



# **CAMBRIDGE EAST BOUNDARY ROAD**

## **NATURAL ENVIRONMENT REPORT**

December 2015



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Environment Data Collection Summary  
East Boundary Road, Cambridge ON

December 2015

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## 1.0 INTRODUCTION

### 1.1 *Project Overview and Study Area*

Savanta Inc. (Savanta) was retained, in partnership with MTE Consultants Inc. and URS Canada Inc., to conduct the Natural Environment component of the Cambridge East Boundary Road Corridor Environmental Assessment (EA). The Study Area boundaries are located within the Township of Puslinch, the Township of North Dumfries and the City of Cambridge (herein referred to as the Study Area) (**Figure 1, Appendix A**).

#### 1.1.1 Project Study Area and Surrounding Landscape

##### **Natural Heritage Corridors and Wetlands**

In addition to the Study Area, information was assessed in this report related to other important natural heritage features and associated functions in the local landscape. Natural heritage features and designated natural areas within and beyond the study area are shown on **Figure 2, Appendix A**.

Two major natural heritage system corridors traverse the Study Area. Mill Creek Wetland Complex and Moffat Creek Swamp Wetland are both Significant Wetland complexes. A smaller wetland complex, the Sheffield Rockton Wetland Complex, also overlaps with the southeast corner of the Study Area.

The Mill Creek Wetland Complex surrounds Mill Creek proper and its tributaries, entering the north boundary of the Study Area at the intersection of Gore Road and Shellard Road.

The Moffat Creek Swamp surrounds the main stem of Moffat Creek. It enters the middle portion of the Study Area at Shellard Road, south of Clyde Road, and traverses the mid-portion of the Study Area in a northeast to southwest direction.

In the southeast corner of the study area to the south of Old Beverly Road, are several smaller wetland pockets associated with the Sheffield Rockton Wetland Complex near Dundas Street. These wetland areas are associated with the headwaters of Fairchild Creek, a warmwater stream system that enters the Grand River downstream of Brantford.

Immediately to the northeast of the Study Area in Puslinch Township, a large portion of the wetland complex also contains the Galt (Mill) Creek and the Forests Life Science Area of Natural and Scientific Interest (ANSI); the ANSI is outside of the Study Area boundary.

##### **Subwatersheds, Aquatic Habitat and Fisheries**

Three main subcatchments comprise the drainage of the Study Area: Mill Creek, Moffat Creek and Fairchild Creek.

Mill Creek, a coldwater stream supporting brook trout and brown trout, flows to Shade's Mills reservoir, a 32 ha (80 acre) flood control facility and dam owned and operated by the Grand River Conservation Authority (GRCA). The Shade's Mills Conservation Area is located on the north side of the reservoir.

Approximately 2100 m upstream of the Shade's Mill Dam, a small dam is present on Mill Creek behind the residences on Grandy Lane. This dam has created a backwater reaching as far upstream as Shellard Sideroad. The dam is privately owned and operated; however, any modifications or alterations to the dam would require permits from GRCA and the Ministry of Natural Resources and Forestry (MNR).

Moffat Creek enters the middle portion of the Study Area at Shellard Road. Throughout the Study Area, Moffat Creek is classified as a warmwater stream, supporting primarily baitfish species.

The wetland areas of the Sheffield Rockton Complex in the southeast corner of the Study Area are associated with the headwaters of Fairchild Creek, a warmwater stream system that enters the Grand River downstream of Brantford. Based on MNR records, many of the culvert and channel areas examined over time exhibit intermittent conditions and at best, may provide seasonal habitat for species of cyprinids (minnows).

## **2.0 SUMMARY OF DATA COLLECTION APPROACHES & METHODS**

### **2.1 *Background References***

Savanta has relied, in part, upon supporting background information and previous site surveys/investigations to provide additional insight into the overall character of the Study Area.

Examples of these background sources and agencies are:

- Federal and Provincial SAR websites;
- Ontario Ministry of Natural Resources, Guelph District;
- MNRF Fishdot data and background fisheries information;
- GIS mapping from GRCA;
- Rare vegetation communities data from MNRF;
- Species at Risk occurrence data from MNRF;
- Natural Environment Study Field Data and Constraints Analysis, South Boundary Corridor Class EA (EcoServices, 2008); and,
- Environmental Update, Bosdale Development, City of Cambridge (IBI, 2014)

#### **2.1.1 LIO Natural Features Summary**

Based on a search of the MNRF Land Information Ontario (LIO) geographic database (2015), there are three Significant Wetland Complexes within the Study Area. As discussed in the previous section, these complexes are Mill Creek Wetland Complex, Moffat Creek Swamp Wetland and Sheffield Rockton Complex. One ANSI, Galt (Mill) Creek Forest, is found outside of the northwest boundary of the Study Area in Puslinch Township (**Figure 2, Appendix A**). No Environmentally Significant/Sensitive Areas (ESAs) were identified within or adjacent to the Study Area.

### **2.2 *Pre-Consultation and Agency Discussions***

#### **Ministry of Natural Resources and Forestry (MNRF)**

The Guelph District MNRF provided a desktop list for both species at risk (that were known to exist within Waterloo Region) and rare vegetation communities within the vicinity of the Study Area in August 2012 (**Table 1, Appendix B**).

A meeting was held with MNRF on March 19, 2014 to discuss approaches to salamander surveys and permits required to conduct those activities. The Study Team also met with MNRF staff on May 22, 2015 to provide an update on the field data collections, including a review of

the findings of the salamander surveys conducted in 2014. This meeting also included a discussion on how field data was used in the generation of route alternatives.

### **Grand River Conservation Authority (GRCA)**

GRCA was consulted at the onset of the project and has provided guidance on various aspects of natural heritage as well as their Regulated Areas mapping during the study. Various GIS layers pertaining to wetlands, regulation limits and other natural heritage layers have been obtained from GRCA sources to assist in assessing the route alternatives.

A meeting was held with GRCA staff on May 12, 2015 to discuss field survey results and to provide an update on the incorporation of field data into the development of route alternatives.

### **2.3 Field Investigations**

Savanta completed various field surveys and natural environment inventories in 2012, 2013 and 2014. Field data collections in 2012 and 2013 were preliminary and investigative. A finalized Study Area and preliminary route alternatives were provided in late winter, 2013. Following the delineation of preliminary route alternatives, a targeted and comprehensive field program was completed in 2014. The field results provided in the sections below reflect data collected from 2014.

All field investigations were conducted only where property access was provided. The field investigations included Ecological Land Classification (ELC) of vegetation communities, botanical inventories, salamander habitat assessments, salamander trapping and tissue sampling, amphibian call count surveys, reptile surveys, breeding bird surveys and incidental wildlife observations. The 2014 surveys are summarized in **Table 2 (Appendix B)**.

### 3.0 ENVIRONMENTAL SETTING AND CHARACTERISTICS

#### 3.1 *Terrestrial Ecology: Habitat Assessment and Species Occurrences*

##### 3.1.1 Vegetation

##### **Survey Methods – Ecological Land Classification and Botanical Inventories**

Following a satellite image interpretation, a preliminary map of potential vegetation types and land use features was created. During the field surveys, the mapping units were confirmed, sampled and revised, if necessary, using the sampling protocol of the Ecosystem Land Classification (ELC) for Southern Ontario (Lee et al. 1998). Botanical investigations were carried out during two survey years: in 2012 (August 22) and in 2014 (May 29, June 18, July 11).

The provincial status of common plant species is based on Newmaster et al. (1998), with updates from the database of the Natural Heritage Information Centre (NHIS website). The provincial status of at-risk plant species is based on the most current version of the Species at Risk in Ontario list (O.Reg. 230/08). Identification of potentially sensitive plant species is based on the assignment of a coefficient of conservatism value (CC) to each native species in southern Ontario (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 a specific natural habitat. Species with a CC value of 9 or 10 generally exhibit a high degree of fidelity to a narrow range of habitat parameters that characterize natural, undisturbed ecosystems.

##### **Survey Results – Ecological Land Classification and Botanical Inventories**

##### ***Ecological Land Classification***

The Subject Lands have a diverse vegetation cover of forests, wetlands and meadows within the matrix of agricultural fields and rural and sub-urban settlements. **Figure 3, Appendix A** (two sheets), maps the ELC communities. Areas where access was not available for surveying are also noted.

**Table 3 (Appendix B)** provides details of the ELC community types that were delineated and classified within the Study Area.

##### ***Botanical Inventory***

A total of 261 species of vascular plants were identified within the Study Area. Of that number, 171 (or 66%) species are provincially native and 90 (or 34%) species are exotic.

The majority of the native species (94%) are ranked S5 (Secure – common, widespread and abundant in Ontario), with ten species (or 6%) ranked S4 (Apparently Secure – uncommon, but not rare in Ontario):

- Arrow-leaved Aster (*Aster urophyllus*) – common in old field meadows;
- Giant Blue Cohosh (*Caulophyllum giganteum*) – common in sugar maple dominated forests (e.g., FOD5-1, FOD5-2, and FOD5-11);
- American Beech (*Fagus grandifolia*) – an S4? species; common;
- Black Walnut (*Juglans nigra*);
- White Ash (*Fraxinus americana*) – an S4? species; common in units FOD5-2 and FOD5-11;
- Northern Evening-primrose (*Oenothera parviflora*) – an S4? species, occasional in old field meadows;
- Long-fruited Anemone (*Anemone cylindrica*) – local in dry old field meadows and open thickets;
- Tuckerman's Sedge (*Carex tuckermanii*) – occasional in units SWD2-2, SWD3-2, and SWD3-3;
- Big Bluestem (*Andropogon gerardii*) – several plants along the railway right-of-way, west of Shellard Road and north of Clyde Road; and,
- Herbaceous Carrion Flower (*Smilax herbacea*) – occasional in several upland forest types.

Fifteen locally (Region of Waterloo) rare species were recorded (rankings for the neighbouring County of Wellington are also provided, for comparison; however, they are not analyzed). Species denoted with an asterisk (\*) are deemed to be significant “but with the expectation that additional research may prove otherwise”; those with a cross (†) are “significant only if demonstrably indigenous”.

- Interrupted Fern (*Osmunda claytoniana*) – local in unit SWD2-2;
- Common Juniper\* (*Juniperus communis*) – abundant in the woodlands and thickets at Old Beverly Road;
- White Spruce\* (*Picea glauca*) – planted;
- Speckled Alder\* (*Alnus incana* ssp. *rugosa*) – occasional to abundant in all thicket swamps;
- Cow-parsnip (*Heracleum maximum*) – an S4? species; local in SWD2-2 between Main Street and Dundas Street;
- Longleaf Stitchwort (*Stellaria longifolia*) – local in deciduous swamps;
- Black Walnut\*\* (*Juglans nigra*) – common in edge habitats and hedgerows, possibly planted;
- Long-fruited Anemone (*Anemone cylindrica*) – local in dry old field meadows and open thickets;
- Wild Licorice (*Galium circaeazans*) – local in sugar maple deciduous forests;
- American Prickly-ash\* (*Zanthoxylum americanum*) – local in open mixed woods;
- Broad-leaved Sedge (*Carex platyphylla*) – occasional in sugar maple deciduous forests;

- Burreed Sedge\* (*Carex sparganioides*) – occasional in sugar maple deciduous forests;
- Tuckerman's Sedge (*Carex tuckermanii*) – occasional in units SWD2-2, SWD3-2, and SWD3-3;
- Big Bluestem (*Andropogon gerardii*) – several plants along railway right-of-way, west of Shellard Road and north of Clyde Road; and
- Sheathed Dropseed (*Sporobolus vaginiflorus*) – local in dry roadside and edges of fields.

No nationally or provincially rare, threatened or endangered species were recorded from the Study Area.

A full species list is included in **Table 4, Appendix B. Table 7 (Appendix B)** provides wildlife information. Wildlife components are addressed in the following sections.

### 3.1.2 Amphibians

#### Methods – Salamander Surveys

Due to the potential presence of Jefferson Salamander in the Study Area, a comprehensive survey program was developed to sample various vernal and permanent pools in areas affected by route alternatives. The salamander surveys required various forms of provincial approval. Savanta received a Wildlife Scientific Collector's Authorization from the Guelph District MNRF and an Animal Care Protocol approval on March 31st, 2014 from the MNRF Wildlife Animal Care Committee (Protocol #14-317). Savanta also registered a 'Notice of Activity Form and Other Notices under the ESA, 2007" and received registration confirmation on March 18, 2013 (Confirmation ID X-102-0000000208).

Sampling methods were derived from the 'Sampling Protocol for Determining the Presence of Jefferson Salamander (*Ambystoma jeffersonianum*) in Ontario' prepared by the Jefferson Salamander Recovery Team (June 2013), as well as through consultation with Guelph District MNRF staff on March 19, 2014.

#### Salamander Habitat Suitability Assessment

Salamander habitat suitability assessments were completed in all accessible properties that contained potentially suitable habitat conditions. Through consultation, Guelph District MNRF staff provided the following survey guidelines:

Four criteria must be met in order for a pond to be considered suitable and mapped as regulated habitat:

1. Water retention duration: Most years there is water in the pond long enough for the Jefferson's Salamander larvae to develop and emerge. Since Jefferson's Salamander is long lived, a dry pond one year does not rule out breeding. Therefore, if the survey is done in a dry year, or after a low snow cover the preceding winter, it may take more than 1 year

to determine this.

2. There is amphibian breeding (consider to be any of: mating, calling, eggs, larvae) occurring in the pond.
3. There are no predatory fish in the pond. Small fish, such as sticklebacks and minnows are not considered to be predatory fish.
4. There are egg attachment sites (woody debris and shrubs are frequently used and sometimes herbaceous vegetation is used if woody vegetation is lacking).

In addition to the four criteria provided by the Guelph District MNRF, the following conditions and characteristics were also recorded to thoroughly assess each potential pond:

- Shape and approximate size of the pond/vernal pool;
- Approximate water depth;
- Percentage of canopy cover over the pond;
- Surrounding ELC community;
- Presence and species of emergent vegetation; and,
- Incidental observations, especially if other amphibians or reptiles are using the pond.

### **Salamander Adult Tissue Sampling – Minnow Trapping**

Minnow traps were set in suitable ponds/vernal pools. The total number of traps depended on the size of each pond/vernal pool. Each trap was well anchored, provided with a unique identifier, flagged and marked with pond/vernal pool UTM coordinates. The traps were set on appropriate evenings once salamanders had migrated to their breeding habitat. The traps were then checked early the following morning. Minnow traps were removed from ponds/vernal pools when sampling was not taking place.

Tissue samples (3 mm to 5 mm tail tips) were collected from each salamander caught. Each tissue sample was provided with an ID code, a UTM and ID of each pond/vernal pool. All trapped salamanders were immediately released to the breeding pond/vernal pool after the tail tip was collected and properly documented. The tissue samples were delivered to Dr. James Bogart at the University of Guelph to conduct genetic analyses for each sample.

The trapping survey involved up to five nights of trap setting. However, if 20 tissue samples were collected in less than five settings from the same pond, the surveys were then considered complete and no further sampling occurred at that pond.

## **Results – Salamander Surveys**

A total of 43 ponds/vernal pools were identified as suitable salamander habitat and were sampled using the above methods (**Figure 4, Appendix A**). Of the 43 ponds/vernal pools, salamanders and tissue samples were collected at the following 11 sites: AF1, AF2, C3, D, R2, R3, Q1, Q2, Q3, V1 and Y2. Therefore, a total of 11 sites are considered salamander breeding ponds. A final assessment of each salamander pond determined that AF1 and AF2 are one pond collectively identified as AF below, R2 and R3 are one pond identified as R below, and Q1, Q2 and Q3 are one pond, identified below as Q.

A total of 68 tissue samples were collected and sent for genetic analysis to Dr. Bogart at the University of Guelph. The following number of salamanders were collected and sampled at the following ponds:

| POND | # COLLECTED | # SAMPLED |
|------|-------------|-----------|
| AF   | 19          | 19        |
| C3   | 11          | 11        |
| D1   | 1           | 1         |
| Q    | 12          | 11        |
| R    | 49          | 23        |
| V1   | 1           | 1         |
| Y2   | 1           | 1         |

All collected samples were identified as Blue-spotted salamanders. No Jefferson Salamanders (JESA) were found within the sampled ponds/vernal pools.

## **Methods – Amphibian Call Count Surveys**

Amphibian call count surveys were conducted on the evenings of April 22 and 23 (Round 1); May 13 and 14 (Round 2); and June 16, 2014. Survey station locations were determined through a combination of the assessment of ortho-photography, vegetation communities and ground observations. Locations of survey stations are depicted on **Figure 5, Appendix A**.

Surveys were conducted at night, in accordance with the Marsh Monitoring Program (Crewe et al., 2006). The call count surveys began approximately 30 minutes after sunset until midnight. Each station was surveyed three times (once in April, once in May and once in June) during optimal weather conditions (low wind levels, no heavy rain). The protocol required minimum night air temperatures were adhered to during each round of surveys, and surveys were conducted at least 15 days apart. All calls heard within a survey station were recorded as well as any call observations outside of the Study Area on adjacent lands.

## **Results – Amphibian Call Count Surveys**

A total of 28 amphibian call count stations were surveyed within the Study Area (**Table 6, Appendix B**). Stations were located within wetland habitats such as swamps, marshes and ponds (**Figure 5, Appendix A**).

A total of seven amphibian species were heard calling within the Study Area during the three rounds of call count surveys. All of these species are provincially ranked S5 (common and secure) or S4 (apparently common and secure).

No breeding amphibians were identified at stations 3, 5, 9, 14 and 18 during all three rounds of surveys. Breeding amphibians were recorded during all three rounds at stations 1, 2, 6, 11, 12, 16, 22 and 23. Highly active amphibian calling stations (full chorus [call code level of 3] and > 4 species) included the following stations: 1, 6, 12, 13, 16 and 26. Also of note, at station 1 during a May rain event, numerous Spring Peepers, Gray Tree Frogs and American Toads were found on or crossing the road. A large number of mortalities were also observed.

### **3.1.3 Reptiles**

#### **Methods – Turtle Surveys**

Three rounds of reptile surveys were completed, occurring on June 5, 16 and 26, 2014. Survey sites were identified through a preliminary review of aerial photography to identify potential summer foraging pond locations, which were further verified in the field. Surveys were focused in June to maximize species nesting observations. Surveys were conducted either before 13:00 or after 17:00 on sunny days when temperatures were between 10°C to 25°C, or after a day of rain.

Water bodies were observed for ten minutes from each observation point for turtle presence. The edges of the water body, rocks and logs were scanned for basking turtles using binoculars to confirm species and number. The surface of the water body was scanned for submerged shells and emergent heads. Approximately 50 m of the Mill Creek shoreline was also walked and surveyed for signs of turtles. Additionally, roadsides were surveyed for mortalities, test pits and predated nests.

#### **Results – Turtle Surveys**

The existing Mill Creek crossing by Shellard Road and two ponds were surveyed for evidence of turtle basking and nesting (**Figure 6, Appendix A**).

Station 1 is located at the intersection of Shellard Sideroad and Gore Road. No turtles were observed at this station; however, three predated nests (two Midland Painted Turtle nests and one Snapping Turtle nest) were recorded.

The majority of turtles were observed at Station 2. This station consisted of a large pond located at the southeast corner of the intersection of Shellard Sideroad and Clyde Road. A total of 24 Midland Painted Turtle observations and four Snapping Turtle observations were recorded over the three visits. Two Midland turtle test pits, as well as possible signs of Snapping turtle nesting were observed along Clyde Road at Station 2.

Three Midland Painted turtles (two adults and one young of the year) were observed dead on the road at Station 3, a pond along the west side of Shellard Sideroad.

### **Methods – Breeding Bird Surveys**

Breeding bird surveys were conducted on May 29 and 30 (round 1) and June 23 and 24 (round 2). The survey protocol was based on a combination of the Ontario Breeding Bird Atlas (Cadman et al., 2005), the Forest Bird Monitoring Program (CWS, 2005) and the Marsh Monitoring Program (Crewe et al., 2006).

Surveys were conducted between dawn and five hours after dawn with suitable wind conditions, in the absence of thick fog or precipitation. Point count stations were located in various vegetation communities within the Study Area to help determine the presence, diversity and abundance of bird species. Each point count station was surveyed for 10 minutes (**Figure 7, Appendix A**). All birds that were heard or observed within the 100 m radius of the point count station were recorded.

Open grassland habitat, including pasture, hay fields and fallow areas, was surveyed according to provincial Ministry of Natural Resources (MNR) Guidelines for Bobolink and Eastern Meadowlark (MNR, 2012). Point count stations (discussed above) were located within open grassland habitat. Where this habitat was greater than 250 m wide or long, two-point count stations were completed (point count stations are set up every 250 m in large habitats). Transects, or walking the open grassland habitat (area searches), were also conducted in addition to the 10-minute point count stations to determine the presence of these grassland bird species at risk.

### **Results – Breeding Bird Surveys**

A total of thirteen-point count stations (PCs) were surveyed within the Study Area. Stations were located within lowland deciduous forests, pine plantations, open meadow, wetlands, hayfields, wet meadows and thickets. (**Figure 7, Appendix A**).

A total of 69 bird species were observed within the Subject Lands (**Table 5, Appendix B**). Of this total, 11 species are confirmed breeders, 41 are probable breeders and 16 are possible breeders. The remaining bird species (1) is considered a non-breeder, flyover or migrant.

A total of 64 (93%) of the confirmed, probable or possible breeders are provincially ranked S5 (common and secure) and S4 (apparently common and secure) or SNA (introduced species

such as Rock Pigeon and European Starling). The remaining 5 bird species are considered S1 – S3 (critically imperiled to vulnerable) and are discussed below.

***Species at Risk and Provincially Significant Species (S1 – S3)***

|                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                            |
|---------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b><i>Barn Swallow</i></b><br><b><i>(threatened)</i></b>            | <ul style="list-style-type: none"> <li>Birds were observed at PCs 3, 4, 5, 12 and 21.</li> <li>Most observations involved small numbers of foraging birds. However, the barn structures at PC 21 hosted a number of nesting birds.</li> <li>Additionally, a number of recently fledged young (5) were seen near PC 11 on June 24 and were presumed to have come from a nearby decrepit building.</li> </ul>                |
| <b><i>Bobolink</i></b><br><b><i>(threatened)</i></b>                | <ul style="list-style-type: none"> <li>Singing males were observed at PCs 3, 4 and 12.</li> <li>The only female observed was at PC 3 in a hayfield with suitable breeding habitat.</li> <li>The males at the other two-point count stations were in fields that had been cut about two weeks previous and were growing back.</li> <li>Another male was observed along Clyde Road on May 29 in suitable habitat.</li> </ul> |
| <b><i>Eastern Meadowlark</i></b><br><b><i>(threatened)</i></b>      | <ul style="list-style-type: none"> <li>Birds were observed at PCs 3 and 5.</li> <li>A presumed breeding pair was present at PC 3 while two singing males were heard at PC 5; one male was on the east side of Shellard Line and the other was on the west side of the large pond, both in suitable habitat.</li> <li>Another individual was singing along Clyde Road on May 29 in suitable habitat.</li> </ul>             |
| <b><i>Eastern Wood Pewee</i></b><br><b><i>(special concern)</i></b> | <ul style="list-style-type: none"> <li>This site had birds on territory in 2013 as well.</li> <li>Singing males were detected at PC 6 and 14.</li> <li>Two males were present at PC 14 on May 29.</li> <li>Another singing male was heard near PC 22 on May 30 and another south of PC 9 in a woodlot on June 24.</li> </ul>                                                                                               |
| <b><i>Wood Thrush</i></b><br><b><i>(special concern)</i></b>        | <ul style="list-style-type: none"> <li>Singing males were detected at PCs 1 and 8.</li> <li>No other breeding evidence was observed.</li> </ul>                                                                                                                                                                                                                                                                            |

### ***Area-sensitive Species***

The following area sensitive species were recorded in the Study Area. Minimum size requirements of forested areas specific to each species are provided below:

| SPECIES                 | MINIMUM AREA REQUIREMENTS (HA) |
|-------------------------|--------------------------------|
| Cooper's Hawk           | 4-50+                          |
| Hairy Woodpecker        | 10                             |
| Pileated Woodpecker     | 30-50                          |
| White-breasted Nuthatch | 10                             |
| Brown Creeper           | 30                             |
| Veery                   | 10-20                          |
| Ovenbird                | 20                             |
| Northern Waterthrush    | 20                             |
| American Redstart       | 20-30                          |
| Pine Warbler            | 15-30                          |
| White-throated Sparrow  | 20                             |

### ***Regionally Significant Species***

Twenty-six of the breeding bird species are listed as regionally significant (Region of Waterloo). These include: Wood Duck, Hooded Merganser, Pied-billed Grebe, Green Heron, Cooper's Hawk, Turkey Vulture, Black-billed Cuckoo, Ruby-throated Hummingbird, Red-bellied Woodpecker, Hairy Woodpecker, Pileated Woodpecker, Willow Flycatcher, Red-breasted Nuthatch, Brown Creeper, Veery, Ovenbird, Northern Waterthrush, Blue-winged Warbler, American Redstart, Pine Warbler, Swamp Sparrow, White-throated Sparrow, Orchard Oriole and Purple Finch.

### ***3.2 Aquatic Systems***

The review of aquatic systems (watercourses, streams, rivers) has been largely completed through an assessment of existing background information. At this point in the study, sufficient

information is available to analyze various route alternatives. With linear road corridor projects, the criteria for screening alternatives generally involves an examination of the number of potential watercourse crossings associated with each alternative. For the East Boundary Corridor study, Mill Creek and Moffat Creek represent the most sensitive watercourses. For the assessment of alternatives, both Mill Creek and Moffat Creek will be crossed at some location along their respective lengths. The examination of additional watercourses, including intermittent systems and minor tributaries to each of the major systems, was undertaken as a desktop exercise, with reconnaissance carried out during other, more detailed surveys related to amphibian habitat.

More detailed analyses of potential crossing areas are expected as preliminary route alternatives are screened out and the study moves towards preliminary design.

#### 4.0 SUMMARY

The East Boundary Road Corridor Environmental Assessment process is intended to identify a preferred corridor alignment for a future arterial road designed to link Townline Road in the north end of the study area to the South Boundary Road intersection at Dundas Street in the south end of the study area. The natural environment component is one of a series of criteria that are examined to arrive at a preferred alternative, with other components such as social impacts, transportation effectiveness and geometry, archaeology and cultural heritage and cost also playing a role in the determination of the preferred alternative.

This report documents the various desktop and field survey activities that were undertaken to identify and to characterize the natural environment within the study area as input to the larger evaluation process led by MTE Consulting Inc. Detailed field surveys identified various areas of significant and sensitive environmental features and functions (e.g., wildlife habitat and vegetation communities). That information informed the development of potential alternative route locations for the future East Boundary Road.

Technical information generated and summarized in this report provides the basis from which potential impacts associated with each alternative, can be assessed and evaluated. This information will also inform any minor adjustments to alternative routes to further avoid and/or minimize potential effects, and will inform broad mitigation recommendations when advancing a preferred alternative. Subsequent to this report, an evaluation report will be prepared building upon the information in this Data Collection Summary Report.

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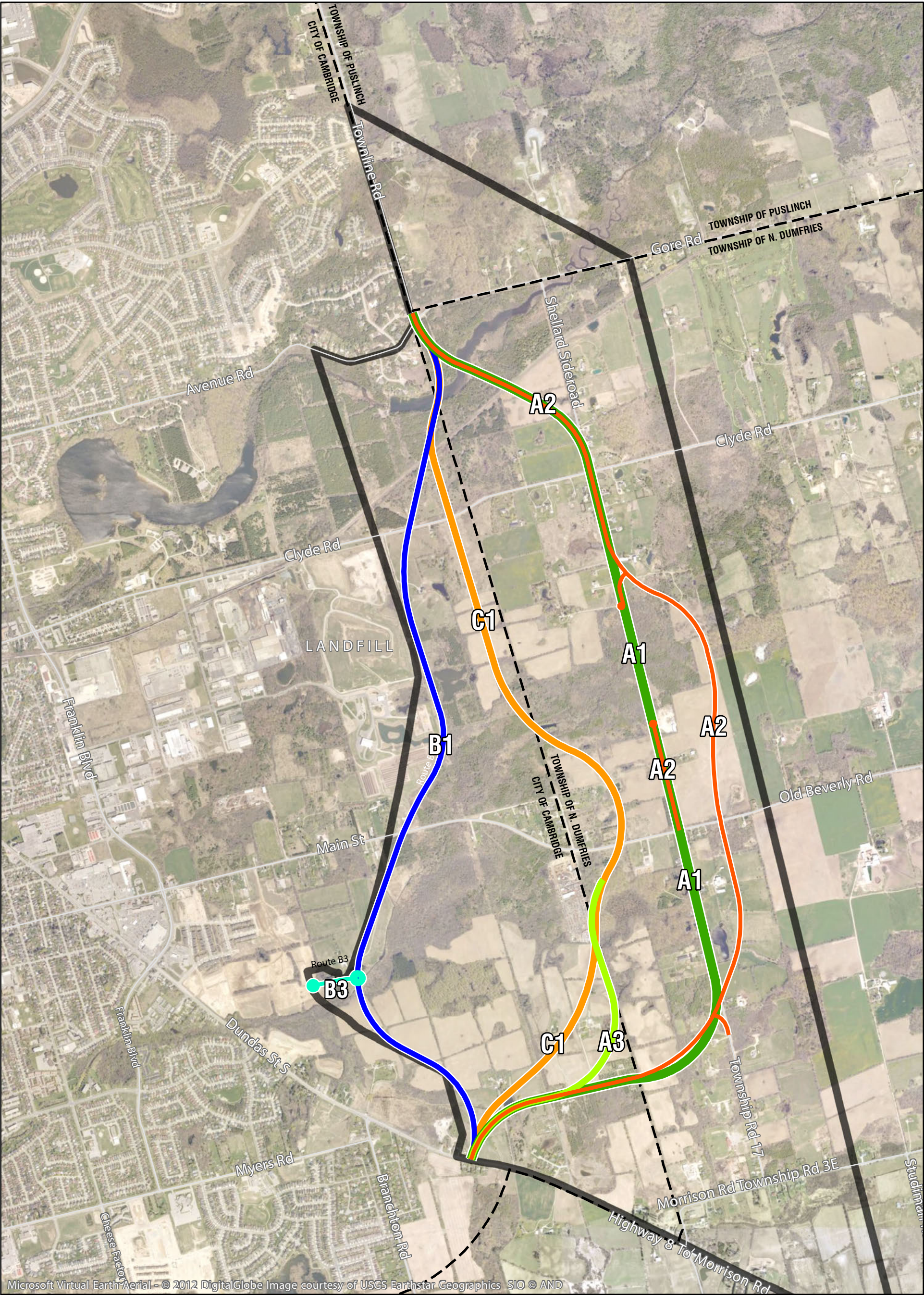


Tom Hilditch  
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## 5.0 REFERENCES AND BACKGROUND MATERIAL

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## **APPENDIX A: FIGURES**



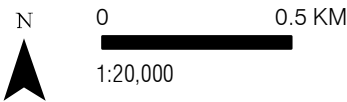
Study Area      City boundary

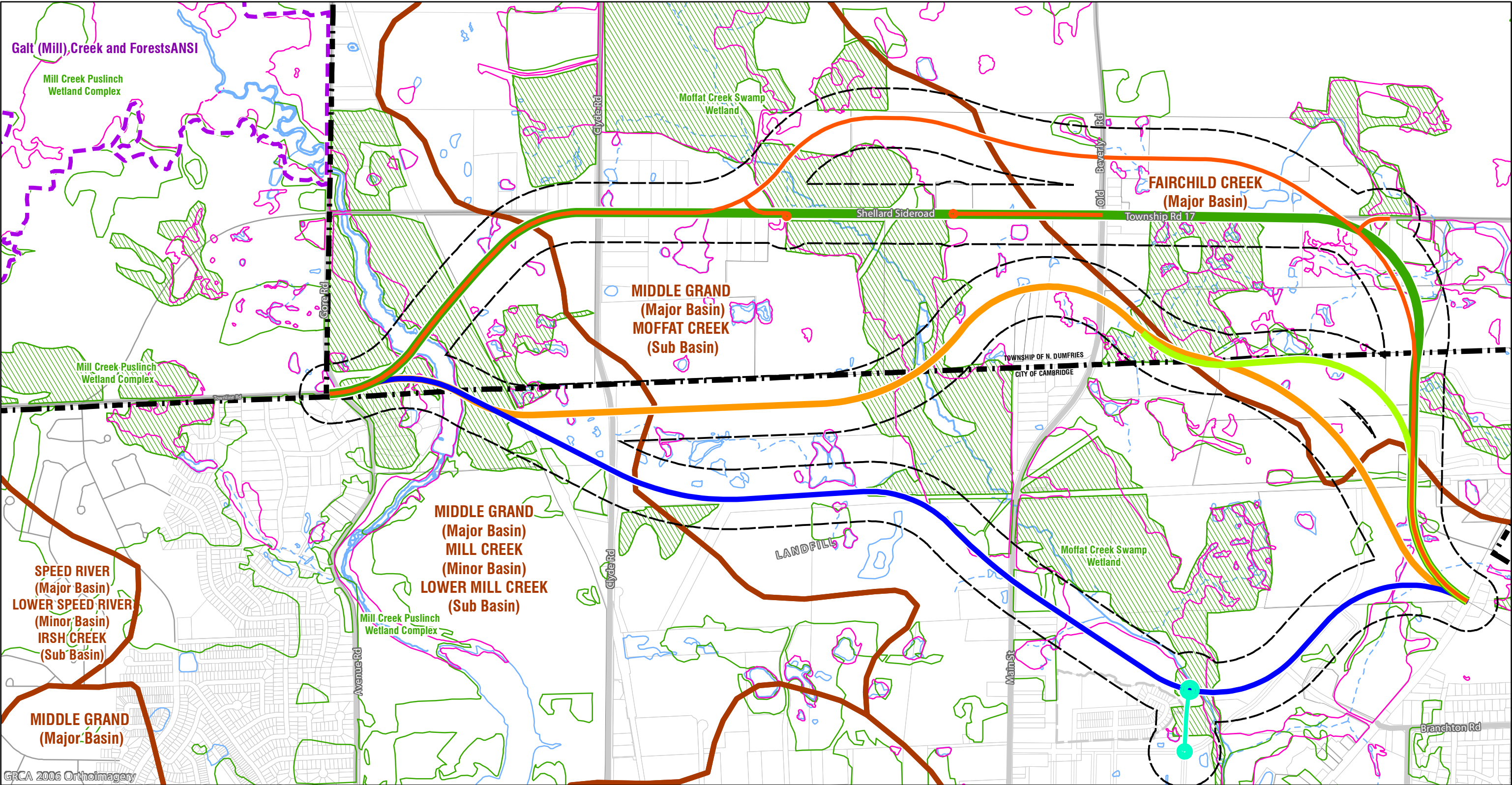
Route Alternative (MTE)

- |                      |                      |
|----------------------|----------------------|
| Route A2 (former A3) | Route B1             |
| Route A1             | Route B3             |
| Route A3 whole       | Route C1 (former C4) |

City of Cambridge East Boundary Corridor EA

Figure 1  
Study Area





City of Cambridge Boundary

**Ponds, Streams, Creeks (Terranet)**

- Creeks, major
- Creeks, minor
- Creeks, intermittent
- Ponds

**Route Alternative (MTE)**

- Route A2
- Route A1
- Route A3
- Route B1
- Route B3
- Route C1
- Route Alternative 120m buffer

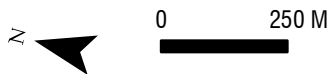
**Natural Features**

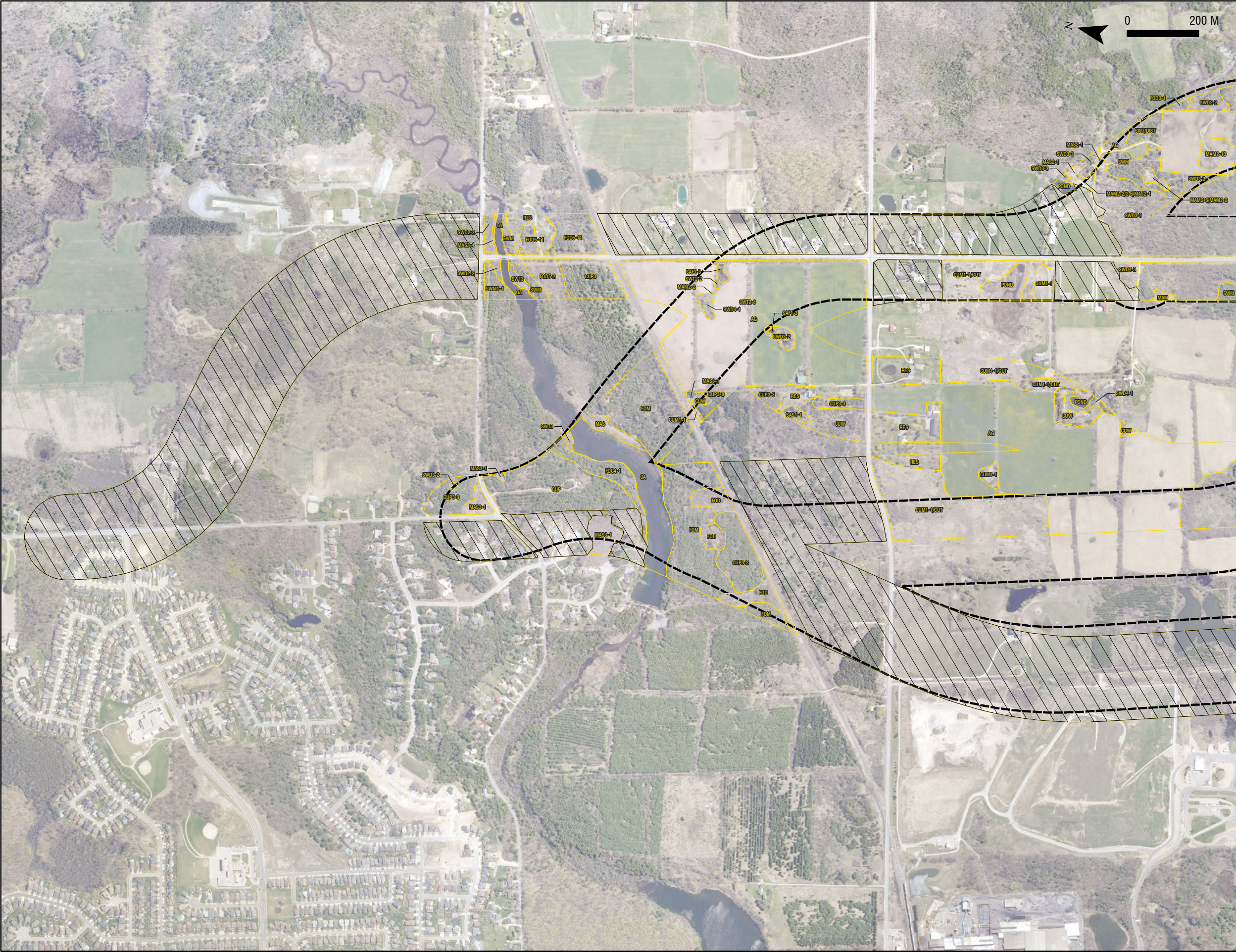
- Subcatchment basin (GRCA)
- Waterbody (MNRF LIO)
- Woodland (MNRF LIO)
- Significant woodlands > 4 ha (327 ha)

- ANSI Life Science (MNRF LIO)
- Wetland (GRCA)

City of Cambridge East Boundary Corridor EA

**Figure 2**  
**Natural Features**





**ELC LEGEND**  
**FOREST**  
FOC2-2 Dry-Fresh White Cedar Coniferous Forest  
FOC4-1 Fresh-Moist White Cedar Coniferous Forest  
FOM Mixed Forest  
FOD Deciduous Forest  
FOD3-1 Dry-Fresh Poplar Deciduous Forest  
FOD5-1 Dry-Fresh Sugar Maple Deciduous Forest  
FOD5-2 Dry-Fresh Sugar Maple-Beech Deciduous Forest  
FOD5-11\* Dry-Fresh Sugar Maple-Hardwood Deciduous Forest  
FOD7-2 Fresh-Moist Ash Lowland Deciduous Forest  
FOD8-1 Fresh-Moist Poplar Deciduous Forest

**SWAMP**  
SWD Deciduous Swamp  
SWD2-2 Green Ash Mineral Deciduous Swamp  
SWD3-2 Silver Maple Mineral Deciduous Swamp  
SWD3-3 Swamp Maple Mineral Deciduous Swamp  
SWD4-1 Willow Mineral Deciduous Swamp  
SWD4-3 Poplar Mineral Deciduous Swamp  
SWM Mixed Swamp  
SWM1-1 White Cedar-Hardwood Mineral Mixed Swamp  
SWT Thicket Swamp  
SWT2-2 Willow Mineral Thicket Swamp  
SWT2-5 Red-osier Mineral Thicket Swamp  
SWT2-8 Silky Dogwood Mineral Thicket Swamp  
SWT3 Mixed Organic Thicket Swamp  
SWT3-2 Willow Organic Thicket Swamp

**MARSH**  
MAM Meadow Marsh  
MAM2-2 Reed-canary Grass Mineral Meadow Marsh  
MAM2-6 Broad-leaved Sedge Mineral Meadow Marsh  
MAM2-10 Forb Mineral Meadow Marsh  
MAM3-6 Broad-leaved Sedge Organic Meadow Marsh  
MAS Shallow Marsh  
MAS2-1 Cattail Mineral Shallow Marsh  
MAS3-1 Cattail Organic Shallow Marsh  
MAS3-4 Broad-leaved Sedge Organic Shallow Marsh

**SHALLOW WATER**  
SAF1-3 Duckweed Floating-leaved Shallow Aquatic  
SAS1-1 Pondweed Submerged Shallow Aquatic

**CULTURAL**  
CUP Plantation  
CUP3 Coniferous Plantations  
CUP3-2 White Pine Coniferous Plantation  
CUP3-3 Scots Pine Coniferous Plantation  
CUP3-8 White Spruce Cultural Plantation  
CUT Cultural Thicket  
CUT1-4 Grey Dogwood Cultural Thicket  
CUW Cultural Woodland  
CUM1-1 Dry-Moist Old Field Meadow

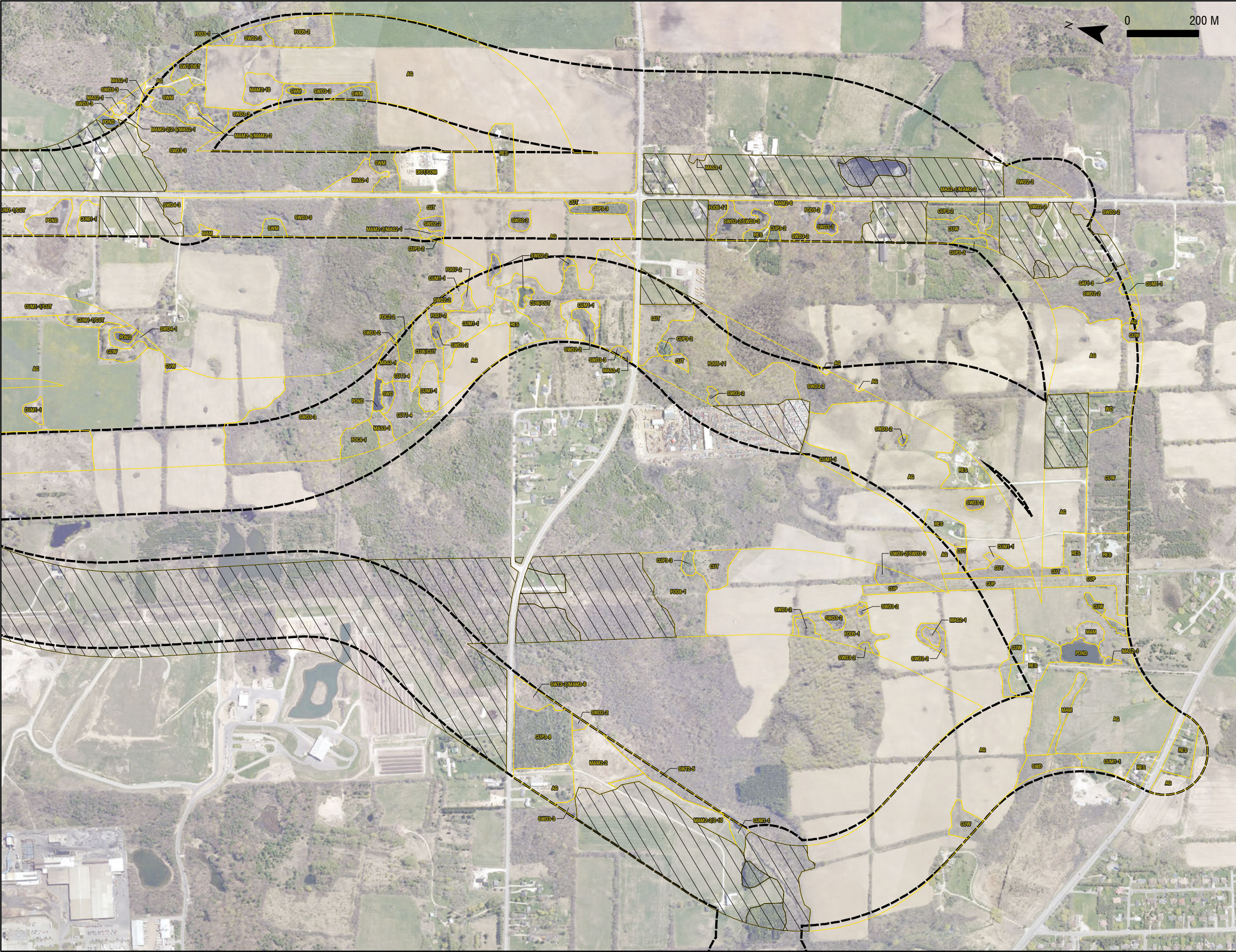
\*not listed in Southern Ontario ELC

AG Agricultural  
POND Pond  
DIST Disturbed  
IND Industrial

Route Alternative 120m buffer  
 Ecological land classification  
 Areas not accessible

City of Cambridge East Boundary Corridor EA

Figure 3  
Ecological Land Classification



- ELC LEGEND**
- FOREST**
- FOC2-2 Dry-Fresh White Cedar Coniferous Forest
  - FOC4-1 Fresh-Moist White Cedar Coniferous Forest
  - FOM Mixed Forest
  - FOD Deciduous Forest
  - FOD3-1 Dry-Fresh Poplar Deciduous Forest
  - FOD5-1 Dry-Fresh Sugar Maple Deciduous Forest
  - FOD5-2 Dry-Fresh Sugar Maple-Beech Deciduous Forest
  - FOD5-11\* Dry-Fresh Sugar Maple-Hardwood Deciduous Forest
  - FOD7-2 Fresh-Moist Ash Lowland Deciduous Forest
  - FOD8-1 Fresh-Moist Poplar Deciduous Forest
- SWAMP**
- SWD Deciduous Swamp
  - SWD2-2 Green Ash Mineral Deciduous Swamp
  - SWD3-2 Silver Maple Mineral Deciduous Swamp
  - SWD3-3 Swamp Maple Mineral Deciduous Swamp
  - SWD4-1 Willow Mineral Deciduous Swamp
  - SWD4-3 Poplar Mineral Deciduous Swamp
  - SWM Mixed Swamp
  - SWM1-1 White Cedar-Hardwood Mineral Mixed Swamp
  - SWT Thicket Swamp
  - SWT2-2 Willow Mineral Thicket Swamp
  - SWT2-5 Red-osier Mineral Thicket Swamp
  - SWT2-8 Silky Dogwood Mineral Thicket Swamp
  - SWT3 Mixed Organic Thicket Swamp
  - SWT3-2 Willow Organic Thicket Swamp
- MARSH**
- MAM Meadow Marsh
  - MAM2-2 Reed-canary Grass Mineral Meadow Marsh
  - MAM2-6 Broad-leaved Sedge Mineral Meadow Marsh
  - MAM2-10 Forb Mineral Meadow Marsh
  - MAM3-6 Broad-leaved Sedge Organic Meadow Marsh
  - MAS Shallow Marsh
  - MAS2-1 Cattail Mineral Shallow Marsh
  - MAS3-1 Cattail Organic Shallow Marsh
  - MAS3-4 Broad-leaved Sedge Organic Shallow Marsh
- SHALLOW WATER**
- SAF1-3 Duckweed Floating-leaved Shallow Aquatic
  - SAS1-1 Pondweed Submerged Shallow Aquatic

- CULTURAL**
- CUP Plantation
  - CUP3 Coniferous Plantations
  - CUP3-2 White Pine Coniferous Plantation
  - CUP3-3 Scots Pine Coniferous Plantation
  - CUP3-8 White Spruce Cultural Plantation
  - CUT Cultural Thicket
  - CUT1-4 Grey Dogwood Cultural Thicket
  - CUW Cultural Woodland
  - CUM1-1 Dry-Moist Old Field Meadow

- \*not listed in Southern Ontario ELC
- AG Agricultural
  - POND Pond
  - DIST Disturbed
  - IND Industrial

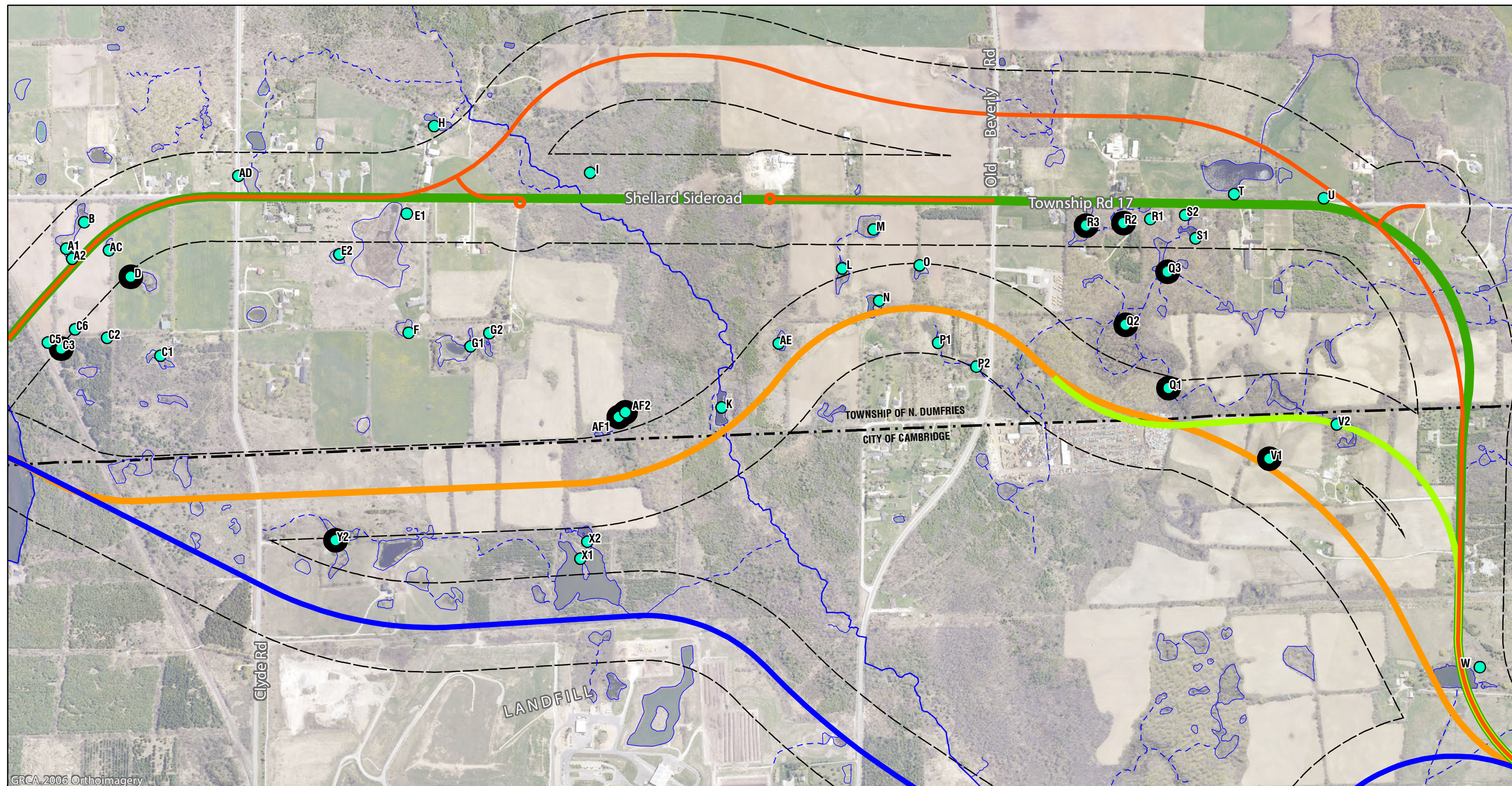
- Route Alternative 120m buffer
- Ecological land classification
- Areas not accessible

City of Cambridge East Boundary Corridor EA

## Figure 3 Ecological Land Classification

SHEET 2 OF 2





GRCA 2006 Orthoimagery

- Route Alternative 120m buffer
- City of Cambridge Boundary

#### Ponds, Streams, Creeks (Terranet)

- Creek, major
- Creek, minor
- Creek, intermittent
- Pond

#### Route Alternative (MTE)

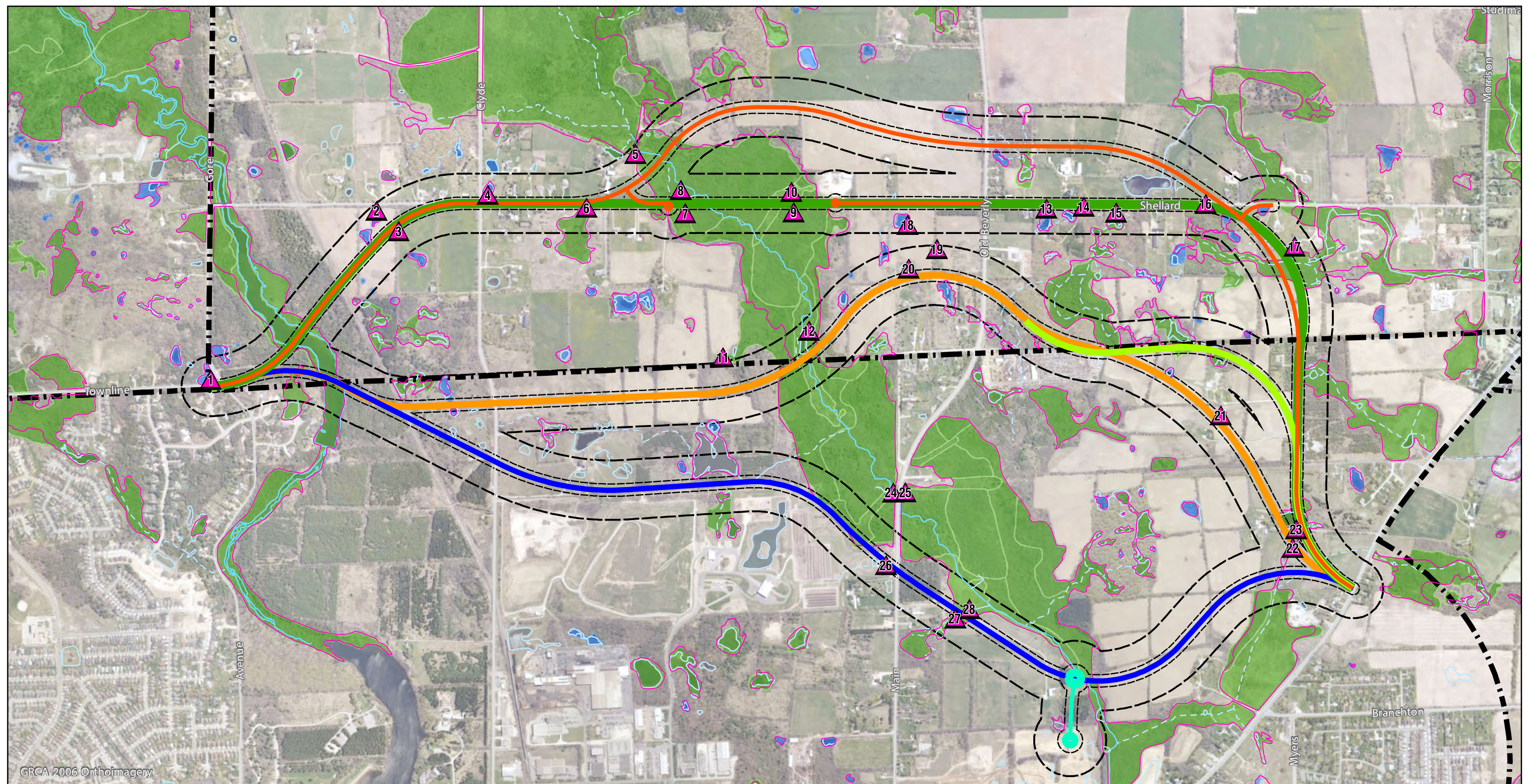
- Route A2
- Route A1
- Route A3
- Route B1
- Route B3
- Route C1

- Location of Potential Salamander Ponds
- Salamander present at time of survey

City of Cambridge East Boundary Corridor EA

## Figure 4 Salamander Ponds





- Route Alternative 120m buffer
- Route Alternative 25m buffer
- City of Cambridge Boundary
- Wetland (GRCA)
- Wetland Evaluated-Provincial (MNRF LIO)
- Wetland Not evaluated per OWES (MNRF LIO)

#### Ponds, Streams, Creeks (Terranet)

- Creeks, intermittent
- Creeks, major
- Creeks, minor
- Ponds

#### Route Alternative (MTE)

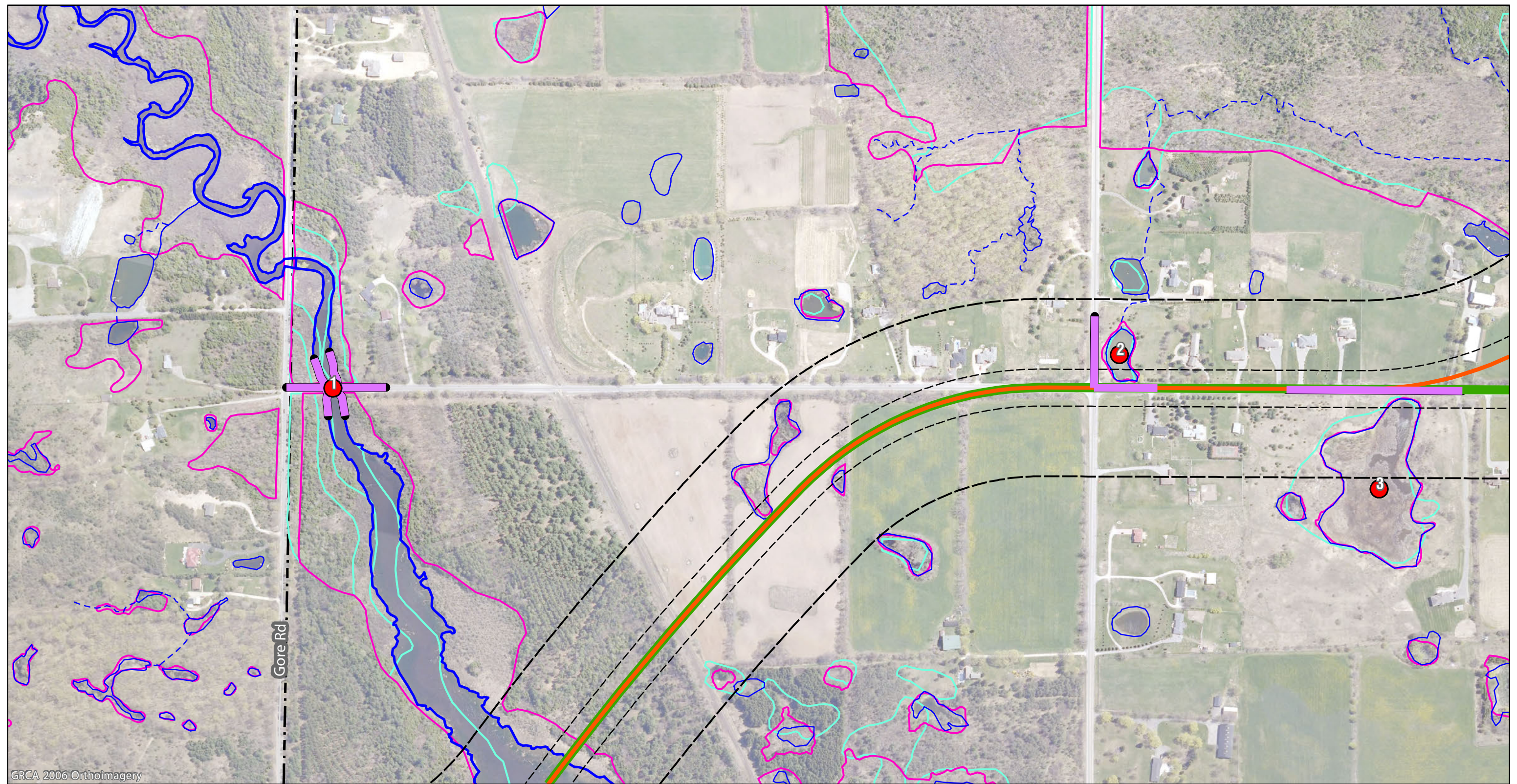
- Route A2
- Route A1
- Route A3
- Route B1
- Route B3
- Route C1

- ▲ Amphibian call count station

City of Cambridge East Boundary Corridor EA

**Figure 5**  
**Amphibian Call Count Stations**

0 200 Meters



GRCA 2006 Orthoimagery

- |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li><span style="border: 1px dashed black; display: inline-block; width: 20px; height: 10px; margin-right: 5px;"></span> Route Alternative 25m buffer</li> <li><span style="border: 2px dashed black; display: inline-block; width: 20px; height: 10px; margin-right: 5px;"></span> Route Alternative 120m buffer</li> <li><span style="border-top: 1px dashed black; display: inline-block; width: 20px; height: 1px; margin-right: 5px;"></span> City of Cambridge Boundary</li> <li><span style="border-bottom: 2px solid magenta; display: inline-block; width: 20px; height: 1px; margin-right: 5px;"></span> Wetland (GRCA)</li> <li><span style="border-bottom: 2px solid cyan; display: inline-block; width: 20px; height: 1px; margin-right: 5px;"></span> Wetland (MNR)</li> </ul> | <b>Ponds, Streams, Creeks (Terranet)</b> <ul style="list-style-type: none"> <li><span style="border-bottom: 2px dashed blue; display: inline-block; width: 20px; height: 1px; margin-right: 5px;"></span> CREEKS_INTERMITTENT</li> <li><span style="border-bottom: 2px solid blue; display: inline-block; width: 20px; height: 1px; margin-right: 5px;"></span> CREEKS_MAJOR</li> <li><span style="border-bottom: 2px solid blue; display: inline-block; width: 20px; height: 1px; margin-right: 5px;"></span> CREEKS_MINOR</li> <li><span style="border-bottom: 2px solid blue; display: inline-block; width: 20px; height: 1px; margin-right: 5px;"></span> PONDS</li> </ul> | <b>Route Alternative (MTE)</b> <ul style="list-style-type: none"> <li><span style="display: inline-block; width: 20px; height: 5px; background-color: orange; margin-right: 5px;"></span> Route A2</li> <li><span style="display: inline-block; width: 20px; height: 5px; background-color: green; margin-right: 5px;"></span> Route A1</li> <li><span style="display: inline-block; width: 20px; height: 5px; background-color: yellow; margin-right: 5px;"></span> Route A3</li> <li><span style="display: inline-block; width: 20px; height: 5px; background-color: blue; margin-right: 5px;"></span> Route B1</li> <li><span style="display: inline-block; width: 20px; height: 5px; background-color: cyan; margin-right: 5px;"></span> Route B3</li> <li><span style="display: inline-block; width: 20px; height: 5px; background-color: orange; margin-right: 5px;"></span> Route C1</li> </ul> | <ul style="list-style-type: none"> <li><span style="display: inline-block; width: 10px; height: 10px; background-color: red; border-radius: 50%; border: 1px solid black; margin-right: 5px;"></span> Turtle survey station</li> <li><span style="display: inline-block; width: 20px; height: 5px; background-color: magenta; margin-right: 5px;"></span> Turtle road survey location</li> </ul> |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

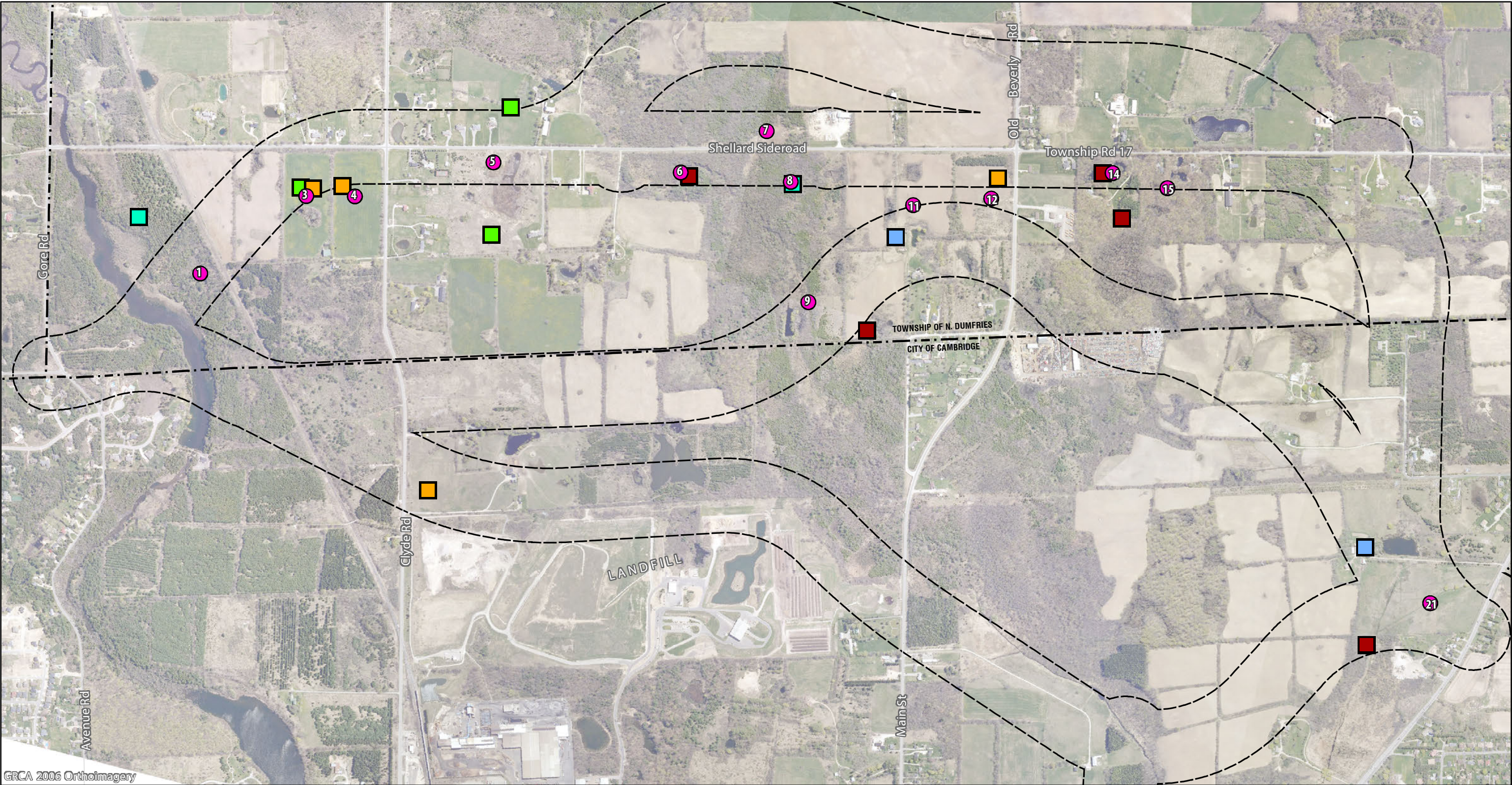
**City of Cambridge East Boundary Corridor EA**

**Figure 6**

**Reptile Survey Stations 2014**

0 100 M

1:5,000



GRCA 2006 Orthoimagery

--- City of Cambridge Boundary  
 --- Route Alternative 120m buffer

**Breeding bird point count stations**  
 ● 2014

**Species at Risk**

|                                       |                      |
|---------------------------------------|----------------------|
| ■ Barn Swallow (nest structures only) | ■ Eastern Wood Pewee |
| ■ Bobolink                            | ■ Wood Thrush        |
| ■ Eastern Meadowlark                  |                      |

**City of Cambridge East Boundary Corridor EA**  
**Figure 7 Breeding Bird Point Count Stations 2014**

0 250 M  

## **APPENDIX B: ECOLOGICAL SURVEY RESULTS**

**Table 1: MNRF LIST OF SAR AND RARE VEGETATION COMMUNITIES ON, OR IN, THE SURROUNDING CAMBRIDGE VICINITY OF STUDY AREA**

|                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• Jefferson Salamander</li> <li>• Blanding's Turtle</li> <li>• Eastern Ribbonsnake</li> <li>• Milksnake</li> <li>• Northern Map Turtle</li> <li>• Queensnake</li> <li>• Snapping Turtle</li> <li>• Wood Turtle</li> <li>• Acadian Flycatcher</li> <li>• Bald Eagle</li> <li>• Barn Swallow</li> <li>• Black Tern</li> <li>• Bobolink</li> <li>• Canada Warbler</li> <li>• Cerulean Warbler</li> </ul> | <ul style="list-style-type: none"> <li>• Chimney Swift</li> <li>• Common Nighthawk</li> <li>• Eastern Meadowlark</li> <li>• Golden-winged Warbler</li> <li>• Henslow's Sparrow</li> <li>• Hooded Warbler</li> <li>• Least Bittern</li> <li>• Louisiana Waterthrush</li> <li>• Northern Bobwhite</li> <li>• Olive-sided Flycatcher</li> <li>• Peregrine Falcon</li> <li>• Red-headed Woodpecker</li> <li>• Short-eared Owl</li> <li>• Whip-poor-will</li> <li>• Yellow-breasted Chat</li> </ul> | <ul style="list-style-type: none"> <li>• Monarch Butterfly</li> <li>• Rusty-patched Bumble Bee</li> <li>• West Virginia White</li> <li>• American Badger</li> <li>• Black Redhorse</li> <li>• Silver Shiner</li> <li>• Rainbow Mussel</li> <li>• Wavy-rayed Lampmussel</li> <li>• Pygmy Pocket Moss</li> <li>• American Chestnut</li> <li>• American Ginseng</li> <li>• Butternut</li> <li>• Eastern Flowering Dogwood</li> <li>• Green Dragon</li> <li>• Kentucky Coffee-tree</li> </ul> |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

**Table 2: Summary of Natural Heritage Field Investigations (Savanta Inc. 2014)**

| FIELD SURVEY DATE<br>(2014)                                                                         | FIELD WORK TYPE                                                                                                                       |
|-----------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>March (various dates)</li> </ul>                             | <ul style="list-style-type: none"> <li>Salamander habitat assessments to determine appropriate locations for trap sampling</li> </ul> |
| <ul style="list-style-type: none"> <li>April 9, 10, 13, 14, 15, 16, 17</li> </ul>                   | <ul style="list-style-type: none"> <li>Salamander trapping and tissue sampling</li> </ul>                                             |
| <ul style="list-style-type: none"> <li>April 22, 23</li> <li>May 13, 14</li> <li>June 16</li> </ul> | <ul style="list-style-type: none"> <li>Amphibian call count surveys</li> </ul>                                                        |
| <ul style="list-style-type: none"> <li>June 5, 16, 26</li> </ul>                                    | <ul style="list-style-type: none"> <li>Reptile surveys</li> </ul>                                                                     |
| <ul style="list-style-type: none"> <li>May 29, 30</li> <li>June 23, 24</li> </ul>                   | <ul style="list-style-type: none"> <li>Breeding bird surveys</li> </ul>                                                               |
| <ul style="list-style-type: none"> <li>May 29</li> <li>June 18</li> <li>July 11</li> </ul>          | <ul style="list-style-type: none"> <li>Ecological Land Classification (ELC) and Botanical inventories</li> </ul>                      |

**Note:**

- Detailed survey methods and results are provided in **Section 3** of the report.

**Table 3 ELC Community Types**

| ELC TYPE                                                           | COMMUNITY DESCRIPTION                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|--------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>FOREST</b>                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>FOC2-2</b><br>Dry-fresh white cedar coniferous forest           | <ul style="list-style-type: none"> <li>This forest type is composed almost entirely of white cedar in all woody strata.</li> <li>Due to shading, acidic soils and competition, there is very little development of the herb layer.</li> </ul>                                                                                                                                                                                                                        |
| <b>FOC4-1</b><br>Fresh-moist white cedar coniferous forest         | Structurally and floristically very similar to FOC2-2, it differs in its moister soil conditions and location in low-lying areas.                                                                                                                                                                                                                                                                                                                                    |
| <b>FOM</b><br>Mixed forest                                         | <ul style="list-style-type: none"> <li>This is a general group incorporating various stands of coniferous and deciduous tree species.</li> </ul>                                                                                                                                                                                                                                                                                                                     |
| <b>FOD3-1</b><br>Dry-fresh poplar deciduous forest                 | <ul style="list-style-type: none"> <li>These are upland communities of trembling aspen, with some presence of sugar maple, white birch and white ash.</li> </ul>                                                                                                                                                                                                                                                                                                     |
| <b>FOD5-1</b><br>Dry-fresh sugar maple deciduous forest            | <ul style="list-style-type: none"> <li>These are usually mature stands of predominantly sugar maple, with minor presence of beech, basswood, white ash and shagbark hickory.</li> <li>The shrub layer is moderately well developed, while in the diverse herb layer such common species as may-apple, jack-in-the-pulpit, enchanter's nightshade, bloodroot, and many woodland sedges are present.</li> </ul>                                                        |
| <b>FOD5-2</b><br>Dry-fresh sugar maple-beech deciduous forest      | <ul style="list-style-type: none"> <li>Sugar maple, the dominant canopy species, is accompanied by beech and sometimes white ash, black cherry, shagbark hickory and white elm.</li> </ul>                                                                                                                                                                                                                                                                           |
| <b>FOD5-11*</b><br>Dry-fresh sugar maple-hardwood deciduous forest | <ul style="list-style-type: none"> <li>Sugar maple, the dominant canopy species, is accompanied by several other hardwoods, including white ash, beech, white elm, black cherry, and ironwood.</li> </ul>                                                                                                                                                                                                                                                            |
| <b>FOD7-2</b><br>Fresh-moist ash lowland deciduous forest          | <ul style="list-style-type: none"> <li>These stands are dominated by green ash, with admixtures of several other species, such as white elm, sugar maple, beech, white and yellow birch and bur oak.</li> </ul>                                                                                                                                                                                                                                                      |
| <b>FOD8-1</b><br>Fresh-moist poplar deciduous forest               | <ul style="list-style-type: none"> <li>In addition to trembling aspen, green ash, sugar maple and white pine are present.</li> <li>Common buckthorn is the main tall shrub species, followed by glossy buckthorn, nannyberry, inserted Virginia-creeper, and cranberry viburnum. Herbs include jack-in-the-pulpit, common woodland sedges, rough-leaved goldenrod and enchanter's nightshade.</li> </ul>                                                             |
| <b>SWAMP</b>                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>SWD2-2</b><br>Green ash mineral deciduous swamp                 | <ul style="list-style-type: none"> <li>This is the most common and largest land coverage vegetation type in the Study Area.</li> <li>The dominant green ash is frequently associated with silver and swamp maple, less so with yellow birch, white elm, black ash, bur oak, and trembling aspen.</li> <li>The shrub layer is typically well developed and composed of such species as glossy buckthorn, dwarf raspberry, poison ivy and common buckthorn.</li> </ul> |

| ELC TYPE                                                  | COMMUNITY DESCRIPTION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-----------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                           | <ul style="list-style-type: none"> <li>The herb layer is diverse and rich in species, including sensitive fern, enchanter's nightshade, rough-leaved goldenrod, foam-flower, ostrich fern, yellow avens, jewelweed, fowl meadow grass, and many others.</li> <li>Most of the stands are extensively flooded in the spring.</li> </ul>                                                                                                                                                                                                                                          |
| <b>SWD3-2</b><br>Silver maple mineral deciduous swamp     | <ul style="list-style-type: none"> <li>Together with related types SWD2-2 and SWD3-3, it forms part of swamp complexes that dominate bottomland areas.</li> <li>Silver maple occurs either as a sole canopy tree, or is associated with willow and green ash, often forming rings of vegetation around shallow pools and ponds.</li> <li>Shrubs are glossy buckthorn and riverbank grape.</li> <li>Herbs grow mostly on hummocks and tree bases and include sensitive fern, Tuckerman's sedge, marsh fern and false nettle.</li> </ul>                                         |
| <b>SWD3-3</b><br>Swamp maple mineral deciduous swamp      | <ul style="list-style-type: none"> <li>This type is related to SWD2-2, with the two frequently intergrading. Swamp maple is accompanied by silver maple, yellow birch, white elm and green ash.</li> <li>The shrub layer is relatively well developed and composed of poison ivy, dwarf raspberry, spicebush and tree saplings. In the herb layer grow fowl meadow grass, sensitive fern, marsh marigold, jack-in-the-pulpit, rough-leaved goldenrod and jewelweed.</li> <li>These communities are among the most heavily flooded from spring through early summer.</li> </ul> |
| <b>SWD4-1</b><br>Willow mineral deciduous swamp           | <ul style="list-style-type: none"> <li>These units are often associated with pools and swales, where reddish willow forms the upper canopy and Manitoba maple a secondary layer.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>SWD4-3</b><br>Poplar mineral deciduous swamp           | <ul style="list-style-type: none"> <li>These stands are dominated by trembling aspen, cottonwood or balsam poplar. The herbaceous understorey is typically well developed.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>SWM1-1</b><br>White cedar-hardwood mineral mixed swamp | <ul style="list-style-type: none"> <li>White cedar is accompanied by several hardwood species, for example white and yellow birch, white elm and poplar.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>SWT2-2</b><br>Willow mineral thicket swamp             | <ul style="list-style-type: none"> <li>Tall shrub thicket dominated by various species of willow, often with admixtures of red-osier and silky dogwood.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>SWT2-5</b><br>Red-osier mineral thicket swamp          | <ul style="list-style-type: none"> <li>These shrub-dominated wetlands are dominated by red-osier dogwood, with secondary presence of shrub willow species.</li> <li>The herb layer is usually well developed.</li> </ul>                                                                                                                                                                                                                                                                                                                                                       |
| <b>SWT2-8</b><br>Silky dogwood mineral thicket swamp      | <ul style="list-style-type: none"> <li>This tall shrub thicket is dominated by silky dogwood, usually accompanied by red-osier dogwood and willow shrubs.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>SWT3</b><br>Mixed organic thicket swamp                | <ul style="list-style-type: none"> <li>Various species of tall shrubs form these diverse communities, including red-osier dogwood, silky dogwood, willow shrubs, and nannyberry.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>SWT3-2</b><br>Willow organic thicket swamp             | <ul style="list-style-type: none"> <li>Bebb's willow, the dominant shrub species, is accompanied by pussy willow and silky and red-osier dogwood. The herb layer is dominated by lake-bank sedge and spotted Joe-Pye-weed.</li> </ul>                                                                                                                                                                                                                                                                                                                                          |

| ELC TYPE                                                         | COMMUNITY DESCRIPTION                                                                                                                                                                                                                                                                                                                                                                                                 |
|------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>MARSH</b>                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>MAM2-2</b><br>Reed-canary grass<br>mineral meadow<br>marsh    | <ul style="list-style-type: none"> <li>These meadows are dominated, often entirely, by densely growing reed canary grass, to the exclusion of other wetland species, which may be represented by swamp aster, tall goldenrod and tall white aster.</li> </ul>                                                                                                                                                         |
| <b>MAM3-6</b><br>Broad-leaved sedge<br>organic meadow<br>marsh   | <ul style="list-style-type: none"> <li>These communities often occur in complexes with other open wetland types. Lake-bank sedge dominates the medium-height herb layer, together with swamp aster, cattail, blue-joint grass and sensitive fern.</li> <li>A few shrubs or even single short trees may be present, including glossy buckthorn, narrow-leaved meadow-sweet, white cedar, green ash and elm.</li> </ul> |
| <b>MAS2-1</b><br>Cattail mineral<br>shallow marsh                | <ul style="list-style-type: none"> <li>Glaucous and broad-leaved cattail are the dominant tall graminoid species.</li> <li>Shorter herbs are reed-canary grass, hemlock water-parsnip and duckweed floating on the surface of the water, where present. In less wet areas, shrubs such as silky dogwood, may occur.</li> </ul>                                                                                        |
| <b>MAS3-1</b><br>Cattail organic<br>shallow marsh                | <ul style="list-style-type: none"> <li>These communities are very similar to MAS2-2, but developed on organic soils.</li> </ul>                                                                                                                                                                                                                                                                                       |
| <b>MAS3-4</b><br>Broad-leaved sedge<br>organic shallow<br>marsh  | <ul style="list-style-type: none"> <li>Lake-bank sedge is the dominant species in this marsh community.</li> </ul>                                                                                                                                                                                                                                                                                                    |
| <b>SHALLOW WATER</b>                                             |                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>SAF1-3</b><br>Duckweed floating-<br>leaved shallow<br>aquatic | These are the simplest of ELC associations consisting of lesser duckweed floating on the surface of water of ponds.                                                                                                                                                                                                                                                                                                   |
| <b>Cultural</b>                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>CUP3</b><br>Coniferous<br>plantations                         | A composite unit of variously composed coniferous plantations, with no leading dominant. Possible species include white pine, white spruce, Norway spruce and Austrian pine.                                                                                                                                                                                                                                          |
| <b>CUP3-2</b><br>White pine<br>coniferous plantation             | Dominated by white pine, often with white spruce, these are simply structured coniferous stands. The invasive glossy buckthorn is the main shrub species. The mostly weedy and poorly developed herb layer contains garlic mustard, dame's rocket and dandelion.                                                                                                                                                      |
| <b>CUP3-3</b><br>Scots pine<br>coniferous plantation             | Within these simply-structured plantations, composed of Scots pine, the relatively well developed herb cover is dominated by old field meadow species.                                                                                                                                                                                                                                                                |
| <b>CUP3-8</b><br>White spruce<br>cultural plantation             | These are often poorly growing communities of white spruce with admixtures of white pine and a few hardwoods establishing (green ash, white elm, balsam poplar). Many stands are heavily infested with glossy buckthorn. The herb layer is variously developed, mostly within canopy gaps, and composed of common species of old field meadows.                                                                       |
| <b>CUT</b><br>Cultural thicket                                   | This is a composite unit of many possible associations dominated by such species as grey dogwood, hawthorn, common buckthorn, and saplings of deciduous trees.                                                                                                                                                                                                                                                        |
| <b>CUT1-4</b><br>Grey dogwood<br>cultural thicket                | Grey dogwood is usually accompanied by nannyberry and hawthorn species in these tall shrub communities. The herb cover is similar to that of old field meadows.                                                                                                                                                                                                                                                       |

| ELC TYPE                                    | COMMUNITY DESCRIPTION                                                                                                                                                                                                                                                                                                                                      |
|---------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>CUW</b><br>Cultural woodland             | These are extremely variable communities of many possible tree species, both deciduous and coniferous, for example Manitoba and Norway maple, sugar maple, black walnut, black cherry, basswood, white cedar, etc.                                                                                                                                         |
| <b>CUM1-1</b><br>Dry-moist old field meadow | These communities occupy areas of former agricultural lands—crop fields or pastures. Although the dominant species is generally tall goldenrod, many other—both exotic weeds of European origin and native plants of weedy character—are found, for example wild carrot, tufted vetch, Canada thistle, red-top, teasel, new England aster, and many others |

\*not listed in Lee et al, 1998

| Species Latin Name                                            | Synonyms                      | Species Common Name        | Coefficient of<br>Conservatism | Wetness Index | Weediness<br>Index | Provincial<br>Status<br>S-Rank | OMNR<br>Status | COSEWIC<br>Status | Global Status<br>G-Rank | Local Status<br>Waterloo   | Local Status<br>Wellington    |
|---------------------------------------------------------------|-------------------------------|----------------------------|--------------------------------|---------------|--------------------|--------------------------------|----------------|-------------------|-------------------------|----------------------------|-------------------------------|
| Reference                                                     |                               |                            |                                |               |                    |                                |                |                   |                         | Region of<br>Waterloo 1999 | Frank and<br>Anderson<br>2009 |
|                                                               |                               |                            |                                |               |                    |                                |                |                   |                         |                            |                               |
| <b>Dennstaedtiaceae</b>                                       |                               | <b>Bracken Fern Family</b> |                                |               |                    |                                |                |                   |                         |                            |                               |
| <i>Pteridium aquilinum</i>                                    |                               | Bracken Fern               | 2                              | 3             |                    | S5                             |                |                   | G5                      |                            | X                             |
| <b>Dryopteridaceae</b>                                        |                               | <b>Wood Fern Family</b>    |                                |               |                    |                                |                |                   |                         |                            |                               |
| <i>Athyrium filix-femina</i>                                  |                               | Lady Fern                  | 4                              | 0             |                    | S5                             |                |                   | G5                      |                            |                               |
| <i>Cystopteris bulbifera</i>                                  |                               | Bulblet Fern               | 5                              | -2            |                    | S5                             |                |                   | G5                      |                            | X                             |
| <i>Dryopteris carthusiana</i>                                 | <i>Dryopteris spinulosa</i>   | Spinulose Wood Fern        | 5                              | -2            |                    | S5                             |                |                   | G5                      |                            | X                             |
| <i>Matteuccia struthiopteris</i> var.<br><i>pennsylvanica</i> |                               | Ostrich Fern               | 5                              | -3            |                    | S5                             |                |                   | G5T5                    |                            | X                             |
| <i>Onoclea sensibilis</i>                                     |                               | Sensitive Fern             | 4                              | -3            |                    | S5                             |                |                   | G5                      |                            | X                             |
| <i>Polystichum acrostichoides</i>                             |                               | Christmas Fern             | 5                              | 5             |                    | S5                             |                |                   | G5                      |                            | X                             |
| <b>Equisetaceae</b>                                           |                               | <b>Horsetail Family</b>    |                                |               |                    |                                |                |                   |                         |                            |                               |
| <i>Equisetum arvense</i>                                      |                               | Field Horsetail            | 0                              | 0             |                    | S5                             |                |                   | G5                      |                            | X                             |
| <i>Equisetum hyemale</i> ssp. <i>affine</i>                   |                               | Scouring-rush              | 2                              | -2            |                    | S5                             |                |                   | G5T5                    |                            | X                             |
| <b>Osmundaceae</b>                                            |                               | <b>Royal Fern Family</b>   |                                |               |                    |                                |                |                   |                         |                            |                               |
| <i>Osmunda claytoniana</i>                                    |                               | Interrupted Fern           | 7                              | -1            |                    | S5                             |                |                   | G5                      | R                          | R2                            |
| <b>Thelypteridaceae</b>                                       |                               | <b>Marsh Fern Family</b>   |                                |               |                    |                                |                |                   |                         |                            |                               |
| <i>Thelypteris palustris</i>                                  | <i>Dryopteris thelypteris</i> | Marsh Fern                 | 5                              | -4            |                    | S5                             |                |                   | G5                      |                            | X                             |
| <b>Cupressaceae</b>                                           |                               | <b>Cedar Family</b>        |                                |               |                    |                                |                |                   |                         |                            |                               |
| <i>Juniperus communis</i>                                     |                               | Common Juniper             |                                | 3             |                    | S5                             |                |                   | G5                      | R+                         | X                             |
| <i>Juniperus virginiana</i>                                   |                               | Eastern Red Cedar          |                                |               |                    | S5                             |                |                   | G5                      |                            | X                             |
| <i>Thuja occidentalis</i>                                     |                               | Eastern White Cedar        | 4                              | -3            |                    | S5                             |                |                   | G5                      |                            | X                             |

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| Species Latin Name | Synonyms | Species Common Name | Coefficient of<br>Conservatism | Wetness Index | Weediness<br>Index | Provincial<br>Status<br>S-Rank | OMNR<br>Status | COSEWIC<br>Status | Global Status<br>G-Rank | Local Status<br>Waterloo   | Local Status<br>Wellington    |
|--------------------|----------|---------------------|--------------------------------|---------------|--------------------|--------------------------------|----------------|-------------------|-------------------------|----------------------------|-------------------------------|
| Reference          |          |                     |                                |               |                    |                                |                |                   |                         | Region of<br>Waterloo 1999 | Frank and<br>Anderson<br>2009 |

Apocynaceae

*Apocynum androsaemifolium* ssp.  
*androsaemifolium*

Dogbane Family

Spreading Dogbane

3

5

S5

G5T5

X

Araliaceae

*Aralia nudicaulis*

Ginseng Family

Wild Sarsaparilla

4

3

S5

G5

X

Asclepiadaceae

*Asclepias incarnata*

Swamp Milkweed

6

-5

S5

G5

X

*Asclepias syriaca*

Common Milkweed

0

5

S5

G5

X

*Cynanchum rossicum*

*Vincetoxicum rossicum*

European Swallow-wort

SNA

GNR

X

Asteraceae

*Achillea millefolium*

Yarrow

3

-1

S5

G5

X

*Ambrosia artemisiifolia*

Annual Ragweed

0

3

S5

G5

X

*Arctium minus*

Common Burdock

5

-2

SNA

GNR

X

*Artemisia vulgaris*

Common Mugwort

5

-1

SNA

GU

X

*Symphotrichum ericoides* var.  
*ericoides*

*Aster ericoides* ssp. *ericoides*

White Heath Aster

S5

G5T5

X

*Symphotrichum lanceolatum* ssp.  
*lanceolatum*

*Aster lanceolatus* ssp. *lanceolatus*

Tall White Aster

3

-3

S5

G5T5

X

*Symphotrichum lateriflorum*

*Aster lateriflorus*

Starved Aster

3

-2

S5

G5

X

*Symphotrichum novae-angliae*

*Aster novae-angliae*

New England Aster

2

-3

S5

G5

X

*Symphotrichum puniceum* var.  
*puniceum*

*Aster puniceus* var. *puniceus*

Swamp Aster

S5

G5T5

X

*Symphotrichum urophyllum*

*Aster urophyllus*, *Aster sagittifolius*

Arrow-leaved Aster

6

5

S4

G4G5

X

| Species Latin Name                                   | Synonyms                                          | Species Common Name        | Coefficient of<br>Conservatism | Wetness Index | Weediness<br>Index | Provincial<br>Status<br>S-Rank | OMNR<br>Status | COSEWIC<br>Status | Global Status<br>G-Rank | Local Status<br>Waterloo   | Local Status<br>Wellington    |
|------------------------------------------------------|---------------------------------------------------|----------------------------|--------------------------------|---------------|--------------------|--------------------------------|----------------|-------------------|-------------------------|----------------------------|-------------------------------|
| Reference                                            |                                                   |                            |                                |               |                    |                                |                |                   |                         | Region of<br>Waterloo 1999 | Frank and<br>Anderson<br>2009 |
| <i>Centaurea stoebe</i>                              | <i>Centaurea maculosa</i>                         | Spotted Knapweed           |                                | 5             | -3                 | SNA                            |                |                   | GNR                     |                            | X                             |
| <i>Centaurea nigra</i>                               |                                                   | Black Knapweed             |                                |               |                    | SNA                            |                |                   | GNR                     |                            | X                             |
| <i>Leucanthemum vulgare</i>                          | <i>Chrysanthemum leucanthemum</i>                 | Oxeye Daisy                |                                | 5             | -1                 | SNA                            |                |                   | GNR                     |                            | X                             |
| <i>Cichorium intybus</i>                             |                                                   | Chicory                    |                                | 5             | -1                 | SNA                            |                |                   | GNR                     |                            | X                             |
| <i>Cirsium arvense</i>                               |                                                   | Canada Thistle             |                                | 3             | -1                 | SNA                            |                |                   | GNR                     |                            | X                             |
| <i>Cirsium vulgare</i>                               |                                                   | Bull Thistle               |                                | 4             | -1                 | SNA                            |                |                   | GNR                     |                            | X                             |
| <i>Conyza canadensis</i>                             |                                                   | Horseweed                  | 0                              | 1             |                    | S5                             |                |                   | G5                      |                            | X                             |
| <i>Erigeron strigosus</i>                            |                                                   | Daisy Fleabane             | 0                              | 1             |                    | S5                             |                |                   | G5                      |                            | X                             |
| <i>Eutrochium maculatum</i> var.<br><i>maculatum</i> | <i>Eupatorium maculatum</i> var. <i>maculatum</i> | Spotted Joe Pye Weed       | 3                              | -5            |                    | S5                             |                |                   | G5T5                    |                            | X                             |
| <i>Euthamia graminifolia</i>                         | <i>Solidago graminifolia</i>                      | Grass-leaved Goldenrod     | 2                              | -2            |                    | S5                             |                |                   | G5                      |                            | X                             |
| <i>Pilosella aurantiaca</i>                          | <i>Hieracium aurantiacum</i>                      | Orange Hawkweed            |                                | 5             | -2                 | SNA                            |                |                   | GNR                     |                            | X                             |
| <i>Pilosella piloselloides</i>                       | <i>Hieracium piloselloides</i>                    | Tall Hawkweed              |                                | 5             | -2                 | SNA                            |                |                   | GNR                     |                            | X                             |
| <i>Lactuca serriola</i>                              |                                                   | Prickly Lettuce            |                                | 0             | -1                 | SNA                            |                |                   | GNR                     |                            | X                             |
| <i>Rudbeckia hirta</i>                               |                                                   | Black-eyed Susan           | 0                              | 3             |                    | S5                             |                |                   | G5                      |                            | X                             |
| <i>Solidago altissima</i>                            |                                                   | Tall Goldenrod             | 1                              | 3             |                    | S5                             |                |                   | G5                      |                            | X                             |
| <i>Solidago gigantea</i>                             |                                                   | Smooth Goldenrod           | 4                              | -3            |                    | S5                             |                |                   | G5                      |                            | X                             |
| <i>Solidago nemoralis</i> ssp. <i>nemoralis</i>      |                                                   | Gray Goldenrod             | 2                              | 5             |                    | S5                             |                |                   | G5T5                    |                            | X                             |
| <i>Solidago rugosa</i>                               |                                                   | Rough-leaf Goldenrod       | 4                              | -1            |                    | S5                             |                |                   | G5                      |                            | X                             |
| <i>Sonchus arvensis</i> ssp. <i>arvensis</i>         |                                                   | Field Sow-thistle          |                                |               |                    | SNA                            |                |                   | GNRTNR                  |                            | X                             |
| <i>Tanacetum vulgare</i>                             |                                                   | Common Tansy               |                                | 5             | -1                 | SNA                            |                |                   | GNR                     |                            | X                             |
| <i>Taraxacum officinale</i>                          |                                                   | Common Dandelion           |                                | 3             | -2                 | SNA                            |                |                   | G5                      |                            | X                             |
| <i>Tragopogon pratensis</i>                          |                                                   | Meadow Goat's-beard        |                                | 5             | -1                 | SNA                            |                |                   | GNR                     |                            | X                             |
| <i>Tussilago farfara</i>                             |                                                   | Colt's Foot                |                                | 3             | -2                 | SNR                            |                |                   | GNR                     |                            | X                             |
| <b>Balsaminaceae</b>                                 |                                                   | <b>Touch-me-not Family</b> |                                |               |                    |                                |                |                   |                         |                            |                               |
| <i>Impatiens capensis</i>                            |                                                   | Spotted Jewelweed          | 4                              | -3            |                    | S5                             |                |                   | G5                      |                            | X                             |

| Species Latin Name | Synonyms | Species Common Name | Coefficient of<br>Conservatism | Wetness Index | Weediness<br>Index | Provincial<br>Status<br>S-Rank | OMNR<br>Status | COSEWIC<br>Status | Global Status<br>G-Rank | Local Status<br>Waterloo   | Local Status<br>Wellington    |
|--------------------|----------|---------------------|--------------------------------|---------------|--------------------|--------------------------------|----------------|-------------------|-------------------------|----------------------------|-------------------------------|
| Reference          |          |                     |                                |               |                    |                                |                |                   |                         | Region of<br>Waterloo 1999 | Frank and<br>Anderson<br>2009 |

Berberidaceae

*Caulophyllum giganteum*  
*Podophyllum peltatum*

Barberry Family

Giant Blue Cohosh  
May Apple

5

3

S4?

S5

G4G5Q

G5

X

Betulaceae

*Alnus incana* spp. *rugosa*  
*Betula alleghaniensis*  
*Betula papyrifera*  
*Ostrya virginiana*

Birch Family

Speckled Alder  
Yellow Birch  
White Birch  
Eastern Hop-hornbeam

6

-5

S5

6

0

S5

2

S5

4

4

S5

G5T5

R\*

X

G5

X

G5

X

G5

X

Boraginaceae

*Echium vulgare*  
*Myosotis laxa*  
*Myosotis scorpioides*

Borage Family

Blueweed  
Small Forget-me-not  
True Forget-me-not

5

-2

SNA

6

-5

S5

0

-1

SNA

GNR

G5

X

G5

X

G5

X

Brassicaceae

*Alliaria petiolata*  
*Barbarea vulgaris*  
*Capsella bursa-pastoris*  
*Cardamine diphylla*  
*Erucastrum gallicum*  
*Erysimum cheiranthoides*  
*Hesperis matronalis*  
*Lepidium campestre*  
*Nasturtium microphyllum*  
*Sisymbrium officinale*

*Alliaria officinalis*  
  
  
*Dentaria diphylla*

Mustard Family

Garlic Mustard  
Yellow Rocket  
Common Shepherd's Purse  
Two-leaf Toothwort  
Common Dogmustard  
Worm-seed Mustard  
Dame's Rocket  
Field Pepper-grass  
Small-leaved Water-cress  
Common Tumble Mustard

0

-3

SNA

0

-1

SNA

1

-1

SNA

7

5

S5

5

-1

SNA

3

-1

SNA

5

-3

SNA

-5

-3

SNA

5

-1

SNA

GNR

GNR

GNR

G5

G5

G5

G4G5

GNR

GNR

GNR

X

X

X

X

X

X

X

X

X

X

| Species Latin Name                         | Synonyms                                 | Species Common Name        | Coefficient of<br>Conservatism | Wetness Index | Weediness<br>Index | Provincial<br>Status<br>S-Rank | OMNR<br>Status | COSEWIC<br>Status | Global Status<br>G-Rank | Local Status<br>Waterloo   | Local Status<br>Wellington    |
|--------------------------------------------|------------------------------------------|----------------------------|--------------------------------|---------------|--------------------|--------------------------------|----------------|-------------------|-------------------------|----------------------------|-------------------------------|
| Reference                                  |                                          |                            |                                |               |                    |                                |                |                   |                         | Region of<br>Waterloo 1999 | Frank and<br>Anderson<br>2009 |
|                                            |                                          |                            |                                |               |                    |                                |                |                   |                         |                            |                               |
| <i>Thlaspi arvense</i>                     |                                          | Field Penny-cress          |                                | 5             | -1                 | SNA                            |                |                   | GNR                     |                            |                               |
|                                            |                                          |                            |                                |               |                    |                                |                |                   |                         |                            |                               |
| <b>Caprifoliaceae</b>                      |                                          | <b>Honeysuckle Family</b>  |                                |               |                    |                                |                |                   |                         |                            |                               |
| <i>Lonicera tatarica</i>                   |                                          | Tartarian Honeysuckle      |                                | 3             | -3                 | SNA                            |                |                   | GNR                     |                            | X                             |
| <i>Sambucus racemosa</i>                   | <i>Sambucus pubens</i>                   | Red Elderberry             | 5                              | 2             |                    | S5                             |                |                   | G5                      |                            | X                             |
| <i>Viburnum lentago</i>                    |                                          | Nannyberry                 | 4                              | -1            |                    | S5                             |                |                   | G5                      |                            | X                             |
| <i>Viburnum opulus</i>                     |                                          | Cranberry Viburnum         |                                | 0             | -1                 | S5                             |                |                   | G5                      |                            | X                             |
|                                            |                                          |                            |                                |               |                    |                                |                |                   |                         |                            |                               |
| <b>Caryophyllaceae</b>                     |                                          | <b>Pink Family</b>         |                                |               |                    |                                |                |                   |                         |                            |                               |
| <i>Arenaria serpyllifolia</i>              |                                          | Thyme-leaf Sandwort        |                                | 0             | -2                 | SNA                            |                |                   | GNR                     |                            | X                             |
| <i>Cerastium fontanum</i>                  | <i>Cerastium vulgatum</i>                | Common Mouse-ear Chickweed |                                | 3             | -1                 | SNA                            |                |                   | GNR                     |                            | X                             |
| <i>Silene latifolia</i>                    | <i>Silene alba</i> , <i>S. pratensis</i> | White Campion              |                                |               |                    | SNA                            |                |                   | GNR                     |                            | X                             |
| <i>Silene vulgaris</i>                     | <i>Silene cucubalus</i>                  | Maiden's Tears             |                                | 5             | -1                 | SNA                            |                |                   | GNR                     |                            | X                             |
| <i>Stellaria longifolia</i>                |                                          | Longleaf Stitchwort        | 2                              | -4            |                    | S5                             |                |                   | G5                      | R                          | X                             |
|                                            |                                          |                            |                                |               |                    |                                |                |                   |                         |                            |                               |
| <b>Celastraceae</b>                        |                                          | <b>Staff-tree Family</b>   |                                |               |                    |                                |                |                   |                         |                            |                               |
| <i>Celastrus scandens</i>                  |                                          | Climbing Bittersweet       | 3                              | 3             |                    | S5                             |                |                   | G5                      |                            | X                             |
| <i>Euonymus obovatus</i>                   |                                          | Running Strawberry-bush    | 6                              | 5             |                    | S5                             |                |                   | G5                      |                            | X                             |
|                                            |                                          |                            |                                |               |                    |                                |                |                   |                         |                            |                               |
| <b>Chenopodiaceae</b>                      |                                          | <b>Goosefoot Family</b>    |                                |               |                    |                                |                |                   |                         |                            |                               |
| <i>Chenopodium album</i> var. <i>album</i> |                                          | White Goosefoot            |                                | 1             | -1                 | SNA                            |                |                   | G5TNR                   |                            | X                             |
|                                            |                                          |                            |                                |               |                    |                                |                |                   |                         |                            |                               |
| <b>Cornaceae</b>                           |                                          | <b>Dogwood Family</b>      |                                |               |                    |                                |                |                   |                         |                            |                               |
| <i>Cornus amomum</i>                       |                                          | Silky Dogwood              | 5                              | -4            |                    | S5                             |                |                   | G5                      |                            | X                             |
| <i>Cornus foemina</i>                      |                                          | Grey Dogwood               | 2                              | -2            |                    | S5                             |                |                   | GNR                     |                            | X                             |
| <i>Cornus sericea</i>                      | <i>Cornus stolonifera</i>                | Red-osier Dogwood          | 2                              | -3            |                    | S5                             |                |                   | G5                      |                            | X                             |

| Species Latin Name                        | Synonyms               | Species Common Name    | Coefficient of<br>Conservatism | Wetness Index | Weediness<br>Index | Provincial<br>Status<br>S-Rank | OMNR<br>Status | COSEWIC<br>Status | Global Status<br>G-Rank | Local Status<br>Waterloo   | Local Status<br>Wellington    |
|-------------------------------------------|------------------------|------------------------|--------------------------------|---------------|--------------------|--------------------------------|----------------|-------------------|-------------------------|----------------------------|-------------------------------|
| Reference                                 |                        |                        |                                |               |                    |                                |                |                   |                         | Region of<br>Waterloo 1999 | Frank and<br>Anderson<br>2009 |
| <b>Cucurbitaceae</b>                      |                        | <b>Gourd Family</b>    |                                |               |                    |                                |                |                   |                         |                            |                               |
| <i>Echinocystis lobata</i>                |                        | Wild Mock-cucumber     | 3                              | -2            |                    | S5                             |                |                   | G5                      |                            | X                             |
| <b>Elaeagnaceae</b>                       |                        | <b>Oleaster Family</b> |                                |               |                    |                                |                |                   |                         |                            |                               |
| <i>Elaeagnus angustifolia</i>             |                        | Russian Olive          |                                | 4             | -1                 | SNA                            |                |                   | GNR                     |                            | X                             |
| <i>Elaeagnus umbellata</i>                |                        | Autumn Olive           |                                | 3             | -3                 | SNA                            |                |                   | GNR                     |                            | X                             |
| <b>Euphorbiaceae</b>                      |                        | <b>Spurge Family</b>   |                                |               |                    |                                |                |                   |                         |                            |                               |
| <i>Euphorbia cyparissias</i>              |                        | Cypress Spurge         |                                | 5             | -2                 | SNA                            |                |                   | G5                      |                            | X                             |
| <b>Fabaceae</b>                           |                        | <b>Pea Family</b>      |                                |               |                    |                                |                |                   |                         |                            |                               |
| <i>Securigera varia</i>                   | <i>Coronilla varia</i> | Common Crown-vetch     |                                | 5             | -2                 | SNA                            |                |                   | GNR                     |                            | X                             |
| <i>Lathyrus latifolius</i>                |                        | Broad-leaf Peavine     |                                | 5             | -1                 | SNA                            |                |                   | GNR                     |                            | X                             |
| <i>Lotus corniculatus</i>                 |                        | Bird's-foot Trefoil    |                                | 1             | -2                 | SNA                            |                |                   | GNR                     |                            | X                             |
| <i>Medicago lupulina</i>                  |                        | Black Medic            |                                | 1             | -1                 | SNA                            |                |                   | GNR                     |                            | X                             |
| <i>Medicago sativa</i> ssp. <i>sativa</i> |                        | Alfalfa                |                                | 5             | -1                 | SNA                            |                |                   | GNRTNR                  |                            | X                             |
| <i>Melilotus albus</i>                    |                        | White Sweetclover      |                                | 3             | -3                 | SNA                            |                |                   | G5                      |                            | X                             |
| <i>Melilotus officinalis</i>              |                        | Yellow Sweetclover     |                                | 3             | -1                 | SNA                            |                |                   | GNR                     |                            | X                             |
| <i>Robinia pseudoacacia</i>               |                        | Black Locust           |                                | 4             | -3                 | SNA                            |                |                   | G5                      |                            | X                             |
| <i>Trifolium pratense</i>                 |                        | Red Clover             |                                | 2             | -2                 | SNA                            |                |                   | GNR                     |                            | X                             |
| <i>Trifolium repens</i>                   |                        | White Clover           |                                | 2             | -1                 | SNA                            |                |                   | GNR                     |                            | X                             |
| <i>Vicia cracca</i>                       |                        | Tufted Vetch           |                                | 5             | -1                 | SNA                            |                |                   | GNR                     |                            | X                             |
| <b>Fagaceae</b>                           |                        | <b>Beech Family</b>    |                                |               |                    |                                |                |                   |                         |                            |                               |
| <i>Fagus grandifolia</i>                  |                        | American Beech         | 6                              | 3             |                    | S4                             |                |                   | G5                      |                            | X                             |
| <i>Quercus alba</i>                       |                        | White Oak              | 6                              | 3             |                    | S5                             |                |                   | G5                      |                            | X                             |
| <i>Quercus macrocarpa</i>                 |                        | Bur Oak                | 5                              | 1             |                    | S5                             |                |                   | G5                      |                            | X                             |

| Species Latin Name                              | Synonyms | Species Common Name           | Coefficient of<br>Conservatism | Wetness Index | Weediness<br>Index | Provincial<br>Status<br>S-Rank | OMNR<br>Status | COSEWIC<br>Status | Global Status<br>G-Rank | Local Status<br>Waterloo   | Local Status<br>Wellington    |
|-------------------------------------------------|----------|-------------------------------|--------------------------------|---------------|--------------------|--------------------------------|----------------|-------------------|-------------------------|----------------------------|-------------------------------|
| Reference                                       |          |                               |                                |               |                    |                                |                |                   |                         | Region of<br>Waterloo 1999 | Frank and<br>Anderson<br>2009 |
| <i>Quercus rubra</i>                            |          | Northern Red Oak              | 6                              | 3             |                    | S5                             |                |                   | G5                      |                            | X                             |
| <b>Grossulariaceae</b>                          |          | <b>Currant Family</b>         |                                |               |                    |                                |                |                   |                         |                            |                               |
| <i>Ribes americanum</i>                         |          | Wild Black Currant            | 4                              | -3            |                    | S5                             |                |                   | G5                      |                            | X                             |
| <i>Ribes rubrum</i>                             |          | Northern Red Currant          |                                | 5             | -2                 | SNA                            |                |                   | G4G5                    |                            | X                             |
| <b>Guttiferae</b>                               |          | <b>St. John's-wort Family</b> |                                |               |                    |                                |                |                   |                         |                            |                               |
| <i>Hypericum perforatum</i>                     |          | Common St. John's-wort        |                                | 5             | -3                 | SNA                            |                |                   | GNR                     |                            | X                             |
| <b>Hydrophyllaceae</b>                          |          | <b>Water-leaf Family</b>      |                                |               |                    |                                |                |                   |                         |                            |                               |
| <i>Hydrophyllum virginianum</i>                 |          | Virginia Waterleaf            | 6                              | -2            |                    | S5                             |                |                   | G5                      |                            | X                             |
| <b>Juglandaceae</b>                             |          | <b>Walnut Family</b>          |                                |               |                    |                                |                |                   |                         |                            |                               |
| <i>Carya ovata</i>                              |          | Shagbark Hickory              | 6                              | 3             |                    | S5                             |                |                   | G5                      |                            | R1                            |
| <i>Juglans nigra</i>                            |          | Black Walnut                  | 5                              | 3             |                    | S4                             |                |                   | G5                      | R+*                        | X                             |
| <b>Lamiaceae</b>                                |          | <b>Mint Family</b>            |                                |               |                    |                                |                |                   |                         |                            |                               |
| <i>Ajuga reptans</i>                            |          | Carpet Bugle                  |                                | 5             | -1                 | SNA                            |                |                   | GNR                     |                            | X                             |
| <i>Lamium amplexicaule</i>                      |          | Common Deadnettle             |                                | 5             | -1                 | SNA                            |                |                   | GNR                     |                            | X                             |
| <i>Lycopus americanus</i>                       |          | American Bugleweed            | 4                              | -5            |                    | S5                             |                |                   | G5                      |                            | X                             |
| <i>Monarda fistulosa</i>                        |          | Wild Bergamot Beebalm         | 6                              | 3             |                    | S5                             |                |                   | G5                      |                            | X                             |
| <i>Prunella vulgaris</i> ssp. <i>lanceolata</i> |          | Self-heal                     | 5                              | 5             |                    | S5                             |                |                   | G5T5                    |                            |                               |
| <i>Salvia pratensis</i>                         |          | Meadow Sage                   |                                | 5             | -1                 | SNA                            |                |                   | GNR                     |                            | X                             |
| <b>Lauraceae</b>                                |          | <b>Laurel Family</b>          |                                |               |                    |                                |                |                   |                         |                            |                               |
| <i>Lindera benzoin</i>                          |          | Spicebush                     | 6                              | -2            |                    | S5                             |                |                   | G5                      |                            | R1                            |

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|--------------------------------|--------------------------------|--------------------------------|--------------------------------|---------------|--------------------|--------------------------------|----------------|-------------------|-------------------------|----------------------------|-------------------------------|
| Reference                      |                                |                                |                                |               |                    |                                |                |                   |                         | Region of<br>Waterloo 1999 | Frank and<br>Anderson<br>2009 |
| <b>Lythraceae</b>              |                                | <b>Loosestrife Family</b>      |                                |               |                    |                                |                |                   |                         |                            |                               |
| <i>Lythrum salicaria</i>       |                                | Purple Loosestrife             |                                | -5            | -3                 | SNA                            |                |                   | G5                      |                            | X                             |
| <b>Moraceae</b>                |                                | <b>Mulberry Family</b>         |                                |               |                    |                                |                |                   |                         |                            |                               |
| <i>Morus alba</i>              |                                | White Mulberry                 |                                | 0             | -3                 | SNA                            |                |                   | GNR                     |                            | X                             |
| <b>Oleaceae</b>                |                                | <b>Olive Family</b>            |                                |               |                    |                                |                |                   |                         |                            |                               |
| <i>Fraxinus americana</i>      |                                | White Ash                      | 4                              | 3             |                    | S4?                            |                |                   | G5                      |                            | X                             |
| <i>Fraxinus nigra</i>          |                                | Black Ash                      | 7                              | -4            |                    | S5?                            |                |                   | G5                      |                            | X                             |
| <i>Fraxinus pennsylvanica</i>  |                                | Red Ash                        | 3                              | -3            |                    | S5                             |                |                   | G5                      |                            | X                             |
| <b>Onagraceae</b>              |                                | <b>Evening-primrose Family</b> |                                |               |                    |                                |                |                   |                         |                            |                               |
| <i>Circaea alpina</i>          |                                | Small Enchanter's Nightshade   | 6                              | -3            |                    | S5                             |                |                   | G5                      |                            | X                             |
| <i>Circaea lutetiana</i>       |                                | Enchanter's Nightshade         | 3                              | 3             |                    | S5                             |                |                   | G5                      |                            | X                             |
| <i>Chamerion angustifolium</i> | <i>Epilobium angustifolium</i> | Fireweed                       | 3                              | 0             |                    | S5                             |                |                   | G5                      |                            | R1                            |
| <i>Oenothera parviflora</i>    |                                | Northern Evening-primrose      | 1                              | 3             |                    | S4?                            |                |                   | G4?                     |                            | X                             |
| <b>Oxalidaceae</b>             |                                | <b>Wood Sorrel Family</b>      |                                |               |                    |                                |                |                   |                         |                            |                               |
| <i>Oxalis stricta</i>          |                                | Upright Yellow Wood-sorrel     | 0                              | 3             |                    | S5                             |                |                   | G5                      |                            | X                             |
| <b>Papaveraceae</b>            |                                | <b>Poppy Family</b>            |                                |               |                    |                                |                |                   |                         |                            |                               |
| <i>Chelidonium majus</i>       |                                | Greater Celandine              |                                | 5             | -3                 | SNA                            |                |                   | GNR                     |                            | X                             |
| <i>Sanguinaria canadensis</i>  |                                | Bloodroot                      | 5                              | 4             |                    | S5                             |                |                   | G5                      |                            | X                             |
| <b>Plantaginaceae</b>          |                                | <b>Plantain Family</b>         |                                |               |                    |                                |                |                   |                         |                            |                               |
| <i>Plantago major</i>          |                                | Common Plantain                |                                | -1            | -1                 | S5                             |                |                   | G5                      |                            | X                             |

| Species Latin Name           | Synonyms                                       | Species Common Name     | Coefficient of<br>Conservatism | Wetness Index | Weediness<br>Index | Provincial<br>Status<br>S-Rank | OMNR<br>Status | COSEWIC<br>Status | Global Status<br>G-Rank | Local Status<br>Waterloo                | Local Status<br>Wellington |
|------------------------------|------------------------------------------------|-------------------------|--------------------------------|---------------|--------------------|--------------------------------|----------------|-------------------|-------------------------|-----------------------------------------|----------------------------|
| Reference                    |                                                |                         |                                |               |                    |                                |                |                   |                         | Frank and<br>Region of<br>Waterloo 1999 | Anderson<br>2009           |
| <b>Polygonaceae</b>          |                                                | <b>Smartweed Family</b> |                                |               |                    |                                |                |                   |                         |                                         |                            |
| <i>Polygonum aviculare</i>   | ssp. <i>aviculare</i>                          | Prostrate Knotweed      |                                | 1             | -1                 | SNA                            |                |                   | GNR                     |                                         | X                          |
| <i>Rumex crispus</i>         |                                                | Curly Dock              |                                | -1            | -2                 | SNA                            |                |                   | GNR                     |                                         | X                          |
| <b>Primulaceae</b>           |                                                | <b>Primrose Family</b>  |                                |               |                    |                                |                |                   |                         |                                         |                            |
| <i>Anagallis arvensis</i>    |                                                | Scarlet Pimpernel       |                                | 4             | -1                 | SNA                            |                |                   | GNR                     |                                         | X                          |
| <i>Lysimachia ciliata</i>    |                                                | Fringed Loosestrife     | 4                              | -3            |                    | S5                             |                |                   | G5                      |                                         | X                          |
| <i>Lysimachia thysiflora</i> |                                                | Tufted Loosestrife      | 7                              | -5            |                    | S5                             |                |                   | G5                      |                                         | X                          |
| <b>Ranunculaceae</b>         |                                                | <b>Buttercup Family</b> |                                |               |                    |                                |                |                   |                         |                                         |                            |
| <i>Actaea pachypoda</i>      |                                                | White Baneberry         | 6                              | 5             |                    | S5                             |                |                   | G5                      |                                         | X                          |
| <i>Anemone acutiloba</i>     |                                                | Sharp-lobed Hepatica    | 6                              | 5             |                    | S5                             |                |                   | G5                      |                                         | X                          |
| <i>Anemone cylindrica</i>    |                                                | Long-fruited Anemone    | 7                              | 5             |                    | S4                             |                |                   | G5                      | R                                       | X                          |
| <i>Anemone virginiana</i>    |                                                | Virginia Anemone        | 4                              | 5             |                    | S5                             |                |                   | G5                      |                                         | X                          |
| <i>Caltha palustris</i>      |                                                | Marsh-marigold          | 5                              | -5            |                    | S5                             |                |                   | G5                      |                                         | X                          |
| <i>Ranunculus abortivus</i>  |                                                | Kidney-leaf Buttercup   | 2                              | -2            |                    | S5                             |                |                   | G5                      |                                         | X                          |
| <i>Ranunculus acris</i>      |                                                | Tall Buttercup          |                                |               | -2                 | SNA                            |                |                   | G5                      |                                         | X                          |
| <i>Thalictrum dioicum</i>    |                                                | Early Meadow-rue        | 5                              | 2             |                    | S5                             |                |                   | G5                      |                                         | X                          |
| <i>Thalictrum pubescens</i>  |                                                | Tall Meadow-rue         | 5                              | -2            |                    | S5                             |                |                   | G5                      |                                         | X                          |
| <b>Rhamnaceae</b>            |                                                | <b>Buckthorn Family</b> |                                |               |                    |                                |                |                   |                         |                                         |                            |
| <i>Rhamnus cathartica</i>    |                                                | Common Buckthorn        |                                | 3             | -3                 | SNA                            |                |                   | GNR                     |                                         | X                          |
| <i>Frangula alnus</i>        | <i>Rhamnus frangula</i> , <i>Alnus frangul</i> | Glossy Buckthorn        |                                | -1            | -3                 | SNA                            |                |                   | GNR                     |                                         | X                          |
| <b>Rosaceae</b>              |                                                | <b>Rose Family</b>      |                                |               |                    |                                |                |                   |                         |                                         |                            |
| <i>Fragaria vesca</i>        |                                                | Woodland Strawberry     | 4                              | 4             |                    | S5                             |                |                   | G5                      |                                         | X                          |
| <i>Geum aleppicum</i>        |                                                | Yellow Avens            | 2                              | -1            |                    | S5                             |                |                   | G5                      |                                         | X                          |

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|---------------------------------------------------|----------------------------------------------|----------------------------|--------------------------------|---------------|--------------------|--------------------------------|----------------|-------------------|-------------------------|----------------------------|-------------------------------|
| Reference                                         |                                              |                            |                                |               |                    |                                |                |                   |                         | Region of<br>Waterloo 1999 | Frank and<br>Anderson<br>2009 |
| <i>Geum canadense</i>                             |                                              | White Avens                | 3                              | 0             |                    | S5                             |                |                   | G5                      |                            | X                             |
| <i>Potentilla norvegica</i> ssp. <i>norvegica</i> |                                              | Norwegian Cinquefoil       |                                |               |                    | S5                             |                |                   | G5                      |                            | X                             |
| <i>Potentilla recta</i>                           |                                              | Sulphur Cinquefoil         |                                | 5             | -2                 | SNA                            |                |                   | GNR                     |                            | X                             |
| <i>Prunus serotina</i>                            |                                              | Black Cherry               | 3                              | 3             |                    | S5                             |                |                   | G5                      |                            | X                             |
| <i>Prunus virginiana</i>                          |                                              | Choke Cherry               | 2                              | 1             |                    | S5                             |                |                   | G5                      |                            | X                             |
| <i>Rubus allegheniensis</i>                       |                                              | Alleghany Blackberry       | 2                              | 2             |                    | S5                             |                |                   | G5                      |                            | X                             |
| <i>Rubus idaeus</i> ssp. <i>strigosus</i>         | <i>Rubus idaeus</i> ssp. <i>melanolasius</i> | Red Raspberry              | 0                              | -2            |                    | S5                             |                |                   | G5T5                    |                            | X                             |
| <i>Rubus pubescens</i>                            |                                              | Dwarf Raspberry            | 4                              | -4            |                    | S5                             |                |                   | G5                      |                            | X                             |
| <i>Spiraea alba</i>                               |                                              | Narrow-leaved Meadow-sweet | 3                              | -4            |                    | S5                             |                |                   | G5                      |                            | X                             |
| <b>Rubiaceae</b>                                  |                                              | <b>Madder Family</b>       |                                |               |                    |                                |                |                   |                         |                            |                               |
| <i>Galium circaezans</i>                          |                                              | Wild Licorice              | 7                              | 4             |                    | S5                             |                |                   | G5                      | R                          | X                             |
| <i>Galium trifidum</i>                            |                                              | Small Bedstraw             | 5                              | -4            |                    | S5                             |                |                   | G5                      |                            | X                             |
| <b>Rutaceae</b>                                   |                                              | <b>Rue Family</b>          |                                |               |                    |                                |                |                   |                         |                            |                               |
| <i>Zanthoxylum americanum</i>                     |                                              | American Prickly-ash       | 3                              | 5             |                    | S5                             |                |                   | G5                      | R*                         | X                             |
| <b>Salicaceae</b>                                 |                                              | <b>Willow Family</b>       |                                |               |                    |                                |                |                   |                         |                            |                               |
| <i>Populus balsamifera</i>                        |                                              | Balsam Poplar              | 4                              | -3            |                    | S5                             |                |                   | G5                      |                            | X                             |
| <i>Populus deltoides</i> ssp. <i>deltoides</i>    |                                              | Eastern Cottonwood         | 4                              | -1            |                    | S5                             |                |                   | G5T5                    |                            | X                             |
| <i>Populus tremuloides</i>                        |                                              | Trembling Aspen            |                                | 0             |                    | S5                             |                |                   | G5                      |                            | X                             |
| <i>Salix bebbiana</i>                             |                                              | Bebb's Willow              | 4                              | -4            |                    | S5                             |                |                   | G5                      |                            | X                             |
| <i>Salix discolor</i>                             |                                              | Pussy Willow               | 3                              | -3            |                    | S5                             |                |                   | G5                      |                            | X                             |
| <i>Salix eriocephala</i>                          |                                              | Heart-leaved Willow        | 4                              | -3            |                    | S5                             |                |                   | G5                      |                            | X                             |
| <i>Salix interior</i>                             | <i>Salix exigua</i>                          | Sandbar Willow             | 3                              | -5            |                    | S5                             |                |                   | GNR                     |                            | X                             |
| <i>Salix petiolaris</i>                           |                                              | Meadow Willow              | 3                              | -4            |                    | S5                             |                |                   | G5                      |                            | X                             |
| <i>Salix purpurea</i>                             |                                              | Basket Willow              |                                | -3            | -1                 | SNA                            |                |                   | G5                      |                            | X                             |

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|-----------------------------------------|----------|--------------------------|--------------------------------|---------------|--------------------|--------------------------------|----------------|-------------------|-------------------------|----------------------------|-------------------------------|
| Reference                               |          |                          |                                |               |                    |                                |                |                   |                         | Region of<br>Waterloo 1999 | Frank and<br>Anderson<br>2009 |
| <i>Salix x rubens</i>                   |          | Reddish Willow           |                                | -4            | -3                 | SNA                            |                |                   | GNA                     |                            | X                             |
| <b>Saxifragaceae</b>                    |          | <b>Saxifrage Family</b>  |                                |               |                    |                                |                |                   |                         |                            |                               |
| <i>Mitella diphylla</i>                 |          | Two-leaved Bishop's Cap  | 5                              | 2             |                    | S5                             |                |                   | G5                      |                            | X                             |
| <i>Tiarella cordifolia</i>              |          | Heart-leaved Foam-flower | 6                              | 1             |                    | S5                             |                |                   | G5                      |                            | X                             |
| <b>Scrophulariaceae</b>                 |          | <b>Figwort Family</b>    |                                |               |                    |                                |                |                   |                         |                            |                               |
| <i>Linaria vulgaris</i>                 |          | Butter-and-eggs          |                                | 5             | -1                 | SNA                            |                |                   | GNR                     |                            | X                             |
| <i>Verbascum thapsus</i>                |          | Common Mullein           |                                | 5             | -2                 | SNA                            |                |                   | GNR                     |                            | X                             |
| <b>Solanaceae</b>                       |          | <b>Nightshade Family</b> |                                |               |                    |                                |                |                   |                         |                            |                               |
| <i>Solanum dulcamara</i>                |          | Climbing Nightshade      |                                | 0             | -2                 | SNA                            |                |                   | GNR                     |                            | X                             |
| <b>Tiliaceae</b>                        |          | <b>Linden Family</b>     |                                |               |                    |                                |                |                   |                         |                            |                               |
| <i>Tilia americana</i>                  |          | American Basswood        | 4                              | 3             |                    | S5                             |                |                   | G5                      |                            | X                             |
| <b>Ulmaceae</b>                         |          | <b>Elm Family</b>        |                                |               |                    |                                |                |                   |                         |                            |                               |
| <i>Ulmus americana</i>                  |          | White Elm                | 3                              | -2            |                    | S5                             |                |                   | G5?                     |                            | X                             |
| <b>Urticaceae</b>                       |          | <b>Nettle Family</b>     |                                |               |                    |                                |                |                   |                         |                            |                               |
| <i>Boehmeria cylindrica</i>             |          | False Nettle             | 4                              | -5            |                    | S5                             |                |                   | G5                      |                            | X                             |
| <i>Urtica dioica</i> ssp. <i>dioica</i> |          | European Stinging Nettle |                                | -1            | -1                 | SNA                            |                |                   | G5T5?                   |                            | X                             |
| <b>Violaceae</b>                        |          | <b>Violet Family</b>     |                                |               |                    |                                |                |                   |                         |                            |                               |
| <i>Viola sororia</i>                    |          | Woolly Blue Violet       |                                |               |                    | S5                             |                |                   | G5                      |                            | X                             |
| <b>Vitaceae</b>                         |          | <b>Grape Family</b>      |                                |               |                    |                                |                |                   |                         |                            |                               |

| Species Latin Name            | Synonyms | Species Common Name       | Coefficient of<br>Conservatism | Wetness Index | Weediness<br>Index | Provincial<br>Status<br>S-Rank | OMNR<br>Status | COSEWIC<br>Status | Global Status<br>G-Rank | Local Status<br>Waterloo   | Local Status<br>Wellington    |
|-------------------------------|----------|---------------------------|--------------------------------|---------------|--------------------|--------------------------------|----------------|-------------------|-------------------------|----------------------------|-------------------------------|
| Reference                     |          |                           |                                |               |                    |                                |                |                   |                         | Region of<br>Waterloo 1999 | Frank and<br>Anderson<br>2009 |
| <i>Parthenocissus inserta</i> |          | Inserted Virginia-creeper | 3                              | 3             |                    | S5                             |                |                   | G5                      |                            | X                             |
| <i>Vitis riparia</i>          |          | Riverbank Grape           | 0                              | -2            |                    | S5                             |                |                   | G5                      |                            | X                             |
| <b>Araceae</b>                |          | <b>Arum Family</b>        |                                |               |                    |                                |                |                   |                         |                            |                               |
| <i>Arisaema triphyllum</i>    |          | Jack-in-the-pulpit        | 5                              | -2            |                    | S5                             |                |                   | G5                      |                            | X                             |
| <b>Cyperaceae</b>             |          | <b>Sedge Family</b>       |                                |               |                    |                                |                |                   |                         |                            |                               |
| <i>Carex aurea</i>            |          | Golden-fruited Sedge      | 4                              | -4            |                    | S5                             |                |                   | G5                      |                            | X                             |
| <i>Carex bromoides</i>        |          | Bromelike Sedge           | 7                              | -4            |                    | S5                             |                |                   | G5                      |                            | X                             |
| <i>Carex gracillima</i>       |          | Graceful Sedge            | 4                              | 3             |                    | S5                             |                |                   | G5                      |                            | X                             |
| <i>Carex granularis</i>       |          | Meadow Sedge              | 3                              | -4            |                    | S5                             |                |                   | G5                      |                            | X                             |
| <i>Carex hystericina</i>      |          | Porcupine Sedge           | 5                              | -5            |                    | S5                             |                |                   | G5                      |                            | X                             |
| <i>Carex intumescens</i>      |          | Bladder Sedge             | 6                              | -4            |                    | S5                             |                |                   | G5                      |                            | X                             |
| <i>Carex lacustris</i>        |          | Lake-bank Sedge           | 5                              | -5            |                    | S5                             |                |                   | G5                      |                            | X                             |
| <i>Carex lupulina</i>         |          | Hop Sedge                 | 6                              | -5            |                    | S5                             |                |                   | G5                      |                            | R3                            |
| <i>Carex pedunculata</i>      |          | Long-stalked Sedge        | 5                              | 5             |                    | S5                             |                |                   | G5                      |                            | X                             |
| <i>Carex pennsylvanica</i>    |          | Pennsylvania Sedge        | 5                              | 5             |                    | S5                             |                |                   | G5                      |                            | X                             |
| <i>Carex platyphylla</i>      |          | Broad-leaved Sedge        | 7                              | 5             |                    | S5                             |                |                   | G5                      | R                          | X                             |
| <i>Carex radiata</i>          |          | Stellate Sedge            | 4                              | 5             |                    | S5                             |                |                   | G4                      |                            | X                             |
| <i>Carex sparganioides</i>    |          | Burreed Sedge             | 5                              | 0             |                    | S5                             |                |                   | G5                      | R*                         | X                             |
| <i>Carex stipata</i>          |          | Awl-fruited Sedge         | 3                              | -5            |                    | S5                             |                |                   | G5                      |                            | X                             |
| <i>Carex tuckermanii</i>      |          | Tuckerman's Sedge         | 7                              | -5            |                    | S4                             |                |                   | G4                      | R                          | X                             |
| <i>Scirpus atrovirens</i>     |          | Dark-green Bulrush        | 3                              | -5            |                    | S5                             |                |                   | G5?                     |                            | X                             |
| <i>Scirpus pendulus</i>       |          | Lined Bulrush             | 3                              | -5            |                    | S5                             |                |                   | G5                      |                            | X                             |
| <b>Iridaceae</b>              |          | <b>Iris Family</b>        |                                |               |                    |                                |                |                   |                         |                            |                               |
| <i>Iris versicolor</i>        |          | Multi-coloured Blue-flag  | 5                              | -5            |                    | S5                             |                |                   | G5                      |                            | X                             |

| Species Latin Name                                                                                | Synonyms                  | Species Common Name          | Coefficient of<br>Conservatism | Wetness Index | Weediness<br>Index | Provincial<br>Status<br>S-Rank | OMNR<br>Status | COSEWIC<br>Status | Global Status<br>G-Rank | Local Status<br>Waterloo   | Local Status<br>Wellington    |
|---------------------------------------------------------------------------------------------------|---------------------------|------------------------------|--------------------------------|---------------|--------------------|--------------------------------|----------------|-------------------|-------------------------|----------------------------|-------------------------------|
| Reference                                                                                         |                           |                              |                                |               |                    |                                |                |                   |                         | Region of<br>Waterloo 1999 | Frank and<br>Anderson<br>2009 |
| <i>Sisyrinchium montanum</i>                                                                      |                           | Montane Blue-eyed-grass      |                                | -1            |                    | S5                             |                |                   | G5                      |                            | X                             |
| <b>Juncaceae</b>                                                                                  |                           | <b>Rush Family</b>           |                                |               |                    |                                |                |                   |                         |                            |                               |
| <i>Juncus articulatus</i>                                                                         |                           | Jointed Rush                 | 5                              | -5            |                    | S5                             |                |                   | G5                      |                            | X                             |
| <i>Juncus bufonius</i>                                                                            |                           | Toad Rush                    | 1                              | -4            |                    | S5                             |                |                   | G5                      |                            | X                             |
| <i>Juncus effusus</i> var. <i>solutus</i>                                                         |                           | Soft Rush                    | 4                              | -5            |                    | S5?                            |                |                   | G5T5                    |                            | X                             |
| <b>Lemnaceae</b>                                                                                  |                           | <b>Duckweed Family</b>       |                                |               |                    |                                |                |                   |                         |                            |                               |
| <i>Lemna minor</i>                                                                                |                           | Lesser Duckweed              | 2                              | -5            |                    | S5                             |                |                   | G5                      |                            | X                             |
| <i>Lemna trisulca</i>                                                                             |                           | Star Duckweed                | 4                              | -5            |                    | S5                             |                |                   | G5                      |                            | X                             |
| <b>Liliaceae</b>                                                                                  |                           | <b>Lily Family</b>           |                                |               |                    |                                |                |                   |                         |                            |                               |
| <i>Convallaria majalis</i>                                                                        |                           | Lily-of-the-valley           |                                | 5             | -2                 | SNA                            |                |                   | G5                      |                            | X                             |
| <i>Erythronium americanum</i>                                                                     |                           | Yellow Trout-lily            | 5                              | 5             |                    | S5                             |                |                   | G5                      |                            | X                             |
| <i>Hemerocallis fulva</i>                                                                         |                           | Orange Day-lily              |                                | 5             | -3                 | SNA                            |                |                   | GNA                     |                            | X                             |
| <i>Maianthemum canadense</i>                                                                      |                           | Wild Lily-of-the-valley      | 5                              | 0             |                    | S5                             |                |                   | G5                      |                            | X                             |
| <i>Maianthemum racemosum</i>                                                                      | <i>Smilacina racemosa</i> | False Solomon's Seal         | 4                              | 3             |                    | S5                             |                |                   | G5T                     |                            | X                             |
| <i>Maianthemum stellatum</i>                                                                      | <i>Smilacina stellata</i> | Star-flowered Solomon's Seal | 6                              | 1             |                    | S5                             |                |                   | G5                      |                            | X                             |
| <i>Trillium grandiflorum</i>                                                                      |                           | White Trillium               | 5                              | 5             |                    | S5                             |                |                   | G5                      |                            | X                             |
| <b>Orchidaceae</b>                                                                                |                           | <b>Orchid Family</b>         |                                |               |                    |                                |                |                   |                         |                            |                               |
| <i>Cypripedium parviflorum</i> var. <i>pubesce</i> <i>Cypripedium calceolus</i> var. <i>pubes</i> |                           | Large Yellow Lady's Slipper  | 5                              | -1            |                    | S5                             |                |                   | G5T5                    |                            | X                             |
| <b>Poaceae</b>                                                                                    |                           | <b>Grass Family</b>          |                                |               |                    |                                |                |                   |                         |                            |                               |
| <i>Agrostis gigantea</i>                                                                          |                           | Redtop                       |                                | 0             | -2                 | SNA                            |                |                   | G4G5                    |                            | X                             |
| <i>Agrostis stolonifera</i>                                                                       |                           | Redtop                       |                                | -3            |                    | S5                             |                |                   | G5                      |                            | X                             |
| <i>Andropogon gerardii</i>                                                                        |                           | Big Bluestem                 | 7                              | 1             |                    | S4                             |                |                   | G5                      | R                          | R1                            |

| Species Latin Name                  | Synonyms                 | Species Common Name         | Coefficient of<br>Conservatism | Wetness Index | Weediness<br>Index | Provincial<br>Status<br>S-Rank | OMNR<br>Status | COSEWIC<br>Status | Global Status<br>G-Rank | Local Status<br>Waterloo   | Local Status<br>Wellington    |
|-------------------------------------|--------------------------|-----------------------------|--------------------------------|---------------|--------------------|--------------------------------|----------------|-------------------|-------------------------|----------------------------|-------------------------------|
| Reference                           |                          |                             |                                |               |                    |                                |                |                   |                         | Region of<br>Waterloo 1999 | Frank and<br>Anderson<br>2009 |
| <i>Bromus inermis</i>               |                          | Awnless Brome               |                                | 5             | -3                 | SNA                            |                |                   | G5TNR                   |                            | X                             |
| <i>Calamagrostis canadensis</i>     |                          | Blue-joint Grass            | 4                              | -5            |                    | S5                             |                |                   | G5                      |                            | X                             |
| <i>Dactylis glomerata</i>           |                          | Orchard Grass               |                                | 3             | -1                 | SNA                            |                |                   | GNR                     |                            | X                             |
| <i>Elymus repens</i>                |                          | Quack Grass                 |                                | 3             | -3                 | SNA                            |                |                   | GNR                     |                            | X                             |
| <i>Eragrostis cilianensis</i>       |                          | Stink Grass                 |                                | 3             | -1                 | SNA                            |                |                   | GNR                     |                            | X                             |
| <i>Schedonorus pratensis</i>        | <i>Festuca pratensis</i> | Meadow Fescue               |                                | 4             | -1                 | SNA                            |                |                   | G5                      |                            | X                             |
| <i>Glyceria striata</i>             |                          | Fowl Meadow Grass           | 3                              | -5            |                    | S5                             |                |                   | G5                      |                            | X                             |
| <i>Lolium perenne</i>               |                          | English Rye Grass           |                                | 3             | -1                 | SNA                            |                |                   | GNR                     |                            | X                             |
| <i>Oryzopsis asperifolia</i>        |                          | White-grained Mountain-rice | 6                              | 5             |                    | S5                             |                |                   | G5                      |                            | X                             |
| <i>Panicum capillare</i>            |                          | Witch Grass                 | 0                              | 0             |                    | S5                             |                |                   | G5                      |                            | X                             |
| <i>Phalaris arundinacea</i>         |                          | Reed Canary Grass           | 0                              | -4            |                    | S5                             |                |                   | G5                      |                            | X                             |
| <i>Phleum pratense</i>              |                          | Timothy                     |                                | 3             | -1                 | SNA                            |                |                   | GNR                     |                            | X                             |
| <i>Poa pratensis ssp. pratensis</i> |                          | Kentucky Bluegrass          | 0                              | 1             |                    | S5                             |                |                   | G5T5                    |                            | X                             |
| <i>Schizachne purpurascens</i>      |                          | False Melic Grass           | 6                              | 2             |                    | S5                             |                |                   | G5                      |                            | X                             |
| <i>Setaria pumila</i>               | <i>Setaria glauca</i>    | Yellow Foxtail              |                                | 0             | -1                 | SNA                            |                |                   | GNR                     |                            | X                             |
| <i>Sporobolus vaginiflorus</i>      |                          | Sheathed Dropseed           | 1                              | 5             |                    | S5                             |                |                   | G5                      | R*                         | R1                            |
| <b>Smilacaceae</b>                  |                          | <b>Catbrier Family</b>      |                                |               |                    |                                |                |                   |                         |                            |                               |
| <i>Smilax herbacea</i>              |                          | Herbaceous Carrion Flower   | 5                              | 0             |                    | S4                             |                |                   | G5                      |                            | X                             |
| <b>Sparganiaceae</b>                |                          | <b>Bur-reed Family</b>      |                                |               |                    |                                |                |                   |                         |                            |                               |
| <i>Sparganium eurycarpum</i>        |                          | Broad-fruited Bur-reed      | 3                              | -5            |                    | S5                             |                |                   | G5                      |                            | X                             |
| <b>Typhaceae</b>                    |                          | <b>Cattail Family</b>       |                                |               |                    |                                |                |                   |                         |                            |                               |
| <i>Typha angustifolia</i>           |                          | Narrow-leaved Cattail       | 3                              | -5            |                    | SNA                            |                |                   | G5                      |                            | X                             |
| <i>Typha latifolia</i>              |                          | Broad-leaved Cattail        | 3                              | -5            |                    | S5                             |                |                   | G5                      |                            | X                             |
| <i>Typha x glauca</i>               |                          | Glaucous Cattail            | 3                              | -5            |                    | SNA                            |                |                   | GNA                     |                            | X                             |

| Species Latin Name | Synonyms | Species Common Name | Coefficient of<br>Conservatism | Wetness Index | Weediness<br>Index | Provincial<br>Status<br>S-Rank | OMNR<br>Status | COSEWIC<br>Status | Global Status<br>G-Rank | Local Status<br>Waterloo   | Local Status<br>Wellington    |
|--------------------|----------|---------------------|--------------------------------|---------------|--------------------|--------------------------------|----------------|-------------------|-------------------------|----------------------------|-------------------------------|
| Reference          |          |                     |                                |               |                    |                                |                |                   |                         | Region of<br>Waterloo 1999 | Frank and<br>Anderson<br>2009 |

STATISTICS

Species Richness

|                          |     |     |
|--------------------------|-----|-----|
| Total Number of Species: | 261 |     |
| Native Species:          | 171 | 66% |
| Exotic Species           | 90  | 34% |

|               |     |     |
|---------------|-----|-----|
| S1-S3 Species | 0   | 0%  |
| S4 Species    | 10  | 6%  |
| S5 Species    | 161 | 94% |

Floristic Quality Indices

|                                        |     |     |
|----------------------------------------|-----|-----|
| Mean Co-efficient of Conservatism (CC) | 3.9 |     |
| CC 0 - 3      lowest sensitivity       | 59  | 37% |
| CC 4 - 6      moderate sensitivity     | 88  | 56% |
| CC 7 - 8      high sensitivity         | 11  | 7%  |
| CC 9 - 10    highest sensitivity       | 0   | 0%  |
| Floristic Quality Index (FQI)          | 49  |     |

Weedy and Invasive Species

|                                       |      |     |
|---------------------------------------|------|-----|
| Mean Weediness Index                  | -1.7 |     |
| -1    low potential invasiveness      | 45   | 52% |
| -2    moderate potential invasiveness | 20   | 23% |
| -3    high potential invasiveness     | 21   | 24% |

Wetland Species

|                    |     |     |
|--------------------|-----|-----|
| Mean Wetness Index | 0.7 |     |
| upland             | 59  | 24% |

| Species Latin Name  | Synonyms | Species Common Name | Coefficient of<br>Conservatism | Wetness Index | Weediness<br>Index | Provincial<br>Status<br>S-Rank | OMNR<br>Status | COSEWIC<br>Status | Global Status<br>G-Rank | Local Status<br>Waterloo   | Local Status<br>Wellington    |
|---------------------|----------|---------------------|--------------------------------|---------------|--------------------|--------------------------------|----------------|-------------------|-------------------------|----------------------------|-------------------------------|
| Reference           |          |                     |                                |               |                    |                                |                |                   |                         | Region of<br>Waterloo 1999 | Frank and<br>Anderson<br>2009 |
|                     |          |                     |                                |               |                    |                                |                |                   |                         |                            |                               |
| facultative upland  |          | 59                  | 24%                            |               |                    |                                |                |                   |                         |                            |                               |
| facultative         |          | 47                  | 19%                            |               |                    |                                |                |                   |                         |                            |                               |
| facultative wetland |          | 52                  | 21%                            |               |                    |                                |                |                   |                         |                            |                               |
| obligate wetland    |          | 31                  | 13%                            |               |                    |                                |                |                   |                         |                            |                               |

| Common Name       | Species Code | Scientific Name       | Provincial Status (S Rank) | National Status (G Rank) | COSSARO (MNR) | COSEWIC (Federal) | Area Sensitive | Highest Breeding Evidence |
|-------------------|--------------|-----------------------|----------------------------|--------------------------|---------------|-------------------|----------------|---------------------------|
|                   |              |                       |                            |                          |               |                   |                |                           |
|                   |              |                       |                            |                          |               |                   |                |                           |
| Anseriformes      |              |                       |                            |                          |               |                   |                |                           |
| Anatidae          |              |                       |                            |                          |               |                   |                |                           |
| Canada Goose      | CANG         | Branta canadensis     | S5                         | G5                       |               |                   |                | P                         |
| Trumpeter Swan    | TRUS         | Cygnus buccinator     | S4                         | G4                       |               |                   |                | SH                        |
| Wood Duck         | WODU         | Aix sponsa            | S5                         | G5                       |               |                   |                | P                         |
| Mallard           | MALL         | Anas platyrhynchos    | S5                         | G5                       |               |                   |                | T                         |
| Hooded Merganser  | HOME         | Lophodytes cucullatus | S5B,S5N                    | G5                       |               |                   |                | SH                        |
|                   |              |                       |                            |                          |               |                   |                |                           |
| Galliformes       |              |                       |                            |                          |               |                   |                |                           |
| Phasianinae       |              |                       |                            |                          |               |                   |                |                           |
| Wild Turkey       | WITU         | Meleagris gallopavo   | S5                         | G5                       |               |                   |                | T                         |
|                   |              |                       |                            |                          |               |                   |                |                           |
| Gaviiformes       |              |                       |                            |                          |               |                   |                |                           |
| Gaviidae          |              |                       |                            |                          |               |                   |                |                           |
|                   |              |                       |                            |                          |               |                   |                |                           |
| Podicipediformes  |              |                       |                            |                          |               |                   |                |                           |
| Podicipedidae     |              |                       |                            |                          |               |                   |                |                           |
| Pied-billed Grebe | PBGR         | Podilymbus podiceps   | S4B,S4N                    | G5                       |               |                   |                |                           |
|                   |              |                       |                            |                          |               |                   |                |                           |
| Suliformes        |              |                       |                            |                          |               |                   |                |                           |
| Phalacrocoracidae |              |                       |                            |                          |               |                   |                |                           |
|                   |              |                       |                            |                          |               |                   |                |                           |
| Pelecaniformes    |              |                       |                            |                          |               |                   |                |                           |
| Ardeidae          |              |                       |                            |                          |               |                   |                |                           |
| Green Heron       | GRHE         | Butorides virescens   | S4B                        | G5                       |               |                   |                | SH                        |
|                   |              |                       |                            |                          |               |                   |                |                           |
| Pelecanidae       |              |                       |                            |                          |               |                   |                |                           |
|                   |              |                       |                            |                          |               |                   |                |                           |
| Accipitriformes   |              |                       |                            |                          |               |                   |                |                           |

| Common Name            | Species Code | Scientific Name                  | Provincial Status (S Rank) | National Status (G Rank) | COSSARO (MNR) | COSEWIC (Federal) | Area Sensitive | Highest Breeding Evidence |
|------------------------|--------------|----------------------------------|----------------------------|--------------------------|---------------|-------------------|----------------|---------------------------|
| <b>Cathartidae</b>     |              |                                  |                            |                          |               |                   |                |                           |
| Turkey Vulture         | TUVU         | <i>Cathartes aura</i>            | S5B                        | G5                       |               |                   |                | SH                        |
|                        |              |                                  |                            |                          |               |                   |                |                           |
| <b>Pandionidae</b>     |              |                                  |                            |                          |               |                   |                |                           |
|                        |              |                                  |                            |                          |               |                   |                |                           |
| <b>Accipitridae</b>    |              |                                  |                            |                          |               |                   |                |                           |
| Cooper's Hawk          | COHA         | <i>Accipiter cooperii</i>        | S4                         | G5                       |               |                   | 4-50+          | D                         |
|                        |              |                                  |                            |                          |               |                   |                |                           |
| <b>Gruiformes</b>      |              |                                  |                            |                          |               |                   |                |                           |
| <b>Rallidae</b>        |              |                                  |                            |                          |               |                   |                |                           |
| <b>Gruidae</b>         |              |                                  |                            |                          |               |                   |                |                           |
|                        |              |                                  |                            |                          |               |                   |                |                           |
| <b>Charadriiformes</b> |              |                                  |                            |                          |               |                   |                |                           |
| <b>Charadriidae</b>    |              |                                  |                            |                          |               |                   |                |                           |
| Killdeer               | KILL         | <i>Charadrius vociferus</i>      | S5B, S5N                   | G5                       |               |                   |                | SH                        |
|                        |              |                                  |                            |                          |               |                   |                |                           |
| <b>Scolopacidae</b>    |              |                                  |                            |                          |               |                   |                |                           |
| Spotted Sandpiper      | SPSA         | <i>Actitis macularius</i>        | S5                         | G5                       |               |                   |                | SH                        |
|                        |              |                                  |                            |                          |               |                   |                |                           |
| <b>Laridae</b>         |              |                                  |                            |                          |               |                   |                |                           |
|                        |              |                                  |                            |                          |               |                   |                |                           |
| <b>Columbiformes</b>   |              |                                  |                            |                          |               |                   |                |                           |
| <b>Columbidae</b>      |              |                                  |                            |                          |               |                   |                |                           |
| Mourning Dove          | MODO         | <i>Zenaida macroura</i>          | S5                         | G5                       |               |                   |                | T                         |
|                        |              |                                  |                            |                          |               |                   |                |                           |
| <b>Cuculiformes</b>    |              |                                  |                            |                          |               |                   |                |                           |
| <b>Cuculidae</b>       |              |                                  |                            |                          |               |                   |                |                           |
| Black-billed Cuckoo    | BBCU         | <i>Coccyzus erythrophthalmus</i> | S5B                        | G5                       |               |                   |                | SM                        |
|                        |              |                                  |                            |                          |               |                   |                |                           |
| <b>Strigiformes</b>    |              |                                  |                            |                          |               |                   |                |                           |
| <b>Strigidae</b>       |              |                                  |                            |                          |               |                   |                |                           |
|                        |              |                                  |                            |                          |               |                   |                |                           |

| Common Name               | Species Code | Scientific Name      | Provincial Status (S Rank) | National Status (G Rank) | COSSARO (MNR) | COSEWIC (Federal) | Area Sensitive | Highest Breeding Evidence |
|---------------------------|--------------|----------------------|----------------------------|--------------------------|---------------|-------------------|----------------|---------------------------|
| Caprimulgiformes          |              |                      |                            |                          |               |                   |                |                           |
| Caprimulgidae             |              |                      |                            |                          |               |                   |                |                           |
|                           |              |                      |                            |                          |               |                   |                |                           |
| Apodiformes               |              |                      |                            |                          |               |                   |                |                           |
|                           |              |                      |                            |                          |               |                   |                |                           |
| Ruby-throated Hummingbird | RTHU         | Archilochus colubris | S5B                        | G5                       |               |                   |                | SH                        |
|                           |              |                      |                            |                          |               |                   |                |                           |
| Coraciiformes             |              |                      |                            |                          |               |                   |                |                           |
| Alcedinidae               |              |                      |                            |                          |               |                   |                |                           |
|                           |              |                      |                            |                          |               |                   |                |                           |
| Piciformes                |              |                      |                            |                          |               |                   |                |                           |
| Picidae                   |              |                      |                            |                          |               |                   |                |                           |
| Red-bellied Woodpecker    | RBWO         | Melanerpes carolinus | S4                         | G5                       |               |                   |                | T                         |
| Downy Woodpecker          | DOWO         | Picoides pubescens   | S5                         | G5                       |               |                   |                | T                         |
| Hairy Woodpecker          | HAWO         | Picoides villosus    | S5                         | G5                       |               |                   | 10             | P                         |
| Northern Flicker          | NOFL         | Colaptes auratus     | S4B                        | G5                       |               |                   |                | P                         |
| Pileated Woodpecker       | PIWO         | Dryocopus pileatus   | S5                         | G5                       |               |                   | 30-50*         | T                         |
|                           |              |                      |                            |                          |               |                   |                |                           |
| Falconiformes             |              |                      |                            |                          |               |                   |                |                           |
| Falconidae                |              |                      |                            |                          |               |                   |                |                           |
|                           |              |                      |                            |                          |               |                   |                |                           |
| Passeriformes             |              |                      |                            |                          |               |                   |                |                           |
| Tyrannidae                |              |                      |                            |                          |               |                   |                |                           |
| Eastern Wood-Pewee        | EAWP         | Contopus virens      | S4B                        | G5                       | SC            | SC                |                | T                         |
| Willow Flycatcher         | WIFL         | Empidonax traillii   | S5B                        | G5                       |               |                   |                | T                         |
| Eastern Phoebe            | EAPH         | Sayornis phoebe      | S5B                        | G5                       |               |                   |                | T                         |
| Great Crested Flycatcher  | GCFL         | Myiarchus crinitus   | S4B                        | G5                       |               |                   |                | T                         |
| Eastern Kingbird          | EAKI         | Tyrannus tyrannus    | S4B                        | G5                       |               |                   |                | P                         |
|                           |              |                      |                            |                          |               |                   |                |                           |
| Laniidae                  |              |                      |                            |                          |               |                   |                |                           |
|                           |              |                      |                            |                          |               |                   |                |                           |
| Vireonidae                |              |                      |                            |                          |               |                   |                |                           |

| Common Name                | Species Code | Scientific Name                   | Provincial Status (S Rank) | National Status (G Rank) | COSSARO (MNR) | COSEWIC (Federal) | Area Sensitive | Highest Breeding Evidence |
|----------------------------|--------------|-----------------------------------|----------------------------|--------------------------|---------------|-------------------|----------------|---------------------------|
| Warbling Vireo             | WAVI         | <i>Vireo gilvus</i>               | S5B                        | G5                       |               |                   |                | T                         |
| Red-eyed Vireo             | REVI         | <i>Vireo olivaceus</i>            | S5B                        | G5                       |               |                   |                | T                         |
|                            |              |                                   |                            |                          |               |                   |                |                           |
| <b>Corvidae</b>            |              |                                   |                            |                          |               |                   |                |                           |
| Blue Jay                   | BLJA         | <i>Cyanocitta cristata</i>        | S5                         | G5                       |               |                   |                | P                         |
| American Crow              | AMCR         | <i>Corvus brachyrhynchos</i>      | S5B                        | G5                       |               |                   |                | FY                        |
| Common Raven               | CORA         | <i>Corvus corax</i>               | S5                         | G5                       |               |                   |                | P                         |
|                            |              |                                   |                            |                          |               |                   |                |                           |
| <b>Alaudidae</b>           |              |                                   |                            |                          |               |                   |                |                           |
|                            |              |                                   |                            |                          |               |                   |                |                           |
| <b>Hirundinidae</b>        |              |                                   |                            |                          |               |                   |                |                           |
| Tree Swallow               | TRES         | <i>Tachycineta bicolor</i>        | S4B                        | G5                       |               |                   |                | T                         |
| Northern Rough-winged Swal | NRWS         | <i>Stelgidopteryx serripennis</i> | S4B                        | G5                       |               |                   |                | SH                        |
| Bank Swallow               | BANS         | <i>Riparia riparia</i>            | S4B                        | G5                       | THR           | THR               |                | X                         |
| Barn Swallow               | BARS         | <i>Hirundo rustica</i>            | S4B                        | G5                       | THR           | THR               |                | AE                        |
|                            |              |                                   |                            |                          |               |                   |                |                           |
| <b>Paridae</b>             |              |                                   |                            |                          |               |                   |                |                           |
| Black-capped Chickadee     | BCCH         | <i>Poecile atricapillus</i>       | S5                         | G5                       |               |                   |                |                           |
|                            |              |                                   |                            |                          |               |                   |                |                           |
| <b>Sittidae</b>            |              |                                   |                            |                          |               |                   |                |                           |
| Red-breasted Nuthatch      | RBNU         | <i>Sitta canadensis</i>           | S5                         | G5                       |               |                   | 0              | SH                        |
| White-breasted Nuthatch    | WBNU         | <i>Sitta carolinensis</i>         | S5                         | G5                       |               |                   | 10             | A                         |
|                            |              |                                   |                            |                          |               |                   |                |                           |
| <b>Certhiidae</b>          |              |                                   |                            |                          |               |                   |                |                           |
| Brown Creeper              | BRCR         | <i>Certhia americana</i>          | S5B                        | G5                       |               |                   | 30             | SM                        |
|                            |              |                                   |                            |                          |               |                   |                |                           |
| <b>Troglodytidae</b>       |              |                                   |                            |                          |               |                   |                |                           |
| House Wren                 | HOWR         | <i>Troglodytes aedon</i>          | S5B                        | G5                       |               |                   |                | T                         |
|                            |              |                                   |                            |                          |               |                   |                |                           |
| <b>Polioptilidae</b>       |              |                                   |                            |                          |               |                   |                |                           |
|                            |              |                                   |                            |                          |               |                   |                |                           |
| <b>Regulidae</b>           |              |                                   |                            |                          |               |                   |                |                           |

| Common Name          | Species Code | Scientific Name                  | Provincial Status (S Rank) | National Status (G Rank) | COSSARO (MNR) | COSEWIC (Federal) | Area Sensitive | Highest Breeding Evidence |
|----------------------|--------------|----------------------------------|----------------------------|--------------------------|---------------|-------------------|----------------|---------------------------|
|                      |              |                                  |                            |                          |               |                   |                |                           |
| <b>Turdidae</b>      |              |                                  |                            |                          |               |                   |                |                           |
| Veery                | VEER         | <i>Catharus fuscescens</i>       | S4B                        | G5                       |               |                   | 10-20          | T                         |
| Wood Thrush          | WOTH         | <i>Hylocichla mustelina</i>      | S4B                        | G5                       | SC            | THR               |                | T                         |
| American Robin       | AMRO         | <i>Turdus migratorius</i>        | S5B                        | G5                       |               |                   |                | FY                        |
|                      |              |                                  |                            |                          |               |                   |                |                           |
| <b>Mimidae</b>       |              |                                  |                            |                          |               |                   |                |                           |
| Gray Catbird         | GRCA         | <i>Dumetella carolinensis</i>    | S4B                        | G5                       |               |                   |                | V                         |
|                      |              |                                  |                            |                          |               |                   |                |                           |
| <b>Sturnidae</b>     |              |                                  |                            |                          |               |                   |                |                           |
| European Starling    | EUST         | <i>Sturnus vulgaris</i>          | SNA                        | G5                       |               |                   |                | FY                        |
|                      |              |                                  |                            |                          |               |                   |                |                           |
| <b>Motacillidae</b>  |              |                                  |                            |                          |               |                   |                |                           |
|                      |              |                                  |                            |                          |               |                   |                |                           |
| <b>Bombycillidae</b> |              |                                  |                            |                          |               |                   |                |                           |
| Cedar Waxwing        | CEDW         | <i>Bombycilla cedrorum</i>       | S5B                        | G5                       |               |                   |                | P                         |
|                      |              |                                  |                            |                          |               |                   |                |                           |
| <b>Calcaridae</b>    |              |                                  |                            |                          |               |                   |                |                           |
|                      |              |                                  |                            |                          |               |                   |                |                           |
| <b>Parulidae</b>     |              |                                  |                            |                          |               |                   |                |                           |
| Ovenbird             | OVEN         | <i>Seiurus aurocapilla</i>       | S4B                        | G5                       |               |                   | 20             | SM                        |
| Northern Waterthrush | NOWA         | <i>Parkesia noveboracensis</i>   | S5B                        | G5                       |               |                   | 20             | T                         |
| Blue-winged Warbler  | BWWA         | <i>Vermivora cyanoptera</i>      | S4B                        | G5                       |               |                   |                | T                         |
| Common Yellowthroat  | COYE         | <i>Geothlypis trichas</i>        | S5B                        | G5                       |               |                   |                | A                         |
| American Redstart    | AMRE         | <i>Setophaga ruticilla</i>       | S5B                        | G5                       |               |                   | 20-30          | SM                        |
| Yellow Warbler       | YWAR         | <i>Setophaga petechia</i>        | S5B                        | G5                       |               |                   |                | T                         |
| Pine Warbler         | PIWA         | <i>Setophaga pinus</i>           | S5B                        | G5                       |               |                   | 15-30          | T                         |
|                      |              |                                  |                            |                          |               |                   |                |                           |
| <b>Emberizidae</b>   |              |                                  |                            |                          |               |                   |                |                           |
| Chipping Sparrow     | CHSP         | <i>Spizella passerina</i>        | S5B                        | G5                       |               |                   |                | T                         |
| Savannah Sparrow     | SAVS         | <i>Passerculus sandwichensis</i> | S4B                        | G5                       |               |                   |                | T                         |
| Song Sparrow         | SOSP         | <i>Melospiza melodia</i>         | S5B                        | G5                       |               |                   |                | FS                        |

| Common Name            | Species Code | Scientific Name                | Provincial Status (S Rank) | National Status (G Rank) | COSSARO (MNR) | COSEWIC (Federal) | Area Sensitive | Highest Breeding Evidence |
|------------------------|--------------|--------------------------------|----------------------------|--------------------------|---------------|-------------------|----------------|---------------------------|
| Swamp Sparrow          | SWSP         | <i>Melospiza georgiana</i>     | S5B                        | G5                       |               |                   |                | FS                        |
| White-throated Sparrow | WTSP         | <i>Zonotrichia albicollis</i>  | S5B                        | G5                       |               |                   | 20             | SM                        |
|                        |              |                                |                            |                          |               |                   |                |                           |
| <b>Cardinalidae</b>    |              |                                |                            |                          |               |                   |                |                           |
| Northern Cardinal      | NOCA         | <i>Cardinalis cardinalis</i>   | S5                         | G5                       |               |                   |                | T                         |
| Rose-breasted Grosbeak | RBGR         | <i>Pheucticus ludovicianus</i> | S4B                        | G5                       |               |                   |                | T                         |
| Indigo Bunting         | INBU         | <i>Passerina cyanea</i>        | S4B                        | G5                       |               |                   |                | P                         |
|                        |              |                                |                            |                          |               |                   |                |                           |
| <b>Icteridae</b>       |              |                                |                            |                          |               |                   |                |                           |
| Bobolink               | BOBO         | <i>Dolichonyx oryzivorus</i>   | S4B                        | G5                       | THR           | THR               | 10             | FS                        |
| Red-winged Blackbird   | RWBL         | <i>Agelaius phoeniceus</i>     | S4                         | G5                       |               |                   |                | FS                        |
| Eastern Meadowlark     | EAME         | <i>Sturnella magna</i>         | S4B                        | G5                       | THR           | THR               |                | P                         |
| Common Grackle         | COGR         | <i>Quiscalus quiscula</i>      | S5B                        | G5                       |               |                   |                | FY                        |
| Brown-headed Cowbird   | BHCO         | <i>Molothrus ater</i>          | S4B                        | G5                       |               |                   |                | P                         |
| Orchard Oriole         | OROR         | <i>Icterus spurius</i>         | S4B                        | G5                       |               |                   |                | FS                        |
| Baltimore Oriole       | BAOR         | <i>Icterus galbula</i>         | S4B                        | G5                       |               |                   |                | FY                        |
|                        |              |                                |                            |                          |               |                   |                |                           |
| <b>Fringillidae</b>    |              |                                |                            |                          |               |                   |                |                           |
| Purple Finch           | PUFI         | <i>Carpodacus purpureus</i>    | S4B                        | G5                       |               |                   |                | SM                        |
| House Finch            | HOFI         | <i>Carpodacus mexicanus</i>    | SNA                        | G5                       |               |                   |                | SM                        |
| American Goldfinch     | AMGO         | <i>Spinus tristis</i>          | S5B                        | G5                       |               |                   |                | P                         |
|                        |              |                                |                            |                          |               |                   |                |                           |
| <b>Passeridae</b>      |              |                                |                            |                          |               |                   |                |                           |
| House Sparrow          | HOSP         | <i>Passer domesticus</i>       | SNA                        | G5                       |               |                   |                | V                         |

SAVANTA INC.  
TABLE 6: AMPHIBIAN CALL COUNT

CAMBRIDGE EAST BOUNDARY ROAD  
DATA COLLECTION SUMMARY REPORT

| Round | Station | NOAM | AMTO | FOTO | GRTR | SPPE | CHFR | WOFR | NLFR | PIFR | GRFR | BULL | MIFR | Water Y/N |
|-------|---------|------|------|------|------|------|------|------|------|------|------|------|------|-----------|
| 1     | AMC 1   |      |      |      |      | 3    |      | 1(1) |      | 1(2) |      |      |      |           |
| 2     | AMC 1   |      | 1(1) |      | 2(4) | 3    |      |      |      |      |      |      |      |           |
| 3     | AMC 1   |      |      |      | 1(2) |      |      |      | 1(2) |      | 1(3) |      |      |           |
| 1     | AMC 2   |      |      |      |      | 2(5) |      | 1(1) |      | 1(2) |      |      |      |           |
| 2     | AMC 2   |      |      |      | 1(1) |      |      |      | 1(1) |      |      |      |      |           |
| 3     | AMC 2   |      |      |      | 1(3) |      |      |      |      |      |      |      |      |           |
| 1     | AMC 3   | x    |      |      |      |      |      |      |      |      |      |      |      |           |
| 2     | AMC 3   | x    |      |      |      |      |      |      |      |      |      |      |      |           |
| 3     | AMC 3   | x    |      |      |      |      |      |      |      |      |      |      |      |           |
| 1     | AMC 4   | x    |      |      |      |      |      |      |      |      |      |      |      |           |
| 2     | AMC 4   | x    |      |      |      |      |      |      |      |      |      |      |      |           |
| 3     | AMC 4   |      |      |      |      |      |      |      |      |      | 1(1) |      |      |           |
| 1     | AMC 5   | x    |      |      |      |      |      |      |      |      |      |      |      |           |
| 2     | AMC 5   | x    |      |      |      |      |      |      |      |      |      |      |      |           |
| 3     | AMC 5   | x    |      |      |      |      |      |      |      |      |      |      |      |           |
| 1     | AMC 6   |      |      |      |      | 3    |      |      |      |      |      |      |      |           |
| 2     | AMC 6   |      |      |      | 1(1) | 3    |      |      | 1(1) | 1(1) |      |      |      |           |
| 3     | AMC 6   |      |      |      | 3    |      |      |      |      |      | 1(5) |      |      |           |
| 1     | AMC 7   |      |      |      |      |      |      | 1(1) |      |      |      |      |      |           |
| 2     | AMC 7   | x    |      |      |      |      |      |      |      |      |      |      |      |           |
| 3     | AMC 7   | x    |      |      |      |      |      |      |      |      |      |      |      |           |
| 1     | AMC 8   | x    |      |      |      |      |      |      |      |      |      |      |      |           |
| 2     | AMC 8   | x    |      |      |      |      |      |      |      |      |      |      |      |           |
| 3     | AMC 8   |      |      |      |      |      |      |      |      |      | 1(3) |      |      |           |
| 1     | AMC 9   | x    |      |      |      |      |      |      |      |      |      |      |      |           |
| 2     | AMC 9   | x    |      |      |      |      |      |      |      |      |      |      |      |           |
| 3     | AMC 9   | x    |      |      |      |      |      |      |      |      |      |      |      |           |
| 1     | AMC 10  | x    |      |      |      |      |      |      |      |      |      |      |      |           |
| 2     | AMC 10  |      |      |      | 3    | 3    |      |      |      |      |      |      |      |           |
| 3     | AMC 10  |      |      |      |      |      |      |      |      |      | 2(5) |      |      |           |
| 1     | AMC 11  |      |      |      |      | 3    |      |      |      |      |      |      |      |           |
| 2     | AMC 11  |      |      |      |      | 3    |      |      |      |      |      |      |      |           |
| 3     | AMC 11  |      |      |      |      |      |      |      |      |      | 1(2) |      |      |           |
| 1     | AMC 12  |      |      |      |      | 3    |      | 1(2) |      | 1(2) |      |      |      |           |

TABLE 6: AMPHIBIAN CALL COUNT

| Round | Station | NOAM | AMTO | FOTO | GRTR | SPPE | CHFR | WOFR | NLFR | PIFR | GRFR | BULL | MIFR | Water Y/N |
|-------|---------|------|------|------|------|------|------|------|------|------|------|------|------|-----------|
| 2     | AMC 12  |      |      |      | 1(1) | 3    |      |      | 1(1) | 1(1) |      |      |      |           |
| 3     | AMC 12  |      |      |      |      |      |      |      |      |      | 3    |      |      |           |
| 1     | AMC 13  | x    |      |      |      |      |      |      |      |      |      |      |      |           |
| 2     | AMC 13  |      | 1(2) |      | 1(3) | 3    |      |      |      |      |      |      |      |           |
| 3     | AMC 13  |      |      |      |      |      |      |      |      |      | 1(2) |      |      |           |
| 1     | AMC 14  | x    |      |      |      |      |      |      |      |      |      |      |      |           |
| 2     | AMC 14  | x    |      |      |      |      |      |      |      |      |      |      |      |           |
| 3     | AMC 14  | x    |      |      |      |      |      |      |      |      |      |      |      |           |
| 1     | AMC 15  | x    |      |      |      |      |      |      |      |      |      |      |      |           |
| 2     | AMC 15  |      |      |      | 1(1) | 1(2) |      |      |      |      |      |      |      |           |
| 3     | AMC 15  |      |      |      |      |      |      |      |      |      | 1(2) |      |      |           |
| 1     | AMC 16  |      |      |      |      | 3    |      | 1(1) |      |      |      |      |      |           |
| 2     | AMC 16  |      | 1(2) |      |      | 2(5) |      |      |      |      |      |      |      |           |
| 3     | AMC 16  |      |      |      |      |      |      |      |      |      | 1(1) |      |      |           |
| 1     | AMC 17  | x    |      |      |      |      |      |      |      |      |      |      |      |           |
| 2     | AMC 17  |      |      |      |      | 1(2) |      |      |      |      |      |      |      |           |
| 3     | AMC 17  | x    |      |      |      |      |      |      |      |      |      |      |      |           |
| 1     | AMC 18  | x    |      |      |      |      |      |      |      |      |      |      |      |           |
| 2     | AMC 18  | x    |      |      |      |      |      |      |      |      |      |      |      |           |
| 3     | AMC 18  | x    |      |      |      |      |      |      |      |      |      |      |      |           |
| 1     | AMC 19  |      |      |      |      | 1(1) |      | 1(1) |      |      |      |      |      |           |
| 2     | AMC 19  |      |      |      |      | 1(1) |      |      | 1(1) | 1(1) |      |      |      |           |
| 3     | AMC 19  | x    |      |      |      |      |      |      |      |      |      |      |      |           |
| 1     | AMC 20  | x    |      |      |      |      |      |      |      |      |      |      |      |           |
| 2     | AMC 20  |      |      |      |      | 1(2) |      |      |      |      |      |      |      |           |
| 3     | AMC 20  |      |      |      |      |      |      |      |      |      | 2(5) |      |      |           |
| 1     | AMC 21  | x    |      |      |      |      |      |      |      |      |      |      |      |           |
| 2     | AMC 21  |      |      |      |      | 1(1) |      |      |      |      |      |      |      |           |
| 3     | AMC 21  |      |      |      | 3    |      |      |      |      |      |      |      |      |           |
| 1     | AMC 22  |      |      |      |      | 3    |      |      |      | 1(1) |      |      |      |           |
| 2     | AMC 22  |      |      |      |      | 1(3) |      |      |      |      |      |      |      |           |
| 3     | AMC 22  |      |      |      | 2(5) |      |      |      |      |      |      |      |      |           |
| 1     | AMC 23  |      |      |      |      |      |      |      |      | 1(2) |      |      |      |           |
| 2     | AMC 23  |      |      |      | 1(1) | 1(4) |      |      |      |      | 1(1) |      |      |           |
| 3     | AMC 23  |      |      |      |      |      |      |      |      |      | 1(4) |      |      |           |

TABLE 6: AMPHIBIAN CALL COUNT

| Round | Station | NOAM | AMTO | FOTO | GRTR | SPPE | CHFR | WOFR | NLFR | PIFR | GRFR | BULL | MIFR | Water Y/N |
|-------|---------|------|------|------|------|------|------|------|------|------|------|------|------|-----------|
| 1     | AMC 24  | x    |      |      |      |      |      |      |      |      |      |      |      |           |
| 2     | AMC 24  | x    |      |      |      |      |      |      |      |      |      |      |      |           |
| 3     | AMC 24  |      |      |      | 1(1) |      |      |      |      |      | 1(2) |      |      |           |
| 1     | AMC 25  | x    |      |      |      |      |      |      |      |      |      |      |      |           |
| 2     | AMC 25  |      |      |      | 1(1) |      |      |      |      |      |      |      |      |           |
| 3     | AMC 25  | x    |      |      |      |      |      |      |      |      |      |      |      |           |
| 1     | AMC 26  |      |      |      |      | 3    |      | 1(2) |      |      |      |      |      |           |
| 2     | AMC 26  | x    |      |      |      |      |      |      |      |      |      |      |      |           |
| 3     | AMC 26  |      |      |      | 1(1) |      |      |      |      |      | 1(1) |      |      |           |
| 1     | AMC 27  | x    |      |      |      |      |      |      |      |      |      |      |      |           |
| 2     | AMC 27  |      |      |      |      | 1(1) |      |      |      |      |      |      |      |           |
| 3     | AMC 27  |      |      |      | 3    |      |      |      |      |      | 1(4) |      |      |           |
| 1     | AMC 28  | x    |      |      |      |      |      |      |      |      |      |      |      |           |
| 2     | AMC 28  |      |      |      |      | 1(3) |      |      |      |      |      |      |      |           |
| 3     | AMC 28  |      |      |      |      |      |      |      |      |      | 1(1) |      |      |           |

**Species Code**

NOAM

FOTO

GRTR

SPPE

CHFR

WOFR

NLFR

PIFR

GRFR

BULL

MIFR

**Common Name**

No Amphibians

Folwers Toad

Gray Tree Frog

Spring Peeper

Chorus Frog

Wood Frog

Northern Leopard

Frog

Pickerel Frog

Green Frog

Bullfrog

Mink Frog

**Scientific Name***Anaxyrus fowleri**Hyla versicolor**Pseudacris crucifer**Pseudacris triseriata**Lithobates sylvatica**Lithobates pipiens**Lithobates palustris**Lithobates clamitans**Lithobates catesbeiana**Lithobates septentrionalis***Amphibian Call Codes**

x = No amphibians heard

2 = Calls overlap but can be reliably estimated

3 = Calls overlap too much to estimate number

**Reference**

Bird Studies Canada (BSC). 2003. Marsh Monitoring Program training kit and instructions for surveying marsh birds, amphibians and their habitats. Long Point Bird Observatory and Environment Canada, 41 pp.

| COMMON NAME                   | SCIENTIFIC NAME                      | SRANK | GLOBAL STATUS | COSSARO | COSEWIC | AREA SENSITIVE (ha) | Local Status Halton | Local Status Hamilton | Local Status TRCA | Regional Status Waterloo | Source | Area Sensitive Reference |
|-------------------------------|--------------------------------------|-------|---------------|---------|---------|---------------------|---------------------|-----------------------|-------------------|--------------------------|--------|--------------------------|
| River Jewelwing               | <i>Calopteryx aequabilis</i>         | S5    | G5            |         |         |                     | HU                  |                       |                   |                          |        |                          |
| Ebony Jewelwing               | <i>Calopteryx maculata</i>           | S5    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| American Rubyspot             | <i>Hetaerina americana</i>           | S4    | G5            |         |         |                     | HR                  |                       |                   |                          |        |                          |
| Smoky Rubyspot                | <i>Hetaerina titia</i>               | S2    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Spotted Spreadwing            | <i>Lestes congener</i>               | S5    | G5            |         |         |                     | HU                  |                       |                   |                          |        |                          |
| Amber-winged Spreadwing       | <i>Lestes eurinus</i>                | S3    | G4            |         |         |                     | HR                  |                       |                   |                          |        |                          |
| Sweetflag Spreadwing          | <i>Lestes forcipatus</i>             | S4    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Elegant Spreadwing            | <i>Lestes inaequalis</i>             | S4    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Slender Spreadwing            | <i>Lestes rectangularis</i>          | S5    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Lyre-tipped Spreadwing        | <i>Lestes unguiculatus</i>           | S5    | G5            |         |         |                     | HU                  |                       |                   |                          |        |                          |
| Swamp Spreadwing              | <i>Lestes vigilax</i>                | S4    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Eastern Red Damsel            | <i>Amphiagrion saucium</i>           | S4    | G5            |         |         |                     | HR                  |                       |                   |                          |        |                          |
| Blue-fronted Dancer           | <i>Argia apicalis</i>                | S4    | G5            |         |         |                     | HR                  |                       |                   |                          |        |                          |
| Violet Dancer                 | <i>Argia fumipennis violacea</i>     | S5    | G5T5          |         |         |                     | HU                  |                       |                   |                          |        |                          |
| Powdered Dancer               | <i>Argia moesta</i>                  | S5    | G5            |         |         |                     | HR                  |                       |                   |                          |        |                          |
| Blue-ringed Dancer            | <i>Argia sedula</i>                  | S2    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Blue-tipped Dancer            | <i>Argia tibialis</i>                | S3    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Dusky Dancer                  | <i>Argia translata</i>               | S2    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Aurora Damsel                 | <i>Chromagrion conditum</i>          | S5    | G5            |         |         |                     | HR                  |                       |                   |                          |        |                          |
| Prairie Bluet                 | <i>Coenagrion angulatum</i>          | SH    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Subarctic Bluet               | <i>Coenagrion interrogatum</i>       | S4    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Taiga Bluet                   | <i>Coenagrion resolutum</i>          | S5    | G5            |         |         |                     | HR                  |                       |                   |                          |        |                          |
| River Bluet                   | <i>Enallagma anna</i>                | S2    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Rainbow Bluet                 | <i>Enallagma antennatum</i>          | S4    | G5            |         |         |                     | HR                  |                       |                   |                          |        |                          |
| Azure Bluet                   | <i>Enallagma aspersum</i>            | S3    | G5            |         |         |                     | HR                  |                       |                   |                          |        |                          |
| Double-striped Bluet          | <i>Enallagma basidens</i>            | S3    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Boreal Bluet                  | <i>Enallagma boreale</i>             | S5    | G5            |         |         |                     | HR                  |                       |                   |                          |        |                          |
| Tule Bluet                    | <i>Enallagma carunculatum</i>        | S5    | G5            |         |         |                     | HR                  |                       |                   |                          |        |                          |
| Familiar Bluet                | <i>Enallagma civile</i>              | S5    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Alkali Bluet                  | <i>Enallagma clausum</i>             | S1    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Spring Northern Bluet         | <i>Enallagma vernale.</i>            | S4    | G4            |         |         |                     |                     |                       |                   |                          |        |                          |
| Stream Bluet                  | <i>Enallagma exsulans</i>            | S5    | G5            |         |         |                     | HR                  |                       |                   |                          |        |                          |
| Skimming Bluet                | <i>Enallagma geminatum</i>           | S4    | G5            |         |         |                     | HR                  |                       |                   |                          |        |                          |
| Hagen's Bluet                 | <i>Enallagma hageni</i>              | S5    | G5            |         |         |                     | HR                  |                       |                   |                          |        |                          |
| Orange Bluet                  | <i>Enallagma signatum</i>            | S4    | G5            |         |         |                     | HR                  |                       |                   |                          |        |                          |
| Slender Bluet                 | <i>Enallagma traviatum westfalli</i> | S1    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Vesper Bluet                  | <i>Enallagma vesperum</i>            | S4    | G4            |         |         |                     |                     |                       |                   |                          |        |                          |
| Citrine Forktail              | <i>Ischnura hastata</i>              | SNA   | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Fragile Forktail              | <i>Ischnura posita</i>               | S4    | G5            |         |         |                     | HR                  |                       |                   |                          |        |                          |
| Sphagnum Sprite               | <i>Nehalennia gracilis</i>           | S4    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Mosaic Darner                 | <i>Aeshna sp.</i>                    |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
| Canada Darner                 | <i>Aeshna canadensis</i>             | S5    | G5            |         |         |                     | HU                  |                       |                   |                          |        |                          |
| Mottled Darner                | <i>Aeshna clepsydra</i>              | S3    | G4            |         |         |                     |                     |                       |                   |                          |        |                          |
| Lance-Tipped Darner           | <i>Aeshna constricta</i>             | S5    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Lake Darner                   | <i>Aeshna eremita</i>                | S5    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Variable (Interrupted) Darner | <i>Aeshna interrupta interrupta</i>  | S5    | G5            |         |         |                     | HR                  |                       |                   |                          |        |                          |
| Variable (Lineate) Darner     | <i>Aeshna interrupta lineata</i>     | S2    | G5T5          |         |         |                     |                     |                       |                   |                          |        |                          |

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|---------------------------|-----------------------------------|-------|---------------|---------|---------|---------------------|---------------------|-----------------------|-------------------|--------------------------|--------|--------------------------|
| Sedge Darner              | <i>Aeshna juncea</i>              | S3?   | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Spatterdock Darner        | <i>Aeshna mutata</i>              | S1    | G4            |         |         |                     |                     |                       |                   |                          |        |                          |
| Azure Darner              | <i>Aeshna septentrionalis</i>     | S1S3  | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Zigzag Darner             | <i>Aeshna sitchensis</i>          | S4    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Subarctic Darner          | <i>Aeshna subarctica</i>          | S2S3  | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Black-Tipped Darner       | <i>Aeshna tuberculifera</i>       | S4    | G4            |         |         |                     |                     |                       |                   |                          |        |                          |
| Shadow Darner             | <i>Aeshna umbrosa</i>             | S5    | G5            |         |         |                     | HU                  |                       |                   |                          |        |                          |
| Green-striped Darner      | <i>Aeshna verticalis</i>          | S3    | G5            |         |         |                     | HR                  |                       |                   |                          |        |                          |
| Common Green Darner       | <i>Anax junius</i>                | S5    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Comet Darner              | <i>Anax longipes</i>              | SNA   | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Springtime Darner         | <i>Basiaeschna janata</i>         | S5    | G5            |         |         |                     | HR                  |                       |                   |                          |        |                          |
| Ocellated Darner          | <i>Boyeria grafiana</i>           | S4    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Fawn Darner               | <i>Boyeria vinosa</i>             | S5    | G5            |         |         |                     | HR                  |                       |                   |                          |        |                          |
| Swamp Darner              | <i>Epiaeschna heros</i>           | S2S3  | G5            |         |         |                     | HR                  |                       |                   |                          |        |                          |
| Harlequin Darner          | <i>Gomphaeschna furcillata</i>    | S3    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Cyrano Darner             | <i>Nasiaeschna pentacantha</i>    | S3    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Horned Clubtail           | <i>Arigomphus cornutus</i>        | S3    | G4            |         |         |                     |                     |                       |                   |                          |        |                          |
| Lilypad Clubtail          | <i>Arigomphus furcifer</i>        | S3    | G5            |         |         |                     | HR                  |                       |                   |                          |        |                          |
| Unicorn Clubtail          | <i>Arigomphus villosipes</i>      | S2S3  | G5            |         |         |                     | HU                  |                       |                   |                          |        |                          |
| Black-shouldered Spinyleg | <i>Dromogomphus spinosus</i>      | S5    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Flag-tailed Spinyleg      | <i>Dromogomphus spoliatus</i>     | S1    | G4G5          |         |         |                     |                     |                       |                   |                          |        |                          |
| Moustached Clubtail       | <i>Gomphus adelphus</i>           | S4    | G4            |         |         |                     |                     |                       |                   |                          |        |                          |
| Beaverpond Clubtail       | <i>Gomphus borealis</i>           | S3    | G4            |         |         |                     |                     |                       |                   |                          |        |                          |
| Harpoon Clubtail          | <i>Gomphus desertus</i>           | S3    | G4            |         |         |                     |                     |                       |                   |                          |        |                          |
| Lancet Clubtail           | <i>Gomphus exilis</i>             | S5    | G5            |         |         |                     | HU                  |                       |                   |                          |        |                          |
| Midland Clubtail          | <i>Gomphus fraternus</i>          | S4    | G5            |         |         |                     | HR                  |                       |                   |                          |        |                          |
| Pronghorn Clubtail        | <i>Gomphus graslinellus</i>       | S3    | G5            |         |         |                     | HR                  |                       |                   |                          |        |                          |
| Ashy Clubtail             | <i>Gomphus lividus</i>            | S4    | G5            |         |         |                     | HR                  |                       |                   |                          |        |                          |
| Rapids Clubtail           | <i>Gomphus quadricolor</i>        | S1    | G3G4          | END     | END     |                     |                     |                       |                   |                          |        |                          |
| Dusky Clubtail            | <i>Gomphus spicatus</i>           | S5    | G5            |         |         |                     | HU                  |                       |                   |                          |        |                          |
| Cobra Clubtail            | <i>Gomphus vastus</i>             | S1    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Skillet Clubtail          | <i>Gomphus ventricosus</i>        | SH    | G3            |         |         |                     |                     |                       |                   |                          |        |                          |
| Green-faced Clubtail      | <i>Gomphus viridifrons</i>        | S1    | G3G4          |         |         |                     |                     |                       |                   |                          |        |                          |
| Dragonhunter              | <i>Hagenius brevistylus</i>       | S5    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Extra-striped Snaketail   | <i>Ophiogomphus anomalus</i>      | S3    | G4            |         |         |                     |                     |                       |                   |                          |        |                          |
| Riffle Snaketail          | <i>Ophiogomphus carolus</i>       | S2S3  | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Boreal Snaketail          | <i>Ophiogomphus colubrinus</i>    | S4    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Maine Snaketail           | <i>Ophiogomphus mainensis</i>     | S1    | G4            |         |         |                     |                     |                       |                   |                          |        |                          |
| Rusty Snaketail           | <i>Ophiogomphus rupinsulensis</i> | S4    | G5            |         |         |                     | HR                  |                       |                   |                          |        |                          |
| Pygmy Snaketail           | <i>Ophiogomphus howei</i>         | S1    | G3            | END     | SC      |                     |                     |                       |                   |                          |        |                          |
| Common Sanddragon         | <i>Progomphus obscurus</i>        | S1    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Eastern Least Clubtail    | <i>Stylogomphus albistylus</i>    | S4    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Riverine Clubtail         | <i>Stylurus amnicola</i>          | S1    | G4            | END     | END     |                     |                     |                       |                   |                          |        |                          |
| Laura's Clubtail          | <i>Stylurus laurae</i>            | S1    | G4            | END     |         |                     |                     |                       |                   |                          |        |                          |
| Elusive Clubtail          | <i>Stylurus notatus</i>           | S2    | G3            |         |         |                     |                     |                       |                   |                          |        |                          |
| Russet-tipped Clubtail    | <i>Stylurus plagiatu</i> s        | SH    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Zebra Clubtail            | <i>Stylurus scudderi</i>          | S4    | G4            |         |         |                     |                     |                       |                   |                          |        |                          |

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| Arrow Clubtail           | <i>Stylurus spiniceps</i>           | S2    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Delta-spotted Spiketail  | <i>Cordulegaster diastatops</i>     | S4    | G5            |         |         |                     | HR                  |                       |                   |                          |        |                          |
| Twin-spotted Spiketail   | <i>Cordulegaster maculata</i>       | S4    | G5            |         |         |                     | HR                  |                       |                   |                          |        |                          |
| Arrowhead Spiketail      | <i>Cordulegaster obliqua</i>        | S1    | G4            |         |         |                     | HU                  |                       |                   |                          |        |                          |
| Stream Cruiser           | <i>Didymops transversa</i>          | S4    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Illinois River Crusier   | <i>Macromia illinoiensis</i>        | S4    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Royal River Cruiser      | <i>Macromia taeniolata</i>          | S1    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| American Emerald         | <i>Cordulia shurtleffi</i>          | S5    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Racket-tailed Emerald    | <i>Dorocordulia libera</i>          | S5    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Beaverpond baskettail    | <i>Epithea canis</i>                | S5    | G5            |         |         |                     | HU                  |                       |                   |                          |        |                          |
| Common Baskettail        | <i>Epithea cynosura</i>             | S5    | G5            |         |         |                     | HU                  |                       |                   |                          |        |                          |
| Prince Baskettail        | <i>Epithea princeps</i>             | S5    | G5            |         |         |                     | HR                  |                       |                   |                          |        |                          |
| Spiny Baskettail         | <i>Epithea spinigera</i>            | S5    | G5            |         |         |                     | HR                  |                       |                   |                          |        |                          |
| Uhler's Sundragon        | <i>Helocordulia uhleri</i>          | S3    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Stygian Shadowdragon     | <i>Neurocordulia yamaskanensis</i>  | S4    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Ringed Emerald           | <i>Somatochlora albicncta</i>       | S4?   | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Lake Emerald             | <i>Somatochlora cingulata</i>       | S4    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Ski-tailed Emerald       | <i>Somatochlora elongata</i>        | S3?   | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Plains Emerald           | <i>Somatochlora ensigera</i>        | S1    | G4            |         |         |                     |                     |                       |                   |                          |        |                          |
| Hine's Emerald           | <i>Somatochlora hineana</i>         | S1    | G2G3          | END     |         |                     |                     |                       |                   |                          |        |                          |
| Forcipate Emerald        | <i>Somatochlora forcipata</i>       | S3    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Delicate Emerald         | <i>Somatochlora franklini</i>       | S4    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Hudsonian Emerald        | <i>Somatochlora hudsonica</i>       | S2S3  | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Incuvate Emerald         | <i>Somatochlora incurvata</i>       | S1    | G4            |         |         |                     |                     |                       |                   |                          |        |                          |
| Kennedy's Emerald        | <i>Somatochlora kennedyi</i>        | S4    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Mocha Emerald            | <i>Somatochlora linearis</i>        | S1    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Ocellated Emerald        | <i>Somatochlora minor</i>           | S4    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Muskeg Emerald           | <i>Somatochlora septentrionalis</i> | S2S3  | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Clamp-tipped Emerald     | <i>Somatochlora tenebrosa</i>       | S2S3  | G5            |         |         |                     | HR                  |                       |                   |                          |        |                          |
| Brush-tipped Emerald     | <i>Somatochlora walshii</i>         | S4    | G5            |         |         |                     | HU                  |                       |                   |                          |        |                          |
| Whitehouse's Emerald     | <i>Somatochlora whitehousei</i>     | S2S3  | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Williamson's Emerald     | <i>Somatochlora williamsoni</i>     | S4    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Ebony Boghaunter         | <i>Williamsonia fletcheri</i>       | S2    | G4            |         |         |                     |                     |                       |                   |                          |        |                          |
| Calico Pennant           | <i>Celithemis elisa</i>             | S5    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Halloween Pennant        | <i>Celithemis eponina</i>           | S4    | G5            |         |         |                     | HR                  |                       |                   |                          |        |                          |
| Banded Pennant           | <i>Celithemis fasciata</i>          | SNA   | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Eastern Pondhawk         | <i>Erythemis simplicicollis</i>     | S5    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Chalk-fronted Corporal   | <i>Ladona julia</i>                 | S5    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Boreal Whiteface         | <i>Leucorrhinia borealis</i>        | S1S3  | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Frosted Whiteface        | <i>Leucorrhinia frigida</i>         | S5    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Crimson-ringed Whiteface | <i>Leucorrhinia glacialis</i>       | S4    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Hudsonian Whiteface      | <i>Leucorrhinia hudsonica</i>       | S5    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Dot-tailed Whiteface     | <i>Leucorrhinia intacta</i>         | S5    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Canada Whiteface         | <i>Leucorrhinia patricia</i>        | S2S3  | G4            |         |         |                     |                     |                       |                   |                          |        |                          |
| Red-waisted Whiteface    | <i>Leucorrhinia proxima</i>         | S5    | G5            |         |         |                     | HR                  |                       |                   |                          |        |                          |
| Slaty Skimmer            | <i>Libellula incesta</i>            | S4    | G5            |         |         |                     | HR                  |                       |                   |                          |        |                          |
| Four-spotted Skimmer     | <i>Libellula quadrimaculata</i>     | S5    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |

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| Painted Skimmer             | <i>Libellula semifasciata</i>   | S2    | G5            |         |         |                     | HR                  |                       |                   |                          |        |                          |
| Great Blue Skimmer          | <i>Libellula vibrans</i>        | S1    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Elfin Skimmer               | <i>Nannothemis bella</i>        | S4    | G4            |         |         |                     |                     |                       |                   |                          |        |                          |
| Blue Dasher                 | <i>Pachydiplax longipennis</i>  | S5    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Wandering Glider            | <i>Pantala flavescens</i>       | S4    | G5            |         |         |                     | HR                  |                       |                   |                          |        |                          |
| Spot-winged Glider          | <i>Pantala hymenaea</i>         | S4    | G5            |         |         |                     | HR                  |                       |                   |                          |        |                          |
| Eastern Amberwing           | <i>Perithemis tenera</i>        | S4    | G5            |         |         |                     | HU                  |                       |                   |                          |        |                          |
| Common Whitetail            | <i>Plathemis lydia</i>          | S5    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Blue-faced Meadowhawk       | <i>Sympetrum ambiguum</i>       | SNA   | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Variegated Meadowhawk       | <i>Sympetrum corruptum</i>      | S3    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Saffron-bordered Meadowhawk | <i>Sympetrum costiferum</i>     | S4    | G5            |         |         |                     | HR                  |                       |                   |                          |        |                          |
| Black Meadowhawk            | <i>Sympetrum danae</i>          | S4    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Cherry-faced Meadowhawk     | <i>Sympetrum internum</i>       | S5    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Ruby Meadowhawk             | <i>Sympetrum rubicundulum</i>   | S5    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Band-winged Meadowhawk      | <i>Sympetrum semicinctum</i>    | S4    | G5            |         |         |                     | HU                  |                       |                   |                          |        |                          |
| Yellow-legged Meadowhawk    | <i>Sympetrum vicinum</i>        | S5    | G5            |         |         |                     | HU                  |                       |                   |                          |        |                          |
| Carolina Saddlebags         | <i>Tamea carolina</i>           | SNA   | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Black Saddlebags            | <i>Tamea lacerata</i>           | S4    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Red Saddlebags              | <i>Tamea onusta</i>             | SNA   | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
|                             |                                 |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
| BUTTERFLIES                 |                                 |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
| Silver Spotted Skipper      | <i>Epargyreus clarus</i>        | S4    | G5            |         |         |                     |                     | m                     |                   |                          |        |                          |
| Southern Cloudywing         | <i>Thorybes bathyllus</i>       | S3    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Northern Cloudywing         | <i>Thorybes pylades</i>         | S5    | G5            |         |         |                     |                     | H                     |                   |                          |        |                          |
| Dreamy Duskywing            | <i>Erynnis icelus</i>           | S5    | G5            |         |         |                     |                     | m                     |                   |                          |        |                          |
| Sleepy Duskywing            | <i>Erynnis bizo</i>             | S1    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Juvenal's Duskywing         | <i>Erynnis juvenalis</i>        | S5    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Mottled Duskywing           | <i>Erynnis martialis</i>        | S2    | G3            | END     | END     |                     | HR                  | H                     |                   |                          |        |                          |
| Columbine Duskywing         | <i>Erynnis lucilius</i>         | S4    | G4            |         |         |                     | HR                  | m                     |                   |                          |        |                          |
| Wild Indigo Duskywing       | <i>Erynnis baptisiae</i>        | S4    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Common Sooty Wing           | <i>Pholisora catullus</i>       | S3    | G5            |         |         |                     | HR                  | m                     |                   |                          |        |                          |
| Arctic Skipper              | <i>Carterocephalus palaemon</i> | S5    | G5            |         |         |                     |                     | H                     |                   |                          |        |                          |
| Least Skipper               | <i>Ancyloxypha numitor</i>      | S5    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Leonard's Skipper           | <i>Hesperia leonardus</i>       | S4    | G4            |         |         |                     | HR                  | H                     |                   |                          |        |                          |
| Indian Skipper              | <i>Hesperia sassacus</i>        | S4    | G5            |         |         |                     | HR                  |                       |                   |                          |        |                          |
| Peck's Skipper              | <i>Polites peckius</i>          | S5    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Tawny-edged Skipper         | <i>Polites themistocles</i>     | S5    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Crossline Skipper           | <i>Polites origenes</i>         | S4    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Long Dash Skipper           | <i>Polites mystic</i>           | S5    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Northern Broken-Dash        | <i>Wallengrenia egermet</i>     | S5    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Little Glassywing           | <i>Pompeius verna</i>           | S4    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Delaware Skipper            | <i>Anatrytone logan</i>         | S4    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Mulberry Wing               | <i>Poanes massasoit</i>         | S4    | G4            |         |         |                     | HR                  | H                     |                   |                          |        |                          |
| Hobomok Skipper             | <i>Poanes hobomok</i>           | S5    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Broad-winged Skipper        | <i>Poanes viator</i>            | S4    | G5            |         |         |                     | HU                  |                       |                   |                          |        |                          |
| Black Dash                  | <i>Euphyes conspicua</i>        | S3    | G4            |         |         |                     | HR                  | m                     |                   |                          |        |                          |
| Dion Skipper                | <i>Euphyes dion</i>             | S3    | G4            |         |         |                     | HU                  | m                     |                   |                          |        |                          |

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| Two-spotted Skipper        | <i>Euphyes bimacula</i>          | S4    | G4            |         |         |                     | HR                  | H                     |                   |                          |        |                          |
| Dun Skipper                | <i>Euphyes vestris</i>           | S5    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Roadside Skipper           | <i>Amblyscirtes vialis</i>       | S4    | G5            |         |         |                     | HR                  |                       |                   |                          |        |                          |
| Pipe Vine Swallowtail      | <i>Battus philenor</i>           | SNA   | G5            |         |         |                     | HR                  | H                     |                   |                          |        |                          |
| Black Swallowtail          | <i>Papilio polyxenes</i>         | S5    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Giant Swallowtail          | <i>Papilio cresphontes</i>       | S3    | G5            |         |         |                     | HR                  | m                     |                   |                          |        |                          |
| Canadian Tiger Swallowtail | <i>Papilio canadensis</i>        | S5    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Eastern Tiger Swallowtail  | <i>Papilio glaucus</i>           | S5    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Spicebush Swallowtail      | <i>Pterourus troilus</i>         | S4    | G5            |         |         |                     | HR                  | H                     |                   |                          |        |                          |
| Mustard White              | <i>Pieris oleracea</i>           | S4    | G4G5          |         |         |                     |                     | m                     |                   |                          |        |                          |
| West Virginia White        | <i>Pieris virginienensis</i>     | S3    | G3G4          |         |         |                     |                     | m                     |                   |                          |        |                          |
| Cabbage White              | <i>Pieris rapae</i>              | SNA   | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Large Marble               | <i>Euchloe ausonides</i>         | S3    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Olympia Marble             | <i>Euchloe olympia</i>           | S4    | G4G5          |         |         |                     |                     |                       |                   |                          |        |                          |
| Clouded Sulphur            | <i>Colias philodice</i>          | S5    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Orange Sulphur             | <i>Colias eurytheme</i>          | S5    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Pink-edged Sulphur         | <i>Colias interior</i>           | S5    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Harvester                  | <i>Feniseca tarquinius</i>       | S4    | G4            |         |         |                     | HR                  | H                     |                   |                          |        |                          |
| American Copper            | <i>Lycaena phlaeas</i>           | S5    | G5            |         |         |                     | HU                  | m                     |                   |                          |        |                          |
| Bronze Copper              | <i>Lycaena hyllus</i>            | S5    | G5            |         |         |                     | HU                  | m                     |                   |                          |        |                          |
| Bog Copper                 | <i>Epidemia epixanthe</i>        | S4S5  | G4G5          |         |         |                     |                     | H                     |                   |                          |        |                          |
| Dorcus Copper              | <i>Lycaena dorcus</i>            | S5    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Purplish Copper            | <i>Lycaena helloides</i>         | S3    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Coral Hairstreak           | <i>Harkenclenus titus</i>        | S5    | G5            |         |         |                     | HU                  | m                     |                   |                          |        |                          |
| Acadian Hairstreak         | <i>Satyrium acadicum</i>         | S4    | G5            |         |         |                     | HU                  |                       |                   |                          |        |                          |
| Edward's Hairstreak        | <i>Satyrium edwardsii</i>        | S4    | G4            |         |         |                     | HR                  | H                     |                   |                          |        |                          |
| Banded Hairstreak          | <i>Satyrium calanus</i>          | S4    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Hickory Hairstreak         | <i>Satyrium caryaevorum</i>      | S3    | G4            |         |         |                     |                     | m                     |                   |                          |        |                          |
| Striped Hairstreak         | <i>Satyrium liparops</i>         | S5    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Brown Elfin                | <i>Callophrys augustinus</i>     | S5    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Hoary Elfin                | <i>Callophrys polios</i>         | S4    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Henry's Elfin              | <i>Incisalia henrici</i>         | S4    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Eastern Pine Elfin         | <i>Callophrys niphon</i>         | S5    | G5            |         |         |                     | HU                  | H                     |                   |                          |        |                          |
| Eastern Tailed Blue        | <i>Everes comyntas</i>           | S5    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Spring Azure               | <i>Celastrina ladon</i>          | S5    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Silvery Blue               | <i>Glaucopsyche lygdamus</i>     | S5    | G5            |         |         |                     |                     | H                     |                   |                          |        |                          |
| Great Spangled Fritillary  | <i>Speyeria cybele</i>           | S5    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Aphrodite Fritillary       | <i>Speyeria aphrodite</i>        | S5    | G5            |         |         |                     | HU                  | m                     |                   |                          |        |                          |
| Atlantis Fritillary        | <i>Speyeria atlantis</i>         | S5    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Silver-bordered Fritillary | <i>Boloria selene</i>            | S5    | G5            |         |         |                     | HU                  | m                     |                   |                          |        |                          |
| Meadow Fritillary          | <i>Boloria bellona</i>           | S5    | G5            |         |         |                     | HU                  |                       |                   |                          |        |                          |
| Silvery Checkerspot        | <i>Chlosyne nycteis</i>          | S5    | G5            |         |         |                     | HU                  |                       |                   |                          |        |                          |
| Harris' Checkerspot        | <i>Chlosyne harrisii</i>         | S4    | G4            |         |         |                     |                     |                       |                   |                          |        |                          |
| Tawny Crescent             | <i>Phyciodes batesii</i>         | S4    | G4            |         |         |                     | HR                  |                       |                   |                          |        |                          |
| Baltimore Checkerspot      | <i>Euphydryas phaeton</i>        | S4    | G4            |         |         |                     | HU                  | m                     |                   |                          |        |                          |
| Question Mark              | <i>Polygonia interrogationis</i> | S5    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Eastern Comma              | <i>Polygonia comma</i>           | S5    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |

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| Green Comma                                | <i>Polygonia faunus</i>            | S4       | G5            |         |         |                     |                     | H                     |                   |                          |        |                          |
| Grey Comma                                 | <i>Polygonia progne</i>            | S5       | G4G5          |         |         |                     | HR                  | m                     |                   |                          |        |                          |
| Compton Tortoiseshell                      | <i>Nymphalis vaualbum</i>          | S5       | G5            |         |         |                     | HU                  | m                     |                   |                          |        |                          |
| Mourning Cloak                             | <i>Nymphalis antiopa</i>           | S5       | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Milbert's Tortoiseshell                    | <i>Nymphalis milberti</i>          | S5       | G5            |         |         |                     | HR                  | H                     |                   |                          |        |                          |
| American Lady                              | <i>Vanessa virginiensis</i>        | S5       | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Painted Lady                               | <i>Vanessa cardui</i>              | S5       | G5            |         |         |                     | HR                  |                       |                   |                          |        |                          |
| Red Admiral                                | <i>Vanessa atalanta</i>            | S5       | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| White Admiral                              | <i>Limenitis arthemis</i>          | S5       | G5            |         |         |                     |                     | m                     |                   |                          |        |                          |
| Red-spotted Purple                         | <i>Limenitis arthemis astyanax</i> | S5       | G5T5          |         |         |                     |                     |                       |                   |                          |        |                          |
| Common Buckeye                             | <i>Junonia coenia</i>              | SNA      | G5            |         |         |                     | HR                  | H                     |                   |                          |        |                          |
| Viceroy                                    | <i>Limenitis archippus</i>         | S5       | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Hackberry Emperor                          | <i>Asterocampa celtis</i>          | S2       | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Tawny Emperor                              | <i>Asterocampa clyton</i>          | S2S3     | G5            |         |         |                     | HR                  |                       |                   |                          |        |                          |
| Eyed Brown                                 | <i>Satyrodes eurydice</i>          | S5       | G4            |         |         |                     |                     |                       |                   |                          |        |                          |
| Appalachian Brown                          | <i>Satyrodes appalachia</i>        | S4       | G4            |         |         |                     |                     |                       |                   |                          |        |                          |
| Common Wood-Nymph                          | <i>Cercyonis pegala</i>            | S5       | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Chryxus Arctic                             | <i>Oeneis chryxus</i>              | S5       | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Jutta Arctic                               | <i>Oeneis jutta</i>                | S4       | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Monarch                                    | <i>Danaus plexippus</i>            | S4B, S2N | G5            | SC      | SC      |                     |                     |                       |                   |                          |        |                          |
|                                            |                                    |          |               |         |         |                     |                     |                       |                   |                          |        |                          |
| OTHER ARTHROPODS                           |                                    |          |               |         |         |                     |                     |                       |                   |                          |        |                          |
| Bogbean Buckmoth                           | <i>Hemileuca sp.</i>               | S1       | G1Q           | END     | END     |                     |                     |                       |                   |                          |        |                          |
| Polyphemus Moth                            | <i>Antheraea polyphemus</i>        | S5       | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Aweme Borer Moth                           | <i>Papaipema aweme</i>             | S1       | G1Q           | END     | END     |                     |                     |                       |                   |                          |        |                          |
| Rusty-Patch Bumble Bee                     | <i>Bombus affinis</i>              | S1       | GU            | END     | END     |                     |                     |                       |                   |                          |        |                          |
| Northern Barrens Tiger Beetle              | <i>Cicindela patruela</i>          | S1       | G3            | END     | END     |                     |                     |                       |                   |                          |        |                          |
| Hungerford's Crawling Water Beetle         | <i>Brychius hungerfordi</i>        | S1       | G1            | END     |         |                     |                     |                       |                   |                          |        |                          |
| Digger Crayfish                            | <i>Fallicambarus fodiens</i>       | S4       | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Meadow Crayfish                            | <i>Cambarus diogenes</i>           | S3       | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
|                                            |                                    |          |               |         |         |                     |                     |                       |                   |                          |        |                          |
| AMPHIBIANS                                 |                                    |          |               |         |         |                     |                     |                       |                   |                          |        |                          |
| Mudpuppy                                   | <i>Necturus maculosus</i>          | S4       | G5            |         |         | 10                  | HR                  | H                     | L2                |                          |        |                          |
| Red-spotted Newt                           | <i>Notophthalmus viridescens</i>   | S5       | G5T5          |         |         |                     |                     | m                     | L1                |                          |        |                          |
| Blue-spotted Salamander                    | <i>Ambystoma laterale</i>          | S4       | G5            |         |         |                     | HR                  | m                     | L1                |                          |        |                          |
| Jefferson Salamander                       | <i>Ambystoma jeffersonianum</i>    | S2       | G5            | END     | END     |                     | HU                  | H                     | L1                |                          |        |                          |
| Spotted Salamander                         | <i>Ambystoma maculatum</i>         | S4       | G5            |         |         |                     | HU                  | m                     | L1                |                          |        |                          |
| Small-mouthed Salamander                   | <i>Ambystoma texanum</i>           | S1       | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Northern Two-lined Salamander              | <i>Eurycea bislineata</i>          | S4       | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Four-toed Salamander                       | <i>Hemidactylium scutatum</i>      | S4       | G5            |         |         |                     | HR                  | H                     | L2                |                          |        |                          |
| Northern Redback Salamander                | <i>Plethodon cinereus</i>          | S5       | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Fowler's Toad                              | <i>Anaxyrus fowleri</i>            | S2       | G5            | END     | END     |                     |                     |                       |                   |                          |        |                          |
| Gray Treefrog                              | <i>Hyla versicolor</i>             | S5       | G5            |         |         |                     |                     |                       | L2                |                          |        |                          |
| Western Chorus Frog (great lakes - shield) | <i>Pseudacris triseriata</i>       | S3       | G5            |         | THR     |                     |                     |                       | L2                |                          |        |                          |

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|-------------------------------------|-----------------------------------------|-------|---------------|---------|---------|---------------------|---------------------|-----------------------|-------------------|--------------------------|--------|--------------------------|
| Western Chorus Frog (carolinian)    | <i>Pseudacris triseriata</i>            | S4    | G5            |         |         |                     |                     |                       | L2                |                          |        |                          |
| Spring Peeper                       | <i>Pseudacris crucifer</i>              | S5    | G5            |         |         |                     |                     |                       | L2                |                          |        |                          |
| American Bullfrog                   | <i>Lithobates catesbeiana</i>           | S4    | G5            |         |         | 1                   | HU                  | m                     | L1                |                          |        |                          |
| Pickerel Frog                       | <i>Lithobates palustris</i>             | S4    | G5            |         |         |                     | HU                  | H                     | L2                |                          |        |                          |
| Mink Frog                           | <i>Lithobates septentrionalis</i>       | S5    | G5            |         |         |                     |                     |                       | L2                |                          |        |                          |
| Northern Dusky Salamander           | <i>Desmognathus fuscus</i>              | S1    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
|                                     |                                         |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
| REPTILES                            |                                         |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
| Snapping Turtle                     | <i>Chelydra serpentina</i>              | S3    | G5            | SC      | SC      |                     |                     |                       | L3                |                          |        |                          |
| Eastern Musk Turtle                 | <i>Sternotherus odoratus</i>            | S3    | G5            | SC      | SC      |                     | HR                  | H                     | L2                |                          |        |                          |
| Midland Painted Turtle              | <i>Chrysemys picta marginata</i>        | S5    | G5T5          |         |         |                     |                     |                       |                   |                          |        |                          |
| Pond Slider                         | <i>Trachemys scripta</i>                | SNA   | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Northern Map Turtle                 | <i>Graptemys geographica</i>            | S3    | G5            | SC      | SC      | 30-50               | HR                  | H                     |                   |                          |        |                          |
| Blanding's Turtle                   | <i>Emydoidea blandingi</i>              | S3    | G4            | THR     | THR     |                     | HR                  | H                     | L2                |                          |        |                          |
| Wood Turtle                         | <i>Glyptemys insculpta</i>              | S2    | G4            | END     | THR     | 25                  |                     |                       |                   |                          |        |                          |
| Spotted Turtle                      | <i>Clemmys guttata</i>                  | S3    | G5            | END     | END     |                     |                     |                       |                   |                          |        |                          |
| Eastern Spiny Softshell             | <i>Apalone spinifera spinifera</i>      | S3    | G5            | THR     | THR     |                     | HR                  | H                     |                   |                          |        |                          |
| Five-lined Skink (south sheild)     | <i>Eumeces fasciatus</i>                | S3    | G5            | SC      | SC      |                     |                     |                       |                   |                          |        |                          |
| Five-lined Skink (carolinian)       | <i>Eumeces fasciatus</i>                | S2    | G5            | END     | END     |                     |                     |                       |                   |                          |        |                          |
| Blue Racer                          | <i>Coluber constrictor flaviventris</i> | S1    | G5T5          | END     | END     |                     |                     |                       |                   |                          |        |                          |
| Eastern Gartersnake                 | <i>Thamnophis sirtalis</i>              | S5    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Butler's Gartersnake                | <i>Thamnophis butleri</i>               | S2    | G4            |         |         |                     |                     |                       |                   |                          |        |                          |
| Eastern Ribbon Snake                | <i>Thamnophis sauritus</i>              | S3    | G5            | SC      | SC      |                     | HR                  | H                     | L2                |                          |        |                          |
| Common Watersnake                   | <i>Nerodia sipedon sipedon</i>          | S5    | G5T5          |         |         | 1                   | HU                  | m                     | L2                |                          |        |                          |
| Lake Erie Watersnake                | <i>Nerodia sipedon insularum</i>        | S2    | G5T2          | END     | END     |                     |                     |                       |                   |                          |        |                          |
| Queen Snake                         | <i>Regina septemvittata</i>             | S2    | G5            | END     | END     |                     |                     |                       |                   |                          |        |                          |
| Northern Red-Bellied Snake          | <i>Storeria occipitomaculata</i>        | S5    | G5            |         |         |                     |                     | m                     | L3                |                          |        |                          |
| Dekay's Brownsnake                  | <i>Storeria dekayi</i>                  | S5    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Smooth Greensnake                   | <i>Opheodrys vernalis</i>               | S4    | G5            |         |         |                     | HR                  | m                     | L3                |                          |        |                          |
| Ring-necked Snake                   | <i>Diadophis punctatus</i>              | S4    | G5            |         |         |                     | HR                  | H                     | L2                |                          |        |                          |
| Eastern Hog-nosed Snake             | <i>Heterodon platirhinos</i>            | S3    | G5            | THR     | THR     | 5                   |                     |                       |                   |                          |        |                          |
| Gray Ratsnake (Frontenac)           | <i>Pantherophis spiloides</i>           | S3    | G5T5          | THR     | THR     |                     |                     |                       |                   |                          |        |                          |
| Gray Ratsnake (carolinian)          | <i>Pantherophis spiloides</i>           | S1    | G5T5          | END     | END     |                     |                     |                       |                   |                          |        |                          |
| Eastern Foxsnake (Georgian Bay)     | <i>Pantherophis gloydi</i>              | S1    | G3            | THR     | END     |                     |                     |                       |                   |                          |        |                          |
| Eastern Foxsnake (carolinian)       | <i>Pantherophis gloydi</i>              | S1    | G3            |         |         |                     |                     |                       |                   |                          |        |                          |
| Eastern Milksnake                   | <i>Lampropeltis triangulum</i>          | S3    | G5            | SC      | SC      |                     |                     |                       | L3                |                          |        |                          |
| Eastern Massasauga (Great Lakes/ St | <i>Sistrurus catenatus</i>              | S1    | G3G4T3        | THR     | END     |                     |                     |                       |                   |                          |        |                          |
| Eastern Massasauga (Carolinian)     | <i>Sistrurus catenatus</i>              | S1    | G3G4T4        | END     | END     |                     |                     |                       |                   |                          |        |                          |
| Timber Rattlesnake                  | <i>Crotalus horridus</i>                | SX    | G4            |         |         |                     |                     |                       |                   |                          |        |                          |
|                                     |                                         |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
| BIRDS                               |                                         |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
| Greater White-fronted Goose         | <i>Anser albifrons</i>                  |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
| Snow Goose                          | <i>Chen caerulescens</i>                | S5B   | S5            |         |         |                     |                     |                       |                   |                          |        |                          |

| COMMON NAME               | SCIENTIFIC NAME                  | SRANK    | GLOBAL STATUS | COSSARO | COSEWIC | AREA SENSITIVE (ha) | Local Status Halton | Local Status Hamilton | Local Status TRCA | Regional Status Waterloo | Source | Area Sensitive Reference |
|---------------------------|----------------------------------|----------|---------------|---------|---------|---------------------|---------------------|-----------------------|-------------------|--------------------------|--------|--------------------------|
| Ross's Goose              | <i>Chen rossi</i>                |          |               |         |         |                     |                     |                       |                   |                          |        |                          |
| Brant                     | <i>Branta bernicla</i>           |          |               |         |         |                     |                     |                       |                   |                          |        |                          |
| Mute Swan                 | <i>Cygnus olor</i>               | SNA      | G5            |         |         |                     | HU                  |                       |                   |                          |        |                          |
| Tundra Swan               | <i>Cygnus columbianus</i>        | S4       | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Gadwall                   | <i>Anas strepera</i>             | S4       | G5            |         |         |                     | HU                  | H                     |                   | X                        |        |                          |
| American Wigeon           | <i>Anas americana</i>            | S4       | G5            |         |         |                     | HU                  | H                     |                   | X                        |        |                          |
| Blue-winged Teal          | <i>Anas discors</i>              | S4       | G5            |         |         |                     | HU                  | H                     | L2                |                          |        |                          |
| Northern Shoveler         | <i>Anas clypeata</i>             | S4       | G5            |         |         |                     |                     | H                     |                   | X                        |        |                          |
| Northern Pintail          | <i>Anas acuta</i>                | S5       | G5            |         |         |                     |                     | H                     |                   |                          |        |                          |
| Green-winged Teal         | <i>Anas crecca</i>               | S4       | G5            |         |         |                     |                     | H                     | L3                | X                        |        |                          |
| Canvasback                | <i>Aythya valisineria</i>        |          |               |         |         |                     |                     |                       |                   |                          |        |                          |
| Redhead                   | <i>Aythya americana</i>          | S2B, S4N | G5            |         |         |                     |                     | H                     | L3                |                          |        |                          |
| Ring-necked Duck          | <i>Aythya collaris</i>           | S5       | G5            |         |         |                     |                     |                       |                   | X                        |        |                          |
| Greater Scaup             | <i>Aythya marila</i>             | S4       | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Lesser Scaup              | <i>Aythya affinis</i>            | S4       | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Surf Scoter               | <i>Melanitta perspicillata</i>   |          |               |         |         |                     |                     |                       |                   |                          |        |                          |
| White-winged Scoter       | <i>Melanitta fusca</i>           |          |               |         |         |                     |                     |                       |                   |                          |        |                          |
| Black Scoter              | <i>Melanitta americana</i>       |          |               |         |         |                     |                     |                       |                   |                          |        |                          |
| Long-tailed Duck          | <i>Clangula hyemalis</i>         |          |               |         |         |                     |                     |                       |                   |                          |        |                          |
| Bufflehead                | <i>Bucephala albeola</i>         | S4       | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Common Goldeneye          | <i>Bucephala clangula</i>        | S5       | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Barrow's Goldeneye        | <i>Bucephala islandica</i>       |          |               |         |         |                     |                     |                       |                   |                          |        |                          |
| Common Merganser          | <i>Mergus merganser</i>          | S5B,S5N  | G5            |         |         |                     |                     |                       |                   | X                        |        |                          |
| Red-breasted Merganser    | <i>Mergus serrator</i>           | S4B,S5N  | G5            |         |         |                     | HU                  |                       |                   |                          |        |                          |
| Ruddy Duck                | <i>Oxyura jamaicensis</i>        | S4B,S4N  | G5            |         |         | 10                  |                     |                       |                   |                          |        |                          |
| Gray Partridge            | <i>Perdix perdix</i>             | SNA      | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Ring-necked Pheasant      | <i>Phasianus colchicus</i>       | SNA      | G5            |         |         |                     | HR                  |                       |                   |                          |        |                          |
| Ruffed Grouse             | <i>Bonasa umbellus</i>           | S4       | G5            |         |         | 20                  |                     | m                     | L3                |                          |        | Sandilands 2005          |
| Spruce Grouse             | <i>Falcapennis canadensis</i>    |          |               |         |         |                     |                     |                       |                   |                          |        |                          |
| Northern Bobwhite         | <i>Colinus virginianus</i>       | S1       | G5            | END     | END     |                     |                     |                       |                   | X                        |        |                          |
| Common Loon               | <i>Gavia immer</i>               | S5B,S5N  | G5            |         |         | 70                  |                     |                       |                   | X                        |        |                          |
| Double-crested Cormorant  | <i>Phalacrocorax auritus</i>     | S5B      | G5            |         |         | 20                  |                     |                       | L3                |                          |        | Sandilands 2005          |
| American Bittern          | <i>Botaurus lentiginosus</i>     | S4B      | G4            |         |         | 10                  | HR                  | H                     | L2                | X                        |        |                          |
| Least Bittern             | <i>Ixobrychus exilis</i>         | S4B      | G5            | THR     | THR     |                     | HR                  | H                     | L2                | X                        |        |                          |
| Great Blue Heron          | <i>Ardea herodias</i>            | S4       | G5            |         |         |                     |                     | m                     | L3                | X                        |        |                          |
| Great Egret               | <i>Ardea alba</i>                | S2B      | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Black-crowned Night-Heron | <i>Nycticorax nycticorax</i>     | S3B,S3N  | G5            |         |         |                     | HU                  | H                     | L3                | X                        |        |                          |
| American White Pelican    | <i>Pelecanus erythrorhynchos</i> | S2B      | G4            | THR     |         |                     |                     |                       |                   |                          |        |                          |
| Osprey                    | <i>Pandion haliaetus</i>         | S5B      | G5            |         |         |                     | HR                  | H                     | L3                | X                        |        |                          |
| Bald Eagle                | <i>Haliaeetus leucocephalus</i>  | S4B,S2N  | G4            | SC      |         |                     |                     |                       |                   |                          |        |                          |
| Northern Harrier          | <i>Circus cyaneus</i>            | S4B      | G5            |         |         | 55                  | HU                  | H                     | L3                | X                        |        | Sandilands 2005          |
| Sharp-shinned Hawk        | <i>Accipiter striatus</i>        | S5       | G5            |         |         | 20-30               | HU                  | H                     | L3                | X                        |        | Sandilands 2005          |
| Northern Goshawk          | <i>Accipiter gentilis</i>        | S4       | G5            |         |         | 100                 | HU                  | H                     | L2                | X                        |        | Sandilands 2005          |
| Red-shouldered Hawk       | <i>Buteo lineatus</i>            | S4B      | G5            |         |         | 50-70               | HR                  | H                     | L2                | X                        |        | Sandilands 2005          |

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|--------------------------|-------------------------------------|----------|---------------|---------|---------|---------------------|---------------------|-----------------------|-------------------|--------------------------|--------|--------------------------|
| Broad-winged Hawk        | <i>Buteo platypterus</i>            | S5B      | G5            |         |         | 100                 | HR                  | H                     | L2                | X                        |        | Sandilands 2005          |
| Red-tailed Hawk          | <i>Buteo jamaicensis</i>            | S5       | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Rough-legged Hawk        | <i>Buteo lagopus</i>                | S1B, S4N | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Golden Eagle             | <i>Aquila chrysaetos</i>            | S2B      | G5            | END     | NAR     |                     |                     |                       |                   |                          |        |                          |
| Yellow Rail              | <i>Coturnicops noveboracensis</i>   | S4B      | G4            | SC      | SC      |                     |                     |                       | L2                |                          |        |                          |
| King Rail                | <i>Rallus elegans</i>               | S2B      | G4G5          | END     | END     | 100                 |                     |                       |                   |                          |        |                          |
| Virginia Rail            | <i>Rallus limicola</i>              | S5B      | G5            |         |         |                     |                     | m                     | L3                | X                        |        |                          |
| Sora                     | <i>Porzana carolina</i>             | S4B      | G5            |         |         |                     | HU                  | m                     | L3                | X                        |        |                          |
| Common Gallinule         | <i>Gallinula galeata</i>            | S4B      | G5            |         |         |                     | HR                  | H                     | L3                | X                        |        |                          |
| American Coot            | <i>Fulica americana</i>             | S4B      | G5            |         |         | 50                  |                     |                       | L3                | X                        |        |                          |
| Black-bellied Plover     | <i>Pluvialis squatarola</i>         | S4N      | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| American Golden-Plover   | <i>Pluvialis dominica</i>           |          |               |         |         |                     |                     |                       |                   |                          |        |                          |
| Semipalmated Plover      | <i>Charadrius semipalmatus</i>      |          |               |         |         |                     |                     |                       |                   |                          |        |                          |
| Piping Plover            | <i>Charadrius melodus</i>           | S1B      | G3            | END     | END     |                     |                     |                       |                   |                          |        |                          |
| Solitary Sandpiper       | <i>Tringa solitaria</i>             | S4B      | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Greater Yellowlegs       | <i>Tringa melanoleuca</i>           | S4B,S4N  | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Lesser Yellowlegs        | <i>Tringa flavipes</i>              | S4B,S4N  | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Upland Sandpiper         | <i>Bartramia longicauda</i>         | S4B      | G5            |         |         | 25                  | HR                  |                       | L3                | X                        |        |                          |
| Whimbrel                 | <i>Numenius phaeopus</i>            |          |               |         |         |                     |                     |                       |                   |                          |        |                          |
| Hudsonian Godwit         | <i>Limosa haemastica</i>            |          |               |         |         |                     |                     |                       |                   |                          |        |                          |
| Marbled Godwit           | <i>Limosa fedoa</i>                 |          |               |         |         |                     |                     |                       |                   |                          |        |                          |
| Ruddy Turnstone          | <i>Arenaria interpres</i>           |          |               |         |         |                     |                     |                       |                   |                          |        |                          |
| Red Knot                 | <i>Calidris canutus (rufa)</i>      | S1N      | G4T2          | END     | END     |                     |                     |                       |                   |                          |        |                          |
| Sanderling               | <i>Calidris alba</i>                | S5N      | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Semipalmated Sandpiper   | <i>Calidris pusilla</i>             |          |               |         |         |                     |                     |                       |                   |                          |        |                          |
| Least Sandpiper          | <i>Calidris minutilla</i>           |          |               |         |         |                     |                     |                       |                   |                          |        |                          |
| White-rumped Sandpiper   | <i>Calidris fuscicollis</i>         |          |               |         |         |                     |                     |                       |                   |                          |        |                          |
| Baird's Sandpiper        | <i>Calidris bairdii</i>             |          |               |         |         |                     |                     |                       |                   |                          |        |                          |
| Pectoral Sandpiper       | <i>Calidris melanotos</i>           |          |               |         |         |                     |                     |                       |                   |                          |        |                          |
| Purple Sandpiper         | <i>Calidris maritima</i>            |          |               |         |         |                     |                     |                       |                   |                          |        |                          |
| Dunlin                   | <i>Calidris alpina</i>              | S4B, S5N | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Stilt Sandpiper          | <i>Calidris himantopus</i>          |          |               |         |         |                     |                     |                       |                   |                          |        |                          |
| Short-billed Dowitcher   | <i>Limnodromus griseus</i>          |          |               |         |         |                     |                     |                       |                   |                          |        |                          |
| Wilson's Snipe           | <i>Gallinago delicata</i>           | S5B      | G5            |         |         |                     | HU                  | H                     |                   | X                        |        |                          |
| American Woodcock        | <i>Scolopax minor</i>               | S4B      | G5            |         |         |                     |                     |                       | L3                |                          |        |                          |
| Wilson's Phalarope       | <i>Phalaropus tricolor</i>          | S3B      | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Red-necked Phalarope     | <i>Phalaropus lobatus</i>           |          |               |         |         |                     |                     |                       |                   |                          |        |                          |
| Bonaparte's Gull         | <i>Chroicocephalus philadelphia</i> | S4B,S4N  | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Little Gull              | <i>Hydrocoloeus minutus</i>         |          |               |         |         |                     |                     |                       |                   |                          |        |                          |
| Herring Gull             | <i>Larus argentatus</i>             | S5B,S5N  | G5            |         |         |                     |                     | m                     | L3                |                          |        |                          |
| Iceland Gull             | <i>Larus glaucoides</i>             |          |               |         |         |                     |                     |                       |                   |                          |        |                          |
| Lesser Black-backed Gull | <i>Larus fuscus</i>                 |          |               |         |         |                     |                     |                       |                   |                          |        |                          |
| Glaucous Gull            | <i>Larus hyperboreus</i>            | S4N      | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Great Black-backed Gull  | <i>Larus marinus</i>                | S2B      | G5            |         |         |                     |                     | H                     |                   |                          |        |                          |
| Caspian Tern             | <i>Hydroprogne caspia</i>           | S3B      | G5            |         |         |                     |                     | m                     | L3                |                          |        |                          |

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|---------------------------|-----------------------------------|----------|---------------|---------|---------|---------------------|---------------------|-----------------------|-------------------|--------------------------|--------|--------------------------|
| Black Tern                | <i>Chlidonias niger</i>           | S3B      | G4            | SC      |         | 20                  |                     |                       | L2                | X                        |        | Dunn and Agro, 1995      |
| Common Tern               | <i>Sterna hirundo</i>             | S4B      | G5            |         |         |                     |                     | m                     | L3                |                          |        |                          |
| Forster's Tern            | <i>Sterna forsteri</i>            | S2B      | G5            |         |         | 300                 |                     |                       |                   |                          |        |                          |
| Rock Pigeon               | <i>Columba livia</i>              | SNA      | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Yellow-billed Cuckoo      | <i>Coccyzus americanus</i>        | S4B      | G5            |         |         |                     | HR                  | H                     | L3                | X                        |        |                          |
| Barn Owl                  | <i>Tyto alba</i>                  | S1       | G5            | END     | END     |                     |                     |                       |                   |                          |        |                          |
| Eastern Screech-Owl       | <i>Megascops asio</i>             | S4       | G5            |         |         |                     |                     | m                     |                   |                          |        |                          |
| Great Horned Owl          | <i>Bubo virginianus</i>           | S4       | G5            |         |         |                     |                     | m                     |                   |                          |        |                          |
| Snowy Owl                 | <i>Bubo scandiacus</i>            | SNA      | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Barred Owl                | <i>Strix varia</i>                | S5       | G5            |         |         | 100                 |                     |                       | L2                | X                        |        |                          |
| Long-eared Owl            | <i>Asio otus</i>                  | S4       | G5            |         |         |                     | HR                  | H                     | L3                | X                        |        |                          |
| Short-eared Owl           | <i>Asio flammeus</i>              | S2N, S4B | G5            | SC      | SC      | 75                  |                     | H                     | L3                | X                        |        |                          |
| Boreal Owl                | <i>Aegolius funereus</i>          | S4       | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Northern Saw-whet Owl     | <i>Aegolius acadicus</i>          | S4       | G5            |         |         |                     |                     | H                     | L3                | X                        |        |                          |
| Common Nighthawk          | <i>Chordeiles minor</i>           | S4B      | G5            | SC      | THR     |                     | HR                  | H                     |                   | X                        |        |                          |
| Eastern Whip-poor-will    | <i>Antrostomus vociferus</i>      | S4B      | G5            | THR     | THR     | 100                 | HR                  | H                     | L2                | X                        |        |                          |
| Chimney Swift             | <i>Chaetura pelagica</i>          | S4B, S4N | G5            | THR     | THR     |                     | HU                  | m                     |                   |                          |        |                          |
| Belted Kingfisher         | <i>Megaceryle alcyon</i>          | S4B      | G5            |         |         |                     |                     | m                     |                   | X                        |        |                          |
| Red-headed Woodpecker     | <i>Melanerpes erythrocephalus</i> | S4B      | G5            | SC      | THR     |                     | HR                  | H                     | L3                | X                        |        |                          |
| Yellow-bellied Sapsucker  | <i>Sphyrapicus varius</i>         | S5B      | G5            |         |         | 30-50               | HU                  | H                     | L3                | X                        |        |                          |
| Black-backed Woodpecker   | <i>Picoides arcticus</i>          | S4       | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| American Kestrel          | <i>Falco sparverius</i>           | S4       | G5            |         |         |                     |                     | m                     |                   |                          |        |                          |
| Merlin                    | <i>Falco columbarius</i>          | S5B      | G5            |         |         |                     | HU                  |                       |                   |                          |        |                          |
| Peregrine Falcon          | <i>Falco peregrinus</i>           | S3B      | G4            | SC      | SC      |                     |                     | H                     |                   |                          |        |                          |
| Olive-sided Flycatcher    | <i>Contopus cooperi</i>           | S4B      | G5            | SC      | THR     |                     |                     |                       |                   |                          |        |                          |
| Yellow-bellied Flycatcher | <i>Empidonax flaviventris</i>     | S5B      | G5            |         |         |                     |                     |                       | L2                |                          |        |                          |
| Acadian Flycatcher        | <i>Empidonax virescens</i>        | S2S3B    | G5            | END     | END     | 30-36               |                     | H                     | L3                | X                        |        | Austen 1994, Page and C  |
| Alder Flycatcher          | <i>Empidonax alnorum</i>          | S5B      | G5            |         |         |                     |                     | m                     |                   | X                        |        |                          |
| Least Flycatcher          | <i>Empidonax minimus</i>          | S4B      | G5            |         |         |                     | HU                  | m                     | L3                | X                        |        |                          |
| Loggerhead Shrike         | <i>Lanius ludovicianus</i>        | S2B      | G5            | END     | END     | 25                  | HR                  |                       | L2                | X                        |        |                          |
| Northern Shrike           | <i>Lanius excubitor</i>           | SNA      | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| White-eyed Vireo          | <i>Vireo griseus</i>              | S2B      | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Yellow-throated Vireo     | <i>Vireo flavifrons</i>           | S4B      | G5            |         |         | 30                  | HR                  | m                     | L3                | X                        |        |                          |
| Blue-headed Vireo         | <i>Vireo solitarius</i>           | S5B      | G5            |         |         | 100                 | HU                  | H                     | L3                | X                        |        |                          |
| Philadelphia Vireo        | <i>Vireo philadelphicus</i>       | S5B      | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Gray Jay                  | <i>Perisoreus canadensis</i>      | S5       | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Horned Lark               | <i>Eremophila alpestris</i>       | S4B      | G5            |         |         |                     | HU                  |                       |                   |                          |        |                          |
| Purple Martin             | <i>Progne subis</i>               | S4B      | G5            |         |         |                     | HU                  | m                     |                   | X                        |        |                          |
| Cliff Swallow             | <i>Petrochelidon pyrrhonota</i>   | S4B      | G5            |         |         |                     |                     | m                     |                   |                          |        |                          |
| Boreal Chickadee          | <i>Poecile hudsonicus</i>         | S5       | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Tufted Titmouse           | <i>Baeolophus bicolor</i>         | S4       | G5            |         |         |                     | HU                  | H                     |                   | X                        |        |                          |
| Carolina Wren             | <i>Thryothorus ludovicianus</i>   | S4       | G5            |         |         |                     | HR                  | H                     |                   | X                        |        |                          |
| Winter Wren               | <i>Troglodytes hiemalis</i>       | S5B      | G5            |         |         | 30                  | HU                  | m                     | L3                | X                        |        | Hejl et al. 2002         |
| Sedge Wren                | <i>Cistothorus platensis</i>      | S4B      | G5            |         |         |                     |                     | H                     | L3                | X                        |        |                          |
| Marsh Wren                | <i>Cistothorus palustris</i>      | S4B      | G5            |         |         |                     | HU                  | H                     | L2                | X                        |        |                          |

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|------------------------------|--------------------------------|-------|---------------|---------|---------|---------------------|---------------------|-----------------------|-------------------|--------------------------|--------|--------------------------|
| Blue-gray Gnatcatcher        | <i>Polioptila caerulea</i>     | S4B   | G5            |         |         | 30                  | HU                  | m                     |                   | X                        |        |                          |
| Golden-crowned Kinglet       | <i>Regulus satrapa</i>         | S5B   | G5            |         |         | 0                   | HR                  | H                     | L3                | X                        |        |                          |
| Ruby-crowned Kinglet         | <i>Regulus calendula</i>       | S4B   | G5            |         |         |                     |                     |                       | L3                | X                        |        |                          |
| Eastern Bluebird             | <i>Sialia sialis</i>           | S5B   | G5            |         |         |                     | HU                  | m                     |                   | X                        |        |                          |
| Gray-cheeked Thrush          | <i>Catharus minimus</i>        | S4B   | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Swainson's Thrush            | <i>Catharus ustulatus</i>      | S4B   | G5            |         |         |                     |                     |                       |                   | X                        |        |                          |
| Hermit Thrush                | <i>Catharus guttatus</i>       | S5B   | G5            |         |         | 20-30               |                     |                       | L3                |                          |        |                          |
| Northern Mockingbird         | <i>Mimus polyglottos</i>       | S4    | G5            |         |         |                     | HU                  | m                     |                   | X                        |        |                          |
| Brown Thrasher               | <i>Toxostoma rufum</i>         | S4B   | G5            |         |         |                     |                     | m                     | L3                | X                        |        |                          |
| American Pipit               | <i>Anthus rubescens</i>        | S4    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Bohemian Waxwing             | <i>Bombycilla garrulus</i>     |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
| Lapland Longspur             | <i>Calcarius lapponicus</i>    | S3B   | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Snow Bunting                 | <i>Plectrophenax nivalis</i>   | SNA   | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Louisiana Waterthrush        | <i>Parusia motacilla</i>       | S3B   | G5            | SC      | SC      | 100                 | HR                  | H                     |                   | X                        |        |                          |
| Golden-winged Warbler        | <i>Vermivora chrysoptera</i>   | S4B   | G4            | SC      | THR     |                     | HR                  | H                     | L2                | X                        |        |                          |
| Black-and-white Warbler      | <i>Mniotilta varia</i>         | S5B   | G5            |         |         | 100                 | HU                  | m                     | L3                | X                        |        |                          |
| Prothonotary Warbler         | <i>Protonotaria citrea</i>     | S1B   | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Tennessee Warbler            | <i>Oreothlypis peregrina</i>   | S5B   | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Orange-crowned Warbler       | <i>Oreothlypis celata</i>      | S4B   | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Nashville Warbler            | <i>Oreothlypis ruficapilla</i> | S5B   | G5            |         |         |                     | HR                  | m                     | L3                | X                        |        |                          |
| Connecticut Warbler          | <i>Oporornis agilis</i>        |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
| Mourning Warbler             | <i>Geothlypis philadelphia</i> | S4B   | G5            |         |         | 30                  | HU                  | m                     |                   | X                        |        |                          |
| Hooded Warbler               | <i>Setophaga citrina</i>       | S4B   | G5            |         |         | 15-30               | HR                  |                       | L2                | X                        |        |                          |
| Kirtland's Warbler           | <i>Setophaga kirtlandii</i>    | S1B   | G1            | END     | END     |                     |                     |                       |                   |                          |        |                          |
| Cape May Warbler             | <i>Setophaga tigrina</i>       | S5B   | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Cerulean Warbler             | <i>Setophaga cerulea</i>       | S3B   | G4            | THR     | END     | 100                 |                     | H                     | L2                | X                        |        |                          |
| Northern Parula              | <i>Setophaga americana</i>     | S4B   | G5            |         |         | 100                 |                     |                       | L2                |                          |        | Robbins, 1979            |
| Magnolia Warbler             | <i>Setophaga magnolia</i>      | S5B   | G5            |         |         | 30                  | HR                  | H                     | L3                | X                        |        |                          |
| Bay-breasted Warbler         | <i>Setophaga castanea</i>      | S5B   | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Blackburnian Warbler         | <i>Setophaga fusca</i>         | S5B   | G5            |         |         | 30-50               | HR                  | H                     | L3                | X                        |        |                          |
| Chestnut-sided Warbler       | <i>Setophaga pensylvanica</i>  | S5B   | G5            |         |         |                     | HU                  | m                     | L3                | X                        |        |                          |
| Blackpoll Warbler            | <i>Setophaga striata</i>       | S4B   | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Black-throated Blue Warbler  | <i>Setophaga caerulescens</i>  | S5B   | G5            |         |         | 30-50               | HR                  | H                     | L2                |                          |        |                          |
| Palm Warbler                 | <i>Setophaga palmarum</i>      | S5B   | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Yellow-rumped Warbler        | <i>Setophaga coronata</i>      | S5B   | G5            |         |         |                     | HR                  | H                     | L3                | X                        |        |                          |
| Prairie Warbler              | <i>Setophaga discolor</i>      | S3B   | G5            |         |         |                     |                     | H                     |                   | X                        |        |                          |
| Black-throated Green Warbler | <i>Setophaga virens</i>        | S5B   | G5            |         |         | 30                  | HU                  | H                     | L3                | X                        |        |                          |
| Canada Warbler               | <i>Cardellina canadensis</i>   | S4B   | G5            | SC      | THR     | 30                  | HR                  | m                     | L2                | X                        |        |                          |
| Wilson's Warbler             | <i>Cardellina pusilla</i>      | S4B   | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Yellow-breasted Chat         | <i>Icteria virens</i>          | S2B   | G5            | END     | END     |                     |                     | H                     |                   | X                        |        |                          |
| Eastern Towhee               | <i>Pipilo erythrophthalmus</i> | S4B   | G5            |         |         |                     | HU                  | m                     | L3                | X                        |        |                          |
| Clay-colored Sparrow         | <i>Spizella pallida</i>        | S4B   | G5            |         |         |                     |                     | H                     | L3                | X                        |        |                          |
| Field Sparrow                | <i>Spizella pusilla</i>        | S4B   | G5            |         |         |                     |                     |                       | L3                |                          |        |                          |
| Vesper Sparrow               | <i>Pooecetes gramineus</i>     | S4B   | G5            |         |         |                     | HU                  | m                     | L3                | X                        |        |                          |
| Grasshopper Sparrow          | <i>Ammodramus savannarum</i>   | S4B   | G5            |         |         |                     | HU                  | m                     | L3                | X                        |        |                          |
| Henslow's Sparrow            | <i>Ammodramus henslowii</i>    | SHB   | G4            | END     | END     | 50                  |                     |                       | L1                | X                        |        | Herkert, 1991            |
| Fox Sparrow                  | <i>Passerella iliaca</i>       | S4B   | G5            |         |         |                     |                     |                       |                   |                          |        |                          |

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| Lincoln's Sparrow           | <i>Melospiza lincolnii</i>           | S5B   | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| White-crowned Sparrow       | <i>Zonotrichia leucophrys</i>        | S4B   | G5            |         |         |                     |                     |                       | L3                |                          |        |                          |
| Scarlet Tanager             | <i>Piranga olivacea</i>              | S4B   | G5            |         |         | 20                  |                     | m                     | L3                | X                        |        |                          |
| Western Meadowlark          | <i>Sturnella neglecta</i>            | S3B   | G5            |         |         |                     |                     | H                     | L3                | X                        |        |                          |
| Yellow-headed Blackbird     | <i>Xanthocephalus xanthocephalus</i> | S2B   | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Brewer's Blackbird          | <i>Euphagus cyanocephalus</i>        | S4B   | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Pine Grosbeak               | <i>Pinicola enucleator</i>           | S4B   | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Red Crossbill               | <i>Loxia curvirostra</i>             | S4B   | G5            |         |         |                     |                     |                       |                   | X                        |        |                          |
| White-winged Crossbill      | <i>Loxia leucoptera</i>              | S5B   | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Common Redpoll              | <i>Acanthis flammea</i>              | S4B   | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Pine Siskin                 | <i>Spinus pinus</i>                  | S4B   | G5            |         |         |                     |                     |                       |                   | X                        |        |                          |
| Evening Grosbeak            | <i>Coccothraustes vespertinus</i>    | S4B   | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
|                             |                                      |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
| MAMMALS                     |                                      |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
| Virginia Opossum            | <i>Didelphis virginiana</i>          | S4    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Masked Shrew                | <i>Sorex cinereus</i>                | S5    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Smoky Shrew                 | <i>Sorex fumeus</i>                  | S5    | G5            |         |         |                     |                     |                       | L2                |                          |        |                          |
| Pygmy Shrew                 | <i>Sorex hoyi</i>                    | S4    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Water Shrew                 | <i>Sorex palustris</i>               | S5    | G5            |         |         |                     |                     | H                     |                   |                          |        |                          |
| Northern Short-tailed Shrew | <i>Blarina brevicauda</i>            | S5    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |

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|-----------------------------|----------------------------------|-------|---------------|---------|---------|---------------------|---------------------|-----------------------|-------------------|--------------------------|--------|--------------------------|
| Hairy-tailed Mole           | <i>Parascalops breweri</i>       | S4    | G5            |         |         |                     |                     | m                     | L3                |                          |        |                          |
| Eastern Mole                | <i>Scalopus aquaticus</i>        | S2    | G5            | SC      | SC      |                     |                     |                       |                   |                          |        |                          |
| Star-nosed Mole             | <i>Condylura cristata</i>        | S5    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Eastern Small-footed Myotis | <i>Myotis leibii</i>             | S2S3  | G3            | END     | END     |                     |                     |                       |                   |                          |        |                          |
| Little Brown Myotis         | <i>Myotis lucifugus</i>          | S4    | G5            | END     | END     |                     |                     |                       |                   |                          |        |                          |
| Northern Myotis             | <i>Myotis septentrionalis</i>    | S3    | G4            | END     | END     |                     |                     |                       | L3                |                          |        |                          |
| Silver-haired Bat           | <i>Lasionycteris noctivagans</i> | S4    | G5            |         |         |                     |                     |                       | L3                |                          |        |                          |
| Eastern Pipistrelle         | <i>Perimyotis subflavus</i>      | S3?   | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Eastern Red Bat             | <i>Lasiurus borealis</i>         | S4    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Big Brown Bat               | <i>Eptesicus fuscus</i>          | S5    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Hoary Bat                   | <i>Lasiurus cinereus</i>         | S4    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Eastern Cottontail          | <i>Sylvilagus floridanus</i>     | S5    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Snowshoe Hare               | <i>Lepus americanus</i>          | S5    | G5            |         |         | 20                  |                     | H                     | L3                |                          |        |                          |
| European Hare               | <i>Lepus europaeus</i>           | SNA   | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Woodchuck                   | <i>Marmota monax</i>             | S5    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Fox Squirrel                | <i>Sciurus niger</i>             | SNA   | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Northern Flying Squirrel    | <i>Glaucomys sabrinus</i>        | S5    | G5            |         |         |                     |                     | H                     | L2                |                          |        |                          |
| Southern Flying Squirrel    | <i>Glaucomys volans</i>          | S4    | G5            |         |         | 20                  |                     |                       | L2                |                          |        |                          |
| White-footed Mouse          | <i>Peromyscus leucopus</i>       | S5    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Deer Mouse                  | <i>Peromyscus maniculatus</i>    | S5    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Southern Red-backed Vole    | <i>Clethrionomys gapperi</i>     | S5    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Muskrat                     | <i>Ondatra zibethicus</i>        | S5    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Southern Bog Lemming        | <i>Synaptomys cooperi</i>        | S4    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Meadow Vole                 | <i>Microtus pennsylvanicus</i>   | S5    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Woodland Vole               | <i>Microtus pinetorum</i>        | S3?   | G5            | SC      | SC      |                     |                     | H                     |                   |                          |        |                          |
| House Mouse                 | <i>Mus musculus</i>              | SNA   | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Meadow Jumping Mouse        | <i>Zapus hudsonicus</i>          | S5    | G5            |         |         |                     |                     |                       | L3                |                          |        |                          |
| Woodland Jumping Mouse      | <i>Napaeozapus insignis</i>      | S5    | G5            |         |         |                     |                     | m                     | L2                |                          |        |                          |
| Porcupine                   | <i>Erethizon dorsatum</i>        | S5    | G5            |         |         |                     |                     |                       | L2                |                          |        |                          |
| Coyote                      | <i>Canis latrans</i>             | S5    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Northern Gray Wolf          | <i>Canis lupus occidentalis</i>  | S4    | G4            |         |         |                     |                     |                       |                   |                          |        |                          |
| Eastern Wolf                | <i>Canis lupus lycaon</i>        | S4    | G4            | SC      | SC      |                     |                     |                       |                   |                          |        |                          |
| Red Fox                     | <i>Vulpes vulpes</i>             | S5    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Grey Fox                    | <i>Urocyon cinereoargenteus</i>  | S1    | G5            | THR     | THR     |                     |                     |                       |                   |                          |        |                          |
| American Black Bear         | <i>Ursus americanus</i>          | S5    | G5            |         |         |                     |                     |                       | L1                |                          |        |                          |
| Northern Raccoon            | <i>Procyon lotor</i>             | S5    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| American Marten             | <i>Martes americana</i>          | S5    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Fisher                      | <i>Martes pennanti</i>           | S5    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Ermine                      | <i>Mustela erminea</i>           | S5    | G5            |         |         |                     |                     | H-m                   | L3                |                          |        |                          |
| Long-tailed Weasel          | <i>Mustela frenata</i>           | S4    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| American Mink               | <i>Mustela vison</i>             | S4    | G5            |         |         |                     |                     |                       | L3                |                          |        |                          |
| American Badger             | <i>Taxidea taxus jacksoni</i>    | S2    | G5            | END     | END     |                     |                     |                       |                   |                          |        |                          |
| North American River Otter  | <i>Lutra canadensis</i>          | S5    | G5            |         |         |                     |                     | H                     | L1                |                          |        |                          |
| Canada Lynx                 | <i>Lynx canadensis</i>           | S5    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Bobcat                      | <i>Lynx rufus</i>                | S4    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Mountain Lion               | <i>Puma concolor</i>             | SU    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
| Eastern Cougar              | <i>Puma concolor couguar</i>     | SU    | G5TH          |         |         |                     |                     |                       |                   |                          |        |                          |

| COMMON NAME                                                                                                                                | SCIENTIFIC NAME    | SRANK | GLOBAL STATUS | COSSARO | COSEWIC | AREA SENSITIVE (ha) | Local Status Halton | Local Status Hamilton | Local Status TRCA | Regional Status Waterloo | Source | Area Sensitive Reference |
|--------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-------|---------------|---------|---------|---------------------|---------------------|-----------------------|-------------------|--------------------------|--------|--------------------------|
| Moose                                                                                                                                      | <i>Alces alces</i> | S5    | G5            |         |         |                     |                     |                       |                   |                          |        |                          |
|                                                                                                                                            |                    |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
|                                                                                                                                            |                    |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
| SUMMARY                                                                                                                                    |                    |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
|                                                                                                                                            |                    |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
| Total Odonata:                                                                                                                             | 8                  |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
| Total Butterflies:                                                                                                                         | 6                  |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
| Total Other Arthropods                                                                                                                     | 0                  |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
| Total Amphibians:                                                                                                                          | 4                  |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
| Total Reptiles:                                                                                                                            | 0                  |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
| Total Birds:                                                                                                                               | 75                 |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
| Total Breeding Birds:                                                                                                                      | 68                 |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
| Total Mammals:                                                                                                                             | 7                  |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
|                                                                                                                                            |                    |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
| SIGNIFICANT SPECIES                                                                                                                        |                    |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
|                                                                                                                                            |                    |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
| Global:                                                                                                                                    | 0                  |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
| National:                                                                                                                                  | 6                  |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
| Provincial:                                                                                                                                | 6                  |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
| Regional:                                                                                                                                  | 26                 |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
| Local:                                                                                                                                     | 26                 |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
|                                                                                                                                            |                    |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
| Explanation of Status and Acronymns                                                                                                        |                    |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
|                                                                                                                                            |                    |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
| COSSARO: Committee on the Status of Species at Risk in Ontario                                                                             |                    |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
| COSEWIC: Committee on the Status of Endangered Wildlife in Canada                                                                          |                    |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
| REGION: Rare in a Site Region                                                                                                              |                    |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
| S1: Critically Imperiled—Critically imperiled in the province (often 5 or fewer occurrences)                                               |                    |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
| S2: Imperiled—Imperiled in the province, very few populations (often 20 or fewer),                                                         |                    |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
| S3: Vulnerable—Vulnerable in the province, relatively few populations (often 80 or fewer)                                                  |                    |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
| S4: Apparently Secure—Uncommon but not rare                                                                                                |                    |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
| S5: Secure—Common, widespread, and abundant in the province                                                                                |                    |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
| SX: Presumed extirpated                                                                                                                    |                    |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
| SH: Possibly Extirpated (Historical)                                                                                                       |                    |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
| SNR: Unranked                                                                                                                              |                    |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
| SU: Unrankable—Currently unrankable due to lack of information                                                                             |                    |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
| SNA: Not applicable—A conservation status rank is not applicable because the species is not a suitable target for conservation activities. |                    |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
| S#S#: Range Rank—A numeric range rank (e.g., S2S3) is used to indicate any range of uncertainty about the status of the species            |                    |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
| S#B- Breeding status rank                                                                                                                  |                    |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
| S#N- Non Breeding status rank                                                                                                              |                    |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
| ?: Indicates uncertainty in the assigned rank                                                                                              |                    |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
| G1: Extremely rare globally; usually fewer than 5 occurrences in the overall range                                                         |                    |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
| G1G2: Extremely rare to very rare globally                                                                                                 |                    |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
| G2: Very rare globally; usually between 5-10 occurrences in the overall range                                                              |                    |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
| G2G3: Very rare to uncommon globally                                                                                                       |                    |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
| G3: Rare to uncommon globally; usually between 20-100 occurrences                                                                          |                    |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
| G3G4: Rare to common globally                                                                                                              |                    |       |               |         |         |                     |                     |                       |                   |                          |        |                          |

| COMMON NAME                                                                                                                                                | SCIENTIFIC NAME | SRANK | GLOBAL STATUS | COSSARO | COSEWIC | AREA SENSITIVE (ha) | Local Status Halton | Local Status Hamilton | Local Status TRCA | Regional Status Waterloo | Source | Area Sensitive Reference |
|------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|-------|---------------|---------|---------|---------------------|---------------------|-----------------------|-------------------|--------------------------|--------|--------------------------|
| G4: Common globally; usually more than 100 occurrences in the overall range                                                                                |                 |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
| G4G5: Common to very common globally                                                                                                                       |                 |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
| G5: Very common globally; demonstrably secure                                                                                                              |                 |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
| GU: Status uncertain, often because of low search effort or cryptic nature of the species; more data needed.                                               |                 |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
| T: Denotes that the rank applies to a subspecies or variety                                                                                                |                 |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
| Q: Denotes that the taxonomic status of the species, subspecies, or variety is <b>questionable</b> .                                                       |                 |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
| END: Endangered                                                                                                                                            |                 |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
| THR: Threatened                                                                                                                                            |                 |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
| SC: Special Concern                                                                                                                                        |                 |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
| NAR: Not At Risk                                                                                                                                           |                 |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
| IND: Indeterminant, insufficient information to assign status                                                                                              |                 |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
| DD: Data Deficient                                                                                                                                         |                 |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
| 6: Rare in Site Region 6                                                                                                                                   |                 |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
| 7: Rare in Site Region 7                                                                                                                                   |                 |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
| Area: Minimum patch size for area-sensitive species (ha)                                                                                                   |                 |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
| H- highly significant in Hamilton Region (i.e. rare)                                                                                                       |                 |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
| m- moderately significant in Hamilton Region (i.e. uncommon)                                                                                               |                 |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
| L1- extremely rare locally (Toronto Region)                                                                                                                |                 |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
| L2- very rare locally (Toronto Region)                                                                                                                     |                 |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
| L3- rare to uncommon locally (Toronto Region)                                                                                                              |                 |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
| HR- rare in Halton Region, highly significant                                                                                                              |                 |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
| HU- uncommon in Halton Region, moderately significant                                                                                                      |                 |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
| * The Pileated Woodpecker will incorporate smaller woodlots into its homerange, therefore it may not be a true area-sensitive species (Naylor et al. 1996) |                 |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
|                                                                                                                                                            |                 |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
| LATEST STATUS UPDATE                                                                                                                                       |                 |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
| Odonata: August 2014                                                                                                                                       |                 |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
| Butterflies: August 2014                                                                                                                                   |                 |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
| Other Arthropods: August 2014                                                                                                                              |                 |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
| Amphibans: August 2014                                                                                                                                     |                 |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
| Reptiles: August 2014                                                                                                                                      |                 |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
| Birds: August 2014                                                                                                                                         |                 |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
| Mammals: August 2014                                                                                                                                       |                 |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
|                                                                                                                                                            |                 |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
| NOTE                                                                                                                                                       |                 |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
| All rankings for birds refer to breeding birds unless the ranking is followed by N                                                                         |                 |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
|                                                                                                                                                            |                 |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
| REFERENCES                                                                                                                                                 |                 |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
|                                                                                                                                                            |                 |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
|                                                                                                                                                            |                 |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
| COSSARO Status                                                                                                                                             |                 |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
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|                                                                                                                                                            |                 |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
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|                                                                                                                                                            |                 |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
|                                                                                                                                                            |                 |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
| Local Status                                                                                                                                               |                 |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
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| COMMON NAME                                                                                                                                                                                                                                                                                                             | SCIENTIFIC NAME | SRANK | GLOBAL STATUS | COSSARO | COSEWIC | AREA SENSITIVE (ha) | Local Status Halton | Local Status Hamilton | Local Status TRCA | Regional Status Waterloo | Source | Area Sensitive Reference |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|-------|---------------|---------|---------|---------------------|---------------------|-----------------------|-------------------|--------------------------|--------|--------------------------|
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|                                                                                                                                                                                                                                                                                                                         |                 |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
| Area-sensitive information                                                                                                                                                                                                                                                                                              |                 |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
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|                                                                                                                                                                                                                                                                                                                         |                 |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
|                                                                                                                                                                                                                                                                                                                         |                 |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
|                                                                                                                                                                                                                                                                                                                         |                 |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
|                                                                                                                                                                                                                                                                                                                         |                 |       |               |         |         |                     |                     |                       |                   |                          |        |                          |
|                                                                                                                                                                                                                                                                                                                         |                 |       |               |         |         |                     |                     |                       |                   |                          |        |                          |

## **APPENDIX C: CURRICULA VITAE OF TECHNICAL PARTICIPANTS**

# Tom Hilditch B.Sc.

## President & CEO



### Curriculum Vitae

#### PRIVATE SECTOR WORK

Tom has completed hundreds of site-specific impact studies, to satisfy regulatory requirements. These projects have required the design and implementation of scientific inventories, assessments of significance and sensitivity to potential development related effects and the development of sound mitigation measure recommendations. He has worked amongst various stakeholders, many involving the design and restoration of rare habitats for plant and wildlife Species at Risk.

Tom has been actively involved and directed the Natural Heritage components of the planning and design of future healthy communities, in approximately 5,000 hectares of future urban lands in Southern Ontario. In that landscape scale work, he completed baseline surveys, impact assessment work and designed and implemented new Natural Heritage Systems as integral components of development.

Working with some of Canada's largest land development companies, Tom has assisted them in strategic planning for land acquisition and disposition, and he is currently working with numerous clients in the consideration of ecosystem monetization and preparation for adaptation requirements associated with climate change.

#### SCIENTIFIC AND INDUSTRY ASSOCIATION WORK

Active in a number of scientific and industry committees and associations over the years, Tom began a five year term in 2009, serving as the Chair of the Species at Risk Program Advisory Committee (SARPAC), a body that reports to Ontario's Ministry of Natural Resources and Forests, regarding the implementation of the Ontario Endangered Species Act, 2007. He also served as Director on the Ontario Board for Nature Conservancy Canada, served as the Special Advisor to the Board of Directors of the Ontario Stone, Sand and Gravel Association (OSSGA) for all matters related to the environment and Natural Heritage, and remains an

active participant in the Building and Land Development Industry of Ontario (BILD).

Tom has served as the President of the Canadian Chapter of the Society of Wetland Scientists and for the Canadian Land Reclamation Association in Ontario.

## **SELECT PUBLICATIONS AND PRESENTATIONS**

Provincial Policy Statement 2014: A Comparison of Recent Changes to the PPS with a Focus on Natural Heritage System Policies. Presented at: Ontario Bar Association; 2015 February 5; Toronto, Canada.

Provincial Planning Statement and Environmental Protection. Presented at: Land Development & Planning Forum; 2014 June 17-18; Toronto, Canada.

Founder and Chair of The Ontario Endangered Species Act Conference; 2013 April 8-9; Royal Ontario Museum, Toronto, Canada.

Innovations in Endangered Species Legislation. Presented at: 2nd World Biodiversity Congress; 2011 September 8-12; Kuching, Malaysia.

Endangered Species Legislation as a Stimulus for Habitat Restoration. Presented at: Society for Ecological Restoration 4th World Conference on Ecological Restoration; 2011 August 21-25; Merida, Mexico.

The Presqu'île Bay Species at Risk Outreach Project Case Study. Presented at: The International Association for Great Lakes Research 53rd Annual Conference on Great Lakes Research; 2010 May 17-21; Toronto, Canada.

Endangered Species Act, 2007: Implications and Opportunities. Presented at: Ontario Stone, Sand and Gravel Rehabilitation Tour: 2008 September 11 and September 25; Bowmanville, Canada.

Endangered Species Act, 2007: Consequences and Opportunities. Presented at: Ontario East Municipal Conference; 2008 September 10-12; Kingston, Canada.

Endangered Species Act, 2007: A Private Sector Perspective. Presented at: Ontario Bar Association; 2008 September 11; Toronto, Canada.

A Private Sector Species at Risk Initiative: St. Mary's Cement & Great Lakes Wetland Stewardship. Presented at: A.D. Latornell Conservation Symposium; 2007 November 14-16; Alliston, Canada.

An Overview of Canadian Environmental Technologies. Presented at: Environment 2001 Conference; 2001 4-8 February; Abu Dhabi, United Arab Emirates.

Achieving Excellence in Natural Heritage Planning. Presented with D. Charlton and R. Hubbard at: Ontario Provincial Planners Conference; 2000 Niagara Falls, Canada.

Biodiversity Planning; Multi-layered Stakeholder Consensus Building, A Model for Success. Presented at: International Association for Impact Assessment Annual Meeting; 1998; Christchurch, New Zealand.

Provincial Wetlands Policy, Environmental Impact Study Requirements. Presented at: Society of Wetland Scientists; 1994; Washington, United States.

Brick Wetlands Complex, An EIS Case Study. Presented at: Wetlands Boundaries, Buffers and Gradients Conference; 1994; Waterloo, Canada.

Wetland Impact Mitigation Techniques, A Case Study. Presented at: Ontario Ministry of Natural Resources and Transportation; 1994; Ontario, Canada.

Wetland Policy Statement Implementation Issues and Experiences, Long Range Planning Directions; 1993; Ontario, Canada.

Woodland Evaluation Systems – Their Use and Application in Municipal Planning. Presented at: The Significant Woodlands Workshop, Ontario Ministry of Natural Resources; 1993; Dorset, Canada.

Buffers for the Protection of Wetland Ecological Integrity – A Model for Buffer Determination. Presented at: International Association of Ecology 4th International Wetlands Conference; 1992 September; Ohio, United States.

GIS – A Tool for Ecological Mapping and Impact Assessment of an Environmentally Sensitive Area. Presented at: The International Association for Impact Assessment Annual Meeting; 1992 August; Washington, D.C., United States.

## **SELECT PROJECT EXPERIENCE**

Grandview Resort Golf Course Development EIA, Huntsville

Environmental Baseline, Impact Assessment and Natural Heritage System Design Study, Heritage Heights, Brampton

Nelson Burlington Quarry License Expansion and Rehabilitation Design

Environmental Inventory Reporting, North Oakville Secondary Plan Implementation

EIAs for Clublink Corporation: Kings Riding, Cherry Downs, Rolling Hills

EIAs for Kaneff Group Golf Course developments: Royal Ontario Lionhead

EIA for golf course, resort and confo development, Grand Niagara, Niagara Falls

Eagle Heights Environmental Impact Assessment, Environmental Monitoring and Expert Testimony

St. Mary's Cement Greenfield Quarry EIA and ARA Application, Flamborough

Brighton, Presqu'île Species at Risk Conservation and Restoration Planning, St. Mary's Cement

American Badger Strategic Assessment of Range and Soils/Habitat; Creation of Innovative Recovery Tools

Airport Expansion, Screening Level Environmental Assessment, Equatorial Guinea, Africa

Mai Po Wetland EIS and Conservation Planning Investigation, Hong Kong, PRC

Niagara Waterfront Planning Study; Master Planning for Economic Rejuvenation

Tom Hilditch B.Sc.

Municipal Class Environmental Assessment, Scarborough Golf Club Road, Rail Separation  
Municipal Class Environmental Assessment Jackson District Sanitary and Storm Sewer  
Horseshoe Valley Resort Corporation, Sewage Treatment Class Environmental Assessment  
Kingston Area Waste Management Master Plan  
GO Transit Class EA, Rail Line Upgrade, Toronto  
Swan Lake Wetland Management Concept Plan, Weihai Province, PRC  
Downsview National Urban Park Design and Green Infrastructure Plan  
Greening of the Official Plan, Regional Municipality of York  
Elephant Conservation ENGO Observations & Opportunities, Confidential Exploratory Document

## EDUCATION

- B.Sc., Agr., Resources Management, University of Guelph

## PROFESSIONAL AND OTHER AFFILIATIONS

- Society for Conservation Biology
- International Association for Impact Assessment
- Ontario Field Ornithologists
- Canadian Society of Environmental Biologists
- International Association for Environmental Philosophy
- The International Society for Ecological Economics
- Ontario Stone, Sand and Gravel Association
- Society for Ecological Restoration
- Canadian Land Reclamation Association

## EMPLOYMENT HISTORY

- Savanta Inc. 2006 – Current: Founder, President & CEO
- Stantec Consulting 2005 – 2006: Vice President
- Stantec Consulting 2005: Senior Principal
- Stantec Consulting 2003 – 2005: Principal
- ESG International Inc. 2001 – 2003: President
- ESG International Inc. 1997 – 2001: Vice President
- ESG International Inc. 1994 – 1997: Senior Ecologist, Principal
- Gartner Lee Ltd. 1989 – 1994: Senior Ecologist, Associate
- Gartner Lee Ltd. 1983 – 1989: Ecologist
- Lake Simcoe Region Conservation Authority 1981 – 1983: Forest and Wetland Technician
- Ecologistics Ltd. 1981: Manager, Field Biology Team
- Toronto and Region Conservation Authority 1979 – 1981: Field Biologist, Environmentally Significant Areas of Study

# Shannon Catton M.Sc.

## Manager, Environmental Consulting



### Curriculum Vitae

Shannon brings a decade of experience working on environmental approvals, impact assessment studies, natural heritage reviews, ecological restoration and Species at Risk assignments for various private interests. Shannon has provided environmental expertise to major oil and gas pipeline expansion projects, limestone quarry expansions, power transmission and electricity infrastructure renewal projects, wind and solar power project approvals and various residential developments. She brings positive energy, insight and mindfulness to the resolution of complex environmental approval challenges.

Shannon's project management experience has included preparing, coordinating and implementing of annual field program and annual work programs, as well as budget requirements, technical reporting and Species at Risk permit applications, as well as on-going collaboration with various government agencies and other stakeholders. Terrestrial surveys included salamander migration and egg mass surveys, tissue sampling (in conjunction with the Ministry of Natural Resources) and amphibian call count surveys.

Shannon has also performed terrestrial surveys including tree inventories, vegetation community assessments (Ecological Land Classification and Ontario Wetland Evaluation Systems), habitat assessments, winter wildlife surveys, and reptile hibernacula surveys. She has also performed Natural Heritage Reviews for various residential development projects in the Oak Ridges Moraine and Niagara Escarpment Plan areas.

Shannon provided on-going provincial guidance for a cross-country pipeline regarding terrestrial policies such as the Species at Risk field programs, Endangered Species Act and Migratory Bird Convention Act and municipal permitting. Shannon also provided senior review for technical reports and the Environmental Assessment Report for the NEB application.

## SELECT PROJECT EXPERIENCE

- Dufferin Aggregates Action Quarry Extension, Action, Ontario
- Terrestrial Surveys for various pit and quarry implementation and extension projects, Ontario
- Timberland Homes Subdivision, LaSalle, Ontario
- Natural Heritage Evaluations for various residential development projects, Ontario
- Environmental Impact Studies for various residential development projects, Ontario
- TransCanada Pipelines Energy East Expansion Project, Alberta to New Brunswick
- TransCanada Pipelines Parkway Loop, Greater Toronto Area, Ontario
- NOVA Chemicals Pipeline Extension Project, Sarnia, Ontario
- Union Gas Bluewater River Crossing Replacement Project, Sarnia, Ontario
- Hydro One Networks Inc. Midtown Electricity Infrastructure Renewal Project, Toronto, Ontario
- Hydro One Networks Inc. Darlington Power Plant, Pickering Ontario
- St. Columban Wind Projects, St. Columban, Ontario
- Almonte Solar Project, Almonte, Ontario

## SELECT PUBLICATIONS AND PRESENTATIONS

- Catton, S. The Ontario Endangered Species Act: Project Implications and Proactive Management. Presentation for various clients and Stantec offices in Ontario, 2012.
- Matthew, U., P.J. Richardson, S. Catton, C.D. Stabler, D.W. Larson. The quarry-to-alvar initiative: Creating new alvar habitat from abandoned limestone quarries. *Canadian Reclamation*, 2:10-15, 2009.
- Tomlinson, S., U. Matthes, P.J. Richardson, D.W. Larson. The ecological equivalence of quarry floors to alvars. *Applied Vegetation Science*, 11:73-82, 2008.
- A comparative analysis of the seed bank, vegetation and environmental conditions of abandoned limestone quarry floors of southern Ontario and alvars on the Bruce Peninsula, Canada. Presentation to the World Conference on Ecological Restoration by the Society of Ecological Restoration (SER), Spain, 2005.
- Biological and physical comparisons of quarry floors and alvars. Presentation to the Aggregate Producers' Association of Ontario Pit and Quarry Restoration Workshop, Hamilton, Ontario, 2005.
- Using alvars as a reference ecosystem to restore abandoned limestone quarries. Poster Presentation at the A.D. Latornell Conservation Symposium, Aliston, Ontario, 2004.
- A comparative analysis of the seed bank, vegetation and environmental characteristics of abandoned limestone quarry floors of southern Ontario and alvars on the Bruce Peninsula. Presentation to the Ontario Ecology and Ethology Colloquium (OEEC), Mississauga, Ontario, 2004.
- The quarry-to-alvar initiative: progress report. The Ontario Aggregate Resources Corporation (TOARC) Annual Report, Burlington, Ontario, 2003.
- The quarry-to-alvar initiative: restoring value to abandoned quarries. The Ontario Aggregate Resources Corporation (TOARC) Annual Report, Burlington, Ontario, 2002.

## **EDUCATION**

M.Sc., Botany, University of Guelph, 2006

B.A., B.Sc., Sociology and Biology (Hons), University of Guelph, 2003

## **CERTIFICATES AND TRAINING**

Ontario Ministry of Natural Resources Ontario Wetland Evaluation

Systems (OWES) Certification, North Bay, Ontario, 2008

Ontario Ministry of Natural Resources Ecological Land Classification for southern Ontario (ELC) Certification, Turkey Point, Ontario, 2006

## **EMPLOYMENT HISTORY**

Savanta Inc., 2014 – 2015: Manager, Environmental Consulting

Savanta Inc., 2013 – 2014: Terrestrial Ecologist, Project Manager

Stantec Consulting, 2012 – 2013: Terrestrial Team Lead

Stantec Consulting, 2010 – 2012: Senior Terrestrial Ecologist and Project Manager

Stantec Consulting, 2007 – 2010: Project Manager

Stantec Consulting, 2006 – 2007: Terrestrial Ecologist

Hamilton Conservation Authority, April – October 2006: Natural Heritage Technical Lead

# Adele Mochrie B.Sc.

## Senior Project Manager



### Curriculum Vitae

Adele is a talented communicator and strategic thinker with 17 years of environmental planning experience. She is well known and highly regarded for her skills in project and consulting team management, permitting and approvals, and meaningful consultation and stakeholder engagement.

Adele is always mindful of the public and stakeholder interest in the projects, utilizing her strong consultation and communication skills to address concerns effectively. She has worked with municipalities on joint initiatives, requiring a working knowledge of the Municipal Class EA, such as developer driven improvements adjacent to the provincial infrastructure.

### PROJECT MANAGEMENT EXPERIENCE

Currently, Adele is managing the Baseline Ecological Studies for a large group of Landowners invested in planning and strategic activities related to the Milton South Urban Area (Phase 4). The work completed to date provides the baseline natural heritage data which will support the Subwatershed Study (SWS) that is being initiated by the Town of Milton.

In other key projects, Adele is leading Savanta's team of ecologists through strategic environmental field studies to determine ecological features, constraints/opportunities and development limits and consulting with local Conservation Authorities on O.Reg. 166/06 Permit Applications.

Adele spent the last 13 years leading the environmental component of large, complex projects through the MTO Class Environmental Assessment for Provincial Transportation Facilities. She has a keen awareness of the larger project goals and ensures the environmental deliverables are prepared within typically tight timelines while maintaining a high quality standard.

## ENVIRONMENTAL PLANNING EXPERIENCE

Adele has spent significant time providing environmental expertise on Preliminary and Detailed Design projects for Highway 401 expansion projects in the Kitchener-Waterloo-Cambridge area, ensuring that all federal legislation (NPA, Fisheries Act), provincial legislation (EPA, ESA), guidelines (MTO Class EA, MTO Environmental Standards and Practices) and consultant acquisition processes (RAQS, Environmental Reference for Design, EOIs and RFPs) requirements were met.

She has led the environmental component of numerous projects, ensuring timelines, budgets and all environmental obligations are met, including permits and approvals. Adele has been responsible for monitoring construction activities to determine the effectiveness of environmental mitigation measures included in contracts. Such work included documenting compliance with the Ministry's environmental policies and commitments made to the public and external agencies, making recommendations for changes to the contract or to policy.

During Preliminary Design projects, Adele was responsible for the scope and review of all project-related environmental technical reports. She assisted in the development and evaluation of design alternatives and selection of recommended plan, ensuring the Transportation Environmental Study Report (TESR) documented all environmental impacts, additional work identified for design and proposed mitigation measures.

During Detailed Design projects, Adele has ensured all environmental commitments made during Preliminary Design are carried forward and continue with consultation. She reviewed proposed mitigation measures and confirmed all environmental commitments made were included in the contract package.

Adele has ample experience working with agencies to secure environmental permits and approvals. She has represented the MTO in negotiations with the MNRF through the Endangered Species Act, 2007, application process, as well as negotiations of environmental issues with the public, external agencies and First Nations, regarding "Mega" projects, engaging in face-to-face meetings with affected property owners, as well as strategy meetings with MNR and CAs, collaborating with the Sarnia Greenbelt Committee for Highway 402 landscaping plans.

Adele has also collaborated with local CAs to identify opportunities to fund portions of their projects that demonstrate overall benefit to impacted species of risk. She has also reviewed PTTW application packages, DFO submissions and has negotiated NPA permit details.

## WASTE AND CONTAMINATED PROPERTY EXPERIENCE

With a strong background in waste and contaminated sites, Adele is aware of the potential impacts to the soil, groundwater and surface water from both temporary works (i.e. construction) and long-term effects resulting from the proposed improvements, striving to ensure these impacts are avoided or mitigated.

## SELECT PROJECT EXPERIENCE

Milton South Urban Area (Phase 4) Ecological Studies and Base-line Inventories.

EIS for several Wyndfield West developments (Empire Homes, Losani Homes) in Brantford.

EIA for golf course, resort and condo development, Grand Niagara, Niagara Falls.

Endangered Species Act Permits for Redside Dace, Black Redhorse and Wavy-Rayed Lampmussels, Project Registration for Barn Swallows.

Design, construction oversight and coordination of 2 year monitoring program of SARTurtle Ecopassage under Highway 24, Brant County.

Pilot Project with Saugeen First Nation and CSPI for innovative design of prefab liner for fish passage through 8% grade culvert.

Active participant in the Ontario Road Ecology Group (OREG).

MTO Class EA: Highway 401 Expansion, Hwy 8 easterly to Wellington/Halton boundary, Preliminary and Detail Design.

MTO Class EA: Highway 402 Expansion, Sarnia, Detail Design and Post Construction Landscaping Plan at three new Storm Water Management Ponds.

## EDUCATION

- B.Sc., Environmental Sciences, University of Western Ontario

## CERTIFICATION AND TRAINING

- Environmental Monitoring for Construction Projects (Course) Vancouver Island University (2013)
- Erosion and Sediment Control (Course) Vancouver Island University (2012)
- Environmental Compliance in Civil Construction (Certificate) Ontario Road Builders Association (2010)
- Module 1 Value Management Training Workshop (Certificate) SAVE International (2007)

## VOLUNTEER WORK

- 2011 – 2015, OPSEU Co-Chair of Local Employee Relations Committee (LERC)
- 2011 – 2012, Coordinator of the “Grabba Java” Knowledge Sessions within the Exeter Road Ontario government building to share information and knowledge from various work-related disciplines.
- 2011 – 2012, Co-Chair of the Volunteer Initiative Committee (VIC), leading Federated Health and United Way fundraising activities in the Exeter Road Ontario government complex.
- 2002 – 2006, Provided palliative care to terminally ill residents at The Carpenter Hospice, Burlington.

## EMPLOYMENT HISTORY

- Savanta: April 2015 - present
- Ministry of Transportation: 2002 – 2015
  - Senior Environmental Planner (2013 – 2015)
  - Environmental Planner (2006 – 2013)
  - Environmental Planner – Waste Specialist (2002 – 2006)
- Trow Consulting Engineers Ltd: 1998 – 2002, Environmental Scientist and Project Manager

# Sean Geddes B.Sc.

## Senior Aquatic Ecologist



### Curriculum Vitae

Sean has 25 years of experience in the fisheries and aquatic habitat field, including fish habitat assessments, impact analyses and site monitoring for projects in the aggregate, waste management, energy, transportation, and land planning and development sectors. His experience includes a mix of private and public sector work, with projects ranging from streams to large rivers and small inland lakes to the Great Lakes environments.

Sean served as a plan review aquatic biologist with the Grand River Conservation Authority (GRCA). With the GRCA, he was responsible for the review of projects under Section 35 of the Federal Fisheries Act on behalf of Fisheries and Oceans Canada as part of a Level 3 Agreement with the agency. Sean has developed extensive experience in the permits and approvals process, including developing and negotiating fish habitat mitigation and compensation approaches as they are outlined in formal Letters of Intent and Fisheries Act authorizations.

During his tenure with the Grand River Conservation Authority, Sean served as the principal reviewer for a wide variety of permit and planning applications, Municipal Class EAs and other planning studies that had the potential to affect fisheries and aquatic habitat. He was also responsible for the review of projects under Section 35 of the Federal Fisheries Act on behalf of the DFO as part of a Level 3 Agreement between the DFO and the provincial conservation authority.

As Senior Aquatic Ecologist with Savanta, Sean applies his combined public and private sector knowledge and experience to a variety of projects where aquatic habitat issues and concerns need to be addressed. He has conducted numerous assessments of stream corridors and river systems to determine potential impacts. He has also been responsible for the development of habitat enhancement plans aimed at achieving the best productivity result for both short and long term time frames.

## SELECT PROJECT EXPERIENCE

Project Aquatic Biologist, North Markham Land Use Planning and Secondary Plan Development, Markham

Project Aquatic Biologist, Northwest Brampton Conceptual Fisheries Compensation Plan, Brampton

Project Aquatic Biologist, Nelson Aggregates Proposed Burlington Quarry Extension, Burlington

Project Ecologist, Proposed Flamborough Quarry Haul Route Study

Project Manager, Grand River Wall Repairs and Species at Risk Assessments, Paris

Project Manager, King Road Development Area Environmental Impact Statement, Burlington

Project Manager, Ellesmere Medical Health Centre Natural Heritage Impact Assessment, Scarborough

Project Aquatic Biologist, Eagle Heights Development Area, Burlington

Project Aquatic Biologist, North Newmarket Land Use Planning (Secondary Plan), Newmarket

Project Manager, Area 48 Master Environmental Servicing Plan, Phases 1 & 2, Brampton

Project Manager, Brantford Industrial Park Site Development and Fisheries Compensation

Project Manager, Piers 22 & 27 Site Development, Hamilton Harbour

Project Co-Manager, Redside Dace Management Approaches in the Golden Horseshoe, MNR / BILD

Project Biologist, Columbia Lake Dam Removal and Lake Enhancement Design, Waterloo

## EDUCATION

- Specialized Honours Bachelor of Science, University of Guelph
  - Area of Specialization: Fisheries Biology
  - Strong emphasis in Wildlife Biology

## CERTIFICATION AND TRAINING

- Burlington DFO Central/Arctic Region Fisheries Act Training - Fisheries Protection Program, 2015
- TRCA Sediment and Erosion Control Workshop, 2003.
- Advanced Fish Habitat Training Sessions (numerous), 1998-2003.
- Fluvial Geomorphology Introductory and Advanced Training Courses, 2002.
- Dam Removal and Restoration of Biological Integrity, 2001.
- Design Standards for Improving Fish Habitat Management, 2001.
- Stream Restoration: Natural Channel Design, 2000.
- Regional Habitat Enforcement Training Course, 2000.
- Second International Conference on Natural Channel Systems, 1999.

## EMPLOYMENT HISTORY

- Savanta Inc., 2009 - Current: Senior Aquatic Ecologist
- Stantec Consulting, 2003 – 2009: Associate/Senior Project Manager
- Grand River Conservation Authority, 1997 – 2003: Aquatic Biologist, Plan Review
- Ecoplans Ltd., 1993 – 1997: Aquatic Biologist
- Dance Environmental Inc., 1992 – 1993: Contract Fisheries Biologist
- Grand River Conservation Authority, 1992: Critical Habitat Technician
- Grand River Conservation Authority, 1991: Fish Habitat Restoration Technician
- University of Guelph, 1991: Fish Genetics Technician
- Ministry of the Environment, 1990: Aquatic Survey Technician
- Ministry of Natural Resources, Lake Erie Research Unit, 1986-1990: Aquatic Technician, Fisheries and Limnology

# Christopher Zoladeski Ph.D.

## Botanist, Senior Ecologist



### Curriculum Vitae

Chris has 25 years of environmental consulting experience on projects ranging from biological surveys to comprehensive natural heritage strategies and sustainable forestry audits. He has an extensive knowledge of forest, wetland and applied plant ecology and Ecological Land Classification and flora of southern and central Ontario.

Chris implemented conservation biology principles in the development of biodiversity, watershed and natural heritage policy planning. He conducted numerous Environmental Impact Assessments including habitat restoration, species at risk management and wetland delineation for projects ranging from housing and golf course developments to comprehensive assessments of aggregate sites.

### **HABITAT RESTORATION**

Chris had a lead role in several projects involving major habitat restoration initiatives, in particular those carried out by aggregate resources operators and major land developers. For example, he provided a template for a tallgrass prairie restoration and rehabilitation strategy at sites in southern Ontario. In northwest Brampton, he was a member of a multidisciplinary team devising a natural heritage system along re-aligned watercourse and valley channel.

### **IMPACT ASSESSMENT**

Participating in various roles, Chris has completed field investigations and data analysis as well as project management duties in hundreds of site-specific environmental impact studies for housing, industrial and pipeline developments. These assignments significantly included proposals for mitigation measures to lessen the impacts on the natural habitats and species, while ensuring a balanced approach to land use.

## WETLAND DELINEATION AND SIGNIFICANT WOODLANDS

Based on his knowledge of wetland vegetation, flora, soils and habitat features and functions, Chris has completed numerous wetland delineations and analyses. The results contributed to a better understanding of these ecosystems and better decisions regarding development limits. Similarly, using the criteria established by municipalities and the province, he delineated and analyzed many sites containing Significant Woodland areas.

## SELECT PUBLICATIONS

### Books

Zoladeski, C.A., Delorme, R.J., Wickware, G.M., Corns, I.G.W. and Allan, D.T. 1998. Forest ecosystem toposequences in Manitoba. Special Report 12, Canadian Forest Service, Northern Forestry Centre, Edmonton, Alberta, 63p.

Zoladeski, C.A., Cowell, D.W. and Ecosystem Classification Advisory Committee. 1996. Ecosystem classification for the southeast Yukon: field guide, first approximation; Yukon Renewable Resources, Canadian Forest Service, Department of Indian and Northern Affairs and Northern Development, Whitehorse, Yukon, 409p.

Zoladeski, C.A., Wickware, G.M., Delorme, R.J., Sims, R.A. and Corns, I.G.W. 1995. Forest ecosystem classification for Manitoba: field guide, special report 2; UBC Press, Vancouver, B.C., 205p.

### Articles in Periodicals

Zoladeski, C.A. 1991. Vegetation zonation in dune slacks on the Leba Bar, Polish Baltic Sea coast; *Journal of Vegetation Science*, v.2, p.255-258.

Zoladeski, C.A. and Maycock, P.F. 1990. Dynamics of the boreal forest in northwestern Ontario; *American Midland Naturalist*, v.124, p.289-300.

Zoladeski, C.A. 1989. Current status of rare vascular plants on Cape Enragé (Bic), Quebec; *Le Naturaliste canadien*, v.116, p.113-116.

Zoladeski, C.A. 1988. New station for *Malaxis paludosa*, bog adder's-mouth orchid, in northwestern Ontario; *The Canadian Field-Naturalist*, v.102, p.548-549.

Zoladeski, C.A. 1988. Classification and gradient analysis of forest vegetation of Cape Enragé, Bic Park, Quebec; *Le Naturaliste canadien*, v.115, p.9-11.

## SELECT PROJECT EXPERIENCE

Lead Botanist, Churchill Phase IV (Lands to the north) Environmental Impact Study, Orlando Corporation, Brampton

Lead Botanist, Block 47-1 & 47-2 Environmental Impact Study for Block Plan, Brampton

Lead Botanist, West Gormley Wetlands Construction Phase Monitoring as part of the Adaptive Management Plan, Richmond Hill

Lead Botanist, Heritage Heights Secondary Plan Area, Northwest Brampton, Natural Heritage System Planning, Subwatershed Study and Impact Assessment

Lead Botanist, Block 51-1 Mount Pleasant Community, Northwest Brampton, Environmental Implementation Report and Associated Vegetation Surveys, Multidisciplinary and Multi-Agency Analysis, Monitoring Natural Heritage System Implementation

Lead Botanist, Boyne Secondary Plan Area, South Milton, Natural Heritage System Planning, Environmental Baseline and Species at Risk Studies, Subwatershed Impact Studies and Natural Heritage Feature Staking

Environmental Impact Studies for golf course, aggregate and residential developments, Greater Toronto Area and Southern Ontario

Pilot Grassland Restoration Project, The Ontario Aggregate Resources Corporation and Ontario Ministry of Natural Resources

Lake Erie Sand Spit Savannas and Species at Risk: Invasive Species Inventory and Vegetation Restoration Strategy, Ontario Ministry of Natural Resources, Canadian Wildlife Service, Walker Industries, and LESSS Recovery Team

Cherry Birch Recovery Strategy, Ontario Ministry of Natural Resources

State of Aggregate Resources in Ontario Study: Paper 6 – Rehabilitation, Field Assessments, Ontario Ministry of Natural Resources

Sustainable Forest Licence Audits, Ontario Ministry of Natural Resources

## EDUCATION

- Ph.D., Botany, University of Toronto
- M.Sc., Forest Ecology and Soil Science, Laval University

## CERTIFICATION AND TRAINING

- Butternut Health Assessment Certificate
- Environmental Impact Study Training Session, Ontario Ministry of Natural Resources
- Ecological Land Classification Training Course
- Ontario Wetland Evaluation System Training Course

## EMPLOYMENT HISTORY

- Savanta Inc. 2009 – Current: Botanist, Senior Ecologist
- Stantec Consulting 2002 – 2009: Senior Scientist
- Toronto and Region Conservation Authority 1999 - 2000: Co-ordinator, Natural Heritage Systems
- Geomatics International Inc. 1992 – 1999: Senior Ecologist
- Acres International Limited (1990-1992): Ecologist

# Peter Burke B.Sc.

## Ornithologist, Senior Ecologist



### Curriculum Vitae

Peter has accumulated 28 years of extensive natural history knowledge that includes wildlife, insect and vegetation communities within Southern Ontario and beyond. He possesses an expert knowledge of birds across North, Central and South America, which includes breeding bird surveys, bird banding, bird field guide illustration and bird tour leading. Peter also possesses expert knowledge of butterfly, dragonfly and damselfly communities in Eastern Canada, including identification of species, both adults and larvae, and field guide illustration. He is experienced in the writing of Management Plans and preparing extensive annotated bibliographies for Species at Risk.

Peter is knowledgeable with regard to Peregrine Falcons, including their biological requirements, reintroduction programs throughout southern Ontario and hacking sites in large cities, including London. He has also been involved with addressing improvements to Barn Swallow replacement nest structures on several recent Savanta projects, working with Savanta team members to design the most effective ways to maximize usage. His familiarity with the scientific literature and field experience have combined to produce meaningful improvements such as nesting cup placement in relation to proximity of cover and audio and visual attractants, that have increased structure usage by Barn Swallows in 2015.

Peter has also been on contract to search for and document potential habitat of the Endangered Kirtland's Warbler in Ontario by the Canadian Wildlife Service. He is a professional tour leader for Field Guides Inc., and is a world-renowned professional illustrator for various bird field identification guides, including National Geographic. Peter has gained extensive work experience as a biologist and consultant for various industries, firms and academic institutions over the last three decades.

## EXPERIENCE

As a biologist for the OMNRF, Peter constructed an annotated bibliography for 25 bird Species at Risk. This included the collection of scientific papers, PhD. dissertations, relevant internet sources, books, and consultations with over 20 experts in Canada and the United States. Covering all SAR in Ontario, information was categorized for various topics ranging from relationship to vegetation management, forestry and agricultural practices, wind turbine energy, aggregates, transportation, pesticides/herbicides, fisheries, mining, and so on. The document exceeded 1200 pages.

As a contract Biologist for Savanta, Peter has conducted field surveys for breeding birds, including SAR species and other wildlife including herptiles, mammals, odonates and lepidoptera. He was responsible for documenting specific breeding information on SAR species and following MNRF protocols while conducting searches for these species. He also reported all species in datasets and provided written summaries of important areas for wildlife found on the subject lands, completed specific reporting on SAR species found on the subject lands, and mapped polygons to delimit specific inhabited areas.

As a biologist for the Canadian Wildlife Service, Peter performed reconnaissance work to detect the endangered and extremely rare Kirtland's Warbler in potential breeding locations in Southern Ontario. This work included site determination via FRI mapping and GIS. This work has involved initiating communications with individuals in the Forestry industry, performing site searches, deploying songmeters, documenting breeding evidence, reporting habitat characteristics, as well as reporting presence /absence, and working to determine what future efforts should take place to secure breeding habitats for this species in Southern Ontario.

During his time with the MNRF and Trent University, Peter conducted yearly breeding bird productivity monitoring studies. He found and monitored the nesting success of forest birds in hardwood communities across several logging practices in Algonquin Park, as well as public and private woodlots in Southwest Ontario. This included banding endangered species such as the Acadian Flycatcher. He also conducted vegetation surveys, which quantified the territory and site level structural characteristics. During this time Peter also participated in salamander monitoring surveys using mark-recapture techniques and cover boards. He also assisted with Southern Flying Squirrel trapping using mark-recapture techniques and live traps.

As a biologist for the Natural Heritage Information Centre (NHIC), Peter conducted surveys on rare species of Odonata throughout numerous sites across Ontario via detection of adult and larval forms. He collected data on site-specific information that described biotic and abiotic features and prepared specimens for museum collection. The final report summarized all species recorded during the surveys.

Additionally, Peter has worked for various organizations, including the Canadian Forest Service and Environment Canada. He has conducted breeding bird surveys, waterfowl surveys via helicopter, and has completed detailed vegetation surveys.

## SELECT PROJECT EXPERIENCE

Contract Biologist, OMNRF; Constructed an annotated 1200+ page bibliography on bird Species at Risk.

Contract Biologist, OMNRF; Created Management Plans for Special Concern Species, the West Virginia White & Black Tern.

Contract Biologist, Savanta; Performed field surveys for SAR species including birds, herptiles, mammals, odonates, lepidoptera, providing documentation, reports, datasets & mapping of specific inhabited areas on the subject lands.

Contract Biologist, Canadian Wildlife Service, Ontario Region; Detecting Kirtland's Warbler in potential breeding locations in Southern Ontario.

Contract Biologist, NHIC; Surveyed rare species of Odonata across Ontario via adult & larval forms. Collected data on site-specific information describing biotic/abiotic features. Specimens prepared for museum collection.

Contract Biologist, MNRF & Trent University, London; Yearly breeding bird productivity monitoring studies.

Biology Consultant; Various organizations, including the Canadian Forest Service and Environment Canada. Conducted breeding bird surveys, waterfowl surveys via helicopter & detailed vegetation surveys.

## EDUCATION

- B.Sc. Biology, Guelph University (1991)

## PROFESSIONAL AND OTHER AFFILIATIONS

- Created Listserve for public use of natural history in Middlesex, Oxford & Elgin Counties: 2009
- Served as Chair of the Ontario Bird Records Committee: 2001
- World renowned illustrator for bird identification guides.

## CERTIFICATION AND TRAINING

- Wilderness First Aid Training
- Wilderness Bear Safety Courses

## EMPLOYMENT HISTORY

- Savanta Incorporated: Biologist June – August 2010-2013 (contract), April 2014 – Present (Full-Time)
- Canadian Wildlife Service: Contract Biologist January 2013 – Present
- Ontario Ministry of Natural Resources and Forestry (OMNRF): Contract Biologist, October 2012 - Present
- Golder & Associates: Contract Biologist April – November 2010
- Natural Heritage Information Centre, MNRF: Contract Biologist June – September 2010, May – September 2003
- MNRF & Trent University: Contract Biologist July 2001 – 2011
- Bird Studies Canada: Field Biologist May 1991 – November 2003
- Various Organizations: Biology Consultant 1987 – 1991 Organizations include: Canadian Forest Service, Canadian Wildlife Service, Environment Canada, Trent University
- Ministry of Natural Resources and Forestry: Interpretive Naturalist June – September (summers) 1987 – 1990

# Rava Lee M.Sc.

## Ecologist



### Curriculum Vitae

Rava is an environmental professional specializing in landscape ecology, environmental restoration and conservation biology. During the past four years, she has directed and managed Species at Risk snake distribution and mitigation studies, Species at Risk turtle reintroduction studies and reintroduction program, as well as helped restore Species at Risk habitat including turtle nesting beaches. These projects required the design and implementation of novel research building on current knowledge of Species at Risk ecology. She has worked amongst various stakeholders, and has conducted outreach and education workshops for landowners and the public. Rava specializes in herptofauna surveys and habitat analysis, and is also experienced in conducting bat surveys, bird surveys and small mammal trapping.

In many of her assignments, Rava has reviewed, assessed and applied academic research to natural heritage planning and ecological mitigation. She has a sound understanding of various conservation biology frameworks and population modeling tools.

Through Rava's landscape ecology, conservation biology work and research regarding reintroduction of species and habitat restoration in Canada, she has developed a detailed knowledge base of current habitat and development challenges and solutions.

## CONSERVATION BIOLOGY EXPERIENCE

Rava was the lead Reptile Biologist for two conservation initiatives in Rouge National Park. Rava installed, conducted and analyzed data from Artificial Cover Objects (ACO) in Rouge Park to determine the impact of roads and the urban environment on one of the last large urban population of Eastern Milksnakes in Ontario. Rava initiated and planned the Rouge Park Blanding's Turtle headstart initiative, which included ecological modeling of the current Blanding's Turtle population as well as future populations for a Population Viability Analysis. Rava collected, incubated and hatched the first cohort of headstart Blanding's Turtles to be released into Rouge Park.

Rava is also familiar with the restoration of reptile habitat including the construction and design of artificial snake hibernacula and artificial turtle nesting beaches. She has provided restoration input for a number of development projects, including the Boyne NHS, to increase reptile habitat such as overwintering habitat, basking sites and nesting habitat.

## ECOLOGICAL MONITORING EXPERIENCE

Rava has conducted numerous ACO snake surveys throughout Southern Ontario. She has conducted wildlife surveys and rescues requiring the use of turtle hoopnets and turtle basking traps. Rava has also conducted radio tracking of turtles as well as the installation of radio transmitters and collecting turtle eggs for incubation. Rava analyzes data collected during monitoring to determine habitat corridors and foraging areas as well as the impacts of development on Species at Risk reptiles.

Rava has also conducted small mammal surveys with the Royal Ontario Museum including pitfall traps, mist netting, harp traps and Sherman traps.

## SELECT PROJECT EXPERIENCE

Lead Reptile Biologist Black's Pond Decommissioning and Restoration, Burlington, Ontario

Reptile Biologist for Boyne Natural Heritage System, Milton, Ontario

Mt. Pleasant Stream Realignment, Brampton, Ontario

Lead Reptile Biologist for the Rouge Park Milksnake Coverboard Study, Scarborough, Ontario

Lead Reptile Biologist for Rouge Park Blanding's Turtle Headstart Initiative, Scarborough, Ontario

Lead Reptile Biologist for the Rouge Park Blanding's Turtle Population Viability Analysis

Salamander surveyor for the East Boundary Road proposal, Cambridge, Ontario

Reptile Biologist for Milton Phase 4 proposed residential developments

OWES wetland co-evaluator for North Markham Berczy and Bruce tableland wetlands, Markham, Ontario.

Rava Lee M.Sc.

## EDUCATION

- M.Sc. Env, Environmental Science, University of Toronto
- B.Sc. Env., Natural Resources Management, University of Guelph

## EMPLOYMENT HISTORY

- Savanta Inc., 2013 – Current: Ecologist
- Toronto Zoo, 2011 – 2013: Natural Resources Biologist
- Parks Canada, 2010: Resource Conservation Technician

# Cate Collinson BA

## Ecologist



### Curriculum Vitae

Cate is an environmental professional specializing in ecosystem restoration and biodiversity monitoring. She has experience working in the municipal and provincial government sectors, the public sector as well as the private sector. During her time with Savanta, Cate has obtained her Ontario Stream Assessment Protocol Crew Lead certification and has led a number of field surveys, including headwater drainage feature and aquatic habitat assessments, fish rescues and biomass sampling, calling amphibian surveys, salamander habitat suitability assessments and salamander trapping and tissue sampling. Cate was also responsible for supervising channel and tableland restoration plantings for the Mount Pleasant community Natural Heritage System design and implementation, ensuring native species were planted and planting protocols were followed. She has also contributed to a number of Environmental Impact Studies through the development of proposals, budgets, fieldwork planning, data analysis and drafting final reports.

Cate has previously worked with the Alberta Biodiversity Monitoring Institute (ABMI), the Toronto and Region Conservation Authority (TRCA), Ontario Power Generation (OPG), The Ministry of Natural Resources and Forestry (MNRF), and the Region of York's Forestry Department. Throughout this time she contributed to numerous terrestrial and aquatic enhancement projects, including the DeCew Headlands Habitat Enhancement Plan, the Alfred Kuehne Channel Naturalization Project, Trumpeter Swan habitat construction and installation, various bank stabilization projects using soft engineering solutions, the Adopt-A-Stream Crossing Program and York Region's Greening Strategy.

While in Alberta working with ABMI, a first of its kind, world-class biodiversity monitoring project, Cate had the privilege of working with the Joint Oil Sands Monitoring Project, visiting Alberta's most disturbed and remote sites. Through ABMI, Cate has gained experience collecting, identifying and processing Bryophytes and Lichen species, collecting soil samples to determine organic content, conducting down woody debris analysis, carrying out

vegetative surveys as well as tree stand composition surveys and tree core extraction. Cate's experiences with TRCA afforded her the opportunity to be in the field assisting with the layout and installation of riparian vegetation plantings in a manner consistent with the Ministry of Natural Resources recommendations for Redside Dace habitat enhancement efforts.

Through her experiences, Cate has developed an understanding and passion for collaborative approaches and innovative solutions to solve environmental challenges.

## **SELECT PROJECT EXPERIENCE**

Mount Pleasant Community Natural Heritage System design implementation, Brampton

Milton Phase 4 Headwater Drainage Feature Assessment, Milton

East Boundary Road Jefferson Salamander Study, Cambridge

Fish Rescue and Biomass Sampling, Mount Pleasant, Brampton

Alfred Kuehne Channel Naturalization Project and Red Side Dace habitat enhancement, Greater Toronto Area

Alberta Biodiversity Monitoring Project and Joint Oil Sands Monitoring Project, Alberta

DeCew Headlands Habitat Enhancement Planning, Ontario Power Generation, Niagara

York Region Adopt-A-Stream Crossing Monitoring Study, York Region

York Region Land Securement Strategy Publication 2009, York Region

## EDUCATION

- Post Graduate Certificate Hons. Ecosystem Restoration, Niagara College
- BA Hons. Environmental Studies and Geography, Con. Environmental Studies, Bishop's University

## CERTIFICATION

- Ontario Stream Assessment Protocol Crew Lead
- Ontario Benthos Biomonitoring Network
- Class 2 Electrofishing Backpack Crew Leader
- Standard First Aid with CPR "C" + AED
- Bear Awareness and Avoidance
- Alberta All Terrain Vehicle Safety Training
- H2S Alive
- Transportation of Dangerous Goods Training
- Alberta Construction Safety System

## AWARDS

- Bishop's University Prize, Environmental Studies and Geography 2010
- Bishop's University, Leadership Excellence Award 2010
- Bishop's University, Student Representative Council Portfolio Award 2010

## EMPLOYMENT HISTORY

- Savanta Inc. 2013-Current: Ecologist
- Toronto and Regional Conservation Authority 2013: Environmental Labourer
- Alberta Biodiversity Monitoring Institute 2013: Environmental Technician
- Ontario Power Generation 2012-2013: Ecosystem Restoration Internship
- Ministry of Natural Resources 2010/2011: Team Lead
- The Regional Municipality of York 2009: Regional Greening Assistant
- The Regional Municipality of York 2007/2008: Forestry Summer Student