, and a permit may be required to remove a wetland.

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24.0 Appendices

Appendix 1: Correspondence with MNR regarding the classification of the Wetland.

To: Dave McLaughlin mclaughlin.environmental@gmail.com
From: Brent Shirley brent.shirley@ontario.ca
Date: June 14, 2021 4:22 pm

Hi Dave,

I reviewed the information that you provided and have answered the three questions you specifically asked.

1) the wetland is not a 'Significant Wetland', as defined by the Provincial Policy Statement,

This unevaluated wetland polygon is not considered as Provincially Significant Wetland (PSW).

2) the wetland does not warrant an OWES evaluation, and

Excerpt from the OWES manual in Italics - *Note that wetland units less than 2 ha in size may be included as part of the complex. Such tiny wetlands may be recognized when, in the opinion of the evaluator, the small wetland pocket may provide important ecological benefit. Some examples of such benefits would be: a grassy area used by spawning pike; an area containing a community or specimen of a rare or unusual plant species; a seepage area in which a regionally or provincially significant plant or animal species is found; or a wetland which strengthens a corridor link between larger wetlands or natural areas.*

Based on OWES criteria and proximity to other adjacent wetlands this small unevaluated wetland polygon would not meet the criteria to be included in any adjacent PSWs. To be complexed into a PSW very small wetland polygons would be required to provide important ecological benefits and be within the distance of 750m of a PSW.

3) the wetland cannot be considered 'complexed' with other local or regional wetland systems.

Excerpt from the OWES manual in Italics - *The maximum distance between units of a complex must not exceed 0.75 km straight line distance, i.e. "as the crow flies".*

This small wetland polygon is over 1.5km away from the nearest PSW, so therefore couldn't be complexed into it due to distance alone.

Please let me know if you have any questions or concerns?

Best Regards,

Brent Shirley | Management Biologist (A) | Midhurst District | Ministry of Natural Resources & Forestry
Cell: (705) 718-3145 | Email: brent.shirley@ontario.ca

Appendix 2: Letter to Township of East Garafraxa confirming the stream assessment complies with the federal Fisheries Act.

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43 Edwin Drive, Brampton, Ontario, L6Y 1A2
www.cotyledonenvironmental.com

Christine Gervais, MCIP, RPP
Township Planner, Township of East Garafraxa
065371 Dufferin County Road 3, Unit 2
East Garafraxa, ON, L9W 7J8

Re: Marsville Estates (Simpson Farm)
Project No.:300051077.0000

Ms. Gervais,

(via email) June 26, 2021

In their review of the environmental assessment report for the Marsville Estates project the Grand River Conservation Authority and R.J. Burnside & Associates made the following request:

“Provide a letter that includes a screening of the proposed watercourse diversion for compliance with the federal Fisheries Act.”

This letter is in response to that request.

The request is predicated on the assumption that there is fish habitat on the property and that the proposed watercourse diversion is, or can be made compliance with, the Fisheries Act. If there is no fish habitat on the property then the requirement to illustrate compliance is not necessary.

Both the federal Fisheries Act (*Fisheries Act R.S.C., 1985, c. F-14, last amended August 28, 2019*) and the MNRF wildlife reference manual (*Ontario Ministry of Natural Resources. March 2010. Natural Heritage Reference Manual for Natural Heritage Policies of the Provincial Policy Statement, 2005. Second Edition. Toronto: Queen's Printer for Ontario. 248 pp.*) were reviewed.

Fish habitat is defined in Section 2 (1) of the Fisheries Act as:

‘fish habitat means water frequented by fish and any other areas on which fish depend directly or indirectly to carry out their life processes, including spawning grounds and nursery, rearing, food supply and migration areas’.

Section 34.4 (1) of the Act states:

‘No person shall carry on any work, undertaking or activity, other than fishing, that results in the death of fish.’

And Section 35 (1) of the Act states:

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'No person shall carry on any work, undertaking or activity that results in the harmful alteration, disruption or destruction of fish habitat.'

The only potential fish habitat on the property is the small wetland that runs through the woodland and the stream that traverses the property. Both of these features are ephemeral, water is present during the spring flush or subsequent to major precipitation events, and they dry out completely during the summer.

The MNRF has three classifications of fish habitat. The fish habitat present on the property is consistent with Habitat Type 3, which is:

'Habitats have low productive capacity or are highly degraded, and do not currently contribute directly to fish productivity. They often have the potential to be improved significantly (e.g., a portion of a waterbody, a channelized stream that has been highly altered physically).'

The potential fish habitat on the property was observed on 10 site visits over two years. On two of the site visits (February 6 and March 13, 2020) there was water present in the wetland and there was shallow, clear, slowly flowing water in the stream. On both occasions the entire stream and wetland on the property were walked. No fish of any size or species were observed. Observation conditions were excellent as the water was clear and only a few inches deep. If fish were present they would have been seen. On May 2, 2021 there was shallow, non-flowing water in the wetland and the stream bed was moist but there was no flowing or standing water. No fish were observed in the wetland. On July 31 and August 25, 2020 and May 17, May 26, June 1, June 7 and June 13, 2021, both the wetland and the stream were completely dry.

The ephemeral stream that traverses the property empties into a grated concrete drain, known as the Brouwer Drain, on the south side of Regional Road 3 at the north edge of the property. The drain has a vertical drop, which was measured with a tape measure and found to be 1 m. The concrete drain connects to a tile drainage system in the agricultural field on the north side of Regional Road 3. The Brouwer Drain and the tile drain system then feeds another ephemeral stream that flows across another agricultural field before becoming a permanently flowing tributary of Butler Creek more than 2 km downstream.

Without question, there is clearly no fish spawning habitat in the stream or the wetland on the property, and because both the wetland and the stream are dry for a substantial portion of the year, there is no sustainable fish foraging habitat. Therefore, the only possible use of either the wetland or the stream by fish would be in the spring when some fish populations migrate upstream. Could fish migrate into the wetland during the spring flush, spawn, and the fry migrate back downstream before the wetland and stream dry up?

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In order to reach either the wetland or the stream on the property, migrating fish from the uppermost tributary of Butler Creek would have to traverse over a kilometer of ephemeral stream through a cultivated agricultural field, then travel another kilometer in the combined subterranean Brouwer Drain and the tile drains of another cultivated agricultural field, and finally navigate up over the 1 m vertical drop in the grated concrete culvert on the south side of Regional Road 3. This is a physical impossibility. No fish were observed in the stream or the wetland on the property at any time during the 10 visits over two years because there is no fish spawning or foraging habitat and fish cannot transit the property during seasonally higher flows because the subterranean drains and the vertical concrete grate are physical barriers that prevent upstream migration. This meets the Matters of Proof definition in Section 40 (5) (b) of the Fisheries Act, which states:

'no water is water frequented by fish, as defined in subsection 34 (1) [water in Canadian territory or jurisdiction], where proof is made that at all times material to the proceedings the water is not, has not been and is not likely to be frequented in fact by fish.'

There is no violation of Sections 34 and 35 of the Fisheries Act because there is no fish habitat on the property, as illustrated by compliance with Section 40 (5) (b).

If there are no fish on the property, and no fish habitat, and no possibility of upstream migration, then the proposed watercourse diversion is compliant with the federal Fisheries Act.

Furthermore, as identified in the Amended Baseline Ecological Assessment report, post-development mitigation strategies will substantially enhance both riparian and wetland habitat on the property, which could include creating fish habitat where none currently exists. This is a substantial net ecological benefit.



Dave McLaughlin. BScF, MScF
Owner and Principal Scientist
Cotyledon Environmental Consulting

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Appendix 3: Correspondence with MNR confirming species at risk designated Special Concern are not afforded protection under Sections 9 and 10 of the Endangered Species Act.

To: Dave McLaughlin mclaughlin.environmental@gmail.com

From: Paul Heeney paul.heeney@ontario.ca

June 7, 2021

9:21 pm

Hi Dave,

Good to hear from you. And yes, so far we have all been doing well at work to stay safe (and sane!) and family is good too. I am really enjoying seeing the “light at the end of the tunnel” for sure. Glad to hear you will fully vaccinated. I have my first and am waiting anxiously for shot number two. Hope you are well and work has been going well.

You are correct – special concern species are not afforded the protections of section 9 and 10 of the ESA. There is a provision (section 12) about preparing management plans for these species. These really are meant to provide some general direction for anyone to use.

When it comes to habitat, it generally falls within the purview of municipalities or MNRF, as the case may be, when it comes to protecting those areas. They may be looked upon as more significant than other natural features and areas, but aren't within the purview of section 10.

Hope that helps, Dave. Happy to answer any other questions this might raise.

Paul

Paul Heeney
Manager, Permissions and Compliance
Species at Risk Branch
Ministry of the Environment, Conservation and Parks
40 St. Clair Ave. W., Toronto ON M4V 1M2
paul.heeney@ontario.ca
C: (613) 202-1889

Appendix 4: The Cotyledon Environmental Consulting Team that worked on the Marsville EIS

Dave McLaughlin

Dave McLaughlin is the owner and principal scientist of *Cotyledon Environmental Consulting*. He was a senior scientist and program director with the Ontario Ministry of the Environment for more than 36 years, where he investigated the impacts of pollution on the terrestrial environment in all eco-zones across Ontario.

Dave McLaughlin obtained a BSc and an MSc from the University of Toronto, where he was an adjunct professor for 15 years.

As a government forensic scientist in the 1980s, Mr. McLaughlin led a multi-year study of the impacts of acidic deposition on Ontario's forests. More recently, he was involved in assessing the environmental impacts of historic mining activities in communities across the province. He is an accomplished phytotoxicologist with almost four decades of professional experience and expert knowledge of environmental sampling, the recognition of air pollution injury symptoms on plants, pollution impacts on soil and vegetation, and the environmental regulatory framework.

During his government career he planned, conducted, and reported on phytotoxicology studies around dozens of pollution sources, including aluminum, base metal and uranium smelters and refineries, foundries, fertilizer and glass manufactures, brickyards, iron and steel mills, petrochemical refineries, municipal refuse and sewage incinerators, salt storage facilities and many other pollution sources that may impact the terrestrial environment. This experience and knowledge made Mr. McLaughlin a leading scientific advisor in the Ministry's program of evaluating and risk managing the ecological and human health impacts in communities with landscape-scale environmental contamination from historic industrial emissions. In this role he was a significant contributor to soil contaminant assessment projects for communities in the Ontario municipalities of Toronto, Mississauga, Deloro, Galetta, Wawa, Port Hope, Cornwall, Cobalt, Sudbury and Port Colborne.

From 2006 to 2007 he was the science liaison for a team of government policy advisors that negotiated agreements on transboundary air pollution between Ontario and its American air-shed neighbours of Michigan, New York and NESCAUM (*North East States for Co-ordinated Air Use Management*), and the provinces of Quebec and New Brunswick.

Dave McLaughlin completed his career with the Ontario Ministry of the Environment as the Assistant Director of the Ministry's Environmental Monitoring and Reporting Branch, the Ontario government's premier environmental science Branch responsible for more than 40 ambient air, land and water monitoring programs across the province. In 2004 the Environmental Monitoring and Reporting Branch received the prestigious ECO

Award from the Environmental Commissioner of Ontario in recognition of the importance of, and the commitment to, long term ambient environmental monitoring. Dave McLaughlin is the author or editor of more than 300 government reports and 11 articles in peer reviewed scientific journals. In his more than 36-year government career he received considerable recognition for his integrity in working with community stakeholders and his comprehensive scientific knowledge. This recognition culminated in his receipt of three Emerald Awards, the Ministry of the Environment's highest recognition for professional achievement, for his role in the Deloro, Sudbury and Port Colborne community-based soil risk assessments. In addition, he is also the recipient of an Amethyst Award, the Ontario Public Service's highest recognition for professional achievement, for his role in stakeholder and community engagement for the cleanup and remediation of the province's largest PCB storage facility at Pottersburg Creek in London, Ontario.

After retirement from government service, in 2012 Dave McLaughlin started *Cotyledon Environmental Consulting*, a sole-proprietor consulting service based in Brampton, Ontario. Recently celebrating 9 years in business, Cotyledon has been the primary contractor or a sub-contracted partner on 30 projects for private, corporate, non-profit and government clients across Ontario.

Fiona Reid

Fiona Reid earned a BA in biology from Cambridge University and an MSc in Animal Behaviour from SUNY at Stony Brook, New York. She has written and/or illustrated more than a dozen books on mammals, including: *A Field Guide to the Mammals of Central America and Southeast Mexico* (Oxford University Press) and a *Peterson Field Guide to Mammals of North America* (Houghton-Mifflin). For these two books, which she both authored and illustrated, she captured and drew from life almost all the bats and small rodents. She also illustrated *The Golden Guide to Bats of the World*, *Bats of Papua New Guinea*, and *Mammals of the Neotropics* (volumes 1–3), and she coauthored and partially illustrated *Wildlife of Costa Rica*. Fiona also co-authored and illustrated *Bats of Trinidad and Tobago*, published in 2016. Fiona has worked as an eco-tourist guide for 33 years, leading trips to numerous destinations worldwide. Her tours focus on mammals and birds. She has done environmental survey work for Credit Valley Conservation in Ontario, and for the Royal Ontario Museum, in Ecuador, Guyana and Costa Rica. She has been studying birds in Halton Region for 26 years and took part in the *Ontario Breeding Bird Atlas 2001-2005*. During that survey she recorded over 120 breeding birds in her atlas square.

Sarah Robins

Sarah Robins earned a Bachelor of Environmental Studies from York University, Toronto, in 2007 and an Environmental Technology Diploma from Georgian College in Barrie in 2015. She has several environmental certifications, including Can-CISEC, CISEC Inc. (2018), Reptile and Amphibian Survey Course, MNRF (2017), Ontario

Wetland Evaluation System (OWES) (2017), Aboriginal Cultural Awareness (2016), Ecological Land Classification (2016), MNRF Level 1 Fish Identification (2016), and Level 1 Benthic Identification (OBBN) (2016). Sarah is a member of the Canadian Herpetological Society (2018) and the Field Botanists of Ontario (2017).

Sarah has more than nine years of professional experience as a terrestrial ecologist, during which she provided support on land development projects in southern and central Ontario and authored environmental impact studies (EIS), annual monitoring reports, and technical reports, and contributed to Class Environmental Assessments (EA) and Environmental Monitoring Plans (EMPs). Additional professional expertise includes vegetation inventories, ecological land classification (ELC), wetland delineation, targeted reptile studies, anural call surveys, sediment transport assessment, environmental compliance monitoring, construction monitoring and water quality monitoring programs.

As a terrestrial ecologist, she has taken a particular interest in SAR bats (Eastern Small-foot myotis, Little Brown myotis, Northern Myotis and Tri-colored bat) and has become a leader in the research and execution of various bat habitat assessments and presence/absence studies.

Bill McIlveen

W.D. (Bill) McIlveen received his B.Sc. and M.Sc. from the University of Guelph and a Ph.D. in Plant Pathology from the Pennsylvania State University. He was a Senior Terrestrial Toxicologist with the Ontario Ministry of the Environment for over 25 years and an environmental consultant for 10 years, conducting flora and fauna inventories throughout Ontario. He has authored or co-authored nearly 350 environmental articles or reports, including naturalist club newsletters, government reports and refereed journals. His government career was related to the investigation of effects of industrial emission on vegetation and soil. His career in environmental consulting included ecological land classification, rare and introduced species studies, and terrestrial toxicology projects. Bill was a Regional Coordinator for the most recent Breeding Bird Atlas. He served as the Regional Coordinator (Halton/Peel) for the Ontario Tree Atlas. Bill is a member of 20 naturalist organizations and has served as an advisor and executive on many, including the Ecological and Environment Advisory Committee and the Lake Ontario Shoreline Algae Action Committee for the Regional Municipality of Halton, the Field Botanists of Ontario, the Esqueping Historical Society, the Hamilton Naturalist Club, the Ontario Bird Banding Association, the Ontario Vernal Pools Association, the Toronto Entomological Association, the Ontario Invasive Plant Council, and he was a Director of the Halton North Peel Naturalist Club. He was the Chairman of the Steering Committee for the Natural Areas Inventory completed in Halton and serves in a similar capacity with the current Natural Areas Inventory initiated in the Region of Peel. Bill received Ontario Nature's prestigious W.W.H. Gunn Conservation Award for his dedication to surveying and writing about Ontario's wildlife and plants, Conservation

Halton's Conservation Award of Excellence, and in 2024 Credit Valley Conservation's highest award the Friends of the Credit Conservation Award for Watershed Excellence.