

Part of Lots 25, 26 and 27, Concession XI
Township of North Dumfries, Region of Waterloo
Scoped Environmental Impact Study

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c/o

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1.0 Introduction

About & Associates Inc. (AA) was retained by Dryden, Smith and Head Planning Consultants Ltd. (DSH) to complete a Scoped Environmental Impact Study (EIS) in support of a proposed industrial subdivision on the lands located within part of Lots 25, 26 and 27, Concession XI, Regional Road 97 within the Township of North Dumfries, Region of Waterloo.

1.1 Proposed Development

The proposed development includes an internal road traversing the property from Regional Road 47 on the east side of the property to Regional Road 97 on the south side of the property, with 6 lots fronting onto the proposed road. A portion of the subject lands are designated as Core Environmental Features as per Map 4 of the Region of Waterloo Official Plan.

Site alteration involves construction of an industrial subdivision and access road. All site development is located within existing Aggregate Extraction lands, it is also identified as lands designated in the Official Plan for Industrial Use – Prime industrial/Strategic Reserve.

1.2 Existing Land Use and Study Area

The study area consists of the subject lands and up to 120 metres from the subject lands on adjacent lands, including areas of the Roseville Swamp- Cedar Creek Provincially Significant Wetland. The study area is located northwest of the intersection of Cedar Creek Road and Dumfries Road. Industrial lands occur north of the subject lands with agriculture to the east, an active gravel pit operation to the south and a portion of the Roseville Swamp- Cedar Creek Provincially Significant Wetland to the west.

1.3 Existing Regulations

1.3.1 Fisheries Act, 1985

The study area contains fish bearing waters in the form of rivers and wetlands. These areas and the fish within are protected under the Federal Fisheries Act, 1985 (amended 2019-08-28). The Fisheries Act provides a framework for the proper management, conservation, and protection of fish and fish habitat.

Section 34.4 (1) of the Fisheries Act States that:

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

And,

Section 35 (1) of the Fisheries Act States that:

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

The Fisheries Act requires that projects and activities avoid causing serious harm to fish and fish habitat unless authorized to do so by the Department of Fisheries and Oceans Canada (DFO). This applies to work conducted in or near waterbodies that support fish.

Within the context of the proposed severances, any proposed actions that could impact fish or fish habitat would need to be assessed for compliance with the Fisheries Act. If it is determined that proposed actions will cause the harmful alteration, disruption or destruction of fish habitat that cannot be mitigated, then a Fisheries Act Authorization would be required.

1.3.2 Provincial Policy Statement

The *Provincial Policy Statement* (PPS; OMMHA 2020) provides policy direction on matters of provincial interest related to land use planning and development.

The PPS states that:

“Natural features and areas shall be protected for the long term.”

And that:

“The diversity and connectivity of natural features in an area, and the long-term ecological function and biodiversity of natural heritage systems, should be maintained, restored or, where possible, improved, recognizing linkages between and among natural heritage features and areas, surface water features and ground water features.”

Under the PPS, development and site alteration are not permitted in:

- a) significant wetlands;
- b) significant woodlands;
- c) significant valleylands;
- d) significant wildlife habitat;
- e) significant areas of natural and scientific interest; and
- f) coastal wetlands,

unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions.

The PPS (2020) also states that:

1. *Development and site alteration is not permitted in fish habitat, habitat of endangered species and threatened species except in accordance with provincial and federal requirements.*
2. *Development and site alteration is not permitted on adjacent lands to the natural heritage features and areas identified above (Items a to f), unless the ecological function of the adjacent lands has been evaluated and it has been demonstrated that there will be no negative impacts on the natural features or on their ecological functions.*
3. *Development and site alteration is restricted in or near sensitive surface water features and sensitive ground water features in order to protect the hydrologic functions of the feature. Mitigation and/or alternative development approaches may be required in order to protect, improve or restore sensitive surface water features, sensitive ground water features, and their hydrologic functions.*

1.3.3 Endangered Species Act, 2007

It is important to note that on April 1, 2019, responsibility for the administration of the provincial Endangered Species Act, 2007 (ESA) transferred from the MNRF to the Ministry of Environment, Conservation and Parks (MECP). As such, over the course of completion of this EIS, correspondence prior to this date regarding the ESA was conducted with the MNRF, while subsequent correspondence will take place with the MECP.

The ESA provides protection to species designated as Threatened or Endangered on the Species at Risk in Ontario list (MECP 2019). The habitat of some species at risk is also protected under the ESA. Protected habitat is habitat identified as essential for life processes including breeding, rearing, feeding, hibernation and migration.

The ESA (Subsection 9(1)) states that:

“No person shall,

- (a) kill, harm, harass, capture or take a living member of a species that is listed on the Species at Risk in Ontario List as an extirpated, endangered or threatened species;*
- (b) possess, transport, collect, buy, sell, lease, trade or offer to buy, sell, lease or trade,*
 - (i) a living or dead member of a species that is listed on the Species at Risk in Ontario List as an extirpated, endangered or threatened species,*
 - (ii) any part of a living or dead member of a species referred to in subclause (i),*
 - (iii) anything derived from a living or dead member of a species referred to in subclause (i); or*
- (c) sell, lease, trade or offer to sell, lease or trade anything that the person represents to be a thing described in subclause (b) (i), (ii) or (iii).*

Clause 10(1)(a) of the ESA also states that:

“No person shall damage or destroy the habitat of a species that is listed on the Species at Risk in Ontario list as an endangered or threatened species.”

An authorization or permit between the proponent and the MECP is required to authorize activities that would otherwise be prohibited by subsection 9(1) and 10(1) of the ESA.

For the purposes of this EIS species listed as Special Concern are not afforded protection under the ESA and are considered under the PPS (2020) as Significant Wildlife Habitat.

1.3.4 Grand River Conservation Authority

The subject property contains a portion of the Roseville Swamp – Cedar Creek Provincially Significant Wetland Complex, Cedar Creek and the allowances of these features. Section 8.4 of the GRCA's *Policies for the Administration of the Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Regulation* (Ontario Regulation 150/06) identifies the area of interference of a Provincially Significant Wetland (PSW) as being 120 metres.

Section 8.4.9 states, development within an area of interference less than or equal to 30 metres from a wetland may be permitted in accordance with the policies in *Section 7.1.2-7.1.3- General Policies*, and where an EIS demonstrates that:

- a) There are no negative or adverse hydrological or ecological impacts on the wetland,
- b) All development is located outside of the wetland and maintains as much setback as feasible,
- c) Development is located above the water table, except as specified in Section 8.4.11, and,
- d) Septic systems are located a minimum of 15 metres from the wetland and 0.9 metres above the annual maximum water table.

Section 8.4.10 states, development within an area of interference between 30 metres and 120 metres from a wetland, which in the opinion of the GRCA may result in hydrologic impact, may be permitted where an EIS demonstrates that policies in *Sections 7.1.2-7.1.3 – General Policies* are met.

1.3.5 Region of Waterloo Official Plan

As per Map 4 of the Official Plan, a portion of the subject property consists of Core Environmental Features. Section 7.C.1 states “Core Environmental Features are those environmental features identified as being provincially significant or regionally significant. These features are the most significant elements of the regional landscape in terms of maintaining, protecting and enhancing biodiversity and important ecological functions.”

Section 7.C.10 states:

“Development or site alteration will only be permitted on lands contiguous to a Core Environmental Feature where an Environmental Impact Statement, or similar study, submitted in accordance with the policies in Section 7.G has determined to the satisfaction of the Region,

Area Municipalities, the Grand River Conservation Authority and/or the Province, as appropriate, that approval of the proposed development or site alteration would not result in adverse environmental impacts on the features and ecological functions of the Core Environmental Feature. The Region may require conditions of approval to implement such recommendations.”

In addition, Section 7.C.11 states:

“An Environmental Impact Statement submitted in accordance with Policies 7.C.9 or 7.C.10 will identify appropriate buffers to Core Environmental Features, to the satisfaction of the Region, in consultation with Area Municipalities and the Grand River Conservation Authority. Such buffers will not only serve to protect Core Environmental Features from adverse environmental impacts but will also provide opportunities for net habitat enhancement to enhance or, wherever feasible, restore the ecological functions of the Core Environmental Feature. The location, width, composition and use of buffers will be in accordance with the approved Environmental Impact Statement, with buffers being a minimum of 10 metres as measures from the outside boundary of the Core Environmental Feature and establish and maintained as appropriate self-sustaining native vegetation.”

1.3.6 Greenlands Network Implementation Guideline

As per Map 4 of the Region of Waterloo Official Plan (2015), a portion of the subject property is within the Greenlands Network. The Greenlands Network Implementation Guideline provides guidance to development applicants, the Ecological and Environmental Advisory Committee, and agency staff in the preparation and review of applications for development and site alteration which affect the Greenlands Network.

Section A1 states:

“An Environmental Impact Statement is defined within the Regional Official Plan as: A study prepared in accordance with established procedures to precisely delineate and map the boundaries of elements of the Greenlands Network, identify the potential impacts of a development application on such elements, and recommend a means of preventing or minimizing these impacts through avoidance or mitigation.

The ROP further specifies that an Environmental Impact Statement should recommend means to enhance or restore the quality and connectivity of elements of the Greenlands Network.

The Environmental Impact Statement will often be coordinated with other technical studies such as hydrological, hydrogeological, or stormwater management reports which are prepared consistent with other applicable guidelines. Environmental Impact Statements will be prepared in accordance with this Guideline.”

1.3.7 Township of North Dumfries Official Plan

The subject property is designated by the Township of North Dumfries Official Plan (2018) as part of the Highway 401/Regional Road 97 Employment Area. Section 2.9.3.2.2 states that

future development within the Highway 401/Regional Road 97 Employment Area designation will generally be limited to privately-serviced logistics and warehousing uses that require close access to the Highway 401 corridor to efficiently move goods into and out of the Region.

The subject lands also contain Core Environmental Features as per Map 5A of the Official Plan. Sections 6.1.7.5 and 6.1.7.6 state the policies outlined in Section 7.C.10 and 7.C.11 of the Region of Waterloo Official Plan noted above.

1.3.8 Township of North Dumfries Zoning By-Law 689-83

The subject property is currently zoned as Mineral Extraction (Zone 14) as per the Township of North Dumfries Zoning By-law 689-83. Section 19A of the Zoning By-law indicate the following as permitted uses within Zone 14.

- The making, establishment or operation of a pit or quarry.
- Farming (except sod farming or commercial greenhouse and not including a residence or residential unit).
- Forestry.
- The following uses only as accessory to the foregoing permitted uses:
 - o Buildings or structures which are incidental to and directly related to the extraction operation and which are shown on the site plan forming part of the license approval.
 - o Any barn, shed, building or structure required as part of the farming operation except a residence or residential unit.
 - o Accessory signs.

1.4 Terms of Reference and Agency Correspondence

Based upon the above Acts, Policies and Regulations, Terms of Reference (ToR) for the Scoped EIS were developed and submitted to the Grand River Conservation Authority and Region of Waterloo on December 18, 2017. John Brum, GRCA Resource Planner, provided comments on July 5, 2018 indicating the need for further clarification of the scope of any proposed hydrological, hydrogeological and stormwater assessments as well as the development of a standard pre-development monitoring program to properly characterize nearby aquatic and wetland features and functions that may be negatively impacted.

Furthermore, the GRCA indicated a third inventory of vegetation communities is considered appropriate and will provide a good basis for wetland delineations and related ecological assessments. It was requested that an updated Terms of Reference addressing the comments be submitted to the GRCA. The updated terms, including information on the content for the SWM and hydrological study were included, and submitted to the GRCA, region and township on February 6, 2020. A response from John Brum of the GRCA was received on April 22, 2020 requesting that mapping clearly show wetland and woodland boundaries verified by GRCA and the Region of Waterloo, as well as that the pond feature on the subject property be further assessed using OWES to confirm its wetland status. GRCA also indicated the need for the

development application to satisfy all applicable policies for the administration of Ontario Regulation 150-06.

Tim Van Hinte, Region of Waterloo Environmental Planner provided comments on December 12, 2017 indicating that two winter wildlife surveys should be included in accordance with the Greenlands Network Implementation Guideline. In addition to the Region's comments, a site visit with Tim Van Hinte and Albert Hovingh (Region of Waterloo forestry staff) to discuss study requirements occurred on December 8, 2017. The revised Terms of Reference and agency correspondence is provided in *Appendix 1*.

2.0 Methods

2.1 Background Review

A background information review was conducted, of both biological and physical features within the vicinity of the study area. The following resources were consulted during this review:

- Atlas of the Breeding Birds of Ontario (Bird Studies Canada, 2008)
- GRCA EIS Guidelines (2005)
- Grand River Information Network (GRCA, 2018)
- Ontario Reptile and Amphibian Atlas (Ontario Nature, 2017a)
- Ontario Reptile and Amphibian Atlas Interactive map (Ontario Nature, 2017b)
- Ontario Mammal Atlas (1994)
- Ontario Ministry of Natural Resources (OMNR), Guelph District
- Natural Heritage Information Centre (NHIC) database (2018)
- Township of North Dumfries Official Plan (2018 Consolidation)
- Township of North Dumfries Zoning By-law 689-83 (2017 Consolidation)
- Region of Waterloo Official Plan (Last Revision: June 18, 2015)
- Region of Waterloo Greenlands Network Implementation Guideline (Final Draft, 2016)
- Region of Waterloo Significant Species list (1986-2007)
- MNRF, Guelph District, Species of Conservation Concern in North Dumfries (2018)
- Cedar Creek Subwatershed Study: Water Management Plan and Natural Heritage System Strategy (2019)

2.2 Natural Feature Delineations

2.2.1 Wetland Boundary

The Provincially Significant Roseville Swamp – Cedar Creek Wetland Complex is partly within the study area. Shannon Davison, Certified Ontario Wetland Evaluator, Aboud & Associates, performed initial staking of the boundary of the PSW within the subject property on August 7, 2018. The GRCA reviewed and confirmed the boundaries of the wetlands on October 2, 2018. Boundaries were determined using vegetation community borders and soil probes to depths of up to 60 cm for water and hydric soil detection, as per the *Ontario Wetland Evaluation system* (MNRF, 2014). The wetland boundary was established where vegetation was comprised of 50% wetland and 50% upland species, and where soils displayed hydric conditions (e.g. presence of mottles and/or gleys), per the *Ontario Wetland Evaluation System* (MNRF 2014). Due to property access restrictions, it was not possible to confirm the accuracy of the entire wetland boundary on adjacent lands outside of the subject property. Detailed survey dates and weather information are provided in *Appendix 8*.

2.2.2 Woodland Dripline

A portion of a woodland community is within the study area. Shannon Davison, Aboud & Associates, performed an initial staking of the woodland dripline within the subject property on October 2, 2018. The Region of Waterloo reviewed and confirmed the limits of the dripline on October 2, 2018.

2.2.3 Environmentally Sensitive Policy Area

The subject property contains a portion of Environmentally Sensitive Policy Area (ESPA) 41-Cedar Creek Spillway. As per the Region of Waterloo data sheet on ESPA 41, it consists of an extended corridor of mixed upland and swamp forest with sporadic concentrations of Eastern White Cedar and Tamarack. Cedar Creek forms the central axis of the ESPA. As per the Region of Waterloo comments on the Terms of Reference, The ESPA limit should be interpreted as the combined boundary of wetlands, woodlands and any other feature(s) where warranted (e.g. SWH, SAR habitat, etc.).

2.2.4 Buffer Recommendations and Setbacks

Recommended buffers and setbacks for wetland and woodland boundaries were determined through a variety of resources, including The GRCA's Wetland Policy Appendix – Interim Wetland Buffer Policy (2003); The City of London – Guidelines for Determining Setbacks and Ecological Buffers (2004); the Ecological Buffer Guideline Review (Beacon 2012) and recommendations of the Cedar Creek Subwatershed Study: Water Management Plan and Natural Heritage System Strategy (2019).

2.3 Vegetation

Ecological Land Classification (ELC) surveys were completed by qualified ecologist, Shannon Davison, OMNRF Certified in Ecological Land Classification, on May 18, August 7, and October 12, 2018. Vegetation communities within the study area were characterized and delineated following the Ecological Land Classification (ELC) system for Southern Ontario 1st approximation; community codes used generally follow the 2nd approximation (Lee, et al., 1998, 2008). Boundaries of ELC communities were mapped using aerial images and field observations (*Figure 2*). As part of this process, soils were characterized, and the study area was systematically searched in order to provide an inventory of vascular plants to provide a two season Botanical Inventory of the study area. Detailed survey dates and weather information are provided in *Appendix 8*.

Identified ELC communities were cross referenced with the NHIC Ontario Plant Community List (NHIC 2018) to determine the presence of rare plant communities (S1-Critically Imperiled, S2-Imperiled, or S3-Vulnerable). The Subnational, or Provincial, Ranks (S Rank) are assigned by the Ontario Ministry of Natural Resources and Forestry (MNRF) Natural Heritage Information Centre (NHIC) in order to help assign protection priorities. Detailed descriptions of each ELC community are provided in *Appendix 3*.

Identified vascular plant species were compared to provincial and federal SAR lists (COSARO, SARA), provincial ranks (NHIC 2018), global ranks, and Distribution and Status of the Vascular Plants of Southwestern Ontario (Oldham 1993) in order to assess federal, provincial, regional and local conservation status of each species. English colloquial names and scientific binomials of plant species generally follow the Database of Vascular Plants of Canada (Brouillet et al, 2010+).

Identification of environmentally sensitive plant species was completed based on assignment of a coefficient of conservatism value (CC) for each native species (Oldham, et al., 1995). The value of CC, ranging from 0 (low) to 10 (high), is based on a species' tolerance of disturbance and fidelity to specific natural habitat parameters. Species with a CC value of 9 or 10 generally exhibit a high degree of fidelity to a narrow range of habitat parameters. These species may be more sensitive to environmental changes (Mortarello et. al., 2010).

A list of all identified plant species is provided in *Appendix 4*. The list provides botanical names, common names, provincial rarity rank (S-rank), global rarity rank (G-rank), provincial Species at Risk status (SARO), federal Species at Risk status (SARA), Local rarity/significance within Wellington County (Dougan & Associates, 2009), coefficient of conservatism (CC) and coefficient of wetness (CW). Plant species that could only be identified to genus were not assigned the above information.

2.4 Wildlife Habitat

2.4.1 Amphibians (Anurans)

Evening point count surveys to detect breeding calls of anurans (frog and toad) were conducted by Shannon Davison, Ecologist and Matthew Iles, Wildlife Ecologist, in accordance with the *Marsh Monitoring Program Participants Handbook for Surveying Amphibians* (Bird Studies Canada 2009). Three surveys were completed during the recommended windows for the spring and early summer, to maximize the chances of detecting all potential species. Surveys coincided with optimum weather conditions for anuran breeding activity and detection of calls, i.e. suitable temperature relative to each survey window, humid or damp but not raining, and low wind. Call Level Codes were applied to each species detected per area of suitable habitat, and numbers of individuals were counted or estimated, where applicable. The surveys took place on April 24, May 25 and June 26, 2018. The Point Count locations are illustrated on *Figure 1*; Survey Results and Call Level Code descriptions are provided in *Appendix 9*. Detailed survey dates and weather information are provided in *Appendix 8*.

2.4.2 Breeding Birds

Breeding Bird Surveys were conducted in 2018 by AA (Matthew Iles, Wildlife Ecologist), to determine if significant breeding bird habitat occurs within, or adjacent to, the study area. Two surveys were conducted, comprised of 10-minute point counts positioned at a pre-determined location. Surveys following the *Ontario Breeding Bird Atlas: Guide for Participants* (Bird Studies Canada, 2001). The highest observed level of breeding evidence was used to assign breeding status (i.e. confirmed, possible, probable or observed) to each species.

As per the OBBA protocol, surveys were performed during the peak breeding season for the bulk of species in southern Ontario (last week of May through early July), and were spaced at least 10 days apart in order to determine presumed permanent territories through territorial singing males. The two surveys took place on the mornings of June 7, 2018 and July 9, 2018, between 30 minutes before dawn and 5 hours after dawn. The Point Count locations are

illustrated on *Figure 2*. Detailed survey dates and weather information are provided in *Appendix 8*.

2.4.3 Winter Wildlife

Winter Wildlife Surveys were completed on January 16, 2018 and January 30, 2018. Detailed surveys dates and weather information are provided in *Appendix 8*. Wildlife sightings and evidence such as tracks, scat, vocalizations, and markings were used to determine species presence. Notes and GPS points were taken for each location.

The entire study area, where access was granted, was surveyed on foot. As part of the survey, effort was applied to locating and identifying raptors, mammal tracks, stick nests, raptor wintering areas, and deer congregation areas. The path travelled during the winter wildlife survey is shown on *Figure 2*. All winter wildlife observations are presented in *Appendix 12*.

2.4.4 Incidental Wildlife Observations

Incidental observations of insects, mammals, birds and reptiles were recorded during all field visits.

2.4.5 Significant Wildlife Habitat

With guidance from the *Significant Wildlife Habitat Technical Guide* (2000) and the Significant Wildlife Habitat (SWH) EcoRegion Criterion Schedule 6E (2015), the subject property and immediately adjacent lands (within 120m) were considered for the presence of SWH (e.g. specialized habitats for wildlife, and habitat for species of conservation concern). An assessment of the study area for all SWH is provided in *Appendix 5*.

2.4.6 Fisheries Assessment

Investigation of the extent and character of fish habitat on the site was conducted by Myler Ecological Consulting (Myler). A roving reconnaissance conducted on 19 November 2018 focused on the segment of Cedar Creek main channel and searching for tributary connections. An exploration of tributaries within the site's White Cedar swamps and observations of the on-site pond were conducted on 20 December 2018.

2.4.7 Species at Risk Habitat

The subject property and immediately adjacent lands (within 120m) were reviewed for the presence of habitat that may be suitable for Species at Risk. Guidance was provided by the MNRF-Guelph District, as to what SAR may have the potential to occur within Waterloo Region. A review of the site, along with habitat requirements for each species was conducted; A variety of sources, including the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) documents were used to determine habitat suitability. The site was then evaluated for potential habitat using Ecological Land Classification, guidance from MNRF documents, and on-site knowledge acquired through field surveys. An assessment of the study area of candidate habitat for SAR is provided in *Appendix 6*.

2.4.7.1 Grassland Breeding Bird Surveys

Bobolink (*Dolichonyx oryzivorus*) and Eastern Meadowlark (*Sturnella magna*) are listed as Threatened provincially as a result of widespread population declines throughout Canada due to several factors, including habitat loss and mortality (McCracken, et al. 2013). Bobolink, Eastern Meadowlark and their habitat are protected under the Endangered Species Act (2007).

On June 4, 17 and July 2, 2020, a Grassland Breeding Bird Study was completed by Matthew Ross, Ecologist (Aboud & Associates) following the MNRF grassland breeding bird survey protocols, which included three rounds of surveys, with point count locations every 250m along transects set 250 m apart throughout the candidate habitat. The locations of birds in candidate habitat, breeding evidence and probable nest locations were identified. All other species observed incidentally were also recorded. The Point Count and transect locations are illustrated on *Figure 2*. Detailed survey dates and weather information are provided in *Appendix 8*.

3.0 Existing Conditions

3.1 Background Review

3.1.1 Natural Heritage Information Centre - Species at Risk

Preliminary investigation through the Natural Heritage Information Centre (NHIC 2018) identified three (3) Species of Conservation Concern records in the 1km x 1km squares (17NJ4800, 17NJ4700, 17NJ4600, 17NH4698, 17NH4699, 17NH4798, 17NH4799, 17NH4898, 17NH4899) within 1km of the study area. The Cedar Creek Tributary Wetland Complex, Roseville Swamp Cedar Creek Wetland Complex, Roseville Swamp, A mixed Wader Nesting Complex (2010-circa) are also noted in the study area. Habitat for Barn Swallow was noted as potentially occurring within the study area. Species and habitat requirements are summarized in *Table 1*.

Table 1. NHIC Species at Risk Records

Scientific Name	Common Name	COSEWIC	SARO	Last Observed	S-Rank	Habitat Requirements
<i>Empidonax virens</i>	Acadian flycatcher	Endangered	Endangered	July 24, 1985	S2S3B	Breeds in mature deciduous and mixed forests, using tableland forests and ravine habitats. Nests are often located over vernal pools, trails or bare ground in tablelands or over streams in ravines (COSEWIC 2010).
<i>Hirundo rustica</i>	Barn Swallow	Threatened	Threatened	May 25, 2016		Known to nest in caves, holes, crevices and ledges in cliff faces as well as artificial structures including barns and other outbuildings, garages, houses, bridges and road culverts (COSEWIC, 2011)
<i>Arigomphus furcifer</i>	Lily pad Clubtail	NAR	NAR	June 26, 1939		Occurs near lakes, ponds and slow-moving streams with floating vegetation including lily pads (Ontario Nature, 2013)
<i>Vallonia cyclophorella</i>	Silky Vallonia	NAR	NAR	May 26, 1996		Inhabit open areas, such as meadows, lawns and exposed rock outcrops, occasionally extended into more open forest vegetation, avoiding dense woods (American Malacological Society, 2008)
<i>Cypripedium arietinum</i>	Ram's-head Lady's-slipper	NAR	NAR	1900?	S3	Habitat for this species includes dry to moist open coniferous and mixed forests, coniferous-forested fens, and beach thickets (eflora, 2008).

3.1.2 Ministry of Natural Resources and Forestry

A request for information was sent to the MNRF to inquire whether any further Species at Risk may occur in the study area. A response was provided on November 29, 2018 and can be found in *Appendix 7*.

3.1.3 Ontario Breeding Bird Atlas

A list of birds determined to be breeding (Possible, Probable or Confirmed) in the 10km x 10km square containing the study area during the 2001-2005 Ontario Breeding Bird Atlas (Cadman et al. 2007) was compiled. This list includes 114 species; eleven are considered Species at Risk under the ESA and SARA, respectively (Least Bittern (THR, THR), Chimney Swift (THR, THR), Eastern Wood-pewee (SC, SC), Bank Swallow (THR, THR), Barn Swallow (THR, THR), Wood Thrush (THR, THR), Cerulean Warbler (END, END), Grasshopper Sparrow (SC, SC), Bobolink (THR, THR) and Eastern Meadowlark (THR, THR). Potential breeding habitat was identified on

the subject parcel for Bobolink and Eastern Meadowlark. Fifty-one of the species determined to be breeding in the square are considered Significant in Waterloo Region (Region of Waterloo, 2007). The findings of this review are presented in *Appendix 2*.

3.1.4 Ontario Reptile and Amphibian Atlas

Review of the Ontario Reptile and Amphibian Atlas (Ontario Nature 2017b) identified twenty-six species that are known to occur within the 10km x 10km square containing the study area (17NJ60). This list includes five species considered at risk under the ESA and SARA, respectively (Jefferson Salamander (END, END), Queensnake (END, END), Eastern Ribbonsnake (SC, SC), Snapping Turtle (SC, SC) and Blandings Turtle (THR, THR)), with two federally listed Species at Risk (Western Chorus Frog (SC) and Milksnake (SC)), and one provincially listed Species at Risk (Unisexual Ambystoma, Jefferson Dependent Population (END)). Fifteen of the species which may occur in the square are considered Significant in Waterloo Region (Region of Waterloo, 2003). The findings of this review are presented in *Appendix 2*.

3.1.5 Atlas of the Mammals of Ontario

Review of the Atlas of the Mammals of Ontario (Dobbyn 1994) identified twenty species that are known to occur within approximately 10km the study area. One species, Little Brown Myotis is listed as Endangered under the ESA and SARA. Five species are considered significant in Waterloo Region (Region of Waterloo, 1986). Potential maternity habitat for bat species at risk may occur on the subject parcel, in the PSW community. The findings of this review are presented in *Appendix 2*.

3.2 Natural Feature Boundary Delineations

3.2.1 Boundary Surveys

Following confirmation by the GRCA and Region of the PSW boundary and woodland dripline on October 2, 2018, they were surveyed by MacDonald Tamblyn Lord Surveying (*Figure 1*).

3.2.2 Wetland Characteristics

The GRCA's online mapping (Grand River Information Network, 2013) shows part of the Provincially Significant Roseville Swamp- Cedar Creek Wetland Complex, within the subject property along the western boundary. The portion of the PSW within the subject property is comprised of Poplar- Conifer Mineral Mixed Swamp with a community in the north-western corner classified as Mixed Graminoid Meadow Marsh that exhibits evidence of anthropogenic impacts.

The pond feature located in the north-west corner of the subject property was investigated in regards to the Ontario Wetland Evaluation System. Through investigation it was determined that the pond a man-made dug feature and showed no signs of any hydrological connection to the larger PSW or natural characteristics. As per OWES (2013), this pond feature was not included as part of the larger PSW as it was constructed for purposes other than wetland conservation.

3.2.3 Woodland Characteristics

Two communities containing existing woodland are present on the subject property. The portion along the western edge is included within the Poplar- Conifer Mineral Mixed Swamp as part of the PSW, while the woodland pocket in the north-east corner is classified as Dry-Fresh Sugar Maple- Oak Deciduous Forest.

3.2.4 Environmentally Significant Policy Area

A portion of the Cedar Creek Spillway ESPA occurs within the southwestern section of the subject property.

3.2.5 Subwatershed Study

The Upper Cedar Creek Subwatershed Study: Water Management Plan and Natural Heritage System Strategy (2019) indicates that the subject property contains MNRF Wooded Areas, Significant Woodlands, the Roseville Swamp – Cedar Creek Provincially Significant Wetland Complex, Cedar Creek Spillway ESPA, GRCA floodplain and regulation limits. All of these features occur within the western and southern portions of the subject property, with the exception of MNRF Wooded Area that is present within the northeastern portion.

The Subwatershed Study recommends the application of 30 m buffers for the Roseville Swamp – Cedar Creek Provincially Significant Wetland Complex and Cedar Creek Spillway ESPA.

3.3 Vegetation

3.3.1 Ecological Land Classification and Botanical Inventory

The community polygons identified during the ELC survey are summarized in *Table 2* below. Field forms and a comprehensive vascular plant list for the entire study area are presented in *Appendices 3* and *4*, respectively.

Table 2. Ecological Land Classification		
ELC Code	Vegetation Type	Community Description
<i>Mixed Meadow (MEM)</i>		
MEMM3	Dry- Fresh Mixed Meadow	This community occurs within the eastern portion of the study area along Dumfries Road and a stretch of Cedar Creek Road. The canopy and sub-canopy are comprised of scattered trees primarily along the edges, including Balsam Poplar (<i>Populus balsamifera</i>), Silver Maple (<i>Acer saccharinum</i>) and Eastern White Cedar (<i>Thuja occidentalis</i>). The understorey is comprised of Eastern Late Goldenrod (<i>Solidago altissima</i> ssp. <i>Altissima</i>), Smooth Brome (<i>Bromus inermis</i>), Wild Carrot (<i>Daucus carota</i>) and Common Mullein (<i>Verbascum thapsus</i>), while the ground layer includes Smooth Brome, Canada Bluegrass (<i>Poa compressa</i>), Gray-stemmed Goldenrod (<i>Solidago nemoralis</i> ssp. <i>Nemoralis</i>) and White Sweet-clover (<i>Melilotus albus</i>).
<i>FOM (Mixed Forest)</i>		

Table 2. Ecological Land Classification

ELC Code	Vegetation Type	Community Description
FOCM7*	Naturalized Mixed Hedgerow	This narrow hedgerow community is located between the subject property and Cedar Creek Community Church on the north-west corner of Cedar Creek Road and Dumfries Road. The canopy and sub-canopy contain species including Trembling Aspen (<i>Populus tremuloides</i>), Eastern White Pine (<i>Pinus strobus</i>), Norway Spruce (<i>Picea abies</i>), Common Buckthorn (<i>Rhamnus cathartica</i>), Eastern White Cedar and Riverbank Grape (<i>Vitis riparia</i>). The understorey is composed of Common Buckthorn, Riverbank Grape, Nannyberry (<i>Viburnum lentago</i>) and Virginia Creeper (<i>Parthenocissus quinquefolia</i>) with Kentucky Bluegrass (<i>Poa pratensis</i>) and Common Dandelion (<i>Taraxacum officinale</i>) in the ground layer.
<i>Commercial and Institutional (CVC)</i>		
CVC4	Extraction	Located in the centre of the subject property, this community is comprised of a portion of the former gravel pit operation. Most of the community is open, with sparse trees and shrubs including Large-tooth Aspen (<i>Populus grandidentata</i>), Balsam Poplar, Basket Willow (<i>Salix purpurea</i>) and Manitoba Maple (<i>Acer negundo</i>) comprising the canopy and sub-canopy. Balsam Poplar, Basket Willow, White Sweet-clover and European Reed (<i>Phragmites australis</i> spp. <i>australis</i>) are the most common species in the understorey while Gray-stemmed Goldenrod, Tall Tumble Mustard (<i>Sisymbrium altissimum</i>), Black Medic (<i>Medicago lupulina</i>) and Basket Willow comprise the ground layer. A second polygon located opposite Cedar Creek Road containing a portion of an active gravel pit operation has also been classified as an Extraction community.
CVC2	Light Industry	StonePlace, a landscape supplier is located immediately north-east of the subject property. A deciduous Sugar Maple- Oak forest separates StonePlace from the former gravel pit operation.
<i>Deciduous Forest (FOD)</i>		
FODM5-3	Dry- Fresh Such Maple- Oak Deciduous Forest	This forested community occurs in the north-east corner of the subject property, backing onto StonePlace on Dumfries Road. The majority of the canopy is Sugar Maple (<i>Acer saccharum</i>) with Red Oak (<i>Quercus rubra</i>) as well as White Ash (<i>Fraxinus americana</i>) and Shagbark Hickory (<i>Carya ovata</i>). The sub-canopy and understorey consist primarily of Common Buckthorn, Sugar Maple, Chokecherry (<i>Prunus virginiana</i>), Staghorn Sumac (<i>Rhus typhina</i>) and Riverbank Grape, while the ground layer includes Trout Lily (<i>Erythronium americanum</i>), Sugar Maple, Common Buckthorn and Blue Cohosh (<i>Caulophyllum thalictroides</i>).
<i>Mixed Swamp (SWM)</i>		
SWMM3-2	Poplar- Conifer Mineral Mixed Swamp	The portion of Roseville Swamp- Cedar Creek PSW within the study area is comprised of a Mixed Swamp. The canopy consists of Trembling Aspen, Eastern White Pine, American Larch (<i>Larix laricina</i>) and Crack Willow (<i>Salix X fragilis</i>), with the sub-canopy being dominated by Eastern White Cedar, Eastern White Pine, Trembling Aspen and Glossy Buckthorn (<i>Frangula alnus</i>). The understorey is composed primarily of species including Glossy Buckthorn, Common Buckthorn, Chokecherry and Black Ash (<i>Fraxinus nigra</i>) with the ground layer bring comprised of Sensitive Fern (<i>Onoclea sensibilis</i>), Dwarf Raspberry (<i>Rubus pubescens</i>), Field Horsetail (<i>Equisetum arvense</i>) and Small Enchanter's Nightshade (<i>Circaea alpina</i>).
<i>Graminoid Meadow (MEG)</i>		
MEGM3-2	Canada Bluegrass Graminoid Meadow	A small polygon that fronts onto Cedar Creek Road contains evidence of a being a former residence has been classified as a graminoid meadow. A thin hedgerow of trees present along the limits of the polygon contains Norway Spruce, Black Walnut (<i>Juglans nigra</i>) and Sugar Maple. Within the polygon, the understorey consists primarily of Smooth Brome, Wild red Raspberry (<i>Rubus ideaus</i> ssp. <i>strigosus</i>) and Eastern Late Goldenrod with the ground layer dominated by Canada Bluegrass and associate species including White Clover (<i>Trifolium repens</i>), Canada Thistle (<i>Cirsium arvense</i>) and Common Dandelion.
<i>Meadow Marsh (MAM)</i>		

Table 2. Ecological Land Classification

ELC Code	Vegetation Type	Community Description
MAMM1-3	Reed Canary Grass Graminoid Mineral Meadow Marsh	This open marsh community is found adjacent to portions of the Mixed Swamp. The canopy and sub-canopy contain sparse trees and shrubs including Trembling Aspen, American Larch, Black Ash (<i>Fraxinus nigra</i>) and Red-osier Dogwood. The understorey is dominated by Reed Canary Grass with associate species consisting of Spotted Joe-Pye-Weed (<i>Eutrochium maculatum</i> var. <i>maculatum</i>), Rice Cut Grass (<i>Leersia oryzoides</i>) and Broad-leaved Cattail (<i>Typha latifolia</i>), with the ground layer including Colt's-foot (<i>Tussilago farfara</i>), Yellow Marsh Marigold (<i>Caltha palustris</i>), Smooth Bedstraw (<i>Galium mollugo</i>) and Great Blue Lobelia (<i>Lobelia siphilitica</i>).
MAMM1-16	Mixed Graminoid Meadow Marsh	This meadow marsh community occurs in the north-west corner of the subject parcel immediately south of the railroad tracks. The canopy and sub-canopy exist only along the railway and are comprised of species including Crack Willow, Trembling Aspen, Black Walnut, Basket Willow, Red-osier Dogwood (<i>Cornus sericea</i>) and Eastern White Pine. The dense understorey is dominated by Common Scouring-rush (<i>Equisetum hyemale</i>), Reed Canary Grass (<i>Phalaris arundinacea</i>), Basket Willow and European Reed with the ground layer consisting of Gray-stemmed Goldenrod, Wild Strawberry (<i>Fragaria virginiana</i>) and Tufted Vetch (<i>Vicia cracca</i>).
<i>Open Agriculture (OAG)</i>		
OAGM1	Annual Row Crops	The portion of the study area east of Dumfries Road contains active agriculture that showed evidence of a corn and soy rotation. Due to property access restrictions, this community could only be observed from Dumfries Road.
OAGM2	Perennial Cover Crops	Two polygons consisting of perennial cover crops border the existing Mixed Swamp community. These polygons are dominated by Alfalfa (<i>Medicago sativa</i>) with associate species mainly along the edges including Reed Canary Grass, Wild Carrot, Red Clover and Black Medic. Trees such as Black Walnut and Manitoba Maple are found scattered along the edges of the polygons.
<i>Green Lands (CGL)</i>		
CGL4	Recreational	The polygons within the study area containing the Cedar Creek Community Church and a portion of the Waterloo Regional Police Association and Recreation Centre have been identified as falling within the Recreational classification.
<i>Residential (CVR)</i>		
CVR4	Rural Property	A small rural residential property is located immediately south of Cedar Creek Road between the Roseville Swamp- Cedar Creek PSW and active gravel pit operation. This property contains a single-family dwelling, garage and two accessory buildings. Due to property access restrictions, this community could only be observed from Cedar Creek Road.

3.3.1.1 Species at Risk, Regional and Local Significance

No vegetation communities listed above are considered rare in the province.

One hundred and six vascular plants were identified to species within subject lands during the botanical inventory. Of those identified, 71 species or 67% were native and 35 species or 33% were exotic. Most of the native species are ranked S5 (Secure in Ontario) or SNA (S-Rank not applicable) with two species, White Ash (*Fraxinus americana*) and Black Ash (*Fraxinus nigra*) ranking S4 (apparently secure in Ontario), and an additional two species, Virginia Creeper (*Parthenocissus quinquefolia*) and Black Walnut (*Juglans nigra*) ranked as S4?, indicating uncertainty in its ranking. No S1-S3 species were observed in the study area. No species observed had a Conservation Co-efficient of 9 or 10. Hard-stemmed Bulrush (*Schoenoplectus*

acutus var. acutus) is considered Significant in Waterloo Region (Regional Municipality of Waterloo, 2007).

No nationally or provincially rare, threatened or endangered species were found.

3.4 Wildlife Habitat

3.4.1 Amphibian (Anurans)

The results of the Anuran Point Count Surveys are summarized in *Table 3* and are discussed below. The Point Count Locations are illustrated in *Figure 1*, and Call Level Code descriptions, along with the complete survey results, are provided in *Appendix 9*.

Table 3. Amphibian Survey Results		
SPECIES	Amphibian Habitat	
	A	B
American Toad		1-1*
Gray Treefrog	1-2	
Spring Peeper		3*
Significance	N	N

Amphibian Call Level codes:

1-#: Calls not simultaneous, number of individuals can be accurately counted

2-#: Some calls simultaneous, number of individuals can be reliably estimated

3: Full chorus, calls continuous and overlapping, number of individuals cannot be reliably estimated

Significance:

Y-Indicates Amphibian Habitat meets the criteria listed under the Ecoregion 6E SWH Criteria guide (2015).

N-Indicates Amphibian Habitat did not meet the criteria listed under the Ecoregion 6E SWH Criteria guide (2015).

*- Denotes species heard calling outside 100m

3.4.1.1 Amphibian Habitat A

One species of frog was detected calling from within Amphibian Habitat A. This site targeted the southern portion of the Roseville Swamp-Cedar Creek PSW within the study area. The proximity to the road as well as the rail line may contribute to the lack of species and overall frogs detected. Based on the species and numbers identified, Amphibian Habitat A does not meet the criteria for Significant Wildlife Habitat- Amphibian Breeding (Woodland).

3.4.1.2 Amphibian Habitat B

Two species of frog were detected calling from within Amphibian Habitat B. This site targeted the northern portion of the Roseville Swamp- Cedar Creek PSW within the study area as well as the man-made pond. All frog species were heard calling from within the Swamp polygon. Amphibian Habitat B does not meet the criteria for Significant Wildlife Habitat- Amphibian Breeding (woodland).

3.4.1.5 Species at Risk, Regional and Local Significance

No species observed are considered federal or provincial Species at Risk. The Subnational, or Provincial, Ranks (S Rank) are assigned by the Ontario Ministry of Natural Resources and Forestry (MNR) Natural Heritage Information Centre (NHIC) in order to help assign protection priorities. All of the species detected are ranked S5 (Very Common) in Ontario (NHIC, 2018).

3.4.2 Breeding Birds

The results of the Breeding Bird Survey (BBS) are presented in *Table 4* and *Table 5* and significant species are shown on *Figure 2*. Locations of observations provided in the figure are approximate and are designed to give a general indication of the area in which the species may be nesting. During BBS visits, a total of 42 species were detected over three-point count locations and area searches. Species breeding evidence observed during point count surveys included eight assigned 'Probable', 12 assigned 'Possible', one assigned 'Confirmed' and two showed no sign of breeding evidence. All were detected within the study area. During the area search transects a total of 37 species were detected, 19 of which were not identified during point counts (Great Blue Heron (*Ardea herodias*), Green Heron (*Butorides virescens*), Canada Goose (*Branta canadensis*), Turkey Vulture (*Cathartes aura*), Spotted Sandpiper (*Actitis macularius*), Rock Pigeon (*Columba livia*), Mourning Dove (*Zenaida macroura*), Yellow-billed Cuckoo (*Coccyzus americanus*), Northern Flicker (*Colaptes auratus*), Willow Flycatcher (*Empidonax traillii*), Least Flycatcher (*Empidonax minimus*), Eastern Kingbird (*Tyrannus tyrannus*), Tree Swallow (*Tachycineta bicolor*), Gray Catbird (*Dumetella carolinensis*), Common Yellowthroat (*Geothlypis trichas*), Indigo Bunting (*Passerina cyanea*), Swamp Sparrow (*Melospiza georgiana*), Orchard Oriole (*Icterus spurius*) and Baltimore Oriole (*Icterus galbula*) of these, only Green Heron, Turkey Vulture and Baltimore Oriole showed probable or confirmed evidence of breeding.

Due to the contiguity with natural lands surrounding the study area, it is important to note that, despite high levels of breeding evidence, a given species may not have been breeding specifically in the area in which it was observed. This is particularly true where species were only detected during one of the Breeding Bird Surveys. These species may have been foraging in these areas or, may have been wandering during post-breeding dispersal. Therefore the following 11 species are those that can be presumed to have been breeding in, or within 120m of the study area and were detected with probable or confirmed breeding evidence: Killdeer (*Charadrius vociferus*), Yellow Warbler (*Dendroica petechia*), Savannah Sparrow (*Passerculus sandwichensis*), Red-winged Blackbird (*Agelaius phoeniceus*), Eastern Meadowlark (*Sturnella magna*), Red-tailed Hawk (*Buteo jamaicensis*), Horned Lark (*Eremophila alpestris*), Song Sparrow (*Melospiza melodia*), Brown-headed Cowbird (*Molothrus ater*), Baltimore Oriole (*Icterus galbula*) and American Goldfinch (*Carduelis tristis*).

The results of the point counts and area searches can be found in *Appendix 10*.

Table 4. Point Count Surveys - Highest Breeding Evidence (HBE)

Common Name	Scientific Name	COSARO	COSEWIC	S Rank	G Rank	Area sensitive	Area required (ha)	PIF priority species	GRCA (web)	Waterloo Region (2007)	A		B		C	
											TOTAL	HBE	TOTAL	HBE	TOTAL	HBE
Red-tailed Hawk	<i>Buteo jamaicensis</i>			S5	G5						1	A	0		0	
Killdeer	<i>Charadrius vociferus</i>			S5B	G5						0		0		2	A
Great Crested Flycatcher	<i>Myiarchus crinitus</i>			S4B	G5						0		1	H	0	
Horned Lark	<i>Eremophila alpestris</i>			S5B	G5				CP		0		0		2	S
Northern Rough-winged Swallow	<i>Stelgidopteryx sripennis</i>			S4B	G5				CP		1	H	0		0	
Bank Swallow	<i>Riparia riparia</i>	THR	THR	S4B	G5			✓	CP		4	FO	0		0	
Barn Swallow	<i>Hirundo rustica</i>	THR	THR	S4B	G5				CP		3	FO	0		0	
Blue Jay	<i>Cyanocitta cristata</i>			S5	G5						1	H	1	FO	0	
Black-capped Chickadee	<i>Poecile atricapillus</i>			S5	G5				CP		2	H	3	S	1	S
American Robin	<i>Turdus migratorius</i>			S5B	G5						0		1	S	2	S
Brown Thrasher	<i>Toxostoma rufum</i>			S4B	G5			✓	CP	✓	0		0		2	P
Warbling Vireo	<i>Vireo gilvus</i>			S5B	G5					✓	0		1	S	0	
Yellow Warbler	<i>Dendroica petechia</i>			S5B	G5						0		1	A	0	
American Redstart	<i>Setophaga ruticilla</i>			S5B	G5	✓	>100		CP	✓	1	S				
Common Yellowthroat	<i>Geothlypis trichas</i>			S5B	G5						2	S	0		1	S
Northern Cardinal	<i>Cardinalis cardinalis</i>			S5	G5						4	P	0		0	
Field Sparrow	<i>Spizella pusilla</i>			S4B	G5			✓	CP		1	S	2	S	3	S
Savannah Sparrow	<i>Passerculus sandwichensis</i>			S4B	G5	✓	>50	✓	CP		1	S	2	S	3	NY
Song Sparrow	<i>Melospiza melodia</i>			S5B	G5						1	S	2	S	0	
Red-winged Blackbird	<i>Agelaius phoeniceus</i>			S4	G5						2	P	2	P	2	P
Eastern Meadowlark	<i>Sturnella magna</i>	THR	THR	S4B	G5	✓	>10	✓	CP		0	CF	0		4	P
Brown-headed Cowbird	<i>Molothrus ater</i>			S4B	G5						0		0		2	P
American Goldfinch	<i>Carduelis tristis</i>			S5B	G5				CP		1	H	0		0	

Table 5. Area Search Transects – Highest Breeding Evidence (HBE)

Common name	Scientific name	COSARO	COSEWIC	SARA	S RANK	G RANK	Area Sensitive (MNRF 2000)	Area Required (Ha)	PIF priority Species (BCR 13)	GRCA(web)	Waterloo Region (2007)	06/07/18 HBE	07/09/18 HBE
Great Blue Heron	Ardea herodias				S4	G5				✓	✓	FO	FO
Green Heron	Butorides virescens				S4B	G5			CP	✓	✓	P	
Canada Goose	Branta canadensis				S5	G5			CP			FO	
Turkey Vulture	Cathartes aura				S5B	G5			CP	✓	✓	FO	P
Red-tailed Hawk	Buteo jamaicensis				S5	G5						P	A
Killdeer	Charadrius vociferous				S5B, S5N	G5						H	P
Spotted Sandpiper	Actitis macularius				S5	G5			CP			H	
Rock Pigeon	Columba livia				SNA	G5						FO	
Mourning Dove	Zenaida macroura				S5	G5						H	
Yellow-billed Cuckoo	Coccyzus americanus				S4B	G5				✓	✓	H	
Northern Flicker	Colaptes auratus				S4B	G5			✓				H
Willow Flycatcher	Empidonax traillii				S5B	G5			✓	✓	✓	S	S
Least Flycatcher	Empidonax minimus				S4B	G5	✓	>100	CP	✓	✓	S	
Eastern Kingbird	Tyrannus tyrannus				S4B	G5			✓	CP		H	H
Tree Swallow	Tachycineta bicolor				S4B	G5						FO	
Northern Rough-winged Swallow	Stelgidopteryx serripennis				S4B	G5			CP			FO	FY
Barn Swallow	Hirundo rustica	THR	THR		S4B	G5			CP			FO	FO
Blue Jay	Cyanocitta cristata				S5	G5							H
Black-capped Chickadee	Poecile atricapillus				S5	G5			CP			H	
American Robin	Turdus migratorius				S5B	G5						S	
Gray Catbird	Dumetella carolinensis				S4B	G5			CP			S	
Warbling Vireo	Vireo gilvus				S5B	G5				✓	✓	S	S
Yellow Warbler	Dendroica petechia				S5B	G5							S
Common Yellowthroat	Geothlypis trichas				S5B	G5							S
Northern Cardinal	Cardinalis cardinalis				S5	G5						S	S
Indigo Bunting	Passerina cyanea				S4B	G5							S
Field Sparrow	Spizella pusilla				S4B	G5							S
Savannah Sparrow	Passerculus sandwichensis				S4B	G5	✓	>50	✓	CP			FY
Song Sparrow	Melospiza melodia				S5B	G5						CF	S
Swamp Sparrow	Melospiza georgiana				S5B	G5			CP	✓	✓		S
Red-winged Blackbird	Agelaius phoeniceus				S4	G5						P	V
Eastern Meadowlark	Sturnella magna	THR	THR		S4B	G5	✓	>10	✓	CP		P	FY
Brown-headed Cowbird	Molothrus ater				S4B	G5						P	FY
Orchard Oriole	Icterus spurius				S4B	G5			CP	✓	✓	S	
Baltimore Oriole	Icterus galbula				S4B	G5			✓			P	H

American Goldfinch	Carduelis tristis				S5B	G5				CP		P	P
Legend (Table 4 and 5): COSARO: Committee on the status of Species at Risk Ontario COSEWIC: Committee on the status of Endangered Wildlife in Canada SARA: Species at Risk Act THR: Threatened SC: Special Concern S-Rank: S4: Apparently Secure—Uncommon but not rare S5: Secure—Common, widespread, and abundant in the province G-Rank: G5: Very common globally; demonstrably secure		Breeding Evidence: <u>Observed</u> FO-flyover <u>Possible</u> H-suitable habitat S-singing male <u>Probable</u> P-Pair T-territory (2 visits) A-Agitated			<u>Confirmed</u> FY-fledged young CF-adult carrying food				Grand River Conservation Authority: CP: Conservation Priority				

3.4.2.1 Species at Risk, Regional and Local Significance

Three species observed are considered federal and provincial Species at Risk. Barn Swallow was observed flying over the Mixed Meadow; Bank Swallow was observed flying over the southern-most cover crop community; and recently fledged Eastern Meadowlarks were observed in the Mixed Meadow. Only Eastern Meadowlark was observed within the subject property. The Subnational, or Provincial Ranks (SRank) are assigned by the Ontario Ministry of Natural Resources and Forestry (OMNRF) Natural Heritage Information Centre (NHIC) in order to help assign protection priorities. All species detected in the study area are ranked as either S4 (Common) or S5 (Very Common) in Ontario. The rank qualified 'B' denotes the status of a migratory species during the breeding species.

Within Waterloo Region, several species that are considered significant have been identified (Regional Municipality of Waterloo, 2007). Eleven Regionally Significant species were observed in the survey area, two of which, Brown Thrasher and Green Heron, displayed probable breeding evidence, seven were observed with possible breeding evidence; American Redstart, Yellow-billed Cuckoo, Willow Flycatcher, Least Flycatcher, Warbling Vireo, Swamp Sparrow, Orchard Oriole and two, Great Blue Heron and Turkey Vulture were observed as fly-overs.

Of the Regionally Significant species observed, only three species were observed from the point count locations within the subject lands. Brown Thrasher was observed in the south-east portion of the Mixed Meadow, this species is associated with overgrown pastures, alvars, hedgerows and shrubby thickets across southern Ontario (Cadman et al, 2007). Warbling Vireo was observed along the south-facing edge of the northern-most portion of the Roseville Swamp-Cedar Creek PSW, this species prefers deciduous woodlands within incomplete canopy closure, but is also found in hedgerows, narrow riparian strips, and landscape plantings, specifically around wet areas (Cadman et al, 2007). American Redstart was observed between the edge of the Roseville Swamp- Cedar Creek PSW and the Canada Bluegrass Graminoid Meadow. This species occurs in open and semi-open deciduous and mixed forests, usually avoiding fully mature forests (Cadman et al, 2007). Breeding habitat for all three species occurs within the subject property.

3.4.2.2 Regional Priority Species

The Ontario Landbird Conservation Plan (OLCP): Lower Great Lakes/St. Lawrence Plain, North American Bird Conservation Region 13 (Partners in Flight, 2008) has identified a number of species that are considered conservation priorities for the region (Ontario PIF, 2006). Nine priority species (Bank Swallow, Brown Thrasher, Field Sparrow, Savannah Sparrow, Eastern Meadowlark, Northern Flicker, Willow Flycatcher, Eastern Kingbird and Baltimore Oriole) were observed in the study area. The OLCP does not provide legislative protection of species or their habitat, but rather identifies species that should be conservation priorities on a regional level, beyond those designated Species at Risk.

3.4.3 Winter Wildlife

A total of nine species were identified during the Winter Wildlife Survey, including five bird species, and four mammal species. Tracks of a small rodent were also observed however a species could not be identified. Figure 2 illustrates the Winter Wildlife Survey route. All species identified during the survey are listed in Appendix 11. All species identified during the survey are considered provincially Secure (S5). No Significant Wildlife Habitat was identified during the Winter Wildlife Survey.

Snow depth in the study area during the January 16 survey was approximately 0.10m up to 0.4m in snow drifts. There was no precipitation during the survey, however approximately 5cm of snow fell within the proceeding 24 hours. During the survey on January 30, snow depth within the study area was approximately 0.15m and up to 0.4m in snow drifts. There was no precipitation during the survey, however approximately 2-5cm of fresh snow cover fell within the preceding 24 hours.

The results of the winter wildlife Survey can be found in *Appendix 12*.

3.4.4 Incidental Wildlife Observations

Incidental wildlife observations made outside of the above formal field surveys are presented in *Table 6*. All observations were of single individuals unless otherwise stated. None of these species are designated as Species at Risk.

Table 6. Incidental Wildlife Observations

Common Name	Scientific Name	Taxa	Date	Location/Notes
Field Sparrow	<i>Spizella pusilla</i>	Bird	August 7, 2018	Observed during ELC/botanical survey
Red-winged Blackbird	<i>Agelaius phoeniceus</i>	Bird	May 18, 2018	Observed during ELC/botanical survey
American Crow	<i>Corvus brachyrhynchos</i>	Bird	May 18, 2018	Flying over during ELC/botanical survey
Black-capped Chickadee	<i>Poecile atricapillus</i>	Bird	August 7, 2018	Observed during ELC/botanical survey
Blue Jay	<i>Cyanocitta cristata</i>	Bird	August 7, 2018	Observed during ELC/botanical survey
American Robin	<i>Turdus migratorius</i>	Bird	May 18, 2017	Observed during ELC/botanical survey
Turkey Vulture	<i>Cathartes aura</i>	Bird	May 18, 2018	Flying over during ELC/ botanical survey
American Goldfinch	<i>Spinus tristis</i>	Bird	August 7, 2018	Observed during ELC/botanical survey

European Starling	<i>Sturnus vulgaris</i>	Bird	May 18, 2018	Observed on adjacent property during ELC/botanical survey
Pileated Woodpecker	<i>Hylatomus pileatus</i>	Bird	August 7, 2018	Observed feeding evidence during ELC/botanical survey
Gray Catbird	<i>Dumetella carolinensis</i>	Bird	August 7, 2018	Observed on adjacent property during ELC/botanical survey
Eastern Cottontail	<i>Sylvilagus floridanus</i>	Mammal	May 18, 2018	Tracks observed during ELC/botanical survey
White-tailed Deer	<i>Odocoileus virginianus</i>	Mammal	June 7, 2018 August 7, 2018	Individual observed during Breeding Bird area search (June 7). Tracks observed during ELC/botanical survey (Aug. 7).
Monarch	<i>Danaus plexippus</i>	Insect	June 7, 2018 July 9, 2018 August 7, 2018	Adult observed during Breeding bird area search (June 7 & July 9). Caterpillar observed on Milkweed during ELC/botanical survey (Aug. 7)
Common Eastern Bumblebee	<i>Bombus impatiens</i>	Insect	August 7, 2018	Observed gathering pollen during ELC/botanical survey
Black Saddlebags	<i>Tramea lacerate</i>	Insect	June 7, 2017	Observed during breeding bird area search.

3.4.5 Species at Risk Habitat Assessment

Species at Risk habitat was identified in 2018 during field surveys by Aboud & Associates Inc. within the proposed development area. Habitat for Grassland Bird Species at Risk (Eastern Meadowlark) occurs within the Dry- Fresh Mixed Meadow in the eastern portion of the subject property. Breeding bird surveys identified two Eastern Meadowlark pairs in suitable nesting habitat during breeding season. Additional surveys following the Grassland Bird protocols were completed in 2020 to confirm the presence/absence of grassland breeding bird habitat, and its limits on the site.

3.4.5.1 Grassland Breeding Bird Survey

The results of the Grassland Breeding Bird Survey (GBBS) are presented in *Table 7* and *Table 8*. During GBBS visits, a total of 22 species were detected over six point count locations and two transect area searches. Species breeding evidence observed during point count surveys included 14 assigned 'Possible', six assigned 'Probable', one assigned 'Confirmed' and one showed no sign of breeding evidence. All were detected within the study area. During the area search transects a total of seven species were detected, two of which were not identified during point counts: Bobolink (*Dolichonyx oryzivorus*) and Baltimore Oriole (*Icterus galbula*); neither of these species exhibited probable or confirmed evidence of breeding.

Due to the contiguity with natural lands surrounding the study area, it is important to note that, despite high levels of breeding evidence, a given species may not have been breeding specifically in the area in which it was observed. This is particularly true where species were only detected during one of the surveys. These species may have been foraging in these areas or, may have been wandering during post-breeding dispersal. Therefore the following seven species are those that can be presumed to have been breeding in, or within 120m of the study area and were detected with probable or confirmed breeding evidence: Horned Lark (*Eremophila alpestris*), Brown Thrasher (*Toxostoma rufum*), Savannah Sparrow (*Passerculus sandwichensis*), Song Sparrow (*Melospiza melodia*) Eastern Meadowlark (*Sturnella magna*), Brown-headed Cowbird (*Molothrus ater*), and American Goldfinch (*Carduelis tristis*).

The results of the Grassland bird point counts and area searches can be found in *Appendix 11*.

Table 7. Point Count Surveys - Highest Breeding Evidence (HBE)

Common Name	Scientific Name	COSSARO	COSEWIC	S-RANK	G-RANK	AREA SENSITIVE	AREA REQUIRED	PIF SPECIES	GRCA(date unk.)	Waterloo Region (2007)	1		2		3		4		5		6	
											TOTAL	HBE	TOTAL	HBE	TOTAL	HBE	TOTAL	HBE	TOTAL	HBE	TOTAL	HBE
Spotted Sandpiper	Actitis macularius			S5	G5				CP		0	NA	0	NA	0	NA	0	NA	1	H	0	NA
Northern Flicker	Colaptes auratus			S4B	G5			✓			0	NA	0	NA	0	NA	0	NA	1	H	0	NA
Eastern Wood-pewee	Contopus virens	SC	SC	S4B	G5			✓			1	S	0	NA	0	NA	0	NA	0	NA	0	NA
Willow Flycatcher	Empidonax traillii			S5B	G5			✓		✓	0	NA	0	NA	0	NA	0	NA	1	S	0	NA
Eastern Kingbird	Tyrannus tyrannus			S4B	G5			✓	CP		0	NA	0	NA	1	S	1	H	0	NA	0	NA
Horned Lark	Eremophila alpestris			S5B	G5				CP		0	NA	0	NA	1	D	0	NA	1	D	0	NA
Bank Swallow	Riparia riparia	THR	THR	S4B	G5			✓	CP		0	NA	0	X	0	X	0	X	0	X	0	X
Gray Catbird	Dumetella carolinensis			S4B	G5				CP		0	NA	0	NA	1	S	0	NA	1	S	0	NA
Brown Thrasher	Toxostoma rufum			S4B	G5			✓	CP	✓	0	S	1	S	1	S	0	NA	1	A	1	S
European Starling	Sturnus vulgaris			SNA	G5						1	S	0	NA	0	NA	0	NA	0	NA	0	NA
Yellow Warbler	Dendroica petechia			S5B	G5						0	NA	0	NA	1	S	0	NA	1	S	0	NA
Northern Cardinal	Cardinalis cardinalis			S5	G5						0	NA	0	NA	0	NA	0	NA	0	NA	1	H
Indigo Bunting	Passerina cyanea			S4B	G5						1	S	0	NA	0	NA	0	NA	0	S	0	S
Clay-colored Sparrow	Spizella pallida			S4B	G5				CP	✓	1	S	1	S	1	S	1	S	2	S	0	NA
Field Sparrow	Spizella pusilla			S4B	G5			✓	CP		0	S	1	S	1	S	0	S	1	S	1	S
Savannah Sparrow	Passerculus sandwichensis			S4B	G5	✓	>50ha	✓	CP		1	S	4	P	3	A	3	P	1	S	2	A
Grasshopper Sparrow	Ammodramus savannarum	SC	SC	S4B	G5TU	✓	>10ha	✓	CP	✓	1	S	0	NA	2	S	1	S	1	S	1	S
Song Sparrow	Melospiza melodia			S5B	G5						1	A	0	NA	0	S	1	S	2	A	2	A
Red-winged Blackbird	Agelaius phoeniceus			S4	G5						0	NA	0	S	1	S	1	S	1	S	0	S
Eastern Meadowlark	Sturnella magna	THR	THR	S4B	G5	✓	>10ha	✓	CP		0	H	2	A	1	S	3	CF	1	A	2	S
Brown-headed Cowbird	Molothrus ater			S4B	G5						2	P	0	NA	0	P	0	NA	0	NA	0	NA
American Goldfinch	Carduelis tristis			S5B	G5				CP		1	S	3	H	0	NA	1	S	2	P	1	H

Table 8. Transect Area Search - Highest Breeding Evidence (HBE)

Common Name	Scientific Name	COSSARO	COSEWIC	SARA	S-RANK	G-RANK	AREA SENSITIVE	AREA REQUIRED	PIF SPECIES (BCR 13)	GRCA (date unk.)	Waterloo Region	04-Jun-20	17-Jun-20	02-Jul-20
												HBE	HBE	HBE
Bank Swallow	Riparia riparia	THR	THR	THR	S4B	G5			✓	CP		X		
Brown Thrasher	Toxostoma rufum				S4B	G5			✓	CP	✓			S
Savannah Sparrow	Passerculus sandwichensis				S4B	G5	✓	>50ha	✓	CP		H	A	A
Grasshopper Sparrow	Ammodramus savannarum	SC	SC	SC	S4B	G5	✓	>10ha	✓	CP	✓	S	S	
Bobolink	Dolichonyx oryzivorus	THR	THR	THR	S4B	G5	✓	>10ha	✓	CP			S	
Eastern Meadowlark	Sturnella magna	THR	THR	THR	S4B	G5	✓	>10ha	✓	CP		S	H	H
Baltimore Oriole	Icterus galbula			S4B	G5				✓			S		

Legend (Table 7 and 8):
 COSARO: Committee on the status of Species at Risk Ontario
 COSEWIC: Committee on the status of Endangered Wildlife in Canada
 SARA: Species at Risk Act
 THR: Threatened SC: Special Concern
 S-Rank:
 S4: Apparently Secure—Uncommon but not rare
 S5: Secure—Common, widespread, and abundant in the province
 G-Rank:
 G5: Very common globally; demonstrably secure

Breeding Evidence:
Observed
 X-observed
Possible
 H-suitable habitat
 S-singing male
Probable
 P-Pair
 T-territory (2 visits)
 A-Agitated

GRCA:
 CP: Conservation Priority
 CF-adult carrying food
 Region of Waterloo:
 ✓ significant

Species at Risk, Regional and Local Significance

Four species observed are considered federal and provincial Species at Risk. Eastern Meadowlark (THR), also observed during 2018 breeding bird surveys, was confirmed to be breeding in the mixed meadow habitat. Three additional SAR were observed during the grassland breeding bird surveys in 2020: Bobolink (THR) and Grasshopper Sparrow (SC) exhibited possible breeding evidence within the mixed meadow habitat, while Eastern Wood-pewee (SC) displayed possible breeding evidence in the deciduous forest habitat at the northernmost portion of the subject property.

The Subnational, or Provincial Ranks (SRank) are assigned by the Ontario Ministry of Natural Resources and Forestry (OMNRF) Natural Heritage Information Centre (NHIC) in order to help assign protection priorities. All species detected in the study area are ranked as either S4 (Common) or S5 (Very Common) in Ontario. The rank qualified 'B' denotes the status of a migratory species during the breeding season.

Within Waterloo Region, several species that are considered significant have been identified (Regional Municipality of Waterloo, 2007). Four Regionally Significant species were observed in the survey area, one of which, Brown Thrasher, displayed probable breeding evidence. The remaining three species, Willow Flycatcher, Grasshopper Sparrow and Clay-colored Sparrow, all displayed possible breeding evidence.

All regionally significant species were observed from the point count locations within the subject property. Brown thrasher was observed in the scrubby portions (small, regenerating trees and shrubs) found within the central and northwestern portions of the mixed- meadow on subject

property. This species is associated with overgrown pastures, alvars, hedgerows and shrubby thickets across southern Ontario (Cadman et al, 2007). Willow Flycatcher was observed in a low lying, hydric portion of the scrub. This species is generally associated with moist or dry shrubby sites (Sedgwick, 2020). Clay-colored Sparrow was also observed within the scrub habitat and is known to occupy a variety of habitat types including young pine plantations, abandoned fields regenerating with small trees and shrubs, forest openings and regenerating burns (Grant and Knapton, 2020). Grasshopper Sparrow was observed within the mixed meadow habitat within the subject property and generally prefers large tracts of moderately open grasslands with patches of bare ground (Vickery, 2020) Breeding habitat for all four species occurs within the subject property.

Regional Priority Species

The Ontario Landbird Conservation Plan (OLCP): Lower Great Lakes/St. Lawrence Plain, North American Bird Conservation Region 13 (Partners in Flight, 2008) has identified a number of species that are considered conservation priorities for the region (Ontario PIF, 2006). A total of 10 priority species (Northern Flicker, Eastern Wood-pewee, Willow Flycatcher, Eastern Kingbird, Bank Swallow, Brown Thrasher, Field Sparrow, Savannah Sparrow, Grasshopper Sparrow, and Eastern Meadowlark) were observed in the study area. The OLCP does not provide legislative protection of species or their habitat, but rather identifies species that should be conservation priorities on a regional level, beyond those designated Species at Risk.

3.4.6 Species Listed Under the Endangered Species Act

Observations, habitat requirements, breeding evidence and a habitat assessment of four species at risk (Eastern Meadowlark, Bobolink, Grasshopper Sparrow and Eastern Wood-pewee) observed in the study area, is discussed below. No other federal or provincially listed flora or fauna species was identified within the study area through background research or field observations.

3.4.6.1 Bobolink and Eastern Meadowlark

Bobolink and Eastern Meadowlark are listed as Threatened provincially (ESA, 2007) and federally (Species at Risk Public Registry, 2018). Bobolink, Eastern Meadowlark and their general habitat are afforded protection under the ESA. Bobolink and Eastern Meadowlark have similar habitat requirements, although each species exhibits its own preferences for certain microhabitat characteristics. Generally, both species tend to occupy grassland >5 ha that contain a high grass to forb ratio, with the presence of scattered woody shrubs or saplings, fence posts, poles, or wires to be used as perches. On a microhabitat scale, Bobolink prefer larger fields (>10ha), lower forb composition, tolerate wetter conditions, and are less tolerant of patches of bare ground. Meadowlark tolerate a higher proportion of shrubs, bare ground, smaller field size and prefer drier sites (McCracken, et al. 2013).

Eastern Meadowlark is a confirmed breeder in the study area, while Bobolink is considered to possibly be breeding. Locations identified as breeding habitat for breeding these species are identified on *Figure 2*.

3.4.6.2 Grasshopper Sparrow and Eastern Wood-pewee

Grasshopper Sparrow and Eastern Wood-pewee are listed as Special Concern species and are therefore considered under SWH and discussed in section 3.4.7.

It is our opinion that the proposed industrial severance and subsequent development will impact identified SAR habitat. Prior to detailed design and development, a mitigation plan and notice of registry must be prepared to ensure habitat for this species at risk is provided.

See *Appendix 6* for a detailed assessment of all potential Species at Risk Habitat that was evaluated for on the site.

3.4.7 Significant Wildlife Habitat Assessment

With guidance from the *Significant Wildlife Habitat Technical Guide* (2000) and the SWH EcoRegion Criterion Schedule 6E (2015), we have determined that Significant Wildlife Habitat (SWH) is present within the subject property.

Due to the results of the Breeding Bird Surveys identifying one Green Heron pair within suitable habitat during breeding season, the Reed Canary Grass and Mixed Graminoid Mineral Meadow Marsh communities adjacent to portions of the Mixed Swamp classify as Significant Marsh Breeding Bird Habitat. It is our opinion that the proposed development is unlikely to impact this SWH as these communities are classified as part of the great Roseville Swamp- Cedar Creek PSW and are afforded protection through adequate vegetation buffers.

The Grassland Breeding Bird Surveys identified habitat for two species of Special Concern within the subject property: Grasshopper Sparrow and Eastern Wood-pewee. Grasshopper Sparrow was present within the mixed- meadow habitat exhibiting possible breeding evidence, while Eastern Wood-pewee was present within the deciduous forest at the north end of the subject property, also exhibiting possible breeding evidence. The proposed development will result in the removal of habitat for Grasshopper sparrow. However, the required habitat management plan for Bobolink and Eastern Meadowlark under the ESA will adequately offset the loss of this grassland habitat, thereby mitigating impacts to Grasshopper Sparrow. As a 10 m buffer has been recommended for the deciduous forest, it is not anticipated that the proposed development will result in impacts to habitat for Eastern Wood-pewee. See *Appendix 5* for a detailed assessment of Significant Wildlife Habitat.

3.4.8 Fisheries Assessment

The entire site is within the Cedar Creek subwatershed, with site drainage generally westward towards the main branch of Cedar Creek. GRCA mapping shows the site contains only a very small segment of the main branch of Cedar Creek that meanders across the boundary near the site's southwestern corner. GRCA mapping also shows a tributary watercourse extending from the main channel along the site boundary with the adjacent railway, and a little branch of that tributary in an open field on the site. These mapped watercourse segments are depicted as "Mapped Watercourse" on Figures 1 and 2.

The Upper Cedar Creek Subwatershed Study (Matrix et al., 2019) reported 21 fish species within Cedar Creek and the presence of groundwater-fed coldwater fish habitat that supports native coldwater fish species, notably Brook Trout and Mottled Sculpin. It states "Cedar Creek has a good fishery and provides habitat to many cool to coldwater species." Aside from the Upper and Lower Millpond dams in Ayr, near the mouth of Cedar Creek, the Subwatershed Study reported no fish migration barriers within Cedar Creek. As such, coldwater and coolwater fish are able to migrate freely to and from the reach of Cedar Creek at and near the site. To protect the coldwater fishery, the Subwatershed Study recommended that 30 metre buffers should be maintained between new development and the Creek and its tributaries.

The Upper Cedar Creek Subwatershed Study – Terrestrial and Aquatic Characterization Report (NRSI, 2018) described the fish species captured by GRCA during 2015, 2016 and 2017 at Cedar Creek monitoring site #6474005 upstream of Cedar Creek Road and immediately downstream of the segment of Cedar Creek on the site. Only five fish species were captured, but they consistently included the coldwater Brook Trout and Mottled Sculpin and comprised entirely native species. Central Mudminnow, Brook Stickleback and Blacknose Dace in the catches are indicative of the monitoring site's location adjacent to small wetland tributaries and also near the headwaters of Cedar Creek. The fish community is indicative of a healthy Brook Trout fishery in which Brook Trout is the top predator and largest fish species and all other fish are small-bodied species. The report also summarized the results of GRCA's 2015 survey of Brook Trout spawning areas, called a "redd survey" as small areas of disturbed substrate where Brook Trout deposit their eggs during the Autumn spawning period are called redds. GRCA discovered redds downstream of Cedar Creek Road, which indicates suitable spawning habitat just downstream of the site and likely suitable conditions for the overwinter survival and development of Brook Trout eggs.

Myler's observations discovered two additional tributary branches associated with on-site White Cedar swamps and extended the tributary adjacent to the railway. These new segments are identified as "Unmapped Watercourse" on Figures 1 and 2. The pond was discovered to be an entirely isolated feature, an artificial dug pond, with no inlet watercourse channel and no outlet to a watercourse. Review of 1954 Air Photos of Southern Ontario confirmed that the location of the pond was a farm field and that no pond, watercourse, waterbody or wetland feature occurred historically at the pond location. No fish were observed in the pond's clear waters, but

as an isolated artificial dug pond the presence of fish would not confer fish habitat status on the pond and therefore no fish habitat buffer is required for the dug pond.

Fish habitat at the site was confirmed to include the main branch of Cedar Creek, the northeast tributary branch that follows the railway and has branches in White Cedar Swamp and Meadow Marsh on site, and the east tributary branch within White Cedar Swamp on site. The main branch of Cedar Creek is large, on the order of 2 – 3 metres wide and approximately 1 metre deep at the site and permanently flowing. Channel, substrate and vegetation characteristics were such that all of the tributaries appeared also to be permanently flowing watercourses, although of much smaller dimensions than the main branch. The Meadow Marsh tributary is very small, with a wetted width of generally less than 30 cm wide and water depth generally in the range of 5 cm. The tributaries with the White Cedar Swamp blocks have more substantial dimensions of width and depth, but are nevertheless small with channel width quite variable but generally on the order of 50 cm and water depth at the time of observations likewise quite variable but generally in the range of 5 – 20 cm. Swamp tributary substrates ranged from muck and organic detritus to sand. Downed wood and tree roots provide cover for fish and many juvenile Brook Trout were observed. The tributary channel along the railway is artificial in that it is essentially the east drainage ditch at the toe of the railbed. Wetted width in the rail ditch ranged from approximately 0.5 – 1.0 metres and water depth was generally in the 10 – 20 cm range. Substrates are primarily gravel and sand. Fish were observed in all but the Meadow Marsh tributary, it being small, shallow, and open such that it affords no substantial cover for fish. It would be considered “contributing” fish habitat. Many juvenile Brook Trout were however, observed in the Cedar Swamp tributaries and in the railway ditch tributary.

Observations of the tributaries confirmed juvenile or “nursery” habitat for Brook Trout for all but the Meadow Marsh tributary branch. No other fish species were observed in the tributaries. The tributaries appeared to be permanently flowing, such that they could provide year-round fish habitat. The tributaries did not appear to provide spawning habitat for Brook Trout and spawning habitat near the site is likely confined to the main branch, consistent with GRCA’s 2015 observations, where water depth and substrates are suitable.

3.5 Hydrogeology Investigations

Detailed hydrogeological and geotechnical studies of the subject property were completed by Chung and Vander Doelen Engineering Ltd. (2020) provided under separate cover. Investigations included a review of background information for the site, and subsurface investigation to identify subsoil stratigraphy and hydrogeological properties, groundwater conditions and hydraulic gradients. Monitoring wells were also installed for monitoring of groundwater levels April 24 and October 9, 2019.

The study identified that the topography of the subject property is variable, but generally slopes to the west toward Cedar Creek. Groundwater also flows in a westerly direction towards Cedar

Creek. The water table depth ranges from 3.5 to 10 m in the eastern and central upland portions of the property to less than 0.6 m within and adjacent to the wetlands along the western edge.

Soils on the subject property are predominately sand and gravel deposits, with small portions containing finer materials, resulting in generally high estimated pre-development infiltration rates (50-300 mm/hr) and high recharge rates (250-500 mm/year) to the unconfined overburden aquifer. The direction of groundwater flow and high recharge rates indicate that the wetland is largely maintained by groundwater discharge. The interpreted water table configuration suggests that the pond in the northwest corner of the property receives some groundwater flow.

Water supply wells drawing from the confined sand and gravel aquifer at depths ranging from 88 to 184 feet were found to provide ample water supply and pumping tests resulted in only modest water level drawdown ranging from 3.75 to 20 gpm/m.

The Hydrogeological study recommended the use of grassed swales or ditches along roadways and lot lines, as well as the direction of rooftop runoff to either subsurface infiltration facilities or open swales or ditches to maintain pre-development levels of groundwater recharge.

3.6 Stormwater Management

A Preliminary Stormwater Management Design Criteria Report was completed by Meritech (2019) as part of the site plan application (provided under separate cover). The report recommends the use of infiltration features on individual lots and within the proposed road right-of-way, including a treatment train approach. Grading of the western lots using native materials taken from the eastern lots and filling a 3:1 slope to the wetland limit (i.e. 30 m buffer) is also proposed to achieve flat lots while maintaining soil permeability, infiltration capacity and drainage pattern of the site, and preventing additional flow to the wetland. The report also proposes the filling in of the existing pond in the northwest corner to become part of lot 5 and attain a flat grade for that lot.

The proposed Stormwater Management (SWM) facilities within the proposed road right-of-way utilize a storm sewer system within the ditch to convey runoff up to the 100-year storm event via catchbasins and pipes to an oil-grit separator (OGS) and an infiltration gallery beneath the ROW. Flows will travel through vegetated buffers before entering catchbasins, and the basins will be equipped with sumps and catchbasin guards to provide pre-treatment before entering the storm sewers. For a storm larger than the 100-year event, the ditches will fill and any overflow would tip into an emergency vegetated swale conveying flow to the wetland at the lowest portion of the site. Rock check dams and other quality enhancement features will be applied within the swale to prevent erosive impacts to the wetland.

A similar approach will be applied to each lot, with the use of vegetated swales and catchbasins with sumps and catchbasin guards. Additionally, clean roof runoff should be pumped directly to

the infiltration gallery, thereby allowing for the use of a smaller OGS unit and providing greater freedom regarding the placement of the galleries.

4.0 Impact Analysis

4.1 Impact Assessment and Mitigation

The proposed development will result in impacts to the existing natural features. An assessment of the impacts (potential and actual) and mitigation measures are provided in *Table 9*. See *Appendix 13* for descriptions of criteria, impact ratings and analysis.

Table 9. Assessment of Impacts and Mitigation Recommendations

PHASE	ACTIVITY	POTENTIAL IMPACTS	DURATION OF IMPACT	REVERSIBILITY	GEOGRAPHIC LEVEL OF INFLUENCE	FREQUENCY	ECOLOGICAL SITE CONTEXT	LIKELIHOOD OF OCCURRING	CUMULATIVE EFFECTS?	POTENTIAL IMPACT RATING ¹	MITIGATION RECOMMENDATIONS / COMMENTS	FINAL ² IMPACT RATING	MONITORING / FOLLOW-UP RECOMMENDATION
Site Preparation and servicing	Vegetation Removal – clearing & grubbing upland areas	<ul style="list-style-type: none"> Loss of vegetation and wildlife habitat Loss of rare plant species or communities 	LT	P	SA	O	PD	H	Y	Moderate	<ul style="list-style-type: none"> Avoid significant wildlife habitat Design to avoid or minimize loss of vegetation and edge habitat Complete Species at Risk Habitat Mitigation plan prior to vegetation removal. Revegetate areas with native species after site preparation Establish and maintain buffers around significant features, habitats of significant species (see section 4.2) 	Minor	Follow SAR habitat mitigation plan (see Section 5.5)

Table 9. Assessment of Impacts and Mitigation Recommendations

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Site Preparation and servicing (cont.)	Vegetation Removal – clearing & grubbing upland areas (cont.)	• Loss of successional habitat	LT	P	SA	O	PD	H	Y	Moderate	• Implement Restoration plan (i.e. within buffers) to restore high edge to interior ratio	Minor	
		• Disturbance of wildlife species	ST	R	SA	O	PD	M	N	Moderate	• Time activities to avoid wildlife disturbance during important life stages	Minor - None	
		• Impacts to Nesting Birds Protected under the Migratory Bird Convention Act	ST	P	SA	O	PD	H	Y	Moderate	• Conduct a bird nest survey to determine locations of active nests prior to construction works including installation of Erosion Sediment Control (ESC) fence and any site clearing. • Create nest protection zones where active bird nests are found and monitor (as needed, e.g. weekly) until inactive.	Minor - None	Contact a qualified wildlife ecologist to complete nest searched when required.

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Site Preparation and servicing (cont.)	Vegetation removal – Clearing & grubbing Wetland Areas	• Increased erosion, sedimentation into wetland	ST	R	SA	O	U	L	Y	Minor	• Develop & implement ESC plan per the ESC guide for Urban Construction (TRCA, 2019).	None	Monitor ESC fence weekly, and after a major storm event for any breaks, and repair
		• Decreased shade and cover	ST	R	SA	O	U	L	Y	Minor	• Maintain or restore vegetative buffers (see Section 4.2)	None	
		• Reduced vegetation diversity	ST	R	SA	O	U	L	Y	Minor	• Maintain or restore riparian vegetation where possible	None	
		• Reduced habitat for sensitive species	ST	R	SA	O	U	L	Y	Minor	• Maintain or restore vegetative buffers (see Section 4.2) • Create physical buffers, such as a berm	None	
	Grading	• Increased erosion, sedimentation and turbidity	ST	R	SA	O	PD	M	N	Minor	• Develop & implement ESC plan • Maintain or restore vegetative buffers (see Section 4.2) • Re-establish vegetation as soon as possible	None	Monitor ESC fence weekly, and after a major storm event for any breaks, and repair

Table 9. Assessment of Impacts and Mitigation Recommendations

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Site Preparation and servicing (cont.)	Grading (cont.)	<ul style="list-style-type: none"> Increase nutrient inputs and contaminants to waterbodies and wetlands 	ST	P	AA	O	PD	M	Y	Minor	<ul style="list-style-type: none"> Develop & implement ESC plan Designate areas for equipment storage 	None	Monitor ESC fence weekly, and after a major storm event for any breaks, and repair
		Increased soil compaction	ST	P	SA	O	PD	H	N	Moderate	Control access and movement of equipment and people	Minor-None	
		<ul style="list-style-type: none"> Changes to drainage Changes to surface runoff 	LT	P	AA	O	PD	H	Y	Moderate	<ul style="list-style-type: none"> Schedule grading to avoid high runoff volumes Minimize changes to land contours and natural drainage Maintain streams and timing, quantity of flows Utilize native materials or similar for grading (see Section 3.5 and 3.6) 	Minor	
		Changes in soil moisture, tree cover and vegetation	LT	P	SA	O	PD	M	Y	Moderate	<ul style="list-style-type: none"> Minimize the area and duration of soil exposure Restore/revegetate where possible 	Minor	

Table 9. Assessment of Impacts and Mitigation Recommendations

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Site Preparation and servicing (cont.)	Grading (cont.)	<ul style="list-style-type: none"> Disturbance to wildlife Alteration or destruction of wildlife Habitat 	ST	P	SA	O	PD	H	Y	Severe	<ul style="list-style-type: none"> Time activities to avoid sensitive periods (Breeding birds, fish spawning) Identify sensitive species prior to work and design grading to avoid disturbing sensitive species Conduct work outside timing windows of sensitive species 	Minor-None	
		<ul style="list-style-type: none"> Wildlife Entering Construction Areas 	ST	R	SA	O	PD	M	N	Minor	<ul style="list-style-type: none"> Develop & implement ESC plan to exclude wildlife 	None	Monitor ESC fence weekly, and after a major storm event for any breaks, and repair
	Installation of Services and utilities (sewer, hydro, infrastructure, stormwater management facilities)	<ul style="list-style-type: none"> Increased erosion, sedimentation and turbidity 	ST	R	SA	O	PD	H	N	Moderate	<ul style="list-style-type: none"> Maintain vegetated buffers (see Section 4.2) Develop ESC plan 	Minor-None	Monitor ESC fence weekly, and after a major storm event for breaks, and repair
		<ul style="list-style-type: none"> Increased nutrient and contaminant inputs to waterbodies 	ST	R	AA	O	PD	M	Y	Moderate	<ul style="list-style-type: none"> Re-establish vegetation as soon as possible 	Minor	
		<ul style="list-style-type: none"> Disturbance to wildlife including sensitive species 	ST	R	SA	O	PD	M	N	Minor	<ul style="list-style-type: none"> Conduct work outside timing windows of sensitive species 	None	

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PHASE	ACTIVITY	POTENTIAL IMPACTS	DURATION OF IMPACT	REVERSIBILITY	GEOGRAPHIC LEVEL OF INFLUENCE	FREQUENCY	ECOLOGICAL SITE CONTEXT	LIKELIHOOD OF OCCURRING	CUMULATIVE EFFECTS?	POTENTIAL IMPACT RATING ¹	MITIGATION RECOMMENDATIONS / COMMENTS	FINAL ² IMPACT RATING	MONITORING / FOLLOW-UP RECOMMENDATION
Site Preparation and servicing (cont.)	Installation of Services and utilities (sewer, hydro, infrastructure, stormwater management facilities) (cont.)	• Hydrological changes	LT	P	AA	O	PD	M	Y	Moderate	• Conduct appropriate studies to determine how to maintain existing hydrology (see Section 3.5 and 3.6) • Design underground facilities to minimize impacts to groundwater (see Section 3.5 and 3.6)	Minor	
		• Fragmentation of natural areas	LT	P	SA	O	PD	M	Y	Moderate	• Identify and avoid significant earth science features when planning and installing services	Minor	
		• Wildlife Entering Construction Areas	ST	R	SA	O	PD	M	N	Minor	• Develop & implement ESC plan to exclude wildlife	None	Monitor ESC fence weekly, and after a major storm event for any breaks, and repair
Construction	Building Construction (including Accessory	• Increased erosion, sedimentation and turbidity	ST	R	SA	O	PD	M	Y	Moderate	• Maintain vegetated buffers (see Section 4.2) • Develop ESC plan	Minor-None	

Table 9. Assessment of Impacts and Mitigation Recommendations

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Construction (cont.)	uses and amenities)	• Water contamination by oils, gasoline, grease and other materials	ST	R	SA	O	PD	M	Y	Moderate	• Control water contamination through good housekeeping practices	Minor-None	
		• Increased impervious surfaces causing, Increased runoff, reduced infiltration and groundwater discharge	LT	R	AA	O	PD	H	Y	Moderate	• Maintain or provide vegetative buffers (see Section 4.2) • Implement infiltration techniques • Control quantity and quality of stormwater discharge (see Section 3.5 and 3.6)	Minor	
		• Barriers to animal and plant movement	LT	R	AA	O	PD	H	Y	Moderate	• Ensure wildlife corridors are maintained	Minor	
		• Disturbance to Wildlife from sounds and activity associated with occupancy.	ST	R	AA	R	PD	H	N	Minor	• Restrict access and buffer natural areas to discourage landowner encroachment and improper use • Provide landowners manual to encourage stewardship	Minor-None	

Table 9. Assessment of Impacts and Mitigation Recommendations

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Construction (cont.)	Building Construction (including Accessory uses and amenities) (cont.)	<ul style="list-style-type: none"> Loss of wildlife (mortality) due to collisions with buildings 	LT	P	SA	C	PD	M	N	Minor	<ul style="list-style-type: none"> Design buildings to minimize/prevent mortality 	Minor - None	
	Roads – Paving	<ul style="list-style-type: none"> Increased impervious surfaces 	LT	P	SA	C	PD	H	Y	Moderate	<ul style="list-style-type: none"> Minimize areas of paved surfaces 	Minor	
		<ul style="list-style-type: none"> Increased runoff 	LT	R	SA	C	PD	M	Y	Moderate	<ul style="list-style-type: none"> Control quantity and quality of stormwater using best management practices (see Section 3.5 and 3.6) 	Minor	

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Construction (cont.)	Roads – Paving (cont.)	<ul style="list-style-type: none"> Reduced infiltration Increased nutrient and contaminant inputs 	LT	R	SA	C	PD	M	Y	Moderate	<ul style="list-style-type: none"> Design roads without curbs, gutters and sidewalks to promote infiltration galleries and other infiltration devices (see Section 3.5 and 3.6) 	Minor	
		<ul style="list-style-type: none"> Increased erosion, sedimentation and turbidity Increased water temperatures 	ST	R	AA	O	PD	M	Y	Moderate	<ul style="list-style-type: none"> Maintain or provide vegetative buffers (see Section 4.2) Control quantity and quality of stormwater using best management practices (see Section 3.5 and 3.6) 	Minor-None	
		<ul style="list-style-type: none"> Loss of wildlife habitat 	LT	R	SA	O	PD	M	N	Moderate	<ul style="list-style-type: none"> Identify species sensitive to disturbance and time paving periods to avoid periods of wildlife habitat use Ensure important corridors are not lost, develop alternate corridors and cover where possible 	Minor-None	

Table 9. Assessment of Impacts and Mitigation Recommendations

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		• Wildlife mortality on roads	LT	R	SA	C	PD	M	Y	Moderate	• Design to reduce / prevent mortality	Minor	Monitor culvert at periodic intervals for blockages
Post-Construction	Use of Septic Systems	• Increased nutrient and contaminant input to waterbodies and wetlands	LT	R	AA	C	PD	L	Y	Moderate	• Make alternative servicing arrangements • Use appropriate locations and materials for septic facilities (see section 3.5 and 3.6)	Minor	
		• Increased algal growth and decreased oxygen levels	LT	R	AA	C	PD	L	Y	Moderate	• use alternative nutrient removal technologies approved by MOE (see section 3.5 and 3.6)	Minor	
		• Adverse effects to vegetation from faulty septic system	LT	R	AA	C	PD	L	Y	Moderate	• Avoid installing system near sensitive vegetation or landforms (see section 3.5 and 3.6)	Minor	Regularly inspect and maintain septic system
	Human Occupation	• Increased nutrient and contaminant inputs to waterbodies, wetlands from fertilizers, pesticides etc.	LT	R	AA	C	PD	L	Y	Moderate	• Avoid use near sensitive vegetation and landforms	Minor	

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Post-Construction (cont.)	Human Occupation (cont.)	<ul style="list-style-type: none"> • vegetation and soil compaction 	LT	R	AA	C	PD	L	Y	Minor	<ul style="list-style-type: none"> • Minimize erosion by using gravel, stones or wood on paths 	None	
		<ul style="list-style-type: none"> • Noise and light pollution from buildings • Non-native species introductions, increased erosion and sedimentation from dumping of debris and compost in natural areas 	LT	R	AA	C	PD	M	Y	Moderate	<ul style="list-style-type: none"> • Provide owner a manual to promote stewardship 	Minor-None	
		<ul style="list-style-type: none"> • Tree and vegetation removals, changes to vegetation structure and composition 	ST	R	SA	S	PD	L	N	Minor	<ul style="list-style-type: none"> • Maintain or provide vegetative buffers (see Section 4.2) 	None	

4.2 Buffers

4.2.1 Wetlands

A 30 m buffer from the approved wetland boundary has been applied for the proposed Industrial subdivision development, as recommended in the Upper Cedar Creek Subwatershed Study (2009). Based on the draft plan of subdivision provided by the client, the 30 m buffer has been incorporated into the lot area of the western lots with development controls to be applied to the buffer area.

4.2.2 Woodlands

A 10 m buffer from the dripline of the deciduous forest at the northern end of the subject property for the proposed development, as recommended in the Upper Cedar Creek Subwatershed Study (2009).

4.2.3 Watercourses

As coldwater watercourses, the main branch and tributaries at the site would be afforded a 30 metre buffer from development per recommendations of the Subwatershed Study. Although no fish were observed in the Meadow Marsh tributary, it nevertheless appeared to be a permanently flowing groundwater-fed watercourse and as a precautionary measure could also be considered for a 30 metre buffer to protect its contribution to the Cedar Creek fishery. However, delineation of precise fish habitat buffers is unnecessary at the site because each of the main branch and the tributaries is separated from the proposed development footprint by mapped PSW and the 30 metre PSW buffer, such that an effective buffer of greater than 30 metres is provided for all fish habitat at the site. Site stormwater management is focused on promotion of infiltration, with no direct discharge of surface runoff to the tributaries or the Cedar Creek main branch. Accordingly, with broad buffering and low-impact site-specific stormwater management, the proposed development will not negatively impact the fish habitat in the on-site tributaries or within the main branch of Cedar Creek.

4.3 Hydrological Function of the Wetland

A detailed hydrological study of the subject property was completed by Chung and Vander Doelen Engineering Ltd. (2020) and a Preliminary Stormwater Management Design Criteria Report prepared by Meritech (2019).

The subject property generally slopes to the west towards Cedar Creek and the PSW. Surface runoff and ground water flow in this direction, and soil conditions on the property results in high rates of infiltration. Consequently, the wetland is largely maintained by groundwater discharge.

Meritech (2019) proposed some surface grading on the property in order to achieve flat lots and maintain pre-development groundwater infiltration and recharge rates. The eastern lots will be lowered and the western lots raised using native materials although the general drainage pattern of the property will not be changed. The existing pond in the northwest

corner of the property, which is anthropogenic in nature, is proposed to be filled to attain a level grade for lot 5. Redirection of surface flows from the proposed development including grading will be minor.

Septic facilities for each lot will be sited appropriately, taking into account the flow volumes of each facility and the percolation rate of the native soils, adjusting as necessary with finer grain materials to slow effluent percolation. Leaching beds and infiltration facilities for the western lots in particular must account for the shallow water table depth near the western edge of the lots in order to appropriately site these facilities and adjust grading and/or location in order to comply with regulatory setbacks from the seasonally high-water table. The same applies to the placement of building structures and foundations in order to minimize impacts to the water table and ground water flow.

The well capacities on the subject property are high and the proposed “dry” industry use is not expected to result in substantial water taking. The majority of water taken is also expected to be returned to the aquifer via the septic systems, therefore regional impacts to the PSW are not anticipated.

With infiltration rates maintained at pre-development levels, low anticipated water usage and appropriately located stormwater and septic facilities, impacts to wetland hydrology are not expected.

5.0 Legislation and Policy Compliance

5.1 Provincial Policy Statement

The *Provincial Policy Statement* (PPS; OMMHA, 2020) provides policy direction on matters of provincial interest related to land use planning and development. Section 2.1.4 of the PPS states that “*Development and site alteration shall not be permitted in: Significant Wetlands in Ecoregions 5E, 6E and 7E*”.

The proposed severance and development does not contravene the policies of the PPS because the proposed severance and development would result in no removal of Significant Wetland, and development will occur 30 m or more beyond (i.e. outside of) the boundary of the significant wetland. Therefore, the proposed severance and development would not negatively impact the *Significant Wetland* or its ecological function.

5.2 Region of Waterloo Official Plan

The *Region of Waterloo Official Plan* (2015) Map 4 shows that the parcel to be severed contains lands designated as Core Environmental Features. Section 7.C.1 states “Core Environmental Features are those environmental features identified as being provincially significant or regionally significant. These features are the most significant elements of the regional landscape in terms of maintaining, protecting, and enhancing biodiversity and important ecological functions.”

The proposed severance, and development would result in no removal of Core Environmental Features, and development will occur 30 m or more beyond (i.e. outside of) the boundary of the Core Environmental Features. Therefore, the proposed severance and development would not have any adverse impact on the wider *Core Environmental Features* or their ecological function.

5.3 Township of North Dumfries

The subject lands contain Core Environmental Features as per Map 5A of the Official Plan. Sections 6.1.7.5 and 6.1.7.6 state the policies outlined in Section 7.C.10 and 7.C.11 of the Region of Waterloo Official Plan noted above in **Section 1.3.4**.

The proposed severance, and development would result in no removal of Core Environmental Features, and development will occur 30 m or more beyond (i.e. outside of) the boundary of the Core Environmental Features. Therefore, the proposed severance and development would not have any adverse impact the wider *Core Environmental Features* or their ecological function.

5.4 GRCA Wetland Policies

Section 8.4 of the GRCA's *Policies for the Administration of the Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Regulation* (Ontario Regulation 150/06, 2015) identifies the area of interference of a Provincially Significant Wetland as being 120m. Section 8.4.9 states:

"development within an area of interference less than or equal to 30 metres from a wetland may be permitted in accordance with the policies in *Section 7.1.2-7.1.3- General Policies*, and where an EIS demonstrates that:

- a) There are no negative or adverse hydrological or ecological impacts on the wetland,
- b) All development is located outside of the wetland and maintains as much setback as feasible,
- c) Development is located above the water table, except as specified in Section 8.4.11, and,
- d) Septic systems are located a minimum of 15 metres from the wetland and 0.9 metres above the annual maximum water table."

Section 8.4.10 states, "development within an area of interference between 30 metres and 120 metres from a wetland, which in the opinion of the GRCA may result in hydrologic impact, may be permitted where an EIS demonstrates that policies in *Sections 7.1.2-7.1.3 – General Policies* are met."

The proposed development, together with the mitigation measures proposed in Section 4.0 of this EIS, will result in no negative or adverse hydrological or ecological impacts upon the PSW. *Figure 1* demonstrates that all development is proposed to occur outside of the wetland and outside of the 30 m buffer established from the wetland boundary, with the exception of the existing anthropogenic pond in the northwest corner of the property, most of which is situated within the 30 m buffer. The pond is proposed to be filled to attain a level grade for lot 5. Grading will utilize native materials to achieve level lots and maintain the drainage pattern and infiltration rates of the property. It is recommended that once filling and grading of the pond is completed, the area within the 30 m wetland buffer be restored with appropriate native vegetation.

Septic systems for each lot will be appropriately situated at least 900mm to the seasonal high groundwater table. SWM facilities will use a treatment train approach including vegetated buffers, catchbasins with guards/filters and sumps, an OGS and infiltration galleries, ultimately utilizing the native soil properties to infiltrate flows and maintain pre-development infiltration rates. Therefore, the proposed development complies with GRCA's wetland policies.

5.5 Endangered Species Act

As 27 hectares of breeding habitat for Bobolink and Eastern Meadowlark is present within the subject property, the proposed development is subject to *Section 23.6 of Ontario Regulation 242/08*. Therefore, prior to commencement of any development activity, notice of the activity must be registered and a habitat management plan must be prepared in order to comply with the ESA.

6.0 Summary and Conclusions

It is our opinion that the measures to mitigate impacts from the proposed development will result in no negative impacts to natural heritage features identified within and adjacent to the proposed development. The Provincially Significant Wetland, and Environmentally Sensitive Policy Area will be protected. Below is a summary of the affected Natural Heritage features and constraints, and associated mitigation and/or protection measures.

6.1 Ecological Constraints

1. Four Species at Risk were identified within the subject property: Bobolink, Eastern Meadowlark, Eastern Wood-pewee and Grasshopper Sparrow.
2. Significant Wildlife Habitat occurs on the subject property (Marsh Breeding Bird Habitat, Grasshopper Sparrow, Eastern Wood-pewee).
3. Breeding habitat for two Species at Risk (Bobolink and Eastern Meadowlark) occurs on the subject property, therefore a notice of registry and a habitat management plan is required prior to development to comply with the ESA.
4. The Provincially Significant Roseville Swamp – Cedar Creek Wetland Complex and Cedar Creek Spillway Environmentally Sensitive Policy Area partially occur within the subject property
5. Juvenile or “nursery” habitat for Brook Trout was confirmed in all the tributary branches except the meadow marsh.

6.2 Impact Assessment

- 1) Potential impacts from the proposed development were assessed to determine their extent (see *Table 9*), and mitigation guidelines have been provided.
- 2) Impacts primarily involve the removal of vegetation and wildlife habitat, site grading and wildlife disturbance.
- 3) 27 ha of habitat for Species at Risk (Bobolink and Eastern Meadowlark) will be removed by the proposed development and a habitat management plan must be prepared in order to comply with the ESA.
- 4) Impacts to the Provincially Significant Roseville Swamp – Cedar Creek Wetland Complex and Cedar Creek Spillway Environmentally Sensitive Policy Area are not anticipated due to the application of a 30 m buffer from the edge of the wetland. However, an anthropogenic pond in the northwest corner of the property is proposed to be filled (including area within the 30 m buffer) to achieve a level grade for one of the proposed lots. Impacts can be mitigated through an ESC plan for site preparation

and construction activities and subsequent restoration of the 30 m buffer with native plant species.

- 5) Significant Wildlife Habitat for Grasshopper Sparrow will be removed by the proposed development, although the SAR Grassland Bird habitat management plan will offset the habitat loss and mitigate impacts to this species. Impacts to Eastern Wood-pewee habitat and Marsh Breeding Bird Habitat are not anticipated:
 - i) A 10 m buffer has been applied to the deciduous forest at the northern end of the subject property (i.e. Eastern Wood-pewee habitat).
 - ii) Marsh Breeding Bird Habitat occurs within the PSW and is afforded protection through adequate vegetation buffers (i.e. 30 m buffer).
- 6) Residual impacts from occupation are expected and can be minimized through provision of an environmental guide/brochure to advise occupants of action and activities that can be taken to avoid impacts to the adjacent natural features.
- 7) There are opportunities on the industrial subdivision for edge enhancement through the planting and management of native species within the 30m buffer to mitigate potential impacts from the proposed development on the PSW.

7.0 Recommendations

The following recommendations are provided to ensure protection of natural heritage features and function within and adjacent the subject property from the proposed development.

1. Implement Erosion and Sediment Control Plan (ESC).
2. Install and monitor a, silt and sediment control barrier
 - i) Silt fence to be inspected weekly during construction and following a storm event of 25mm of rainfall within 24 hours.
3. ESC measures to be kept in place until construction is completed and disturbed soils have been vegetated.
4. Accumulated sediment and debris to be removed before silt fence is removed.
5. All disturbed areas to be re-vegetated or restored with site appropriate indigenous plants wherever opportunities exist.
6. Install silt fence at appropriate locations. Installed silt fence is to be inspected that it is in place and functioning as designed prior to any activities or construction.
7. Install native tree and shrub enhancement plantings within the 30 m wetland and 10 m woodland buffers.
8. Areas within the above buffers that are currently vegetated with weedy non-native species are recommended to be re-vegetated using native species of trees and shrubs.
9. Conduct an active nest survey immediately prior to site disturbances or alterations (e.g. tree removal) that will occur within the Core Nesting Period.
10. Promote occupant's environmental stewardship awareness through provision of an environmental guide/brochure that contains a list of recommendations (e.g. do's / don'ts) to avoid/minimize residual impacts (e.g. avoid tree removals, avoid use of pesticides and toxic materials, use of invasive plant species).

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7.0 References

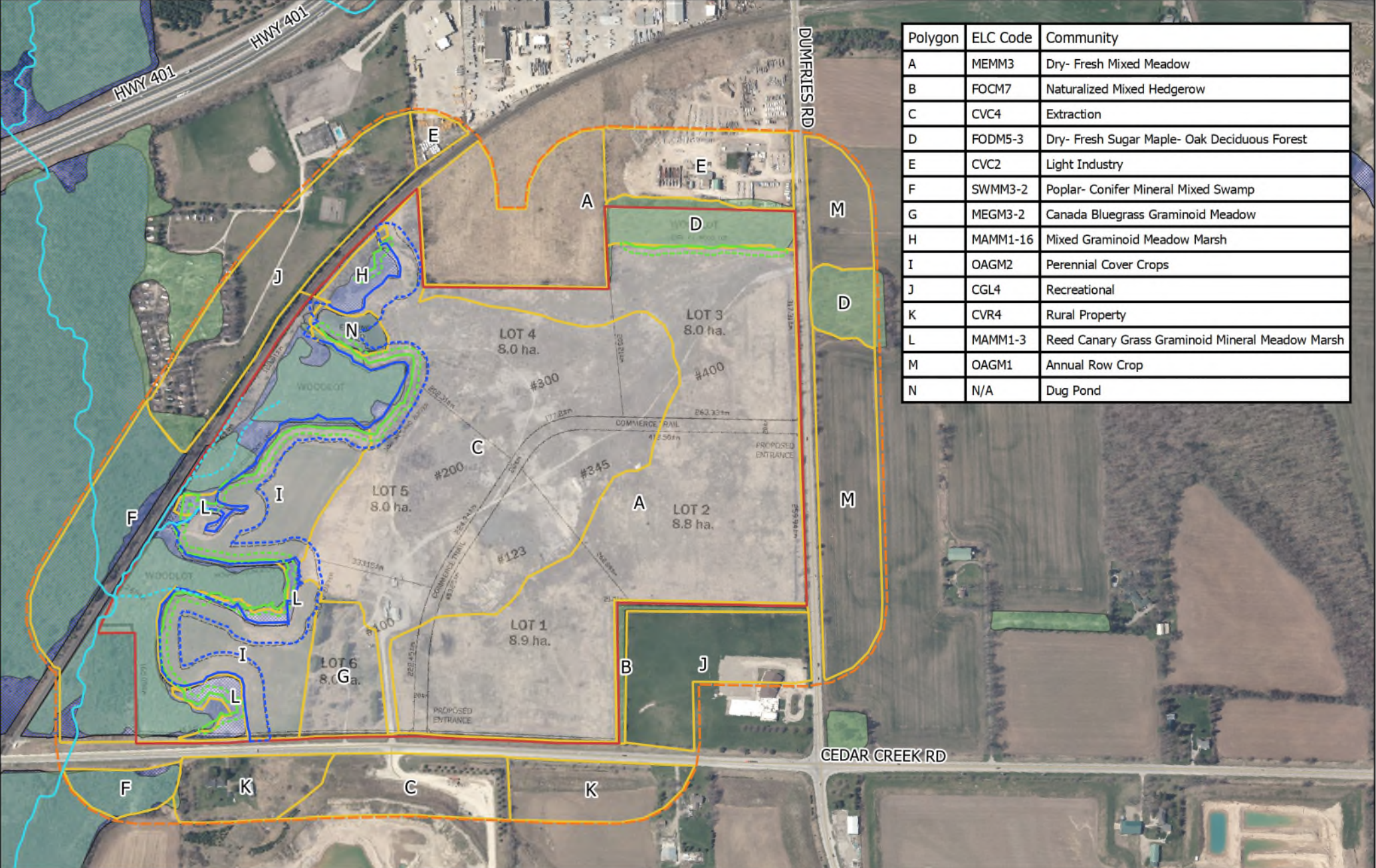
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FIGURES



Polygon	ELC Code	Community
A	MEMM3	Dry- Fresh Mixed Meadow
B	FOCM7	Naturalized Mixed Hedgerow
C	CVC4	Extraction
D	FODM5-3	Dry- Fresh Sugar Maple- Oak Deciduous Forest
E	CVC2	Light Industry
F	SWMM3-2	Poplar- Conifer Mineral Mixed Swamp
G	MEGM3-2	Canada Bluegrass Graminoid Meadow
H	MAMM1-16	Mixed Graminoid Meadow Marsh
I	OAGM2	Perennial Cover Crops
J	CGL4	Recreational
K	CVR4	Rural Property
L	MAMM1-3	Reed Canary Grass Graminoid Mineral Meadow Marsh
M	OAGM1	Annual Row Crop
N	N/A	Dug Pond

- STUDY AREA
- SUBJECT PROPERTY
- ECOLOGICAL LAND CLASSIFICATION
- WETLAND
- WETLAND DELINEATION
- WETLAND BUFFER (30M)
- WOODLAND
- WOODLAND DELINEATION
- WOODLAND BUFFER (10M)
- WATERCOURSE
- UNMAPPED WATERCOURSE

Information Sources:

1. Orthophotography provided by First Base Solutions Accessed September, 2020.
2. Ecological Land Classification, provided by Aboud & Associates 2018
3. Site Plan provided by Dryden, Smith & Head (2020)
4. Wetland polygons & watercourses provided by Grand River Conservation Authority, Accessed September, 2020
5. Woodland polygons provided by Land Information Ontario Accessed September, 2020
6. Woodland & Wetland delineations provided by MacDonak Tamlyn Lord Surveying, 2018
7. Unmapped watercourses provided by Myler Ecological Consulting, 2020

Title:
ECOLOGICAL LAND CLASSIFICATION & NATURAL FEATURES

Project:
CEDAR CREEK NORTH DUMFRIES

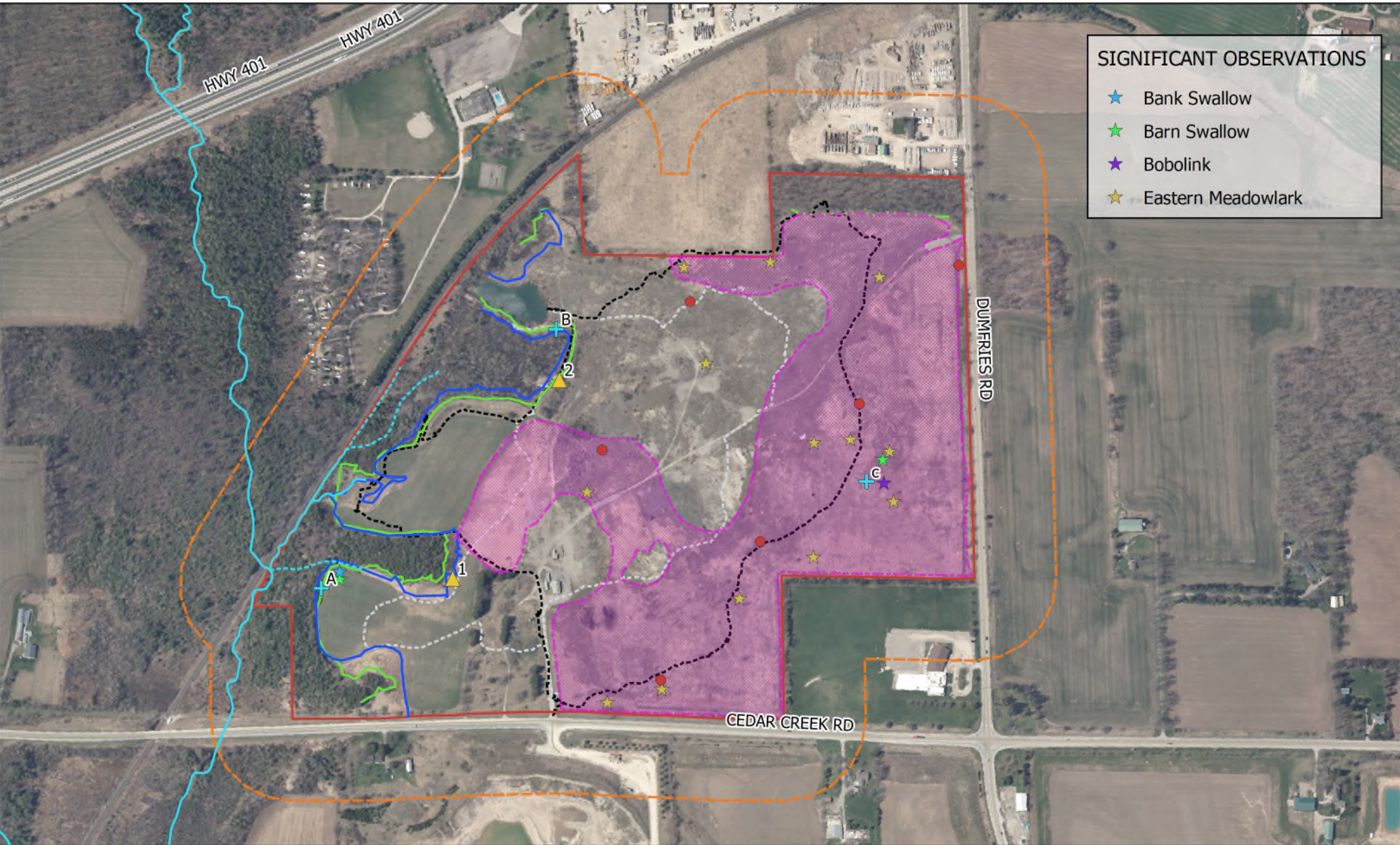
Date: SEPTEMBER 2020

Project: AA17-196A

Scale: 1 : 7500

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 190 Hicklin Road, Guelph, Ontario, N1H 7L5, 519.822.6539, www.aboudinc.com

Figure No: **1**



SIGNIFICANT OBSERVATIONS

- ★ Bank Swallow
- ★ Barn Swallow
- ★ Bobolink
- ★ Eastern Meadowlark

SUBJECT PROPERTY	WETLAND LIMIT
STUDY AREA	WOODLAND LIMIT
SAR GRASSLAND BIRD HABITAT	WATERCOURSE
AMPHIBIAN SURVEY LOCATION	UNMAPPED WATERCOURSE
BREEDING BIRD SURVEY LOCATION	WINTER WILDLIFE SURVEY 1
GRASSLAND BIRD SURVEY LOCATION	WINTER WILDLIFE SURVEY 2

Information Sources:

1. Orthophotography provided by First Base Solutions Accessed September, 2020.
2. Wetland polygons & Watercourses provided by Grand River Conservation Authority. Accessed September, 2020
3. Woodland polygons provided by Land Information Ontario Accessed September, 2020
4. Woodland & Wetland delineations provided by MacDonald Tamblin Lord Surveying, 2018
5. Species observations provided by Aboud & Associates 2017-2020
6. Unmapped watercourses provided by Myler Ecological Consulting, 2020

Title:
SURVEY LOCATIONS & RESULTS

Project:
CEDAR CREEK
NORTH DUMFRIES

Date: SEPTEMBER 2020

Project: AA17-196A

Scale: 1 : 7500

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Figure No:

2

APPENDIX 1
Terms of Reference and Approvals



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URBAN FORESTRY

ARBORIST REPORTS
MANAGEMENT PLANS
TREE PRESERVATION PLANS
TREE RISK ASSESSMENT
GIS TREE INVENTORIES
TREE APPRAISALS
MONITORING

ECOLOGICAL RESTORATION

NATURAL SYSTEMS DESIGN
HABITAT RESTORATION
EDGE MANAGEMENT PLANS
RAVINE STEWARDSHIP PLANS
NATURALIZATION PLANS
INTERPRETIVE DESIGN
MONITORING
CONTRACT ADMINISTRATION

ENVIRONMENTAL STUDIES

SUBWATERSHED STUDIES
ENVIRONMENTAL IMPACT
STATEMENTS
ECOLOGICAL LAND
CLASSIFICATION
WETLAND EVALUATION
VEGETATION ASSESSMENT
BOTANICAL INVENTORIES
WILDLIFE SURVEYS
MONITORING

LANDSCAPE ARCHITECTURE

MASTER PLANNING
RESIDENTIAL COMMUNITIES
COMMERCIAL/INDUSTRIAL
HEALTHCARE AND EDUCATION
STREETSCAPES
PARKS AND OPEN SPACES
TRAIL SYSTEMS
GREEN ROOFS
CONTRACT ADMINISTRATION

EXPERT OPINION

OMB TESTIMONY
LEGAL PROCEEDINGS
PEER REVIEW
RESEARCH
EDUCATION

February 06, 2020

Our Project No.: AA17-196A
Sent By Email: jbrum@grandriver.ca

John Brum
Resource Planner
Grand River Conservation Authority
400 Clyde Road PO Box 729
Cambridge, Ontario N1R 5W6

**Re: Part of Lots 25, 26 and 27- Concession XI
Regional Road 97, Township of North Dumfries
Terms of Reference - Scoped Environmental Impact Study (R1)**

Dear Mr. Brum:

This document outlines the revised Terms of Reference (ToR) of the scoped Environmental Impact Study (EIS) for the proposed industrial subdivision on the lands located within part of lots 25, 26 and 27- Concession XI, Regional Road 97 within the Township of North Dumfries. Please review the revised terms and circulate to GRCA staff for discussion and approval.

BACKGROUND

The proponent is proposing an industrial subdivision on the lands currently occupied by a former gravel pit. The proposed concept plan includes an internal road traversing the property from Regional Road 47 on the east side of the property to Regional Road 97 on the south side of the property, with 14 lots fronting on to the proposed road.

A portion of the subject lands are within the Grand River Conservation Authority (GRCA) regulation limit, located within the regulated area for the Roseville Swamp Cedar Creek Provincially Significant Wetland Complex and floodplain for the Cedar Creek watercourse.

Comments provided by the GRCA and Environmental Planning staff at the Region of Waterloo state that a scoped Environmental Impact Study (EIS) is required, and that the Terms of Reference for the EIS must be submitted and approved by the GRCA, Township of North Dumfries and the Region of Waterloo.

In preparing the Terms of Reference, the following sources were reviewed for background information:

- Aerial photography of the subject site,
- Proposed Concept Plan on air photo (provided by Dryden, Smith & Head Planning Consultants Ltd., undated)
- Pre-submission consultation comments provided by Waterloo Region (October 4, 2013) and GRCA (August 6, 2013)
- Township of North Dumfries Official Plan (2016) and Schedules,
- Waterloo Region Official Plan (2015) and Schedules,
- Region of Waterloo Greenlands Network Implementation Guideline (2016)
- GRCA mapping (accessed December 1, 2017) of natural heritage features (e.g. regulation limit, GRCA and OMNR wetlands, ANSI's, and MNR Woodlands),
- Natural Heritage Information Center, Make-a-map, accessed December 1, 2017
- Ontario Nature. Ontario Reptile and Amphibian Atlas: a citizen science project to map the distribution of Ontario's reptiles and amphibians. Accessed December 1, 2017.
- Ontario Breeding Bird Atlas. Bird Studies Canada, 2007.
- Cedar Creek Scoped Subwatershed Study. GRCA. 2002

STUDY AREA

The study area includes the lands described as Part of Lots 25, 26 and 27- Concession XI Regional Road 97, Township of North Dumfries and up to 120m beyond the boundary of the study area where permission to access lands is granted (*Figure 1*, attached).

As needed, the lands adjacent to the proposed may require further access in order to assist with understanding the features and functions of natural heritage features.

Lands outside of the field study area will be reviewed from existing background information e.g. Cedar Creek Subwatershed Study.

PLANNING CONTEXT

Region of Waterloo Official Plan

The Region of Waterloo OP indicates that the subject lands are not designated as being within a Prime Agricultural Area as per Map 7 however they do contain a portion of Core Environmental Features (Roseville Swamp-Cedar Creek PSW, Cedar Creek ESPA & Significant Woodland) as per Map 4.

The OP indicates that development or site alteration is generally not permitted within Core Environmental Features.

Development or site alteration may be permitted on lands contiguous to a Core Environmental Feature where an EIS, or similar study, has determined to the satisfaction of the Region, Area

Municipalities, the GRCA and/or the Province as appropriate, that approval of the proposed development or site alteration would not result in adverse environmental impacts on the features and ecological functions of the Core Environmental Feature.

The EIS will be prepared in accordance with the provisions of the Regional Greenlands Network Implementation Guideline (2016).

Township of North Dumfries Official Plan

The subject lands are designated by the Township of North Dumfries Official Plan as part of the Highway 401/Regional Road 97 Employment Area. Section 2.9.3.2.2 states that future development within the Highway 401/Regional Road 97 Employment Area designation will generally be limited to privately-serviced logistics and warehousing uses that require close access to the Highway 401 corridor to efficiently move goods into and out of the Region.

The subject lands also contain Core Environmental Features as per Map 5A, which identifies those environmental features that are provincially or regionally significant. Development or site alteration will only be permitted on lands contiguous to a Core Environmental Feature where an EIS, or similar study, submitted in accordance with the policies in Section 6.3 has determined to the satisfaction of the Township, the Region, the GRCA and/or the Province, as appropriate, that approval of the proposed development or site alteration would not result in adverse environmental impacts on the features and ecological functions of the Core Environmental Feature.

Grand River Conservation Authority

The subject property contains a portion of the Roseville Swamp-Cedar Creek Provincially Significant Wetland Complex, Cedar Creek, and the allowances of these features. Section 8.4 of the GRCA's *Policies for the Administration of the Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Regulation* (Ontario Regulation 150/06, 2013) identifies the area of interference of a Provincially Significant Wetland as being 120m.

Section 8.4.9 states, development within an area if interference less than or equal to 30 metres from a wetland may be permitted in accordance with the policies in *Section 7.1.2-7.1.3- General Policies*, and where an EIS demonstrates that:

- a) There are no negative or adverse hydrological or ecological impacts on the wetland,
- b) All development is located outside of the wetland and maintains as much setback as feasible,
- c) Development is located above the water table, except as specified in Section 8.4.11, and,
- d) Septic systems are located a minimum of 15 metres from the wetland and 0.9 metres above the annual maximum water table.

The Provincial Policy Statement and Region of Waterloo OP indicate that development may be permitted within the congruent/adjacent lands of the Core Environmental Feature where an EIS demonstrates that there will be no negative impacts on the natural heritage features.

BACKGROUND REVIEW

Additional background natural heritage information related to the subject lands and adjacent lands identified the following information:

1. The Ontario Reptile and Amphibian Atlas shows within a 10 km square of the subject lands, the recent and historical presence of 29 species (including complexes and hybrids) of reptiles and amphibians (accessed December 1, 2017). Including seven species of Conservation Concern (Blanding's Turtle, Eastern Ribbonsnake, Jefferson Salamander, Jefferson/Blue-spotted Salamander Complex, Jefferson/Blue-spotted Salamander Hybrid, Snapping Turtle and Western Chorus Frog).
2. The Natural Heritage Information Center indicates the presence of 0 species of conservation concern within 1km of the project location.
3. The Ontario Breeding Bird Atlas shows within a 10 km square of the subject lands, the recent presence of 114 species of bird. Including 10 species of Conservation Concern (Least Bittern, Chimney Swift, Eastern Wood-pewee, Bank Swallow, Barn Swallow, Wood Thrush, Canada Warbler, Grasshopper Sparrow, Bobolink and Eastern Meadowlark).
4. The Ontario Mammal Atlas indicates that one species of Conservation Concern, Little Brown Myotis (bats) may occur in the study area.

This information indicates that there is a potential presence of additional natural heritage features and constraints that may require investigation and/or comment.

PROPOSED TERMS OF REFERENCE

Scoped Environmental Impact Study

To fulfill the requirements of this study, we will:

1. Review background information, (e.g. proposed activity, relevant sections of natural heritage system components of the Region of Waterloo OP, investigation of wildlife atlases and NHIC)
2. Complete a MNRF Request for Information, to determine the potential presence of SAR or other significant natural features in the study area.
3. Conduct a breeding bird survey of the study area following the protocol of the Ontario Breeding Bird Atlas (Bird Studies Canada. 2004). The breeding bird survey requires two, focused, early morning site visits during the period between late May and early July.
4. Conduct an amphibian (frogs and toads) call survey as per the Marsh Monitoring Program (2003), by Bird Studies Canada. This requires 3 surveys conducted between ½ hour after sunset and before midnight within specific periods: 15-30 April, 15-30 May, and 15-30 June. Surveys will be conducted when evening temperatures are appropriate.
5. Conduct Winter Wildlife Surveys as per the Region of Waterloo's Greenlands Network Implementation Guideline. This requires two visual encounter surveys between January 1 and February 28, 24 to 72 hours after a snowfall of at least two centimetres. All animals, calls, tracks, scat, browse etc. and over wintering habitat use by waterfowl, raptors, wild turkeys, and deer as per the current applicable Significant Wildlife Technical Guideline must be documented.
6. Complete a three-season Ecological Land Classification (MNRF) and botanical inventory of the study area.
7. Conduct a site visit to confirm the extent and character of fish habitat within the study area, where access is permitted, with a focus on distinguishing between permanent and intermittent tributaries, the presence/absence of habitat potentially suitable for Brook Trout, and potential restoration, enhancement and mitigation opportunities.
8. Investigate the study area for the presence of significant wildlife habitat, Species at Risk habitat and Species at Risk presence.
9. Wetland Limit: Pre-stake the boundary of the PSW and the GRCA wetland within the parcel to be severed and coordinate with the GRCA to field-verify the actual boundary of the wetland. GRCA conducts wetland boundary delineations during the growing season only, i.e. late April to mid-September. Wetland limit to be picked up by project surveyors. *Requirement to be determined per GRCA and previously delineated wetland boundary limitations.*
10. Woodland Limit & ESPA 41 Delineation & Determination of Woodland Significance: To determine the actual limit of the Woodland and whether it meets the criteria for

significance. Woodland limit to be picked up by project surveyors. *Requirement to be determined per Region and previously delineated woodland boundary limitations.*

11. Record observations of incidental wildlife during site visits.
12. Describe the proposed development and provide alternatives to avoid impacts to the natural heritage system. Provide recommendations and justifications for the size (i.e. width) of the buffer to the PSW.
13. Provide mitigation and avoidance measure recommendations
14. Communications with project team, GRCA, Township and Region as needed.
15. Analyze findings and prepare figures that show:
 - a. Identified natural heritage features, and functions and landscape level features (e.g. linkages, forest interior habitat).
 - b. The proposed site plan
 - c. ELC vegetation communities
 - d. Locations of amphibian surveys
 - e. Other noteworthy features as needed
 - f. Locations of the results of the breeding bird survey
 - g. Locations of other natural heritage features from background literature searches (e.g. mammal atlas, herpetofaunal atlas, Region of Waterloo OP, Township of North Dumfries OP.
 - h. Wetland Boundary delineation, as verified with the GRCA.
 - i. Woodland drip line, as verified with the Region of Waterloo.
 - j. Identification of fish habitat and recommended fisheries setbacks.
16. Conduct an impact assessment by reviewing the proposed development's direct, in-direct, and induced (i.e. residual, ongoing) impacts on the natural features. Provide an opinion about the location of the components of the site plan (e.g. buildings, road) to reduce/avoid impacts to natural heritage features. Show the configuration of the proposed development on the severed parcel and assess for minimizing impacts to ecological features and functions. This will involve discussions with the proponent, project engineer and AA.
17. Provide policy rationale for expected impacts to natural heritage features e.g. removal of trees and grading to accommodate the site plan.
18. Edge Management Guidelines and Compensation: Provide general recommendations of where and why naturalization treatments may be needed to protect vegetation and surface water features (e.g. woodlands, wetlands, watercourses) adjacent to the development activity. Provide rationale and recommendations for tree compensation (e.g. where, why and how much), provide recommendations for the removal of invasive species, and enhancement/restoration of the on-site water features and/or other areas, where warranted.
19. Ensure that quantitative and qualitative aspects of hydrological and hydrogeological regimes to the wetland are maintained per studies completed by others, including:

- a. Characterizing the shallow hydrogeological setting with a detailed field investigation (i.e. boreholes, monitoring wells, field tests and water level monitoring)
 - b. Characterizing the inter-relationship between groundwater and surface water features (wetlands and watercourses) with a detailed field investigation (i.e. piezometers and monitoring).
 - c. Characterize the deeper hydrogeological setting and aquifer supply use (i.e. aquitards and deep aquifers, hydrostratigraphy, water use) using existing background information (i.e. well records, watershed study data).
 - d. Determine the pre-development and post-development water balance conditions and objectives (using site data and watershed study data and objectives).
 - e. Evaluate the site infiltration rates and enhanced recharge opportunities/restrictions to support future SWM design designs and objectives.
 - f. Evaluate site conditions for future sewage system leaching beds.
 - g. Evaluate water supply requirements for the future development lots.
 - h. Evaluate potential groundwater and surface water impacts from future sewage system effluent.
 - i. Evaluate potential groundwater and surface water impacts from future water supply wells.
 - j. Completion of a stormwater management report.
20. Prepare a report of the EIS that includes background information, methods, existing conditions, proposed development, impact assessment and mitigation measures, and appendices of field studies (e.g. flora and ELC data sheets, breeding bird survey results, amphibian survey results).

I look forward to your response regarding these revised Terms of Reference. If you require clarification, please do not hesitate to email or call me at 519.822.6839 x5.

Yours truly,

ABOUD & ASSOCIATES INC.



Shannon Davison, B. Env., Eco. Rest. Cert.
Ecologist
MNRF Certified Ecological Land Classification
MNRF Certified Wetland Evaluation

Cc: Sam Head, Dryden, Smith & Head Planning Consultants Ltd.
Jane Gurney, Region of Waterloo
Michelle Schaeffe, Township of North Dumfries
Lauren Curnow, Chung & Vander Doelen Engineering Ltd.
Ian Robertson, Meritech Engineering

S:\A+A Projects\2017\2-Approved Projects\17-196A Cedar Creek Road, North Dumfries EIS\Approvals, Comments\17-196A Part of Lots 25, 26 and 27- Concession XI RR 97
EIS Revised ToR.docx



LEGEND

- SUBJECT PROPERTY
 PROVINCIAL SIGNIFICANT WETLAND
 STUDY AREA (120M)
 WOODLAND

Information Sources:
 1. Orthophotography provided by First Base Solutions
 Accessed December 1, 2017.
 2. Woodlands & Wetland communities provided by
 Land Information Ontario accessed, August 28, 2017.

STUDY AREA

Project:
 PART OF LOTS 25, 26
 & 27- CONC. XI
 TOWNSHIP OF NORTH
 DUMFRIES



Date: DECEMBER 2017
 Project: AA17-196A
 Scale: 1 : 6000


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Figure No:

1

Shannon Davison

From: John Brum <jbrum@grandriver.ca>
Sent: July-05-18 9:00 AM
To: Shannon Davison
Cc: Jane Gurney (JGurney@regionofwaterloo.ca); Michelle Schaeffle (mschaeffle@northdumfries.ca); Tony Zammit; Janet Ivey
Subject: RE: 17-196 Parts of Lots 25, 26 and 27- Concession XI Regional Road 97, Townships of North Dumfries Scoped EIS Terms of Reference-GRCA Review

Hi Shannon:

My apologies, I thought I had sent out our comments already. I did get comments back from staff and they are as follows:

Subwatershed Planning

As Natural Heritage staff have advised, the 2002 Cedar Creek Scoped Subwatershed Study (SWS) does not constitute a Comprehensive Environmental Impact Study (EIS). In fact, the 2002 study notes the need for a Phase 2/Comprehensive EIS. The Region of Waterloo and GRCA initiated the Upper Cedar Creek Scoped Subwatershed Study (Phase 2) in 2017 and it is underway. The subject property is within the Detailed Study Area of the new Phase 2 study.

We note that the 2013 and 2014 comments provided by GRCA recommended a Full EIS, not a Scoped EIS, for this proposed development. To that end, the proposed Terms of Reference for the Scoped EIS are lacking mention of some key items (per GRCA's EIS Guidelines and previous comments):

- There is no mention of the presence of Cedar Creek itself on the subject property, nor a scope of work to address potential impacts on fish habitat. In support of the currently-underway Cedar Creek Subwatershed Study, GRCA has undertaken monitoring of Cedar Creek in the vicinity of the subject lands and can confirm the presence of brook trout within this reach. I support Tony's elaboration on this point below.
- Maintenance of groundwater recharge/discharge, and surface and groundwater quality are a key issue. Therefore, hydrologic, hydrogeologic and stormwater management plans should be required.
- The Terms of Reference (TOR) does not address the Stormwater Management Plan and Hydrogeological Report noted as required in GRCA's previous comments.

Natural Heritage

It might be worth pointing out to the applicant that the Cedar Creek SWS completed in 2002 does not constitute a Comprehensive EIS, and that the GRCA and the Region of Waterloo are currently in the process of completing a Phase 2 SWS in order to support future development within a broader study area. The fact that the Phase 2 subwatershed study is still in progress suggests there is a need for additional comprehensive information to support industrial development on this site. Generally speaking, the TOR does not provide sufficient detail that would indicate that the GRCA's policies, or Provincial Policies for that matter, will be adequately addressed.

The need for and scope of any proposed hydrological, hydrogeological, and stormwater assessments requires further clarification.

There was no mention of aquatic surveys in the TOR. It is requested that a standard pre-development monitoring program be developed for the subject lands to properly characterize nearby aquatic and wetland features and functions (e.g. water levels, flows, nutrient levels, temperature, etc.) that might be negatively or adversely impacted as a result of the proposed industrial development.

A detailed assessment of potential hydrological and ecological impacts, particularly stormwater-related impacts, is required. The consultant(s) responsible for this aspect of the EIS should be identified and a detailed work plan provided to the GRCA for review and comment.

A 3-season inventory of vegetation communities is considered appropriate for this site and will provide a good basis for wetland delineations and related ecological assessments.

Advisory Comments

A minimum of 2 bird surveys during the breeding period is generally recommended. However, additional surveys may be necessary to confirm the presence of over-wintering raptors, nesting raptors, and species at risk such as Common Nighthawk.

Please be advised that there are records of pignut hickory (*provincially rare*) and snapping turtle (*special concern*) within this area. The Ministry of Natural Resources and Forestry (MNRF) should be contacted to obtain a complete list of conservation priority species, including species at risk, that may be present on or adjacent to the subject property.

Please be advised that brook trout spawning habitat has been identified immediately downgradient and downstream of the subject property.

The current TOR should be revised to demonstrate that the level of analysis on this site will be comparable to the Phase 2 SWS being completed by the Region of Waterloo and GRCA within the broader SWS area.

I trust this helps. If you have any further questions, please let us know.



John Brum | Resource Planner
Grand River Conservation Authority
400 Clyde Road, PO Box 729, Cambridge, Ontario N1R 5W6
Tel: 519-621-2763 x2233 | Fax: 519-621-4945 | Toll free: 1-866-900-4722
jbrum@grandriver.ca

From: Shannon Davison [mailto:sdavison@aboudtng.com]

Sent: Wednesday, July 4, 2018 12:56 PM

To: John Brum

Subject: RE: 17-196 Parts of Lots 25, 26 and 27- Concession XI Regional Road 97, Townships of North Dumfries Scoped EIS Terms of Reference

Good Afternoon John,

I'm inquiring about the status of the comments on the Terms of Reference for the above noted property. If you can please let me know when I can expect to receive those comments that would be greatly appreciated.

Regards,

Shannon Davison B.Env. Eco. Rest. Cert.

Ecologist

MNRF Certified Wetland Evaluation . MNRF Certified Ecological Land Classification

ABOUD & ASSOCIATES INC. 190 Nicklin Road . Guelph . Ontario . N1H 7L5

T : 519.822.6839 x5 C : 226.581.0707 www.aboudtng.com sdavison@aboudtng.com

From: John Brum <jbrum@grandriver.ca>
Sent: February-01-18 10:09 AM
To: Shannon Davison <sdavison@aboudtng.com>
Subject: RE: 17-196 Parts of Lots 25, 26 and 27- Concession XI Regional Road 97, Townships of North Dumfries Scoped EIS Terms of Reference

Thanks Shannon. I've forwarded this info to my staff and we'll provide comments ASAP.

Regards,

John Brum
GRCA

From: Shannon Davison [<mailto:sdavison@aboudtng.com>]
Sent: Thursday, February 1, 2018 8:17 AM
To: John Brum
Subject: RE: 17-196 Parts of Lots 25, 26 and 27- Concession XI Regional Road 97, Townships of North Dumfries Scoped EIS Terms of Reference

Hi John,

I have attached correspondence from the Region and GRCA from 2013. I failed to clarify that the 2013 GRCA comments were between Andrew Herreman and Steve Stone (North Dumfries). I have also attached comments from Beth Brown in 2014 regarding the Official Plan Application for the property. If you need anything further please let me know.

Regards,

Shannon Davison B.Env. Eco. Rest. Cert.
Ecologist
MNR Certified Wetland Evaluation . MNR Certified Ecological Land Classification
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From: John Brum [<mailto:jbrum@grandriver.ca>]
Sent: January-31-18 4:44 PM
To: Shannon Davison
Subject: FW: 17-196 Parts of Lots 25, 26 and 27- Concession XI Regional Road 97, Townships of North Dumfries Scoped EIS Terms of Reference
Importance: High

Hi Shannon:

My staff has asked about the comments the GRCA provided on Aug. 6, 2013 which you reference in your Terms of Reference. I haven't been able to track down or locate these comments in our files. Could you please forward a copy of those comments?

Thanks,

John Brum
GRCA

From: John Brum
Sent: Wednesday, January 31, 2018 2:43 PM
To: 'Shannon Davison'

Subject: RE: 17-196 Parts of Lots 25, 26 and 27- Concession XI Regional Road 97, Townships of North Dumfries Scoped EIS Terms of Reference

Hi Shannon:

I'm still waiting for comments from internal staff. I've sent out a reminder notice to them to get me their comments.

Regards,



John Brum | Resource Planner
Grand River Conservation Authority
400 Clyde Road, PO Box 729, Cambridge, Ontario N1R 5W6
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jbrum@grandriver.ca

From: Shannon Davison [<mailto:sdavison@aboudtng.com>]

Sent: Monday, January 29, 2018 12:54 PM

To: John Brum

Subject: 17-196 Parts of Lots 25, 26 and 27- Concession XI Regional Road 97, Townships of North Dumfries Scoped EIS Terms of Reference

Good Afternoon John,

I'm following up on a Terms of Reference for the property listed above that I submitted to you on December 19. If you would be able to give me an estimation of when I could expect GRCA comments that would be greatly appreciated.

Regards,

Shannon Davison B.Env. Eco. Rest. Cert.

Ecologist

MNRF Certified Wetland Evaluation . MNRF Certified Ecological Land Classification

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Shannon Davison

From: Tim Van Hinte <TVanHinte@regionofwaterloo.ca>
Sent: December-22-17 9:08 AM
To: Shannon Davison; John Brum
Cc: alexg@dsh.ca; mschaefle@northdumfries.ca; Jane Gurney
Subject: RE: 17-196 Parts of Lots 25, 26 and 27- Concession XI Regional Road 97, Townships of North Dumfries Scoped EIS Terms of Reference
Attachments: ESPA_041_TDS.doc

Thanks Shannon – a few comments for your consideration:

- Two winter wildlife surveys (visual encounter) should be included between January 1 and February 28 (24 to 72 hours after snowfall) in accordance with our Greenlands Network Implementation Guideline (Section. 4.4.7, p. 28).
- Item #8 on page 5 should be revised to “Woodland Limit and ESPA 41 Delineation...”. The ESPA limit should be interpreted as the combined boundary of wetlands, woodlands and any other feature(s) where warranted (e.g. SWH, SAR habitat, etc.). I have attached our data sheet of ESPA 41 for your information.
- Item #16 on page 6 should be revised to “...removal of invasive species, and enhancement/restoration of the on-site water feature and/or other areas, where warranted.”

Otherwise, it looks good to me and includes all the items we talked about on our site walk.

Tim

From: Shannon Davison [mailto:sdavison@aboudtng.com]
Sent: Monday, December 18, 2017 10:35 AM
To: John Brum
Cc: alexg@dsh.ca; Tim Van Hinte; mschaefle@northdumfries.ca
Subject: 17-196 Parts of Lots 25, 26 and 27- Concession XI Regional Road 97, Townships of North Dumfries Scoped EIS Terms of Reference

Good Morning John,

Please find the attached Terms of Reference for the scoped Environmental Impact Study for the proposed development within the property listed as Part of Lots 25, 26 and 27- Concession XI in the Township of North Dumfries. If you could send any comments you may have regarding the Terms of Reference at your earliest convenience that would be greatly appreciated.

Regards,

Shannon Davison B.Env. Eco. Rest. Cert.
Ecologist
MNRF Certified Wetland Evaluation . MNRF Certified Ecological Land Classification
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Please note the change in my last name & e-mail address

APPENDIX 2
Background Wildlife List

DATE OBS	COMMON NAME	SCIENTIFIC NAME	SARO	COSEWIC	SARA	SCHEDULE	S-RANK	G-RANK	GROUP	COSEWIC_DATE	AREA SENSITIVE	AREA REQUIRED	PIF SPECIES (BCR 13)	GRCA (date unk.)	REGION OF WATERLOO (1999-2007)
	AMPHIBIANS														
ORAA (2012)	Jefferson Salamander	Ambystoma jeffersonianum	END	END	END	Schedule 1	S2	G4	Amphibians	2005-10-17					✓
ORAA (2014)	Blue-spotted Salamander	Ambystoma laterale					S4	G5	Amphibians						✓
ORAA (2017)	Spotted Salamander	Ambystoma maculatum					S4	G5	Amphibians						✓
ORAA (2012)	Unisexual Ambystoma, Jefferson dependent population	Ambystoma laterale - (2) jeffersonianum	END	END			S2	G5	Amphibians						✓
ORAA (2016)	Four-toed Salamander	Hemidactylium scutatum	NAR	NAR			S4	G5	Amphibians	2005-10-17					✓
ORAA (1993)	Eastern Red-backed Salamander	Plethodon cinereus					S5	G5	Amphibians						✓
ORAA (1996)	Mudpuppy	Necturus maculosus	NAR	NAR			S4	G5	Amphibians	2005-10-17					✓
ORAA (2015_)	Red-spotted Newt	Notophthalmus viridescens viridescens					S5	G5	Amphibians						✓
ORAA (2017)	American Toad	Anaxyrus americanus					S5	G5	Amphibians						
ORAA (2012)	Gray Treefrog	Hyla versicolor					S5	G5	Amphibians						
ORAA (2014)	Spring Peeper	Pseudacris crucifer					S5	G5	Amphibians						
ORAA (2016)	Western Chorus Frog - Great Lakes / St. Lawrence - Canadian Shield Population	Pseudacris triseriata pop. 2	NAR	THR	THR	Schedule 1	S3	G5TNR	Amphibians	2008-04-30					
ORAA (2013)	American Bullfrog	Lithobates catesbeianus					S4	G5	Amphibians		✓				✓
ORAA (2017)	Green Frog	Lithobates clamitans					S5	G5	Amphibians						
ORAA (2017)	Pickerel Frog	Lithobates palustris	NAR	NAR			S4	G5	Amphibians	2005-10-17					✓
ORAA (2017)	Northern Leopard Frog	Lithobates pipiens	NAR	NAR			S5	G5	Amphibians	2005-10-17					
ORAA (2017)	Wood Frog	Lithobates sylvaticus					S5	G5	Amphibians						
	SNAKES AND LIZARDS														
ORAA (1966)	Milksnake	Lampropeltis triangulum		SC	SC	Schedule 1	S3	G5T5	Snakes & Lizards	2002-05-01					✓
ORAA (1984)	Northern Watersnake	Nerodia sipedon sipedon	NAR	NAR			S5	G5T5	Snakes & Lizards	2005-10-17					✓
ORAA (1988)	Queensnake	Regina septemvittata	END	END	END	Schedule 1	S2	G5	Snakes & Lizards	2010-04-30					✓
ORAA (1978)	DeKay's Brownsnake	Storeria dekayi	NAR	NAR			S5	G5T5	Snakes & Lizards	2005-10-17					
ORAA (1993)	Northern Red-bellied Snake	Storeria occipitomaculata occipitomaculata					S5	G5	Snakes & Lizards						
ORAA (2012)	Eastern Ribbonsnake	Thamnophis sauritus	SC	SC	SC	Schedule 1	S3	G5	Snakes & Lizards	2002-05-01					✓
	TURTLES														
ORAA (2011)	Snapping Turtle	Chelydra serpentina	SC	SC	SC	Schedule 1	S3	G5T5	Turtles	2008-11-30					

APPENDIX 2. BACKGROUND WILDLIFE LIST

Project #: AA17-196A

ORAA (2017)	Midland Painted Turtle	Chrysemys picta marginata					S5	G5T5	Turtles						
ORAA (2017)	Blanding's Turtle	Emydoidea blandingii	THR	THR	THR	Schedule 1	S3	G4	Turtles	2005-05-01					✓
	BIRDS														
OBBA (2007)	Pied-billed Grebe	Podilymbus podiceps					S4B,S4N	G5	Birds					CP	✓
OBBA (2007)	Least Bittern	Ixobrychus exilis	THR	THR	THR	Schedule1	S4B	G5	Birds	2005-10-17	✓			CP	✓
OBBA (2007)	Green Heron	Butorides virescens					S4B	G5	Birds					CP	✓
OBBA (2007)	Trumpeter Swan	Cygnus buccinator	NAR	NAR			S4	G4	Birds	2005-10-17					
OBBA (2007)	Mute Swan	Cygnus olor					SNA	G5	Birds						
OBBA (2007)	Canada Goose	Branta canadensis					S5	G5	Birds					CP	
OBBA (2007)	Wood Duck	Aix sponsa					S5	G5	Birds						
OBBA (2007)	Mallard	Anas platyrhynchos					S5	G5	Birds						
OBBA (2007)	Blue-winged Teal	Anas discors					S4	G5	Birds					CP	
OBBA (2007)	Hooded Merganser	Lophodytes cucullatus					S5B,S5N	G5	Birds					CP	✓
OBBA (2007)	Ruddy Duck	Oxyura jamaicensis					S4B,S4N	G5	Birds						
OBBA (2007)	Turkey Vulture	Cathartes aura					S5B	G5	Birds					CP	✓
OBBA (2007)	Northern Harrier	Circus cyaneus	NAR	NAR			S4B	G5	Birds	2005-10-17	✓	>30ha	✓	CP	✓
OBBA (2007)	Sharp-shinned Hawk	Accipiter striatus	NAR				S5	G5	Birds		✓	>30ha		CP	✓
OBBA (2007)	Cooper's Hawk	Accipiter cooperii	NAR	NAR			S4	G5	Birds	2005-10-17	✓	>10ha		CP	✓
OBBA (2007)	Red-shouldered Hawk	Buteo lineatus	NAR	NAR			S4B	G5	Birds		✓	>100ha	✓	CP	✓
OBBA (2007)	Red-tailed Hawk	Buteo jamaicensis	NAR	NAR			S5	G5	Birds	2005-10-17					
OBBA (2007)	American Kestrel	Falco sparverius					S4	G5	Birds				✓	CP	
OBBA (2007)	Ring-necked Pheasant	Phasianus colchicus					SNA	G5	Birds						
OBBA (2007)	Ruffed Grouse	Bonasa umbellus					S4	G5	Birds					CP	
OBBA (2007)	Wild Turkey	Meleagris gallopavo					S5	G5	Birds						
OBBA (2007)	Virginia Rail	Rallus limicola					S5B	G5	Birds					CP	✓
OBBA (2007)	Sora	Porzana carolina					S4B	G5	Birds					CP	✓
OBBA (2007)	Common Moorhen	Gallinula chloropus					S4B	G5	Birds					CP	✓
OBBA (2007)	American Coot	Fulica americana	NAR	NAR			S4B	G5	Birds	2005-10-17				CP	✓
OBBA (2007)	Killdeer	Charadrius vociferus					S5B,S5N	G5	Birds						
OBBA (2007)	Spotted Sandpiper	Actitis macularius					S5	G5	Birds					CP	
OBBA (2007)	American Woodcock	Scolopax minor					S4B	G5	Birds					CP	
OBBA (2007)	Rock Pigeon	Columba livia					SNA	G5	Birds						
OBBA (2007)	Mourning Dove	Zenaida macroura					S5	G5	Birds						
OBBA (2007)	Black-billed Cuckoo	Coccyzus erythrophthalmus					S5B	G5	Birds				✓	CP	✓
OBBA (2007)	Yellow-billed Cuckoo	Coccyzus americanus					S4B	G5	Birds						✓
OBBA (2007)	Eastern Screech-Owl	Megascops asio	NAR	NAR			S4	G5	Birds	2005-10-17					
OBBA (2007)	Great Horned Owl	Bubo virginianus					S4	G5	Birds						
OBBA (2007)	Chimney Swift	Chaetura pelagica	THR	THR	THR	Schedule1	S4B,S4N	G5	Birds	2007-04-28			✓		
OBBA (2007)	Ruby-throated Hummingbird	Archilochus colubris					S5B	G5	Birds					CP	✓
OBBA (2007)	Belted Kingfisher	Megasceryle alcyon					S4B	G5	Birds				✓		✓

APPENDIX 2. BACKGROUND WILDLIFE LIST

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OBBA (2007)	Red-bellied Woodpecker	Melanerpes carolinus					S4	G5	Birds					CP	✓
OBBA (2007)	Yellow-bellied Sapsucker	Sphyrapicus varius					S5B	G5	Birds		✓	2-5ha		CP	✓
OBBA (2007)	Downy Woodpecker	Picoides pubescens					S5	G5	Birds						
OBBA (2007)	Hairy Woodpecker	Picoides villosus					S5	G5	Birds		✓	4-8ha			✓
OBBA (2007)	Northern Flicker	Colaptes auratus					S4B	G5	Birds				✓		
OBBA (2007)	Pileated Woodpecker	Dryocopus pileatus					S5	G5	Birds		✓	>40ha		CP	✓
OBBA (2007)	Eastern Wood-pewee	Contopus virens	SC	SC		No Schedule	S4B	G5	Birds	2014-06-27			✓		
OBBA (2007)	Alder Flycatcher	Empidonax alnorum					S5B	G5	Birds					CP	✓
OBBA (2007)	Willow Flycatcher	Empidonax traillii					S5B	G5	Birds				✓		✓
OBBA (2007)	Least Flycatcher	Empidonax minimus					S4B	G5	Birds		✓	>100ha		CP	✓
OBBA (2007)	Eastern Phoebe	Sayornis phoebe					S5B	G5	Birds					CP	
OBBA (2007)	Great Crested Flycatcher	Myiarchus crinitus					S4B	G5	Birds						
OBBA (2007)	Eastern Kingbird	Tyrannus tyrannus					S4B	G5	Birds				✓	CP	
OBBA (2007)	Horned Lark	Eremophila alpestris					S5B	G5	Birds					CP	
OBBA (2007)	Tree Swallow	Tachycineta bicolor					S4B	G5	Birds						
OBBA (2007)	Northern Rough-winged Swallow	Stelgidopteryx serripennis					S4B	G5	Birds					CP	
OBBA (2007)	Bank Swallow	Riparia riparia	THR	THR		No Schedule	S4B	G5	Birds	2014-06-27			✓	CP	
OBBA (2007)	Barn Swallow	Hirundo rustica	THR	THR		No Schedule	S4B	G5	Birds	2011-05-09				CP	
OBBA (2007)	Blue Jay	Cyanocitta cristata					S5	G5	Birds						
OBBA (2007)	American Crow	Corvus brachyrhynchos					S5B	G5	Birds						
OBBA (2007)	Black-capped Chickadee	Poecile atricapillus					S5	G5	Birds					CP	
OBBA (2007)	Red-breasted Nuthatch	Sitta canadensis					S5	G5	Birds		✓	>10ha		CP	✓
OBBA (2007)	White-breasted Nuthatch	Sitta carolinensis					S5	G5	Birds		✓	>10ha			
OBBA (2007)	Brown Creeper	Certhia americana					S5B	G5	Birds		✓	>30ha		CP	✓
OBBA (2007)	House Wren	Troglodytes aedon					S5B	G5	Birds						
OBBA (2007)	Winter Wren	Troglodytes troglodytes					S5B	G5	Birds		✓	>30ha			✓
OBBA (2007)	Sedge Wren	Cistothorus platensis	NAR	NAR			S4B	G5	Birds	2005-10-17				CP	✓
OBBA (2007)	Marsh Wren	Cistothorus palustris					S4B	G5	Birds					CP	✓
OBBA (2007)	Blue-gray Gnatcatcher	Poliophtila caerulea					S4B	G5	Birds		✓	>30ha		CP	✓
OBBA (2007)	Eastern Bluebird	Sialia sialis	NAR	NAR			S5B	G5	Birds	2005-10-17				CP	✓
OBBA (2007)	Veery	Catharus fuscescens					S4B	G5	Birds		✓	>10ha		CP	✓
OBBA (2007)	Wood Thrush	Hylocichla mustelina	SC	THR		No Schedule	S4B	G5	Birds	2014-06-27			✓		
OBBA (2007)	American Robin	Turdus migratorius					S5B	G5	Birds						
OBBA (2007)	Gray Catbird	Dumetella carolinensis					S4B	G5	Birds					CP	
OBBA (2007)	Northern Mockingbird	Mimus polyglottos					S4	G5	Birds					CP	✓
OBBA (2007)	Brown Thrasher	Toxostoma rufum					S4B	G5	Birds				✓	CP	✓
OBBA (2007)	Cedar Waxwing	Bombicilla cedrorum					S5B	G5	Birds						
OBBA (2007)	European Starling	Sturnus vulgaris					SNA	G5	Birds						
OBBA (2007)	Yellow-throated Vireo	Vireo flavifrons					S4B	G5	Birds		✓	>30ha			✓
OBBA (2007)	Warbling Vireo	Vireo gilvus					S5B	G5	Birds						✓
OBBA (2007)	Red-eyed Vireo	Vireo olivaceus					S5B	G5	Birds						

APPENDIX 2. BACKGROUND WILDLIFE LIST

Project #: AA17-196A

OBBA (2007)	Yellow Warbler	Dendroica petechia					S5B	G5	Birds						
OBBA (2007)	Chestnut-sided Warbler	Dendroica pensylvanica					S5B	G5	Birds					CP	
OBBA (2007)	Black-throated Green Warbler	Dendroica virens					S5B	G5	Birds		✓	>30ha			✓
OBBA (2007)	Pine Warbler	Dendroica pinus					S5B	G5	Birds		✓	15-30ha		CP	✓
OBBA (2007)	Cerulean Warbler	Dendroica cerulea	THR	END	SC	Schedule1	S3B	G4	Birds	2010-11-29	✓	>100ha	✓	CP	✓
OBBA (2007)	Black-and-white Warbler	Mniotilta varia					S5B	G5	Birds		✓	>100ha		CP	✓
OBBA (2007)	American Redstart	Setophaga ruticilla					S5B	G5	Birds		✓	>100ha		CP	✓
OBBA (2007)	Ovenbird	Seiurus aurocapilla					S4B	G5	Birds		✓	>70ha		CP	✓
OBBA (2007)	Northern Waterthrush	Seiurus noveboracensis					S5B	G5	Birds						✓
OBBA (2007)	Mourning Warbler	Oporornis philadelphia					S4B	G5	Birds					CP	✓
OBBA (2007)	Common Yellowthroat	Geothlypis trichas					S5B	G5	Birds						
OBBA (2007)	Canada Warbler	Wilsonia canadensis	SC	THR	THR	Schedule1	S4B	G5	Birds	2008-04-01	✓	>30ha			✓
OBBA (2007)	Scarlet Tanager	Piranga olivacea					S4B	G5	Birds		✓	>20ha		CP	✓
OBBA (2007)	Northern Cardinal	Cardinalis cardinalis					S5	G5	Birds						
OBBA (2007)	Rose-breasted Grosbeak	Pheucticus ludovicianus					S4B	G5	Birds				✓		
OBBA (2007)	Indigo Bunting	Passerina cyanea					S4B	G5	Birds						
OBBA (2007)	Eastern Towhee	Pipilo erythrophthalmus					S4B	G5	Birds				✓	CP	
OBBA (2007)	Chipping Sparrow	Spizella passerina					S5B	G5	Birds						
OBBA (2007)	Clay-colored Sparrow	Spizella pallida					S4B	G5	Birds					CP	✓
OBBA (2007)	Field Sparrow	Spizella pusilla					S4B	G5	Birds				✓	CP	
OBBA (2007)	Vesper Sparrow	Poocetes gramineus					S4B	G5	Birds				✓	CP	✓
OBBA (2007)	Savannah Sparrow	Passerculus sandwichensis					S4B	G5	Birds		✓	>50ha	✓	CP	
OBBA (2007)	Grasshopper Sparrow	Ammodramus savannarum	SC	SC		No Schedule	S4B	G5TU	Birds		✓	>10ha	✓	CP	✓
OBBA (2007)	Song Sparrow	Melospiza melodia					S5B	G5	Birds						
OBBA (2007)	Swamp Sparrow	Melospiza georgiana					S5B	G5	Birds					CP	✓
OBBA (2007)	White-throated Sparrow	Zonotrichia albicollis					S5B	G5	Birds					CP	✓
OBBA (2007)	Bobolink	Dolichonyx oryzivorus	THR	THR		No Schedule	S4B	G5	Birds	2010-04-01	✓	>10ha	✓	CP	
OBBA (2007)	Red-winged Blackbird	Agelaius phoeniceus					S4	G5	Birds						
OBBA (2007)	Eastern Meadowlark	Sturnella magna	THR	THR		No Schedule	S4B	G5	Birds	2011-05-09	✓	>10ha	✓	CP	
OBBA (2007)	Yellow-headed Blackbird	Xanthocephalus xanthocephalus					S2B	G5	Birds						
OBBA (2007)	Common Grackle	Quiscalus quiscula					S5B	G5	Birds						
OBBA (2007)	Brown-headed Cowbird	Molothrus ater					S4B	G5	Birds						
OBBA (2007)	Baltimore Oriole	Icterus galbula					S4B	G5	Birds				✓		
OBBA (2007)	House Finch	Carpodacus mexicanus					SNA	G5	Birds						
OBBA (2007)	American Goldfinch	Carduelis tristis					S5B	G5	Birds					CP	
OBBA (2007)	House Sparrow	Passer domesticus					SNA	G5	Birds						
	MAMMALS														
OMA (1994)	Virginia Opossum	Didelphis virginiana					S4	G5	Mammals						✓
OMA (1994)	Star-nosed Mole	Condylura cristata					S5	G5	Mammals						
OMA (1994)	Little Brown Myotis	Myotis lucifugus	END	END	END	Schedule 1	S4	G3G4	Mammals	2012-02-03					

APPENDIX 2. BACKGROUND WILDLIFE LIST

Project #: AA17-196A

OMA (1994)	Big Brown Bat	Eptesicus fuscus					S5	G5	Mammals						
OMA (1994)	Eastern Cottontail	Sylvilagus floridanus					S5	G5	Mammals						
OMA (1994)	European Hare	Lepus europaeus					SNA	G5	Mammals						
OMA (1994)	Eastern Chipmunk	Tamias striatus					S5	G5	Mammals						
OMA (1994)	Woodchuck	Marmota monax					S5	G5	Mammals						
OMA (1994)	Eastern Gray Squirrel	Sciurus carolinensis					S5	G5	Mammals						
OMA (1994)	Red Squirrel	Tamiasciurus hudsonicus					S5	G5	Mammals						
OMA (1994)	Beaver	Castor canadensis					S5	G5	Mammals						✓
OMA (1994)	Meadow Vole	Microtus pennsylvanicus					S5	G5	Mammals						
OMA (1994)	Muskrat	Ondatra zibethicus					S5	G5	Mammals						
OMA (1994)	Porcupine	Erethizon dorsatum					S5	G5	Mammals						✓
OMA (1994)	Coyote	Canis latrans					S5	G5	Mammals						✓
OMA (1994)	Red Fox	Vulpes vulpes					S5	G5	Mammals						
OMA (1994)	Northern Raccoon	Procyon lotor					S5	G5	Mammals						
OMA (1994)	American Mink	Mustela vison					S4	G5	Mammals						✓
OMA (1994)	Striped Skunk	Mephitis mephitis					S5	G5	Mammals						
OMA (1994)	White-tailed Deer	Odocoileus virginianus					S5	G5	Mammals						

APPENDIX 3
Ecological Land Classification forms

ELC COMMUNITY DESCRIPTION & CLASSIFICATION

Project: Cedar Creek/Dumfries Road Project #: 17-196 Observer(s): SD

Weather conditions:

Date: May 18, August 7, October 12, 2018

Temp (°C)	Wind*	Cloud Cover	Precipitation	Precipitation(24hrs)
11	3	30	None	None

*Beaufort Scale: 0- (0 km/hr), 1- (1-5km/hr), 2- (6-11km/hr), 3- (12-19km/hr), 4- (20-28km/hr), 5- (29-38km/hr), 6- (39-49km/hr)

Polygon: A	Polygon UTM E: 547802.48 N: 4798869.02	Community Series MEM- Mixed Meadow	Ecosite MEMM3- Dry Fresh Mixed Meadow	Vegetation Type
System Terrestrial Wetland Aquatic	Topographic Feature Lacustrine Riverine Bottomland Terrace Valley slope Tableland Rolling upland Cliff Talus Crevice Cave Alvar Rockland Beach Bar Sand dune Bluff			Dominant Plant Form Plankton Submerged Floating-lvd. Graminoid Forb Lichen Bryophyte Deciduous Coniferous Mixed
Cover Open Shrub Treed	History Natural Cultural	Community Class Beach-Bar Sand Dune Bluff Cliff Talus Alvar Rock Barren Crevice-Cave Sand Barren Meadow Tallgrass Prairie Savannah Woodland Forest Thicket Cultural Swamp Fen Bog Marsh Open Water Shallow Water		
Stand Description:		Soil Analysis:		
Community Age Pioneer Young Mid-Aged Mature Old Growth		Basal Area (m²/ha)	Soil Drainage Very Rapid Rapid Well Moderately Well Imperfect Poor Very Poor	
Standing Snags Rare Occasional Abundant Dominant		Soil Moisture Regime Dry Fresh Moist Wet		
Deadfall Logs Rare Occasional Abundant Dominant		Effective Soil Texture Sandy Loam- Only able to auger 30cm due to coarse gravel/rocks		
Health Low Medium High	Sensitivity Low Medium High	Botanical Quality Low Medium High	Depth to Mottles / Gley Sample: M - -- cm / G - -- cm	
Slope none gentle moderate steep (simple or complex)		Depth to Groundwater metres at surface less than 1m more than 1 m		Depth to Bedrock metres at surface less than 1m more than 1 m

Vegetation Layer	Height ¹	Cover ²	Dominant Species per Vegetation Layer
1 Canopy	2	1	POPBALS = ACESASA > POPGRAN
2 Subcanopy	3	1	THUOCCI > SALPURP
3 Understorey	4	3	SOLALTI. > BROINER > DAUCARO > VERTHAP
4 Ground Layer	6	3	BROINER > POACOMP > SOLNEMO > MELALBU

¹ Height Code: 1=>20m, 2=10m-20m, 3=2m-10m, 4=1m-2m, 5=0.5m-1m, 6=0.2m-0.5m, 7= < 0.2m ² Cover Codes: 0 = none, 1 = 0%- 10%, 2 = 10%- 25%, 3 = 25%-60%, 4= >60%

Size Class Analysis ³	R	R	R	
³ Abundance Code: RS=Rare, O=Occasional, A=Abundant, D=Dominant	< 10 cm DBH	10 to 24 cm DBH	25 to 50 cm DBH	> 50 cm DBH

Evidence of Disturbance:
Pockets of gravel/fill throughout

Wildlife / Habitat Observations / Comments:
FISP, RWBB, AMCR, BCCH, MONA (caterpillar), BLJA

				Community Name	Code	% Coverage
Inclusion		Complex				
Inclusion		Complex				
Inclusion		Complex				

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Representative Photographs of Vegetation Community:



ELC COMMUNITY DESCRIPTION & CLASSIFICATION

Project: Cedar Creek Project #: 17-196 Observer(s): SD

Weather conditions:

Date: 18/05/2018

Temp (°C)	Wind*	Cloud Cover	Precipitation	Precipitation(24hrs)
11	3	30	None	None

*Beaufort Scale: 0- (0 km/hr), 1- (1-5km/hr), 2- (6-11km/hr), 3- (12-19km/hr), 4- (20-28km/hr), 5- (29-38km/hr), 6- (39-49km/hr)

Polygon: B	Polygon UTM E: 547820.17 N: 4798636.25	Community Series TAG- Treed Agriculture	Ecosite TAGM5- Fencerow (Mixed)	Vegetation Type
System Terrestrial Wetland Aquatic	Topographic Feature Lacustrine Riverine Bottomland Terrace Valley slope Tableland Rolling upland Cliff Talus Crevice Cave Alvar Rockland Beach Bar Sand dune Bluff			Dominant Plant Form Plankton Submerged Floating-lvd. Graminoid Forb Lichen Bryophyte Deciduous Coniferous Mixed
Cover Open Shrub Treed	History Natural Cultural	Community Class Beach-Bar Sand Dune Bluff Cliff Talus Alvar Rock Barren Crevice-Cave Sand Barren Meadow Tallgrass Prairie Savannah Woodland Forest Thicket Cultural Swamp Fen Bog Marsh Open Water Shallow Water		
Stand Description:		Soil Analysis:		
Community Age Pioneer Young Mid-Aged Mature Old Growth		Basal Area (m²/ha)	Soil Drainage Very Rapid Rapid Well Moderately Well Imperfect Poor Very Poor	
Standing Snags Rare Occasional Abundant Dominant		Soil Moisture Regime Dry Fresh Moist Wet		
Deadfall Logs Rare Occasional Abundant Dominant		Effective Soil Texture		
Health Low Medium High	Sensitivity Low Medium High	Botanical Quality Low Medium High	Depth to Mottles / Gley Sample: M - -- cm / G - -- cm	
Slope none gentle moderate steep (simple or complex)		Depth to Groundwater at surface less than 1m more than 1m	Depth to Bedrock at surface less than 1m more than 1m	

Vegetation Layer	Height ¹	Cover ²	Dominant Species per Vegetation Layer
1 Canopy	2	3	POPTREM > PINSTRO = PICABIE
2 Subcanopy	3	4	RHACATH > PINSTRO > THUOCCI > VITRIPA
3 Understorey	4	4	RHACATH > VITRIPA > VIBLENT > PARQUIN
4 Ground Layer	6	3	POAPRAT > TAROFFI

¹ Height Code: 1=>20m, 2=10m-20m, 3=2m-10m, 4=1m-2m, 5=0.5m-1m, 6=0.2m-0.5m, 7= < 0.2m ² Cover Codes: 0 = none, 1 = 0%- 10%, 2 = 10%- 25%, 3 = 25%-60%, 4= >60%

Size Class Analysis ³		O	O	
³ Abundance Code: RS=Rare, O=Occasional, A=Abundant, D=Dominant	< 10 cm DBH	10 to 24 cm DBH	25 to 50 cm DBH	> 50 cm DBH

Evidence of Disturbance:

Land belongs Cedar Creek Community Church, most is manicured lawn.

Wildlife / Habitat Observations / Comments:

Unable to conduct soil analysis due to property access restrictions.

*- Code not found in ELC Codes 2nd Approximation

Inclusion		Complex		Community Name	Code	% Coverage
Inclusion		Complex				
Inclusion		Complex				
Inclusion		Complex				

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Representative Photographs of Vegetation Community:

ELC COMMUNITY DESCRIPTION & CLASSIFICATION

Project: Cedar Creek Project #: 17-196 Observer(s): SD

Weather conditions:

Date: 18/05/2018

Temp (°C)	Wind*	Cloud Cover	Precipitation	Precipitation(24hrs)
13	3	40	None	None

*Beaufort Scale: 0- (0 km/hr), 1- (1-5km/hr), 2- (6-11km/hr), 3- (12-19km/hr), 4- (20-28km/hr), 5- (29-38km/hr), 6- (39-49km/hr)

Polygon: C	Polygon UTM E: 547557.62 N: 4798853.52	Community Series CVC- Commercial & Institutional	Ecosite CVC4- Extraction	Vegetation Type
System Terrestrial <input type="checkbox"/> Wetland Aquatic <input type="checkbox"/>	Topographic Feature Lacustrine Riverine Bottomland Terrace Valley slope Tableland <input type="checkbox"/> Rolling upland Cliff Talus Crevice Cave Alvar Rockland Beach Bar Sand dune Bluff		Dominant Plant Form Plankton Submerged Floating-lvd. Graminoid <input type="checkbox"/> Forb Lichen Bryophyte Deciduous Coniferous Mixed	
Cover <input type="checkbox"/> Open <input type="checkbox"/> Shrub Tree <input type="checkbox"/>	History Natural <input type="checkbox"/> Cultural <input type="checkbox"/>	Community Class Beach-Bar Sand Dune Bluff Cliff Talus Alvar Rock Barren Crevice-Cave Sand Barren Meadow Tallgrass Prairie Savannah Woodland Forest Thicket <input type="checkbox"/> Cultural Swamp Fen Bog Marsh Open Water Shallow Water		
Stand Description:				
Community Age Pioneer Young Mid-Aged Mature Old Growth		Basal Area (m²/ha)	Soil Analysis:	
			Soil Drainage Very Rapid Rapid Well Moderately Well Imperfect Poor Very Poor	
Standing Snags Rare Occasional Abundant Dominant		Soil Moisture Regime Dry Fresh Moist Wet		
Deadfall Logs Rare Occasional Abundant Dominant		Effective Soil Texture		
Health Low Medium High	Sensitivity Low Medium High	Botanical Quality Low Medium High	Depth to Mottles / Gley Sample: M - -- cm / G - -- cm	
Slope none gentle moderate steep (simple or complex)		Depth to Groundwater metres at surface less than 1m more than 1 m		Depth to Bedrock metres at surface less than 1m more than 1 m

Vegetation Layer	Height ¹	Cover ²	Dominant Species per Vegetation Layer
1 Canopy	3	1	POPGRAN > POPTREM
2 Subcanopy	4	2	POPBALS > SALPURP > POPGRAN > ACENEGU
3 Understorey	5	3	POPBALS > SALPURP > MELALBU > PHRAUST
4 Ground Layer	6	3	SOLNEMO > SYSALTI > MEDLUPU > SALPURP

¹ Height Code: 1=>20m, 2=10m-20m, 3=2m-10m, 4=1m-2m, 5=0.5m-1m, 6=0.2m-0.5m, 7= < 0.2m ² Cover Codes: 0 = none, 1 = 0%- 10%, 2 = 10%- 25%, 3 = 25%-60%, 4 = >60%

Size Class Analysis ³				
³ Abundance Code: RS=Rare, O=Occasional, A=Abundant, D=Dominant	< 10 cm DBH	10 to 24 cm DBH	25 to 50 cm DBH	> 50 cm DBH

Evidence of Disturbance:

Former extraction site

Wildlife / Habitat Observations / Comments:

Unable to auger due to coarse fill. AMRO, TUVU, EACO (tracks), AMGO, BOMBUS IMPATIENS

Inclusion	Complex	Community Name	Code	% Coverage
Inclusion	Complex			
Inclusion	Complex			
Inclusion	Complex			

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Representative Photographs of Vegetation Community:



ELC COMMUNITY DESCRIPTION & CLASSIFICATION

Project: Cedar Creek Project #: 17-196 Observer(s): SD

Weather conditions:

Date: 18/05/2018

Temp (°C)	Wind*	Cloud Cover	Precipitation	Precipitation(24hrs)
13	3	40	None	None

*Beaufort Scale: 0- (0 km/hr), 1- (1-5km/hr), 2- (6-11km/hr), 3- (12-19km/hr), 4- (20-28km/hr), 5- (29-38km/hr), 6- (39-49km/hr)

Polygon: D	Polygon UTM E: 547703.78 N: 4799289.69	Community Series FOD- Deciduous Forest	Ecosite FODM5- Dry- Fresh Sugar Maple Deciduous Forest	Vegetation Type FODM5-3- Dry- Fresh Sugar Maple- Oak Deciduous Forest
System Terrestrial <input type="checkbox"/> Wetland Aquatic <input type="checkbox"/>	Topographic Feature Lacustrine Riverine Bottomland Terrace Valley slope Tableland <input type="checkbox"/> Rolling upland Cliff Talus Crevice Cave Alvar Rockland Beach Bar Sand dune Bluff			Dominant Plant Form Plankton Submerged <input type="checkbox"/> Floating-lvd. Graminoid Forb Lichen Bryophyte <input type="checkbox"/> Deciduous Coniferous Mixed
Cover Open Shrub <input type="checkbox"/> <input type="checkbox"/> Treed	History <input type="checkbox"/> Natural <input type="checkbox"/> Cultural	Community Class Beach-Bar Sand Dune Bluff Cliff Talus Alvar Rock Barren Crevice-Cave Sand Barren Meadow Tallgrass Prairie Savannah Woodland <input type="checkbox"/> Forest Thicket Cultural Swamp Fen Bog Marsh Open Water Shallow Water		
Stand Description:		Soil Analysis:		
Community Age Pioneer Young <input type="checkbox"/> Mid-Aged <input type="checkbox"/> Mature <input type="checkbox"/> Old Growth		Basal Area (m²/ha)	Soil Drainage Very Rapid Rapid Well <input type="checkbox"/> Moderately Well Imperfect Poor Very Poor	
Standing Snags Rare <input type="checkbox"/> Occasional <input type="checkbox"/> Abundant <input type="checkbox"/> Dominant <input type="checkbox"/>		Soil Moisture Regime Dry <input type="checkbox"/> Fresh <input type="checkbox"/> Moist <input type="checkbox"/> Wet		
Deadfall Logs Rare <input type="checkbox"/> Occasional <input type="checkbox"/> Abundant <input type="checkbox"/> Dominant <input type="checkbox"/>		Effective Soil Texture Sandy Loam		
Health Low <input type="checkbox"/> Medium <input type="checkbox"/> High <input type="checkbox"/>	Sensitivity Low <input type="checkbox"/> Medium <input type="checkbox"/> High <input type="checkbox"/>	Botanical Quality Low <input type="checkbox"/> Medium <input type="checkbox"/> High <input type="checkbox"/>	Depth to Mottles / Gley Sample: M - 45 cm / G - -- cm	
Slope none gentle <input type="checkbox"/> moderate <input type="checkbox"/> steep (simple or complex)		Depth to Groundwater at surface <input type="checkbox"/> less than 1m <input type="checkbox"/> more than 1m	Depth to Bedrock at surface less than 1m <input type="checkbox"/> more than 1m <input type="checkbox"/>	

Vegetation Layer	Height ¹	Cover ²	Dominant Species per Vegetation Layer
1 Canopy	1	3	ACESACC >> QUERUBR > FRAAMER > CAROVAT
2 Subcanopy	2	4	RHACATH > ACESACC > PRUVIRG > RHUTYPH
3 Understorey	3	3	RHACATH > ACESACC > PRUVIRG > VITRIPA
4 Ground Layer	6	4	ERYAMER > ACESACC > RHACATH > CAUTHAL

¹ Height Code: 1=>20m, 2=10m-20m, 3=2m-10m, 4=1m-2m, 5=0.5m-1m, 6=0.2m-0.5m, 7= < 0.2m ² Cover Codes: 0 = none, 1 = 0%- 10%, 2 = 10%- 25%, 3 = 25%-60%, 4= >60%

Size Class Analysis ³	A	A	O	R
³ Abundance Code: RS=Rare, O=Occasional, A=Abundant, D=Dominant	< 10 cm DBH	10 to 24 cm DBH	25 to 50 cm DBH	> 50 cm DBH

Evidence of Disturbance:

Wildlife / Habitat Observations / Comments:
BLJA, EUST

Community Name				Code	% Coverage
Inclusion		Complex			
Inclusion		Complex			
Inclusion		Complex			

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Representative Photographs of Vegetation Community:

ELC COMMUNITY DESCRIPTION & CLASSIFICATION

Project: Cedar Creek Project #: 17-196 Observer(s): SD

Weather conditions:

Date: May 18, August 7, October 12, 2018

Temp (°C)	Wind*	Cloud Cover	Precipitation	Precipitation(24hrs)
13	3	30	None	None

*Beaufort Scale: 0- (0 km/hr), 1- (1-5km/hr), 2- (6-11km/hr), 3- (12-19km/hr), 4- (20-28km/hr), 5- (29-38km/hr), 6- (39-49km/hr)

Polygon: F	Polygon UTM E: 547203.75 N: 4798906.69	Community Series SWM- Mixed Swamp	Ecosite SWMM3- Birch-Poplar Mineral Mixed Swamp	Vegetation Type SWMM3-2- Poplar-Conifer Mineral Mixed Swamp
System Terrestrial <input type="checkbox"/> Wetland Aquatic	Topographic Feature Lacustrine Riverine <input type="checkbox"/> Bottomland Terrace Valley slope Tableland Rolling upland Cliff Talus Crevice Cave Alvar Rockland Beach Bar Sand dune Bluff			Dominant Plant Form Plankton Submerged Floating-lvd. Graminoid <input type="checkbox"/> Forb Lichen Bryophyte Deciduous Coniferous <input type="checkbox"/> Mixed
Cover Open Shrub <input type="checkbox"/> Treed	History <input type="checkbox"/> Natural <input type="checkbox"/> Cultural	Community Class Beach-Bar Sand Dune Bluff Cliff Talus Alvar Rock Barren Crevice-Cave Sand Barren Meadow Tallgrass Prairie Savannah Woodland Forest Thicket Cultural <input type="checkbox"/> Swamp Fen Bog Marsh Open Water Shallow Water		
Stand Description:				
Community Age Pioneer Young <input type="checkbox"/> Mid-Aged Mature Old Growth		Basal Area (m²/ha)		
Standing Snags Rare <input type="checkbox"/> Occasional Abundant Dominant		Soil Drainage Very Rapid Rapid Well Moderately Well <input type="checkbox"/> Imperfect <input type="checkbox"/> Poor Very Poor		
Deadfall Logs Rare <input type="checkbox"/> Occasional Abundant Dominant		Soil Moisture Regime Dry Fresh <input type="checkbox"/> Moist <input type="checkbox"/> Wet		
Health Low <input type="checkbox"/> Medium High		Effective Soil Texture Sandy Clay Loam		
Sensitivity Low <input type="checkbox"/> Medium High		Depth to Mottles / Gley Sample: M - 10 cm / G - 10 cm		
Botanical Quality Low <input type="checkbox"/> Medium High		Depth to Groundwater metres at surface <input type="checkbox"/> less than 1m more than 1 m		
Slope none gentle moderate steep (simple or complex)		Depth to Bedrock metres at surface less than 1m <input type="checkbox"/> more than 1 m		

Vegetation Layer	Height ¹	Cover ²	Dominant Species per Vegetation Layer
1 Canopy	1	4	POPTREM > PINSTRO > LARLARI > SALXFRAG
2 Subcanopy	2	4	THUOCCI > PINSTRO > POPTREM > FRAALNU
3 Understorey	3	3	FRAALNU > RHACATH > FRANIGR > PRUVIRG
4 Ground Layer	6	3	ONOSENS > RUBPUBE > EQUARVE > CIRALPI

¹ Height Code: 1=>20m, 2=10m-20m, 3=2m-10m, 4=1m-2m, 5=0.5m-1m, 6=0.2m-0.5m, 7= < 0.2m ² Cover Codes: 0 = none, 1 = 0%- 10%, 2 = 10%- 25%, 3 = 25%-60%, 4= >60%

Size Class Analysis ³	A	A	A	R
³ Abundance Code: RS=Rare, O=Occasional, A=Abundant, D=Dominant	< 10 cm DBH	10 to 24 cm DBH	25 to 50 cm DBH	> 50 cm DBH

Evidence of Disturbance:

Wildlife / Habitat Observations / Comments:
PIWO, GRCA, WTDE (TRACK)

Community Name				Code	% Coverage
Inclusion		Complex			
Inclusion		Complex			
Inclusion		Complex			

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Representative Photographs of Vegetation Community:

ELC COMMUNITY DESCRIPTION & CLASSIFICATION

Project: Cedar Creek Project #: 17-196 Observer(s): SD

Weather conditions:

Date: 18/05/2018

Temp (°C)	Wind*	Cloud Cover	Precipitation	Precipitation(24hrs)
14	2	50	None	None

*Beaufort Scale: 0- (0 km/hr), 1- (1-5km/hr), 2- (6-11km/hr), 3- (12-19km/hr), 4- (20-28km/hr), 5- (29-38km/hr), 6- (39-49km/hr)

Polygon: G	Polygon UTM E: 547202.77 N: 4798720.99	Community Series MEG- Graminoid Meadow	Ecosite MEGM3- Dry- Fresh Graminoid Meadow	Vegetation Type MEGM3-2- Canada Bluegrass Graminoid Meadow
System Terrestrial Wetland Aquatic	Topographic Feature Lacustrine Riverine Bottomland Terrace Valley slope Tableland Rolling upland Cliff Talus Crevice Cave Alvar Rockland Beach Bar Sand dune Bluff			Dominant Plant Form Plankton Submerged Floating-lvd. Graminoid Forb Lichen Bryophyte Deciduous Coniferous Mixed
Cover Open Shrub Treed	History Natural Cultural	Community Class Beach-Bar Sand Dune Bluff Cliff Talus Alvar Rock Barren Crevice-Cave Sand Barren Meadow Tallgrass Prairie Savannah Woodland Forest Thicket Cultural Swamp Fen Bog Marsh Open Water Shallow Water		
Stand Description:		Soil Analysis:		
Community Age Pioneer Young Mid-Aged Mature Old Growth		Basal Area (m²/ha)	Soil Drainage Very Rapid Rapid Well Moderately Well Imperfect Poor Very Poor	
Standing Snags Rare Occasional Abundant Dominant		Soil Moisture Regime Dry Fresh Moist Wet		
Deadfall Logs Rare Occasional Abundant Dominant		Effective Soil Texture Loamy Sand		
Health Low Medium High	Sensitivity Low Medium High	Botanical Quality Low Medium High	Depth to Mottles / Gley Sample: M - 55 cm / G - -- cm	
Slope none gentle moderate steep (simple or complex)		Depth to Groundwater at surface less than 1m more than 1m		Depth to Bedrock at surface less than 1m more than 1m

Vegetation Layer	Height ¹	Cover ²	Dominant Species per Vegetation Layer
1 Canopy	1	1	PICABIE > ACESACC > JUGNIGR
2 Subcanopy	2	1	JUGNIGR
3 Understorey	4	2	BROINER > RUBIDAE > RHACATH > SOLALTI
4 Ground Layer	5	4	POACOMP >> TRIREPE > CIRARVE > TAROFFI

¹ Height Code: 1=>20m, 2=10m-20m, 3=2m-10m, 4=1m-2m, 5=0.5m-1m, 6=0.2m-0.5m, 7= < 0.2m ² Cover Codes: 0 = none, 1 = 0%- 10%, 2 = 10%- 25%, 3 = 25%-60%, 4= >60%

Size Class Analysis ³			O-R	
³ Abundance Code: RS=Rare, O=Occasional, A=Abundant, D=Dominant	< 10 cm DBH	10 to 24 cm DBH	25 to 50 cm DBH	> 50 cm DBH

Evidence of Disturbance:
Run-down building at the end of driveway entrance

Wildlife / Habitat Observations / Comments:

Community Name				Code	% Coverage
Inclusion		Complex			
Inclusion		Complex			
Inclusion		Complex			

[illegible][illegible]

Representative Photographs of Vegetation Community:

ELC COMMUNITY DESCRIPTION & CLASSIFICATION

Project Cedar Creek Project #: 17-196 Observer(s): SD

Weather conditions:

Date: May 18, 2018

Temp (°C)	Wind*	Cloud Cover	Precipitation	Precipitation(24hrs)
13	3	40	None	None

*Beaufort Scale: 0- (0 km/hr), 1- (1-5km/hr), 2- (6-11km/hr), 3- (12-19km/hr), 4- (20-28km/hr), 5- (29-38km/hr), 6- (39-49km/hr)

Polygon: H	Polygon UTM E: 547239.27 N: 4799066.86	Community Series MAM- Meadow Marsh	Ecosite MAMM1- Graminoid Mineral Meadow Marsh	Vegetation Type MAMM1-16- Mixed Graminoid Meadow Marsh
System Terrestrial <input type="checkbox"/> Wetland Aquatic <input type="checkbox"/>	Topographic Feature Lacustrine Riverine Bottomland Terrace Valley slope <input type="checkbox"/> Tableland <input type="checkbox"/> Rolling upland Cliff Talus Crevice Cave Alvar Rockland Beach Bar Sand dune Bluff			Dominant Plant Form Plankton Submerged Floating-lvd. <input type="checkbox"/> Graminoid <input type="checkbox"/> Forb Lichen Bryophyte Deciduous Coniferous Mixed
Cover <input type="checkbox"/> Open <input type="checkbox"/> Shrub Tree <input type="checkbox"/>	History Natural <input type="checkbox"/> Cultural <input type="checkbox"/>	Community Class Beach-Bar Sand Dune Bluff Cliff Talus Alvar Rock Barren Crevice-Cave Sand Barren Meadow Tallgrass Prairie Savannah Woodland Forest Thicket Cultural Swamp Fen Bog <input type="checkbox"/> Marsh <input type="checkbox"/> Open Water Shallow Water		
Stand Description:		Soil Analysis:		
Community Age Pioneer Young Mid-Aged Mature Old Growth		Basal Area (m²/ha)	Soil Drainage Very Rapid Rapid Well Moderately Well Imperfect Poor Very Poor	
Standing Snags Rare Occasional Abundant Dominant		Soil Moisture Regime Dry Fresh Moist Wet		
Deadfall Logs Rare Occasional Abundant Dominant		Effective Soil Texture Sandy Loam		
Health Low Medium High	Sensitivity Low Medium High	Botanical Quality Low Medium High	Depth to Mottles / Gley Sample: M - -- cm / G - -- cm	
Slope none gentle moderate steep (simple or complex)		Depth to Groundwater metres at surface less than 1m more than 1 m		Depth to Bedrock metres at surface less than 1m more than 1 m

Vegetation Layer	Height ¹	Cover ²	Dominant Species per Vegetation Layer
1 Canopy	2	2	SALXFRAG > POPTREM > JUGNIGR
2 Subcanopy	3	2	SALPUR > CORSERI > PINSTRO > POPTREM
3 Understorey	5	4	EQUHYEM > PHAARUN > SALPUR > PHRAUST
4 Ground Layer	2	2	SOLNEMO > FRAVIRG > VICCRAC

¹ Height Code: 1=>20m, 2=10m-20m, 3=2m-10m, 4=1m-2m, 5=0.5m-1m, 6=0.2m-0.5m, 7= < 0.2m ² Cover Codes: 0 = none, 1 = 0%- 10%, 2 = 10%- 25%, 3 = 25%-60%, 4 = >60%

Size Class Analysis ³	O	O	R	R
³ Abundance Code: RS=Rare, O=Occasional, A=Abundant, D=Dominant	< 10 cm DBH	10 to 24 cm DBH	25 to 50 cm DBH	> 50 cm DBH

Evidence of Disturbance:

Anthropogenic wetland impacted by surrounding land use and adjacent offline pond presumed to be man-made. Surface soils composed of coarse gravel similar to Polygon C. Could not auger due to composition.

Wildlife / Habitat Observations / Comments:

Trees occur along edges of community.

Community Name				Code	% Coverage
Inclusion		Complex			
Inclusion		Complex			
Inclusion		Complex			

[illegible][illegible]

Representative Photographs of Vegetation Community:

ELC COMMUNITY DESCRIPTION & CLASSIFICATION

Project Cedar Creek/ Dumfries Road Project #: 17-196 Observer(s): SD

Weather conditions:

Date: May 18, August 7, October 12, 2018

Temp (°C)	Wind*	Cloud Cover	Precipitation	Precipitation(24hrs)
11	3	30	None	None

*Beaufort Scale: 0- (0 km/hr), 1- (1-5km/hr), 2- (6-11km/hr), 3- (12-19km/hr), 4- (20-28km/hr), 5- (29-38km/hr), 6- (39-49km/hr)

Polygon: I	Polygon UTM E: 547206.23 N: 4798713.68	Community Series OAG- Open Agriculture	Ecosite OAGM2- Perennial Cover Crops	Vegetation Type
System Terrestrial Wetland Aquatic	Topographic Feature Lacustrine Riverine Bottomland Terrace Valley slope <input type="checkbox"/> Tableland <input type="checkbox"/> Rolling upland Cliff Talus Crevice Cave Alvar Rockland Beach Bar Sand dune Bluff			Dominant Plant Form Plankton Submerged Floating-lvd. Graminoid <input type="checkbox"/> Forb Lichen Bryophyte Deciduous Coniferous Mixed
Cover <input type="checkbox"/> Open <input type="checkbox"/> Shrub Treed	History Natural <input type="checkbox"/> Cultural	Community Class Beach-Bar Sand Dune Bluff Cliff Talus Alvar Rock Barren Crevice-Cave Sand Barren Meadow Tallgrass Prairie Savannah Woodland Forest Thicket <input type="checkbox"/> Cultural Swamp Fen Bog Marsh Open Water Shallow Water		
Stand Description:		Soil Analysis:		
Community Age Pioneer Young Mid-Aged Mature Old Growth		Basal Area (m²/ha)	Soil Drainage Very Rapid Rapid <input type="checkbox"/> Well Moderately Well Imperfect Poor Very Poor	
Standing Snags Rare Occasional Abundant Dominant		Soil Moisture Regime Dry <input type="checkbox"/> Fresh Moist Wet		
Deadfall Logs Rare Occasional Abundant Dominant		Effective Soil Texture Sandy Loam		
Health Low Medium High	Sensitivity Low Medium High	Botanical Quality Low Medium High	Depth to Mottles / Gley Sample: M - 60 cm / G - 65 cm	
Slope none gentle moderate steep (simple or complex)		Depth to Groundwater at surface <input type="checkbox"/> less than 1m more than 1 m		Depth to Bedrock at surface less than 1m <input type="checkbox"/> more than 1 m

Vegetation Layer	Height ¹	Cover ²	Dominant Species per Vegetation Layer
1 Canopy	2	1	JUGNIGR
2 Subcanopy	3	1	ACENEGU
3 Understorey	5	4	MEDSATI >> PHAARUN > DAUCARO > PHLPRAT
4 Ground Layer	6	2	TAROFFI > TRIPRAT > MEDLUPU > TRIPEPE

¹ Height Code: 1=>20m, 2=10m-20m, 3=2m-10m, 4=1m-2m, 5=0.5m-1m, 6=0.2m-0.5m, 7= < 0.2m ² Cover Codes: 0 = none, 1 = 0%- 10%, 2 = 10%- 25%, 3 = 25%-60%, 4= >60%

Size Class Analysis ³				
³ Abundance Code: RS=Rare, O=Occasional, A=Abundant, D=Dominant	< 10 cm DBH	10 to 24 cm DBH	25 to 50 cm DBH	> 50 cm DBH

Evidence of Disturbance:

Planted cover crop

Wildlife / Habitat Observations / Comments:

Community Name				Code	% Coverage
Inclusion		Complex			
Inclusion		Complex			
Inclusion		Complex			

[illegible][illegible]

Representative Photographs of Vegetation Community:

ELC COMMUNITY DESCRIPTION & CLASSIFICATION

Project Cedar Creek Project #: 17-196 Observer(s): SD

Weather conditions:

Date: May 18, August 7, October 12, 2018

Temp (°C)	Wind*	Cloud Cover	Precipitation	Precipitation(24hrs)
13	3	30	None	None

*Beaufort Scale: 0- (0 km/hr), 1- (1-5km/hr), 2- (6-11km/hr), 3- (12-19km/hr), 4- (20-28km/hr), 5- (29-38km/hr), 6- (39-49km/hr)

Polygon: L	Polygon UTM E: 547197.07 N: 4798446.07	Community Series MAM- Meadow Marsh	Ecosite MAMM1- Graminoid Mineral Meadow Marsh	Vegetation Type MAMM1-3- Reed Canary Grass Graminoid Mineral Meadow Marsh
System Terrestrial <input type="checkbox"/> Wetland Aquatic	Topographic Feature Lacustrine Riverine Bottomland Terrace Valley slope <input type="checkbox"/> Tableland Rolling upland Cliff Talus Crevice Cave Alvar Rockland Beach <input type="checkbox"/> Bar Sand dune Bluff			Dominant Plant Form Plankton Submerged Floating-lvd. <input type="checkbox"/> Graminoid Forb Lichen Bryophyte Deciduous Coniferous Mixed
Cover <input type="checkbox"/> Open <input type="checkbox"/> Shrub Tree	History <input type="checkbox"/> Natural Cultural	Community Class Beach-Bar Sand Dune Bluff Cliff Talus Alvar Rock Barren Crevice-Cave Sand Barren Meadow Tallgrass Prairie Savannah Woodland Forest Thicket Cultural Swamp Fen Bog <input type="checkbox"/> Marsh Open Water Shallow Water		
Stand Description:				
Community Age Pioneer Young Mid-Aged Mature Old Growth		Basal Area (m²/ha)		Soil Analysis:
				Soil Drainage Very Rapid Rapid Well Moderately Well <input type="checkbox"/> Imperfect <input type="checkbox"/> Poor Very Poor
Standing Snags Rare Occasional Abundant Dominant		Soil Moisture Regime Dry Fresh <input type="checkbox"/> Moist <input type="checkbox"/> Wet		
Deadfall Logs Rare Occasional Abundant Dominant		Effective Soil Texture Sandy Clay Loam, shallow layer of organics present		
Health Low Medium High	Sensitivity Low Medium High	Botanical Quality Low Medium High		Depth to Mottles / Gley Sample: M - 10 cm / G - 10 cm
Slope none gentle moderate steep (simple or complex)		Depth to Groundwater at surface <input type="checkbox"/> less than 1m more than 1 m		Depth to Bedrock at surface less than 1m <input type="checkbox"/> more than 1 m

Vegetation Layer	Height ¹	Cover ²	Dominant Species per Vegetation Layer
1 Canopy	2	1	POPTREM > LARLARI > FRANIGR
2 Subcanopy	3	2	CORSERI > FRANIGR > POPTREM
3 Understorey	4	4	PHAARUN > EUTMACU > LEEORYZ > TYPLATI
4 Ground Layer	6	3	TUSFARF > CALPALU > GALTMOU > LOBSIPH

¹ Height Code: 1=>20m, 2=10m-20m, 3=2m-10m, 4=1m-2m, 5=0.5m-1m, 6=0.2m-0.5m, 7= < 0.2m ² Cover Codes: 0 = none, 1 = 0%- 10%, 2 = 10%- 25%, 3 = 25%-60%, 4 = >60%

Size Class Analysis ³	O	R		
³ Abundance Code: RS=Rare, O=Occasional, A=Abundant, D=Dominant	< 10 cm DBH	10 to 24 cm DBH	25 to 50 cm DBH	> 50 cm DBH

Evidence of Disturbance:

Wildlife / Habitat Observations / Comments:

Community Name				Code	% Coverage
Inclusion		Complex			
Inclusion		Complex			
Inclusion		Complex			

[illegible][illegible]

Representative Photographs of Vegetation Community:

ELC COMMUNITY DESCRIPTION & CLASSIFICATION

Project Cedar Creek/Dumfries Road Project #: 17-197 Observer(s): SD

Weather conditions:

Date: May 18, August 7, October 12, 2018

Temp (°C)	Wind*	Cloud Cover	Precipitation	Precipitation(24hrs)
13	3	40	None	None

*Beaufort Scale: 0- (0 km/hr), 1- (1-5km/hr), 2- (6-11km/hr), 3- (12-19km/hr), 4- (20-28km/hr), 5- (29-38km/hr), 6- (39-49km/hr)

Polygon: M	Polygon UTM E: 547250.21 N: 4799009.08	Community Series OA- Open Water	Ecosite OAO- Open Aquatic	Vegetation Type
System Terrestrial Wetland <input type="checkbox"/> Aquatic	Topographic Feature Lacustrine Riverine Bottomland Terrace Valley slope <input type="checkbox"/> Tableland <input type="checkbox"/> Rolling upland Cliff Talus Crevice Cave Alvar Rockland Beach Bar Sand dune Bluff			Dominant Plant Form Plankton Submerged Floating-lvd. <input type="checkbox"/> Graminoid <input type="checkbox"/> Forb Lichen Bryophyte Deciduous <input type="checkbox"/> Coniferous <input type="checkbox"/> Mixed
Cover <input type="checkbox"/> Open <input type="checkbox"/> Shrub Tree	History Natural <input type="checkbox"/> Cultural <input type="checkbox"/>	Community Class Beach-Bar Sand Dune Bluff Cliff Talus Alvar Rock Barren Crevice-Cave Sand Barren Meadow Tallgrass Prairie Savannah Woodland Forest Thicket Cultural Swamp Fen Bog Marsh <input type="checkbox"/> Open Water <input type="checkbox"/> Shallow Water		
Stand Description:		Soil Analysis:		
Community Age Pioneer Young Mid-Aged Mature Old Growth		Basal Area (m²/ha)	Soil Drainage Very Rapid Rapid Well Moderately Well Imperfect Poor Very Poor	
Standing Snags Rare Occasional Abundant Dominant		Soil Moisture Regime Dry Fresh Moist Wet		
Deadfall Logs Rare Occasional Abundant Dominant		Effective Soil Texture Sandy Loam		
Health Low Medium High	Sensitivity Low Medium High	Botanical Quality Low Medium High	Depth to Mottles / Gley Sample: M - -- cm / G - -- cm	
Slope none gentle moderate steep (simple or complex)		Depth to Groundwater metres at surface less than 1m more than 1 m		Depth to Bedrock metres at surface less than 1m more than 1 m

Vegetation Layer	Height ¹	Cover ²	Dominant Species per Vegetation Layer
1 Canopy	2	1	SAL X FRAG > POPTREM
2 Subcanopy	3	1	POPTREM
3 Understorey	4	2	PHRAUST
4 Ground Layer			

¹ Height Code: 1=>20m, 2=10m-20m, 3=2m-10m, 4=1m-2m, 5=0.5m-1m, 6=0.2m-0.5m, 7= < 0.2m ² Cover Codes: 0 = none, 1 = 0%- 10%, 2 = 10%- 25%, 3 = 25%-60%, 4= >60%

Size Class Analysis ³				
³ Abundance Code: RS=Rare, O=Occasional, A=Abundant, D=Dominant	< 10 cm DBH	10 to 24 cm DBH	25 to 50 cm DBH	> 50 cm DBH

Evidence of Disturbance:

Man-made pond, no observed vegetation within the pond.

Wildlife / Habitat Observations / Comments:

Vegetation noted is only present around edge of polygon with canopies arching over the pond.

				Community Name	Code	% Coverage
Inclusion		Complex				
Inclusion		Complex				
Inclusion		Complex				

[illegible][illegible]

Representative Photographs of Vegetation Community:

APPENDIX 4
Vascular Plants List

Spring	Summer	Fall	Plant Type ¹	Scientific Name	Common Name	CC ²	CW ³	SARO Status ⁴	SARA Status ⁵	Global Rank ⁶	Prov. Rank ⁷	Region of Waterloo
✓	✓	✓	TR	<i>Abies balsamea</i>	Balsam Fir	5	-3	NL	NL	G5	S5	
✓	✓	✓	TR	<i>Acer negundo</i>	Manitoba Maple	0	-2	NL	NL	G5	S5	
✓		✓	TR	<i>Acer saccharinum</i>	Silver Maple	5	-3	NL	NL	G5	S5	
✓	✓	✓	TR	<i>Acer saccharum</i>	Sugar Maple	4	3	NL	NL	G5	S5	
	✓		FO	<i>Achillea millefolium</i>	Common Yarrow	0	3	NL	NL	G5	SNA	
	✓		FO	<i>Actaea pachypoda</i>	White Baneberry	6	5	NL	NL	G5	S5	
✓			FO	<i>Actaea rubra</i>	Red Baneberry	5	5	NL	NL	G5	S5	
	✓	✓	FO	<i>Agrimonia gryposepala</i>	Hooked Agrimony	2	2	NL	NL	G5	S5	
✓		✓	FO	<i>Alliaria petiolata</i>	Garlic Mustard	*	0	NL	NL	GNR	SNA	
	✓		FO	<i>Amphicarpaea bracteata</i>	American Hog-peanut	4	0	NL	NL	G5	S5	
	✓		FO	<i>Anemone canadensis</i>	Canada Anemone	3	-3	NL	NL	G5	S5	
✓	✓		FO	<i>Arisaema triphyllum</i>	Jack-in-the-pulpit	5	-2	NL	NL	G5	S5	
	✓		FO	<i>Asarum canadense</i>	Wild Ginger	6	5	NL	NL	G5	S5	
✓		✓	FO	<i>Asclepias syriaca</i>	Milkweed species							
		✓	FO	<i>Asparagus officinalis</i>	Garden Asparagus	*	3	NL	NL	G5?	SNA	
✓			TR	<i>Betula allegheniensis</i>	Yellow Birch	6	0	NL	NL	G5	S5	
	✓	✓	GR	<i>Bromus inermis</i>	Smooth Brome	*	5	NL	NL	G5TNR	SNA	
✓			FO	<i>Caltha palustris</i>	Yellow Marsh Marigold	5	-5	NL	NL	G5	S5	
✓	✓		TR	<i>Carya ovata</i>	Shagbark Hickory	6	3	NL	NL	G5	S5	
✓	✓	✓	FO	<i>Caulophyllum thalictroides</i>	Blue Cohosh	6	5	NL	NL	G5	S5	
	✓	✓	FO	<i>Cichorium intybus</i>	Chicory	*	5	NL	NL	GNR	SNA	
	✓		FO	<i>Circaea alpina</i>	Small Enchanter's Nightshade	6	-3	NL	NL	G5	S5	
	✓		FO	<i>Circaea canadensis</i>	Broad-leaved Enchanter's Nightshade	3	3	NL	NL	G5	S5	
	✓	✓	FO	<i>Cirsium arvense</i>	Canada Thistle	*	3	NL	NL	GNR	SNA	
✓		✓	SH	<i>Cornus sericea</i>	Red-osier Dogwood	2	-3	NL	NL	G5	S5	
✓	✓	✓	FO	<i>Daucus carota</i>	Wild Carrot	*	5	NL	NL	GNR	SNA	
✓	✓	✓	VI	<i>Echinocystis lobata</i>	Wild Mock-cucumber	3	-2	NL	NL	G5	S5	
✓	✓	✓	FE	<i>Equisetum arvense</i>	Field Horsetail	0	0	NL	NL	G5	S5	
		✓	FE	<i>Equisetum hyemale</i>	Common Scouring-rush	2	-2	NL	NL	G5	S5	
	✓		FO	<i>Erigeron philadelphicus</i>	Philadelphia Fleabane	1	-3	NL	NL	G5	S5	
	✓		FO	<i>Eutrochium maculatum</i> var. <i>maculatum</i>	Spotted Joe Pye Weed	3	-5	NL	NL	G5T5	S5	

APPENDIX 4. VASCULAR PLANT LIST

Project: AA17-196A

✓			FO	Erythronium americanum	Yellow Trout-lily	5	5	NL	NL	G5	S5	
		✓	FO	Euthamia graminifolia	Grass-leaved Goldenrod	2	-2	NL	NL	G5	S5	
✓	✓		FO	Fragaria virginiana	Wild Strawberry	2	1	NL	NL	G5T5	SU	
✓	✓	✓	SH	Frangula alnus	Glossy Buckthorn	*	-1	NL	NL	GNR	SNA	
✓	✓	✓	TR	Fraxinus americana	White Ash	4	3	NL	NL	G5	S4	
✓	✓	✓	TR	Fraxinus nigra	Black Ash	7	-4	NL	NL	G5	S4	
✓		✓	FO	Galium mollugo	Smooth Bedstraw	*	5	NL	NL	GNR	SNA	
	✓		FO	Geranium robertianum	Herb-robert	*	5	NL	NL	G5	S5	
	✓		FO	Geum aleppicum	Yellow Avens	2	-1	NL	NL	G5	S5	
✓			GR	Grass sp.	Grass sp.							
	✓		FO	Hypericum perforatum	Common St. John's-wort	*	5	NL	NL	GNR	SNA	
	✓		TR	Juglans nigra	Black Walnut	5	3	NL	NL	G5	S4?	
		✓	TR	Juniperus virginiana	Eastern Red Cedar	4	3	NL	NL	G5	S5	
✓	✓		TR	Larix laricina	American Larch	7	-3	NL	NL	G5	S5	
	✓	✓	GR	Leersia oryzoides	Rice Cutgrass	3	-5	NL	NL	G5	S5	
	✓		FO	Lobelia siphilitica	Great Blue Lobelia	6	-4	NL	NL	G5	S5	
	✓		FO	Lotus corniculatus	Garden Bird's-foot Trefoil	*	1	NL	NL	GNR	SNA	
	✓		FO	Lythrum salicaria	Purple Loosestrife	*	-5	NL	NL	G5	SNA	
✓			FO	Maianthemum racemosum	False Solomon's Seal	4	3	NL	NL	G5	S5	
	✓		FE	Matteuccia struthiopteris	Ostrich Fern	5	-3	NL	NL	G5	S5	
✓		✓	FO	Medicago lupulina	Black Medic	*	1	NL	NL	GNR	SNA	
	✓		FO	Medicago sativa	Alfalfa	*	5	NL	NL	GNR	SNA	
✓	✓	✓	FO	Melilotus albus	White Sweet-clover	*	3	NL	NL	G5	SNA	
		✓	FO	Monarda fistulosa var. fistulosa	Wild Bergamot	6	3	NL	NL	G5T5?	SU	
	✓		FO	Oenothera biennis	Common Evening Primrose	0	3	NL	NL	G5	S5	
✓	✓	✓	FE	Onoclea sensibilis	Sensitive Fern	4	-3	NL	NL	G5	S5	
✓	✓	✓	VI	Parthenocissus quinquefolia	Virginia Creeper	6	1	NL	NL	G5	S4?	
✓	✓	✓	GR	Phalaris arundinacea	Reed Canary Grass	0	-4	NL	NL	G5	S5	
	✓		GR	Phleum pratense	Common Timothy	*	3	NL	NL	GNR	SNA	
✓	✓	✓	GR	Phragmites australis ssp. australis	European Reed			NL	NL	G5T5	SNA	
✓	✓		TR	Picea abies	Norway Spruce	*	5	NL	NL	G5	SNA	
		✓	TR	Picea pungens	Blue Spruce			NL	NL	G5	SNA	
✓	✓	✓	TR	Pinus strobus	Eastern White Pine	4	3	NL	NL	G5	S5	
	✓		FO	Plantago lanceolata	English Plantain	*	0	NL	NL	G5	SNA	
	✓	✓	FO	Plantago major	Common Plantain	*	-1	NL	NL	G5	S5	
	✓	✓	GR	Poa compressa	Canada Bluegrass	0	2	NL	NL	GNR	SNA	

APPENDIX 4. VASCULAR PLANT LIST

Project: AA17-196A

✓	✓	✓	GR	<i>Poa pratensis</i> ssp. <i>pratensis</i>	Kentucky Bluegrass	0	1	NL	NL	G5T5	SNA	
✓	✓		FO	<i>Podophyllum peltatum</i>	May-apple	5	3	NL	NL	G5	S5	
✓	✓	✓	TR	<i>Populus balsamifera</i>	Balsam Poplar	4	-3	NL	NL	G5	S5	
	✓	✓	TR	<i>Populus grandidentata</i>	Large-tooth Aspen	5	3	NL	NL	G5	S5	
✓	✓	✓	TR	<i>Populus tremuloides</i>	Trembling Aspen	2	0	NL	NL	G5	S5	
✓	✓	✓	FO	<i>Potentilla norvegica</i>	Norwegian Cinquefoil	0	0	NL	NL	G5	S5	
	✓		FO	<i>Potentilla simplex</i>	Old-field Cinquefoil	3	4	NL	NL	G5	S5	
✓	✓		SH	<i>Prunus virginiana</i>	Choke Cherry	2	1	NL	NL	G5	S5	
✓	✓	✓	TR	<i>Quercus rubra</i>	Northern Red Oak	6	3	NL	NL	G5	S5	
✓	✓	✓	SH	<i>Rhamnus cathartica</i>	Common Buckthorn	*	3	NL	NL	GNR	SNA	
✓	✓	✓	SH	<i>Rhus typhina</i>	Staghorn Sumac	1	5	NL	NL	G5	S5	
	✓	✓	TR	<i>Robinia pseudoacacia</i>	Black Locust	*	4	NL	NL	G5	SNA	
✓	✓		SH	<i>Rubus ideaus</i> ssp. <i>Strigosus</i>	Wild Red Raspberry	0	-2	NL	NL	G5T5	S5	
✓	✓	✓	FO	<i>Rubus pubescens</i>	Dwarf Raspberry	4	-4	NL	NL	G5	S5	
✓			FO	<i>Rumex obtusifolius</i>	Bitter Dock	*	-3	NL	NL	GNR	SNA	
✓		✓	SH	<i>Salix bebbiana</i>	Bebb's Willow	4	-4	NL	NL	G5	S5	
✓	✓	✓	SH	<i>Salix purpurea</i>	Basket Willow	*	-3	NL	NL	G5	SNA	
✓		✓	TR	<i>Salix x fragilis</i>	Crack Willow	*	-1	NL	NL	GNR	SNA	
✓			FO	<i>Sanguinaria canadensis</i>	Bloodroot	5	4	NL	NL	G5	S5	
	✓		SE	<i>Schoenoplectus acutus</i> var. <i>acutus</i>	Hard-stemmed Bulrush	6	-5	NL	NL	G5	S5	S
	✓	✓	FO	<i>Silene vulgaris</i>	Bladder Campion	*	5	NL	NL	GNR	SNA	
	✓		FO	<i>Sisymbrium altissimum</i>	Tall Tumble Mustard	*	3	NL	NL	GNR	SNA	
	✓	✓	FO	<i>Solidago altissima</i> ssp. <i>altissima</i>	Eastern Late Goldenrod	1	3	NL	NL	GNR	S5	
		✓	FO	<i>Solidago nemoralis</i> ssp. <i>Nemoralis</i>	Gray-stemmed Goldenrod	2	5	NL	NL	G5T5	S5	
✓			FO	<i>Solidago</i> sp.	Goldenrod species							
		✓	FO	<i>Symphotrichum ericoides</i> var. <i>ericoides</i>	White Heath Aster	*	5	NL	NL	G5T5	S5	
		✓	FO	<i>Symphotrichum novae-angliae</i>	New England Aster	6	0	NL	NL	G5	S5	
✓			FO	<i>Symplocarpus foetidus</i>	Skunk Cabbage	7	-5	NL	NL	G5	S5	
✓	✓	✓	FO	<i>Taraxacum officinale</i>	Common Dandelion	*	3	NL	NL	G5	SNA	
	✓	✓	FO	<i>Thalictrum dioicum</i>	Early Meadow-rue	5	2	NL	NL	G5	S5	
✓	✓	✓	TR	<i>Thuja occidentalis</i>	Eastern White Cedar	4	-3	NL	NL	G5	S5	
✓	✓		FO	<i>Toxicodendron rydbergii</i>	Rydberg's Poison Ivy	0	0	NL	NL	G5	S5	
✓	✓	✓	FO	<i>Trifolium pratense</i>	Red Clover	*	2	NL	NL	GNR	SNA	

✓	✓	✓	FO	Trifolium repens	White Clover	*	2	NL	NL	GNR	SNA	
✓			FO	Trillium grandiflorum	White Trillium	5	5	NL	NL	G5	S5	
✓	✓	✓	FO	Tussilago farfara	Colt's-foot	*	3	NL	NL	GNR	SNA	
✓	✓	✓	FO	Typha latifolia	Broad-leaved Cattail	3	-5	NL	NL	G5	S5	
✓	✓	✓	FO	Verbascum thapsus	Common Mullein	*	5	NL	NL	GNR	SNA	
	✓		SH	Viburnum lentago	Nannyberry	4	-1	NL	NL	G5	S5	
✓		✓	FO	Vicia cracca	Cow Vetch	*	5	NL	NL	GNR	SNA	
✓			FO	Viola sororia	Woolly Blue Violet	4	1	NL	NL	G5	S5	
✓			FO	Viola sp.	Violet species							
✓	✓	✓	VW	Vitis riparia	Riverbank Grape	0	-2	NL	NL	G5	S5	

1.	Plant Types: AL = Algae; FE = Fern; FO = Forb; GR = Grass; LC = Lichen; LV = Liverwort; MO = Moss; RU = Rush; SE = Sedge; SH = Shrub; TR = Tree; VI = Herbaceous vine; VW = Woody Vine
2.	CC: Coefficient of Conservatism reflects a species' fidelity to a specific habitat. Range from 0 to 10; 10 = very conservative, not likely in disturbed habitats. 1 = least conservative, likely found in a broad range of habitat. * = value not assigned because they are non-native
3.	CW: Coefficient of Wetness reflects a species' affinity for wet soil conditions. Range from -5 to 5; -5 = obligate wetland species, 5 = obligate upland species.
4.	SARO: Status under the Provincial Endangered Species Act, listed on the Species at Risk in Ontario (SARO) list. In order of severity, statuses include: EXP = Extirpated; END =
5.	SARA: Status under the National Species at Risk Act (SARA), assessed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). In order of severity, statuses
6.	Global rarity rank. Range from G1 to G5; G1 = Extremely rare, G5 = Very Common. NR = Unranked; U = Unrankable.
7.	Provincial rarity rank. Range from S1 to S5; S1 = Extremely rare, S5 = Very Common. NR = Unranked; U = Unrankable.
8.	Region of Waterloo. S= Significant, t=Significant, but possibly common, n=Significant only if native status can be demo'd.

APPENDIX 5
SWH Habitat Assessment

#	SIGNIFICANT WILDLIFE HABITAT (SWH)	CANDIDATE SWH CRITERIA	CRITERIA FOR SWH CONFIRMATION	SWH PROTECTED AREA	SITE ASSESSMENT DETAILS	CANDIDATE SWH	FIELD STUDIES REQUIRED/ COMPLETED	CONFIRMED SWH
SEASONAL CONCENTRATION AREAS OF ANIMALS								
1	Waterfowl stopover and Staging Areas (terrestrial)	- Fields with Sheet water in spring (incl. agricultural)	- Mixed species aggregations of 100 or more individuals confirms SWH	flooded field ecosite and 100-300m radius is the SWH	No habitat matching criteria identified in Study Area	No	None required.	No
2	Waterfowl Stopover and Staging (Aquatic)	- Ponds, marshes, lakes, bays, coastal inlets and watercourses and reservoirs - SWTP & SWMP are not SWH	- Aggregations of 100 or more listed species for 7 days (ie. >700 waterfowl use days) confirms SWH	Aquatic ecosite and 100m radius is the SWH	Man-made open pond within the study area, however OAO community is not considered a candidate ELC Code (MNRF, 2015)	No	None required.	No
3	Shorebird Migratory stopover	- Shorelines of Lakes, rivers, wetlands, beaches, bars; seasonally flooded, muddy and un-vegetated shoreline habitat	- 3 or more listed species and >1000 shorebird use days, or >100 whimbrel, confirms SWH	Shoreline ecosite and 100m radius is the SWH	No habitat matching criteria identified in Study Area, >5km from any Lake Ontario	No	None required.	No
4	Raptor Wintering Area	- Combination of upland field and woodland habitat >20ha total (includes, >15ha upland field) - least disturbed sites, idle, fallow or lightly grazed field/meadow best	- 1 or more Short-eared Owl, or, at least 10 individuals and 2 listed species for a minimum of 20 days, and 3 of 5 years, confirms SWH	Ecosite communities (field and woodland) is the SWH	Combination of forest and meadow communities within the study area may provide suitable habitat.	Yes-marginal	Two winter wildlife surveys were conducted of the site, and found snow depths to be restrictive to winter raptor wintering.	No
5	Bat Hibernacula	- Caves, mine shafts, underground foundations, karsts - buildings are not SWH	- All sites with confirmed hibernating bats, confirms SWH	Ecosite and 200m radius is the SWH	No habitat matching criteria identified in Study Area	No	None required	No
6	Bat Maternity Colony	- All forested ecosites, FOD, FOC, FOM, SWD, SWM, SWC with >10/ha trees (>25cm DBH) in early stages of decay (class 1-3) - buildings are not SWH	- >10 Big Brown Bats, >20 Little Brown Myotis, >5 adult female Silver-haired Bats confirms SWH	Entire woodland or forest stand ELC ecosite containing colony is the SWH	Forested ecosites present primarily in western portion of Study area with trees >25cm DBH.	Yes	Studies recommended pre-construction in areas where tree removal/damage to occur in candidate habitat.	unknown

APPENDIX 5. CANDIDATE SIGNIFICANT WILDLIFE HABITAT ASSESSMENT

Project #: AA17-196A

#	SIGNIFICANT WILDLIFE HABITAT (SWH)	CANDIDATE SWH CRITERIA	CRITERIA FOR SWH CONFIRMATION	SWH PROTECTED AREA	SITE ASSESSMENT DETAILS	CANDIDATE SWH	FIELD STUDIES REQUIRED/ COMPLETED	CONFIRMED SWH
7	Turtle Wintering Area	- Areas with permanent water deep enough not to freeze, with mud/soft substrates	- 5 over-wintering Midland Painted Turtles, 1 or more Northern Map Turtle or Snapping Turtle confirms SWH	Mapped ELC ecosite, or deep pool element where turtles overwinter is the SWH	The man-made pond within the study area does not classify as candidate habitat.	No	No turtles identified incidentally or observed in community during spring and summer surveys.	No
8	Reptile Hibernaculum	- Sites below the frost line; rock barren, crevice and cave, talus, alvar, rock piles, slopes, stone fences and crumbling foundations	- Presence of hibernacula with minimum 5 individuals of 1 snake species/ individuals of 2 or more species confirms SWH - Congregations of a minimum of 5 snakes of 1 species/ individuals of 2 or more snake species, near potential hibernacula on sunny warm days in spring and fall confirms SWH	Feature hibernacula is located in, and 30m radius is the SWH	No habitat matching criteria identified in Study Area	No	None required.	No
9	Colonially-nesting Bird Habitat (cliff/bank)	- Eroding banks, sandy hills, borrow pits, steep slopes, sand piles, cliff faces, bridge abutments, silos, barns	- 1 or more nest sites with 8 or more Cliff Swallow or, 50 Bank Swallow and Rough-winged Swallow pairs during the breeding season.	Colony and 50m radius around peripheral nest is the SWH	Standing gravel piles within the subject property may provide suitable habitat	Yes	Breeding bird surveys completed.	No
10	Colonially-nesting Bird Habitat (Tree/shrub)	- Live or dead standing trees in wetlands, lakes, islands and peninsulas, occasionally shrubby and emergent vegetation	- 5 or more active Great-blue Heron or other listed species nests	Edge of the colony plus minimum 300m radius, or extent of the forest ecosite, or entire island <15ha is the SWH	No habitat matching criteria identified in Study Area	No	Breeding bird surveys completed.	No
11	Colonially-nesting Bird Habitat (Ground)	- Rocky islands or peninsulas within a lake or large river (natural or artificial)	- >25 active nests of Herring Gull, Ring-billed Gull, >5 active nests of Common Tern, or >2 active nests of Caspian Tern. 5 or more pairs of Brewer's Blackbird. Any active nesting colony of Little Gull, Great Black-backed Gull.	Edge of colony plus min 150m radius or extent of ELC ecosite, or island <3ha is the SWH	No habitat matching criteria identified in Study Area	No	Breeding bird surveys completed.	No

APPENDIX 5. CANDIDATE SIGNIFICANT WILDLIFE HABITAT ASSESSMENT

Project #: AA17-196A

#	SIGNIFICANT WILDLIFE HABITAT (SWH)	CANDIDATE SWH CRITERIA	CRITERIA FOR SWH CONFIRMATION	SWH PROTECTED AREA	SITE ASSESSMENT DETAILS	CANDIDATE SWH	FIELD STUDIES REQUIRED/ COMPLETED	CONFIRMED SWH
12	Migratory Butterfly Stopover Area	- At least 10ha, with undisturbed field/meadow and forest or woodland edge habitat present, within 5km of Lake Ontario.	- Presence of Monarch use days >5000 or >3000 where there is a mix of Monarch with Painted Ladies or White Admirals	Field/meadow and forest/woodland is the SWH	No habitat matching criteria identified in Study Area, >5km from Lake Ontario	No	None required.	No
13	Land bird Migratory Stopover Area	- Woodlots >5ha in size within 5km of lake Ontario	- Use by >200 birds/day, with >35species, with at least 10sp recorded on 5 different survey dates.	Woodlot is the SWH	No habitat matching criteria identified in Study Area, >5km from Lake Ontario	No	None required.	No
14	Deer Yarding Areas	- ELC communities providing Thermal cover (FOM,FOC,SWM,SWC, CUP2, CUP3, FOD3, CUT)	- Deer yards are managed by MNRF, available through district offices and LIO.	LIO mapping	No Deer yarding areas identified on LIO Mapping	No	None required.	No
15	Deer Winter Congregation Areas	- All forested ecosites >100ha - Conifer Plantations <50ha may be used	- Deer management is the responsibility of the MNRF - Contact MNRF or LIO for known deer winter areas.	LIO mapping	No Deer Winter Congregation areas identified on LIO Mapping	No	None required.	No
RARE VEGETATION COMMUNITIES								
16	Cliffs & Talus Slopes	- Cliff: vertical to near vertical bedrock >3m in height - Talus slope: rock rubble at the base of a cliff made up of coarse rocky debris	- Confirm any ELC Vegetation Type for Cliffs or Talus Slopes	Area of ELC sites: TAO, TAS, TAT, CLO, CLS, CLT	No habitat matching criteria identified in Study Area	No	None required	No
17	Sand Barren	- Exposed, sparsely vegetated & caused by lack of moisture, fires and erosion.	- area >0.5ha in size - Confirm any ELC vegetation Type for Sand Barren - Not dominated by exotic or introduced species	Area of ELC ecosite is the SWH	No habitat matching criteria identified in Study Area	No	None required	No
18	Alvar	- Level, mostly un-fractured calcareous bedrock feature, overlain by a thin veneer or soil	- area >0.5ha in size - Field Studies that identify four of the five Alvar Indicator Species - Not dominated by exotic or introduced species	Area of ELC ecosite is the SWH	No habitat matching criteria identified in Study Area	No	None required	No
19	Old Growth Forest	- >30ha forests with at least 10ha interior habitat and multi-layered canopy	- Dominant Tree Species >140 years old - No recognizable signs forestry practices (old stumps)	Area of ELC ecosite is the SWH	No habitat matching criteria identified in Study Area	No	None required	No

APPENDIX 5. CANDIDATE SIGNIFICANT WILDLIFE HABITAT ASSESSMENT

Project #: AA17-196A

#	SIGNIFICANT WILDLIFE HABITAT (SWH)	CANDIDATE SWH CRITERIA	CRITERIA FOR SWH CONFIRMATION	SWH PROTECTED AREA	SITE ASSESSMENT DETAILS	CANDIDATE SWH	FIELD STUDIES REQUIRED/ COMPLETED	CONFIRMED SWH
20	Savannah	<ul style="list-style-type: none"> - Tall Grass Prairie Habitat with 25%-60% Tree cover - Remnant sites such as Railway Right of ways are not SWH 	<ul style="list-style-type: none"> - No minimum size, and must be restored to a natural state. - Confirm one or more savannah indicator species - Not dominated by exotic or introduced species 	Area of ELC ecosite is the SWH	No habitat matching criteria identified in Study Area	No	None required	No
21	Tallgrass Prairie	<ul style="list-style-type: none"> - Ground cover dominated by prairie grasses with <25% tree cover - Remnant sites such as Railway Right of ways are not SWH 	<ul style="list-style-type: none"> - No minimum size, and must be restored to a natural state. - Confirm one or more prairie indicator species - Not dominated by exotic or introduced species 	Area of ELC ecosite is the SWH	No habitat matching criteria identified in Study Area	No	None required	No
22	Other Rare Vegetation Communities	<ul style="list-style-type: none"> - All Provincially Rare S1, S2, S3 Vegetation Communities (Appendix M of SWHTG) 	<ul style="list-style-type: none"> - Field Studies Confirming ELC vegetation type is a rare vegetation community 	Area of ELC ecosite is the SWH	No communities identified on site are S1-S3 communities	No	None required	No
SPECIALIZED HABITAT FOR WILDLIFE								
23	Waterfowl Nesting Areas	<ul style="list-style-type: none"> - Upland Habitat, adjacent to Wetland ELC ecosites (except SWC, SWM) - Extends 120m from a wetland (>0.5ha) and any small wetlands (<0.5ha) within a cluster of at least 3 - Upland area at least 120m wide 	<ul style="list-style-type: none"> - Presence of 3 or more nesting pairs of listed species excluding Mallards - Presence of 10 or more nesting pairs including mallards - Any active Black Duck nesting site 	SWH may be greater than or less than 120m from the wetland edge and must provide enough habitat for waterfowl to successfully nest	Treed communities adjacent all wetlands/ponds, may provide nesting habitat	No	None required	No
24	Bald Eagle or Osprey Nesting, Foraging and Perching Habitat	<ul style="list-style-type: none"> - Forest communities, adjacent to riparian areas - Osprey nests usually at top of tree - Bald Eagle nest usually in super canopy tree in a notch within canopy 	<ul style="list-style-type: none"> - Studies confirm one or more active Bald Eagle or Osprey nest - Alternate nests included in SWH - Nests must be used annually, if found inactive, must be known inactive at least 3 years, or suspected unused for 5 years if unknown 	Active nest plus 300m for Osprey Active nest plus 400-800m for Bald Eagle	No habitat matching criteria identified in Study Area	No	None required	No

APPENDIX 5. CANDIDATE SIGNIFICANT WILDLIFE HABITAT ASSESSMENT

Project #: AA17-196A

#	SIGNIFICANT WILDLIFE HABITAT (SWH)	CANDIDATE SWH CRITERIA	CRITERIA FOR SWH CONFIRMATION	SWH PROTECTED AREA	SITE ASSESSMENT DETAILS	CANDIDATE SWH	FIELD STUDIES REQUIRED/ COMPLETED	CONFIRMED SWH
25	Woodland Raptor Nesting Habitat	<ul style="list-style-type: none"> - Forested communities, forested swamp communities and cultural Plantations - Natural Forested/conifer plantations >30ha with >10ha interior habitat (200m buffer) 	<ul style="list-style-type: none"> - One or more active nest of listed species 	Nest protection radius: <ul style="list-style-type: none"> - Red-Shouldered Hawk, Northern Goshawk 400m - Barred Owl 200m - Broad-winged Hawk, Coopers Hawk 100m - Sharp-shinned Hawk 50 	Forested swamp community within the study area that extends west may provide suitable habitat.	Yes	No stick nests observed during SWH or Winter Wildlife Surveys	No
26	Turtle Nesting Areas	<ul style="list-style-type: none"> - Exposed Mineral soil (sand or gravel) adjacent (<100m) or within shallow marsh, shallow submerged, shallow floating, bog or fen communities - Located in open sunny areas, away from roads and less prone to predation - Municipal and provincial road shoulders are not SWH. 	<ul style="list-style-type: none"> - Confirm 5 or more nesting Midland Painted Turtles, 1 or more nesting Northern Map Turtle or Snapping Turtle 	Area or sites with exposed mineral soils, plus a radius of 30-100m around the nesting area is the SWH.	Exposed mineral soils surrounding the man-made pond may provide suitable habitat.	Yes	No nesting evidence observed during spring and summer ELC/botanical surveys.	No
27	Seeps and Springs	<ul style="list-style-type: none"> - Areas where ground water comes to the surface - Any forested area within the headwaters of a stream or river system 	<ul style="list-style-type: none"> - Confirm site with 2 or more seeps/springs. 	Area of ELC forest ecosite containing seep/spring is the SWH	Seeps and springs possible within forested and wetland communities	Yes	ELC complete	No seeps or springs identified
28	Amphibian Breeding Habitat (woodland)	<ul style="list-style-type: none"> - Breeding pools within woodlands - Wetland, pond or pool >500m² within or adjacent (<120m) to a woodland. - Woodlands with permanent ponds, or those with water until mid-July more likely to be used. 	<ul style="list-style-type: none"> - Confirm Breeding population of 1 or more listed newt/salamander species, 2 or more of the listed frog species with at least 20 individuals (adults or egg masses), 2 or more of the listed frog species with call code levels of 3. - Wetland adjacent to woodlands includes travel corridor connecting features as SWH. 	Wetland area, plus 230m radius of woodland is the SWH.	Wooded areas adjacent to the wetland may provide suitable habitat.	Yes	Amphibian Surveys complete	No

APPENDIX 5. CANDIDATE SIGNIFICANT WILDLIFE HABITAT ASSESSMENT

Project #: AA17-196A

#	SIGNIFICANT WILDLIFE HABITAT (SWH)	CANDIDATE SWH CRITERIA	CRITERIA FOR SWH CONFIRMATION	SWH PROTECTED AREA	SITE ASSESSMENT DETAILS	CANDIDATE SWH	FIELD STUDIES REQUIRED/ COMPLETED	CONFIRMED SWH
29	Amphibian Breeding Habitat (Wetland)	<ul style="list-style-type: none"> - Swamp, marsh, fen, bog, open aquatic and shallow aquatic ELC communities. - Typically isolated from woodlands (>120m), but includes larger wetlands with primarily aquatic species (bull frogs) that are adjacent to woodlands. - Wetlands >500m² - Presence of shrubs & logs - Bullfrogs require permanent water bodies and abundant emergent vegetation. 	<ul style="list-style-type: none"> - Confirm Breeding populations of 1 or more listed newt/salamander species, or 2 or more listed frog/toad species with at least 20 individuals (adults or egg masses), or 2 or more listed frog/toad species with a call code level of 3 - Or any wetland with confirmed breeding Bullfrog. 	ELC ecosite and shoreline is the SWH Movement corridors (SWH) must be considered if this habitat is significant	No wetlands >120m from woodland habitat	No	Amphibian surveys completed	No
30	Area-sensitive Breeding Bird Habitat	<ul style="list-style-type: none"> - Habitats where interior breeding birds are breeding - Large mature(>60 years) forest stands or woodlots >30ha - Forest and swamp ELC communities - Interior habitat at least 200m from edge 	<ul style="list-style-type: none"> - Presence of nesting or breeding pairs of 3 or more of the listed species - Any site with Cerulean Warbler or Canada Warbler is SWH - 	ELC ecosite is the SWH	No interior habitat (>200m) identified in study area	No	Breeding bird surveys completed.	No
HABITATS OF SPECIES OF CONSERVATION CONCERN CONSIDERED SWH								

APPENDIX 5. CANDIDATE SIGNIFICANT WILDLIFE HABITAT ASSESSMENT

Project #: AA17-196A

#	SIGNIFICANT WILDLIFE HABITAT (SWH)	CANDIDATE SWH CRITERIA	CRITERIA FOR SWH CONFIRMATION	SWH PROTECTED AREA	SITE ASSESSMENT DETAILS	CANDIDATE SWH	FIELD STUDIES REQUIRED/ COMPLETED	CONFIRMED SWH
31	Marsh Bird Breeding Habitat	<ul style="list-style-type: none"> - Some meadow marsh, shallows submerged, shallow floating, mixed shallow floating, fen and bog communities (see SWH Ecoregion guide for specifics) - Nesting occurs in wetlands, all wetland habitat is considered with presence of shallow water with emergent aquatic vegetation - Green heron at edge of water sheltered by shrubs and trees. 	<ul style="list-style-type: none"> - 5 or more nesting pairs of Sedge Wren or Marsh Wren, 1 pair of Sandhill Crane, or breeding by any combination of 5 or more of the listed species - Any Wetland with 1 or more breeding pair Black Tern, Trumpeter Swan, Green Heron or Yellow Rail 	ELC ecosite is the SWH	The Reed Canary Grass and Mixed Graminoid Mineral Marshes within the Subject Property may provide suitable habitat.	Yes	One Green Heron pair identified in suitable nesting habitat in nesting season during Breeding Bird Surveys	Yes
32	Open Country Bird Breeding Habitat	<ul style="list-style-type: none"> - Grassland area >30ha (natural & cultural fields and meadows) - Grasslands not class 1 or 2 agriculture (no row crops or intensive hay or livestock pasturing) - Mature hayfields or pasture at least 5 years old 	<ul style="list-style-type: none"> - Nesting or breeding of 2 or more of the listed species - Field with 1 or more Short-eared Owls 	Contiguous ELC ecosite is the SWH	Marginal- meadow habitat within study area is < 30ha	Yes	Breeding Bird Surveys complete	No
33	Shrub/Early Successional Bird Breeding Habitat	<ul style="list-style-type: none"> - Cultural thickets, savannah and woodland habitat - Large field area succeeding to shrub and thicket habitat >10ha in size - Patches of shrub ecosite may be complexed into larger old field ecosites for some species 	<ul style="list-style-type: none"> - Confirm nesting or breeding of 1 of the listed indicator species and at least 2 of the common species - Habitat with Yellow-breasted Chat or Golden-winged Warbler is SWH 	SWH is contiguous ELC ecosite field/thicket area	No habitat matching criteria identified in Study Area	No	Breeding Bird Surveys complete	No

APPENDIX 5. CANDIDATE SIGNIFICANT WILDLIFE HABITAT ASSESSMENT

Project #: AA17-196A

#	SIGNIFICANT WILDLIFE HABITAT (SWH)	CANDIDATE SWH CRITERIA	CRITERIA FOR SWH CONFIRMATION	SWH PROTECTED AREA	SITE ASSESSMENT DETAILS	CANDIDATE SWH	FIELD STUDIES REQUIRED/ COMPLETED	CONFIRMED SWH
34	Terrestrial Crayfish	<ul style="list-style-type: none"> - Meadow marsh, shallow marsh, swamp thicket, deciduous swamp and mixed swamp communities - Cultural meadow with inclusions of meadow marsh may be used - Wet edges of marshes and wet meadows should be surveyed for crayfish 	<ul style="list-style-type: none"> - Presence of 1 or more individuals of listed species or their chimneys in suitable habitat 	Area of ELC ecosite or Eco element area of meadow marsh or swamp within the larger ecosite area is the SWH	Candidate habitat identified in study area.	Yes	Incidental observation during ELC conducted	No
35	Special Concern & Rare Wildlife Species	<ul style="list-style-type: none"> - All Special concern and Provincially Rare plant and animal species - Where an element occurrence is identified within a 1 or 10km grid for a species listed, linking candidate habitat on the site must be completed to ELC ecosites 	<ul style="list-style-type: none"> - Assessment/inventory of site for identified special concern or rare species completed during time of year when species is present or easily identifiable - Habitat must be easily mapped and cover an important life stage component (specific nesting habitat, foraging) 	SWH is the finest ELC scale that protects the form and function of the habitat	<p>No element occurrences for Special Concern or rare Wildlife Species identified within 1km of the study area</p> <p>Background Atlas review identified 6 Special concern species within 10km of the Study Area</p> <ul style="list-style-type: none"> - Eastern Ribbonsnake (ORAA) - Snapping Turtle (ORAA) - Eastern Wood-pewee (OBBA) - Wood Thrush (OBBA) - Canada Warbler (OBBA) - Grasshopper Sparrow (OBBA) 	Yes- Woodlands on site and within 120m may provide habitat for Eastern-Wood-pewee, Wood Thrush and Canada Warbler. Marsh communities and man-made pond on site, and within 120m may provide habitat for Common Snapping Turtle. Meadow community may provide suitable habitat for Grasshopper Sparrow.	Three season Botanical Survey Breeding Bird Survey (by others) Amphibian surveys Winter Wildlife Surveys Incidental wildlife	No

ANIMAL MOVEMENT CORRIDORS

APPENDIX 5. CANDIDATE SIGNIFICANT WILDLIFE HABITAT ASSESSMENT

Project #: AA17-196A

#	SIGNIFICANT WILDLIFE HABITAT (SWH)	CANDIDATE SWH CRITERIA	CRITERIA FOR SWH CONFIRMATION	SWH PROTECTED AREA	SITE ASSESSMENT DETAILS	CANDIDATE SWH	FIELD STUDIES REQUIRED/ COMPLETED	CONFIRMED SWH
36	Amphibian Movement Corridor	<ul style="list-style-type: none"> - Corridors may occur in all ecosites associated with water - Presence of significant amphibian breeding indicates the requirement for identifying corridors - Movement corridors between breeding habitat and summer habitat 	<ul style="list-style-type: none"> - Corridors typically include areas with native vegetation, with several layers of vegetation, unbroken by roads, waterways or waterbodies are most significant - At least 15 of vegetation on both sides of the waterway or up to 200m wide of woodland habitat with gaps of <20m - Shorter corridors are more significant than longer, but amphibians must be able to get to and from their summer breeding habitat 	Corridor is the SWH	No habitat matching criteria identified in Study Area	No	None required	No
37	Deer Movement Corridor	<ul style="list-style-type: none"> - May occur in all forested ecosites - Determined when deer wintering habitat is confirmed as SWH 	<ul style="list-style-type: none"> - Corridors at least 200m wide with gaps <20m leading to wintering habitat - Unbroken by roads and residential areas - Shorter corridors are more significant 	Corridor is the SWH	No habitat matching criteria identified in Study Area	No	None required	No

APPENDIX 6
SAR Habitat Assessment

APPENDIX X. SPECIES AT RISK HABITAT ASSESSMENT

PROJECT #: AA17-196A

COMMON NAME	SCIENTIFIC NAME	SARO	COSEWIC	S-RANK	BACKGROUND SOURCES	HABITAT REQUIREMENTS	SUITABLE HABITAT IN STUDY AREA	FIELD STUDIES COMPLETED/ REQUIRED	OBSERVED BY A & A	REFERENCE
Amphibians										
Jefferson Salamander	<i>Ambystoma jeffersonianum</i>	END	END	S2	ORAA (2012) MNRF (North Dumfries)	Adults are found within upland deciduous or mixed forest habitat with suitable breeding ponds, such as kettle ponds, natural basins and limestone sink holes, which can be permanent or ephemeral, and include appropriate egg attachment sites and lack of predatory fish (OCSEWIC 2010).	No habitat matching criteria identified in Study Area	The Study Area was investigated for habitat during ELC and Vegetation Surveys. No further studies required.	None observed.	COSEWIC. 2010. COSEWIC assessment and status report on the Jefferson Salamander <i>Ambystoma jeffersonianum</i> in Canada. Committee on the Status of Endangered Wildlife in Canada . Ottawa. xi + 38 pp.
'Unisexual Ambystoma, Jefferson dependent population	' <i>Ambystoma laterale</i> - (2) <i>jeffersonianum</i>	END	END	S2	ORAA (2012) MNRF (North Dumfries)	Unisexual ambystoma share the same habitat requirements as Jefferson salamander, as they rely on Jefferson salamander for sperm donation in order to breed (COSEWIC 2016).	No habitat matching criteria identified in Study Area	The Study Area was investigated for habitat during ELC and Vegetation Surveys. No further studies required.	None observed.	COSEWIC. 2016. COSEWIC assessment and status report on the unisexual Ambystoma, Ambystoma laterale, Small-mouthed Salamander–dependent population, Jefferson Salamander–dependent population and the Blue-spotted Salamander–dependent population, in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xxii + 61 pp.
Western Chorus Frog – Great Lakes / St. Lawrence - Canadian Shield Population	Pseudacris triseriata pop. 2	NAR	THR	S3	ORAA (2016)	Generally found in lowland communities, such as swamps, inhabiting lowland shrubs and grasses in the community, near breeding habitat. Breeding occurs in lowland, ephemeral ponds, devoid of predatory fish species (COSEWIC 2008a)	The swamp community along the railroad tracks may provide suitable habitat.	The Study Area was investigated for habitat during ELC and Vegetation Surveys. Amphibian surveys completed.	None observed.	COSEWIC. 2008. COSEWIC assessment and update status report on the Western Chorus Frog Pseudacris triseriata Carolinian population and Great Lakes/St. Lawrence – Canadian Shield population in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 47 pp.
Butterflies, Bees, Damselflies, Dragonflies & Insects										
Monarch	<i>Danaus plexippus</i>	SC	SC	S2N, S4B	MNRF (North Dumfries)	Requires milkweed for larval feeding, other wildflower species are also important for adult feeding when milkweed is not in flower; often found in abandoned farmland, along roadsides, and other open spaces (COSEWIC 2010b)	Meadow community in the eastern portion of the study area may provide suitable habitat	The Study Area was investigated for habitat during ELC and Vegetation Surveys. No further studies required.	Monarch larvae observed on scattered milkweed plants in the Dry- Fresh Mixed Meadow	COSEWIC. 2010. COSEWIC assessment and status report on the Monarch Danaus plexippus in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 43 pp.
Rusty-patched Bumble Bee	<i>Bombus affinis</i>	END	END	S1	MNRF (North Dumfries)	Uses a variety of open or semi-open habitat, including meadows, agricultural land and savannah habitat for foraging. Nests are often found underground, in old rodent burrows (COSEWIC 2010c).	Meadow community in the eastern portion of the study area may provide suitable habitat	The Study Area was investigated for habitat during ELC and Vegetation Surveys. No further studies required.	None observed.	COSEWIC. 2010. COSEWIC assessment and status report on the Rusty-patched Bumble Bee Bombus affinis in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 34 pp.
West Virginia White	<i>Pieris virginenisis</i>	SC	NAR	S3	MNRF (North Dumfries)	Found in rich deciduous and mixed forests and swamps with a poorly vegetated shrub layer. The larvae feed only on the leaves of a few host plants, including the Two-leaved Toothwort (<i>Cardamine diphylla</i>) and cut-leaved toothwort (Burke 2013).	No habitat matching criteria identified in Study Area	The Study Area was investigated for habitat during ELC and Vegetation Surveys. No further studies required.	None observed.	Peter S. Burke. 2013. Management Plan for the West Virginia White (<i>Pieris virginiensis</i>) in Ontario. Ontario Management Plan Series. Prepared for the Ontario Ministry of Natural Resources, Peterborough, Ontario. v + 44 pp.
Birds										

APPENDIX X. SPECIES AT RISK HABITAT ASSESSMENT

PROJECT #: AA17-196A

COMMON NAME	SCIENTIFIC NAME	SARO	COSEWIC	S-RANK	BACKGROUND SOURCES	HABITAT REQUIREMENTS	SUITABLE HABITAT IN STUDY AREA	FIELD STUDIES COMPLETED/ REQUIRED	OBSERVED BY A & A	REFERENCE
Acadian Flycatcher	<i>Empidonax Virens</i> scens	END	END	S2S3B	MNRF (North Dumfries)	Breeds in mature deciduous and mixed forests, using tableland forests and ravine habitats. Nests are often located over vernal pools, trails or bare ground in tablelands or over streams in ravines (COSEWIC 2010d).	No habitat matching criteria identified in Study Area	The Study Area was investigated for habitat during ELC and Vegetation Surveys. Breeding bird surveys completed.	None observed.	COSEWIC. 2010. COSEWIC assessment and status report on the Acadian Flycatcher <i>Empidonax virescens</i> in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. x + 38 pp.
Bald Eagle	<i>Haliaeetus leucocephalus</i>	SC	NAR	S2N, S4B	MNRF (North Dumfries)	Prefers deciduous and mixed-deciduous mature forest habitat close to water bodies including lakes and rivers; nests in super canopy trees including Pine (Armstrong 2014).	No habitat matching criteria identified in Study Area	The Study Area was investigated for habitat during ELC and Vegetation Surveys. Breeding bird surveys completed.	None observed.	Armstrong, Ted (E.R.). 2014. Management Plan for the Bald Eagle (<i>Haliaeetus leucocephalus</i>) in Ontario. Ontario Management Plan Series. Prepared for the Ontario Ministry of Natural Resources and Forestry, Peterborough, Ontario. vii + 53 pp.
Bank Swallow	<i>Riparia riparia</i>	THR	THR	S4B	OBBA (2007) MNRF (North Dumfries)	Breeds in a variety of natural and artificial bank type habitat, such as bluffs, stream and river banks, sand and gravel pits, piles of sand, topsoil and other material. Nests are typically in vertical or near-vertical surfaces (COSEWIC 2013b).	Existing piles of gravel may provide suitable habitat.	The Study Area was investigated for habitat during ELC and Vegetation Surveys. Breeding bird surveys completed.	Observed four Bank Swallows flying over the subject property.	COSEWIC. 2013. COSEWIC assessment and status report on the Bank Swallow <i>Riparia riparia</i> in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. ix + 48 pp.
Barn Swallow	<i>Hirundo rustica</i>	THR	THR	S4B	OBBA (2007) MNRF (North Dumfries)	Occurs in farmland, along lake/river shorelines, in wooded clearings and in urban populated areas. Nesting may occur inside or outside buildings; under bridges and in road culverts (COSEWIC 2011a).	Existing buildings on subject property may provide suitable habitat	The Study Area was investigated for habitat during ELC and Vegetation Surveys. Breeding bird surveys completed.	Three Barn Swallows identified flying over the subject property.	COSEWIC. 2011. COSEWIC assessment and status report on the Barn Swallow <i>Hirundo rustica</i> in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. ix + 37 pp.
Bobolink	<i>Dolichonyx oryzivorus</i>	THR	THR	S4B	OBBA (2007) MNRF (North Dumfries)	Nest in grassland habitats, including hayfields and meadows with a mixture of grasses and broad-leaved forbs with a high litter cover. Area Sensitive, with increased density in grasslands greater than 10ha (Renfrew et. al. 2015)	Dry- Fresh mixed meadow may provide suitable habitat.	The Study Area was investigated for habitat during ELC and Vegetation Surveys. Breeding bird surveys completed.	One Bobolink observed in suitable nesting habitat	Renfrew, R., A.M. Strong, N.G. Perlut, S.G. Martin and T.A. Gavin. 2015. Bobolink (<i>Dolichonyx oryzivorus</i>), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Birds of North America Online: http://bna.birds.cornell.edu/bna/species/176
Canada Warbler	<i>Wilsonia canadensis</i>	SC	THR	S4B	OBBA (2007) MNRF (North Dumfries)	Prefers wet coniferous, deciduous and mixed forest types, with a dense shrub layer (COSEWIC 2008b).	The Poplar-Conifer Mixed Swamp may provide suitable habitat.	The Study Area was investigated for habitat during ELC and Vegetation Surveys. Breeding bird surveys completed.	None observed.	COSEWIC. 2008. COSEWIC assessment and status report on the Canada Warbler <i>Wilsonia Canadensis</i> in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 35 pp. (www.sararegistry.gc.ca/status/status_e.cfm).
Cerulean Warbler	<i>Setophaga cerulea</i>	THR	END	S3B	OBBA (2007) MNRF (North Dumfries)	Occur in older, mature, deciduous forests, preferentially oak-maple composition, with a full, to partially open canopy, and little to no understory cover. Often in bottomland forests, or adjacent to treed swamplands (COSEWIC 2010f).	No habitat matching criteria identified in Study Area	The Study Area was investigated for habitat during ELC and Vegetation Surveys. Breeding bird surveys completed.	None observed.	COSEWIC. 2010. COSEWIC assessment and status report on the Cerulean Warbler <i>Dendroica cerulea</i> in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. x + 40 pp.
Chimney Swift	<i>Chaetura pelagica</i>	THR	THR	S4B, S4N	OBBA (2007) MNRF (North Dumfries)	Typically nests in traditional chimneys of older buildings, which also provide roosting sites for many individuals during spring and fall migration (MNRF 2013).	Existing buildings on subject property may provide suitable habitat	The Study Area was investigated for habitat during ELC and Vegetation Surveys. Breeding bird surveys completed.	None observed.	MNRF, 2013. General Habitat Description for the Chimney Swift (<i>Chaetura pelagica</i>). Ontario Ministry of Natural Resources and Forestry. July 2, 2013.

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Common Nighthawk	<i>Chordeiles minor</i>	SC	THR	S4B	MNRF (North Dumfries)	Breeds in open habitat, on the ground, in areas with no vegetation, including sand dunes, burned areas, open forests, railways, and gravel rooftops. Eggs are laid directly on the ground (COSEWIC 2007b).	No habitat matching criteria identified in Study Area	The Study Area was investigated for habitat during ELC and Vegetation Surveys. Breeding bird surveys completed.	None observed.	COSEWIC 2007. COSEWIC assessment and status report on the Common Nighthawk <i>Chordeiles minor</i> in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 25 pp.
Eastern Meadowlark	<i>Sturnella magna</i>	THR	THR	S4B	OBBA (2007) MNRF (North Dumfries)	Nest in grassland habitats, including hayfields, pasture, savannahs, and other open areas. Preferential habitat includes areas with good grass and thatch (litter) cover (Jaster et. al. 2012).	Dry- Fresh Mixed Meadow may provide suitable habitat	The Study Area was investigated for habitat during ELC and Vegetation Surveys. Breeding bird surveys completed.	Two pairs identified in suitable nesting habitat.	aster, Levi A., William E. Jensen and Wesley E. Lanyon. (2012). Eastern Meadowlark (<i>Sturnella magna</i>), The Birds of North America (P. G. Rodewald, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America: https://birdsna.org/Species-Account/bna/species/easmea
Eastern Wood-pewee	<i>Contopus virens</i>	SC	SC	S4B	ORAA (2007) MNRF (North Dumfries)	Associated with mid-age mixed and deciduous forest stands, often dominated by Maple (Acer), Elm (Ulmus) or Oak (Quercus), and include areas with clear-cuts, openings or forest edges. Also prefers forest stands with little to no understory vegetation (COSEWIC 2012a).	Forested communities may provide suitable habitat.	The Study Area was investigated for habitat during ELC and Vegetation Surveys. Breeding bird surveys completed.	None observed.	? COSEWIC. 2012. COSEWIC assessment and status report on the Eastern Wood-pewee Contopus virens in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. x + 39 pp. (www.registrelep-sararegistry.gc.ca/default_e.cfm).
Grasshopper Sparrow	<i>Ammodramus savannarum</i>	SC	SC	S4B	OBBA (2007)	Prefers moderately open grasslands and prairies with patchy bare ground; avoids grasslands with extensive shrub cover (Vickery 1996).	Patches of bare ground present throughout portions of the previous excavation area	The Study Area was investigated for habitat during ELC and Vegetation Surveys. Breeding bird surveys completed.	None observed.	Vickery, Peter D. 1996. Grasshopper Sparrow (<i>Ammodramus savannarum</i>), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: http://bna.birds.cornell.edu/bna/species/239
Least Bittern	<i>Ixobrychus exilis</i>	THR	THR	S4B	OBBA (2007) MNRF (North Dumfries)	Breeds in large marshes (>5ha) with emergent vegetation, typically cattails, with at least 50% open water, and relatively stable water levels (COSEWIC 2009b).	No habitat matching criteria identified in Study Area	The Study Area was investigated for habitat during ELC and Vegetation Surveys. Breeding bird surveys completed.	None observed.	COSEWIC. 2009. COSEWIC assessment and update status report on the Least Bittern Ixobrychus exilis in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 36 pp.
Louisiana Waterthrush	<i>Seiurus motacilla</i>	SC	THR	S3B	MNRF (North Dumfries)	Nests along headwater streams and associated wetlands which occur within large tracts of mature forest especially mixed wood forests with a component of hemlock. Nests are located in stream bank niches, under mossy logs, and within the roots of fallen trees (COSEWIC 2006b)	No habitat matching criteria identified in Study Area	The Study Area was investigated for habitat during ELC and Vegetation Surveys. Breeding bird surveys completed.	None observed.	COSEWIC 2006. COSEWIC assessment and update status report on the Louisiana Waterthrush Seiurus motacilla in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 26 pp. (www.sararegistry.gc.ca/status/status_e.cfm).
Northern Bobwhite	<i>Colinus virginianus</i>	END	END	S1	MNRF (North Dumfries)	Requires early successional habitat with a mix of croplands, dense brush cover and grassland in close proximity for feeding, dusting, roosting, escaping predators and nesting. Only known self-sustaining population found on Walpole island (COEWSIC 2003).	No habitat matching criteria identified in Study Area	The Study Area was investigated for habitat during ELC and Vegetation Surveys. Breeding bird surveys completed.	None observed.	COSEWIC 2003. COSEWIC assessment and update status report on the Northern Bobwhite Colinus virginianus in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 20 pp.
Red-headed Woodpecker	<i>Melanerpes erythrocephalus</i>	SC	THR	S4B	MNRF (North Dumfries)	Found in a variety of open areas, with a high density of dead or dying trees, particularly forests dominated by oak or beech (COSEWIC 2007d).	No habitat matching criteria identified in Study Area	The Study Area was investigated for habitat during ELC and Vegetation Surveys. Breeding bird surveys completed.	None observed.	COSEWIC 2007. COSEWIC assessment and update status report on the Red-headed Woodpecker <i>Melanerpes erythrocephalus</i> in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 27 pp.

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Wood Thrush	<i>Hylocichla mustelina</i>	SC	THR	S4B	OBBA (2007) MNRF (North Dumfries)	Prefers second growth moist deciduous forests, with tall trees, and a dense understory of low saplings and an open forest floor with decaying leaf litter. Often nests in saplings, shrubs or occasionally dead stumps (COSEWIC 2012b).	Forested communities within Study Area may provide suitable habitat	The Study Area was investigated for habitat during ELC and Vegetation Surveys. Breeding bird surveys completed.	None observed.	COSEWIC. 2012. COSEWIC assessment and status report on the Wood Thrush <i>Hylocichla mustelina</i> in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. ix + 46 pp.
Yellow-breasted Chat	<i>Icteria virens</i>	END	END	S2B	MNRF (North Dumfries)	Shrub specialist, nesting in early successional, dense, low-shrub habitat, including old fields, hydro-cutovers and forest edges experiencing regeneration (COSEWIC 2011c).	No habitat matching criteria identified in Study Area	The Study Area was investigated for habitat during ELC and Vegetation Surveys. Breeding bird surveys completed.	None observed.	COSEWIC. 2011. COSEWIC assessment and status report on the Yellow-breasted Chat <i>auricollis</i> subspecies <i>Icteria virens auricollis</i> and the Yellow-breasted Chat <i>virens</i> subspecies <i>Icteria virens virens</i> in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xvi + 51 pp. (www.registrelep-sararegistry.gc.ca/default_e.cfm).
Fish										
Black Redhorse	<i>Moxostoma duquesnei</i>	THR	THR	S2	MNRF (North Dumfries)	Associated with cool, clear streams of moderate size with substrates of rocky, cobble, sand or silt. Found in the Lake Erie and Grand River Watersheds (COSEWIC, 2005a).	No habitat matching criteria identified in Study Area	The Study Area was investigated for habitat during ELC and Vegetation Surveys. Aquatic habitat survey completed.	None observed.	COSEWIC 2005. COSEWIC assessment and update status report on the black redhorse <i>Moxostoma duquesnei</i> in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 21 pp.
Silver Shiner	<i>Notropis photogenis</i>	THR	THR	S2S3	MNRF (North Dumfries)	Associated with large, wide streams (usually >20m) in deep riffles and pools, with substrates of gravel, boulder, rubble and sand (COSEWIC, 2011d).	No habitat matching criteria identified in Study Area	The Study Area was investigated for habitat during ELC and Vegetation Surveys. Aquatic habitat survey completed.	None observed.	COSEWIC 2011. COSEWIC assessment and status report on the Silver Shiner in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 45 pp.
Mammals										
American Badger	<i>Taxidea taxus</i>	END	END	S2	MNRF (North Dumfries)	Associated with open habitat, including agricultural hedgerows, grasslands, fallow habitat and open linear corridors in forests. Soil composition must be coherent to maintain structure for digging and tunneling, usually coarse silts to fine sands, in Ontario usually found in areas of sandy and loam soils. Prey availability is also important for site suitability (COSEWIC, 2012c).	No habitat matching criteria identified in Study Area	The Study Area was investigated for habitat during ELC and Vegetation Surveys.	None observed.	COSEWIC. 2012. COSEWIC assessment and status report on the American Badger <i>Taxidea taxus</i> in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. iv + 63 pp. (www.registrelep-sararegistry.gc.ca/default_e.cfm).
Eastern Small-footed Myotis	<i>Myotis leibii</i>	END	NA	S2S3	MNRF (North Dumfries)	Associated with hilly or mountainous terrain, in or near coniferous or deciduous forest habitat. Maternity roosts located in cracks and crevices of talus slopes and rocky outcrops, or, occasionally in bridges, old buildings, hollow trees (or loose bark) and caves and mines during the maternity season. Hibernate singly or in small clusters in mines and caves (NatureServe, 2015).	No habitat matching criteria identified in Study Area.	The Study Area was investigated for habitat during ELC and Vegetation Surveys. No further studies required.	None observed.	COSEWIC. 2013. COSEWIC assessment and status report on the Little Brown Myotis <i>Myotis lucifugus</i> , Northern Myotis <i>Myotis septentrionalis</i> and Tri-colored Bat <i>Perimyotis subflavus</i> in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xxiv + 93 pp. (www.registrelep-sararegistry.gc.ca/default_e.cfm).
Little Brown Myotis	<i>Myotis lucifugus</i>	END	END	S4	OMA (1994) MNRF (North Dumfries)	Hibernate in Caves; maternity colonies located in warm sites, often associated with human habitation; including attics, old buildings, under bridges, rock crevices and cavities in canopy trees in wooded areas (COSEWIC, 2013c).	Forested communities within the Study Area may provide suitable habitat	The Study Area was investigated for habitat during ELC and Vegetation Surveys. No further studies required.	None observed.	COSEWIC. 2013a COSEWIC assessment and status report on the Little Brown Myotis <i>Myotis lucifugus</i> , Northern Myotis <i>Myotis septentrionalis</i> and Tri-colored Bat <i>Perimyotis subflavus</i> in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xxiv + 93 pp. (www.registrelep-sararegistry.gc.ca/default_e.cfm).

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Northern Myotis	<i>Myotis septentrionalis</i>	END	END	S3	MNRF (North Dumfries)	Hibernate in Caves; maternity colonies usually located in trees, and are closely associated with specific tree characteristics and density of suitable trees. Characterized by tall, large diameter trees in early stages of decay, located in openings in mature forest canopies (COSEWIC, 2013c).	Forested communities within the Study Area may provide suitable habitat	The Study Area was investigated for habitat during ELC and Vegetation Surveys. No further studies required.	None observed.	COSEWIC. 2013. COSEWIC assessment and status report on the Little Brown Myotis <i>Myotis lucifugus</i> , Northern Myotis <i>Myotis septentrionalis</i> and Tri-colored Bat <i>Perimyotis subflavus</i> in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xxiv + 93 pp. (www.registrelep-sararegistry.gc.ca/default_e.cfm).
Tri-colored Bat	<i>Perimyotis subflavus</i>	END	END	S3?	MNRF (North Dumfries)	Hibernate in caves; form day roosts and maternity colonies in older forests and occasionally anthropogenic structures. Forage over water and along streams in forests. Females roost alone or in groups of up to 30 bats in clusters of leaves in maple and oak trees, buildings and rock crevices (Wisconsin Department of Natural Resources, 2013)	Forested communities within the Study Area may provide suitable habitat	The Study Area was investigated for habitat during ELC and Vegetation Surveys. No further studies required.	None observed.	Wisconsin Department of Natural Resources. 2013. Wisconsin Eastern Pipistrelle Species Guidance. Bureau of Natural Heritage Conservation, Wisconsin Department of Natural Resources, Madison, Wisconsin. PUB-ER-706
Woodland Vole	<i>Microtus pinetorum</i>	SC	SC	S3?	MNRF (North Dumfries)	Associated with deciduous forests but also inhabit scrubby sand dunes, swamps and orchards. They are influenced by the amount and type of cover, soil moisture and soil type, favouring areas with dense herbaceous vegetation and friable soils with low saturation (COSEWIC, 2010).	No habitat matching criteria identified in Study Area	The Study Area was investigated for habitat during ELC and Vegetation Surveys. No further studies required.	None observed.	COSEWIC. 2010. COSEWIC assessment and status report on the Woodland Vole <i>Microtus pinetorum</i> in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. x + 35 pp. (www.sararegistry.gc.ca/status_e.cfm)
Molluscs										
Wavy-rayed lampmussel	<i>Lampsilis fasciola</i>	THR	SC	S1	MNRF (North Dumfries)	Occur in clear, flowing rivers and large creeks, in riffle areas with sand or gravel substrates, and occasional large substrates (COSEWIC, 2010g)	No habitat matching criteria identified in Study Area	The Study Area was investigated for habitat during ELC and Vegetation Surveys. No further studies required.	None observed.	COSEWIC. 2010. COSEWIC assessment and status report on the Wavy-rayed Lampmussel <i>Lampsilis fasciola</i> in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 60 pp.
Reptiles										
Blanding's Turtle	<i>Emydoidea blandingii</i>	THR	THR	S3	ORAA (2017) MNRF (North Dumfries)	Use a variety of eutrophic wetland habitat types, including lakes, ponds, watercourses, marshes, man-made channels, farm fields, coastal areas and bays. Seasonal overland terrestrial movements up to 2.5 km occur to reach nesting and overwintering areas, generally through wooded coniferous or mixed forest habitat. Nests are usually laid in loose sand or organic soil (COSEWIC 2005b).	The wetland communities and pond within the Study Area may provide suitable habitat	The Study Area was investigated for habitat during ELC and Vegetation Surveys. No further studies required.	None observed.	COSEWIC 2005. COSEWIC assessment and update status report on the Blanding's Turtle <i>Emydoidea blandingii</i> in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. viii + 40 pp. (www.sararegistry.gc.ca/status/status_e.cfm).
Northern Map Turtle	<i>Graptemys geographica</i>	SC	SC	S3	MNRF (North Dumfries)	Highly aquatic species, found in deep, large waterbodies, including Lakes and large rivers, with abundant basking sites. Emerge onto land only during nesting, which occurs in soft sand or soil. Waterbodies with slow currents, soft mud bottoms and abundant aquatic vegetation are preferred (COSEWIC, 2002b).	No habitat matching criteria identified in Study Area	The Study Area was investigated for habitat during ELC and Vegetation Surveys. No further studies required.	None observed.	COSEWIC 2002. COSEWIC assessment and status report on the northern map turtle <i>Graptemys geographica</i> in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 34 pp.
Snapping Turtle	<i>Chelydra serpentina</i>	SC	SC	S3	ORAA (2011) MNRF (North Dumfries)	Inhabit slow-moving waters with soft, muck bottom and dense aquatic vegetation. Ponds, sloughs and shallow bays are all often used as summering and overwintering habitat (COSEWIC 2008d).	Man-made Pond on subject property may provide suitable habitat	The Study Area was investigated for habitat during ELC and Vegetation Surveys. No further studies required.	None observed.	COSEWIC. 2008. COSEWIC assessment and status report on the Snapping Turtle <i>Chelydra serpentina</i> in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 47 pp. (www.sararegistry.gc.ca/status/status_e.cfm).

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Eastern Ribbonsnake	<i>Thamnophis sauritus</i>	SC	SC	S3	ORAA (2012) MNRF (North Dumfries)	A semi-aquatic species that inhabits dense, low- vegetation, edges of ponds, streams, marshes, fens and bogs, with open sunlit areas for basking (COSEWIC 2002c).	No habitat matching criteria identified in Study Area	The Study Area was investigated for habitat during ELC and Vegetation Surveys. No further studies required.	None observed.	COSEWIC 2002. COSEWIC assessment and status report on the eastern ribbonsnake <i>Thamnophis sauritus</i> . Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 24 pp.
Milksnake	<i>Lampropeltis triangulum</i>	SC	SC	S3	ORAA (1966)	Habitat generalists often associated with edge habitat, meadows, prairies, pastures, rocky outcrops and human disturbances such as hydro corridors and railway embankments. Habitat is usually close to a water source. Hibernation occurs in a variety of natural and man-made features, including rotting logs, old foundations, basements and burrows (COSEWIC 2014).	Meadow and excavation communities may provide suitable habitat	The Study Area was investigated for habitat during ELC and Vegetation Surveys. No further studies required.	None observed.	COSEWIC. 2014. COSEWIC assessment and status report on the Eastern Milksnake <i>Lampropeltis triangulum</i> in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. x + 61 pp.
Queensnake	<i>Regina septemvittata</i>	END	END	S2	ORAA (1988) MNRF (North Dumfries)	A highly aquatic species associated with rocky streams and rivers, but occasionally found in marsh, pond and lakeshore habitats.	No habitat matching criteria identified in Study Area	The Study Area was investigated for habitat during ELC and Vegetation Surveys. No further studies required.	None observed.	COSEWIC. 2010. COSEWIC assessment and status report on the Queensnake <i>Regina septemvittata</i> in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 34 pp. (www.sararegistry.gc.ca/status/status_e.cfm)
Vascular Plants										
American Chestnut	<i>Castanea dentata</i>	END	END	S2	MNRF (North Dumfries)	Typically occur in upland deciduous forests in Southern Ontario with dry, sandy, acid-neutral soils, Typical associates include Red Oak, Black Cherry, Sugar Maple, American Beech, White Ash, White Oak, Red Maple and Sassafras (COSEWIC 2004).	Deciduous forest within the Study Area may provide suitable habitat	The Study Area was investigated for habitat during ELC and Vegetation Surveys. No further studies required.	None observed.	COSEWIC 2004. COSEWIC assessment and status report on the American chestnut <i>Castanea dentata</i> in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 19 pp. (www.sararegistry.gc.ca/status/status_e.cfm)
American Ginseng	<i>Panax quinquefolius</i>	END	END	S2	MNRF (North Dumfries)	Occur in moist, rich, undisturbed, mature Sugar Maple dominated deciduous woodlands. Often, colonies are located at the bottom of south facing slopes (COSEWIC, 2000).	No habitat matching criteria identified in Study Area	The Study Area was investigated for habitat during ELC and Vegetation Surveys. No further studies required.	None observed.	COSEWIC 2000. COSEWIC assessment and update status report on the American ginseng <i>Panax quinquefolius</i> in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 17 pp.
Butternut	<i>Juglans cinerea</i>	END	END	S3?	MNRF (North Dumfries)	Occur in rich moist sites, that are well-drained, often found along stream banks or gravelly sites. Butternut is shade intolerant (COSEWIC, 2003b).	No habitat matching criteria identified in Study Area	The Study Area was investigated for habitat during ELC and Vegetation Surveys. No further studies required.	None observed.	COSEWIC 2003. COSEWIC assessment and status report on the butternut <i>Juglans cinerea</i> in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 32 pp. (www.sararegistry.gc.ca/status/status_e.cfm)
Green Dragon	<i>Arisaema dracontium</i>	SC	SC	S3	MNRF (North Dumfries)	Occurs along creek, river and clay floodplains in moist to wet deciduous woodlands and thickets. Grows in shaded to partly shaded, seasonally wet areas (Donley et. al. 2013).	The portion of the wetland surrounding Cedar Creek in the Study Area may provide suitable habitat	The Study Area was investigated for habitat during ELC and Vegetation Surveys. No further studies required.	None observed.	Donley, R., J.V. Jalava and J. van Overbeeke. 2013. Management Plan for the Green Dragon (<i>Arisaema dracontium</i>) in Ontario. Ontario Management Plan Series. Prepared for the Ontario Ministry of Natural Resources, Peterborough, Ontario. vi + 43 pp.

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Pygmy Pocket Moss	Fissidens exilis	SC			MNRF (North Dumfries)	Found largely on bare, moist, partially shaded, clay-based soil or loam. It has been collected on forested banks of streams and ravines, floodplains, bluffs, beaches, roadsides, trails and other environments where bare soil is exposed (COSEWIC, 2016).	No habitat matching criteria identified in Study Area	The Study Area was investigated for habitat during ELC and Vegetation Surveys. No further studies required.	None observed.	COSEWIC.2016. COSEWIC assessment and status report on the Pygmy Pocket Moss <i>Fissidens exilis</i> in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 28 pp. (http://www.registrelep-sararegistry.gc.ca/default_e.cfm)

References:

Cadman, M.D.,D.A. Sutherland, G.G. Beck, D. Lepage, and A.R. Couturier. 2007. The Atlas of the Breeding Birds Ontario 2001-2005. Bird Studies Canada, Environment Canada, Ontario Field Ornithologists, Ontario Ministry of Natural Resources, and Ontario Nature, Toronto,xxii + 706pp. (Available online here: <http://www.birdsontario.org/atlas/datasummaries.jsp>)

Colin Jones, Ross Layberry, and Alan Macnaughton. Ontario Butterfly Atlas Online. (April 30, 2015). (Available online here: Toronto Entomologists’ Association: http://www.ontarioinsects.org/atlas_online.htm)

Dobbyn, J. 1994. Atlas of the Mammals of Ontario. Federation of Ontario Naturalists, Altona Manitoba, Canada. (available online here: <http://www.ontarionature.org/discover/resources/publications.php>)

MNRF, 2015. Wellington County Upper Tier Species at Risk. Ministry of Natural Resources and Forestry. Provided February 10, 2015.

NatureServe. 2015. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available <http://explorer.natureserve.org>. (Accessed: January 5, 2016).

NHIC, 2015. MNRF Make a map: Natural Heritage Areas. (Available online: <http://www.ontario.ca/environment-and-energy/make-natural-heritage-area-map>)

Ontario Nature. 2015. Ontario Reptile and Amphibian Atlas: a citizen science project to map the distribution of Ontario’s reptiles and amphibians. Ontario Nature, Ontario. (Available onlnie here: <http://www.ontarionature.org/atlas>; Accessed April 29, 2015].

APPENDIX 7
MNRF Information Request

Natural Heritage Information Request Form – Guelph District MNRF *(updated: Dec. 2017)*

Please be advised that failure to complete this form in its entirety may result in delays in receiving a response from MNRF.

Forward the completed form to: esa.guelph@ontario.ca

Consultant Name:	<input type="text"/>
Consultant Company:	<input type="text"/>
Email Address:	<input type="text"/>
Phone Number:	<input type="text"/>
Proponent Name:	<input type="text"/>
Proponent Company:	<input type="text"/>

Project Name:	<input type="text"/>
Property Address:	<input type="text"/>
Township/Municipality:	<input type="text"/>
Lot & Concession:	<input type="text"/>

UTM Coordinates: (NAD83)	<input type="text"/>	<input type="text"/>
	Easting (X)	Northing (Y)

Brief Description
of Undertaking:

Are any municipal planning, provincial or other approvals required for this project? (Check all that apply)

Aggregate Resources Act

Planning Act

Public Lands Act

Lakes and Rivers Improvement Act

Drainage Act

Niagara Escarpment Planning & Development Act

Environmental Protection Act

Other (specify)

Have you previously contacted someone at MNRF for information on this site?

Yes

No

If yes, when and who?

Provide a map (aerial photo preferred) of accurate scale to illustrate footprint/study area of the proposed activity in relation to the surrounding landscape (include property boundaries, roads, waterbodies, natural features etc.).

REQUEST - I would like to request the following information for the property identified above:

Wetland Evaluation File
(provide name of wetland if known)

Area of Natural and Scientific Interest (ANSI) Checksheet
(provide name of ANSI if known)

Fish Dot Information
(fish and other aquatic species found in a particular
area of a watercourse)

Species at Risk

Other (specify)

In-Water Work Timing Window



LEGEND

- SUBJECT PROPERTY
 PROVINCIAL SIGNIFICANT WETLAND
 STUDY AREA (120M)
 WOODLAND

Information Sources:
 1. Orthophotography provided by First Base Solutions
 Accessed December 1, 2017.
 2. Woodlands & Wetland communities provided by
 Land Information Ontario accessed, August 28, 2017.

STUDY AREA

Project:
 PART OF LOTS 25, 26
 & 27- CONC. XI
 TOWNSHIP OF NORTH
 DUMFRIES



Date: DECEMBER 2017
 Project: AA17-196A
 Scale: 1 : 6000


ABOUT & ASSOCIATES INC.
 Consulting Arborists • Ecologists • Landscape Designers
 591 Woolwich Street, Guelph, Ontario, Canada N1H 3Y5
 T: 519.822.6839 • F: 519.822.4052 • info@aboutdntg.com • www.aboutdntg.com

Figure No:

1

Shannon Davison

From: Buck, Graham (MNRF) <Graham.Buck@ontario.ca>
Sent: November-29-18 12:44 PM
To: Shannon Davison
Subject: MNRF_Response_2212_Cedar_Creek-Road
Attachments: SAR_North_Dumfries.pdf; Roseville Swamp - Cedar Creek Wetland Evaluation.pdf

Hello Shannon,

The Ministry of Natural Resources and Forestry (MNRF), Guelph District Office, has reviewed the natural heritage information available for the above-noted property and surrounding area (the “study area”), and offers the following comments:

WETLANDS

The Ministry has identified the following provincially significant wetlands (PSWs) within the study area:

- Roseville Swamp - Cedar Creek PSW

As requested, a copy of the wetland evaluation file for the Roseville Swamp - Cedar Creek PSW is attached. Please be advised that wetland evaluation files are considered “open” files and may be updated from time to time as new information becomes available.

SPECIES AT RISK

There are records in the area for the following species at risk (SAR):

- American Badger – Endangered
- Blanding’s Turtle - Threatened
- Barn Swallow - Threatened
- Snapping Turtle – Special Concern

Threatened and Endangered Species receive both individual species and habitat protection under the Endangered Species Act, 2007 (ESA). SAR habitat prescribed under regulation is listed in Ont. Reg. 242/08 (<https://www.ontario.ca/laws/regulation/080242>). Therefore the Ministry recommends turtle nest surveys be completed to inform whether any at risk turtles are using the property for nesting.

Please be advised that because the province has not been surveyed comprehensively for the presence of listed species, the absence of a record does not necessarily indicate the absence

of SAR from an area. To determine the presence of SAR for a given study area, the District's recommended approach is as follows:

I. Habitat Inventory

The Ministry recommends undertaking a comprehensive botanical inventory of the entire area that may be subject to direct and indirect impacts from the proposed activity. The vegetation communities should be classified as per the "Ecological Land Classification (ELC) for Southern Ontario" system, to either the "Ecosite" or "Vegetation Type" level. For aquatic habitats in the study area, we recommend that you collect data on the physical characteristics of the waterbodies and inventory the riparian zone vegetation, so that these habitats can be classified as per the Aquatic Ecosites described in the ELC manual.

II. Potential SAR within the Study Area

A list of SAR that have the potential to occur in the area can be produced by cross-referencing the ecosites described during the habitat inventory with the habitat descriptions of SAR known to occur within the planning area. The list of SAR known to occur in the North Dumfries is attached for your reference. The species-specific COSEWIC status reports (<https://www.canada.ca/en/environment-climate-change/services/committee-status-endangered-wildlife.html>) are a good source of information on habitat needs and will be helpful in determining the suitability of the study areas ecosites for a given species.

Please note that the Species at Risk in Ontario (SARO) List is a living document that is periodically amended as a result of species assessment and re-assessments conducted by the Committee on the Status of Species at Risk in Ontario (COSSARO). The SARO List can be accessed on the following webpage: <https://www.ontario.ca/environment-and-energy/species-risk-ontario-list>.

COSSARO also maintains a list of species to be assessed in the future. It is recommended that you take COSSARO's list of anticipated assessments into consideration, especially when the proposed start date of an activity is more than 6 months away, or the project will be undertaken over a period greater than 6 months. This list can be viewed at: <https://www.ontario.ca/page/how-comment-protecting-species-risk>.

III. SAR Surveys

The Ministry recommends that each potential SAR identified under Step II is surveyed for, regardless of whether or not the species has been previously recorded in the area. The survey report should describe how each SAR was surveyed for, and provide a rationale for why certain species were not afforded a survey (e.g., habitat within the study area is not suitable

for a specific SAR). Please note that some targeted surveys may require provincial authorizations (e.g., ESA permit or Wildlife Scientific Collector's Permit).

ADDITIONAL INFORMATION

Natural heritage features (e.g. wetlands, ANSIs) can be viewed for a given study area through the MNRF's "Make a Map" web application: <https://www.ontario.ca/page/make-natural-heritage-area-map>. Digital data layers can be obtained through the Land Information Ontario (LIO) geowarehouse <https://www.ontario.ca/page/land-information-ontario>.

Additionally, the MNRF recommends contacting the municipality and the conservation authority to determine if they have any additional information or records of interest for the study area.

Please be advised that it is your responsibility to comply with all other relevant provincial or federal legislation, municipal by-laws, other MNRF approvals or required approvals from other agencies. If your investigations reveal the presence of Threatened or Endangered species, please contact the MNRF at esa.guelph@ontario.ca for further direction.

I trust that the above information is of assistance.

Sincerely,

Graham buck

*Graham Buck
Management Biologist
Ministry of Natural Resources and Forestry
Guelph District
1 Stone Road West Guelph ON
N1G 4Y2
519 826 4505
graham.buck@ontario.ca*

From: Shannon Davison <sdavison@aboudtng.com>

Sent: October-31-18 3:29 PM

To: ESA Guelph (MNRF) <ESAGUELPH@ontario.ca>

Subject: AA17-196A Cedar Creek Dumfries Road- MNRF Request for Information

Good Afternoon,

Please find attached a completed Natural Heritage Information Request form for a property northwest of the intersection of Cedar Creek road and Dumfries Road in the Township of North Dumfries. Any information you can provide would be greatly appreciated.

Regards,

Shannon Davison B.Env. Eco. Rest. Cert.

Ecologist

MNRF Certified Wetland Evaluation . MNRF Certified Ecological Land Classification

ABOUD & ASSOCIATES INC. 190 Nicklin Road . Guelph . Ontario . N1H 7L5

T : 519.822.6839 x5 C : 226.581.0707 www.aboudtng.com sdavison@aboudtng.com

WETLAND DATA RECORD

- (i). WETLAND NAME AND/OR NUMBER ROSEVILLE SWAMP - CEDAR CREEK
- (ii). ADMINISTRATIVE REGION CENTRAL, AND DISTRICT CAMBRIDGE
OF ONTARIO MINISTRY OF NATURAL RESOURCES
- (iii). CONSERVATION AUTHORITY JURISDICTION GRAND RIVER CONSERVATION AUTH.

If not within a designated Conservation Authority, check here _____

- (iv). COUNTY OR REGIONAL MUNICIPALITY WATERLOO R.M.
- (v). TOWNSHIP NORTH DUMFRIES TWP ; WATERLOO TWP.
- (vi). LOTS AND CONCESSIONS ND (CONC VII 28-30; CONC VIII 29-34; CONC II 28-32; CONC I 27-32;
CONC XI 26-28; CONC XII 31-35) W (SEALEY/SHAW SURVEY LOTS 1-3)
- (vii). MAP AND AIR PHOTO REFERENCES

- (a) Longitude and Latitude 80° 26' W 43° 21' N
- (b) U.T.M. Grid Reference Zone: 17; Grid: NU 460 000
- (c) National Topographic Series Scale and Map Number(s) & Name 1:50,000 GALT 40P/8
- (d) Air Photos
- (1) Date photo taken 1978 JUNE 23
- (2) Scale of air photos 1:10,000
- (3) Flight and plate numbers SEC FIGURE 1

(viii). WETLAND SIZE AND BOUNDARIES

- (a) Single contiguous wetland area: 508 hectares
- OR
- (b) "Wetland Complex" comprised of _____ individual wetlands as follows:.

Wetland Number (for
reference purposes)

Size of each wetland
in the complex

Wetland No. 1	_____	hectares
Wetland No. 2	_____	"
Wetland No. 3	_____	"
Wetland No. 4	_____	"
Wetland No. 5	_____	"
Wetland No. 6	_____	"
Total size of wetland complex:	=====	"

1.0. BIOLOGICAL COMPONENT

1.1. PRODUCTIVITY VALUES

1.1.1. Growing Degree-Days

Number of accumulated growing degree-days (check one)

<u> </u>	<2800
<u> </u>	2800 to 3200
<u> ✓ </u>	3200 to 3600
<u> </u>	>3600

1.1.2. Soils

SEE FIGURE 2

Estimated % of Area

- Clays, loams or silts (mineral)
- Organic
- Undesignated

WETLAND MAPPING
SERIES

<u> </u>	5
<u> </u>	95
<u> </u>	

1.1.3. Type of Wetland

(check one or more)

Estimated % of Area

<u> </u>	Bog
<u> ✓ </u>	Fen
<u> ✓ </u>	Swamp
<u> ✓ </u>	Marsh (includes Open Water Marsh)

<u> </u>	1
<u> </u>	96
<u> </u>	3

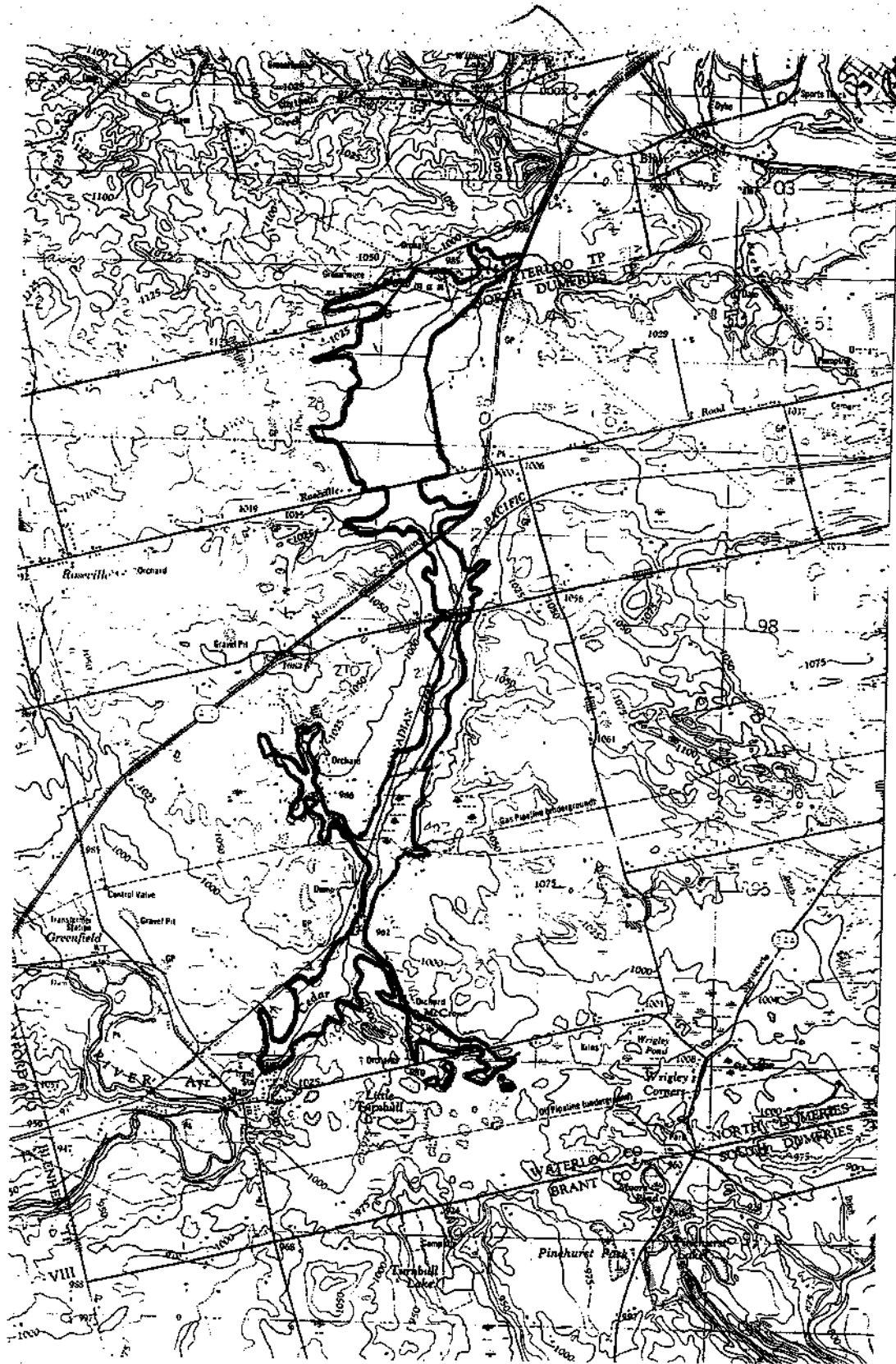
1.1.4. Site

(check one or more)

Estimated % of Area

<u> </u>	Isolated
<u> ✓ </u>	Palustrine (permanent or intermittent outflow)
<u> ✓ </u>	Riverine
<u> </u>	Riverine (at rivermouth)
<u> </u>	Lacustrine (at rivermouth)
<u> </u>	Lacustrine (on enclosed bay)
<u> </u>	Lacustrine (exposed to lake)

<u> </u>	
<u> </u>	70
<u> </u>	30
<u> </u>	
<u> </u>	
<u> </u>	



ROSEVILLE SWAMP - CEDAR CREEK WETLAND

1 km



FLIGHT LINE NO.

4326

4325

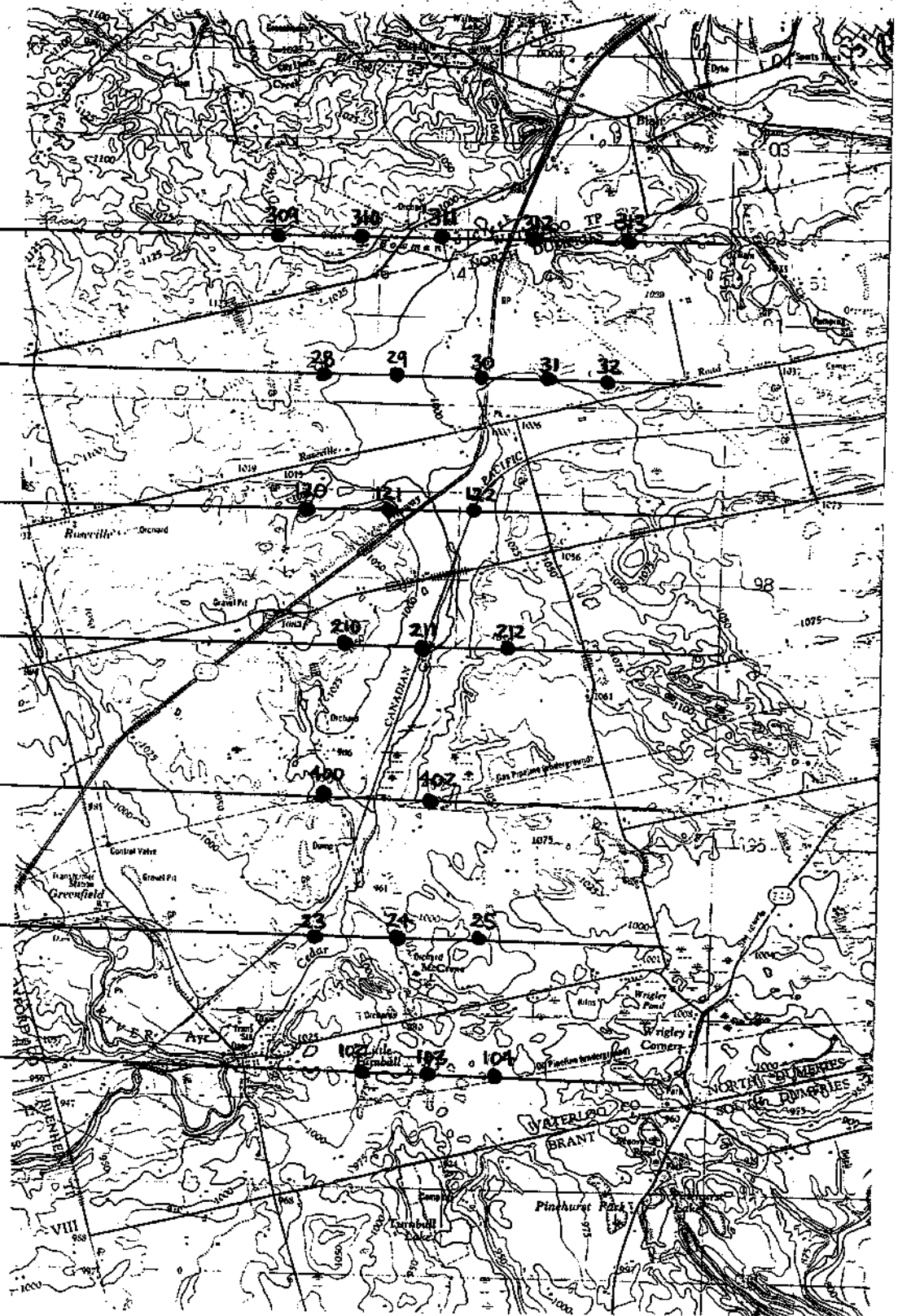
4324

4323

4322

4321

4320



1.1.5. Nutrient Status of Surface Water

- (a) Write conductivity bridge reading and calculate T.D.S. at 25°C as per tables in Appendix VIII.

Location Sampled (ie. inflow, outflow, etc.)	Initial Specific Conductance (umhos/cm)	Temperature (°C)	Total Dissolved Solids (T.D.S.) (mg/l)
(SEE TABLE 1 AND FIGURE 3)			
Average T.D.S.			

- (b) Check appropriate category (from (a))

Average T.D.S. (mg/l)

<100

100-500

501-1500

>1500

NO READING

<input type="checkbox"/>
<input checked="" type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>

range 427-483

1.2. DIVERSITY VALUES

1.2.1. Number of Wetland Types

(check one)

☐ One

☐ Two

☒ Three

☐ Four

1.2.2. Vegetation Communities

(enter form and map code if available, or enter dominant species if known, and appropriate code/symbol)

a) One form

Code

(SEE TABLE)

<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>

final draft
presently unavailable
8 Oct 1984

TABLE 1:

ROSEVILLE SWAMP - CEDAR CREEK WETLANDCONDUCTIVITY READINGS - TDS VALUES14 AUGUST 1984

Station	Time	Stream Temp.	Cell Temp.	Initial Specific Conductance (umhos/cm)	TDS Values (mg/l)	TDS (mg/l)
*1	1310	14°C	22°C 20°C 20°C	650 590 590	460 440 440	447
*2	1340	15°C	17°C 19°C 16°C	620 630 590	490 480 480	483
*3	1400	15°C	18°C 17°C 17°C	550 540 530	426 430 425	427

range 427 - 483
(425 - 490)

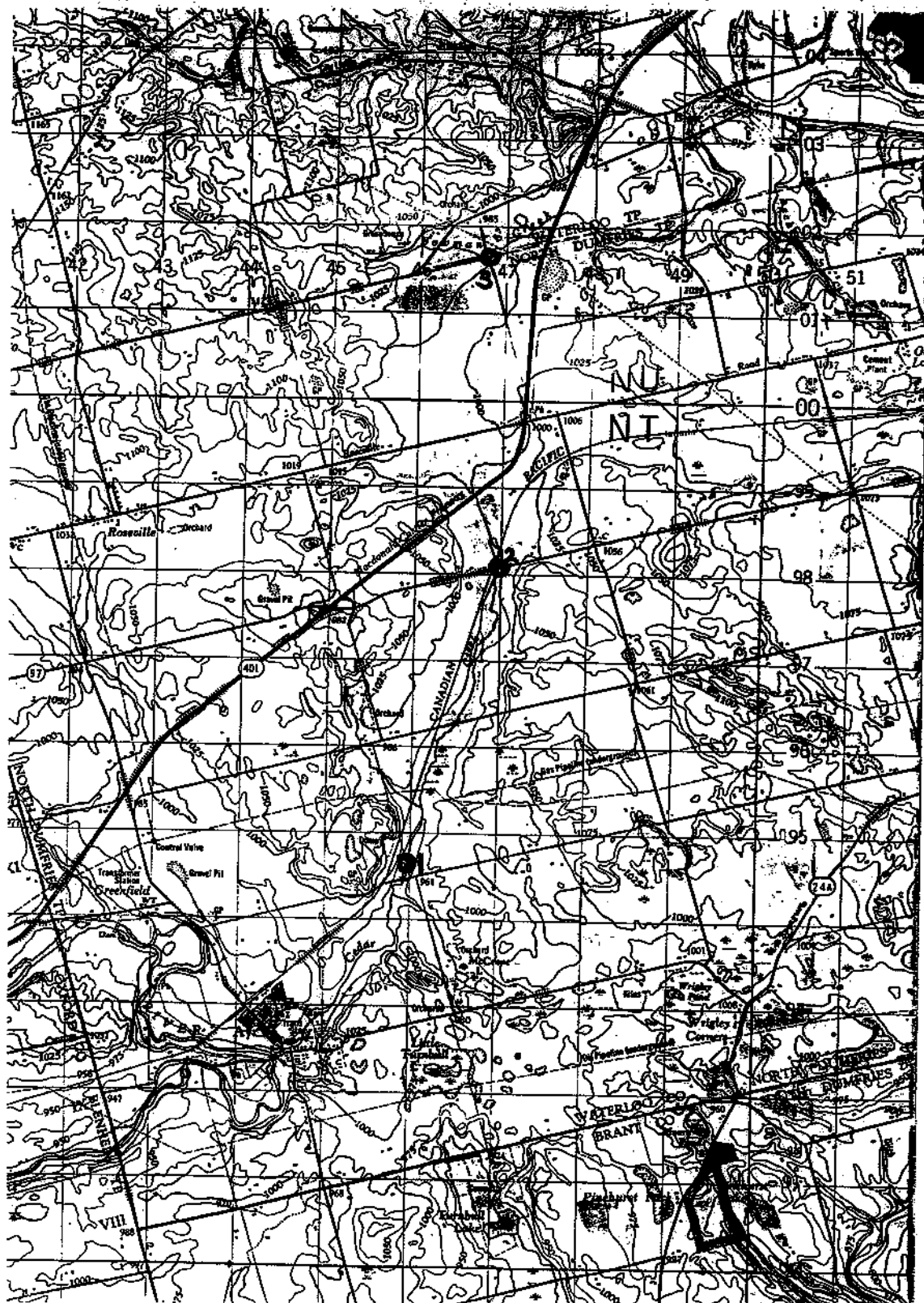


FIGURE 3:

CONDUCTIVITY - TDS STATIONS IN THE BLACK RIVER SWAMP,
14 AUGUST 1984.

1.2.3. Diversity of Surrounding Habitat

(check all appropriate items)

- ☒ row crops
- ☒ pasture
- ☒ abandoned agricultural land
- ☒ deciduous forest
- ☒ coniferous forest
- ☒ urban or cottage development
- ☒ pits, quarries or mining waste disposal
- ☒ open lake or deep river
- ☒ fence rows with cover, or shelterbelts
- ☒ terrain undulating or hilly with ravines
- ☒ creek(s)

Enter Total = 11

1.2.4. Proximity to Other Wetlands

(check first appropriate category)

- i) Hydrologically connected by surface water to other wetlands (different dominant type) or open water within 1.5 km.
- ii) Hydrologically connected by surface water to other wetlands (same dominant type) within 0.5 km. ✓
- iii) Hydrologically connected by surface water to other wetlands (different dominant type) or open water body from 1.5 to 4 km away.
- iv) Hydrologically connected by surface water to other wetlands (same dominant type) from 0.5 to 1.5 km away.
- v) Within 0.75 km of other wetlands (different dominant type) or open water body, but not hydrologically connected by surface water.
- vi) Within 1 km of other wetlands, but not hydrologically connected by surface water.
- vii) No wetland within 1.5 km.

1.2.5. Interspersion

(check one)

- Type 1 ✓
- Type 2
- Type 3
- Type 4

1.2.6. Open Water Types

(check one)

- No open water _____
Type 1 _____
Type 2 _____
Type 3 ✓ _____
Type 4 _____
Type 5 _____
Type 6 _____
Type 7 _____
Type 8 _____

1.3. SIZE (Biological Component)

(refer to viii)

508 hectares

2.0. SOCIAL COMPONENT

2.1. RESOURCE PRODUCTS WITH CASH VALUE

2.1.1. Timber (lumber and firewood)

- (1) ✓ 51 to 100% of wetland area has mature trees (>10 cm dbh, >25% cover)
(2) _____ 10 to 50% of wetland area has mature trees (as above)
(3) _____ Wetland has few, immature or no trees

Source of information: _____

2.1.2. Wild Rice

- (1) _____ Present
(2) ✓ Absent

Source of Information: FIELD RECONNAISSANCE 1984

2.1.3. Commercial Fish (Bait Fish and/or Coarse Fish) SEE SECTION II

- (1) _____ Fish harvested from the wetland (as per MNR)
(2) _____ Abundant during at least part of the year
(3) _____ Not abundant or only occasional
(4) _____ Habitat not suitable for fish

Source of Information: _____

2.1.4. Bullfrogs

SEE SECTION II

- (1) ✓ Present
(2) _____ Absent

Source of Information: FIELD RECONNAISSANCE 1984

2.1.5. Snapping Turtles

SEE SECTION II

(1) ☒ Present

(2) ☐ Absent

Source of Information: FIELD RECONNAISSANCE '84

2.1.6. Furbearers

(check if present)

☒ muskrat

☒ raccoon

☒ beaver

☒ mink

☒ other

skunk, red squirrel, coyote

Source of Information: FIELD RECONNAISSANCE '84

2.2. RECREATIONAL ACTIVITIES

SEE SECTION II

(check appropriate spaces)

Intensity of Use	Type of Wetland Associated Use			
	Hunting	Nature Appreciation or Study	Fishing	Canoeing/Boating
High				
Moderate	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
Low			<input checked="" type="checkbox"/>	
None Known				<input checked="" type="checkbox"/>
Not Possible				
Source of Information	<u>FIELD RECONNAISSANCE '84</u>			

2.3. AESTHETICS

2.3.1. Landscape Distinctness

(1) ☒ Clearly distinct

(2) ☐ Indistinct

2.3.2. Absence of Human Disturbances

2.3.2.1. Level of Disturbance

- (1) ☐ Human disturbances absent or nearly so
- (2) ☐ One or several singular or localized disturbances
- (3) ☒ Moderate disturbance or localized water pollution
- (4) ☐ Impairment of natural quality intense in some areas or severe localized water pollution
- (5) ☐ Extremely intense disturbance or water pollution severe and widespread.

2.3.2.2. Types of Disturbances

- ☒ roads
- ☒ utility corridor *hydro & gas pipelines*
- ☒ buildings
- ☒ channelization
- ☒ drainage
- ☒ filling
- ☒ water pollution *(Ave dump located only 200m from creek in canal gravel area)*
- ☐ other: _____

2.4. EDUCATION AND PUBLIC AWARENESS

2.4.1. Educational Uses

SEE SECTION II

- (1) ☐ Frequent - an average of 2 or more visits per year by one or more school groups, local clubs for the purpose of studying the animals, plants, environment, etc.
- (2) ☐ Infrequent - use by organized groups (one visit or less per year or only casual visits)
- (3) ☐ No known visits

List groups utilizing the wetland

<u>Name of Group(s)</u>	<u>Source of Information</u>
_____	_____
_____	_____
_____	_____

2.4.2. Facilities and Programs (check one)

SEE SECTION II

- (1) ☐ Staffed interpretation center with shelters, trails, literature
- (2) ☐ No interpretation center or staff, but a system of self-guiding trails and observation points or brochures available
- (3) ☐ No facilities or programs

2.4.3. Research and Studies
(check one)

SEE SECTION II

- (1) ☐ One or more wetland-related scientific research papers published in a scientific journal;
 (2) ☐ One or more reports written outlining some aspect of the wetland's natural resources;
 (3) ☐ No reports or papers.

List scientific papers, reports, etc.

2.5. PROXIMITY TO URBAN AREAS
(check one)

- (1) ☐ In an urban or suburban area
 (2) ☒ <10 km from a population center greater than 10,000
 (3) ☐ 10 to 60 km from a population center greater than 10,000
 (4) ☐ Isolated or relatively remote

2.6. OWNERSHIP/ACCESSIBILITY

Estimate % of area and enter in the appropriate space(s)

<u>ACCESSIBILITY</u>	<u>OWNERSHIP</u>				
	Public, unrestricted activities	Public, restricted activities	Private, open to public for limited activities	Private Club, closed to public	Private or Private and posted
1) Easy at most times by road/waterway			5 (.5)	5 (.35)	70 (.8)
2) Easy only at certain times of the year					
3) Limited, moderate effort required					20 (.8)
4) Difficult*					

* Requires extended effort due to distance from roads, navigable waterways or isolated geographical position.

Source of information FIELD RECONNAISSANCE, MNR FILES, ESA REPORT

2.7. Size (Social Component)

508 hectares (refer to viii)

3.0. HYDROLOGICAL COMPONENT

3.1. EFFECT OF ADJOINING LARGE WATER BODY
(check one)

- (1) ☐ Wetland located on the Ottawa, St. Lawrence, Niagara;
Detroit or St. Clair Rivers (Go to 3.3)
- (2) ☐ Wetland bordering on one of the Great Lakes (Go to 3.3)
- (3) ☒ Wetland not located as above (Go to 3.2)

If (1) or (2), omit Section 3.2, FLOW STABILIZATION. Continue with Section 3.3, WATER QUALITY IMPROVEMENT. If (3), proceed to Section 3.2.

3.2. FLOW STABILIZATION

(All wetlands except those bordering on the Great Lakes or the 5 large rivers)

3.2.1. Detention Due to Surface Area

3.2.1.1. Size of Catchment Basin above Wetland Outflow

Catchment Basin Size 60.9 sq. km SEE FIGURE 4

3.2.1.2. Total Size of all Detention Areas (Lakes, Reservoirs and Wetlands) Draining into the Wetland (sq. km)

List Detention Areas	Size
<u>450 013</u>	<u>.10</u>
<u>435 020</u>	<u>.05</u>
<u>225 022</u>	<u>.05</u>
_____	_____
_____	_____
_____	_____
_____	_____
Total	<u>.20</u> sq. km

based upon preliminary wetland map by THT 1983

3.2.1.3. Size of Adjoining Lake (Lacustrine wetlands only)

+ hectares

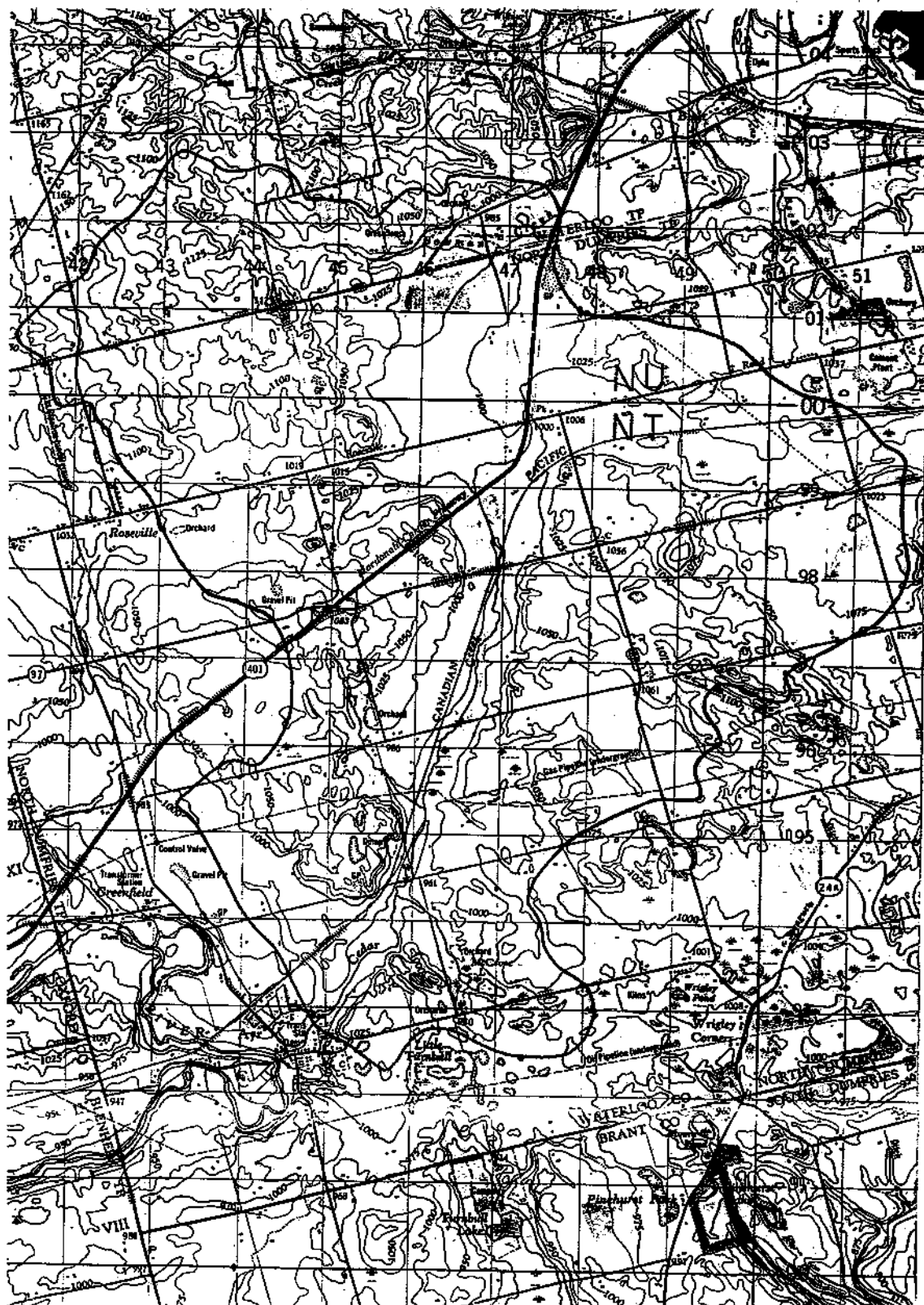


FIGURE 4:

ROSEVILLE SWAMP - CEDAR CREEK WETLAND
CATCHMENT BASIN ~ 61 km²

3.2.1.4. Size of Adjoining River (Riverine wetlands only)
(not assessed)

3.2.1.5. Location and Size of Detention Areas (Lakes, Reservoirs and Wetlands) within 30 km above and below the wetland

(NOTE: 1 sq. km = 100 ha)

(a) Detention areas above the wetland (within 30 km)

Name and/or Number of Detention Area	Distance upstream from wetland (in km)	Size (hectares)	For Scoring Use
450 018	< 3	~10	-5
435 020	< 3	~5	-2
440 022	< 3	~5	-2

(b) Detention areas below the wetland (within 30 km)

Name and/or Number of Detention Area	Distance downstream from wetland (in km)	Size (hectares)	For Scoring Use
NORTH RIVER WETLANDS			
435 920	3	~20	-5
410 910	6	~10	-4
403 913	8	~10	-4
396 905	10	~10	-4
390 873	16	~10	-2
403 365	19	~20	-2
410 860	20	~10	-2
430 850	25	~5	0

3.2.1.6. Land Use along River or Stream Shoreline for 20 km Below the Wetland

(Palustrine and all Riverine wetlands except those located along the 5 large rivers).

(check one)

- (1) Wetland outflow exits into a deep ravine
(2) A village, town or urban area is located along outflow within 20 km
(3) Not as above, and actively farmed agricultural land borders onto outflow, and

length of agricultural border = <1 km
(sum of shoreline 1-3
on both sides of 4-8
river within 20 km) >8

- (4) Not as above, (eg. lands bordering outflow within 20 km are forested, or abandoned by agriculture, or outflow enters another wetland or lake, etc.)

3.2.1.7. Size (Hydrological Component)
(see viii)

508 ha

3.2.2. Flow Augmentation (Palustrine wetlands only)

Size of Catchment basin 61 sq. km (See 3.2.1.1)

Wetland Area as a % of Catchment Basin Size 8 % (8.3)

(Note: convert wetland area to sq. km before calculating %)

3.3. WATER QUALITY IMPROVEMENT (All wetlands)

3.3.1. Short Term Removal of Nutrients from Surface Water

3.3.1.1. Site Type (see 1.1.4 and check dominant site)

- Isolated
 ✓ Palustrine (with permanent or intermittent outflow)
 Riverine
 Riverine (at rivermouth)
 Lacustrine (at rivermouth)
 Lacustrine (on enclosed bay)
 Lacustrine (exposed to lake)

3.3.1.2. Actual Wetland Area Dominated by Robust Emergents and Submergents
(check one)

<input checked="" type="checkbox"/>	<5	9.2 ha
<input type="checkbox"/>	5 - 50	
<input type="checkbox"/>	51 - 100	
<input type="checkbox"/>	101 - 250	
<input type="checkbox"/>	251 - 500	
<input type="checkbox"/>	501 - 1000	
<input type="checkbox"/>	>1000 hectares	

3.3.1.3. Land Use in Catchment Basin
(check one)

- (1) ☒ Mainly agriculture and/or urban
(2) ☐ Roughly 40-60% agriculture; remainder forested or abandoned agriculture
(3) ☐ Mainly forested and/or less than 40% agriculture

3.2.2. Long Term Nutrient Trap
(check one)

- (1) ☐ Wetland located on an active delta
(2) ☐ Wetland rivermouth but without obvious delta
(3) ☒ Wetland with organic soils occupying 50% or more of the area
(4) ☐ Wetland with organic soils occupying less than 50% of the area (i.e. mainly mineral or undesigned soils)

3.4. EROSION CONTROL

3.4.1. Erosion Buffer (Lacustrine and Riverine wetlands only)

NOTE: Assess for the dominant site type (see 3.3.1.1)

3.4.1.1. Riverine Wetlands (shoreland and flood plain)
(check principal vegetation form)

- (1) ☒ Trees or Shrubs
(2) ☐ Emergents
(3) ☐ Non-vegetated or nearly so

3.4.1.2. Lacustrine Wetlands (with or without barrier beach)
(check principal vegetation form)

- (1) ☐ Trees or Shrubs
(2) ☐ Emergents
(3) ☐ Submergents and Floating
(4) ☐ Non-vegetated or nearly so

3.4.1.3. Fetch (Lacustrine wetlands or Riverine wetlands on any of the 5 large rivers)

	Maximum distance
(1)	<input type="checkbox"/> barrier beach present
(2)	<input type="checkbox"/> <2 km
(3)	<input type="checkbox"/> 2 to 8 km
(4)	<input type="checkbox"/> >8 km

3.4.2 Sheet Erosion (All except Lacustrine wetlands)
(check the appropriate space)

Wetland Size (ha)	R FACTOR VALUE			
	<50	50-75	75-100	>100
<2				
2-5				
6-10				
11-15				
16-20				
>20				✓

4.0. SPECIAL FEATURES COMPONENT

4.1. RARITY AND/OR SCARCITY

4.1.1. Individual Wetlands

Name of Physiographic Unit: GUELPH MORaine
Unit Number: 5

4.1.2. Wetland Type Representation (minimum size 0.5 ha) (check one or more)

<input checked="" type="checkbox"/>	Marsh
<input checked="" type="checkbox"/>	Swamp
<input checked="" type="checkbox"/>	Fen
<input type="checkbox"/>	Bog

4.1.3. Individual Species

SEE SECTION II

4.1.3.1. Breeding Habitat for an Endangered Animal or Plant Species

	<u>Name of Species</u>	<u>Source of Information</u>
(1)	_____	_____
(2)	_____	_____

4.1.3.2. Traditional Migration or Feeding Habitat for an Endangered Animal Species

	<u>Name of Species</u>	<u>Source of Information</u>
(1)	_____	_____
(2)	_____	_____

4.1.3.3. Breeding or Feeding Habitat for a Provincially Significant Animal Species

	<u>Name of Species</u>	<u>Source of Information</u>
(1)	_____	_____
(2)	_____	_____

4.1.3.4. Provincially Significant Plant Species

	<u>Name of Species</u>	<u>Source of Information</u>
(1)	_____	_____
(2)	_____	_____

4.1.3.5. Regionally Significant Species

SEE SECTION II

	<u>Name of Species</u>	<u>Source of Information</u>
(1)	_____	_____
(2)	_____	_____
(3)	_____	_____
(4)	_____	_____

4.2. SIGNIFICANT FEATURES AND/OR FISH AND WILDLIFE HABITAT

4.2.1. Nesting of Colonial Waterbirds
(check one)

SEE SECTION II

- (1) _____ Currently nesting; species name(s) _____
- (2) _____ Known to have nested within past 5 years;
species name(s) _____
- (3) _____ Active feeding area _____
- (4) _____ None known _____

Source of Information: _____

4.2.2. Winter Cover for Wildlife

SEE SECTION II

(check only highest level of significance)

- (1) _____ Provincial significance for Deer _____, Moose _____
- (2) _____ Regional significance for Deer _____, Moose _____
- (3) _____ Local significance for Deer _____, Moose _____
- (4) _____ Good winter cover for other species (list): _____

- (5) _____ Poor winter cover _____

Source of Information: _____

4.2.3. Waterfowl Staging

SEE SECTION II

(check only highest level of significance)

- (1) _____ National significance
- (2) _____ Provincial significance
- (3) _____ Regional significance
- (4) _____ Local or no significance

Source of Information: _____

4.2.4. Waterfowl Production

SEE SECTION II

(check only highest level of significance)

- (1) _____ Provincial significance
- (2) _____ Regional significance
- (3) _____ Local significance
- (4) _____ Little or no significance

Source of Information: _____

4.2.5. Migratory Passerine and/or Shorebird Stopover Area SEE SECTION II
(check one)

- (1) _____ High significance
(2) _____ No significance

Source of Information: _____

4.2.6. Significance for Fish Spawning and Rearing SEE SECTION II
(check one)

- (1) _____ Regional significance
(2) _____ Present
(3) _____ Unknown
(4) _____ Not possible

Species and Source of Information: _____

4.2.7. Unusual Geological or other Surficial Features

Feature

Source of Information

- (1) NONE KNOWN
(2) _____

4.3. ECOLOGICAL AGE

Type of Wetland

Enter % of Area

- _____ Bog
✓ _____ Fen
✓ _____ Swamp
✓ _____ Marsh

1

26

3

INVESTIGATORS

DARYL COULSON, JOHN FELUCH, FRED KEMPF

AFFILIATION

ONTARIO MINISTRY OF NATURAL RESOURCES

DATE

12 JULY - 18 JULY 1984 & 14 AUG. 1984 SEE TABLE 2

ESTIMATED TIME DEVOTED TO COMPLETING THE FIELD SURVEY IN "PERSON HOURS"

63

WEATHER CONDITIONS

- (i) at time of field work: variable sunny; hot → overcast; cool
(ii) summer conditions in general: mostly sunny; warm; little rainfall

TABLE 2:

ROSEVILLE SWAMP - CEDAR CREEK WETLANDFIELD RECONNAISSANCE

DATE	INVESTIGATORS	TIME IN FIELD (HOURS)	PERSON HOURS	WEATHER
12 JULY 1984	DPL, JGEP, FJK	5	15	-sunny, warm
13 JULY 1984	JGEP, FJK	5	10	-sunny, hot
16 JULY 1984	JGEP, FJK	4	8	-overcast, cool
17 JULY 1984	NT, DPL, JGEP, FJK	4	12	-overcast, cool
18 JULY 1984	DPL, JGEP, FJK	4	12	-cloudy, cool
14 AUG. 1984	DPL, JGEP, FJK	2	6	-sunny, hot

WETLAND EVALUATION RECORD

WETLAND NAME AND/OR NUMBER ROSEVILLE SWAMP - CEDAR CREEK WETLAND

1.0 BIOLOGICAL COMPONENT

1.1. PRODUCTIVITY VALUES

1.1.1. Growing Degree-Days
1.1.2. Soils 5.7 + 0.5
1.1.3. Type of Wetland .08 + 11.52 + 0.6
1.1.4. Site 2.8 + 2.4
1.1.5. Nutrient Status of Surface Water

COPY
14
6
12
5
20

TOTAL for Productivity Values

57

1.2. DIVERSITY VALUES

1.2.1. Number of Wetland Types
1.2.2. Vegetation Communities (not to exceed 30)
1.2.3. Diversity of Surrounding Habitat
1.2.4. Proximity to Other Wetlands
1.2.5. Interspersion
1.2.6. Open Water Types

9
30
10
10
6
14

TOTAL for Diversity Values

79

1.3. SIZE (Biological Component)

50

TOTAL FOR BIOLOGICAL COMPONENT (not to exceed 250)

186

2.0 SOCIAL COMPONENT

2.1. RESOURCE PRODUCTS WITH CASH VALUE

2.1.1. Timber (lumber and firewood)	<u>20</u>
2.1.2. Wild Rice	<u>0</u>
2.1.3. Commercial Fish (Bait Fish and/or Coarse Fish)	<u>10</u>
2.1.4. Bullfrogs	<u>2</u>
2.1.5. Snapping Turtles	<u>2</u>
2.1.6. Furbearers	<u>15</u>

TOTAL for Resource Products
with Cash Value (not to exceed 60)

49

2.2. RECREATIONAL ACTIVITIES (not to exceed 70)

65

2.3. AESTHETICS

2.3.1. Landscape Distinctness	<u>5</u>
2.3.2. Absence of Human Disturbances	<u>10</u>

TOTAL for Aesthetics

15

2.4. EDUCATION AND PUBLIC AWARENESS

2.4.1. Educational Uses	<u>10</u>
2.4.2. Facilities and Programs	<u>0</u>
2.4.3. Research and Studies	<u>5</u>

TOTAL for Education and
Public Awareness

15

2.5. PROXIMITY TO URBAN AREAS

16

2.6. OWNERSHIP/ACCESSIBILITY

5

2.7. SIZE (Social Component)

20

TOTAL FOR SOCIAL COMPONENT (not to exceed 250)

185

3.0. HYDROLOGICAL COMPONENT

3.1. EFFECT OF ADJOINING LARGE WATER BODY

3.2. FLOW STABILIZATION

3.2.1. Detention Due to Surface Area

3.2.1.1. and

3.2.1.2. FIRST step (from table)

110

3.2.1.3. SECOND step minus 0 =

0

3.2.1.5. THIRD step minus 32 =

78

3.2.1.6. FOURTH step minus 0 =

78

3.2.1.7. FIFTH step plus 38 =

116

(minimum allowable = 0)

TOTAL for Detention Due to Surface Area

116

3.2.2. Flow Augmentation (from table)

38

TOTAL for Flow Stabilization

154

3.3. WATER QUALITY IMPROVEMENT

3.3.1. Short Term Removal of Nutrients from Surface Water

3.3.1.1. Site Type

2

3.3.1.2. Actual Wetland Area Dominated
by Robust Emergents and
Submergents

2

3.3.1.3. Land Use in Catchment Basin

10

TOTAL for Short Term Removal of Nutrients
from Surface Water

14

3.3.2. Long Term Nutrient Trap

6

TOTAL for Water Quality Improvement

20

3.4. EROSION CONTROL

3.4.1. Erosion Buffer

3.4.1.1. Riverine Wetlands

15

3.4.1.2. Lacustrine Wetlands

0

3.4.1.3. Fetch

0

TOTAL for Erosion Buffer

15

3.4.2. Sheet Erosion

5

TOTAL for Erosion Control

20

TOTAL FOR HYDROLOGICAL COMPONENT (not to exceed 250)

194

4.0 SPECIAL FEATURES COMPONENT

4.1. RARITY AND/OR SCARCITY

4.1.1.	Individual Wetlands		<u>20</u>
4.1.2.	Wetland Type Representation		<u>20</u>
4.1.3.	Individual Species		
4.1.3.1.	Breeding Habitat for an Endangered Animal or Plant Species		<u> </u>
4.1.3.2.	Traditional Migration or Feeding Habitat for an Endangered Animal Species		<u> </u>
4.1.3.3.	Breeding or Feeding Habitat for a Provincially Significant Animal Species		<u>150</u>
4.1.3.4.	Provincially Significant Plant Species	?	<u>(100)</u>
4.1.3.5.	Regionally Significant Species		<u>30</u>
TOTAL for Individual Species (not to exceed			<u>180</u>
			250) (280)
<u>TOTAL FOR RARITY AND/OR SCARCITY</u> (not to exceed 250)			<u>220</u>
			(220)

4.2. SIGNIFICANT FEATURES AND/OR FISH AND WILDLIFE HABITAT

4.2.1.	Nesting of Colonial Waterbirds	3
4.2.2.	Winter Cover for Wildlife	50
4.2.3.	Waterfowl Staging	0
4.2.4.	Waterfowl Production	0
4.2.5.	Migratory Passerine and/or Shorebird Stopover Area	0
4.2.6.	Significance for Fish Spawning and Rearing	50
4.2.7.	Unusual Geological or other Surficial Features	0

TOTAL FOR SIGNIFICANT FEATURES AND/OR
FISH AND WILDLIFE HABITAT (not to exceed 250) 103

4.3. ECOLOGICAL AGE .09 + .92 + .03

TOTAL FOR SPECIAL FEATURES COMPONENT (not to exceed 250) 250

SUMMARY OF EVALUATION RESULTS

FOR THE ROSEVILLE SWAMP - CEDAR CREEK WETLAND
(name or number)

TOTAL FOR 1.0, BIOLOGICAL COMPONENT 186
TOTAL FOR 2.0, SOCIAL COMPONENT 185
TOTAL FOR 3.0, HYDROLOGICAL COMPONENT 194
TOTAL FOR 4.0, SPECIAL FEATURES COMPONENT 250

TOTAL 815
CLASS 1

INVESTIGATORS

NANCY TILT
DARYL COULSON, JOHN PELUCH, FRED KEMPF
MARK FERGUSON, JOHN MCCracken

AFFILIATION

ONTARIO MINISTRY OF NATURAL RESOURCES

DATE

12-18 JULY 1984, 14 AUG 1984 FIELD RECOGNIZANCE 84
20 SEPT. 1984 EVALUATION

North Dumfries

Date Generate

November-29-18

Amphibian	SAR	Protection	Habitat Information	Timing Windows	Survey Protocol
Jefferson Salamander <i>Ambystoma jeffersonianum</i>	END	Species Protection and Habitat Regulation	Inhabits deciduous and mixed deciduous forests with suitable breeding areas which generally consist of ephemeral (temporary) bodies of water that are fed by spring runoff, groundwater, or springs.	Active: March – October Hibernates: October – March Breeding: Late March - Mid April	Contact MNRF Guelph District Management Biologist to obtain a copy of the protocol
Unisexual Ambystoma - Jefferson-dominated <i>Ambystoma laterale - jeffersonianum</i>	END	Species Protection and General Habitat Protection	Inhabits deciduous and mixed deciduous forests with suitable breeding areas which generally consist of ephemeral (temporary) bodies of water that are fed by spring runoff, groundwater, or springs.	Active: March – October Hibernates: October – March Breeding: Late March - Mid April	Contact MNRF Guelph District Management Biologist to obtain a copy of the protocol
Bird	SAR	Protection	Habitat Information	Timing Windows	Survey Protocol
Acadian Flycatcher <i>Empidonax vireescens</i>	END	Species Protection and General Habitat Protection	Generally requires large areas of mature, undisturbed forest; avoids the forest edge; often found in well wooded swamps and ravines.	Migrate South before Winter	Follow Breeding Bird Survey Protocol
Bald Eagle <i>Haliaeetus leucocephalus</i>	SC	N/A	Prefers deciduous and mixed-deciduous forest; and habitat close to water bodies such as lakes and rivers. They roost in super canopy trees such as Pine.	Breed and Nest - April or May Some Migrate South when waterbodies freeze over	Follow Breeding Bird Survey Protocol
Bank Swallow <i>Riparia riparia</i>	THR	Species Protection and General Habitat Protection	It nests in a wide variety of naturally and anthropogenically created vertical banks, which often erode and change over time including aggregate pits and the shores of large lakes and rivers.	Migrate South before Winter	Follow Breeding Bird Survey Protocol. Colony and Roost information should be recorded and submitted using Bird Studies Canada's Ontario Bank Swallow Project data forms (2010).
Barn Swallow <i>Hirundo rustica</i>	THR	Species Protection and General Habitat Protection	Prefers farmland; lake/river shorelines; wooded clearings; urban populated areas; rocky cliffs; and wetlands. They nest inside or outside buildings; under bridges and in road culverts; on rock faces and in caves etc.	Migrate South before Winter	Follow Breeding Bird Survey Protocol

Bobolink <i>Dolichonyx oryzivorus</i>	THR	Species Protection and General Habitat Protection	Generally prefers open grasslands and hay fields. In migration and in winter uses freshwater marshes and grasslands	Migrate South for the Winter	Contact MNR Guelph District Management Biologist to obtain a copy of the protocol
Canada Warbler <i>Cardellina canadensis</i>	SC	N/A	Generally prefers wet coniferous, deciduous and mixed forest types, with a dense shrub layer. Nests on the ground, on logs or hummocks, and uses dense shrub layer to conceal the nest.	Arrive in Early May Migrate South for the Winter	Follow Breeding Bird Survey Protocol
Cerulean Warbler <i>Setophaga cerulea</i>	THR	Species Protection and General Habitat Protection	Generally found in mature deciduous forests with an open understorey; also nests in older, second-growth deciduous forests.	Migrate South for the Winter	Follow Breeding Bird Survey Protocol
Chimney Swift <i>Chaetura pelagica</i>	THR	Species Protection and General Habitat Protection	Historically found in deciduous and coniferous, usually wet forest types, all with a well developed, dense shrub layer; now most are found in urban areas in large uncapped chimneys	Nesting - Late April to Mid-May Migrate South in September or Early October	Chimney Swift Monitoring Protocol. Bird Studies Canada, March 2009
Common Nighthawk <i>Chordeiles minor</i>	SC	N/A	Generally prefer open, vegetation-free habitats, including dunes, beaches, recently harvested forests, burnt-over areas, logged areas, rocky outcrops, rocky barrens, grasslands, pastures, peat bogs, marshes, lakeshores, and river banks. This species also inhabits mixed and coniferous forests. Can also be found in urban areas (nest on flat roof-tops).	Migrate South for the Winter	Contact MNR Guelph District Management Biologist to obtain a copy of the protocol
Eastern Meadowlark <i>Sturnella magna</i>	THR	Species Protection and General Habitat Protection	Generally prefers grassy pastures, meadows and hay fields. Nests are always on the ground and usually hidden in or under grass clumps.	Migrate South for the Winter	Contact MNR Guelph District Management Biologist to obtain a copy of the protocol

Eastern Wood-Pewee <i>Contopus virens</i>	SC	N/A	Associated with deciduous and mixed forests. Within mature and intermediate age stands it prefers areas with little understory vegetation as well as forest clearings and edges.	Migrate South for the Winter	Follow Breeding Bird Survey Protocol
Least Bittern <i>Ixobrychus exilis</i>	THR	Species Protection and General Habitat Protection	Generally located near pools of open water in relatively large marshes and swamps that are dominated by cattail and other robust emergent plants	Migrate South for the Winter	Follow Marsh Monitoring Protocol; 10 day window of male calling (variable timing). Does not respond well to playback. Very difficult to detect.
Louisiana Waterthrush <i>Seiurus motacilla</i>	THR	Species Protection and General Habitat Protection	Generally inhabits mature forests along steeply sloped ravines adjacent to running water. It prefers clear, cold streams and densely wooded swamps	Migrate South for the Winter	Follow Breeding Bird Survey Protocol or Marsh Monitoring Protocol
Northern Bobwhite <i>Colinus virginianus</i>	END	Species Protection and General Habitat Protection	Generally inhabits a variety of edge and grassland type - habitats including non-intensively farmed agricultural lands.	Active Year Round	Follow Breeding Bird Survey Protocol
Red-Headed Woodpecker <i>Melanerpes erythrocephalus</i>	SC	N/A	Generally prefer open oak and beech forests, grasslands, forest edges, orchards, pastures, riparian forests, roadsides, urban parks, golf courses, cemeteries, as well as along beaver ponds and brooks	Active from May to September	Follow Breeding Bird Survey Protocol
Wood Thrush <i>Hylocichla mustelina</i>	SC	N/A	Nests mainly in second-growth and mature deciduous and mixed forests, with saplings and well-developed understory layers. Prefers large forest mosaics, but may also nest in small forest fragments.	Migrate South for the Winter Arrive in Ontario in mid to late spring	Follow Breeding Bird Survey Protocol
Yellow-breasted Chat <i>Icteria virens</i>	END	Species Protection and General Habitat Protection	Generally prefer dense thickets around wood edges, riparian areas, and in overgrown clearings	Migrate South for the Winter Arrive in Ontario Early May	Follow Breeding Bird Survey Protocol
Bryophyte	SAR	Protection	Habitat Information	Timing Windows	Survey Protocol

Pygmy Pocket Moss <i>Fissidens exilis</i>	SC	N/A	Moist, barren soil, typically clay, often associated with forests		Search for dark green moss growing on exposed clay soil. A microscope is required for proper identification
Fish	SAR	Protection	Habitat Information	Timing Windows	Survey Protocol
Black Redhorse <i>Moxostoma duquesnei</i>	THR	Species Protection and General Habitat Protection	Generally lives in moderately sized rivers and streams, with generally moderate to fast currents	Active Year Round	For information please contact your local MNRF office, CA or DFO
Silver Shiner <i>Notropis photogenis</i>	THR	Species Protection and General Habitat Protection	Generally prefer moderate to large, deep, relatively clear streams with swift currents, and moderate to high gradients	Spawning occurs in May and June	For information please contact your local MNRF office, CA and/or DFO
Insect	SAR	Protection	Habitat Information	Timing Windows	Survey Protocol
Monarch Butterfly <i>Danaus plexippus</i>	SC	N/A	Exist primarily wherever milkweed and wildflowers exist; abandoned farmland, along roadsides, and other open spaces	Usually migrate south in late September and October	Watch for adults along roadsides and in open fields. Caterpillars feed on milkweeds: Common milkweed grows in open disturbed habitats (fields, roadsides, etc) and swamp milkweed grows in wet habitats (along streams, lakes, marshes) Adults can be spotted from a distance; caterpillars must be looked for carefully on the host plant.
Rusty-patched Bumble Bee <i>Bombus affinis</i>	END	Species Protection and General Habitat Protection	Generally inhabits a range of diverse habitats including mixed farmland, sand dunes, marshes, urban and wooded areas. It usually nests underground in abandoned rodent burrows	Active from early Spring to late Fall	Contact MNRF Guelph District Management Biologist to obtain a copy of the protocol
West Virginia White <i>Pieris virginiensis</i>	SC	N/A	Generally prefer moist, deciduous woodlands. The larvae feed only on the leaves of the two-leaved toothwort (Cardamine diphylla), which is a small, spring-blooming plant of the forest floor.	Adult butterfly emerges from pupa in late March; flies only in April and May	Watch for adults within moist, deciduous woodlands Caterpillars feed on the two-leaved toothwort: Toothwort grows in damp, open, rich hardwood woodlands and blooms from April to June. Adults can be spotted from a distance; caterpillars must be searched for carefully by checking host plant

Mammal	SAR	Protection	Habitat Information	Timing Windows	Survey Protocol
American Badger <i>Taxidea taxus</i>	END	Species Protection and Habitat Regulation	Generally prefers open habitats, whether natural (grasslands) or man-made (agricultural fields, road right-of-ways, golf courses).	Breed: Late Summer Semi-dormant over Winter	Determine if soils are suitable (sandy or loamy) Dens and Woodchuck burrows should be surveyed for use
Eastern Small-footed Myotis <i>Myotis leibii</i>	END	Species Protection and General Habitat Protection	Overwintering habitat: Caves and mines that remain above 0 degrees Celsius Maternal Roosts: primarily under loose rocks on exposed rock outcrops, crevices and cliffs, and occasionally in buildings, under bridges and highway overpasses and under tree bark.	Hibernates in caves and mines during winter	Contact MNRF Guelph District Management Biologist to obtain a copy of the protocol
Little Brown Myotis <i>Myotis lucifugus</i>	END	Species Protection and General Habitat Protection	Overwintering habitat: Caves and mines that remain above 0 degrees Celsius Maternal Roosts: Often associated with buildings (attics, barns etc.). Occasionally found in trees (25-44 cm dbh).	Hibernates during winter	Contact MNRF Guelph District Management Biologist to obtain a copy of the protocol
Northern Myotis <i>Myotis septentrionalis</i>	END	Species Protection and General Habitat Protection	Overwintering habitat: Caves and mines that remain above 0 degrees Celsius Maternal Roosts: Often associated with cavities of large diameter trees (25-44 cm dbh). Occasionally found in structures (attics, barns etc.)	Hibernates during winter	Contact MNRF Guelph District Management Biologist to obtain a copy of the protocol
Tri-colored Bat <i>Perimyotis subflavus</i>	END	Species Protection and General Habitat Protection	Overwintering habitat: Caves and mines that remain above 0 degrees Celsius Maternal Roosts: Can be in trees or dead clusters of leaves or arboreal lichens on trees. May also use barns or similar structures.	Hibernates during winter	Contact MNRF Guelph District Management Biologist to obtain a copy of the protocol

Woodland Vole <i>Microtus pinetorum</i>	SC	N/A	Generally associated with deciduous forests in areas of soft, friable, often sandy soil beneath deep humus, where it can burrow easily.	Active Year Round	Contact MNRF Guelph District Management Biologist to obtain a copy of the protocol
Mollusc	SAR	Protection	Habitat Information	Timing Windows	Survey Protocol
Wavy-rayed Lampmussel <i>Lampsilis fasciola</i>	THR	Species Protection and Habitat Regulation	Generally inhabit clear rivers and streams of a variety of sizes, where the water flow is steady and the substrate is stable	Active Year Round	Please reference: Mackie, G, T.J Morris, and D Ming. "Protocol for the Detection and Relocation of Freshwater Mussel Species at Risk in Ontario Great Lakes Area (OGLA)." Fisheries and Oceans Canada. (2008): Print.
Plant	SAR	Protection	Habitat Information	Timing Windows	Survey Protocol
American Chestnut <i>Castanea dentata</i>	END	Species Protection and General Habitat Protection	Found in deciduous forest communities; this tree prefers arid forests with acid and sandy soils.	Flowers occur in Late Spring and Early Summer	Walk slowly and systematically in grid fashion, pausing to scan for plants every 5 meters Use a plant field guide to distinguish from similar species Perform detailed floristic inventory Look for distinctive fruits on the ground
American Ginseng <i>Panax quinquefolius</i>	END	Species Protection and General Habitat Protection	Grows in rich, moist, undisturbed and relatively mature deciduous woods in areas of neutral soil (such as over limestone or marble bedrock).	Flowering begins in June and continues until August The fruit develop from July to August and ripen in August and September	Walk slowly and systematically in grid fashion, pausing to scan for plants every 5 meters Use a plant field guide to distinguish from similar species
Butternut <i>Juglans cinerea</i>	END	Species Protection and General Habitat Protection	Generally grows in rich, moist, and well-drained soils often found along streams. It may also be found on well-drained gravel sites, especially those made up of limestone. It is also found, though seldomly, on dry, rocky and sterile soils. In Ontario, the Butternut generally grows alone or in small groups in deciduous forests as well as in hedgerows	Flowers from April to June. Fruits reach maturity during the month of September or October	Walk slowly and systematically in grid fashion through suitable habitat pausing every 30 meters for a detailed scan of trees within sight. Areas with dense foliage or many saplings will require a more intensive survey to detect sapling butternut. Use Butternut Health Assessment Protocol if planning on removing trees.
Green Dragon <i>Arisaema dracontium</i>	SC	N/A	Generally grows in damp deciduous forests and along streams.	Flowering occurs in May and June	Walk slowly and systematically in grid fashion, pausing to scan for plants every 5 meters Use a plant field guide to distinguish from similar species

Reptile	SAR	Protection	Habitat Information	Timing Windows	Survey Protocol
Blanding's Turtle <i>Emydoidea blandingii</i>	THR	Species Protection and General Habitat Protection	Generally occur in freshwater lakes, permanent or temporary pools, slow-flowing streams, marshes and swamps. They prefer shallow water that is rich in nutrients, organic soil and dense vegetation. Adults are generally found in open or partially vegetated sites, and juveniles prefer areas that contain thick aquatic vegetation including sphagnum, water lilies and algae. They dig their nest in a variety of loose substrates, including sand, organic soil, gravel and cobblestone. Overwintering occurs in permanent pools that average about one metre in depth, or in slow-flowing streams.	Eggs are laid in June, with hatchlings emerging in late September and early October.	Contact MNR Guelph District Management Biologist to obtain a copy of the protocol
Eastern Ribbonsnake <i>Thamnophis sauritus</i>	SC	N/A	Generally occur along the edges of shallow ponds, streams, marshes, swamps, or bogs bordered by dense vegetation that provides cover. Abundant exposure to sunlight is also required, and adjacent upland areas may be used for nesting.	Hibernate: October - April Mating: Early Spring Hatching: Early Fall (September)	Contact MNRF Guelph District Management Biologist to obtain a copy of the protocol
Northern Map Turtle <i>Graptemys geographica</i>	SC	N/A	Generally inhabits both lakes and rivers, showing a preference for slow moving currents, muddy bottoms, and abundant aquatic vegetation. These turtles need suitable basking sites (such as rocks and logs) and exposure to the sun for at least part of the day.	Active: At night Hibernate: October - April Hatching: Late August - Early September	Scan shoreline in spring and partially submerged logs/rocks in summer for basking turtles Be aware that map turtles do not allow as close of approach as other turtles before leaving a basking site Snorkel in desired aquatic habitat

Queensnake <i>Regina septemvittata</i>	END	Species Protection and Habitat Regulation	Generally require a permanent body of water, flowing or still, with a temperature remaining at or above 18.3°C throughout most of the active season; abundant cover, such as flat rocks submerged and/or on the bank; and an abundance of crayfish. Other important habitat features may include rocky, gravelly, or slate stream-bed substrates, swift to moderate current, and woodland surroundings.	Active: May - October	Contact MNRF Guelph District Management Biologist to obtain a copy of the protocol
--	-----	---	---	-----------------------	--

Snapping Turtle <i>Chelydra serpentina</i>	SC	N/A	Generally inhabit shallow waters where they can hide under the soft mud and leaf litter. Nesting sites usually occur on gravelly or sandy areas along streams. Snapping Turtles often take advantage of man-made structures for nest sites, including roads (especially gravel shoulders), dams and aggregate pits.	Nesting: Late May and June Hibernate: October - April	Scan offshore rocks and logs for basking turtles (10am-2pm) Snorkel in desired aquatic habitat Nesting Season: Search known or preferred nesting habitat areas for females
--	----	-----	---	--	--

APPENDIX 8
Site Investigation Details

SURVEY	TIME	DATE	STAFF	TEMP.	WIND (beaufort)	CLOUD COVER (%)	PRECIP.	PAST PRECIP.
Breeding Bird Point Count	8:25-9:40	07-Jun-18	M. Iles	15	1	7	none	none
Breeding Bird Point Count	8:50-10:00	09-Jul-18	M. Iles	22	2	0	none	none
Breeding Bird Area Search	7:40-11:00	07-Jun-18	M. Iles	14	1	7	none	none
Breeding Bird Area Search	8:30-10:00	09-Jul-18	M. Iles	20	1	0	none	none
Amphibian Call Counts	22:50-23:03	24-Apr-18	S. Davison, M. Iles	10	1	100	light	light
Amphibian Call Counts	22:15-22:28	25-May-18	S. Davison, M. Iles	25	1	30	none	none
Amphibian Call Counts	22:33-22:44	26-Jun-18	S. Davison, M. Iles	19	1	90	none	none
Winter Wildlife	8:15-10:00	16-Jan-18	S. Davison	-10	1	80	none	none
Winter Wildlife	8:00-9:30	30-Jan-18	S. Davison	-14	1	0	none	none
ELC	8:00-16:00	18-May-18	S. Davison	11	3	30	none	none
ELC	8:00-16:00	07-Aug-18	S. Davison	21	1	80	none	light
ELC	8:00-16:00	12-Oct-18	S. Davison	14	1	100	light	light
Grassland Breeding Birds	6:37-8:42	04-Jun-20	M. Ross	13	3	0	none	rain
Grassland Breeding Birds	6:47-8:29	17-Jun-20	M. Ross	12	1	0	none	none
Grassland Breeding Birds	6:44-8:37	02-Jul-20	M. Ross	18	3	30	none	none

APPENDIX 9
Amphibian Call Codes and Survey Details

AMPHIBIAN CALL SURVEY

Project: Cedar Creek Project #: AA 17-196A Observer(s): SD, MI
North Dumfries
 Weather conditions: rainy, warm Date: 04 / 24 / 18

Temp (°C)	Wind*	Cloud Cover	Precipitation	Precipitation(24hrs)
<u>10</u>	<u>1</u>	<u>100</u>	<u>light</u>	<u>light</u>

*Beaufort Scale: 0-Calm (0 km/hr), 1-light Air (1-5km/hr), 2-Light Breeze (6-11km/hr), 3-gentle Breeze (12-19km/hr), 4-moderate Breeze (20-28km/hr), 5-fresh breeze (29-38km/hr), 6-strong breeze (39-49km/hr)

Call Level codes:

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

Survey Start time: 22:50 Survey End time: 23:03

Species	In*	Out*
AMTO		
BCFR		
BULL		
CHFR		
CGTR		
FOTO		
GRTR		
GRFR		
MIFR		
NLFR		
PIFR		
SPPE		
WOFR		

*Check if species is calling from inside/outside 100m station area.

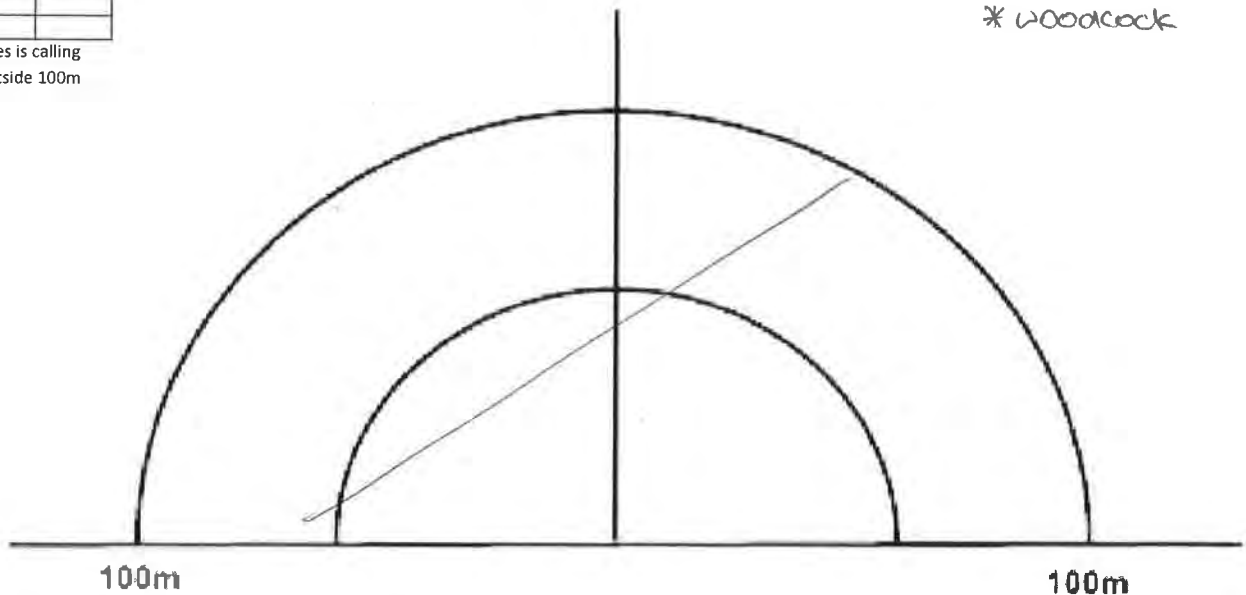
Station ID: 1

230°

547263
UTM: <u>4798592</u>
Station start time: <u>22:50</u>
Background noise (1-4): <u>2</u>
Water present (y/n): <u>N</u>
Approx. depth: <u>N/A</u>

Substantial amount of noise from Cedar Creek road

* Woodcock



Station ID: 2

Species	In*	Out*
AMTO		
BCFR		
BULL		
CHFR		
CGTR		
FOTO		
GRTR		
GRFR		
MIFR		
NLFR		
PIFR		
SPPE		X
WOFR		

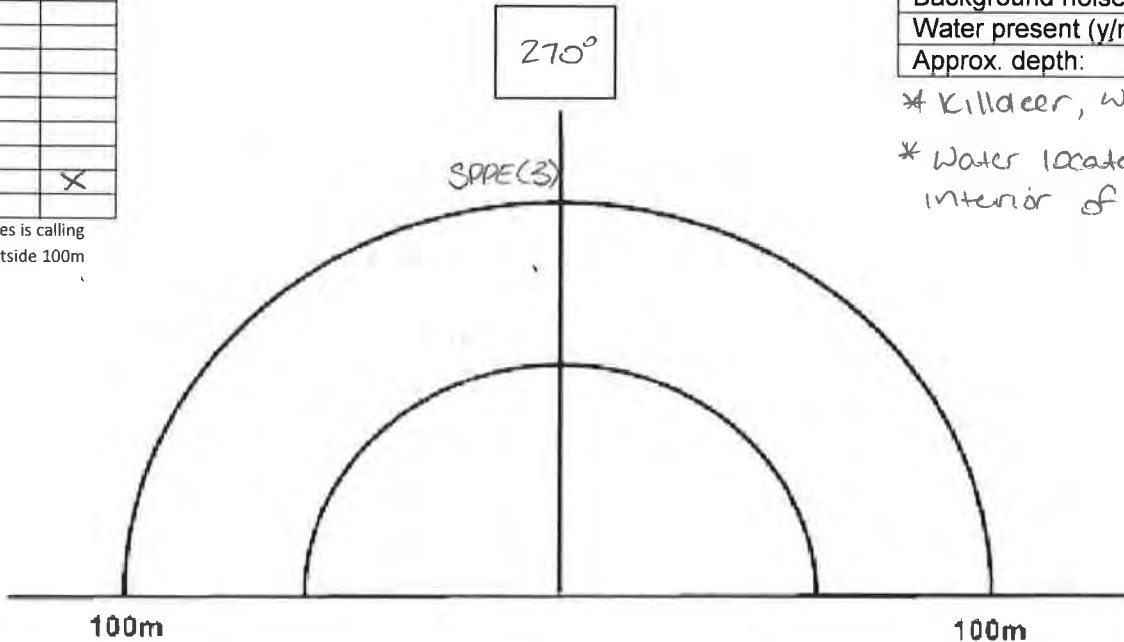
*Check if species is calling from inside/outside 100m station area.

547335

UTM: 4798915
Station start time: 23:00
Background noise (1-4): 1
Water present (y/n): ~
Approx. depth: N/A

* Killdeer, Woodcock

* Water located in interior of wetland.

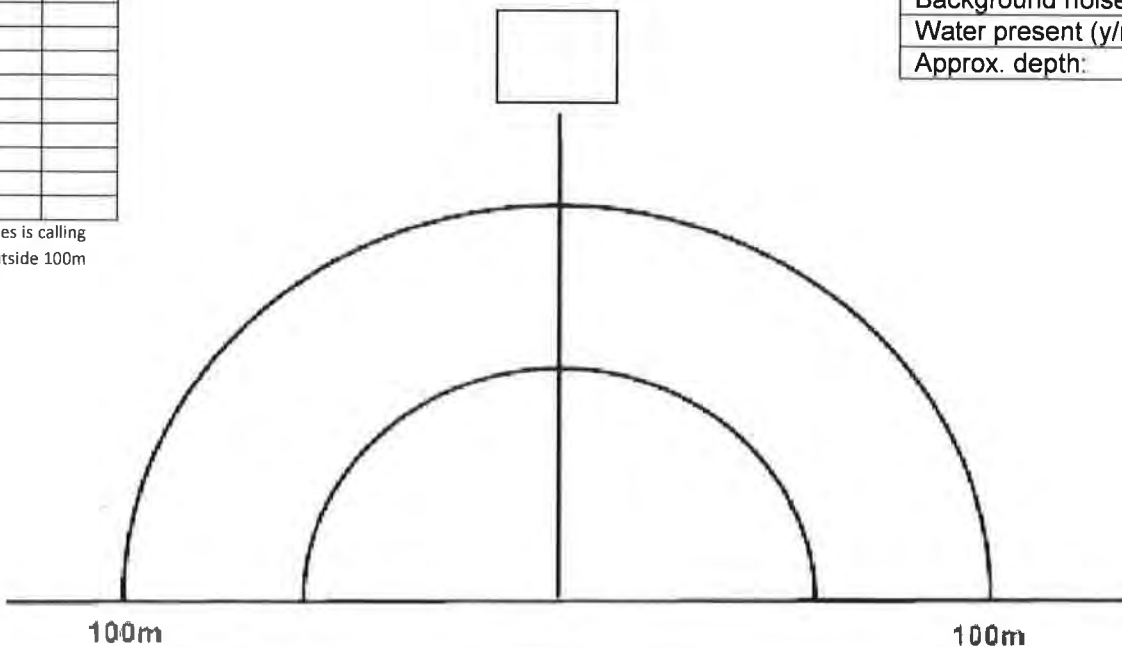


Station ID:

Species	In*	Out*
AMTO		
BCFR		
BULL		
CHFR		
CGTR		
FOTO		
GRTR		
GRFR		
MIFR		
NLFR		
PIFR		
SPPE		
WOFR		

*Check if species is calling from inside/outside 100m station area.

UTM:
Station start time:
Background noise (1-4):
Water present (y/n):
Approx. depth:



AMPHIBIAN CALL SURVEY

Project: Cedar Creek Project #: 17-196 Observer(s): SD, MT

Weather conditions: _____ Date: 2018/05/29 / /

Temp (°C)	Wind*	Cloud Cover	Precipitation	Precipitation(24hrs)
<u>25</u>	<u>1</u>	<u>30</u>	<u>none</u>	<u>none</u>

*Beaufort Scale: 0-Calm (0 km/hr), 1-light Air (1-5km/hr), 2-Light Breeze (6-11km/hr), 3-gentle Breeze (12-19km/hr), 4-moderate Breeze (20-28km/hr), 5-fresh breeze (29-38km/hr), 6-strong breeze (39-49km/hr)

Call Level codes:	
1#	Calls not simultaneous, number of individuals can be accurately counted
2#	Some calls simultaneous, number of individuals can be reliably estimated
3	Full chorus, calls continuous and overlapping, number of individuals cannot reliably be estimated

Survey Start time: 22:15 Survey End time: 22:28

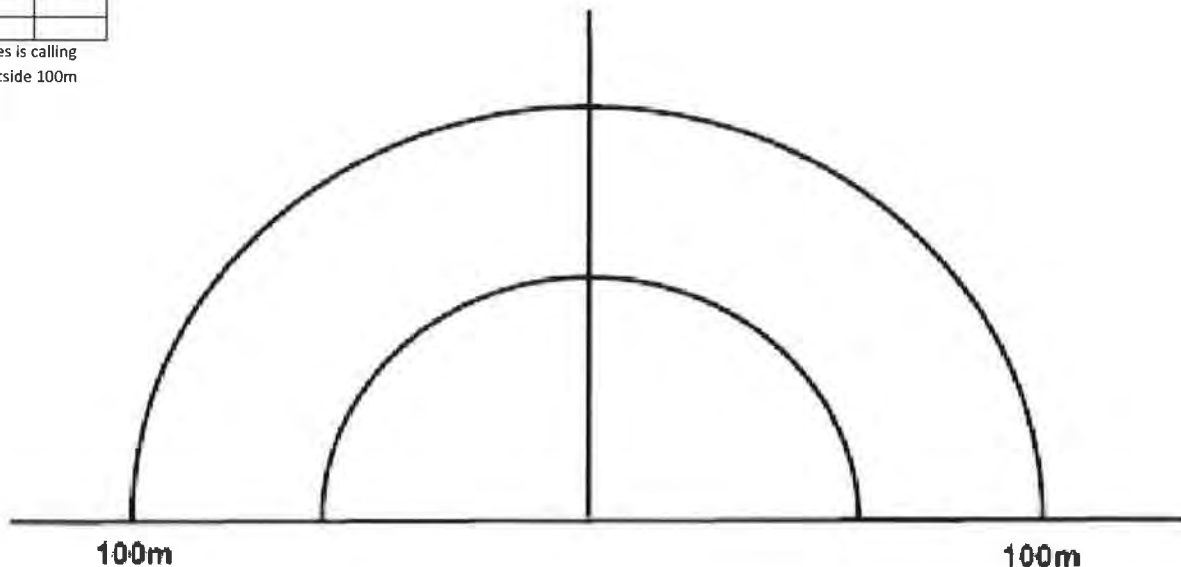
Species	In*	Out*
AMTO		
BCFR		
BULL		
CHFR		
CGTR		
FOTO		
GRTR		
GRFR		
MIFR		
NLFR		
PIFR		
SPPE		
WOFR		

*Check if species is calling from inside/outside 100m station area.

Station ID: 1

270

UTM:
Station start time: <u>22:15</u> traffic
Background noise (1-4): <u>2</u>
Water present (y/n): <u>n</u>
Approx. depth: _____

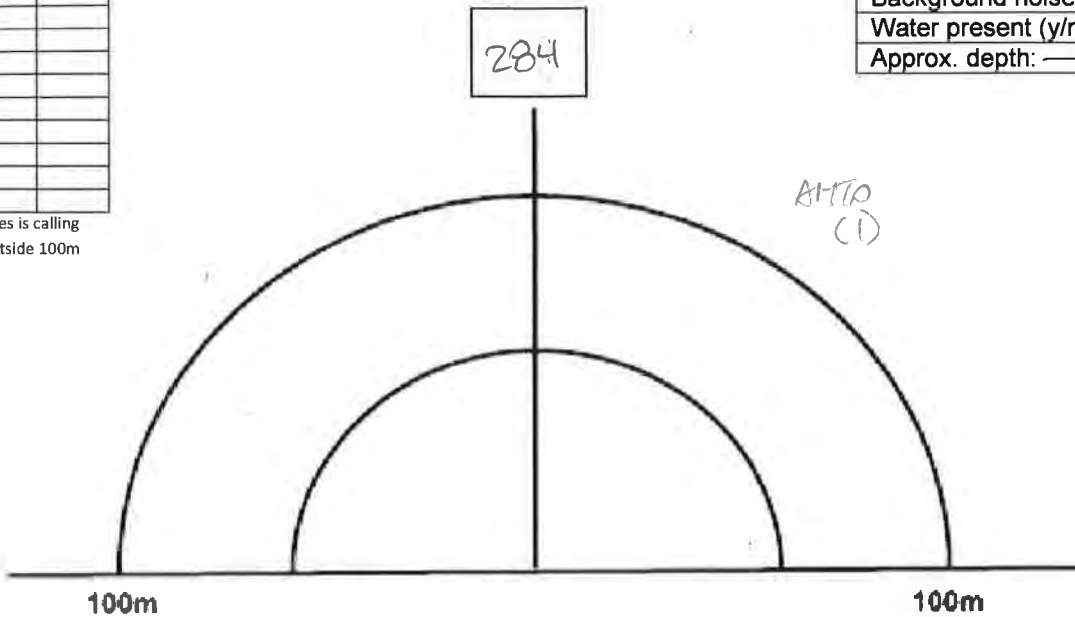


Station ID: 2

Species	In*	Out*
AMTO		X
BCFR		
BULL		
CHFR		
CGTR		
FOTO		
GRTR		
GRFR		
MIFR		
NLFR		
PIFR		
SPPE		
WOFR		

*Check if species is calling from inside/outside 100m station area.

UTM:
Station start time: <u>22:24</u>
Background noise (1-4): <u>1</u> → traffic
Water present (y/n): <u>n</u>
Approx. depth: _____

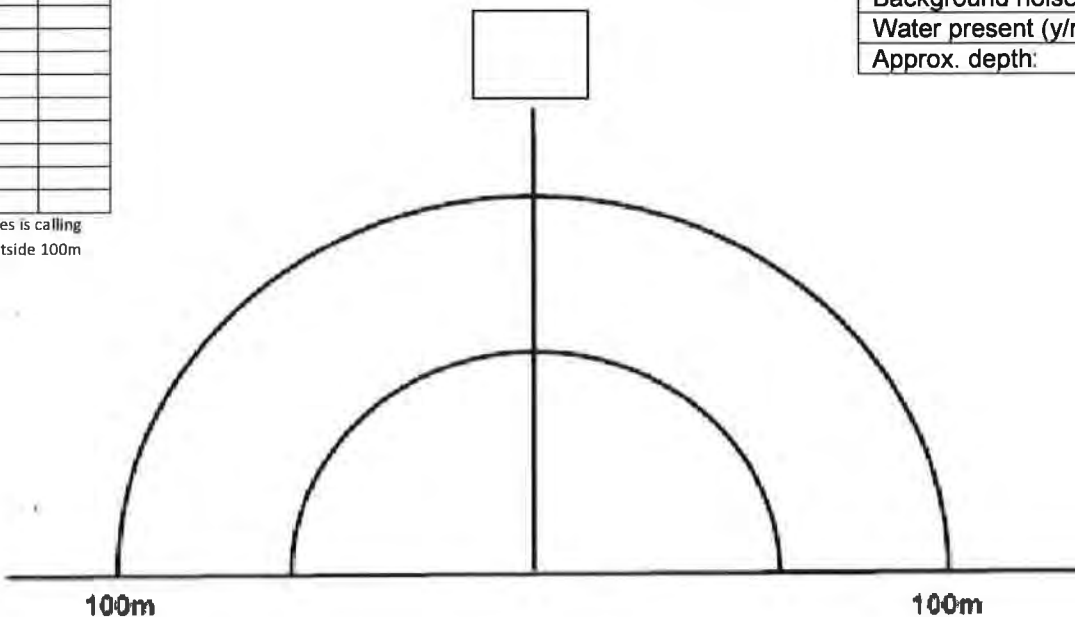


Station ID:

Species	In*	Out*
AMTO		
BCFR		
BULL		
CHFR		
CGTR		
FOTO		
GRTR		
GRFR		
MIFR		
NLFR		
PIFR		
SPPE		
WOFR		

*Check if species is calling from inside/outside 100m station area.

UTM:
Station start time:
Background noise (1-4):
Water present (y/n):
Approx. depth:



AMPHIBIAN CALL SURVEY

Project: Cedar creek Project #: 17-196 Observer(s): SD, MI

Weather conditions: dry, breezy Date: 26 / 06 / 18

Temp (°C)	Wind*	Cloud Cover	Precipitation	Precipitation(24hrs)
<u>19</u>	<u>1</u>	<u>90</u>	<u>None</u>	<u>None</u>

*Beaufort Scale: 0-Calm (0 km/hr), 1-light Air (1-5km/hr), 2-Light Breeze (6-11km/hr), 3-gentle Breeze (12-19km/hr), 4-moderate Breeze (20-28km/hr), 5-fresh breeze (29-38km/hr), 6-strong breeze (39-49km/hr)

Call Level codes:

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

Survey Start time: 22:33 Survey End time: 22:44

Species	In*	Out*
AMTO		
BCFR		
BULL		
CHFR		
CGTR		
FOTO		
GRTR		
GRFR		
MIFR		
NLFR		
PIFR		
SPPE		
WOFR		

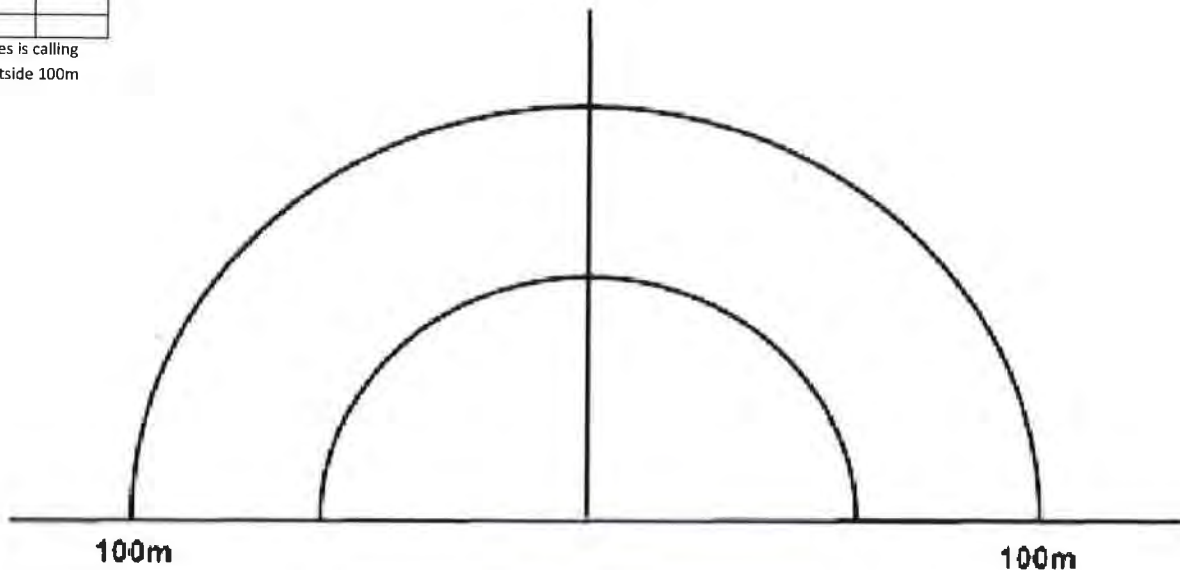
*Check if species is calling from inside/outside 100m station area

Station ID: |

270°

547263
UTM: 4793592
Station start time: 22:33
Background noise (1-4): 2
Water present (y/n): n
Approx. depth: n/a

background noise from traffic & train

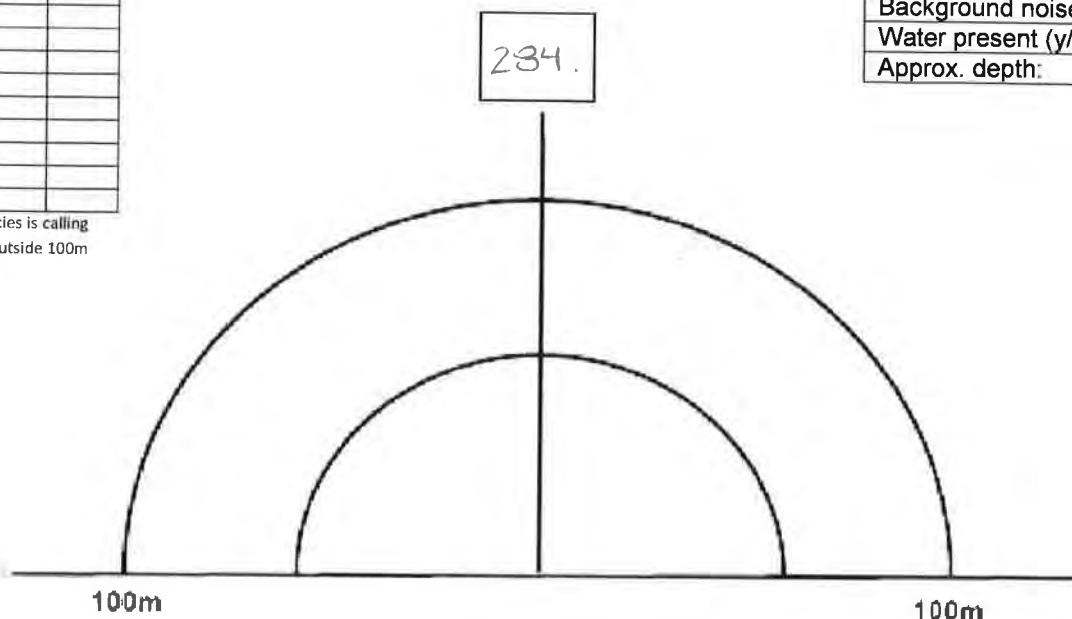


Station ID: 2

Species	In*	Out*
AMTO		
BCFR		
BULL		
CHFR		
CGTR		
FOTO		
GRTR		
GRFR		
MIFR		
NLFR		
PIFR		
SPPE		
WOFR		

*Check if species is calling
 from inside/outside 100m
 station area.

UTM: <u>547335</u> <u>4798915</u>
Station start time: <u>22:41</u>
Background noise (1-4): <u>2</u>
Water present (y/n): <u>n</u>
Approx. depth: <u>n/a</u>

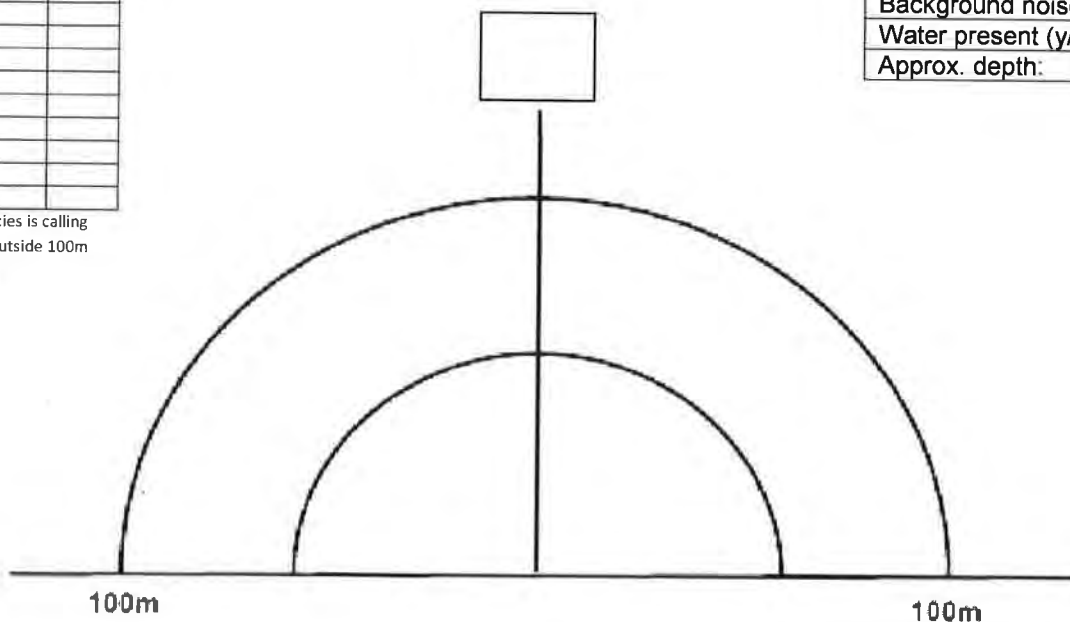


Station ID:

Species	In*	Out*
AMTO		
BCFR		
BULL		
CHFR		
CGTR		
FOTO		
GRTR		
GRFR		
MIFR		
NLFR		
PIFR		
SPPE		
WOFR		

*Check if species is calling
 from inside/outside 100m
 station area.

UTM:
Station start time:
Background noise (1-4):
Water present (y/n):
Approx. depth:








APPENDIX 10
Breeding Bird Survey Results

ABOUT & ASSOCIATES INC.
Consulting Arborists • Ecologists • Landscape Architects

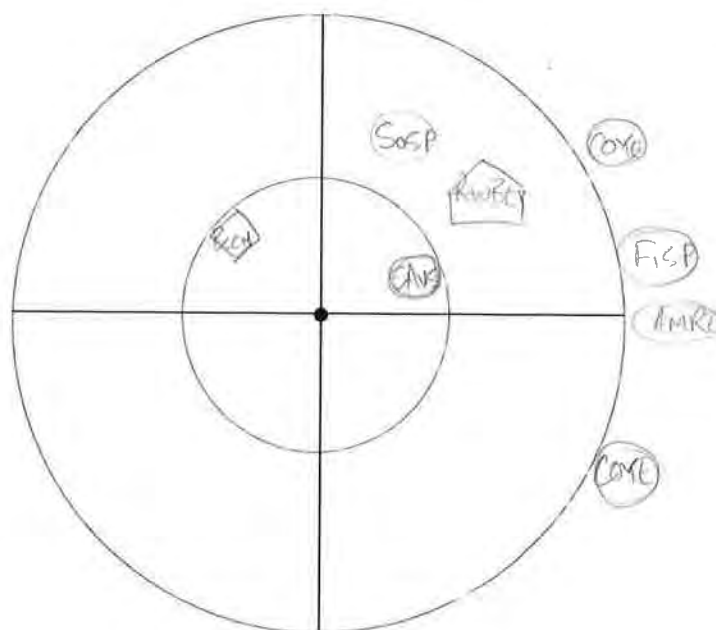
190 Nicklin Road, Guelph, Ontario, Canada N1H 2L5
T: 519.822.6839 F: 519.822.4052 info@aboutd.com www.aboutdina.com

Weather conditions: _____ Date: 7 / June / 2017

Temp (°C)	Wind*	Cloud Cover	Precipitation	Precipitation(24hrs)
15	1	7	—	—

Breeding Evidence Codes:			
FBMP symbols	Observed	Probable	Confirmed
Singing male	 X-no breeding evidence FO-flyover	P-Pair T-territory (2 visits)	DD-distraction display NU-used nest
Male observed		D-display	FY-fledged young
Female observed	 Possible H-suitable habitat	V-visiting nest	AE-adult entering/leaving nest
Pair, mated	 S-singing male	A-Agitated	FS-adult carrying fecal sac
Calling, sex unknown		B-brood patch N-nest building or excavation	CF-adult carrying food NE-nest with eggs NY-nest with young

N

[illegible]

Direction:

N

Direction:

W

A hand-drawn diagram of a circle divided into four quadrants by a vertical and horizontal line. The quadrants contain various handwritten labels: Top-Left (KILL, AVS, TIME, CORE), Top-Right (HOLA, AVS, EAME), Bottom-Left (CORE, THEO, BRT), and Bottom-Right (BRT).

ABOUT & ASSOCIATES INC.
Consulting Arborists • Ecologists • Landscape Architects

190 Nicklin Road, Guelph, Ontario, Canada N1H 7L5
T: 519.822.6839 F: 519.822.4052 info@aboutinc.com www.aboutinc.com

Weather conditions:

Date: 9 Jul 2018

*Beaufort Scale: 0-Calm (0 km/hr), 1-light Air (1-5km/hr), 2-Light Breeze (6-11km/hr), 3-gentle Breeze (12-19km/hr), 4-moderate Breeze (20-28km/hr), 5-fresh breeze (29-38km/hr), 6-strong breeze (39-49km/hr)

Feeding Evidence Codes		Observed	Probable	Confirmed
FBMP symbols		X-no breeding evidence FO-flyover	P-Pair T-territory (2 visits)	DD-distraction display NU-used nest
Male observed			D-display	FY-fledged young
Female observed		Possible H-suitable habitat	V-visiting nest	AE-adult entering/leaving nest
Pair, mated		S-singing male	A-Agitated	FS-adult carrying fecal sac
Calling, sex unknown			B-brood patch	CF-adult carrying food
			N-nest building or excavation	NE-nest with eggs
				NY-nest with young

UTM:

ABOUT & ASSOCIATES INC.
Consulting Arborists • Ecologists • Landscape Architects

190 Nicklin Road, Guilford, Ontario, Canada N1H 7J5
T: 519.422.6839 F: 519.822.4052 info@aboutinc.com www.aboutinc.com

Weather conditions: _____ Date: 7 / JUNE / 2018

*Beaufort Scale: 0-Calm (0 km/hr), 1-light Air (1-5km/hr), 2-Light Breeze (6-11km/hr), 3-gentle Breeze (12-19km/hr), 4-moderate Breeze (20-28km/hr), 5-fresh breeze (29-38km/hr), 6-strong breeze (39-49km/hr)

Species	BE	Count (est.)	Species	BE	Count (est.)	Species	BE	Count (est.)	Species	BE	Count (est.)	Species	BE	Count (est.)
COLO			RBGU			EAKI		I	NOMO			GRSP †		
PBGR			HEGU			YTVI			BRTH	P	II	SOSP	P.A.	IIII
DCCO			CATE			BHVI			EUST	P	II	SWSP		
AMBI			BLTE †			WAVI		I	CEWA			WTSP		
LEBI †			COTE			REVI			BWWA			NOCA	S	II
GBHE	FO	I	ROPI	FO	I	BLJA			GMWA †			RBGR		
GREG			MODO		I	AMCR			TEWA			INBU		
GRHE	P	II	BBCU			CORA			NAWA			BOBO †		
BCNH			YBCU	H	I	HOLA	P	III	Yewa	S	I	RWB	P	IIII
TUVU	FO	III	EASO			PUMA			CSWA			EAME †	P	III
CAND	FO	30	GHOW			TRES	FO	II	MAWA			COGR		
WODU			BAOW			NRWS	FO	IIII	BTBW			BHCO	P	IIII
AMBD			LEOW			BANS †			YRWA			OROR	S	I
MALL	FO	I	NSOW			CLSW			BTGW			BAOR	S	I
OSPR			CONI †			BARS †	FO	I	BLWA			PUFI		
NOHA			EWPW †			BCCH	H	II	PIWA			HOFI		
SSHA			CHSW †			TUTI †			CEWA †			PISI		
COHA			RTHU			RBNU			BAWW			AMGO	P	IIII
RSHA			BEKI			WBNU			AMRE			HOSP		
RTHA	P	II	RHWO †			BRCR			OVEN			Other species, notes, incidentals: Monarchs White-tailed Deer Black Saddlebags		
AMKE			RBWO			HOWR			NOWA					
PEFA †			YBSA			WIWR			MOWA					
RUGR			DOWO			SEWR			COYE	S	III			
WITU	Tracks	I	HAWO			MAWR			HOWA †					
VIRA			NOFL			GCKI			CAWA †					
SORA			PIWO			BGGN			SCTA					
KILL	H	II	EAWP †			EABL			EATO					
SOSA			ALFL			VEER			CHSP					
SPSA	H	I	WIFL	S	I	HETH			CCSP					
UPSA			LEFL	S	I?	WOTH †			FISP	S	III			
WISN			EAPH			AMRO	S	I	VESP					
AMWO			GCFL			GRCA	S	I	SAWS	P	IIII			

AE

Breeding Bird Area Search



Project: Cedar Creek Project number: _____ Observer(s): MRI

Weather conditions:

Date: JUL 19 2018

Temp (°C)	Wind*	Cloud Cover	Precipitation	Precipitation(24hrs)
<u>20</u>	<u>1</u>	<u>0</u>		

*Beaufort Scale: 0-Calm (0 km/hr), 1-light Air (1-5km/hr), 2-Light Breeze (6-11km/hr), 3-gentle Breeze (12-19km/hr), 4-moderate Breeze (20-28km/hr), 5-fresh breeze (29-38km/hr), 6-strong breeze (39-49km/hr)

HABITAT: _____ POLYGON ID (map): _____ START: 0830 END: _____

Species	BE	Count (est.)	Species	BE	Count (est.)	Species	BE	Count (est.)	Species	BE	Count (est.)	Species	BE	Count (est.)
COLO			RBGU			EAKI		<u>11</u>	NOMO			GRSP †		
PBGR			HEGU			YTVI			BRTH			SOSP	<u>S</u>	<u>11</u>
DCCO			CATE			BHVI			EUST			SWSP	<u>S</u>	<u>11</u>
AMBI			BLTE †			WAVI		<u>91</u>	CEWA			WTSP		
LEBI †			COTE			REVI			BWWA			NOCA	<u>S</u>	<u>11</u>
GBHE	<u>FO</u>	<u>1</u>	ROPI			BLJA		<u>11</u>	GMWA †			RBGR		
GREG			MODO			AMCR			TEWA			INBU		<u>1</u>
GRHE			BBCU			CORA			NAWA			BOBO †		
BCNH			YBCU			HOLA	<u>CF</u>	<u>1</u>	YEWA	<u>S</u>	<u>1</u>	RWBB	<u>V</u>	<u>1</u>
TUVU	<u>P</u>	<u>11</u>	EASO			PUMA			CSWA			EAME †	<u>FY</u>	<u>11</u>
CAGO			GHOW			TRES			MAWA			COGR		
WODU			BAOW			NRWS	<u>FY</u>	<u>11</u>	BTBW			BHCO	<u>FY</u>	<u>1</u>
AMBD			LEOW			BANS †			YRWA			OROR		
MALL			NSOW			CLSW			BTGW			BAOR		<u>1</u>
OSPR			CONI †			BARS †		<u>1</u>	BLWA			PUFI		
NOHA			EWPP †			BCCH			PIWA			HOFI		
SSHA			CHSW †			TUTI †			CEWA †			PISI		
COHA			RTHU			RBNU			BAWW			AMGO	<u>P</u>	<u>11</u>
RSAH			BEKI			WBNU			AMRE			HOSP		
RTHA		<u>1</u>	RHWO †			BRCR			OVEN			Other species, notes, incidentals: <u>Monarch</u>		
AMKE			RBWO			HOWR			NOWA					
PEFA †			YBSA			WIWR			MOWA					
RUGR			DOWO			SEWR			COYE	<u>S</u>	<u>1</u>			
WITU			HAWO			MAWR			HOWA †					
VIRA			NOFL	<u>H</u>	<u>1</u>	GCKI			CAWA †					
SORA			PIWO			BGGN			SCTA					
KILL	<u>P</u>	<u>11</u>	EAWP †			EABL			EATO					
SOSA			ALFL			VEER			CHSP					
SPSA			WIFL	<u>S</u>	<u>1</u>	HETH			CCSP					
UPSA			LEFL			WOTH †			FISP		<u>111</u>			
WISN			EAPH			AMRO			VESP					
AMWO			GCFL			GRCA		<u>1</u>	SASP	<u>N, FY</u>	<u>111</u>			

† Endangered, threatened or special concern species

APPENDIX 11
Grassland Bird Survey Results

Species	Count & distance(m)			Breeding evidence
	<50	50-100	>100	
BHCO	2			P
SAVS		1		S
SOSP		1	1	S
INBU		1		S
CCSP		1		S
AMGO		1		S
FISP			1	S
EAMG			1	H
REVI			1	S
EWPE			1	S



Temp (C)	Wind	Cloud Cover	Precip.	Precip. (24hr)
18	3	30	Ø	Ø

Breeding Evidence Codes:			
FBMP symbols	Observed	Probable	Confirmed
Singing male Male observed Female observed	X- No breeding evidence FO- No breeding evidence Possible	P- Pair T- Territory (2 visits) D- Display V- Visiting nest	DD- Distraction display NU- Used nest FY- Fledged young AE- Adult entering/leaving nest FS- Adult carrying fecal sac
Pair, mated Calling, sex unknown	H- Suitable habitat S- Singing male	A- Agitated B- Brood patch	CF- Adult carrying food NE- Nest with eggs

UTM:

Start Time: 6:44

End Time: 6:54

Feature: PCI

Beaufort Scale*- 0- Calm (0km/hr), 1- Light -air (1-5km/hr), 2- Light breeze (6-11km/hr) 3- Gentle breeze (12-19km/hr), 4- Moderate breeze (20 -28km/hr), 5- Fresh breeze (29-38km hr), 6- Strong breeze (39-49km/hr)

Date: July 2 / 20

Observer(s): MR

Project: 2194 DUMFRIES ROAD NORTH DUMFRIES

Project #: AA17-196A

Scale: 1 : 1000

Information Sources:
1. Orthophotography provided by Google Satellite.



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Title: BREEDING BIRD PC STATION #1

Species	Count & distance(m)			Breeding evidence
	<50	50-100	>100	
SAUS	1	1		S
SAUS	1			A
BANS	2			FO
FISP		1		S
BRTH		1		S
GRCA		1		S
EAME			1	S
EAKI			1	S
SOSP			1	S



Temp (C)	Wind	Cloud Cover	Precip.	Precip. (24hr)
19	3	15	0	0

Breeding Evidence Codes:			
FBMP symbols	Observed	Probable	Confirmed
Singing male Male observed Female observed	X- No breeding evidence FO- No breeding evidence	P- Pair T- Territory (2 visits) D- Display V- Visiting nest	DD- Distraction display NU- Used nest FY- Fledged young AE- Adult entering/leaving nest FS- Adult carrying fecal sac
Pair, mated Calling, sex unknown	H- Suitable habitat S- Singing male	A- Agitated B- Brood patch	CF- Adult carrying food NE- Nest with eggs

UTM:
Start Time: 7:21
End Time: 7:31
Feature: PC3

Beaufort Scale*- 0- Calm (0km/hr), 1- Light -air (1-5km/hr), 2- Light breeze (6-11km/hr) 3- Gentle breeze (12-19km/hr), 4- Moderate breeze (20 -28km/hr), 5- Fresh breeze (29-38km hr), 6- Strong breeze (39-49km/hr)

Date: July 2/20
Observer(s): MR
Project: 2194 DUMFRIES ROAD
NORTH DUMFRIES

Project #: AA17-196A
Scale: 1 : 1000
Information Sources:
1. Orthophotography provided by Google Satellite.








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Title: BREEDING BIRD PC
STATION #1

[illegible]

Temp (C)	Wind	Cloud Cover	Precip.	Precip. (24hr)
15	3	0	None	Rain

Breeding Evidence Codes:			
FBMP symbols	Observed	Probable	Confirmed
Singing male Male observed Female observed	 X- No breeding evidence  FO- No breeding evidence  Possible	P- Pair T- Territory (2 visits) D- Display V- Visiting nest	DD- Distraction display NU- Used nest FY- Fledged young AE- Adult entering/leaving nest ES- Adult carrying fecal sac
Pair, mated Calling, sex unknown	 H- Suitable habitat  S- Singing male	A- Agitated B- Brood patch	CF- Adult carrying food NE- Nest with eggs

UTM:

Start Time:

End Time:

Feature:

Beaufort Scale*- 0- Calm (0km/hr), 1- Light
-air (1-5km/hr), 2- Light breeze (6-11km/hr)
3- Gentle breeze (12-19km/hr), 4- Moderate

breeze (20 -28km/hr), 5- Fresh breeze (29-38km/hr) 6- Strong breeze (39-49km/hr)

Date:

Observer(s):

Project:

2194 DUMFRIES ROAD
NORTH DUMFRIES

breeze (20 -28km/hr), 5- Fresh breeze (29-38km/hr) 6- Strong breeze (39-49km/hr)

Date: June 4/20

Observer(s): MR

Project:

**2194 DUMFRIES ROAD
NORTH DUMFRIES**

Project #: AA17-196A

Scale: 1 : 1000






Information Sources:
1. Orthophotography provided by Google Satellite.

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Title: BREEDING BIRD PC
STATION #1

[illegible]

Temp (C)	Wind	Cloud Cover	Precip.	Precip. (24hr)
19	3	15	Ø	Ø

Breeding Evidence Codes:			
FBMP symbols	Observed	Probable	Confirmed
Singing male Male observed Female observed	 X- No breeding evidence  FO- No breeding evidence  Possible	P- Pair T- Territory (2 visits) D- Display V- Visiting nest	DD- Distraction display NU- Used nest FY- Fledged young AE- Adult entering/leaving nest ES- Adult carrying fecal sac
Pair, mated Calling, sex unknown	 H- Suitable habitat  S- Singing male	A- Agitated B- Brood patch	CF- Adult carrying food NE- Nest with eggs

UTM:

Start Time:

End Time:

Feature:

Beaufort Scale*- 0- Calm (0km/hr), 1- Light
-air (1-5km/hr), 2- Light breeze (6-11km/hr)
3- Gentle breeze (12-19km/hr), 4- Moderate

breeze (20 -28km/hr), 5- Fresh breeze (29-38km/hr) 6- Strong breeze (39-49km/hr)

Date:

Observer(s):

Project:

2194 DUMFRIES ROAD
NORTH DUMFRIES

breeze (20 -28km/hr), 5- Fresh breeze (29-38km/hr) 6- Strong breeze (39-49km/hr)

Project #: AA17-196A

Scale: 1 : 1000

Information Sources:
1. Orthophotography provided by Google Satellite.

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Title: **BREEDING BIRD PC**
STATION #1

[illegible]

Temp (C)	Wind	Cloud Cover	Precip.	Precip. (24hr)
19	3	0	None	Rain

Breeding Evidence Codes:

FBMP symbols	Observed	Probable	Confirmed
Singing male Male observed Female observed	X- No breeding evidence FO- No breeding evidence	P- Pair T- Territory (2 visits) D- Display V- Visiting nest	DD- Distraction display NU- Used nest FY- Fledged young AE- Adult entering/leaving nest ES- Adult carrying fecal sac
Pair, mated Calling, sex unknown	Possible H- Suitable habitat S- Singing male	A- Agitated B- Brood patch	CF- Adult carrying food NE- Nest with eggs

UTM:

Start Time:

End Time:

Feature:

Beaufort Scale*- 0- Calm (0km/hr), 1- Light
-air (1-5km/hr), 2- Light breeze (6-11km/hr)
3- Gentle breeze (12-19km/hr), 4- Moderate

breeze (20 -28km/hr), 5- Fresh breeze (29-38km/hr) 6- Strong breeze (39-49km/hr)

Date:

Observer(s):

Project:

2194 DUMFRIES ROAD
NORTH DUMFRIES

Project #: AA17-196A

Scale: 1 : 1000

Information Sources:






1. Orthophotography provided by Google Satellite.

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Title: BREEDING BIRD PC
STATION #1

[illegible]

Temp (C)	Wind	Cloud Cover	Precip.	Precip. (24hr)
19	3	15	Ø	Ø

Breeding Evidence Codes:			
FBMP symbols	Observed	Probable	Confirmed
Singing male 	X- No breeding evidence	P- Pair	DD- Distraction display
Male observed 	FO- No breeding evidence	T- Territory (2 visits)	NU- Used nest
Female observed 	Possible	D- Display	FY- Fledged young
Pair, mated 	H- Suitable habitat	V- Visiting nest	AE- Adult entering/leaving nest
Calling, sex unknown 	S- Singing male	A- Agitated	FS- Adult carrying fecal sac
		B- Brood patch	CF- Adult carrying food
			NE- Nest with eggs

UTM:

Start Time: 8:10

End Time: 8:30

Feature: PC5

Beaufort Scale*- 0- Calm (0km/hr), 1- Light -air (1-5km/hr), 2- Light breeze (6-11km/hr)
3- Gentle breeze (12-19km/hr), 4- Moderate

breeze (20 -28km/hr), 5- Fresh breeze (29-38km/hr) 6- Strong breeze (39-49km/hr)

Date: July 2/20

Observer(s): MR

Project: _____

2194 DUMFRIES ROAD
NORTH DUMFRIES

Project #: AA17-196A

Scale: 1 : 1000

Information Sources:

1. Orthophotography provided by Google Satellite.








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Title: BREEDING BIRD PC
STATION #1

[illegible]

Temp (C)	Wind	Cloud Cover	Precip.	Precip. (24hr)
14	3	0	0	0

Breeding Evidence Codes:				
FBMP symbols		Observed	Probable	Confirmed
Singing male		X- No breeding evidence	P- Pair	DD- Distraction display
Male observed		FO- No breeding evidence	T- Territory (2 visits)	NU- Used nest
Female observed		Possible	D- Display	FY- Fledged young
Pair, mated			V- Visiting nest	AE- Adult entering/leaving nest
Calling, sex unknown		H- Suitable habitat	A- Agitated	ES- Adult carrying fecal sac
		S- Singing male	B- Brood patch	CF- Adult carrying food
				NE- Nest with eggs

UTM:	
Start Time:	8:16
End Time:	8:26
Feature:	AC 6

Beaufort Scale*- 0- Calm (0km/hr), 1- Light
-air (1-5km/hr), 2- Light breeze (6-11km/hr)
3- Gentle breeze (12-19km/hr), 4- Moderate
breeze (20 -28km/hr), 5- Fresh breeze (29-
38km/hr), 6- Strong breeze (39-49km/hr)

Date: June 17/20

Observer(s): MR

Project:

2194 DUMFRIES ROAD
NORTH DUMFRIES

Project #: AA17-196A

Scale: 1 : 1000

Information Sources:

1. Orthophotography provided by Google Satellite.



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Title: BREEDING BIRD PC
STATION #1



Temp (C)	Wind	Cloud Cover	Precip.	Precip. (24hr)
13-19	3	0	None	Rain

Breeding Evidence Codes:

FBMP symbols	Observed	Probable	Confirmed
Singing male	X- No breeding evidence	P- Pair	DD- Distraction display
Male observed	FO- No breeding evidence	T- Territory (2 visits)	NU- Used nest
Female observed	Possible	D- Display	FY- Fledged young
Pair, mated	H- Suitable habitat	V- Visiting nest	AE- Adult entering/leaving nest
Calling, sex unknown	S- Singing male	A- Agitated	FS- Adult carrying fecal sac
		B- Brood patch	CF- Adult carrying food
			NE- Nest with eggs

UTM:

Start Time: 6:47

End Time: 8:42

Feature: A, B

Beaufort Scale*- 0- Calm (0km/hr), 1- Light -air (1-5km/hr), 2- Light breeze (6-11km/hr) 3- Gentle breeze (12-19km/hr), 4- Moderate breeze (20 -28km/hr), 5- Fresh breeze (29-38km hr). 6- Strong breeze (39-49km/hr)

Date: June 4/20

Observer(s): MR

Project: 2194 DUMFRIES ROAD NORTH DUMFRIES

Project #: AA17-196A

Scale: 1 : 1000

Information Sources:
1. Orthophotography provided by Google Satellite.



Title: BREEDING BIRD PC STATION #1



Temp (C)	Wind	Cloud Cover	Precip.	Precip. (24hr)
12-14	1-3	☒	☐	☒

Breeding Evidence Codes:

FBMP symbols	Observed	Probable	Confirmed
Singing male	X- No breeding evidence	P- Pair	DD- Distraction display
Male observed	FO- No breeding evidence	T- Territory (2 visits)	NU- Used nest
Female observed	Possible	D- Display	FY- Fledged young
Pair, mated	H- Suitable habitat	V- Visiting nest	AE- Adult entering/leaving nest
Calling, sex unknown	S- Singing male	A- Agitated	FS- Adult carrying fecal sac
		B- Brood patch	CF- Adult carrying food
			NE- Nest with eggs

UTM:

Start Time: 6:57

End Time: 8:29

Feature:

Beaufort Scale*- 0- Calm (0km/hr), 1- Light -air (1-5km/hr), 2- Light breeze (6-11km/hr) 3- Gentle breeze (12-19km/hr), 4- Moderate breeze (20 -28km/hr), 5- Fresh breeze (29-38km hr), 6- Strong breeze (39-49km/hr)

Date: June 17/20

Observer(s): MR

Project:

2194 DUMFRIES ROAD
NORTH DUMFRIES

Project #: AA17-196A

Scale: 1 : 1000

Information Sources:
1. Orthophotography provided by Google Satellite.



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Title: BREEDING BIRD PC
STATION #1



Temp (C)	Wind	Cloud Cover	Precip.	Precip. (24hr)
18-19	3	30-715	Ø	Ø

Breeding Evidence Codes:

FBMP symbols	Observed	Probable	Confirmed
Singing male	X- No breeding evidence	P- Pair	DD- Distraction display
Male observed	FO- No breeding evidence	T- Territory (2 visits)	NU- Used nest
Female observed	Possible	D- Display	FY- Fledged young
Pair, mated	H- Suitable habitat	V- Visiting nest	AE- Adult entering/leaving nest
Calling, sex unknown	S- Singing male	A- Agitated	FS- Adult carrying fecal sac
		B- Brood patch	CF- Adult carrying food
			NE- Nest with eggs

UTM:
Start Time: 6:54
End Time: 6:37
Feature: TRANSECTS
Beaufort Scale*- 0- Calm (0km/hr), 1- Light -air (1-5km/hr), 2- Light breeze (6-11km/hr) 3- Gentle breeze (12-19km/hr), 4- Moderate breeze (20 -28km/hr), 5- Fresh breeze (29-38km hr), 6- Strong breeze (39-49km/hr)

Date: July 2/20
Observer(s): MR
Project: 2194 DUMFRIES ROAD NORTH DUMFRIES

Project #: AA17-196A
Scale: 1 : 1000
Information Sources:
1. Orthophotography provided by Google Satellite.

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Title: BREEDING BIRD PC STATION #1

APPENDIX 12
Winter Wildlife Survey Results

COMMON NAME	SCIENTIFIC NAME	SARO	COSEWIC	SARA	S-Rank	G-Rank	GRCA	Region of Waterloo	Area Sensitive	Area Req'd	PIF Priority
BIRDS											
Blue Jay	<i>Cyanocitta cristata</i>				S5	G5					
American Crow	<i>Corvus brachyrhynchos</i>				S5B	G5					
Black-capped Chickadee	<i>Poecile atricapillus</i>				S5	G5	✓				
White-breasted Nuthatch	<i>Sitta carolinensis</i>				S5	G5			✓	>10 ha	
Downy Woodpecker	<i>Picoides pubescens</i>										
MAMMALS											
Coyote	<i>Canis latrans</i>				S5	G5		S			
Eastern Cottontail	<i>Sulvilagus floridanus</i>				S5	G5					
White-tailed Deer	<i>Odocoileus virginianus</i>				S5	G5					
Mouse sp.											
Gray Squirrel	<i>Sciurus carolinensis</i>				S5	G5					

G-Rank:
G1: Extremely rare globally
G1G2: Extremely rare to very rare globally
G2: Very rare globally
G2G3: Very rare to uncommon globally
G3: Rare to uncommon globally
G3G4: Rare to common globally
G4: Common globally
G4G5: Common to very common globally
G5: Very common globally
T: rank applies to a subspecies or variety

Legend:
SARO: Species at Risk Ontario
COSEWIC: Committee on the Status of Endangered Wildlife in Canada
SARA: Species at Risk Act

Grand River Conservation Authority:

✓

: Conservation Priority

S-Rank:
S1: Critically Imperiled- Critically Imperiled in the province
S2: Imperiled- Imperiled in the province
S3: Vulnerable- Vulnerable in the province
S4: Apparently Secure- Uncommon but not rare
S5: Secure- Common, widespread, and abundant
SX: Presumed Extirpated
SH: Possible Extirpated (Historical)
SNR: Unranked
SU: Unrankable- Currently unrankable
SNA: Not applicable- A conservation status rank is not applicable
S#S#: Range rank- indicates range of uncertainty about the status
S#B: Breeding status rank
?: indicates uncertainty in the assigned rank

References:

1. Ontario Partners in Flight (PIF). 2008. Ontario Landbird Conservation Plan: Lowwer Great Lakes/St. Lawrence Plain (North American Bird Conservation Region 13), Priorities, Objectives and Recommended Actions. Environment Canada (Ontario Region) and Ontario Ministry of Natural Resources. Final Draft, November, 2008.
2. COSSARO Status Endangered Species Act, 2007 (Bill 184). Schedules 1-5. June 30 2008.
3. COSEWIC Status COSEWIC. 2014. Canadian Species at Risk. Committee on the Status of Endangered Wildlife in Canada.
4. Endangered Species Act, 2007 (Bill 184). Schedules 1-5. April 21, 2015
5. Grand River Conservation Authority, date unk., A Checklist of Birds within the Grand River Watershed
6. Regional Municipality of Waterloo, 1985. Appendix 4: Mammals in Environmentally Sensitive Policy Areas Technical Appendix
7. Regional Municipality of Waterloo, 2007. Regionally Significant Breeding Birds

WINTER WILDLIFE SURVEY



Project: Cedar Creek rd North Dumfries Project number: 17-196 Observer(s): SD

Weather Conditions:

Date: 16 / 01 / 18

Temp (°C)	Wind*	Cloud Cover	Precipitation (current)	Days since last snowfall	Approx. snow depth	% snow cover	Snow texture
<u>-10</u>	<u>1</u>	<u>ec</u>	<u>0</u>	<u>1</u>	<u>510cm</u>	<u>90</u>	<u>light</u>

Survey Start Time: 8:15 Survey End Time: 10:00

Species	Location (Map ID/UTM)	Habitat Type	Count	Observation type (Scat/Track/Observed)	Notes
<u>Coyote</u>	<u>547452</u> <u>4798465</u>	<u>Open field</u>	<u>2</u>	<u>track</u>	<u>side by side</u>
<u>BLJA</u>	<u>547667</u> <u>4798708</u>	<u>Open field</u>	<u>1</u>	<u>flying over</u>	
<u>Coyote</u>	<u>547724</u> <u>4799083</u>	<u>downway from Dumfries</u>	<u>1</u>	<u>track</u>	
<u>AMCR</u>	<u>547411</u>	<u>Woodlot</u>	<u>1</u>	<u>flapping wings n</u>	<u>within lot beside dumfries rd.</u>
<u>Wlk</u>	<u>4799234</u>	<u>Field</u>	<u>1</u>		<u>den.</u>
<u>BOCH</u>	<u>547676</u> <u>4799262</u>	<u>Woodlot</u>	<u>1</u>	<u>calling</u>	
<u>EACO</u>	<u>547646</u> <u>4799263</u>	<u>Woodlot</u>	<u>#2-3</u>	<u>tracks</u>	
<u>Coyote</u>	<u>547461</u> <u>4799131</u>	<u>Open field</u>	<u>1</u>	<u>tracks</u>	
<u>Coyote</u>	<u>547327</u> <u>4799027</u>	<u>Path</u>	<u>~5</u>	<u>tracks</u>	<u>confluence from several directions</u>
<u>EACO</u>	<u>547337</u> <u>4798982</u>	<u>Path</u>	<u>1</u>	<u>Tracks</u>	
<u>FLSP</u>	<u>547103</u> <u>4798815</u>	<u>Woodlot 2</u>	<u>1</u>	<u>calling</u>	
<u>WTDE</u>	<u>547120</u> <u>4798708</u>	<u>Open field</u>	<u>1</u>	<u>tracks</u>	
<u>WBNW</u>	<u># 11</u> <u>11</u>	<u>Woodlot 2</u>	<u>3 1</u>	<u>calling</u>	
<u>Coyote</u>	<u>547193</u> <u>4798043</u>	<u>edge</u>	<u>1</u>	<u>track</u>	

Project number: 17-196

Date: 16/01/18

Page: of

WINTER WILDLIFE SURVEY



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[illegible]

Incidental Observations:

WINTER WILDLIFE SURVEY



Project: Dwires rd B Cedarcreek Project number: 17-196 Observer(s): SD

Weather Conditions:

Date: 01 / 30 / 18

Temp (°C)	Wind*	Cloud Cover	Precipitation (current)	Days since last snowfall	Approx. snow depth	% snow cover	Snow texture
<u>-14</u>	<u>1</u>	<u>0</u>	<u>none</u>	<u><24hrs</u>	<u>10cm</u>	<u>100</u>	<u>Puffy</u>

Survey Start Time: 8:00 Survey End Time: 9:30

Species	Location (Map ID/UTM)	Habitat Type	Count	Observation type (Scat/Track/Observed)	Notes
<u>UNK</u>	<u>547610</u> <u>4798827</u>	<u>fill piles</u>	<u>1</u>	<u>Track</u>	
<u>myale B</u> <u>unk</u>	<u>547620</u> <u>4798944</u>	<u>driveway</u>	<u>1 per</u>	<u>track</u>	
<u>unk prob</u> <u>myale</u>	<u>547804</u> <u>4799110</u>	<u>open field</u>	<u>2</u>	<u>track</u>	
<u>AMCR</u> <u>COYO</u>		<u>flower field</u>	<u>1</u>	<u>observed</u>	
<u>UNK</u>	<u>5474104</u> <u>4799031</u>	<u>park</u>	<u>1</u>	<u>tracks</u>	
<u>COYO</u>	<u>547272</u> <u>4798978</u>	<u>by pond</u>	<u>1</u>	<u>track</u>	
<u>COYO</u>	<u>547332</u> <u>4798910</u>		<u>2</u>	<u>track</u>	
<u>woodpecker</u>	<u>"</u>		<u>1</u>		<u>hear pecking</u>
<u>SACRO</u>	<u>547315</u> <u>4798358</u>		<u>1</u>	<u>track</u>	
<u>BLJA</u>	<u>"</u>		<u>2</u>	<u>observed</u>	<u>Bheard</u>
<u>COYO</u>	<u>547272</u> <u>4798910</u>		<u>1</u>	<u>track</u>	
<u>BOCH</u>	<u>"</u>		<u>1</u>		<u>calling</u>
<u>COYO</u>	<u>547173</u> <u>4798464</u>		<u>1</u>	<u>tracks</u>	
<u>UNK</u>	<u>547243</u> <u>4798509</u>		<u>1</u>		<u>some photo</u>

Project number:

Date:

Page: of

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[illegible]

Incidental Observations:

APPENDIX 13
Glossary of Impacts and Terms

Glossary of terms and Impacts**Duration of Impact**

ST – Short-term (define based on project)

LT- Long-term (define based on project)

Reversibility

R- Reversible

P – Permanent

Geographic Extent of Influence

SA– Subject Area (physical disturbance area)

AA- Assessment Area (120m zone of influence)

LA – Landscape Area (Area outside AA that may be affected)

Frequency of Disturbance

O - Occurs once.

S - Occurs sporadically at irregular intervals.

R - Occurs on a regular basis and at regular intervals.

C – Continuous, ongoing and all the time.

Existing Ecological Site Context

U - Undisturbed: Area relatively or not adversely affected by human activity.

PD – Past Disturbance: Area Adversely affected by human activity in recent past, but regeneration has occurred.

D -Disturbed: Area has been substantially previously disturbed by human development or human development is still present.

Likelihood of impact occurring

If the Proposed activity occurs, the likelihood of the impact occurring is:

L: Low probability of occurrence.

M: Medium probability of occurrence.

H: High probability of occurrence.

Cumulative Environmental Effects

Will the proposed activity interact with other impacts?

Y: Potential for environmental effect to interact with the environmental effects of other past, present or foreseeable future activities

N: Environmental effect will not or is not likely to interact with the environmental effects of other past, present or foreseeable future activities.

Impact Rating

None: An event that, if it occurs, will cause no foreseeable impact.

Minor: An event that, if it occurs, will cause small, reversible and geographically localized impact that can be easily mitigated.

Moderate: Significant but reversible, OR irreversible and geographically localized, impact that requires significant mitigation.

Severe: Significant AND irreversible impact on the environment, impacts cannot be fully mitigated.

Potential vs. Actual impact

¹ *Potential Impact* is a relative rating of the expected impact to occur in the absence of any mitigation measures.

² *Actual Impact* is the expected impact in consideration of implementation of mitigation measures or where potential impact may cause little to no actual impact.

- Urban Forestry
- Ecological Restoration
- Landscape Architecture
- Environmental Studies
- Expert Opinion

