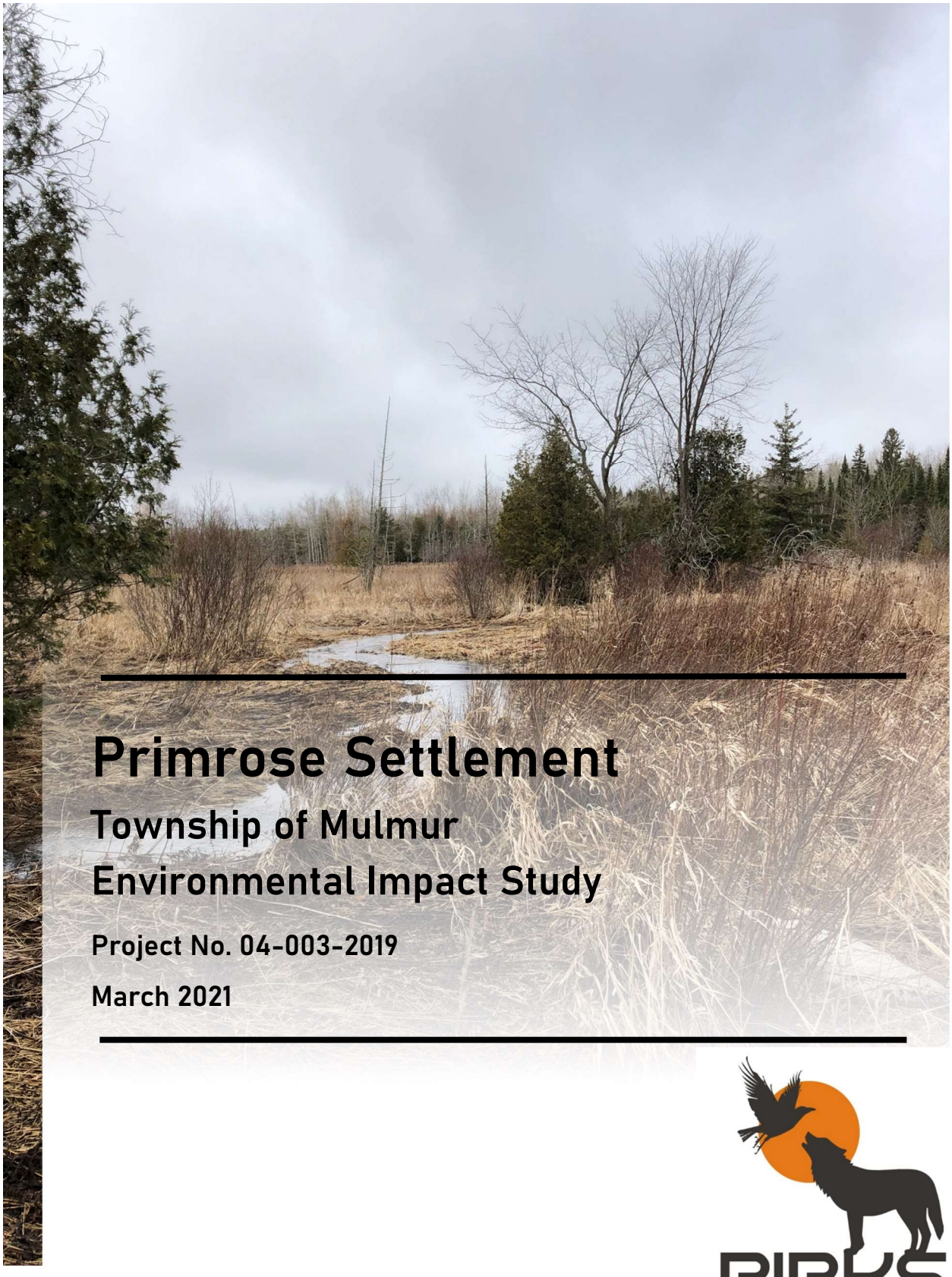


Primrose Settlement

Township of Mulmur
Environmental Impact Study

Project No. 04-003-2019

March 2021

BIRKS
NATURAL HERITAGE CONSULTANTS

23 HERRELL AVENUE, BARRIE ON L4N 6T5
WWW.BIRKSNHC.CA

March 29, 2021

Deltini Commercial Developments, Inc.
c/o Ms. Marika Zigon & Mr. Tony Deltini
1350 Shawson Drive
Missisauga, ON
L4W 1C5

RE: BIRKS NHC 04-003-2019
Environmental Impact Study
636040 Prince of Wales Road, 506243 & 506249 Highway 89
Settlement of Primrose, Township of Mulmur

Dear Ms. Zigon & Mr. Deltini:

Thank you for retaining Birks Natural Heritage Consultants, Inc. (Birks NHC) to prepare an Environmental Impact Study (EIS) for the properties described above. It is our understanding that the EIS has been requested in support of a Plan of Subdivision for the proposed industrial development of the properties.

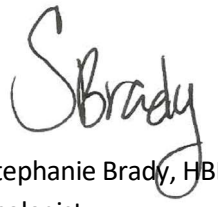
Site specific data was collected by Birks NHC ecologists during the 2019 season. Through the assessment of the field data, background information, and applicable policies and regulations, we have determined that portions of the property contain natural heritage features including un-evaluated wetland, significant woodland, and fish habitat.

The report provides an assessment of significance of those identified natural heritage features and assesses for potential negative ecological impacts associated with the proposed development. We conclude that development can occur without resulting in negative ecological impacts to those natural heritage features and functions. Mitigation measures are outlined within the report to reduce any potential negative ecological impacts.

If you have any questions or concern regarding this report, please do not hesitate to contact the undersigned.

Yours truly,

Birks Natural Heritage Consultants Inc.



Stephanie Brady, HBES
Ecologist

Melissa Fuller, H.B.Sc
Ecologist

cc: Ray Duhamel, The Jones Consulting Group, Ltd.

https://birksnhc.sharepoint.com/sites/BirksNHCTeamforall/Shared Documents/Project Folders/SBrady Projects/2019/04-003-2019 Primrose EIS/Reporting/Final/Birks NHC 04-003-2019 Primrose EIS Report Final 29Mar2021.docx

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1 INTRODUCTION

Birks Natural Heritage Consultants, Inc. (Birks NHC) was retained by Deltini Commercial Developments, Inc. to undertake an Environmental Impact Study (EIS) for the proposed industrial development of the properties identified as 636040 Prince of Wales Road, 506243 Highway 89, and 506249 Highway 89, in the Settlement of Primrose, Township of Mulmur (hereafter described as the 'properties'; Figure 1).

1.1 PURPOSE

The objective of the EIS report is to identify the potential natural heritage features and functions present on the property and determine if potential impacts to those functions could arise from the proposed works. The assessment is focused on potential ecological impacts which could result from the proposed Plan of Subdivision for an industrial development. The EIS is required due to the presence of lands regulated by the Nottawasaga Valley Conservation Authority (NVCA) under Ontario Regulation (O. Reg.) 172/06.

This report has been prepared to address the natural heritage requirements of the Provincial Policy Statement, 2020 (PPS), *Endangered Species Act,* 2007 (ESA), Township of Mulmur Official Plan (2012), and the Growth Plan for the Greater Golden Horseshoe (MMAH, 2020).

1.2 SITE DESCRIPTION

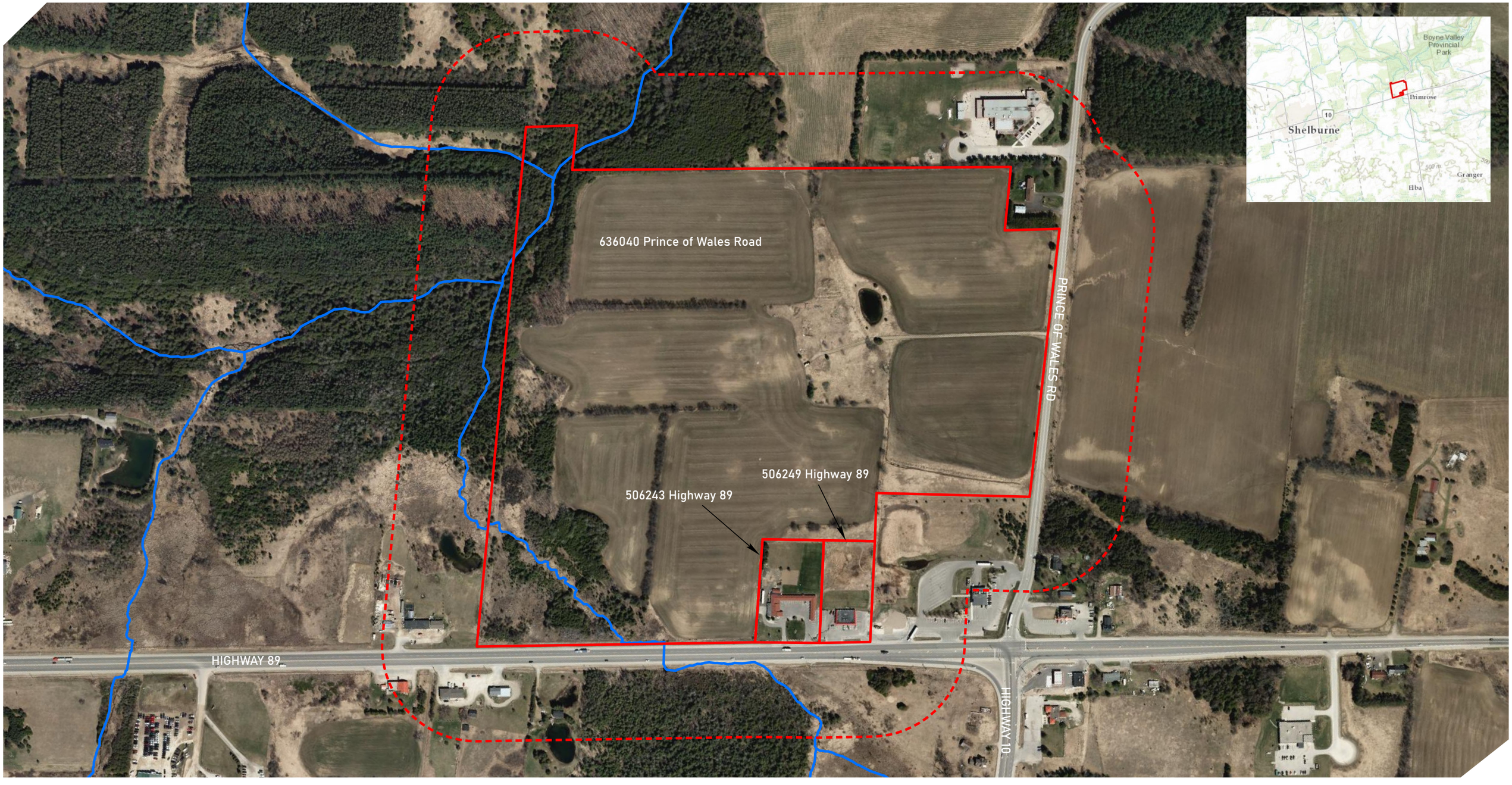
The larger property (636040 Prince of Wales) contains both agricultural (*i.e.,* active row crops) and naturalized lands including wetland, woodland, watercourses, and meadow areas. A small dug pond is present where evidence of past residential use was noted (*i.e.,* foundation). A drainage feature was noted during the first two site visits which has since been altered to improve tile drainage for agricultural purposes. Hedgerows, as seen in aerial photos, were removed prior to the commencement of the EIS. Primrose Creek and an unnamed tributary traverse the property in the western corners of the property.

The two smaller properties (506243 and 506249 Highway 89) are developed properties fronting Highway 89 which contain commercial uses (*i.e.,* motel, restaurant). Maintained lawn is present on both properties, and a small wetland feature is present within the 506249 Highway 89 property.

1.3 ADJACENT LAND USE

The properties are within a defined settlement approximately 7 kilometres (km) east of the Town of Shelburne. The Primrose Elementary School is present directly north of the property limits, and various restaurants and gas stations are present along Highway 89 which borders the properties to the south.

Natural areas present adjacent to the properties include the Boyne Valley Provincial Park and Boyne Valley Area of Natural and Scientific Interest (ANSI) which abut the larger property to the north.



Primrose Settlement EIS

Township of Mulmur

Figure 1:
Study Area

120m Study Area | Property Boundary | Primrose Creek (LIO)

MAP DRAWING INFORMATION:
DATA PROVIDED BY: ESRI CANADA

MAP CREATED BY: SB
MAP CHECKED BY: BB
MAP PROJECTION: NAD 1983 UTM ZONE 17N

N W E S

0 60 120 240 360 480 Meters

FILE LOCATION:

Path: C:\Users\steph\BIRKS NATURAL HERITAGE CONSULTANTS INC\Birks NHC Team for all - Project Folders\SBrady Projects\ArcGIS - Projects here\Projects - here\Primrose_UTM

PROJECT: 02-004-2020 STATUS: DRAFT DATE: 22/12/2020

Woodland cover present to the north and west extends within the property limits along the western property boundary. Highway 89 borders the two smaller properties to the south and existing commercial development is present to the east of the properties.

1.4 Study Area

For the purpose of this EIS, the Study Area is focused within an area approximately 120 metres surrounding the area of proposed severance as illustrated in Figure 1. The Ministry of Natural Resources and Forestry (MNRF) recommends a distance of 120 metres for consideration of development and/or site alteration impacts to adjacent features, as outlined within the Natural Heritage Reference Manual (MNR, 2010). To allow for the consideration of any other natural heritage features or functions in the area a landscape level screening was also undertaken through a review of air photos within approximately one kilometre surrounding the Study Area.

2 ENVIRONMENTAL POLICY FRAMEWORK

The following summarizes the planning policies and regulations related to natural heritage that apply to the proposed development.

2.1 Provincial Policy Statement (2020)

Ontario's Planning Act requires that planning decisions shall be consistent with the PPS. Section 2.1 of the PPS specifies policy related to protection of natural heritage features and functions. All proposed development needs to meet the "no negative impact" test and demonstrate that there will be no negative impacts to the natural features and their ecological functions per Section 2.1 of the PPS (MMAH, 2020).

According to Section 2.1.4 of the PPS, development and site alteration shall not be permitted in the following features:

a) Significant wetlands in Ecoregions 5E, 6E, and 7E; and,
b) Significant coastal wetlands.

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

a) Significant woodlands in Ecoregions 6E and 7E;
b) Significant valleylands in Ecoregions 6E and 7E;
c) Significant wildlife habitat (SWH);
d) Significant areas of natural and scientific interest (ANSI); and,
e) Coastal wetlands in Ecoregions 5E, 6E, and 7E that are not subject to policy 2.1.4(b).

Sections 2.1.6 and 2.1.7 state that development and site alteration is not permitted in fish habitat or habitat of endangered and threatened species except in accordance with federal and provincial requirements.

Section 2.1.8 extends protection of those features defined above in policies 2.1.4, 2.1.5 and 2.1.6 to adjacent lands, typically those within 120 m of the potential impact. Section 2.1.8 states that development and site alteration shall not be permitted on adjacent lands to natural heritage features identified in policies 2.1.4, 2.1.5, and 2.1.6 unless the ecological function of the adjacent lands has been evaluated and it has been demonstrated that there will be no negative impacts on the natural features or on their ecological function.

While many of these features are mapped and direction is available to allow for candidate features and functions to be identified, it remains the responsibility of the province and/or the municipality to designate areas identified within Section 2.1.4 and 2.1.5 of the PPS as significant. The Natural Heritage Reference Manual (MNR, 2010) and Significant Wildlife Habitat Criterion Schedule for Ecoregion 6E (MNRF, 2015) were used within this report to identify candidate features and functions not currently identified by the province and/or municipality.

2.2 Endangered Species Act (2007)

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

O. Reg. 230/08 of the ESA identifies Species at Risk in Ontario and includes species listed as Extirpated, Endangered, Threatened, and Special Concern. As noted above, only species listed as Endangered and Threatened receive species and habitat protection through the ESA. Species designated as Special Concern may receive protection under the Significant Wildlife Habitat provisions of the PPS.

2.3 Fisheries Act (1985)

The purpose of the federal *Fisheries Act*, 1985 is, in part, to provide a framework for the conservation and protection of fish and fish habitat through the various regulations that protect against serious harm to fish by death or any permanent or temporary harmful alteration, disruption or destruction (HADD) to their habitat. Fish habitat is defined as "spawning grounds and any other areas, including nursery, rearing, food supply and migration areas, on which fish depend directly or indirectly in order to carry out their life processes". The fish and fish habitat protection provisions of the *Fisheries Act* include:

- a prohibition against causing the death of fish, by means other than fishing (section 34.4);
- a prohibition against causing the harmful alteration, disruption or destruction of fish habitat (section 35);

- establishment of standards and codes of practice in relation to works, undertakings and activities during any phase of their construction, operation, modification, decommissioning or abandonment for the avoidance of death to fish, HADD, and for the prevention of pollution (Section 34.2); and,
- ministerial powers to ensure the free passage of fish or the protection of fish or fish habitat with respect to existing obstructions (section 34.3).

The interpretation and application of the regulations of the *Fisheries Act* is overseen by Fisheries and Oceans Canada (DFO). Under the direction of DFO, projects that have potential to affect fish and fish habitat are to be screened using their online guidance platform, 'Projects Near Water' to determine if the project will require review under the *Fisheries Act*. Projects that can not completely implement measures to protect fish and fish habitat, and do not qualify under the current standards and Codes of practice require review by DFO prior to any site disturbance.

When reviewing applications, the DFO will employ a risk-based approach to determine the likelihood and severity of potential impacts to fish and fish habitat that could result from given work, undertaking or activity and will advise the proponent accordingly.

2.4 Growth Plan for the Greater Golden Horseshoe (2020)

A Place to Grow: Growth Plan for the Greater Golden Horseshoe (Growth Plan) was issued under the authority of Section 7 of the *Places to Grow Act*, 2005. It was most recently amended and replaces the initial Growth Plan that took effect in 2017. Like other provincial plans, the Growth Plan builds upon the policy foundation provided by the PPS and provides additional and more specific land use planning policies to address issues facing specific geographic areas in Ontario.

A Natural Heritage System (NHS) for the Growth Plan has been mapped by the province and excludes lands within settlement area boundaries. The two smaller properties (506243 and 506249 Highway 89) and a portion of the larger property (636040 Prince of Wales Road) are within a defined settlement area and therefore excluded from the NHS for the Growth Plan. A portion of the larger property along the western limit is located within the NHS of the Growth Plan. Lands to the north and west adjacent to the property are also mapped as part of the Growth Plan NHS. Relevant policies applicable to the Growth Plan are as follows:

Outside of settlement areas, development or site alteration is not permitted in key natural heritage features (KNHFs) that are part of the NHS for the Growth Plan or in key hydrologic features (KHFs) except for natural resource management, conservation and flood control projects, aggregate operations, and expansions or alterations to existing buildings and structures (Section 4.2.3). Within the NHS for the Growth Plan new development or site alteration will demonstrate that:

i. there are no negative impacts on [KNHFs] or [KHFs] or their functions;

ii. *connectivity along the system and between [KNHFs] and [KHFs] located within 240 metres of each other will be maintained or, where possible, enhanced for the movement of native plants and animals across the landscape;*

iii. *the removal of other natural features not identified as [KNHFs] and [KHFs] is avoided, where possible. Such features should be incorporated into the planning and design of the proposed use wherever possible;*

iv. *except for uses described in and governed by the policies in subsection 4.2.8, the disturbed area, including any buildings and structures, will not exceed 25 per cent of the total developable area, and the impervious surface will not exceed 10 per cent of the total developable area;*

v. *with respect to golf courses, the disturbed area will not exceed 40 per cent of the total developable area; and*

vi. *at least 30 per cent of the total developable area will remain or be returned to natural self-sustaining vegetation, except where specified in accordance with the policies in subsection 4.2.8*

(MMAH, 2020, Section 4.2.2.3)

Outside settlement areas, a proposal for new development or site alteration within 120 m of a KNHF or KNHF will require an EIS that identifies a vegetation protection zone (VPZ). For KHFs, fish habitat and significant woodlands, the VPZ is to be no less than 30 m from the outside boundary of the feature (Section 4.2.4).

Beyond the NHS for the Growth Plan, the municipality will continue to protect any other natural heritage features and areas in a manner that is consistent with the PPS.

2.5 Nottawasaga Valley Conservation Authority

Portions of the property are regulated by the Nottawasaga Valley Conservation Authority (NVCA) in accordance with O. Reg. 172/06 – *Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Regulation* (Appendix A). Under this regulation, the NVCA requires that approvals be obtained for any proposed development within regulated areas.

A Terms of Reference for the EIS was established in consultation with the NVCA and can be found in Appendix A.

2.6 Township of Mulmur Official Plan (2012)

As per Schedules A1 and A7 of the Township of Mulmur Official Plan (OP), the two smaller properties (506243 and 506249 Highway 89) and a portion of the larger property (636040 Prince of Wales Road) are within the Primrose Settlement Area; a smaller portion of the larger property at the western boundary is mapped outside of the settlement area as Natural Area (Appendix B). The Natural Area is further illustrated on Schedules B1 and B2 as containing Wetlands, Wooded Area, and Streams.

Adjacent lands are mapped as containing both Core Deer Wintering Area and ANSI Life Sciences (Appendix B).

According to Section 5.18 of the Township of Mulmur's OP, development and site alteration shall not be permitted in significant habitat of Threatened and Endangered species, or significant woodlands. Further, development and site alteration shall not be permitted in significant woodlands, significant valleylands, SWH, and ANSIs unless it has been demonstrated that there will be no negative impacts on the features or their functions. Development and site alteration shall not be permitted in fish habitat except in accordance with provincial and federal requirements. Additionally, development and site alteration shall not be permitted on adjacent lands to the natural heritage features and functions listed above unless the ecological function of the adjacent lands has been evaluated and it has been demonstrated that there will be no negative impacts. Impacts of development and site alteration shall be identified and evaluated in an EIS and appropriate buffers, including VPZs are to be established.

3 STUDY APPROACH

The following activities and assessments were undertaken to fulfill the objectives of this study.

3.1 Background Data Review and Sources

Background documents provide information on site characteristics, habitat, wildlife, rare species and communities, and other aspects of the study area. For the purpose of this EIS, the following sources were considered:

- Aerial images (Google, ESRI);
- Atlas of the Breeding Birds of Ontario (Bird Studies Canada, 2006);
- Land Information Ontario (LIO; MNRF, 2020);
- Natural Heritage Information Centre (MNRF, 2020);
- Ontario Reptile and Amphibian Atlas (Ontario Nature, 2019);
- Aquatic Species at Risk Maps (DFO, 2019);
- Species at Risk in Ontario List (MECP, 2021);
- Township of Mulmur Official Plan (2012).

3.2 Species at Risk Assessment

The Species at Risk assessment included an analysis of the habitat requirements of Species at Risk reported to occur in the area to identify those having potential to occur within the study area. Birks NHC ecologists reviewed data obtained through desktop review and the site visits, related to potential habitat for provincially designated species, notably Species at Risk listed under O. Reg. 230/08 of the ESA as Threatened or Endangered.

Habitat requirements and appropriate designations for all species that could potentially occur in the were considered. Where it is determined that the species have potential habitat within the study area, survey results were considered to determine the function of the potential habitat and whether the proposed works are in compliance with the regulations of the ESA.

3.3 Field Surveys

Natural heritage features and functions within the Study Area were characterized through completion of field surveys. The following sections outline the methods used for each of the surveys, including specific provincial protocols utilized. Incidental wildlife, plant and habitat observations were considered during all surveys. Searches were also conducted to document the presence or absence of suitable habitat, based on habitat requirements of Threatened or Endangered species with habitat ranges overlapping the property. The dates when all surveys were completed are included in Table 1 below.

Table 1: Summary of Field Surveys Conducted in 2019

Dates	Start/End Time	Type of Survey	Biologists
April 9 May 30 June 26	10:00 - 13:00 18:20 - 19:00 18:45 - 19:30	Headwater Drainage Feature Assessment	M. Fuller & S. Brady - Birks NHC Ecologists
April 24 May 30 June 26	20:19 - 20:58, 21:10 - 22:00 21:26 - 21:55	Amphibian Calling surveys	S. Brady, M. Fuller, & B. Baker - Birks NHC Ecologists
April 9 August 6	10:00 - 13:00 9:30 - 12:30	Fish Habitat Assessment	M. Fuller, S. Brady – Birks NHC Ecologists
June 11 June 24	6:10 - 7:45 6:10 - 8:10	Dawn Breeding Bird surveys	S. Brady - Birks NHC Ecologist
June 24 October 1	10:00-12:30 14:00 - 15:25	Ecological Land Classification and Vegetation surveys	S. Brady - Birks NHC Ecologist
June 24 October 1	14:30 - 15:40 12:00 - 13:30	Vegetation Survey and feature delineation	S. Brady - Birks NHC Ecologist M. Francis & A. Knapp – NVCA
August 6 August 18-19	9:30 - 12:30 15:30-12:30	Fish community sampling	S. Brady & M. Fuller - Birks NHC Ecologists Gary Pritchard – Fisheries Ecologist

3.3.1 Ecological Land Classification and Vegetation Surveys

Vegetation communities were assessed using Ecological Land Classification (ELC) as a first step in identifying and assessing for potential natural heritage features within the study area. The ELC system for Southern Ontario (Lee *et al.,* 1998) was used for the study area. The ecological community boundaries were determined through a review of aerial photography and then further refined during the site visits.

In early 2007, the MNRF refined their original vegetation type codes to encompass the vast range of natural and cultural communities across Southern Ontario. Through this process, new codes have been added while some have changed slightly. These updated ELC codes have also been used for reporting purposes in this study in areas where they are more representative of the vegetation communities within study area.

Vascular plants were considered during the ELC site visits. A formal list of species encountered during the vegetation survey is included in Table A. No Species at Risk or provincially rare plant species were documented within the study area.

Wetland Delineation

The wetland boundary was established in the field using the Ontario Wetland Evaluation System (MNR, 2013) employing the "50% rule" to identify a boundary between upland and wetland habitat based on vegetation cover. The wetland boundary was mapped in the field using GPS on June 24, 2019 and confirmed with NVCA staff October 1, 2019.

3.3.2 Dawn Breeding Bird Surveys

Diurnal breeding bird surveys within the property followed methods outlined in the Ontario Breeding Bird Atlas Guide for Participants (Cadman *et al.,* 2001) as completed by Birks NHC ecologists on June 11 and June 24, 2019. Specifically, breeding bird surveys consisted of ten-minute point counts that were used to establish quantitative estimates of bird abundance, species presence, and breeding activity in all habitat types within the property.

3.3.3 Amphibians

A total of three surveys were completed to assess for the potential presence of suitable amphibian breeding habitat within the wetland communities and pond feature. Surveys were conducted on April 24, May 30, and June 26, 2019. Three amphibian monitoring stations were surveyed within the study area (Figure 2).

The calling activity of individuals estimated to be within 100 m of the observation point were documented. All individuals beyond 100 m were recorded as outside the count circle, and calling

activity was not recorded. Calling activity was ranked using one of the three abundance code categories:

- Code 1: Calls not simultaneous, number of individuals can be accurately counted
- Code 2: Some calls simultaneous, number of individuals can be reliably estimated
- Code 3: Calls continuous and overlapping, number of individuals cannot be estimated

In areas where appropriate habitat was identified (*i.e.,* pond), visual inspections for egg masses and amphibian larvae in conjunction with other field surveys were completed.

3.3.4 Aquatic Habitat Assessment

The site was visited on April 9, August 6, and August 19 of 2019 to complete a characterization of aquatic fish habitat within the study area. The assessment incorporated the following survey parameters: type of fish habitat present; thermal regime; fish species observed/known to be present based on field data and available background information from MNRF, LIO and NVCA.

All fish habitat identified within the study area was assigned one of the following designations:

- Permanent direct fish habitat – a feature where flowing or standing water is present year-round and connected to known fish habitat;
- Seasonal direct fish habitat: a feature that provides direct habitat for fish under elevated water levels (during spring freshet and large storm events) but not under low water conditions due to insufficient open water and refuge habitat or anoxic water quality conditions; or,
- Indirect fish habitat – a feature where there is sufficient water to sustain aquatic life however, fish cannot directly access the area as a result of a barrier to upstream fish movement (*i.e*., steep channel grade, low water levels, perched culvert) and the feature discharges to direct habitat downstream.

Fish community sampling was completed in 2019 (via overnight minnow traps and electrofishing surveys) to confirm the community within Primrose Creek and the tributary. Fish species captured were then evaluated to designate a thermal regime for the watercourse, according to the Ontario Freshwater Fishes Life History Database (Eakins, 2021). In general, thermal preference is assigned based on summer water temperature as follows: Warmwater = greater than 25°C; Coolwater = 19 to 25°C; and Coldwater = less than 19°C.

3.3.5 Headwater Drainage Assessment

The site was visited on April 9, May 30, and June 26 of 2019 to undertake the completion of a Headwater Drainage Feature Assessment (HDFA). The assessment was conducted based on the protocol established by the Credit Valley Conservation Authority (CVC) and Toronto and Region Conservation Authority (TRCA) titled “Evaluation, Classification and Management of Headwater Drainage Features Guidelines” (2014).

3.3.6 General Wildlife Surveys

A wildlife assessment within the properties was undertaken through incidental observation of wildlife during the field program outlined above. Any incidental observations of wildlife were noted, as well as other wildlife evidence such as dens, tracks, and scat. For each observation notes, and when possible, photos were taken. These observations also serve to validate our conclusions on the ecological function of the ecosystems identified within the study area.

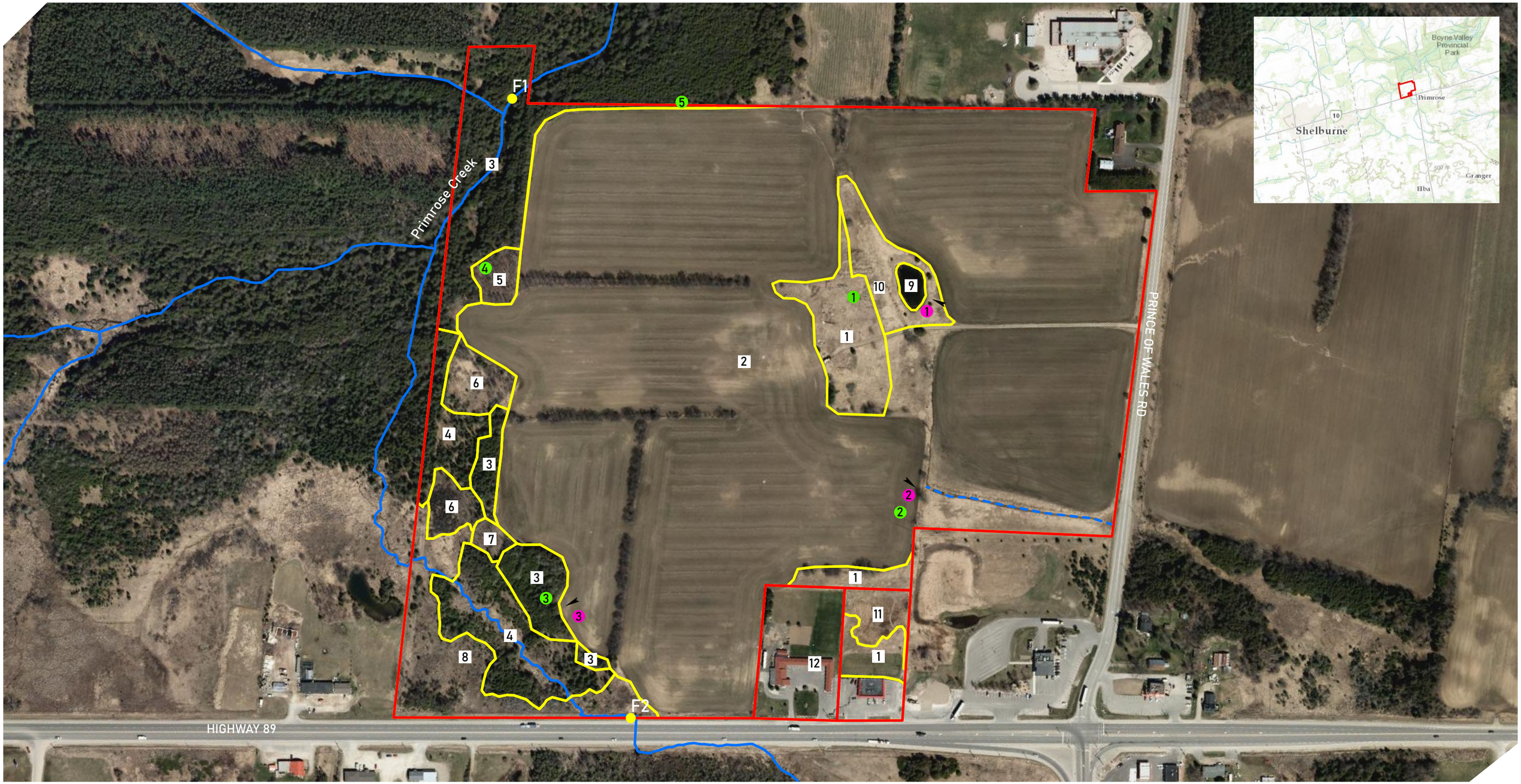
4 EXISTING CONDITIONS

4.1 VEGETATION

A total of eleven vegetation communities were identified within the properties. Naturalized portions contain both upland and wetland conditions. The vegetation communities that occur on the properties include:

1. CUM: Cultural Meadow
2. AG: Agriculture
3. FOCM4-1: Fresh-Moist White Cedar Coniferous Forest
4. SWCM1-2: White Cedar-Conifer Mineral Coniferous Swamp
5. FODM5-1: Fry-Fresh Sugar Maple Deciduous Swamp
6. SWTM3-6: Mixed Willow Mineral Deciduous Thicket Swamp
7. SWDM4-5: Poplar Mineral Deciduous Swamp
8. SWTM2-1: Red-osier Dogwood Mineral Deciduous Thicket Swamp
9. OAW: Open Water
10. MAMM1-3: Reed-canary Grass Graminoid Mineral Meadow Marsh
11. MAMM1-12: Common Reed Graminoid Mineral Meadow Marsh

Vegetation communities and their respective locations within the property are illustrated on Figure 2. Table A provides a list of vascular plants recorded in the properties.



Primrose Settlement EIS

Township of Mulmur

Figure 2:

Existing Conditions and Survey Locations

- Property Boundary
- Primrose Creek (LIO)
- Drainage Feature

Vegetation Communities

- 1) CUM - Cultural Meadow
- 2) Agriculture
- 3) FOCM4-1 - Fresh-Moist White Cedar Coniferous Forest
- 4) SWCM1-2 - White Cedar - Conifer Mineral Coniferous Swamp
- 5) FODM5-1 - Dry-Fresh Sugar Maple Deciduous Forest
- 6) SWTM3-6 - Mixed Willow Mineral Deciduous Thicket Swamp
- 7) SWDM4-5 - Poplar Mineral Deciduous Swamp
- 8) SWTM2-1 - Red-osier Dogwood Mineral Deciduous Thicket Swamp
- 9) OAW - Open Water
- 10) MAMM1-3 - Reed-canary Grass Garminoid Mineral Meadow Marsh
- 11) MAMM1-12 - Common Reed Graminoid Mineral Meadow Marsh
- 12) Maintained Area

Survey Locations:

- Fish Sampling
- Dawn Breeding Bird
- Amphibian Calling

MAP DRAWING INFORMATION:
DATA PROVIDED BY: ESRI CANADA

MAP CREATED BY: SB
MAP CHECKED BY: BB
MAP PROJECTION: NAD 1983 UTM ZONE 17N

N W E S

0 45 90 180 270 360 Meters

FILE LOCATION:

Path: C:\Users\steph\BIRKS NATURAL HERITAGE CONSULTANTS INC\Birks NHC Team for all - Project Folders\SBrady Projects\ArcGIS - Projects here\Projects - here\Primrose_UTM

PROJECT: 04-003-2019 STATUS: DRAFT DATE: 12/02/2021

4.2 WILDLIFE

4.2.1 Birds

Five locations were surveyed within the property limits as illustrated on Figure 2. The breeding bird surveys conducted in June of 2019 documented 29 species within the study area (Table B). Of these, evidence of breeding was recorded for 12 species. The remainder were either species with wide ranges that were observed flying over, were not documented with sufficient frequency to establish probable breeding or were not in appropriate habitat.

Eastern Meadowlark (Threatened) was documented on June 11 in a remnant meadow community to the south-east of the properties. This was a calling male and was recorded at survey point 2. It was not documented during the second survey on June 24 and it is expected that this was a transient male.

4.2.2 Mammals

Typical mammals observed in urban and rural settings are expected to utilize the habitats within the study area. These include Gray Squirrel, Raccoon, and White-tailed Deer. White-tailed Deer was observed within the study area and evidence of Coyote and Racoon (*i.e.,* tracks) was noted during site visits. Based on available background mapping from the Township of Mulmur OP and MNRF (LIO), deer wintering habitat is present within the study area.

Given that the woodlands present within the study area contain standing mature trees with features such as cavities and crevices, it is also possible that bat species utilize the habitat present within and adjacent to the properties.

4.2.3 Amphibians

Three amphibian monitoring stations were surveyed within the study area (Figure 2). Four species were documented from these locations: Wood Frog, Spring Peeper, American Toad, and Grey Treefrog (Table C). Spring Peeper and Grey Treefrog were documented at calling level of 3, associated with the pond feature, small Common Reed patch in the south-east corner, and the larger wetland unit west of the properties.

4.2.4 Reptiles

No reptile species were documented within the properties. Given the habitats present, species range maps, and observations in the general area, the following reptiles may utilize appropriate habitats within the Study Area: Snapping Turtle, Midland Painted Turtle, and Eastern Gartersnake.

4.2.5 Fish

The project site is located within the NVCA watershed and the Boyne River Subwatershed. The subwatershed is comprised largely of forests, wetlands and agricultural lands with 21.5% forest cover, 63.5% riparian cover and 10.3% wetland cover (NVCA, 2013). Primrose Creek flows northerly through

Niagara Escarpment lands before ultimately discharging to the Boyne River. Within the headwaters, the Boyne River is largely groundwater fed, associated with high permeability of soils (NVCA, 2009).

Three drainage features on the property have been assessed for their ability to provide fish habitat. These features are further described below:

Primrose Creek and Tributary

The tributary of Primrose Creek originates south of Highway 89, enters the larger property via a 1 m concrete box culvert then flows northerly through the south-west corner of the property, traversing a cattail meadow marsh and cedar swamp vegetation community (Figure 2). Bankfull width was approximately 2 m and depth 1.5 m. Substrate of the feature was comprised of fine sandy and silty sediments. The tributary then connects with Primrose Creek west of the property boundary. Primrose Creek proper then curves and runs in a generally north direction and re-enters the north-west corner of the property (Figure 2). In this location, Primrose Creek traverses a cedar forest. Average bankfull width was 9.93 m with depths ranging from 10-30 cm. Substrate in this location was predominantly bedrock, with step-pool formations. Both the tributary and creek are naturalized along the entire reach intersecting the property.

Fish community sampling within Primrose Creek and the tributary occurred in summer 2019; species identified are listed in Table and sample locations are indicated on Figure 2. In addition, LIO reports that sculpin species, Johnny Darter, Blacknose Dace and Longnose Dace have been captured at Primrose Creek sampling stations in proximity to the property.

Table 2: Fish Community Data for Primrose Creek (Birks NHC, 2019)

Species		Thermal Regime[1]
Scientific Name	**Common Name**	
Chrosomus eos	Northern Redbelly Dace	Coolwater
Oncorhynchus mykiss	Rainbow Trout	Coldwater
Salvelinus fontinalis	Brook Trout	Coldwater
Rhinichthys obtusus	Eastern Blacknose Dace	Coolwater
Salmo trutta	Brown Trout	Coldwater

[1] Ontario Freshwater Fishes Life History Database (Eakins, 2021)

Given the presence of numerous sensitive coldwater fish, Primrose Creek and its tributary are considered Permanent Direct Coldwater Fish Habitat. The thermal regime of this feature has been confirmed through correspondence with the NVCA.

Un-named Drainage Feature

The feature bisects the property along the north-south axis. Flow entered the property through a 30 cm corrugated steel pipe (CSP) under Prince of Wales Road. The feature then flowed westerly through a dug channel (Appendix C, Photo 1), then north-west towards the northern property limits (Appendix C, Photo 2, 3,4). A second CSP culvert was present under the existing farm lane. The final 93 m of the feature intersected regularly tilled lands (Appendix C, Photo 5a, 5b), infiltrating a rock structure at the property limits (Photo 6). No evidence of outflow or surface water connection to downstream features was documented beyond the terminus. Flows were observed both in April and May of 2019, with May flows dissipating within the riparian habitat north of the farm lane (Photo 5b). The feature is not considered to be fish habitat due to the absence of a connection to downstream surface water features.

The un-named drainage feature was identified by the NVCA as a candidate Headwater Drainage Feature (HDF) through establishment of the TOR of this EIS. Analysis of the feature as a HDF was completed under the direction of the "Headwaters Drainage Feature Assessment" protocol (TRCA and CVC, 2014) and is presented in Appendix C. A total of five reaches were assessed in relation to their respective hydrologic regime, riparian vegetation, provision of fish habitat and provision of terrestrial habitat. The protocol provides management recommendations based on the function of the noted parameters. According to the protocol, the majority of the reaches were identified as those that should be mitigated through development. Two reaches (3 and 4) were identified for conservation. Note that following the assessment, during the June 2019 site visit, it was discovered that the entire length of the feature had been incorporated into the property's tile drainage and no further assessment was completed.

Offline Pond

A dug offline pond was present within the central portion of the property. The pond appeared to have no surface water outlet and thus is not connected to confirmed fish habitat. In accordance with the recommendations of the "Project Near Water" website relating to the DFO request for review process, works within and adjacent to the feature do not require a DFO request for review.

No fish sampling occurred within the pond feature and no visual documentation of fish was noted throughout the course of the 2019 field program. Regardless, a residual fish community may be present within the pond and appropriate measures should be taken during decommissioning of the feature to ensure that decommissioning of the pond occurs without direct impact to fish.

5 SIGNIFICANT NATURAL HERITAGE FEATURES AND FUNCTIONS

In the following sections we summarize the range of natural heritage features and functions attributable to the study area based on existing designations/delineations by agencies and as revealed through the application of provincial guidelines for identification of significant natural heritage features and functions.

5.1 Provincially Significant Wetland

There are no mapped Provincially Significant Wetlands identified within the study area.

5.2 Un-evaluated Wetland

Background mapping (*i.e.,* NVCA, MNRF) indicated the presence of un-evaluated wetland within the properties. Formal wetland delineation exercises were undertaken by Birks NHC ecologists to obtain an accurate limit of where wetland habitat occurred (Figure 3). The wetland boundary was established in the field using the Ontario Wetland Evaluation System employing the "50% rule" to identify a boundary between upland and wetland habitat based on vegetation cover.

Wetland habitat within the larger property (636040 Prince of Wales Road) is contained within the forested portions along the western boundary of the property. Some portions of this wetland limit directly border the agricultural field however the majority is setback and within the woodland feature (Figure 3). This wetland limit was confirmed in the field with NVCA staff on October 1, 2019. Based on aerial imagery and background mapping, this wetland habitat appears to be contiguous off property, extending to the south and west. Other wetlands on the larger property included a 0.6 ha Reed-canary Grass Meadow Marsh (MAMM1-3) that encompassed the pond.

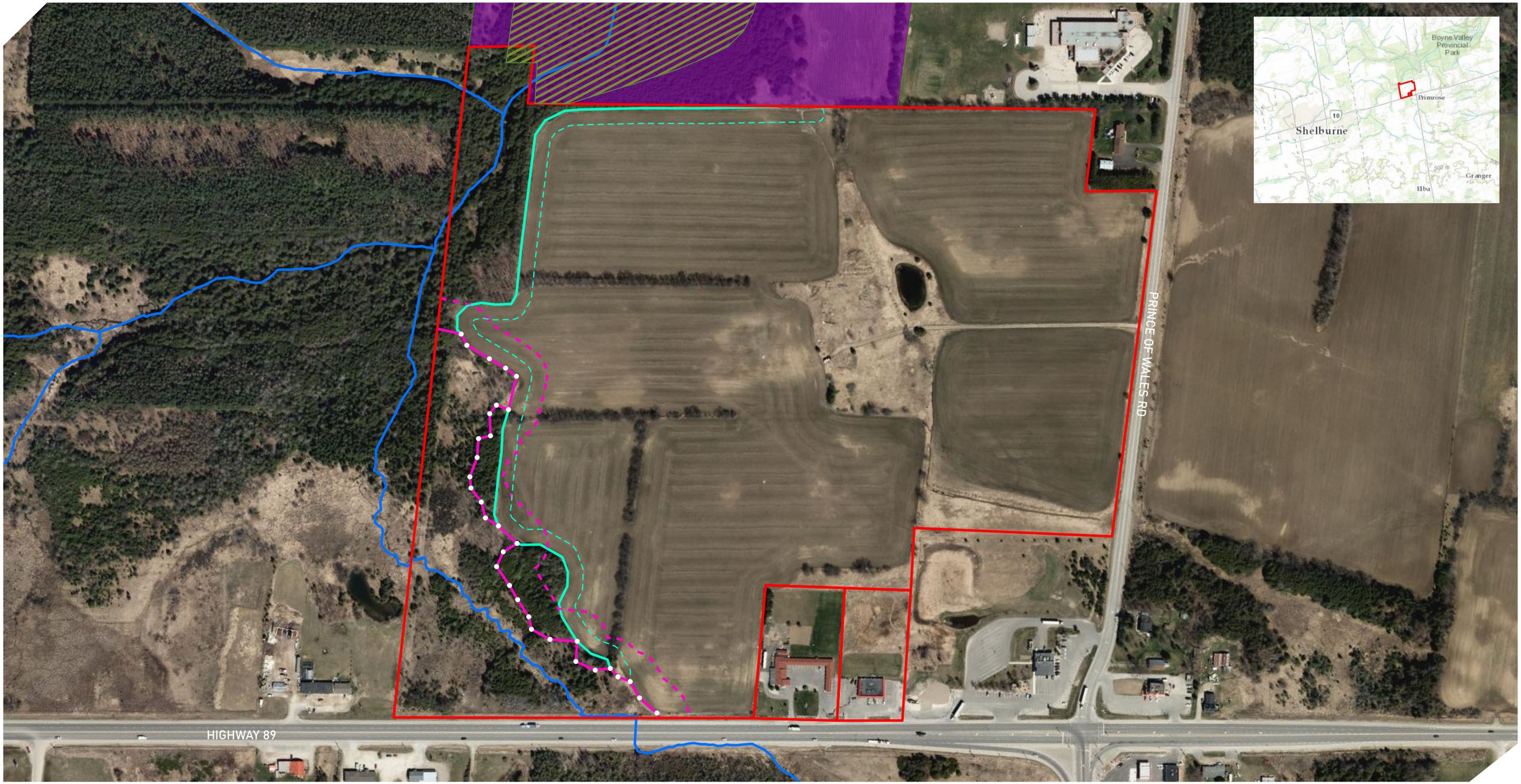
A Common Reed Meadow Marsh (MAMM1-12) is present within the property identified as 506249 Highway 89. This wetland appears to extend beyond the property limits to the east, where thick Common Reed were noted.

5.3 Significant Woodland

The western portion of the larger Prince of Wales property contains a contiguous woodland feature that extends off property to the west and north. Portions of the contiguous woodland feature, including those areas within the property, are identified as Category 2 Natural Features within the Township of Mulmur Official Plan Schedule B2 which encompasses Significant Woodland (Appendix B). The contiguous woodland has been measured at approximately 438 hectares, of which 4.5 hectares are within the property limits (Appendix D). For the purpose of this assessment, the woodlands within the property will be considered to be Significant Woodland.

5.4 Significant Valleylands

There are no mapped Significant Valleylands within the study area.



Primrose Settlement EIS

Township of Mulmur

Figure 3:

Natural Heritage Features and Setbacks

- Property Boundary
- Primrose Creek (LIO)
- Wetland Limit (Birks NHC; June 24, 2019)
- Wetland Delineation GPS Points
- 30m Wetland Setback
- Woodland Limit
- 15m Woodland Setback
- ANSI - Life Sciences - Boyne Valley
- Boyne River Provincial Park

MAP DRAWING INFORMATION:
DATA PROVIDED BY: ESRI CANADA

MAP CREATED BY: SB
MAP CHECKED BY: BB
MAP PROJECTION: NAD 1983 UTM ZONE 17N

N W E S

0 45 90 180 270 360 Meters

FILE LOCATION:

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PROJECT: 04-003-2019 STATUS: DRAFT DATE: 10/02/2021

5.5 Significant Wildlife Habitat

The Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E (MNRF, 2015) provides a description of each SWH type, species that occur in those habitats and criteria for assessing those significant habitats. SWH functions were assessed utilizing expert knowledge of the site. Habitat and species data sources were reviewed in addition to field data gathered by Birks NHC ecologists. Appendix E summarizes the SWH assessment.

5.5.1 Seasonal Concentration Areas of Animals

As outlined within the criteria for Significant Wildlife Habitat in Ecoregion 6E Schedules, Seasonal Concentration Areas are areas where wildlife species occur annually. These seasonal aggregations result in large numbers of individuals, sometimes highly concentrated within relatively small areas. As a result, the loss of, or damage to, these features can result in a significant impact to populations.

Bat Maternity Colonies

Bat Maternity Colonies for Silver-haired Bat and Big Brown Bat are identified as candidate SWH because known locations of forested bat maternity colonies are extremely rare in Ontario. According to the Significant Wildlife Habitat Technical Guide (MNR, 2000) and Significant Wildlife Habitat in Ecoregion 6E Schedules (MNRF, 2015), maternity colonies located in mature deciduous or mixed forest stands with greater than ten large diameter wildlife trees per hectare are candidates for SWH designation.

Forest community FODM5-1 contains appropriate features, including mature trees containing suitable roosting habitat elements (*i.e.,* loose bark, cavities, cracks). Therefore, the FODM5-1 community would be considered candidate for SWH. Other forest communities in the study area were either too young in nature or did not contain suitable species composition (*i.e.,* White Cedar forest).

For the purpose of this assessment and the proposed development (*i.e.,* no works in the woodland), surveys were not completed for this study. Therefore, the presence of bat maternity colonies is assumed to be present within the FODM5-1 vegetation community.

Deer Yarding Areas

According to the Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E (MNRF, 2015), deer yarding areas are areas that deer move to in response to the onset of winter. The yard is composed of two areas referred to as Stratum I and Stratum II. Stratum II covers the entire winter yard area and is usually a mixed or deciduous forest with plenty of browse available for food. The core of a deer yard (Stratum I) is located within the Stratum II area and is critical for deer survival in areas where winters become severe. Deer yards are mapped by the MNRF and locations of Stratum I and Stratum II deer yards considered significant by MNRF are available via LIO.

Background information from the MNRF (*i.e.*, LIO) confirms that the Boyne Valley Provincial Park and portions of the Prince of Wales property provide habitat for wintering White-tailed Deer as they are

mapped as Stratum II. The mapped area is a large contiguous wooded community that extends beyond the property limits to the north and west (Appendix E). Note that the LIO Deer Wintering Area mapping includes areas of open agricultural lands within the property. It is assumed that these lands are included in error. As described in the Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E (MNRF, 2015), and illustrated in the Township of Mulmur OP Schedule B2 (2012), deer yarding areas are within treed communities (forest, swamp, plantation) that provide browse and thermal cover.

5.5.2 Specialized Habitat for Wildlife

Specialized Habitat for Wildlife is a community or diversity-based category. The more wildlife species a habitat contains, the more significant the habitat becomes to the planning area. Some species require large areas of habitat for their long-term survival and many require substantial areas of suitable habitat for successful breeding. The largest and least fragmented habitats will support the most significant populations of wildlife (MNRF, 2015).

Seeps and Springs

Seeps and springs are areas where groundwater comes to the surface and are typical of headwater areas. They are often at the source of coldwater streams and can serve as important wildlife feeding and drinking areas, especially in the winter. Any forested ecosite within the headwater areas of a stream or river system is to be considered candidate SWH (MNRF, 2015). The properties are situated within the headwater areas of a stream and contain forested ecosites at the western boundary. Seepage was observed by Birks NHC ecologists on site, in particular within the White Cedar forest community located at the north-western portion of the study area.

5.5.3 Animal movement corridors

Often animals move between different areas and habitats to satisfy various life requirements. Wildlife move to access seasonal summer and winter habitats, feeding spots, or breeding and nesting areas. Corridors must be available to provide suitable habitat for wildlife to safely disperse and move through the landscape to access these important life cycle habitats. Deer movement corridors are listed as SWH in the Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E (MNRF, 2015).

Deer Movement Corridors

White-tailed Deer typically travel through forest habitats to migrate seasonally between summer and winter range. Deer wintering (Stratum II) habitat as identified by MNRF is present within and adjacent to the larger Prince of Wales property (Appendix G). The Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E (MNRF, 2015) indicates that corridors leading to deer wintering habitat should be unbroken by roads and residential areas. Corridors should be at least 200 m wide (MNRF, 2015) and so hedgerows are not suitable for deer movement corridors.

Due to the presence of Deer Wintering Area (Stratum II), it is likely that deer movement corridors are also present within the study area. The naturalized portions contained within the contiguous woodland feature as well as the Primrose Creek and tributary riparian corridor would provide suitable habitat for this function. It is expected that the majority of deer movement is concentrated within this area, rather than traversing the open agricultural fields present within property.

5.6 Areas of Natural and Scientific Interest

Lands adjacent to the north-west corner of the larger property (636040 Prince of Wales) are contained within the Boyne Valley Life Science ANSI (Figure 3), which in turn are contained within the Boyne Valley Provincial Park. The ANSI is represented by landscape units including bottomland wetlands, mesic north facing ravines, limestone canyons and cliffs, as well as tablelands and bottomland fields (MNRF, 2019).

5.7 Fish and Fish Habitat

Three drainage features in the study area have been assessed for their ability to provide fish habitat: Primrose Creek, Primrose Creek tributary, and un-named drainage feature. Fish community sampling within Primrose Creek and the tributary has recorded coolwater and coldwater fishes including: Northern Redbelly Dace, Rainbow Trout, Brook Trout, Eastern Blacknose Dace, and Brown Trout. Given the presence of numerous sensitive coldwater fish, Primrose Creek and its tributary are considered to be Permanent Direct Coldwater Fish Habitat. The thermal regime of this feature has been confirmed through correspondence with the NVCA.

The un-named drainage feature flowed westerly through a dug channel then north-west towards the northern property limits. Flows were observed both in April and May, with May flows dissipating within the riparian habitat north of the farm lane. Note that following the assessment, it was discovered that the feature had been incorporated into the property's tile drainage and no further assessment was completed. Although the drainage feature demonstrated permanency in the landscape, as determined through established riparian vegetation, and channel form, absence of surface connection to downstream features excludes the feature to be considered both direct and indirect fish habitat.

The off-line pond appears to have no surface water outlet and thus is not connected to confirmed fish habitat. No fish sampling occurred within the feature however no visual documentation of fish was noted throughout the course of the 2019 field program. Regardless, a residual fish community may be present within the pond, and appropriate measures should be taken during decommissioning of the feature to ensure that decommissioning of the pond occurs with no impact to fish. See Section 4.2.5 above for more details regarding fish and fish habitat.

5.8 Habitat of Threatened and Endangered Species

Habitat requirements and appropriate designations for all species that could potentially occur in the area are outlined in Table below. Where it is determined that the species have potential habitat within

the study area, survey results were reviewed to determine the function of the potential habitat and whether the proposed works are in compliance with the regulations made under the ESA.

Table 3: Species at Risk Assessment

Common Name	Scientific Name	Designation[1]	Habitat Affinities Present Within Study Area
Mammals			
Little Brown Myotis	*Myotis lucifugus*	Endangered	**Yes** – Woodland community FODM5-1 may contain suitable features. The existing strictures within the two Highway 89 properties may provide suitable anthropogenic roosting habitat.
Northern Myotis	*Myotis septentrionalis*	Endangered	**Marginal** – Woodland community FODM5-1 may contain suitable features.
Tri-colored Bat	*Perimyotis subflavus*	Endangered	**Marginal** – Woodland community FODM5-1 may contain suitable features.
Birds			
Barn Swallow	*Hirundo rustica*	Threatened	**Yes** – Existing structures may provide suitable nesting conditions for this species. Species and/or nests were not observed during the field surveys.
Bobolink	*Dolichonyx oryzivorus*	Threatened	**No** - remnant meadow communities are too small to sustain this species. Species not documented in 2019.
Chimney Swift	*Chaetura pelagica*	Threatened	**No** - Adjacent developed areas do not contain suitable features.
Eastern Meadowlark	*Sturnella manga*	Threatened	**Marginal** - remnant meadow communities are too small to sustain this species. Species documented on June 11, 2019.
Eastern Whip-poor-will	*Caprimulgus vociferus*	Threatened	**No** - Naturalized habitat within the study area is generally characterized as mature woodland and therefore not suitable for the species. Furthermore, available background information does not identify this species within the study area.
Reptiles			
Blanding's Turtle	*Emydoidea blandingii*	Threatened	**No** – Although wetland communities are present within the study area, this species is not documented within the area (ORAA).
Vegetation			
Butternut	*Juglans cinerea*	Endangered	**No** - Species not documented within the property.

[1] Provincial Status – Species at Risk in Ontario list maintained by the Ministry of the Environment, Conservation, and Parks, O. Reg. 230/08. *Endangered Species Act,* 2007

Of the species identified in the table above, the following are relevant to the study area and proposed development:

- Mammals: Little Brown Myotis, Northern Myotis, and Tri-colored Bat
- Birds: Eastern Meadowlark

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

Important habitat functions for Little Brown Myotis, Northern Myotis, and Tri-colored Bat could include hibernacula, maternity roost, day roosts, and foraging habitat. Of these habitat types, no features with potential to function as hibernacula exists within the study area. Potential foraging habitat would be associated with areas of the study area providing water or an abundance of flying insects. Foraging habitat is widely available within the matrix of open field and wooded areas common throughout the County of Dufferin. Unless the foraging habitat was in proximity to a maternity roost, the loss of potential foraging habitat is unlikely to result in a contravention of the ESA.

Day roosts are those that are used by males and non-reproductive females as they move across the landscape and can take the form of any tree with appropriate snag features such as loose bark, cracks or crevices. There is no indication that there is any fidelity to specific day roost sites. The loss of potential day roost habitat is unlikely to result in a contravention of the ESA. Thus, maternity roost habitat is the only habitat function considered in detail on the property.

Females establish summer maternity colonies, often in buildings or large diameter trees in early stages of decay with cracks, crevices, or cavities. For the purpose of this assessment, given the presence of suitable species and of suitable age class, assumptions are made that the FODM5-1 community provides forest roosting for Endangered bat species Little Brown Myotis, Northern Myotis, and Tri-colored Bat. Surveys to confirm this function are not required as no development is being proposed within the identified potential habitat.

Although all three species are known to utilize wooded areas for roosting, Little Brown Myotis in Ontario has generally been restricted to anthropogenic structures. A visual inspection of the structures was completed by Birks NHC ecologists during the 2019 field program. The structures were generally well maintained and only limited areas where bat individuals could enter/exit were identified. However, given the estimated age of the structures (*i.e.,* ± 50 years), it is recommended that additional consideration for potential habitat for Little Brown Myotis be completed prior to demolition of the structure. A combination of visual inspection of the interior (*i.e.,* attic) of the structures as well as exit surveys following the *Technical Note for SAR Bats* (MNRF, 2015) should be completed to confirm that a maternity roost is not present.

5.8.2 Eastern Meadowlark

Eastern Meadowlark is considered as an obligate-grassland species (McCraken *et al.*, 2013). According to the Assessment and Status Report (COSEWIC, 2011), the suitability of grassland habitat for Eastern Meadowlark involves a combination of landscape and patch characteristics. Large tracts of grassland are preferred over smaller fragments, and breeding densities are positively associated with grassland area. The minimum area required is estimated at 5 hectares.

One Eastern Meadowlark was documented during the dawn breeding bird surveys on June 11, 2019. This male individual was observed singing and is expected that the individual was a transient male. Breeding was not confirmed, and the individual was not observed during the second dawn breeding bird survey, or subsequent field surveys.

Although communities of suitable habitat attributes (*i.e.,* cultural meadow) are present within the study area, these areas are small in nature (0.5 hectares) and not expected to provide the suitable breeding habitat conditions required by this species. Therefore, there is no expectation that suitable breeding habitat is present within the study area and no further consideration is warranted.

5.9 Natural Heritage Features and Functions Summary

The results of the field surveys, review of background information and analysis indicate the potential for the following candidate significant natural heritage features and functions to be located within the study area. Our impact assessment will consider potential impacts only to features and functions summarized in Table .

Table 4: Summary of Natural Heritage Features

Natural Heritage Feature	Within Properties	Within 120 metres of Property	Actions Required
Provincially Significant Wetland	None	None	No actions required.
Un-evaluated Wetland	• SWCM1-2 • SWTM3-6 • SWDM4-5 • SWTM2-1 • MAMM1-3 • MAMM1-12	Wetland portions within the study area are contiguous beyond the properties limit.	Evaluation for potential impacts required.
Significant Woodland	The western portion of the Prince of Wales property contains woodlands that are part	Significant Woodland feature extends off property to the west and north.	Evaluation for potential impacts required.

Table 4: Summary of Natural Heritage Features

Natural Heritage Feature	Within Properties	Within 120 metres of Property	Actions Required
	of a Significant Woodland feature.		
Significant Valleylands	None	None	No actions required.
Significant Wildlife Habitat	Confirmed: • Deer Wintering Area (Stratum II) • Seeps and Springs Potential: • Deer Movement Corridor • Bat Maternity Colonies	Confirmed: • Deer Wintering Area (Stratum II) Potential: • Deer Movement Corridor • Bat Maternity Colonies • Seeps and Springs	Evaluation for potential impacts required.
Provincial Areas of Natural and Scientific Interest	None	Boyne Valley Life Science ANSI	Evaluation for potential impacts required.
Fish Habitat	Primrose Creek and Tributary		Evaluation for potential impacts required.
Habitat of Threatened or Endangered Species	Potential: Little Brown Myotis, Northern Myotis, and Tri-colored Bat		Evaluation for potential impacts required.

6 IMPACT ASSESSMENT

The intent of this study is to identify natural heritage features and functions associated with the property and determine if potential impacts could arise from the proposed development. Impacts are evaluated on the current knowledge of the property based on data collected in 2019 by Birks NHC ecologists.

6.1 DEVELOPMENT PLAN

A Draft Plan of Subdivision is proposed to divide the land into multiple lots for the purpose of industrial development (Figure 4). The development area consists of three blocks (Block 1 proposed to be 4.74 hectares, Block 2 to be 10.71 hectares, and Block 3 to be 9.65 hectares), a stormwater management

(SWM) pond (1.98 hectares), and an access road (Street 'A') approximately 520 m long (Figure 4). One of the blocks would be accessible from Highway 89 while the other two blocks would be accessed by the proposed road Street 'A' from Prince of Wales Road. An Environmental Protection Block (Block 4, 8.40 hectares) is proposed to contain the identified natural heritage features and functions and associated setbacks.

The Draft Plan of Subdivision proposes to convey stormwater runoff towards a SWM facility located at the north-western portion of the property. Water is to be conveyed through an open channel from Blocks 1 and 2 westerly and then north to the SWM facility. A second open channel is proposed along the northern boundary of the site to convey water from Block 3 to the SWM facility. Stormwater runoff from Street 'A' is proposed to be conveyed to the SWM facility by curb and gutter and below grade storm pipe network (The Jones Consulting Group Ltd., 2020). The SWM facility is to be a detention wet pond that will discharge through an outfall channel to Primrose Creek (Figure 4).

6.2 Direct Impacts

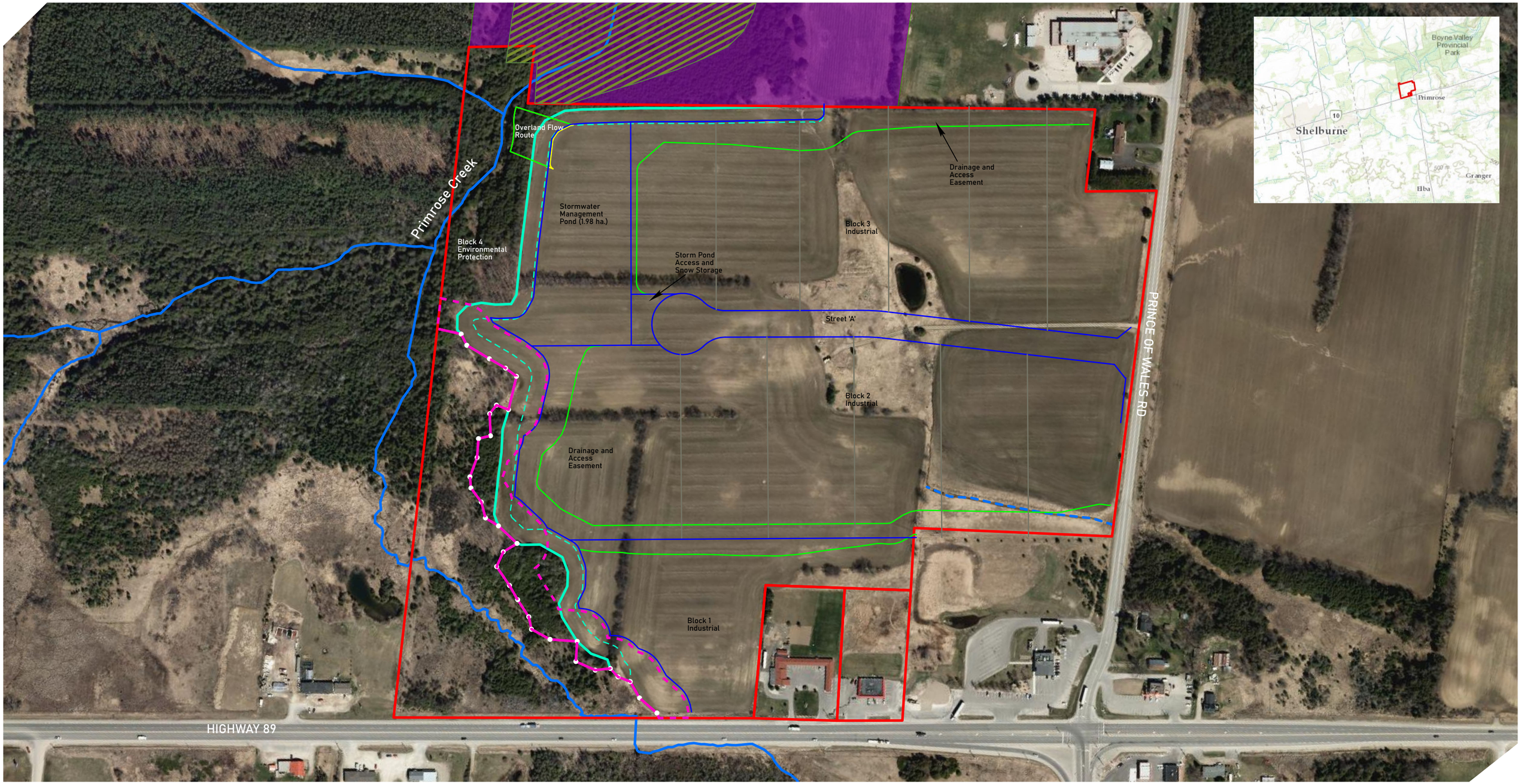
Direct impacts are those that are immediately evident as a result of a development. Typically, the adverse effects of direct impacts are most evident during the site preparation and construction phase of a development. Potential impacts of the proposed development include the following:

- Tree and Vegetation Removals
- Erosion and Sedimentation into Natural Heritage Features
- Removal of Structures Containing Potential Habitat for Species at Risk
- Changes to the Hydrology/Water Quality Entering Sensitive Features

In the following sections we assess the potential for negative ecological impact to the identified natural heritage features and functions.

6.2.1 Tree and Vegetation Removal

The site plan indicates that the proposed development lands would predominantly result in the loss of agricultural lands. Aside from the woodlands and wetlands mentioned below, two small cultural meadow communities (CUM) would be removed for the proposed development. This would result in a total of 1.2 hectares of cultural meadow being removed. These communities are not considered significant and provide very minimal ecological function. The loss of these cultural meadow communities would be considered insignificant in the landscape.



Primrose Settlement EIS

Township of Mulmur

Figure 4:
Proposed Site Plan

- Property Boundary
- Primrose Creek (LIO)
- Drainage Feature
- Wetland Limit (Birks NHC; June 24, 2019)
- Wetland Delineation GPS Points
- 30m Wetland Setback
- Woodland Limit
- 15m Woodland Setback
- ANSI - Life Sciences - Boyne Valley
- Boyne River Provincial Park

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PROJECT: 04-003-2019 STATUS: DRAFT DATE: 12/02/2021

Woodland

Development and site alteration is not permitted within Significant Woodlands and adjacent lands unless the ecological function of the feature has been evaluated and it has been demonstrated that there will be no negative impact to the natural feature or its ecological function.

For the purposes of this assessment, the woodlands located within the western area of the larger Prince of Wales property are considered to be Significant Woodland. The Draft Plan of Subdivision indicates that the proposed development lands would be outside of those woodlands, with the exception a small area between the SWM detention pond and Primrose Creek where vegetation removal would be required for the SWM pond outlet. The total area of White Cedar forest (FOCM4-1) lost in that area is measured at approximately 0.11 hectares, or 0.03%, of the total woodland feature measured at 438 hectares. The woodland post-development will continue to be of sufficient size to maintain the current ecological functions, including providing wildlife habitat and benefitting wetland and fish habitats. Additionally, setbacks have been applied to the natural features (wetlands, woodlands) at the western area of the property. Therefore, the Draft Plan of Subdivision would not adversely impact the function of the woodland features. A naturalized VPZ to the woodlands is recommended (see Section 7.2) to further mitigate indirect impact to the woodland feature.

Wetland

The Draft Plan of Subdivision indicates that the proposed development lands would be outside of the wetlands within the western area. The wetlands at the western boundary will therefore continue to maintain the current ecological functions, including providing wildlife habitat and benefitting fish habitat. Additionally, setbacks have been applied to the natural features (wetlands, woodlands) at the western area of the property, with a minimum of a 30 m setback to the western wetlands (Figure 4).

The Draft Plan of Subdivision proposes to remove the Reed-canary Grass meadow marsh community (MAMM1-3, 0.6 hectares) that encompasses the pond and the Common Reed community (MAMM1-12, 0.29 hectares) within the 506249 Highway 89 property. These communities are unmapped by the MNRF and Township of Mulmur (2012), dominated by non-native and invasive species, and provide minimal function in terms of wildlife habitat.

Mitigation measures are provided in Section 7.

6.2.2 Erosion and Sedimentation into Natural Heritage Features

Natural heritage features of particular concern for sedimentation typically include wetland and fish habitat. No site alteration (grading, storage of materials, *etc.*) within wetlands along the western boundary or fish habitat is proposed as part of the proposed development. Setbacks are proposed as part of the development, including a setback from the natural features (woodlands, wetlands) which encompass Primrose Creek and the tributary, resulting in an average setback of 45 m to the wetland and an average setback of 110 m to fish habitat. Any potential direct impacts to retained wetland and fish

habitat which could result from sedimentation can be mitigated through the application of erosion and sediment control plans along the boundary of the setback and/or edges of the proposed soil disturbances.

Future construction activities, especially operations involving the handling of earthen material, increases the availability of sediment for erosion and transport by surface drainage. In order to mitigate the adverse environmental impacts caused by the release of sediment-laden runoff into any potential receiving wetland communities and watercourses, measures for erosion and sediment control are required for construction sites.

Measures to mitigate local and downstream impacts from erosion and sedimentation are provided in Section 7.4.

6.2.3 Removal of Structures Containing Potential Habitat for Species at Risk

Little Brown Myotis

As discussed, the existing structures within the Highway 89 properties may provide habitat for Little Brown Myotis (Endangered). It remains unknown at this time whether this species is utilizing the existing structures as an anthropogenic roost. The general condition of the structures would suggest that individuals do not have access to the internal structure of the buildings (*i.e.,* attics). Additional consideration to confirm that no roost is present is required and should occur prior to any alterations to the structures. Should a roost be identified, consultation with the Ministry of the Environment, Conservation, and Parks (MECP) would be required to determine potential permitting requirements.

Barn Swallow

Barn Swallow (designated as Threatened) is a medium sized songbird that builds their nests almost exclusively on human-made structures such as barns, under bridges and in culverts. While no Barn Swallows were observed on the properties, and no nests were seen during site visits in 2019, there is the possibility that Barn Swallows may use the existing buildings within the Highway 89 properties for nesting in the future. A qualified ecologist should inspect the buildings prior to any alteration to the structures to confirm that no Barn Swallows are present.

6.2.4 Changes to the Hydrology/Water Quality Entering Sensitive Features

Wetland hydrology refers to the timing and extent of flooding or soil saturation. Currently, the un-developed portions of the property are permeable and therefore there is an expectation that these areas contribute to the hydrology conditions of the wetlands through groundwater input. In development cases where there is a significant change in land use resulting in increased impervious surfaces, there is potential for impacting the hydrology of adjacent wetland habitats.

A water balance assessment was conducted to estimate the water budgets (water inputs and water outputs) in the existing conditions and post-development (WSP, 2020). Based on the water balance assessment, groundwater storage of soils at the site will not change as a result of the proposed development (WSP, 2020). Changes in land use (industrial development; paved surfaces, buildings) would result in a "precipitation surplus" (*i.e.,* increase in surface runoff and decrease in infiltration). Without mitigation or Low Impact Development (LID) measures, the proposed development would result in a 27% decrease in infiltration and a 18% increase in post-development runoff (WSP, 2020).

Best management practices and LID measures are recommended to increase post-development infiltration rates and maintain as closely as possible pre-development groundwater conditions. These could include, for example, permeable pavers or redirecting roof runoff to pervious areas. At this stage of site planning (*i.e.,* Draft Plan of Subdivision), details associated with LIDs have not been completed however site-specific LIDs that promote groundwater infiltration and recharge will be investigated and specified in the Detail Design.

The SWM plan includes the use of a detention wet pond, an internal roadway with storm sewer infrastructure and overland drainage channels for conveyance of stormwater runoff. Flow leaving the SWM facility is to be conveyed through a flow spreader and outfall channel (Figure 4). A detention wet pond was determined to be the best SWM design to provide the required quantity and quality control for the site (The Jones Consulting Group Ltd., 2020). The "enhanced" level of protection has been applied (i.e., 80% removal of Total Suspended Solids from 90% of annual runoff volume (The Jones Consulting Group Ltd., 2020). Furthermore, the pond has been sized to ensure that the post-development peak flow from a storm event is released over a 48-hour period (The Jones Consulting Group Ltd., 2020). Future site-specific LIDs are proposed to meet NVCA's water balance and phosphorus criteria (The Jones Consulting Group Ltd., 2020).

Given that the properties are situated within a headwaters area and connected to coldwater fish habitat, mitigation measures relating to SWM and the pond design are being considered to ensure maximum cooling prior to releasing stormwater runoff to Primrose Creek. Provided that the SWM pond outflow can be cooled sufficiently and that the existing groundwater and subsurface flow water conditions are maintained; it is expected that the development will not significantly alter the thermal regime and hydrologic contributions to adjacent fish habitat.

Mitigation measures are provided in Section 7 which address potential impacts associated with stormwater run-off and thermal cooling.

6.3 Indirect Impacts

Indirect impacts are those that do not always manifest in the core development area but in the lands adjacent to the development. Indirect impacts can begin in the construction phase; however, they can continue post-construction.

The potential indirect impacts of the proposed development include:

- Anthropogenic Disturbance to Wildlife
- Loss of and Disturbance to Wildlife Habitat
- Increased potential for invasion of non-native species
- Release of Contaminants

6.3.1 Anthropogenic Disturbance to Wildlife

Wildlife tolerance to human presence varies; while some species are highly tolerant and are common in developed areas (*i.e.*, Grey Squirrel, Raccoon), other species are more sensitive to human presence and disturbance. An industrial development will bring increased human presence and associated anthropogenic disturbances. These impacts would be more prominent when a new development is proposed in un-developed areas.

The properties are within a defined settlement approximately 7 km east of the Town of Shelburne. The Primrose Elementary School is present directly north of the property limits, and various restaurants and gas stations are present along Highway 89 which borders the properties to the south. Therefore, a significant portion of the study area has experienced anthropogenic disturbance through agricultural and commercial activities. It is expected that wildlife currently using the habitats within the study area are relatively tolerant to nearby human activity. The proposed development, while it will result in an increase of human presence and vehicular traffic, is not expected to result in a noticeable intensification of human impacts and therefore ecological impacts are not anticipated to occur. Nonetheless, a significant amount of contiguous wildlife habitat will remain post-development in which wildlife can continue to inhabit away from the proposed development.

6.3.2 Loss and Disturbance to Wildlife Habitat

The woodlands along the western and northern borders of the property are assumed to function as bat maternal roosting habitat and are confirmed deer yarding habitat. As discussed in Section 6.2.1, the Draft Plan of Subdivision indicates that the proposed development lands would be outside of the woodlands, with the exception a small area where vegetation removal would be required for the SWM pond outlet. White Cedar forest (FOCM4-1) mapped as part of the deer yarding area would be lost in the area of the SWM outlet. The area to be removed is measured at approximately 0.11 hectares, or 0.03%, of the total woodland feature. Given the relatively small amount of woodland to be removed, and because of the strong tradition deer show to using a given wintering habitat, it is expected that deer will continue to utilize the habitat after development has occurred. Candidate bat roosting habitat was not determined to be within White Cedar forest and therefore no potential bat roosting habitat would be removed.

Within adjacent lands, the proposed development may affect the movement of deer into and out of the wintering habitat. Movement impacts would occur when the forest cover of the corridor is removed,

fragmenting or bisecting the movement corridor cover. In this case, however, the proposed development is planned to occur within existing open agricultural and meadow lands and therefore would not involve any removal of tree cover that could act as part of a deer movement corridor.

Primrose Creek and its tributary were determined to be fish habitat. Direct impacts to fish habitat are not expected to occur as a result of the proposed development given the distance from the proposed development area to the creeks. Consideration for potential impacts to fish habitat related to woodland cover and hydrology are discussed in relevant sections. The off-line pond on the property appears to have no surface water outlet and thus is not connected to confirmed fish habitat. Regardless, a residual fish community may be present within the pond and appropriate measures should be taken during decommissioning of the feature to ensure that decommissioning of the pond occurs with no impact to fish.

Seepage areas are listed as SWH as they may provide wildlife habitat (particularly in the winter) and may also contribute to fish habitat. Development on adjacent lands has the potential to affect seeps and springs, particularly development that occurs in recharge areas that are the source of the water for the seep or spring. The proposed development areas are outside of the woodlands, within a Significant Groundwater Recharge Area (NVCA, 2021). The woodlands in the seepage habitat would remain post-development to allow wildlife to continue to travel to and from seepage areas. Best management practices and LID measures are recommended to increase post-development infiltration rates and maintain as closely as possible pre-development groundwater conditions. At this stage of site planning (*i.e.*, Draft Plan of Subdivision), details associated with LIDs have not been completed however site-specific measures that promote groundwater infiltration and recharge will be investigated and specified in the Detail Design.

Therefore, the proposed development is not expected to result in a negative ecological impact to deer winter yarding habitat, deer movement corridors, fish habitat, or bat maternity colonies habitat. Note that setbacks are proposed as part of the proposed development which would serve as a buffer to wildlife and wildlife habitat.

6.3.3 Increased Potential for Invasion of Non-native Species

Site disturbance may increase the likelihood that non-native and/or invasive vegetation species will become established within the retained vegetation communities. A number of non-native and/or invasive species were identified within the properties, particularly Common Reed (also known as European Reed).

Mitigation measures are provided in Section 7 below to control the potential introduction of invasive species.

6.3.4 Release of Contaminants

Development may result in the increase of contaminants (*i.e.*, sediments, salt, gasoline, oil) in surface runoff, which may affect nearby wetland features and fish habitat. In order to mitigate the impacts of development, SWM controls and water quality approaches are required. The SWM design for the property will incorporate the policies and criteria of a number of agencies.

On-site SWM is proposed to ensure that contaminated run-off is treated to MECP and NVCA water quality standards prior to entering Primrose Creek. The "enhanced" level of protection has been applied (*i.e.,* 80% removal of Total Suspended Solids from 90% of annual runoff volume (The Jones Consulting Group Ltd., 2020). Furthermore, the pond has been sized to ensure that the post-development peak flow from a storm event is released over a 48-hour period (The Jones Consulting Group Ltd., 2020). Future site-specific LIDs are proposed to meet NVCA's water balance and phosphorus criteria (The Jones Consulting Group Ltd., 2020).

Further mitigation measures are provided in Section 7.

7 RECOMMENDATIONS AND MITIGATION MEASURES

Mitigation refers to the avoidance or reduction of impacts associated with the proposed works through best construction practices. As previously discussed, potential impacts were identified which could result to the natural heritage features and functions associated with the study area. Where applied correctly, mitigation is intended to reduce the potential for impacts to ensure that the natural heritage features and functions will continue uninhibited by the proposed development. Thus, mitigation would be required to ensure that there is no negative impact and the development can proceed in conformity with the relevant planning documents and in compliance with environmental law.

The following recommended mitigation measures are recommended to minimize the above listed potential impacts.

7.1 Species at Risk

Given the dynamic character of the natural environment, as well as changes to policy (*i.e.,* new species listing), consideration is recommended in the interpretation of potential presence of Threatened or Endangered species as protected under the ESA.

This report was produced based on the most up-to-date policy information however, it is not intended to act as a long-term assessment of potential Species at Risk. The ESA is recognized as being a 'proponent-driven' piece of legislation and therefore it is the responsibility of the landowner/developer to ensure compliance with the regulations made under this act. Should a considerable length of time and/or sudden change in policy occur prior to construction, it is recommended that a review of the

assessment provided within this report be undertaken by a qualified Ecologist to ensure compliance with the ESA at that time.

All current Threatened or Endangered species listed under O. Reg. 230/08 made under the ESA with a currency date of August 1, 2018 (the most recent as of March 2, 2021) have been considered within this report.

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

Select tree cutting, if required, should be timed to occur during the calendar months of November 1 to March 31 and no cutting activity in forested areas should occur outside that period. This will ensure that no bats actively roosting in trees will be killed or harmed as a result of tree removal activities.

As discussed, the existing structures on the Highway 89 properties may provide habitat for Little Brown Myotis. Prior to any alterations and/or demolition of the existing structures, a visual inspection of the structures should be undertaken to determine whether bats may be using the structures for maternity roosting habitat. Should the visual inspection indicate potential use, a formal bat exit survey may be required. The exit survey, should it be required, would be conducted between June 1 and July 31. The month of June is considered optimal timing according to MNRF's *Technical Note SAR Bats* (2015).

7.1.2 Barn Swallow

While no Barn Swallows were observed on the properties, and no nests were seen during site visits in 2019, there is the possibility that Barn Swallows may use the existing buildings within the Highway 89 properties for nesting in the future. A qualified ecologist should inspect the buildings prior to any alteration/demolition to the structures to confirm that no Barn Swallows are using the structures for nesting.

7.2 Vegetation Protection Zone

A VPZ should be implemented to the wetland and Significant Woodland limits to the west and north of the property to protect the Significant Woodlands, wetlands, and fish habitat from potential impacts of the proposed development. A VPZ is proposed as part of the proposed development (Figure 4), including an average wetland setback of 45.25 m (minimum 30 m, maximum 85 m) and a 15 m setback to the woodlands. The resulting average setback to fish habitat being 110 m. The VPZ is to be naturalized through plantings. A variety of approved native tree and shrub species are to be planted in the VPZ that are representative of the adjacent natural community.

Tree protection measures should be implemented prior to commencement of construction activity to ensure trees designated for retention are not impacted by the development. Retainable trees should be protected through the installation of fencing or a comparable barrier along the drip line of the retainable trees. It is recommended that sediment and erosion controls along the limits of the VPZ be installed prior to all construction activities. Sediment and erosion controls must be maintained

throughout construction and until vegetation is re-established post-construction. Development or site alteration is not permitted in the VPZ.

7.3 Isolation of Work Area

In advance of any vegetation clearing or earth works (*i.e.*, clearing or grubbing) the development limits approved in the Draft Plan of Subdivision should be established in proximity to natural heritage features and functions to be protected. A temporary fence (*i.e.*, sediment fence) should be erected along the surveyed limits to prevent inadvertent encroachment into these areas to be protected. This fence should be kept intact throughout the entire construction and monitored to ensure that the barrier remains in good working condition. No development activities (*i.e.*, material and equipment storage, grading, equipment activity, *etc*.) are permitted outside of the identified development limit. The installation of a permanent fence should be considered to ensure that the VPZ setback remains protected.

7.4 Erosion and Sediment Control Plan

The use of various sediment and erosion control measures are to be implemented to protect the receiving watercourses and retained natural features from migrating sediments. In addition, similar control measures shall be applied along the length of the VPZ (Figure 4). These measures are to be in place until site works have been completed and the risk of sedimentation is no longer a concern. These measures include but may not be limited to:

- Revegetation and stabilization of all disturbed soils following construction and re-grading activities, using a selection of native species suitable to the location and habitat conditions;
- Installation of light duty sediment control fencing along the down gradient portion of the limit of proposed grading (limit of disturbance) prior to earthwork operations;
- Installation of heavy-duty sediment control fencing along the top of bank of all drainage swales / ditches prior to earthwork operations. Fencing shall be maintained during the entire construction period;
- Construction of an entrance mud mat to the site during construction;
- Installation of sediment control structures (silt sacks) in all storm structures during the construction period;
- Installation of tree protection barrier along limit of all tree clearing as staked prior to construction; and
- Installation of straw bale barriers at the proposed drainage outlet locations.

7.5 Stormwater Management

The following mitigation measures are recommended to further reduce potential impacts to wetlands and fish habitat, specifically relating to potential thermal impacts:

- Bottom draw outlets in SWM pond;
- Cooling trenches installed in SWM pond;
- Subsurface trench outlets;

- Shading of the pond's permanent pool, outfall channel, and paved surfaces in the catchment area; and,
- Improved SWM pond design (*e.g.*, selecting location and orientation to minimize sun exposure, increasing length-to-width ratio, and application of planted berms within pond).

7.6 Fish Habitat

As stated above, the off-line pond has potential to contain fish and thus pond decommissioning must proceed with consideration of fish. The pond should be dewatered to a level that will allow for removal of fish through netting or electrofishing. Any fish and amphibians encountered during decommissioning of the pond should be released to adjacent fish habitat or disposed of as directed by the MNRF and NVCA. A 'License to Collect Fish' permit from the MNRF will be required prior to works.

All water removed from the pond should be pumped to a filter bag (*i.e.*, envirobag or equivalent) prior to being release. Filter bags should be placed a minimum of 30 metres from the drainage features on stable, vegetated ground to allow fines to settle out of the water. Monitoring of dewatering operations should occur throughout the construction process to ensure water is free of fines before entering the drainage features.

7.7 Migratory Birds

Development activities involving the removal of vegetation should be restricted from occurring during the breeding bird season. Migratory birds, nests, and eggs are protected by the Migratory Birds Convention Act, 1994 and the Fish and Wildlife Conservation Act, 1997. Environment Canada outlines dates when activities in any region have potential to impact nests at the Environment Canada Website (https://www.canada.ca/en/environment-climate-change/services/avoiding-harm-migratory-birds.html).

For this location, vegetation removal should be avoided between April 1st and August 30th of any given year. If vegetation clearing is required between these dates, screening by an ecologist with knowledge of bird species present in the area should be undertaken to ensure that the vegetation has been confirmed to be free of nests prior to clearing.

7.8 General Mitigation Plan

General mitigation of potential impacts to identified natural heritage features and functions during construction include:

- Fencing should be used appropriately as directed so that wildlife movements are only blocked when desired (*i.e.,* as exclusion fencing during construction).
- Given the presence of White-tailed Deer and the adjacent deer yarding area, new plantings should be protected from deer browse and damage.

- Erosion and sediment control plan to be implemented to protect the retained habitats (wetland, woodland). Control measures to be in place until site works have been completed and the risk of sedimentation is no longer a concern.
- Tree cutting should be timed to occur during the calendar months of November 1 to March 31 and no cutting activity in forested areas should occur outside that period. This will ensure that no bats actively roosting in trees will be killed or harmed as a result of clearing activities and is outside of the breeding bird season.
- Where possible, maximize the distance of construction equipment used from the woodland and edge to avoid disturbing wildlife.
- Increase habitat wherever possible, native plantings within the VPZ are recommended to expand habitat available in the area.
- Refueling of all equipment should occur at least 30 m from retained natural features, including woodland and wetland habitat.
- Control potentially contaminated materials (*i.e.,* fill, soil, gravel, excavated materials) moved by equipment during construction to prevent the spread of invasive plants.
- Inspect and clean equipment and vehicles prior to allowing access to the property to prevent the spread of invasive plants into the site.
- Should an animal be injured or found injured during the construction phase, they should be transported to an appropriate wildlife rehabilitation centre.

7.9 Agency Approvals

Portions of the study area associated with wetland habitat and hazardous lands are regulated under O. Reg. 172/06. Therefore, a permit from the NVCA will be required prior to any site works within regulated areas.

8 CONCLUSIONS

This EIS was prepared for the proposed development of the properties identified 636040 Prince of Wales Road, 506243 Highway 89, and 506249 Highway 89, in the Settlement of Primrose, Township of Mulmur. It is our understanding that an EIS is required as part of a submission for Draft Plan of Subdivision due to the presence of natural heritage features as well as areas regulated under O. Reg. 172/06. Through the assessment, it was determined that the study area contains natural heritage features and functions relating to the presence of woodland, wetland, and fish habitat. The intent of the EIS was to identify a development envelope which protects the natural heritage features and does not result in any ecological impacts to those functions associated with the features.

The findings of the field survey program completed by Birks NHC are presented in the EIS report and potential impacts to identified natural heritage features are discussed.

The mitigation measures recommended in this report have been developed to avoid and mitigate any potential negative ecological impacts associated with the proposed development. Overall, potential ecological impacts are minimal and mitigable provided the listed mitigation measures are applied accordingly. At this time, it is the position of Birks NHC that this EIS supports the Draft Plan application and that developable areas are present within the properties to allow for future site development.

9 REFERENCES

Bird Studies Canada. 2006. Atlas of the Breeding Birds of Ontario, Second Version, 2001 – 2005. Data accessed online at: https://www.birdsontario.org/jsp/downloaddata.jsp

Cadman, M.D. and N. Kopysh. 2001. Ontario Breeding Bird Atlas, Guide for Participants. Bird Studies Canada, Environment Canada, Ontario Field Ornithologists, Ontario Ministry of Natural Resources, and Ontario Nature.

COSEWIC. 2011. COSEWIC Assessment and Status Report on the Eastern Meadowlark *Strunella magna* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa.

COSEWIC. 2013. COSEWIC Assessment and Update Status Report on the Little Brown Myotis, Northern Myotis, Tri-colored Bat. Committee on the Status of Endangered Wildlife in Canada. Ottawa.

Department of Fisheries and Oceans (DFO). 2019. Aquatic Species at Risk Map. Accessed online at: https://www.dfo-mpo.gc.ca/species-especes/sara-lep/map-carte/index-eng.html

Eakins, R.J. 2021. Ontario Freshwater Fishes Life History Database. Accessed online at: https://www.ontariofishes.ca/home.htm

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

Lee, H.T., W.D. Bakowsky, J. Riley, J. Bowles, M. Puddister, P. Uhlig and S. McMurray. 1998. Ecological Land Classification for Southern Ontario: First Approximation and Its Application.

McCracken, J.D., R.A. Reid, R.B. Renfrew, B. Frei, J.V. Jalava, A. Cowie, and A.R. Couturier. 2013. Recovery Strategy for the Bobolink (*Dolichonyx oryzivorus*) and Eastern Meadowlark (*Strunella magna*) in Ontario. Ontario Recovery Strategy Series. Prepared for the Ontario Ministry of Natural Resources, Peterborough, Ontario.

Ministry of Environment, Conservation and Parks (MECP). 2021. Species at Risk in Ontario List. Accessed online at: https://www.ontario.ca/laws/regulation/080230

Ministry of Municipal Affairs and Housing (MMAH). 2020. A Place to Grow: Growth Plan for the Greater Golden Horseshoe. Office Consolidation August 2020. Accessed online at: https://www.ontario.ca/document/place-grow-growth-plan-greater-golden-horseshoe

Ministry of Municipal Affairs and Housing (MMAH). 2020. Provincial Policy Statement. Accessed online at: https://www.ontario.ca/page/provincial-policy-statement-2020

Ministry of Natural Resources (MNR). 2014. Ontario Wetland Evaluation System. Southern Manual. 3rd Edition, Version 3.3. Queens Printer for Ontario.

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

Ministry of Natural Resources (MNR). 2010. Natural Heritage Reference Manual for Natural Heritage Policies of the Provincial Policy Statement, 2005. Second Edition. Toronto: Queens Printer for Ontario.

Ministry of Natural Resources and Forestry (MNRF). 2014. Significant Wildlife Habitat Mitigation Support Tool.

Ministry of Natural Resources and Forestry (MNRF). 2015. Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E. Regional Operations Division, Southern Region Resources Section. Peterborough, Ontario.

Ministry of Natural Resources and Forestry (MNRF). 2019. Boyne Valley Provincial Park Management Statement. Available at https://www.ontario.ca/page/boyne-valley-provincial-park-management-statement-amendment

Ministry of Natural Resources and Forestry. 2020. Land Information Ontario. Published July 14, 2014, updated October 28, 2020. Accessed online at: https://www.ontario.ca/page/land-information-ontario

Ministry of Natural Resources and Forestry (MNRF). 2020. Natural Heritage information Centre. Published July 17, 2004, updated October 21, 2020. Accessed online at: https://www.ontario.ca/page/natural-heritage-information-centre

Nottawasaga Valley Conservation Authority (NVCA). (2009). Fisheries Habitat Management Plan Nottawasaga Valley Conservation Authority Area of Jurisdiction. March 2009.

Nottawasaga Valley Conservation Authority (NVCA). 2013. Boyne River 2013 Subwatershed Health Check.

Nottawasaga Valley Conservation Authority (NVCA). 2021. Interactive Data Viewer. Accessed online at: https://www.nvca.on.ca/Pages/Maps.aspx

Ontario Nature. 2019. Ontario Reptile and Amphibian Atlas: a citizen science project to map the distribution of Ontario's reptiles and amphibians. Accessed online at: https://www.ontarioinsects.org/herp/

The Jones Consulting Group Ltd. 2020. Preliminary Stormwater Management & Functional Servicing Report. 636040 Prince of Whales Road, DELTINI Commercial Development Ltd.

Toronto and Region Conservation Authority and Credit Valley Conservation (TRCA and CVC). 2014. Evaluation, Classification and Management of Headwater Drainage Features Guidelines.

Township of Mulmur. 2012. Official Plan for the Township of Mulmur. Accessed online at: https://mulmur.ca/build/official-plan
TRCA Approval July 2013 (Finalized January 2014).

WSP. October 2020. DRAFT Water Balance Study. 636040 Prince of Whales Road West, Township of Mulmur, Ontario. DELTINI Commercial Developments Inc.

Table A: Vascular Plant List

		Ranking		
Scientific Name	Common Name	Provincial Rank	Global Rank	Provincial Endangered Species Act
Abies balsamea	Balsam Fir	S5	G5	NAR
Acer saccharum	Sugar Maple	S5	G5	NAR
Ajuga reptans	Creeping Bugleweed	SNA	GNR	NAR
Anemonastrum canadense	Canada Anemone	S5	G5	NAR
Arctium minus	Common Burdock	SNA	GNR	NAR
Asclepias syriaca	Common Milkweed	S5	G5	NAR
Betula papyrifera	Paper Birch	S5	G5	NAR
Brassica rapa	Field Mustard	SNA	GNR	NAR
Chenopodium album	White Goosefoot	SNA	G5	NAR
Cichorium intybus	Chicory	SNA	GNR	NAR
Circaea alpina	Small Enchanter's Nightshade	S5	G5	NAR
Cornus alternifolia	Alternate-leaved Dogwood	S5	G5	NAR
Cornus sericea	Red-osier Dogwood	S5	G5	NAR
Dactylis glomerata	Orchard Grass	SNA	GNR	NAR
Daucus carota	Wild Carrot	SNA	GNR	NAR
Echinochloa crus-galli	Large Barnyard Grass	SNA	GNR	NAR
Echium vulgare	Common Viper's Bugloss	SNA	GNR	NAR
Erigeron hyssopifolius	Daisy Fleabane	S5	G5	NAR
Erigeron philadelphicus	Philadelphia Fleabane	S5	G5	NAR
Erythronium americanum	Yellow Trout-lily	S5	G5	NAR
Euthamia graminifolia	Grass-leaved Goldenrod	S5	G5	NAR
Eutrochium maculatum var. maculatum	Spotted Joe Pye Weed	S5	G5T5	NAR
Fragaria vesca	Woodland Strawberry	S5	G5	NAR
Fragaria virginiana	Wild Strawberry	S5	G5	NAR
Fraxinus americana	White Ash	S4	G5	NAR
Fraxinus pennsylvanica	Green Ash	S4	G5	NAR
Galium aparine	Cleavers	S5	G5	NAR
Galium triflorum	Three-flowered Bedstraw	S5	G5	NAR
Geranium robertianum	Herb-Robert	S5	G5	NAR
Geum aleppicum	Yellow Avens	S5	G5	NAR
Impatiens capensis	Spotted Jewelweed	S5	G5	NAR
Larix laricina	Tamarack	S5	G5	NAR
Leucanthemum vulgare	Oxeye Daisy	SNA	GNR	NAR
Lotus corniculatus	Garden Bird's-foot Trefoil	SNA	GNR	NAR
Lythrum salicaria	Purple Loosestrife	SNA	G5	NAR
Malus pumila	Common Apple	SNA	G5	NAR
Myosotis scorpioides	True Forget-me-not	SNA	G5	NAR
Onoclea sensibilis	Sensitive Fern	S5	G5	NAR
Oxalis corniculata	Creeping Wood-sorrel	SNA	GNR	NAR
Parthenocissus quinquefolia	Virginia Creeper	S4?	G5	NAR
Phalaris arundinacea var. arundinacea	Reed Canary Grass	S5	G5TNR	NAR
Phragmites australis ssp. Australis	European Reed	SNA	G5T5	NAR
Picea glauca	White Spruce	S5	G5	NAR
Pilosella aurantiaca	Orange Hawkweed	SNA	GNR	NAR
Plantago major	Common Plantain	SNA	G5	NAR
Populus balsamifera	Balsam Poplar	S5	G5	NAR
Populus tremuloides	Trembling Aspen	S5	G5	NAR
Prunus pensylvanica	Pin Cherry	S5	G5	NAR
Prunus serotina var. serotina	Black Cherry	S5	G5T5	NAR
Pteridium aquilinum	Bracken Fern	S5	G5	NAR
Ranunculus acris	Tall Buttercup	SNA	G5	NAR
Rubus idaeus	Common Red Raspberry	S5	G5	NAR
Rubus occidentalis	Black Raspberry	S5	G5	NAR
Rubus pubescens	Dewberry	S5	G5	NAR

		Ranking		
Scientific Name	**Common Name**	**Provincial Rank**	**Global Rank**	**Provincial Endangered Species Act**
Rudbeckia hirta	Black-eyed Susan	S5	G5	NAR
Rumex crispus	Curly Dock	SNA	GNR	NAR
Salix bebbiana	Bebb's Willow	S5	G5	NAR
Salix discolor	Pussy Willow	S5	G5	NAR
Salix lucida	Shining Willow	S5	G5	NAR
Scirpus atrovirens	Dark-green Bulrush	S5	G5	NAR
Securigera varia	Common Crown-vetch	SNA	GNR	NAR
Solidago canadensis	Canada Goldenrod	S5	G5	NAR
Solidago patula	Round-leaved Goldenrod	S4	G5	NAR
Sonchus palustris	Marsh Sow-thistle	SNA	G5	NAR
Symphyotrichum lanceolatum ssp. lanceolatum	Panicled Aster	S5	G5T5	NAR
Symphyotrichum lateriflorum	Calico Aster	S5	G5	NAR
Symphyotrichum puniceum	Swamp Aster	S5	G5	NAR
Taraxacum officinale	Common Dandelion	S5	G5	NAR
Thuja occidentalis	Eastern White Cedar	S5	G5	NAR
Tragopogon dubius	Yellow Goat's-beard	SNA	GNR	NAR
Trifolium pratense	Red Clover	SNA	GNR	NAR
Tussilago farfara	Colt's-foot	SNA	G5	NAR
Typha angustifolia	Narrow-leaved Cattail	S5	G5	NAR
Ulmus americana	American Elm	SNA	GNR	NAR
Verbascum thapsus	Common Mullein	S5	G5	NAR
Vitis riparia	Riverbank Grape	S5	G5	NAR

Provincial Rank: S1 - Extremely Rare, S2 - Very Rare, S3 - Rare to Uncommon, S4 - Common, S5 - Very Common

Global Rank: G1 - Critically Imperiled, G2 - Imperiled, G3 - Vulnerable, G4 - Apparently Secure, G5 - Secure

Endangered Species Act: EXP (Extirpated), END (Endangered), THR (Threatened), SC (Special Concern), NAR (Not At Risk)

Table B: Bird Species Observed

			Point Count Stations [A, B]						Breeding Evidence [C]	Conservation Rank [D]		
Family	**Scientific Name**	**English Common Name**	**1**	**2**	**3**	**4**	**5**	**Incidental**		**G-rank [E]**	**S-rank [F]**	**SARO Status [G]**
Alaudidae	Eremophila alpestris	Horned Lark	H[B]	H[A]				H	Possible	G5	S5B	NAR
Anatidae	Bucephala albeola	Bufflehead						H	Observed	G5	S4	NAR
Anatidae	Anas platyrhynchos	Mallard					FO[A]		Observed	G5	S5	NAR
Bombycillidae	*Bombycilla cedrorum*	Cedar Waxwing				S(1)[B]			Possible	G5	S5B	NAR
Cardinalidae	*Passerina cyanea*	Indigo Bunting	T(2)	T(1)	S(1)[B]	S(1)[B]	S(1)[B]	H	Probable	G5	S4B	NAR
Cathartidae	*Cathartes aura*	Turkey Vulture						H	Observed	G5	S5B	NAR
Charadriidae	*Charadrius vociferus*	Killdeer		H[A]			H[B]		Possible	G5	S5B,S5N	NAR
Corvidae	*Corvus brachyrhynchos*	American Crow	FO/A[A,B]					H	Probable	G5	S5B	NAR
Corvidae	*Cyanocitta cristata*	Blue Jay					T		Probable	G5	S5	NAR
Emberizidae	*Melospiza melodia*	Song Sparrow	T(2)	T(1)	T(1)	S(2)[B]	T(1)	H	Probable	G5	S5B	NAR
Emberizidae	*Passerculus sandwichensis*	Savannah Sparrow	S(1)[B]	T(1)			S(2)[B]	H	Probable	G5	S4B	NAR
Fringillidae	Carpodacus mexicanus	House Finch				S(1)[A]			Possible	G5	SNA	NAR
Fringillidae	*Carduelis tristis*	American Goldfinch					H(2)[A]		Possible	G5	S5B	NAR
Icteridae	*Agelaius phoeniceus*	Red-winged Blackbird	T(2)	T(1)	H(1)B			H	Probable	G5	S4	NAR
Icteridae	*Sturnella magna*	Eastern Meadowlark	S(1)[A,H]						Possible	G5	S4B	THR
Paridae	*Poecile atricapillus*	Black-capped Chickadee			C(2)[B]	C(1)[B]	C(1)[A]	H	Possible	G5	S5	NAR
Parulidae	*Dendroica petechia*	Yellow Warbler		S(1)[B]					Possible	G5	S5B	NAR
Parulidae	*Geothlypis trichas*	Common Yellowthroat	T(1)	S(1)[B]	S(1)[B]	T(1)		H	Probable	G5	S5B	NAR
Parulidae	*Mniotilta varia*	Black-and-white Warbler				T(4)			Probable	G5	S5B	NAR
Parulidae	Dendroica virens	Black-throated Green Warbler			T(1)	T(1)			Probable	G5	S5B	NAR
Parulidae	*Setophaga ruticilla*	American Redstart	S(1)[B]		T(1)				Probable	G5	S5B	NAR
Phasianidae	*Meleagris gallopavo*	Wild Turkey	S(1)[A]				S(1)[B]		Possible	G5	S5	NAR
Scolopacidae	Actitis macularius	Spotted Sandpiper		T(1)					Probable	G5	S5	NAR
Sturnidae	Sturnus vulgaris	European Starling		H[A]					Possible	G5	SNA	NAR
Troglodytidae	*Troglodytes aedon*	House Wren	S(1)[A]		S(1)[B]				Possible	G5	S5B	NAR
Turdidae	*Turdus migratorius*	American Robin	S(1)[A]				H(1)[B]	H	Possible	G5	S5B	NAR
Tyrannidae	Empidonax traillii	Willow Flycatcher			S(1)[B]				Possible	G5	S5B	NAR
Vireonidae	*Vireo olivaceus*	Red-eyed Vireo				T(1)	T(1)		Probable	G5	S5B	NAR
Vireonidae	Vireo gilvus	Warbling Vireo			S(1)[A]				Possible	G5	S5B	NAR

Surveys Conditions:

[A]June 11, 201; Start Time 0610hr/ End Time 0745hr; Temperature +11°C; Wind B1; Cloud Cover 0%; Precipitation Nil; S. Brady

[B]June 24, 2019; Start Time 0610hr/ End Time 0810hr; Temperature +13°C; Wind B0; Cloud Cover 90%; Precipitation Nil; Observer S. Brady

[C]OBBA Breeding Evidence Codes:

H - Species observed in its breeding season in suitable nesting habitat
C - Call heard (male or female), in suitable nesting habitat in nesting season.
S - Singing male Present, or breeding calls heard, in suitable nesting habitat in nesting season.
N - Nest Building or excavation of nest hole
P - Pair observed in suitable nesting habitat in nesting season
VO - Vocalization
T - Permanent territory assumed based on calling male (S) on subsequent surveys
FO - Fly Over
CF - Adult carrying food for young
FY - Recently fledged or downy young (including incapable of sustaining flight)

[D]Conservation Rank - from OMNRF, NHIC, SAR and SARO Lists

[E]G-Rank - G1 - Critically Imperiled, G2 - Imperiled, G3 - Vulnerable, G4 - Apparently Secure, G5 - Secure

[F]S-rank - S1 - Extremely Rare, S2 - Very Rare, S3 - Rare to Uncommon, S4 - Common, S5 - Very Common

[G]SARO - EXP (Extirpated), END (Endangered), THR (Threatened), SC (Special Concern), NAR (Not At Risk)

Table C: Amphibian Call Survey Data

Latin Name	Comon Name	Station 1[2]			Station 2[2]			Station 3[2]			Incidental	G-rank	S-rank	ESA Status
		1[3]	2[4]	3[5]	1[3]	2[4]	3[5]	1[3]	2[4]	3[5]				
Bufo americanus	American Toad					1(3)					X	G5	S5	NAR
Hyla versicolor	Grey Treefrog		1(3)	1(5)		1(1)				3	X	G5	S5	NAR
Lithobates catesbeianus	American Bullfrog											G5	S4	NAR
Lithobates clamitans	Green Frog											G5	S5	NAR
Pseudacris crucifer	Spring Peeper	3	3		2(15)	3			3		X	G5	S5	NAR
Pseudacris triseriata pop. 1	Western Chorus Frog - Carolinian Population											G5TNR	S4	NAR
Rana pipiens	Leopard Frog											G5	S5	NAR
Rana sylvatica	Wood Frog	1(6)			1(3)							G5	S5	NAR

Call Codes: 1 = individuals can be counted/calls not simultaneous; 2 = calls distinguishable/some simultaneous calling; 3 = full chorus/calls continuous and overlapping, cannot count males.
(#) = number of vocalizing males.

[2]See Figure 2 for monitoring station locations.

[3]Amphibian Survey Conditions: April 24, 2019; survey time: 20:19 - 20:58; air temperature: 12C; wind: B0; cloud cover: 75%; precipitation: nil; surveyors: B.Baker & M. Fuller

[4]Amphibian Survey Conditions: May 30, 2019; survey time: 21:10-22:00; air temperature 18C; wind B1; cloud cover 5%; precipitation nil; surveyors: S. Brady & M. Fuller

[5]Amphibian Survey Conditions: June 26, 2019; survey time: 21:26-21:55; air temperature 23C; wind B0; cloud cover 5%; precipitation nil; surveyors: S. Brady & M. Fuller

APPENDIX A

NVCA Regulation Mapping and Consultation

Nottawasaga Valley Conservation Authority

Property Screening Report

12-Feb-2021

Information Resources for Regulated Properties

Do I need a permit?

Submit a Property Inquiry

Google Driving Directions

Info Regarding Covid-19

Email the Regulations Department
permits@nvca.on.ca

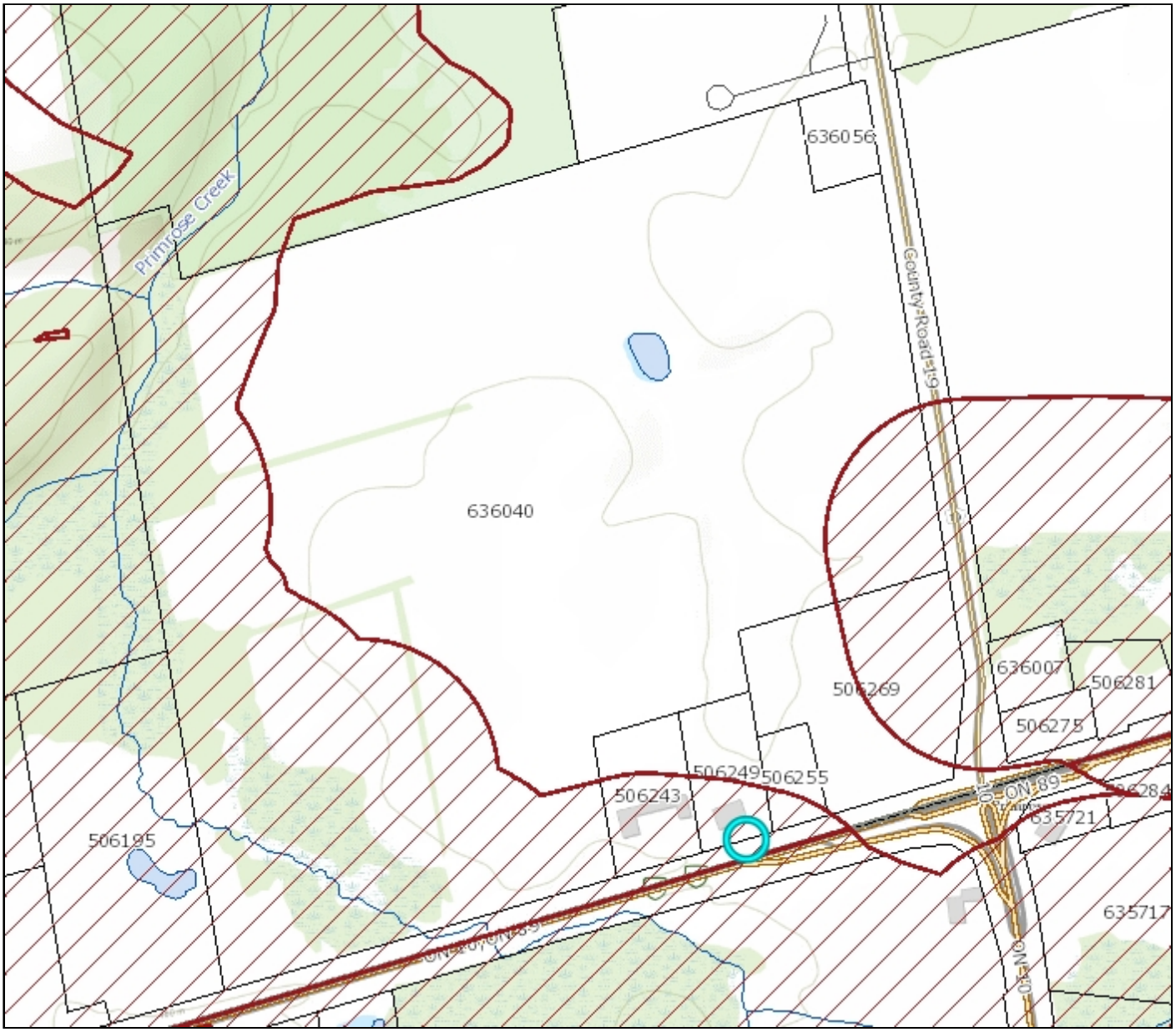
NVCA Contact Information

(705) 424-1479

8195 8th Line,
Utopia, ON L0M 1T0

www.nvca.on.ca

Monday to Friday
8:30 a.m. to 4:30 p.m.
except between 12:00 p.m. - 1:00 p.m.



Stephanie Brady

From: Amy Knapp <aknapp@nvca.on.ca>
Sent: April 5, 2019 9:36 AM
To: Stephanie Brady
Cc: 'Ray Duhamel'; 'marikaz@frendel.com'
Subject: RE: 636040 Prince of Wales Environmental Impact Study - Proposed Terms of Reference
Attachments: 636040 Prince of Whales_NVCA Wetland.pdf

Good Morning Stephanie,

NVCA technical staff have reviewed the Terms of Reference and have provided comments in RED within your original email.

In addition, I have attached our internal wetland layer for your reference. Please note this layer is not comprehensive, but should be considered more accurate than the provincial unevaluated layer.

Trusting this provides sufficient information to move forward. If you have any question, please feel free to contact me directly.

Sincerely,
Amy Knapp | **Planner II**

Nottawasaga Valley Conservation Authority
8195 8th Line, Utopia, ON L0M 1T0
T 705-424-1479 ext.233 | **F** 705-424-2115
aknapp@nvca.on.ca | **nvca.on.ca**

From: Stephanie Brady [mailto:sbrady@birksnhc.ca]
Sent: Tuesday, April 2, 2019 3:15 PM
To: Lee Bull <lbull@nvca.on.ca>
Cc: Ray Duhamel <RDuhamel@jonesconsulting.com>; Marika Zigon <marikaz@frendel.com>
Subject: 636040 Prince of Wales Environmental Impact Study - Proposed Terms of Reference

Lee Bull, Manager, Planning Services, Nottawasaga Valley Conservation Authority

Good afternoon Lee:

Birks Natural Heritage Consultants, Inc. (Birks NHC) has been retained by Deltini Commercial Developments Inc. and Jones Consulting Group Ltd. to undertake an Environmental Impact Study (EIS) for the property identified as **636040 Prince of Wales Road, in the Settlement of Primrose, Township of Mulmur** for the application for Plan of Subdivision for a proposed commercial/industrial development.

It is our understanding that an EIS is required due to the presence of lands regulated by the Nottawasaga Valley Conservation Authority. Further, based on background mapping, lands identified as 'Natural Heritage System' are present within the property and therefore policies of the Growth Plan for the Greater Golden Horseshoe (2017) would be applicable. Birks NHC Ecologists have reviewed available background information of the property and have established the following scope of work to complete the EIS:

1. **Site Assessment**

- Review available background information for the property and surrounding lands (i.e., within 120 metres) as well as available mapping from the Natural Heritage Information Centre (NHIC);
- Review policies related to the natural heritage components of the proposed development, including municipal and provincial policies;
- Map any key natural heritage feature within the property including characterization of vegetation communities utilizing the Ecological Land Classification system which will involve the characterization and delineation of any potential wetland or woodland habitat;
- Conduct an assessment on the watercourse (Primrose Creek Tributary and Primrose Creek proper (coldwater habitat)) present within the property, including characterizing potential fish habitat (i.e., direct and indirect) which will involve a total of one site visit in 2019;
- Headwater drainage feature assessment (TRCA 2014), with focus on drainage across central portion of subject lands;
- Conduct two dawn breeding bird surveys in June of 2019;
- Conduct two amphibian calling surveys during suitable weather conditions in May and June of 2019 (*please ensure that a survey is completed during the early-season window (e.g. W. Chorus Frog); and
- Complete one Spring/Summer vegetation surveys including conducting a search for Butternut (Endangered).
- Additional notes:
    - A site-specific water balance should be undertaken to adequately assess potential direct/indirect development impacts on local groundwater systems. The EIS should incorporate an ecological assessment of water balance results, specifically on groundwater-influenced wetland communities and local coldwater stream systems.
    - Agency dripline staking/wetland boundary delineation exercise may be warranted for this site.

2. **Report Preparation and Submission**

- Review the existing development plan upon which the EIS will be based. Impacts will be considered on the plans available at the onset of the EIS writing.
- Prepare one EIS report which will include the following:
    - The scope of development, including concept site plan and grading limits;
    - An outline of any key natural heritage features or functions on the property or adjacent lands within 120 meters, as defined by the Natural Heritage Reference Manual (2010);
    - Mapping outlining:
        - The approximate boundary of the property or study area
        - Ecological Land Classification communities with associated field data in table format
        - The locations of any identified key natural heritage features or functions on the property
        - Delineated limits of appropriate policy/regulatory constraints, e.g. veg. protection zones.
    - An outline of any potential impacts to those features or functions associated with the proposed development
    - Assessment of setbacks/vegetation protection zones required to appropriately maintain/enhance existing natural heritage functions;
    - Assessment of natural heritage policy conformity, with focus on Section 2.1 of the P.P.S. (2014) and Sections 4.2.2, 4.2.3, and 4.2.4 of the Growth Plan (2017);
    - Proposed mitigation to reduce the potential for any impacts to those features or functions
    - Conclusion, recommendations and mitigations
- A final electronic copy of the EIS report will be provided for submission

At this time, Birks NHC requests that the NVCA staff review the above proposed Terms of Reference and provide any feedback where deemed required.

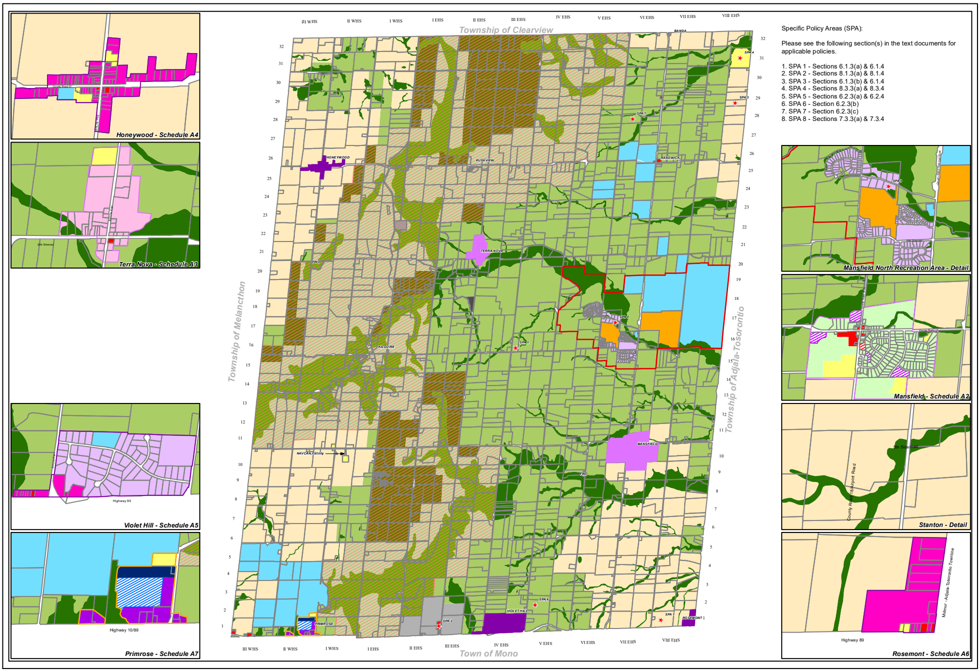
If you have any questions or concerns, please do not hesitate to contact me directly at anytime. Thank you for your assistance in this matter.

Regards,

Stephanie Brady,
H.B.E.S.
Birks Natural Heritage Consultants, Inc.
Ecologist
p. (705)305-9102
e. sbrady@birksnhc.ca
w. www.birksnhc.ca
a. 23 Herrell Avenue, Barrie ON L4N 6T5

APPENDIX B

Township of Mulmur Official Plan Schedules



Township of Mulmur

Official Plan

Schedule A1 -
Land Use Designations

mulmur

Legend

Symbol	Designation
★	Property Subject to Specific Policy
	Mansfield North Recreation Area
	Primrose Settlement Area (Community Boundary)
	Settlement Area (Hamlet Boundary)
	Settlement Area (Community Boundary)
EXI	Extractive Industrial
NE-PA	Niagara Escarpment - Protected Area
NE-RU	Niagara Escarpment - Rural
NE-NA	Niagara Escarpment - Natural Area
NE-EXI	Niagara Escarpment - Extractive Industrial
BPT	Business Park Transition
BPG	Business Park Gateway
BPC	Business Park Core
NA	Natural Area
FWD	Former Waste Disposal Area (FWD)
OSR	Open Space Recreation
OS	Open Space
RU	Rural
HM	Hamlet
ER	Estate Residential
C	Commercial
R	Recreation
A	Agricultural
I	Institutional
CH	Highway Commercial
CO	Community
WD	Waste Disposal Industrial
HR	Hamlet Residential
	Parcels
	Niagara Escarpment Plan Area

NOTES:

1. Schedule A - Official Plan Constraints information has not been approved by the Ontario Municipal Board (OMB) or the Ministry of Municipal Affairs and Housing (MMAH) and therefore could be subject to change.

SOURCES:

1. Lot and Concession Data has been provided by the Ministry of Natural Resources (MNR) © Her Majesty the Queen in Right of Ontario.
2. Parcel Fabric has been supplied under license by Teranet Inc.
3. Official Plan data has been provided by the Township of Mulmur.

DISCLAIMER:

R.J. Burnside and Associates and the above mentioned sources are not responsible for any errors, omissions or inaccuracies in the data depicted on this map. It is the responsibility of the user of this map to verify the accuracy of the data depicted.

N

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Meters

Scale: 1:40,000
Date: August, 2009
Last Revised: September, 2012

Projection: UTM Zone 17
Datum: NAD 83

Project: MSO09635.4

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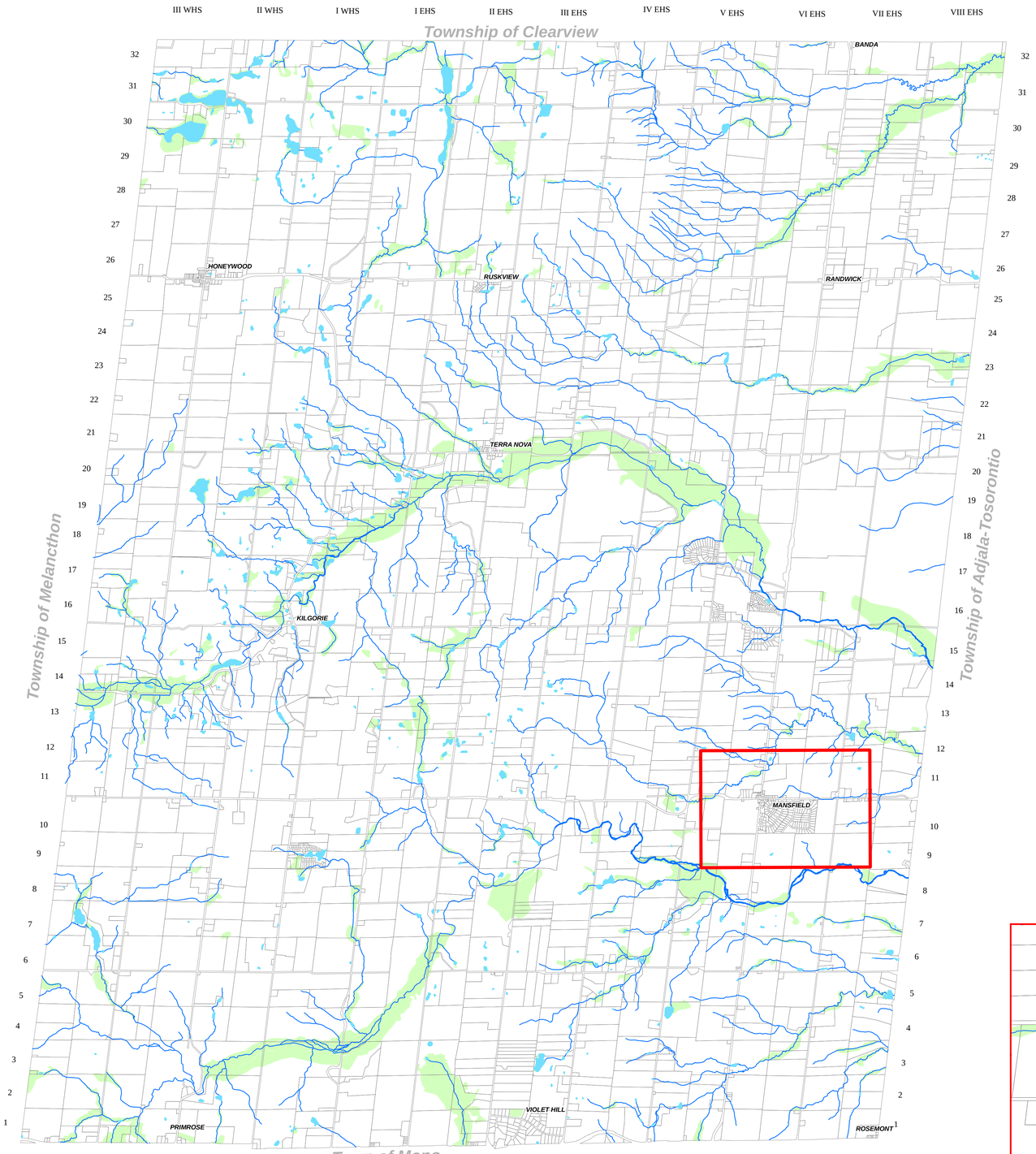

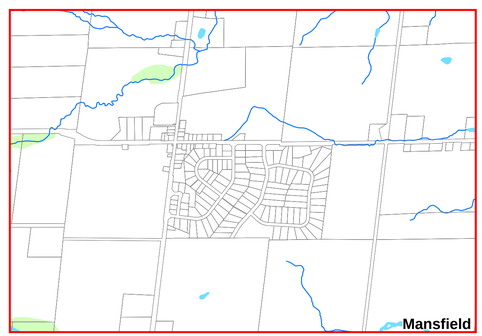

Township of Mulmur

Official Plan

Schedule B1 - Category One Natural Features

Legend

- Streams Without Associated Buffers
- Pond & Flooded Lands
- Wetlands Without Associated Buffers
- Parcels

NOTES:

1. Schedule B1 - Category One Natural Features information has not been approved by the Ontario Municipal Board (OMB) or the Ministry of Municipal Affairs and Housing (MMAH) and therefore could be subject to change.

SOURCES:

1. Lakes, Rivers, Provincial Wetlands, Core Deer Areas, ANSI Earth and Life Science, Lot and Concession data has been provided by the Ministry of Natural Resources (MNR) © Her Majesty the Queen in Right of Ontario
2. Parcel Fabric has been supplied under license by Teranet Inc.
3. Local Wetlands and forestry data has been supplied by the NVCA.

DISCLAIMER:

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Meters

Scale: 1:40,000
Date: August, 2009
Last Revised: October, 2011

Projection: UTM Zone 17
Datum: NAD 83

Project: MSO09635.4

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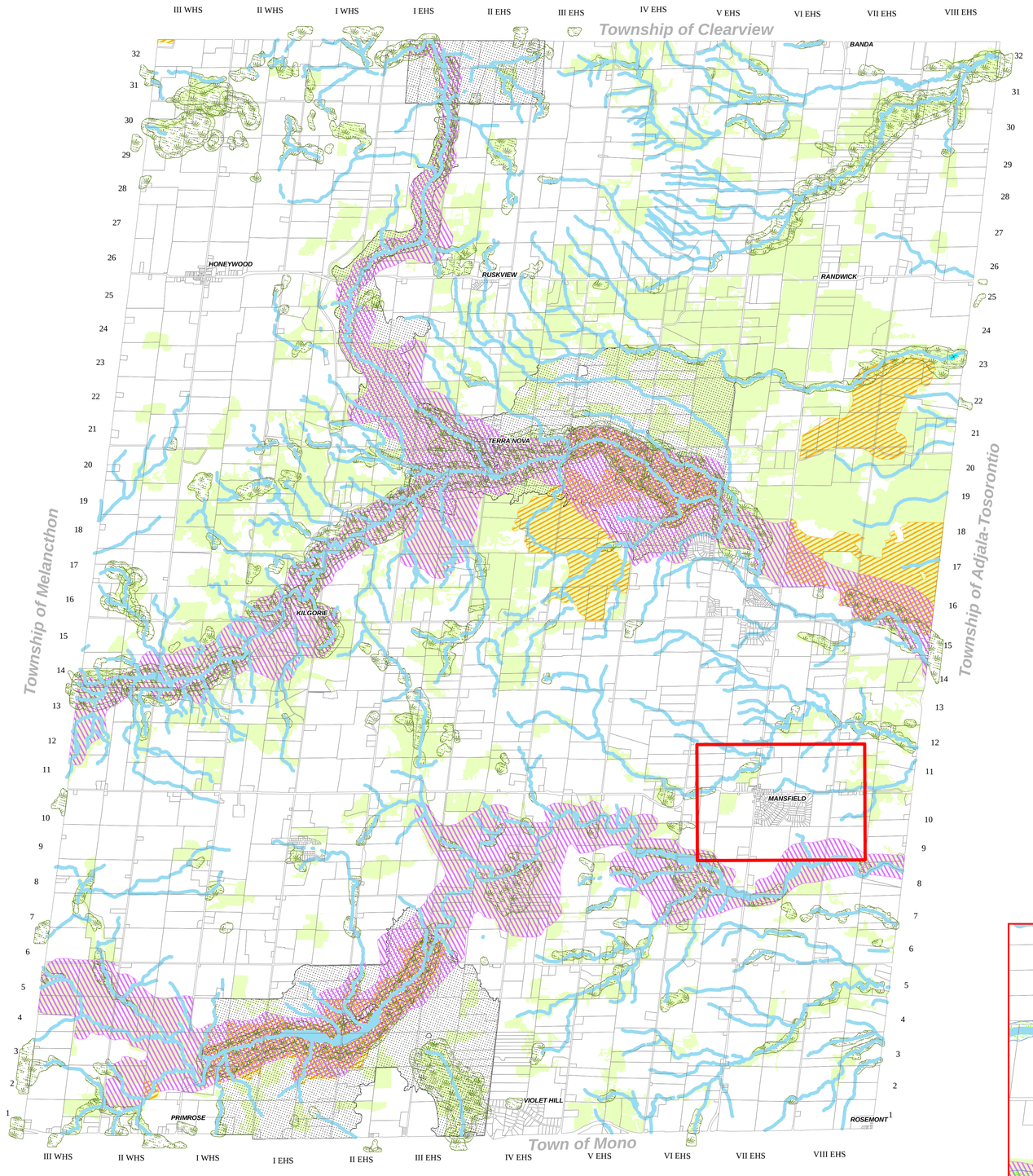

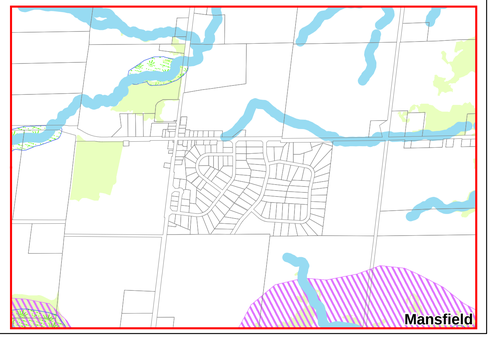

Township of Mulmur

Official Plan

Schedule B2 - Category Two Natural Features

Legend

- Parcels
- Streams (With Associated Buffers)
- Wetlands (With Associated Buffers)
- Core Deer Wintering Area
- ANSI Earth Sciences
- ANSI Life Sciences
- Wooded Area (Over 10ha.)

NOTES:

1. Schedule B2 - Category Two Natural Features information has not been approved by the Ontario Municipal Board (OMB) or the Ministry of Municipal Affairs and Housing (MMAH) and therefore could be subject to change.

2. Wooded areas smaller than 5 h.a. do not appear on this map. Please refer to MNR and NVCA mapping for all forested areas

SOURCES:

1. Lakes, Rivers, Provincial Wetlands, Core Deer Areas, ANSI Earth and Life Science, Lot and Concession data has been provided by the Ministry of Natural Resources (MNR) © Her Majesty the Queen in Right of Ontario
2. Parcel Fabric has been supplied under license by Teranet Inc.
3. Local Wetlands and forestry data has been supplied by the NVCA.

DISCLAIMER:

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Meters

Scale: 1:40,000
Date: August, 2009
Last Revised: October, 2011

Projection: UTM Zone 17
Datum: NAD 83

Project: MSO09635.4

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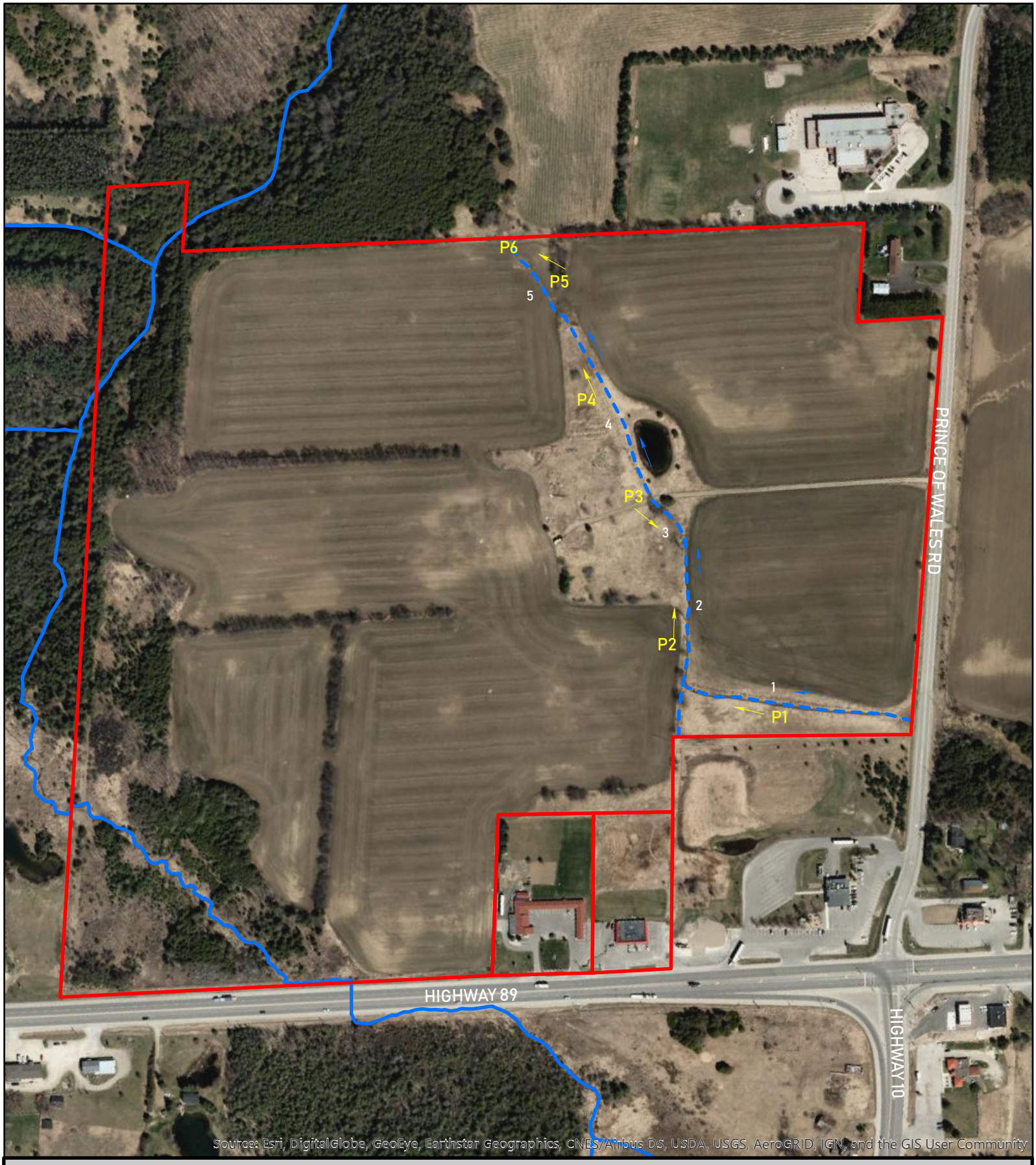
APPENDIX C

Headwater Drainage Feature Assessment



BIRKS
NATURAL HERITAGE CONSULTANTS

Flow Direction

Property Boundary

Headwater Drainage Feature

Primrose Creek (LIO)

Segment

P# Picture Location and Direction

Primrose Settlement EIS
Birks NHC 04-003-2019

Appendix C - Headwater Drainage Feature Assessment

Drainage Feature Segment	Step 1		Step 2	Step 3	Step 4	Management
	Hydrology	Modifers	Riparian	Fish Habitat	Terrestrial Habitat	Recommendation
1	Valued - Intermittent	Nutrient Input, realigned channel	Valued	No habitat	Contributing	Mitigation
2	Valued - Intermittent	Nutrient Input, realigned channel	Valued	No habitat	Contributing	Mitigation
3	Valued - Intermittent	Nutrient Input	Important	No habitat	Contributing	Conservation
4	Contributing - Ephemeral	Nutrient Input	Important	No habitat	Contributing	Conservation
5	Contributing - Ephemeral	Regular Tilling, nutrient input	Limited	No habitat	Limited	Mitigation
Terminus	Recharge - Dry	Feature enters rock pile, no apparent downstream connection, no outflow observed	Limited	No habitat	Limited	Maintain Recharge

Photograph 1. Typical Reach One during spring freshet (April 9, 2019)

Photograph 2. Typical Reach Two during spring freshet (April 9, 2019).

Photograph 3. Typical Reach 3 (April 9, 2019).

Photograph 4. Typical Reach 4 (April 9, 2019).

Photograph 5a. Reach 5 with property limit in background (April, 9, 2019).

Photograph 5b. Reach 5 with property limit in background (May 30, 2019).

Photograph 6. Terminus. Flow enters ground a tip of arrow (April 9, 2019).

APPENDIX D

Significant Woodland Mapping


5
Mulmur-Melancthon Townline
2 Line W
Prince of Wales Rd
10
1187 m
© 2018 Google

APPENDIX E

Significant Wildlife Habitat Assessment

Significant Wildlife Habitat Criteria Schedule for Ecoregion 6E

Seasonal Concentrations of Areas of Animals

Wildlife Habitat	Wildlife Species	Candidate SWH		Confirmed SWH	Assessment
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Waterfowl Stopover and Staging Areas (Terrestrial) **Rationale:** Habitat important to migrating waterfowl.	American Black Duck Wood Duck Green-winged Teal Blue-winged Teal Mallard Northern Pintail Northern Shoveler American Wigeon Gadwall	CUM1 CUT1 Plus evidence of annual spring flooding from melt water or run-off within these Ecosites.	Fields with sheet water during Spring (mid-March to May). • Fields flooding during spring melt and run-off provide important invertebrate foraging habitat for migrating waterfowl. • Agricultural fields with waste grains are commonly used by waterfowl, these are not considered SWH unless they have spring sheet water available. Information Sources • Anecdotal information from the landowner, adjacent landowners or local naturalist clubs may be good information in determining occurrence. • Reports and other information available from Conservation Authorities • Sites documented through waterfowl planning processes • Field Naturalist Clubs • Ducks Unlimited Canada • Natural Heritage Information Centre (NHIC) Waterfowl Concentration Area	Studies carried out and verified presence of an annual concentration of any listed species, evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects" • Any mixed species aggregations of 100 or more individuals required. • The flooded field ecosite habitat plus a 100-300m radius area, dependant on local site conditions and adjacent land use is the significant wildlife habitat. • Annual use of habitat is documented from information sources or field studies (annual use can be based on studies or determined by past surveys with species numbers and dates). • Significant Wildlife Habitat Mitigation Support Tool Index #7 provides development effects and mitigation measures.	ELC communities associated with this function are present within the study area. However, these are small in size and sheet water or flooding was not observed. Listed wildlife species were not documented during the course of the EIS field program.
Waterfowl Stopover and Staging Areas (Aquatic) **Rationale:** Important for local and migrant waterfowl populations during the spring or fall migration or both periods combined. Sites identified are usually only one of a few in the eco-district.	Canada Goose Cackling Goose Snow Goose American Black Duck Northern Pintail Northern Shoveler American Wigeon Gadwall Green-winged Teal Blue-winged Teal Hooded Merganser Common Merganser Lesser Scaup Greater Scaup Long-tailed Duck Surf Scoter White-winged Scoter Black Scoter Ring-necked duck Common Goldeneye Bufflehead Redhead Ruddy Duck Red-breasted Merganser Brant Canvasback Ruddy Duck	MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 SWD1 SWD2 SWD3 SWD4 SWD5 SWD6 SWD7	• Ponds, marshes, lakes, bays, coastal inlets, and watercourses used during migration. Sewage treatment ponds and storm water ponds do not qualify as a SWH, however a reservoir managed as a large wetland or pond/lake does qualify. • These habitats have an abundant food supply (mostly aquatic invertebrates and vegetation in shallow water) Information Sources • Environment Canada. • Naturalist clubs often are aware of staging/stopover areas. • OMNRF Wetland Evaluations indicate presence of locally and regionally significant waterfowl staging. • Sites documented through waterfowl planning processes • Ducks Unlimited projects • Element occurrence specification by Nature Serve: http://www.natureserve.org • Natural Heritage Information Centre (NHIC) Waterfowl Concentration Areas	Studies carried out and verified presence of: • Aggregations of 100 or more of listed species for 7 days, results in > 700 waterfowl use days. • Areas with annual staging of ruddy ducks, canvasbacks, and redheads are SWH • The combined area of the ELC ecosites and a 100m radius area is the SWH • Wetland area and shorelines associated with sites identified within the Significant Wildlife Habitat Technical Guide Appendix K are significant wildlife habitat. • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects" • Annual Use of Habitat is Documented from Information Sources or Field Studies (Annual can be based on completed studies or determined from past surveys with species numbers and dates recorded). • Significant Wildlife Habitat Mitigation Support Tool Index #7 provides development effects and mitigation measures.	ELC communities associated with the function are present within the study area. However, the SWD communities are groundwater fed and standing water was not commonly observed. It is not expected that these communities are suitable for this function. Only one species (Bufflehead) was documented during the course of the EIS field program, within the dog pond.

Wildlife Habitat	Wildlife Species	Candidate SWH		Confirmed SWH	Assessment
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Shorebird Migratory Stopover Area **Rationale:** High quality shorebird stopover habitat is extremely rare and typically has a long history of use.	Greater Yellowlegs Lesser Yellowlegs Marbled Godwit Hudsonian Godwit Black-bellied Plover American Golden-Plover Semipalmated Plover Solitary Sandpiper Spotted Sandpiper Semipalmated Sandpiper Pectoral Sandpiper White-rumped Sandpiper Baird's Sandpiper Least Sandpiper Purple Sandpiper Stilt Sandpiper Short-billed Dowitcher Red-necked Phalarope Whimbrel Ruddy Turnstone Sanderling Dunlin	BBO1 BBO2 BBS1 BBS2 BBT1 BBT2 SDO1 SDS2 SDT1 MAM1 MAM2 MAM3 MAM4 MAM5	• Shorelines of lakes, rivers and wetlands, including beach areas, bars and seasonally flooded, muddy and un-vegetated shoreline habitats. • Great Lakes coastal shorelines, including groynes and other forms of armour rock lakeshores, are extremely important for migratory shorebirds in May to mid-June and early July to October. • Sewage treatment ponds and storm water ponds do not qualify as a SWH. Information Sources • Western hemisphere shorebird reserve network. • Canadian Wildlife Service (CWS) Ontario Shorebird Survey. • Bird Studies Canada • Ontario Nature • Local birders and naturalist clubs • Natural Heritage Information Center (NHIC) Shorebird Migratory Concentration Area	Studies confirming: • Presence of 3 or more of listed species and > 1000 shorebird use days during spring or fall migration period (shorebird use days are the accumulated number of shorebirds counted per day over the course of the fall or spring migration period) • Whimbrel stop briefly (<24hrs) during spring migration, any site with >100 Whimbrel used for 3 years or more is significant. • The area of significant shorebird habitat includes the mapped ELC shoreline ecosites plus a 100m radius area • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects" • Significant Wildlife Habitat Mitigation Support Tool Index #8 provides development effects and mitigation measures.	ELC communities associated with this function are present within the study area. However, these are small in size and dominated by non-native species. One Spotted Sandpiper was documented during the course of the EIS field program.
Raptor Wintering Area **Rationale:** Sites used by multiple species, a high number of individuals and used annually are most significant	Rough-legged Hawk Red-tailed Hawk Northern Harrier American Kestrel Snowy Owl **Special Concern:** Short-eared Owl Bald Eagle	Hawks/Owls: Combination of ELC Community Series; need to have present one Community Series from each land class; Forest: FOD, FOM, FOC. Upland: CUM; CUT; CUS; CUW. Bald Eagle: Forest community Series: FOD, FOM, FOC, SWD, SWM or SWC on shoreline areas adjacent to large rivers or adjacent to lakes with open water (hunting area).	• The habitat provides a combination of fields and woodlands that provide roosting, foraging and resting habitats for wintering raptors. • Raptor wintering sites (hawk/owl) need to be > 20 ha with a combination of forest and upland. • Least disturbed sites, idle/fallow or lightly grazed field/meadow (>15ha) with adjacent woodlands • Field area of the habitat is to be wind swept with limited snow depth or accumulation. • Eagle sites have open water, large trees and snags available for roosting Information Sources: • OMNRF Ecologist or Biologist Field Naturalist Clubs • Natural Heritage Information Center (NHIC) Raptor Winter Concentration Area • Data from Bird Studies Canada • Results of Christmas Bird Counts Reports and other information available from Conservation Authorities.	Studies confirm the use of these habitats by: • One or more Short-eared Owls or; One or more Bald Eagles or; At least 10 individuals and two of the listed hawk/owl species. • To be significant a site must be used regularly (3 in 5 years) for a minimum of 20 days by the above number of birds. • The habitat area for an Eagle winter site is the shoreline forest ecosites directly adjacent to the prime hunting area • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects" • Significant Wildlife Habitat Mitigation Support Tool Index #10 and #11 provides development effects and mitigation measures.	The study area does contain a combination of field and woodlands of suitable size. However, the adjacent fields are active agriculture (*i.e.,* row crops) and not suitable for this function.

Wildlife Habitat	Wildlife Species	Candidate SWH		Confirmed SWH	Assessment
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Bat Hibernacula **<u>Rationale:</u>** Bat hibernacula are rare habitats in all Ontario landscapes.	Big Brown Bat Tri-coloured Bat	Bat Hibernacula may be found in these ecosites: CCR1 CCR2 CCA1 CCA2 (Note: buildings are not considered to be SWH)	• Hibernacula may be found in caves, mine shafts, underground foundations and Karsts. • Active mine sites should not be considered as SWH • The locations of bat hibernacula are relatively poorly known. <u>Information Sources</u> • OMNRF for possible locations and contact for local experts • Natural Heritage Information Center (NHIC) Bat Hibernaculum Ministry of Northern • Development and Mines for location of mine shafts. • Clubs that explore caves (e.g. Sierra Club) • University Biology Departments with bat experts.	• All sites with confirmed hibernating bats are SWH. • The habitat area includes a 200m radius around the entrance of the hibernaculum, for most development types and 1000m for wind farms • Studies are to be conducted during the peak swarming period (Aug. – Sept.). Surveys should be conducted following methods outlined in the "Bats and Bat Habitats: Guidelines for Wind Power Projects. • Significant Wildlife Habitat Mitigation Support Tool Index #1 provides development effects and mitigation measures.	No caves, mine shafts, karst or underground foundations have been identified within the study area.
Bat Maternity Colonies **<u>Rationale:</u>** Known locations of forested bat maternity colonies are extremely rare in all Ontario landscapes.	Big Brown Bat Silver-haired Bat	Maternity colonies considered SWH are found in forested Ecosites. All ELC Ecosites in ELC Community Series: FOD FOM SWD SWM	• Maternity colonies can be found in tree cavities, vegetation and often in buildings (buildings are not considered to be SWH). • Maternity roosts are not found in caves and mines in Ontario. • Maternity colonies located in Mature deciduous or mixed forest stands with >10/ha large diameter (>25cm dbh) wildlife trees • Female Bats prefer wildlife tree (snags) in early stages of decay, class 1-3. • Silver-haired Bats prefer older mixed or deciduous forest and form maternity colonies in tree cavities and small hollows. Older forest areas with at least 21 snags/ha are preferred <u>Information Sources</u> • OMNRF for possible locations and contact for local experts • University Biology Departments with bat experts.	• Maternity Colonies with confirmed use by; • >10 Big Brown Bats[7] • >5 Adult Female Silver-haired Bats • The area of the habitat includes the entire woodland or a forest stand ELC Ecosite or an Ecoelement containing the maternity colonies. • Evaluation methods for maternity colonies should be conducted following methods outlined in the "Bats and Bat Habitats: Guidelines for Wind Power Projects". • Significant Wildlife Habitat Mitigation Support Tool Index #12 provides development effects and mitigation measures.	**The FODM5-1 forest community present within the study area is mature and may provide this function to the listed bat species.**
Turtle Wintering Areas **<u>Rationale:</u>** Generally sites are the only known sites in the area. Sites with the highest number of individuals are most significant.	Midland Painted Turtle **<u>Special Concern:</u>** Northern Map Turtle Snapping Turtle	Snapping and Midland Painted Turtles; ELC Community Classes; SW, MA, OA and SA, ELC Community Series; FEO and BOO Northern Map Turtle; Open Water areas such as deeper rivers or streams and lakes with current can also be used as over-wintering habitat.	• For most turtles, wintering areas are in the same general area as their core habitat. Water must be deep enough not to freeze and have soft mud substrates. • Over-wintering sites are permanent water bodies, large wetlands, and bogs or fens with adequate Dissolved Oxygen • Man-made ponds such as sewage lagoons or storm water ponds should not be considered SWH. <u>Information Sources</u> • EIS studies carried out by Conservation Authorities. • Local field naturalists and experts, as well as university herpetologists may also know where to find some of these sites. • OMNRF Ecologist or Biologist • Field Naturalist clubs • Natural Heritage Information Center (NHIC)	• Presence of 5 over-wintering Midland Painted Turtles is significant. • One or more Northern Map Turtle or Snapping Turtle over-wintering within a wetland is significant. • The mapped ELC ecosite area with the over wintering turtles is the SWH. If the hibernation site is within a stream or river, the deep-water pool where the turtles are over wintering is the SWH. • Over wintering areas may be identified by searching for congregations (Basking Areas) of turtles on warm, sunny days during the fall (Sept. – Oct.) or spring (Mar. – May) • Congregation of turtles is more common where wintering areas are limited and therefore significant • Significant Wildlife Habitat Mitigation Support Tool Index #28 provides development effects and mitigation measures for turtle wintering habitat.	The wetland habitat within the study area does not contain suitable features (*i.e.,* permanent water) to support this function. The dug pond present in the Prince of Wales property is offline and not part of a wetland complex. No turtle species were documented during course of the EIS field program.

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

Wildlife Habitat	Wildlife Species	Candidate SWH		Confirmed SWH	Assessment
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Colonially -Nesting Bird Breeding Habitat (Tree/Shrubs) **<u>Rationale</u>:** Large colonies are important to local bird population, typically sites are only known colony in area and are used annually.	Great Blue Heron Black-crowned Night-Heron Great Egret Green Heron	SWM2 SWM3 SWM5 SWM6 SWD1 SWD2 SWD3 SWD4 SWD5 SWD6 SWD7 FET1	• Nests in live or dead standing trees in wetlands, lakes, islands, and peninsulas. Shrubs and occasionally emergent vegetation may also be used. • Most nests in trees are 11 to 15 m from ground, near the top of the tree. <u>Information Sources</u> • Ontario Breeding Bird Atlas, colonial nest records. • Ontario Heronry Inventory 1991 available from Bird Studies Canada or NHIC (OMNRF). • Natural Heritage Information Center (NHIC) Mixed Wader Nesting Colony • Aerial photographs can help identify large heronries. • Reports and other information available from CAs. • MNRF District Offices. • Local naturalist clubs.	Studies confirming: • Presence of 5 or more active nests of Great Blue Heron or other listed species. • The habitat extends from the edge of the colony and a minimum 300m radius or extent of the Forest Ecosite containing the colony or any island <15.0ha with a colony is the SWH • Confirmation of active heronries are to be achieved through site visits conducted during the nesting season (April to August) or by evidence such as the presence of fresh guano, dead young and/or eggshells • Significant Wildlife Habitat Mitigation Support Tool Index #5 provides development effects and mitigation measures.	Although the property contains appropriate ELC communities, no evidence of nests within these communities was observed. None of the listed species were documented during the field investigations.
Colonially -Nesting Bird Breeding Habitat (Ground) **<u>Rationale;</u>** Colonies are important to local bird population, typically sites are only known colony in area and are used annually.	Herring Gull Great Black-backed Gull Little Gull Ring-billed Gull Common Tern Caspian Tern Brewer's Blackbird	Any rocky island or peninsula (natural or artificial) within a lake or large river (two-lined on a 1;50,000 NTS map). Close proximity to watercourses in open fields or pastures with scattered trees or shrubs (Brewer's Blackbird) MAM1 – 6; MAS1 – 3; CUM CUT CUS	• Nesting colonies of gulls and terns are on islands or peninsulas associated with open water or in marshy areas. • Brewers Blackbird colonies are found loosely on the ground in low bushes in close proximity to streams and irrigation ditches within farmlands. <u>Information Sources</u> • Ontario Breeding Bird Atlas , rare/colonial species records. • Canadian Wildlife Service • Reports and other information available from CAs. • Natural Heritage Information Center (NHIC) Colonial Waterbird Nesting Area • MNRF District Offices. • Field Naturalist clubs.	Studies confirming: • Presence of > 25 active nests for Herring Gulls or Ring-billed Gulls, >5 active nests for Common Tern or >2 active nests for Caspian Tern. • Presence of 5 or more pairs for Brewer's Blackbird. • Any active nesting colony of one or more Little Gull, and Great Black-backed Gull is significant. • The edge of the colony and a minimum 150m radius area of habitat, or the extent of the ELC ecosites containing the colony or any island <3.0ha with a colony is the SWH • Studies would be done during May/June when actively nesting. Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects" • Significant Wildlife Habitat Mitigation Support Tool Index #6 provides development effects and mitigation measures.	Habitat does not meet key criteria to be considered significant – no rocky islands or peninsulas were documented.

Wildlife Habitat	Wildlife Species	Candidate SWH		Confirmed SWH	Assessment
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Migratory Butterfly Stopover Areas **<u>Rationale:</u>** Butterfly stopover areas are extremely rare habitats and are biologically important for butterfly species that migrate south for the winter.	Painted Lady Red Admiral <u>Special Concern</u> Monarch	Combination of ELC Community Series; need to have present one Community Series from each land class: <u>Field:</u> CUM CUT CUS <u>Forest:</u> FOC FOD FOM CUP Anecdotally, a candidate site for butterfly stopover will have a history of butterflies being observed.	A butterfly stopover area will be a minimum of 10 ha in size with a combination of field and forest habitat present and will be located within 5 km of Lake Ontario. • The habitat is typically a combination of field and forest, and provides the butterflies with a location to rest prior to their long migration south • The habitat should not be disturbed, fields/meadows with an abundance of preferred nectar plants and woodland edge providing shelter are requirements for this habitat. • Staging areas usually provide protection from the elements and are often spits of land or areas with the shortest distance to cross the Great Lakes <u>Information Sources</u> • OMNRF (NHIC) • Agriculture Canada in Ottawa may have list of butterfly experts. • Field Naturalist Clubs • Toronto Entomologists Association • Conservation Authorities	Studies confirm: • The presence of Monarch Use Days (MUD) during fall migration (Aug/Oct). MUD is based on the number of days a site is used by Monarchs, multiplied by the number of individuals using the site. Numbers of butterflies can range from 100-500/day, significant variation can occur between years and multiple years of sampling should occur. • Observational studies are to be completed and need to be done frequently during the migration period to estimate MUD. • MUD of >5000 **or** >3000 with the presence of Painted Ladies or Red Admiral's is to be considered significant. • Significant Wildlife Habitat Mitigation Support Tool Index #16 provides development effects and mitigation measures.	Study area is not located within 5km of Lake Ontario and thus this habitat function is not applicable.
Landbird Migratory Stopover Areas **<u>Rationale:</u>** Sites with a high diversity of species as well as high numbers are most significant.	All migratory songbirds.: Canadian Wildlife Service Ontario website. All migrant raptor species: Ontario Ministry of Natural Resources: Fish and Wildlife Conservation Act, 1997. Schedule 7: Specially Protected Birds (Raptors)	All Ecosites associated with these ELC Community Series; FOC FOM FOD SWC SWM SWD	Woodlots need to be >10 ha in size and within 5 km of Lake Ontario. • If multiple woodlands are located along the shoreline those Woodlands <2km from Lake Ontario are more significant • Sites have a variety of habitats; forest, grassland and wetland complexes. • The largest sites are more significant • Woodlots and forest fragments are important habitats to migrating birds, these features located along the shore and located within 5km of Lake Ontario are Candidate SWH . <u>Information Sources</u> • Bird Studies Canada • Ontario Nature • Local birders and naturalist club • Ontario Important Bird Areas (IBA) Program	Studies confirm: • Use of the habitat by >200 birds/day and with >35 spp with at least 10 bird spp. recorded on at least 5 different survey dates. This abundance and diversity of migrant bird species is considered above average and significant. • Studies should be completed during spring (Apr./May) and fall (Aug/Oct) migration using standardized assessment techniques. Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects" • Significant Wildlife Habitat Mitigation Support Tool Index #9 provides development effects	Study area is not located within 5km of Lake Ontario and thus this habitat function is not applicable.

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

Rare Vegetation Communities

Rare Vegetation Community	Candidate SWH			Confirmed SWH	Assessment
	ELC Ecosite Code	Habitat Description	Detailed Information and Sources	Defining Criteria	
Cliffs and Talus Slopes **Rationale:** Cliffs and Talus Slopes are extremely rare habitats in Ontario.	Any ELC Ecosite within Community Series: TAO TAS TAT CLO CLS CLT	A Cliff is vertical to near vertical bedrock >3m in height. A Talus Slope is rock rubble at the base of a cliff made up of coarse rocky debris	Most cliff and talus slopes occur along the Niagara Escarpment. Information Sources • The Niagara Escarpment Commission has detailed information on location of these habitats. • OMNRF District • Natural Heritage Information Center (NHIC) has location information available on their website • Field Naturalist clubs • Conservation Authorities	• Confirm any ELC Vegetation Type for Cliffs or Talus Slopes • Significant Wildlife Habitat Mitigation Support Tool Index #21 provides development effects and mitigation measures.	Habitat in the study area does not meet key criteria to be considered significant.
Sand Barren **Rationale;** Sand barrens are rare in Ontario and support rare species. Most Sand Barrens have been lost due to cottage development and forestry	ELC Ecosites: SBO1 SBS1 SBT1 Vegetation cover varies from patchy and barren to continuous meadow (SBO1), thicket-like (SBS1), or more closed and treed (SBT1). Tree cover always ≤ 60%	Sand Barrens typically are exposed sand, generally sparsely vegetated and caused by lack of moisture, periodic fires and erosion. Usually located within other types of natural habitat such as forest or savannah. Vegetation can vary from patchy and barren to tree covered, but less than 60%.	A sand barren area >0.5ha in size. Information Sources • OMNRF Districts. • Natural Heritage Information Center (NHIC) has location information available on their website. • Field Naturalist clubs • Conservation Authorities	• Confirm any ELC Vegetation Type for Sand Barrens • Site must not be dominated by exotic or introduced species (<50% vegetative cover are exotic sp.) • Significant Wildlife Habitat Mitigation Support Tool Index #20 provides development effects and mitigation measures.	Habitat in the study area does not meet key criteria to be considered significant.
Alvar **Rationale;** Alvars are extremely rare habitats in Ecosregion 6E. Most alvars in Ontario are in Ecoregions 6E and 7E. Alvars in 6E are small and highly localized just north of the Palaeozoic-Precambrian contact.	ALO1 ALS1 ALT1 FOC1 FOC2 CUM2 CUS2 CUT2-1 CUW2 **Five Alvar Species:** 1) *Carex crawei* 2) *Panicum philadelphicum* 3) *Eleocharis compressa* 4) *Scutellaria parvula* 5) *Trichostema brachiatum* These indicator species are very specific to Alvars within Ecoregion 6E	An alvar is typically a level, mostly unfractured calcareous bedrock feature with a mosaic of rock pavements and bedrock overlain by a thin veneer of soil. The hydrology of alvars is complex, with alternating periods of inundation and drought. Vegetation cover varies from sparse lichen-moss associations to grasslands and shrublands and comprising a number of characteristic or indicator plants. Undisturbed alvars can be phyto- and zoogeographically diverse, supporting many uncommon or are relict plant and animal species. Vegetation cover varies from patchy to barren with a less than 60% tree cover	An Alvar site > 0.5 ha in size. Information Sources • Alvars of Ontario (2000), Federation of Ontario Naturalists. • Ontario Nature – Conserving Great Lakes Alvars. • Natural Heritage Information Center (NHIC) has location information available on their website • OMNRF Districts • Field Naturalist clubs. • Conservation Authorities.	• Field studies that identify four of the five Alvar Indicator Species at a Candidate Alvar site is Significant. • Site must not be dominated by exotic or introduced species (<50% vegetative cover are exotic sp.). • The alvar must be in excellent condition and fit in with surrounding landscape with few conflicting land uses • Significant Wildlife Habitat Mitigation Support Tool Index #17 provides development effects and mitigation measures.	Habitat in the study area does not meet key criteria to be considered significant.
Old Growth Forest	Forest Community Series: FOD	Old Growth forests are characterized by heavy mortality	Woodland areas 30 ha or greater in size or with at least 10 ha interior habitat assuming 100 m buffer at edge of forest.	Field Studies will determine:	Forest communities in study area do not meet key criteria related to Woodland areas.

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

Specialized Habitat for Wildlife

Wildlife Habitat	Wildlife Species	Candidate SHW		Confirmed SWH	Assessment
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Waterfowl Nesting Area **Rationale;** Important to local waterfowl populations, sites with greatest number of species and highest number of individuals are significant.	American Black Duck Northern Pintail Northern Shoveler Gadwall Blue-winged Teal Green-winged Teal Wood Duck Hooded Merganser Mallard	All upland habitats located adjacent to these wetland ELC Ecosites are Candidate SWH: MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 SWT1 SWT2 SWD1 SWD2 SWD3 SWD4 **Note: includes adjacency to Provincially Significant Wetlands**	A waterfowl nesting area extends 120 m from a wetland (> 0.5 ha) or a wetland (>0.5ha) and any small wetlands (0.5ha) within 120m or a cluster of 3 or more small (<0.5 ha) wetlands within 120 m of each individual wetland where waterfowl nesting is known to occur. • Upland areas should be at least 120 m wide so that predators such as racoons, skunks, and foxes have difficulty finding nests. • Wood Ducks and Hooded Mergansers utilize large diameter trees (>40cm dbh) in woodlands for cavity nest sites. Information Sources • Ducks Unlimited staff may know the locations of particularly productive nesting sites. • OMNRF Wetland Evaluations for indication of significant waterfowl nesting habitat. • Reports and other information available from Conservation Authorities.	Studies confirmed: • Presence of 3 or more nesting pairs for listed species excluding Mallards, or; • Presence of 10 or more nesting pairs for listed species including Mallards. • Any active nesting site of an American Black Duck is considered significant. • Nesting studies should be completed during the spring breeding season (April - June). Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects” • A field study confirming waterfowl nesting habitat will determine the boundary of the waterfowl nesting habitat for the SWH, this may be greater or less than 120 m from the wetland and will provide enough habitat for waterfowl to successfully nest. • Significant Wildlife Habitat Technical Guide Index #25 provides development effects and mitigation measures.	Although the property contains appropriate ELC communities, no evidence of nests within these communities was observed. None of the listed species were documented during the field investigations.
Bald Eagle and Osprey Nesting, Foraging and Perching Habitat **Rationale;** Nest sites are fairly uncommon in Eco-region 6E and are used annually by these species. Many suitable nesting locations may be lost due to increasing shoreline development pressures and scarcity of habitat.	Osprey **Special Concern** Bald Eagle	ELC Forest Community Series: FOD, FOM, FOC, SWD, SWM and SWC directly adjacent to riparian areas – rivers, lakes, ponds and wetlands	Nests are associated with lakes, ponds, rivers or wetlands along forested shorelines, islands, or on structures over water. • Osprey nests are usually at the top a tree whereas Bald Eagle nests are typically in super canopy trees in a notch within the tree’s canopy. • Nests located on man-made objects are not to be included as SWH (e.g. telephone poles and constructed nesting platforms). Information Sources • Natural Heritage Information Center (NHIC) compiles all known nesting sites for Bald Eagles in Ontario. • MNRF values information (LIO/NRVIS) will list known nesting locations. Note: data from NRVIS is provided as a point and does not represent all the habitat. • Nature Counts, Ontario Nest Records Scheme data. • OMNRF Districts. • Check the Ontario Breeding Bird Atlas or Rare Breeding Birds in Ontario for species documented • Reports and other information available from Conservation Authorities. • Field Naturalists clubs	Studies confirm the use of these nests by: • One or more active Osprey or Bald Eagle nests in an area. • Some species have more than one nest in a given area and priority is given to the primary nest with alternate nests included within the area of the SWH. • For an Osprey, the active nest and a 300 m radius around the nest or the contiguous woodland stand is the SWH , maintaining undisturbed shorelines with large trees within this area is important . • For a Bald Eagle the active nest and a 400-800 m radius around the nest is the SWH. , Area of the habitat from 400-800m is dependent on-site lines from the nest to the development and inclusion of perching and foraging habitat • To be significant a site must be used annually. When found inactive, the site must be known to be inactive for > 3 years or suspected of not being used for >5 years before being considered not significant. • Observational studies to determine nest site use, perching sites and foraging areas need to be done from mid March to mid August. • Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”	The study area is not located in proximity to a large body of water required for this function.

Wildlife Habitat	Wildlife Species	Candidate SHW		Confirmed SWH	Assessment
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
				• Significant Wildlife Habitat Technical Guide Index #26 provides development effects and mitigation measures	
Woodland Raptor Nesting Habitat **<u>Rationale:</u>** Nests sites for these species are rarely identified; these area sensitive habitats and are often used annually by these species.	Northern Goshawk Cooper's Hawk Sharp-shinned Hawk Red-shouldered Hawk Barred Owl Broad-winged Hawk	May be found in all forested ELC Ecosites. May also be found in SWC, SWM, SWD and CUP3	All natural or conifer plantation woodland/forest stands >30ha with >10ha of interior habitat. Interior habitat determined with a 200m buffer • Stick nests found in a variety of intermediate-aged to mature conifer, deciduous or mixed forests within tops or crotches of trees. Species such as Coopers hawk nest along forest edges sometimes on peninsulas or small off-shore islands. • In disturbed sites, nests may be used again, or a new nest will be in close proximity to old nest. <u>Information Sources</u> • OMNRF Districts. • Check the Ontario Breeding Bird Atlas or Rare Breeding Birds in Ontario for species documented. • Check data from Bird Studies Canada. • Reports and other information available from Conservation Authorities.	Studies confirm: • Presence of 1 or more active nests from species list is considered significant. • Red-shouldered Hawk and Northern Goshawk – A 400m radius around the nest or 28 ha area of habitat is the SWH (the 28ha habitat area would be applied where optimal habitat is irregularly shaped around the nest) • Barred Owl – A 200m radius around the nest is the SWH. • Broad-winged Hawk and Coopers Hawk– A 100m radius around the nest is the SWH. • Sharp-Shinned Hawk – A 50m radius around the nest is the SWH. • Conduct field investigations from mid-March to end of May. The use of call broadcasts can help in locating territorial (courting/nesting) raptors and facilitate the discovery of nests by narrowing down the search area. • Significant Wildlife Habitat Technical Guide Index #27 provides development effects and mitigation measures.	Although the property contains appropriate ELC communities, no evidence of nests within these communities was observed. None of the listed species were documented during the field investigations.
Turtle Nesting Areas **<u>Rationale:</u>** These habitats are rare and when identified will often be the only breeding site for local populations of turtles.	Midland Painted Turtle <u>Special Concern Species</u> Northern Map Turtle Snapping Turtle	Exposed mineral soil (sand or gravel) areas adjacent (<100m) or within the following ELC Ecosites: MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 BOO1 FEO1	• Best nesting habitat for turtles are close to water and away from roads and sites less prone to loss of eggs by predation from skunks, raccoons or other animals. • For an area to function as a turtle-nesting area, it must provide sand and gravel that turtles are able to dig in and are located in open, sunny areas. Nesting areas on the sides of municipal or provincial road embankments and shoulders are not SWH. • Sand and gravel beaches adjacent to undisturbed shallow weedy areas of marshes, lakes, and rivers are most frequently used. <u>Information Sources</u> • Use Ontario Soil Survey reports and maps to help find suitable substrate for nesting turtles (well-drained sands and fine gravels). • Check the Ontario Herpetofaunal Summary Atlas records or other similar atlases for uncommon turtles; location information may help to find potential nesting habitat for them. • Natural Heritage Information Center (NHIC) • Field Naturalist clubs	Studies confirm: • Presence of 5 or more nesting Midland Painted Turtles • One or more Northern Map Turtle or Snapping Turtle nesting is a SWH. • The area or collection of sites within an area of exposed mineral soils where the turtles nest, plus a radius of 30-100m around the nesting area dependant on slope, riparian vegetation and adjacent land use is the SWH. • Travel routes from wetland to nesting area are to be considered within the SWH as part of the 30-100m area of habitat. • Field investigations should be conducted in prime nesting season typically late spring to early summer. Observational studies observing the turtles nesting is a recommended method. Significant Wildlife Habitat Technical Guide Index #28 provides development effects and mitigation measures for turtle nesting habitat.	Suitable ELC ecosites were not documented within the study area. The agricultural field does contain well drained sandy soils, however, is regularly disturbed and not appropriate for this function.

Wildlife Habitat	Wildlife Species	Candidate SHW		Confirmed SWH	Assessment
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Seeps and Springs **Rationale;** Seeps/Springs are typical of headwater areas and are often at the source of coldwater streams.	Wild Turkey Ruffed Grouse Spruce Grouse White-tailed Deer Salamander spp.	Seeps/Springs are areas where ground water comes to the surface. Often they are found within headwater areas within forested habitats. Any forested Ecosite within the headwater areas of a stream could have seeps/springs.	Any forested area (with <25% meadow/field/pasture) within the headwaters of a stream or river system. • Seeps and springs are important feeding and drinking areas especially in the winter will typically support a variety of plant and animal species Information Sources • Topographical Map. • Thermography. • Hydrological surveys conducted by Conservation Authorities and Ministry of the Environment, Conservation and Parks. • Field Naturalists clubs and landowners. • Municipalities and Conservation Authorities may have drainage maps and headwater areas mapped.	Field Studies confirm: • Presence of a site with 2 or more seeps/springs should be considered SWH. • The area of an ELC forest ecosite or an ecoelement within ecosite containing the seeps/springs is the SWH. The protection of the recharge area considering the slope, vegetation, height of trees and groundwater condition need to be considered in delineation the habitat. • Significant Wildlife Habitat Technical Guide Index #30 provides development effects and mitigation measures	**The study area is situated within a headwaters area.** **Groundwater seepage was observed within the north-western portion of the study area, in the Sugar Maple forest community.**
Amphibian Breeding Habitat (Woodland). **Rationale:** These habitats are extremely important to amphibian biodiversity within a landscape and often represent the only breeding habitat for local amphibian populations	Eastern Newt Blue-spotted Salamander Spotted Salamander Gray Treefrog Spring Peeper Western Chorus Frog Wood Frog	All Ecosites associated with these ELC Community Series; FOC FOM FOD SWC SWM SWD Breeding pools within the woodland or the shortest distance from forest habitat are more significant because they are more likely to be used due to reduced risk to migrating amphibians	• Presence of a wetland, pond or woodland pool (including vernal pools) >500m2 (about 25m diameter) within or adjacent (within 120m) to a woodland (no minimum size). Some small wetlands may not be mapped and may be important breeding pools for amphibians. • Woodlands with permanent ponds or those containing water in most years until mid-July are more likely to be used as breeding habitat Information Sources • Ontario Herpetofaunal Summary Atlas (or other similar atlases) for records • Local landowners may also provide assistance as they may hear spring-time choruses of amphibians on their property. • OMNRF District. • OMNRF wetland evaluations • Field Naturalist clubs • Canadian Wildlife Service • Amphibian Road Call Survey • Ontario Vernal Pool Association: http://www.ontariovernalpools.org	Studies confirm; • Presence of breeding population of 1 or more of the listed newt/salamander species or 2 or more of the listed frog species with at least 20 individuals (adults or eggs masses) or 2 or more of the listed frog species with Call Level Codes of 3. • A combination of observational study and call count surveys will be required during the spring (March-June) when amphibians are concentrated around suitable breeding habitat within or near the woodland/wetlands. • The habitat is the wetland area plus a 230m radius of woodland area. If a wetland area is adjacent to a woodland, a travel corridor connecting the wetland to the woodland is to be included in the habitat. • Significant Wildlife Habitat Technical Guide Index #14 provides development effects and mitigation measures.	Amphibian breeding habitat is considered below.
Amphibian Breeding Habitat (Wetlands) **Rationale;** Wetlands supporting breeding for these amphibian species are extremely important	Eastern Newt American Toad Spotted Salamander Four-toed Salamander Blue-spotted Salamander Gray Treefrog Western Chorus Frog Northern Leopard Frog Pickerel Frog	ELC Community Classes SW, MA, FE, BO, OA and SA. Typically these wetland ecosites will be isolated (>120m) from woodland ecosites, however larger wetlands containing predominantly aquatic species	• Wetlands>500m2 (about 25m diameter), supporting high species diversity are significant; some small or ephemeral habitats may not be identified on MNRF mapping and could be important amphibian breeding habitats. • Presence of shrubs and logs increase significance of pond for some amphibian species because of available structure for calling, foraging, escape and concealment from predators. • Bullfrogs require permanent water bodies with abundant emergent vegetation.	Studies confirm: • Presence of breeding population of 1 or more of the listed newt/salamander species or 2 or more of the listed frog/toad species with at least 20 individuals (adults or eggs masses) or 2 or more of the listed frog/toad species with Call Level Codes of 3. **or;** Wetland with confirmed breeding Bullfrogs are significant.	The wetland habitat within the study area does not meet the defining criteria related to species and calling codes.

Wildlife Habitat	Wildlife Species	Candidate SHW		Confirmed SWH	Assessment
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
and fairly rare within Central Ontario landscapes.	Green Frog Mink Frog Bullfrog	(e.g. Bull Frog) may be adjacent to woodlands.	<u>Information Sources</u> • Ontario Herpetofaunal Summary Atlas (or other similar atlases) • Canadian Wildlife Service Amphibian Road Surveys and Backyard Amphibian Call Count. • OMNRF Districts and wetland evaluations • Reports and other information available from Conservation Authorities.	• The ELC ecosite wetland area and the shoreline are the SWH. • A combination of observational study and call count surveys will be required during the spring (March-June) when amphibians are concentrated around suitable breeding habitat within or near the wetlands. • If a SWH is determined for Amphibian Breeding Habitat (Wetlands) then Movement Corridors are to be considered as outlined below. • Significant Wildlife Habitat Technical Guide Index #15 provides development effects and mitigation measures.	
Woodland Area-Sensitive Bird Breeding Habitat **<u>Rationale:</u>** Large, natural blocks of mature woodland habitat within the settled areas of Southern Ontario are important habitats for area sensitive interior forest song birds.	Yellow-bellied Sapsucker Red-breasted Nuthatch Veery Blue-headed Vireo Northern Parula Black-throated Green Warbler Blackburnian Warbler Black-throated Blue Warbler Ovenbird Scarlet Tanager Winter Wren **Special Concern:** Canada Warbler	All Ecosites associated with these ELC Community Series; FOC FOM FOD SWC SWM SWD	Habitats where interior forest breeding birds are breeding, typically large mature (>60 yrs old) forest stands or woodlots >30 ha, • Interior forest habitat is at least 200 m from forest edge habitat. <u>Information Sources</u> • Local bird clubs. • Canadian Wildlife Service (CWS) for the location of forest bird monitoring. • Bird Studies Canada conducted a 3-year study of 287 woodlands to determine the effects of forest fragmentation on forest birds and to determine what forests were of greatest value to interior species • Reports and other information available from Conservation Authorities.	Studies confirm: • Presence of nesting or breeding pairs of 3 or more of the listed wildlife species. • Note: any site with breeding Canada Warblers is to be considered SWH. • Conduct field investigations in spring and early summer when birds are singing and defending their territories. • Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects” • Significant Wildlife Habitat Technical Guide Index #34 provides development effects and mitigation measures.	The study area contains suitable ELC communities of suitable age and size. However, only one of the listed wildlife species was documented within the study area (Black-throated Green Warbler).

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

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

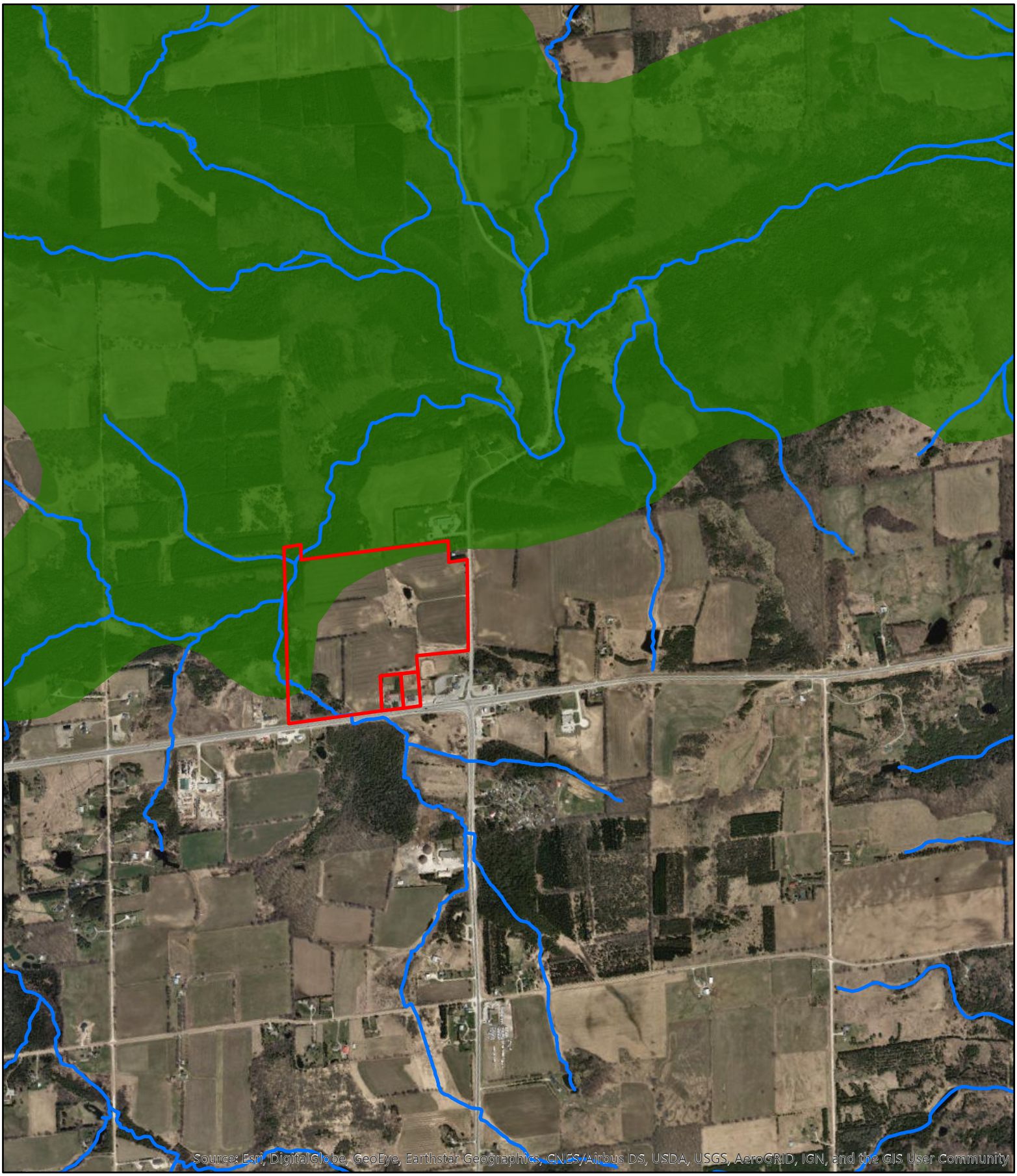
Wildlife Habitat	Wildlife Species	Candidate SHW		Confirmed SWH	Assessment
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
Terrestrial Crayfish **<u>Rationale:</u>** Terrestrial Crayfish are only found within SW Ontario in Canada and their habitats are very rare.	Chimney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

Animal Movement Corridors

Wildlife Habitat	Wildlife Species	Candidate SHW		Confirmed SWH	Assessment
		ELC Ecosite	Habitat Criteria and Information Sources	Defining Criteria	
Amphibian Movement Corridors **Rationale;** Movement corridors for amphibians moving from their terrestrial habitat to breeding habitat can be extremely important for local populations.	Eastern Newt American Toad Spotted Salamander Four-toed Salamander Blue-spotted Salamander Gray Treefrog Western Chorus Frog Northern Leopard Frog Pickerel Frog Green Frog Mink Frog Bullfrog	Corridors may be found in all ecosites associated with water. • Corridors will be determined based on identifying the significant breeding habitat for these species	Movement corridors between breeding habitat and summer habitat. • Movement corridors must be determined when Amphibian breeding habitat is confirmed as SWH (**Amphibian Breeding Habitat –Wetland)** Information Sources • MNRF District Office. • Natural Heritage Information Center (NHIC). • Reports and other information available from Conservation Authorities. • Field Naturalist Clubs.	• Field Studies must be conducted at the time of year when species are expected to be migrating or entering breeding sites. • Corridors should consist of native vegetation, with several layers of vegetation. • Corridors unbroken by roads, waterways or bodies, and undeveloped areas are most significant • Corridors should have at least 15m of vegetation on both sides of waterway or be up to 200m wide of woodland habitat and with gaps <20mcxlix . • Shorter corridors are more significant than longer corridors, however amphibians must be able to get to and from their summer and breeding habitat. • Significant Wildlife Habitat Technical Guide Index #40 provides development effects and mitigation measures	Amphibian breeding habitat is not present, therefore amphibian movement corridors is not expected to be present within the study area.
Deer Movement Corridors **Rationale:** Corridors important for all species to be able to access seasonally important life-cycle habitats or to access new habitat for dispersing individuals by minimizing their vulnerability while travelling.	White-tailed Deer	Corridors may be found in all forested ecosites. A Project Proposal in Stratum II Deer Wintering Area has potential to contain corridors.	Movement corridor must be determined when **Deer Wintering Habitat** is confirmed as SWH • A deer wintering habitat identified by the OMNRF as will have corridors that the deer use during fall migration and spring dispersion. • Corridors typically follow riparian areas, woodlots, areas of physical geography (ravines, or ridges). Information Sources • MNRF District Office. • Natural Heritage Information Center (NHIC). • Reports and other information available from Conservation Authorities. • Field Naturalist Clubs.	• Studies must be conducted at the time of year when deer are migrating or moving to and from winter concentration areas. • Corridors that lead to a deer wintering habitat should be unbroken by roads and residential areas. • Corridors should be at least 200m wide with gaps <20m and if following riparian area with at least 15m of vegetation on both sides of waterway. • Shorter corridors are more significant than longer corridors. • Significant Wildlife Habitat Technical Guide Index #39 provides development effects and mitigation measures	**Deer Wintering Area (Stratum II) is mapped within the study area. It is expected that Deer Movement Corridors are present within the study area, anticipated to follow the Primrose Creek and tributary riparian corridors.**

Exceptions for Ecoregion 6E

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



Property Boundary

Primrose Creek (LIO)

Deer Wintering Area (Stratum II)

0.3 0.15 0 0.3 0.6 0.9 1.2

Kilometers

N

W E

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