



## Memo

Project 2085

**To: Dave Hallman, MTE Consultants Inc.**

**From: Elaine Gosnell**

**Date: August 20, 2018**

**Re: County Road 124 Class B Environmental Assessment  
Natural Environmental Characterization – DRAFT Preliminary Constraints  
Report**

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Natural Resource Solutions Inc. (NRSI) has been working to complete the Natural Environmental Characterization for the Class B Environmental Assessment for improvements to County Road 124 (County Road 1 to Fife Road) (hereafter referred to as the “Subject Lands”).

The County of Wellington intends to undertake improvements to County Road 124 within the project limits between County Road 1 and Fife Road, approximately 5.8 km. The improvements may include roundabouts at the intersections with County Road 32 and Whitelaw Road, drainage improvements, some urbanization (i.e. curb and gutter, storm sewers) and minor widening within the right-of way. It is understood that 2 culverts/watercourse crossings, including Ellis Creek and a second tributary, will be extended as part of this project.

To characterize natural features and identify significant and sensitive features and species that have potential to be adversely affected by the proposed road improvements, NRSI completed field visits within the Subject Lands on a total of 14 dates from April 24 to July 12, 2018. Survey methods were undertaken in accordance with provincial and local guidance documents. The locations of specific monitoring stations are shown on Map 1.

The following is a preliminary summary of this natural environmental characterization and the identified environmental constraints within the Subject Lands.

## 1.0 Existing Conditions

### 1.1 Vegetation

#### 1.1.1 Vegetation Communities

The Subject Lands consist primarily of the rural road-right-of way and the adjacent agricultural lands as well as residential, industrial and commercial lands near the intersections with County Road 32. Natural features within and adjacent to the Subject Lands include Ellis Creek Wetland Complex, which is a Provincially Significant Wetland (PSW), the Speed River PSW, the Guelph Southwest Wetland Complex, which is a non-provincially significant wetland, and 2 watercourses regulated by the Grand River Conservation Authority (GRCA) (Ellis Creek and a second watercourse referred to here as 'Tributary A'). The Ellis Creek PSW, Speed River PSW, and a portion of the Guelph Southwest Wetland Complex, as well as riparian areas around these wetlands, are identified as Core Greenlands within the County of Wellington's Official Plan (2016) (Map 1).

A summary of vegetation communities identified within the Subject Lands is provided in Table 1 and shown on Map 1.

**Table 1. Vegetation Communities Identified within the Subject Lands**

ELC Ecosite Type	ELC Description	Environmental Characteristics
<b>Wetlands</b>		
SWD2	Ash Mineral Deciduous Swamp	This swamp is dominated by Freeman's Maple ( <i>Acer X freemanii</i> ) in the canopy, Common Buckthorn ( <i>Rhamnus cathartica</i> ), Grey/ Red Panicked Dogwood ( <i>Cornus foemina</i> ssp. <i>racemosa</i> ) and Red-osier Dogwood ( <i>Cornus stolonifera</i> ) in the understory, and Sensitive fern ( <i>Onoclea sensibilis</i> ) and Horsetail species ( <i>Equisetum</i> sp.) as groundcover.
SWD3	Maple Mineral Deciduous Swamp	This swamp has a canopy dominated by Silver Maple ( <i>Acer saccharinum</i> ) and Ash species ( <i>Fraxinus</i> sp.) while the understory is dominated by Common Buckthorn, Common Lilac ( <i>Syringa vulgaris</i> ) and Red-osier Dogwood.
SWD4-1	Willow Mineral Deciduous Swamp	The canopy and subcanopy of this swamp are dominated by Crack Willow ( <i>Salix fragilis</i> ) and White Willow ( <i>Salix alba</i> var. <i>alba</i> ) while the understory is dominated by Sandbar Willow ( <i>Salix exigua</i> ) and the groundcover is dominated by Reed Canary Grass ( <i>Phalaris arundinacea</i> ).
MAS2-1	Cattail Mineral Shallow Marsh	This marsh is dominated by Broad-leaved cattail ( <i>Typha latifolia</i> ).

ELC Ecosite Type	ELC Description	Environmental Characteristics
<b>Cultural</b>		
CUM1-1	Dry Moist Old Field Meadow	This meadow understory community is dominated by grasses (Poaceae sp.) with occasional Common Buckthorn and Common Apple ( <i>Malus domestica</i> ).
CUW1	Mineral Cultural Woodland	This woodland is dominated by Manitoba Maple ( <i>Acer negundo</i> ), White Ash ( <i>Fraxinus americana</i> ) and American Basswood ( <i>Tilia americana</i> ) in the canopy and Siberian Elm ( <i>Ulmus pumila</i> ) and Manitoba Maple in the sub-canopy.
CUP3	Coniferous Plantation	This plantation has a canopy dominated by Norway Spruce ( <i>Picea abies</i> ), with Staghorn Sumac ( <i>Rhus hirta</i> ) and Common Buckthorn in the understory.

### 1.1.2 Vascular Flora

A total of 102 vascular plant species were recorded during vegetation inventories within the Subject Lands in 2018 (including trees that were assessed during the tree inventory and were not in any of the assigned vegetation communities). A list of all species of plants can be found in Appendix I.

The majority of species observed were native, with forty-three non-native species recorded during vascular flora surveys, comprising 42% of all vascular plant species observed.

Background information and SAR and SCC screening indicates that 3 SAR and 2 SCC plant species are known from within Wellington County (MNRF 2018) and have potential to be present in the Subject Lands. Although 1 Butternut (*Juglans cinerea*), which is listed as Endangered provincially and federally (MNRF 2018c, Government of Canada 2018), was observed by NRSI biologists adjacent to the SWD3 swamp in 2018, the tree was dead. No other SAR, or SCC species were documented.

One vascular plant species considered to be locally significant, Black Maple (*Acer saccharum* ssp. *nigrum*), (Dogan & Associates 2009, City of Guelph 2012), was observed within the Subject Lands (Map 2). Two individuals were documented in the north portion of the Subject Lands on private property during the tree inventory (Map 2). The crowns of these trees hang over the road right of way.

## 1.2 Wildlife

### 1.2.1 Birds

A total of 101 bird species are reported from the Subject Lands based on the OBBA for Square 17NJ51 (BSC et al. 2008). The data found in the OBBA includes those species that have been observed in the area (10 x 10km range), are known to nest in the area, and/or have exhibited some evidence of breeding in the area. A total of 45 species were documented within the Subject Lands during field surveys conducted by NRSI staff in 2018. Of the species observed, 8 were confirmed to be breeding (“CO”), and 25 exhibited probable (“PR”) signs of breeding, such as females carrying food or nest materials, and 14 exhibited possible (“PO”) signs of breeding such as singing or being observed in suitable breeding habitat. A list of all species of birds known from the study area is included in Appendix II.

Background information indicates that 5 SAR and 4 SCC bird species are known from within Wellington County (MNRF 2016) or within 1km of the Subject Lands (BSC et al. 2008, MNRF 2015a). The SAR screening assisted in flagging 11 bird species, which potentially have suitable habitat within the Subject Lands, to be targeted during the breeding bird surveys.

NRSI observed 1 SAR bird species during 2017 surveys: Barn Swallow (*Hirundo rustica*). Barn Swallow is listed as Threatened provincially and federally (MNRF 2018c, Government of Canada 2018). Approximately 15 individuals were observed on June 20 from station BMB-010 (Map 2). These individuals exhibited probable (“PR”) signs of breeding outside of the Subject Lands as they were observed flying in and out of a barn on the south side of the road (Map 2). Foraging individuals were also observed within the Subject Lands at monitoring stations BMB-007 and BMB-009; however there was no evidence of breeding observed at these locations.

NRSI observed 1 SCC during field surveys. One Eastern Wood-Pewee (*Contopus virens*), listed as Special Concern provincially and federally (MNRF 2018b, Government of Canada 2018), was heard singing during the second breeding bird survey conducted on June 20, 2018 from station BMB-004. This bird was observed outside of the Subject Lands in the agricultural field to the south (Map 2). Given that this species was only documented during one breeding bird survey, it is considered to be a possible (“PO”) breeding species within the Subject Lands.

A total of 10 bird species considered to be locally significant were observed (Dougan & Associates 2009, City of Guelph 2012). Of these, 2 species, Baltimore Oriole (*Icterus galbula*) and Eastern Kingbird (*Tyrannus tyrannus*) were confirmed to be breeding within the Subject Lands. A nest of Eastern Kingbird was found in the Ellis Creek culvert. One species, Savannah Sparrow (*Passerculus sandwichensis*), exhibited probable (“PR”) signs of breeding. Three other species, Eastern Wood-Pewee (*Contopus virens*), Willow Flycatcher (*Empidonax traillii*), and Vesper Sparrow (*Pooecetes gramineus*), exhibited possible (“PO”) signs of breeding (Map 2).

### **1.2.2 Herpetofauna**

According to the background information 24 species of herpetofauna, including 3 SAR and 9 SCC, are known from within Wellington County (MNR 2016) or within 10km of the Subject Lands (Ontario Nature 2018). The SAR screening assisted in flagging 3 SAR and 3 SCC species, which potentially have suitable habitat within the Subject Lands, to be targeted during 2018 surveys.

NRSI field investigations confirmed the presence of 4 species of amphibians within the Subject Lands. Four common species of anurans were recorded during call surveys and other site visits in 2018: Gray Treefrog (*Hyla versicolor*), Northern Green Frog (*Lithobates clamitans melanota*), American Toad (*Anaxyrus americanus*) and Spring Peeper (*Pseudacris crucifer*). Of the 6 survey stations monitored, 4 were documented to have calling anurans, while 2 were silent (Table 2).

One common reptile species, Eastern Gartersnake (*Thamnophis sirtalis sirtalis*) was observed incidentally during fieldwork conducted in 2018.

No SAR, SCC, or regionally significant reptiles or amphibian species were observed. All species of herpetofauna known from the study area is included in Appendix II.

**Table 2. Anuran Call Survey Results from 2018**

Anuran Call Station	Species	Anuran Call Survey			Total Number of Species	Total Number of Individuals
		1	2	3		
ANR-001	American Toad				0	0
	Gray Treefrog					
	Greenfrog					
	Northern Leopard Frog					
	Spring Peeper					
ANR-002	American Toad				1	3
	Gray Treefrog					
	Greenfrog					
	Northern Leopard Frog					
	Spring Peeper	Code 1 (2)	Code 1 (1)			
ANR-003	American Toad				0	0
	Gray Treefrog					
	Greenfrog					
	Northern Leopard Frog					
	Spring Peeper					
ANR-004	American Toad				2	12
	Gray Treefrog		Code 1 (2)			
	Greenfrog					
	Northern Leopard Frog					
	Spring Peeper	Code 2 (8)	Code 1 (2)			
ANR-005	American Toad				1	2
	Gray Treefrog					
	Greenfrog					
	Northern Leopard Frog					
	Spring Peeper	Code 1 (2)				
ANR-007	American Toad				1	2
	Gray Treefrog					
	Greenfrog					
	Northern Leopard Frog					
	Spring Peeper	Code 1 (2)				

<sup>1</sup>Marsh monitoring anuran call code with estimated number of individuals in brackets.

### 1.2.3 Mammals

According to the Mammal Atlas of Ontario (Dobbyn 1994) and the MNR (2016), 46 mammal species, including 5 SAR, are reported from within 10km of the Subject Lands, in Wellington County. In 2018, NRSI staff observed evidence of 4 common mammal species in the Subject Lands, including the Eastern Cottontail, Eastern Chipmunk (*Tamias striatus*), Eastern Gray Squirrel (*Sciurus carolinensis*), and White-tailed Deer (*Odocoileus virginianus*).

Background information indicates that 3 SAR bats [Little Brown Myotis (*Myotis lucifungus*), Northern Myotis (*Myotis septentrionalis*), and Tri-coloured Bat (*Perimyotis subflavus*)] are known from within 1 km of the study area (Dobbyn 1994, MNR 2015a). An assessment of trees with a diameter greater than 10cm in Diameter at Breast Height (DBH) and trees or snags within the proposed development area was undertaken on May 15, 2018 to identify suitable maternity roosting habitat for bat SAR. This assessment followed both the *Bats and Bat Habitats: Guidelines for Wind Power Projects* (MNR 2011) and *Use of Buildings and Isolated Trees by Species at Risk Bats Survey Methodology* (MNR 2014). In total, 15 potentially suitable bat cavity trees were documented within the Subject Lands (Map 2). Habitat for bats may be present within the woodlands adjacent to the Subject Lands, as well; however, as any natural features outside the road right-of-way will be retained, focused plot surveys to identify potential maternity roosts were not deemed necessary.

No SAR, SCC or locally significant mammal species were observed. All species of mammals known from the study area is included in Appendix II.

### 1.2.4 Butterflies

The Ontario Butterfly Atlas had 18 species recorded for the Subject Lands and surrounding area, including 1 regionally significant species, Giant Swallowtail (*Papilio cresphontes*), and 1 SCC species, the Monarch Butterfly (*Danaus plexippus*) (MacNaughton et al. 2017). A list of all species of butterflies known from the study area is included in Appendix II.

One SCC, the Monarch Butterfly (*Danaus plexippus*), was observed in the Subject Lands by NRSI biologists in 2018. The larval foodplant of the Monarch, Common Milkweed (*Asclepias syriaca*), was also documented during ELC and vascular plant surveys in the CUM1-1 community within the Subject Lands. This species is discussed further in the context of Significant Wildlife Habitat (Section 2.5). No other significant butterfly species were observed.

### **1.2.5 Odonata**

Background reviews revealed that 32 species of odonata (dragonflies and damselflies), including 3 locally significant species, were recorded in the Ontario Odonata Atlas in the vicinity of the Subject Lands (Ontario Odonata Atlas Database 2018). No significant species were observed by NRSI in 2018. A list of all species of dragonflies and damselflies known from the study area is included in Appendix II.

### **1.2.6 Road Mortality Surveys**

Six road mortality surveys were completed by NRSI staff between April 24 and June 8, 2018. The only observations of wildlife on the road surface or shoulder within the Subject Lands were of common mammal species including 1 dead Eastern Cottontail (*Sylvilagus floridanus*) observed on May 9; 3 dead Eastern Cottontails and a Gray Squirrel on May 14, and a bird; 1 dead Northern Cardinal (*Cardinalis cardinalis*) observed on June 8.

## **1.3 Aquatic Resources**

### **1.3.1 Fish Community**

Background reviews revealed that 2 species of SAR fish, Black Redhorse (*Moxostoma duquesnei*) and Redside Dace (*Clinostomus elongatus*), and 1 species of SAR mussel, Wavy-rayed Lampmussel (*Lampsilis fasciola*), all with potentially suitable habitat within the Subject Lands, have been reported in the vicinity (MNRF 2016).

NRSI aquatic biologists recorded 3 common species of fish during targeted surveys in Ellis Creek: Blacknose Dace (*Rhinichthys atratulus*), Creek Chub (*Semotilus atromaculatus*), and Brook (Speckled) Trout (*Salvelinus fontinalis*). No fish species were observed in Tributary A. No mussels were observed in either of the watercourses within the Subject Lands. A list of all species of fish known from the study area is included in Appendix II.

No significant fish or mussel species were observed by NRSI in 2018.

## **2.0 Environmental Constraints**

This section analyzes the significance and sensitivity of natural features to determine what areas need to be protected, and therefore are considered constraints, and what areas present opportunities for development. Natural features that are sensitive to disturbance are identified based on the rarity or significance of the feature or the functions/processes and/or policies inhibiting development within them. These areas are discussed in the context of natural heritage policies governing their protection.

This analysis is intended to guide the planned improvements to County Road 124 to avoid or minimize impacts to significant and sensitive natural features and their ecological functions. Identified natural features to be protected during development are shown on Map 2 and are described in detail below.

### **2.1 Watercourses**

There are 2 watercourses within the Subject Lands. Ellis Creek flows south under County Road 124 in the southern portion of the Subject Lands, while Tributary A flows east under County Road 124 in the northern portion of the Subject Lands (Map 1). Both watercourses are regulated by the GRCA according to Ontario Regulation 150/06 (2015). The GRCA can prohibit or regulate the straightening, changing, diverting or interfering in any way with the existing channel the creek and its shorelines (GRCA 2015). Development, interference or alterations within the GRCA regulation limit may be permitted if, in the opinion of the GRCA, the development will not affect the control of flooding, erosion, dynamic beaches, pollution or the conservation of land. Typically, a 30m buffer from the top of bank is recommended for coldwater watercourses (Ellis Creek), with a 15m buffer recommended for warmwater watercourses (Tributary A).

### **2.2 Floodplain**

As shown on Map 2, the Ellis Creek and Tributary A floodplains are regulated by the GRCA. In accordance with GRCA Ontario Regulation 150/06, Section 8.1.15, public infrastructure including roads, pipelines and utilities may be permitted in a regulated floodplain as determined through an Environmental Assessment process (GRCA 2015). The EA must demonstrate that adverse hydraulic or fluvial impacts are limited, risk of flood damage to upstream and downstream properties is not increased, there is no loss of flood storage wherever possible, and intrusions on significant natural features or hydrologic or ecological functions are minimized

(GRCA 2015). Development within the regulated area will also require prior permission from GRCA in the form of a permit pursuant to Ontario Regulation 150/06 (GRCA 2015). This constraint will be addressed through the hydrology study team members.

## **2.3 Wetlands**

### **2.3.1 Provincially Significant Wetlands**

There are 2 PSW Complexes adjacent to the Subject Lands. The Ellis Creek PSW is situated on the north side of County Road 124 encompassing the deciduous swamp along the Ellis Creek corridor. The Speed River PSW is just south of the Subject Lands, running along the length of the Speed River (Map 1 and 2). Both PSW wetland complexes and their adjacent lands are regulated under the GRCA's *Regulation of Development, Interface with Wetlands and Alterations to Shorelines and Watercourses*, Ontario Regulation 150/06 (2015). Typically buffers or other mitigation and protection measures are required from wetlands to protect them from road improvement impacts.

### **2.3.2 Other Wetlands**

There are 6 non-significant wetlands (not PSW) within the Subject Lands, including 3 wetland areas flagged by NRSI, and 1 wetland of the Guelph Southwest Wetland Complex (Map 1 and 2). As outlined above, these wetlands are regulated under Ontario Regulation 150/06 and permits are required for developments occurring within the regulated area (GRCA 2015).

## **2.4 Fish Habitat**

Aquatic habitat for fishes within the Subject Lands is provided by Ellis Creek, which provides direct fish habitat for a small number of fish species, including the coldwater indicator species, Brook Trout. Direct fish habitat is defined as spawning grounds and any other areas, including nursery, rearing, food supply and migration areas, on which fish depend directly in order to carry out their life processes. See Map 2 for the extent of assessed fish habitat within the Subject Lands.

Should in-water work be required at the culvert/creek crossings, a permit will be required from the GRCA. Given the fish community and thermal regime within Ellis Creek, the MNRF in-water work timing window guidelines would restrict in-water work in order to protect local fish communities during spawning migrations, and other critical life stages. Based on the presence

of Brook Trout within Ellis Creek any and all in-water works would be restricted between October 1 and May 31.

In addition to in-water works timing restrictions, the Water Quality for the Protection of Aquatic Life places restrictions on turbidity increases as a result of projects in and around water (CCME 2008). Given the sensitivity of the fish community known from within Ellis Creek the Canadian Council of Ministers of the Environment (CCME) recommends that turbidity should not increase more than 8 NTUs above background levels over short-term exposure (<24 hr) and 2 NTUs above background over long-term exposure (30 days). Any thermal addition should be such that the maximum weekly average temperature is not exceeded (CCME 2008).

Section 35 of the federal *Fisheries Act* protects fish that are considered to be part of, or that support, Commercial, Recreational, and/or Aboriginal (CRA) fisheries (Government of Canada 1985). It also protects the habitat on which they rely. Any proposed work, undertaking, or activity should aim to avoid causing *serious harm* to CRA and supporting fish as well as their habitat. Under the Act, *serious harm* is defined as “the death of fish or the permanent alteration to, or destruction of, fish habitat,” with fish habitat defined as “spawning grounds and any other areas, including nursery, rearing, food supply and migration areas, on which fish depend directly or indirectly in order to carry out their life processes”.

Any proposed works in the vicinity of Ellis Creek have the potential to cause *serious harm*. A proponent-led Department of Fisheries and Oceans (DFO) self-assessment must be completed for the proposed road improvements. If there is potential that the proposed work to County Road 124 will cause *serious harm*, the project will need to be submitted to DFO for a site-specific review. If *serious harm* cannot be avoided, a *Fisheries Act* Authorization will be required. Works occurring below the high-water mark of the creek, and particularly within the creek, have a higher probability of requiring a DFO review and potential *Fisheries Act* Authorization.

## **2.5 Significant Wildlife Habitat**

The comprehensive background review was used to identify candidate SWH types within the Subject Lands. The 2018 field program was scoped to include specific surveys to investigate the potential for these significant habitats within the Subject Lands. Based on our findings, a number of candidate SWH types were ruled out such as Amphibian Breeding Habitat (wetland).

The following SWH types were identified as possible within the Subject Lands and are further discussed below:

- Seasonal Concentration Areas – Snake Hibernaculum

Although only 1 snake was observed by NRSI biologists during site visits in 2018, it is often difficult to identify snake hibernaculum sites because hibernation takes places below ground and features are not easily identifiable. It is possible that features reaching below the frost line, such as rock piles and old foundations are present around the old house/barn foundation east of Wellington Road 32 (south), and therefore this should be considered *Candidate SWH* and should be investigated further if changes are to be made in this area.

- Habitat for Species of Conservation Concern – Special Concern and Rare Wildlife Species.

Two SCC, Eastern Wood-pewee (Special Concern) and Monarch (Special Concern), were confirmed within the Subject Lands during field surveys in 2018 (Map 2). According to the MNRF guidelines, for SCC habitat to qualify as SWH, it needs to be easily mapped and cover an important life stage component for the species (e.g. specific nesting habitat, foraging habitat, etc.) (MNRF 2015). Given these criteria, neither species is considered to have SWH in the Subject Lands.

## **2.6 Habitat of Endangered and Threatened Species**

### **2.6.1 Barn Swallow**

As discussed in the Existing Conditions section, Barn Swallow, were observed within the Subject Lands. Barn Swallow is listed as Threatened federally and provincially (MNRF 2018b, Government of Canada 2018). Federally, Barn Swallows and their nests are protected from harm by the *Migratory Birds Convention Act* (Government of Canada 1994). Given its status in Ontario, Barn Swallow and its habitat are protected under the *Endangered Species Act (ESA)*, 2007 (Government of Ontario 2007). The General Habitat Description for the Barn Swallow (MNRF 2015a) provides information on the area of habitat protected by the ESA, and comprises 3 categories:

- Category 1 - Barn Swallow nests.

- Category 2 - The area within 5 m of a Barn Swallow nest.
- Category 3 - The area between 5 and 200 m of the nest.

Barn Swallows were observed entering and exiting a barn south of County Road 124 and therefore were likely nesting in this structure just south of the Subject Lands. Although the barn is within 200 m of the road right-of-way, there is no suitable habitat within the Subject Lands for this species.

### **2.6.2 Species at Risk Bat Habitat**

A SAR bat habitat assessment identified 15 potentially suitable bat cavity trees within the Subject Lands (Map 2). Confirming use by SAR bats is extremely labourintensive and costly (consisting of 10 nights of bat acoustic monitoring, with acoustic data analysis). Therefore, if any of these trees are to be removed for the County Road 124 improvements, the tree removals should be completed outside the peak roosting period for bats (April 30th to September 30th).

### **2.6.3 Migratory Birds Convention Act**

The removal of vegetation (trees, shrubs, grasses, etc.) or work on road structures has the potential to disrupt nesting birds. The Migratory Birds Convention Act (MBCA, Government of Canada 1994) prohibits the destruction of nests, birds and activities that would cause an adult bird to abandon a nest. Construction activities such as vegetation and tree removal are to occur outside of the core nesting period for migratory birds as established by the Canadian Wildlife Service (CWS 2012). This period extends from approximately April 1 through August 31.

If vegetation removal or structure work must occur within the peak nesting season and is limited to a simple habitat, nest surveys may be conducted by a qualified biologist just prior to the activity (less than 48 hours prior to) to ensure that nesting birds are not present. Trees, shrubs, grassy vegetation, culverts, bridges and other structures should be inspected for active nests. Should an active nest be identified, a protective buffer will be established around the location and there shall be no activity until sign-off is obtained from the qualified biologist that the nest is no longer active. Nest searches are valid for 48 hours. If work does not occur within this time frame, additional nest searches are to be conducted.

In the event a nest survey is conducted, a clearance letter is to be prepared by the qualified biologist that undertook the survey and submitted to the County for their files in the event a record of due diligence is requested by CWS.

## 2.7 Locally Significant Species

Eleven species, considered rare in Wellington County and the City of Guelph (Dougan & Associates 2009, City of Guelph 2012), were observed within the Subject Lands. Two Black Maple trees were documented in the north portion of the Subject Lands on private property during the tree inventory (Map 2). The crowns of these trees hang over the County Road 124 right of way. In addition, 10 locally significant bird species were observed throughout the Subject Lands (for locations, see Map 2).

## 2.8 Protection of Natural Features

Buffers are typically required to protect natural heritage features such as woodlands, wetlands, SWH, and watercourses from impacts during development projects. Relevant buffers within the Subject Lands include:

- 30 m buffers from the Ellis Creek and Speed River PSWs
- 15 m buffers from all non-significant wetlands
- 30m buffers from the top banks of coldwater watercourses (Ellis Creek)
- 15m buffers from the top banks of warmwater watercourses (Tributary A)

These buffers are shown on Map 2. Given the nature of the road improvement projects in close proximity to natural features, it is understood that buffers may not be possible. Other mitigation measures, such as minimizing encroachments wherever possible, installing protective fencing and silt fencing around natural heritage features, abiding by key timing windows, and conducting natural feature monitoring during construction activities (e.g. water turbidity and temperature monitoring) will be employed to mitigate impacts to natural heritage features within the Subject Lands.

### 3.0 Summary

NRSI's detailed background review and original field surveys identified environmental constraints which may be impacted by the proposed County Road 124 improvements. A summary of the constraints identified within the Subject Lands and the implications for the proposed road improvements is provided in Table 3, below.

**Table 3. Summary of Environmental Constraints and their Implications**

<b>Constraint</b>	<b>Implications</b>
Watercourses	One coldwater watercourse, Ellis Creek, and one warmwater watercourse, Tributary A, both regulated by the GRCA, are present within the Subject Lands. Typically, 30 m buffers are required from the highwater mark for coldwater watercourses, and 15 m buffers are required for warmwater watercourses.
Provincially Significant Wetlands (PSW)	The Ellis Creek PSW and the Speed River PSW are adjacent to the Subject Lands. Both PSW wetland complexes and their adjacent lands are regulated under the GRCA's <i>Regulation of Development, Interface with Wetlands and Alterations to Shorelines and Watercourses</i> , Ontario Regulation 150/06 (2015). Typically 30 m buffers or other mitigation and protection measures are required from wetlands to protect them from road improvement impacts.
Wetlands	There are 6 GRCA-regulated, non-significant wetlands within the Subject Lands. Typically 15 m buffers or other mitigation and protection measures are required from wetlands to protect them from road improvement impacts.
Fish Habitat	Ellis Creek provides direct habitat for a small number of fish species, including the coldwater indicator species, Brook Trout. Should in-water work be required at the culvert / creek crossings, a permit will be required from the GRCA. A proponent-led DFO self-assessment must be completed. If there is potential for serious harm to be caused, the project will need to be submitted to DFO for a site-specific review, and if serious harm cannot be avoided, a Fisheries Act Authorization will be required. Based on the presence of Brook Trout, work in Ellis Creek would be restricted between October 1 and May 31. In addition, restrictions on turbidity and water temperature changes during in-water works would have to be followed and these parameters would have to be closely monitored.
Significant Wildlife Habitat	Candidate SWH - Snake Hibernaculum potential habitat at old house/barn foundation east of County Road 32 South.
Habitat for Endangered and Threatened Species – Barn Swallow	One SAR species, the Threatened Barn Swallow, was observed within the Subject Lands, however there is no suitable habitat for this species within the Subject Lands.
Habitat for Endangered and	A total of 15 potentially suitable bat cavity trees were identified within the Subject Lands. If any of these trees need to be removed for the proposed

Constraint	Implications
Threatened Species – Bats	road improvements, removals should be completed outside the peak roosting period for bats (April 30th to September 30th).
Locally Significant Species	Eleven locally significant species (1 plant and 10 birds) were observed within the Subject Lands. The locally significant plant species, Black Maple, is located on private lands, and will likely not be impacted by the proposed road work. To avoid impacts to the locally significant birds, as well as all other bird species protected under the <i>Migratory Birds Convention Act</i> (Government of Canada 1994), vegetation removal should either occur outside the peak breeding bird period (before April 30th or after August 15th) (Government of Canada 2017), or bird nest surveys should be completed within 48 hours prior to vegetation clearing. Culverts should be inspected for bird nesting prior to any construction or alteration work.

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## 5.0 References

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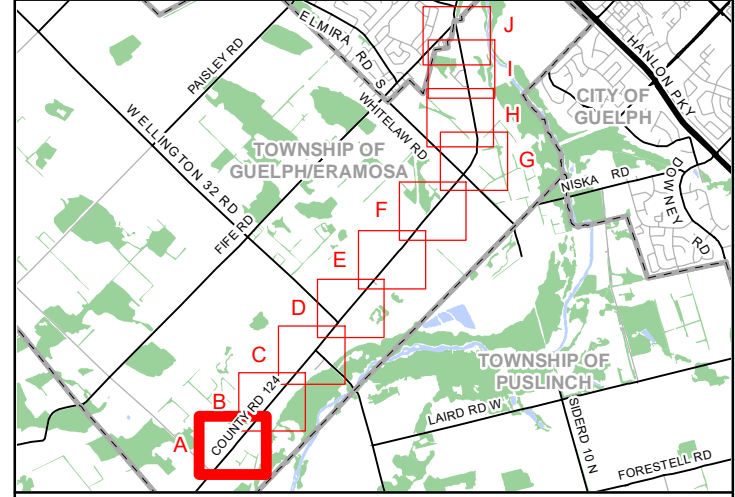
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June 1, 2018 by C.D. Jones.

DRAFT

**MAPS**

# County Road 124 Class B EA Vegetation Communities and Monitoring Station Locations

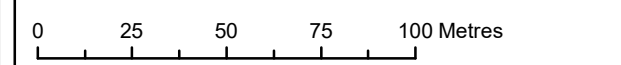


- Legend**
- Study Area
  - Railway
  - Utility Line
  - Permanent Watercourse
- Monitoring Stations**
- Aquatic Habitat Point (AHP)
  - Anuran Monitoring Station (ANR)
  - Breeding Bird Monitoring (BMB)
  - Ecological Land Classifications (ELC)
- (CUM1-1) Dry - Moist Old Field Meadow Type  
 (CUP3) Coniferous Plantations  
 (CUW1) Mineral Cultural Woodland Ecosite  
 (MAS2-1) Cattail Mineral Shallow Marsh Type  
 (SWD2) Ash Mineral Deciduous Swamp Ecosite  
 (SWD3) Maple Mineral Deciduous Swamp Ecosite  
 (SWD4-1) Willow Mineral Deciduous Swamp Type

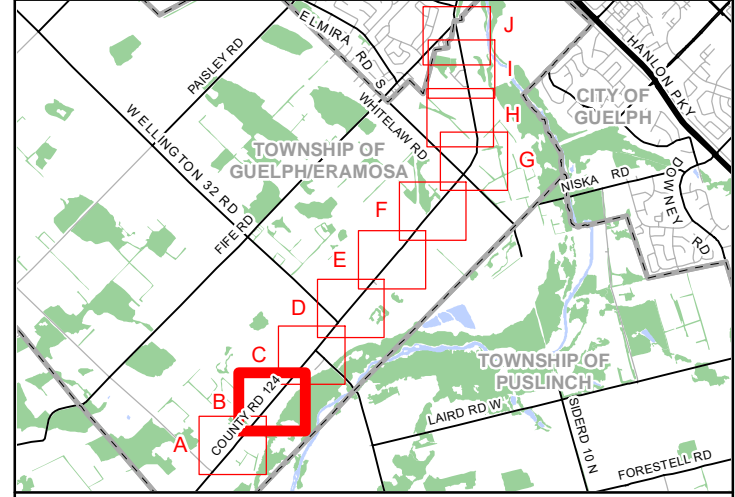


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# County Road 124 Class B EA Vegetation Communities and Monitoring Station Locations



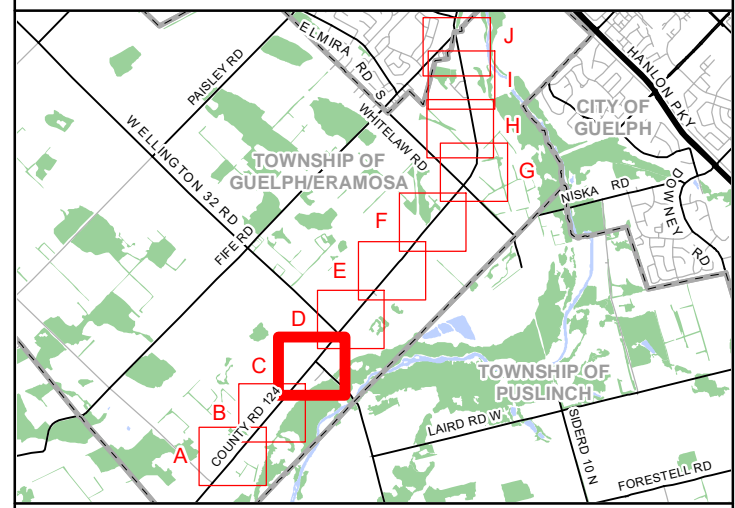
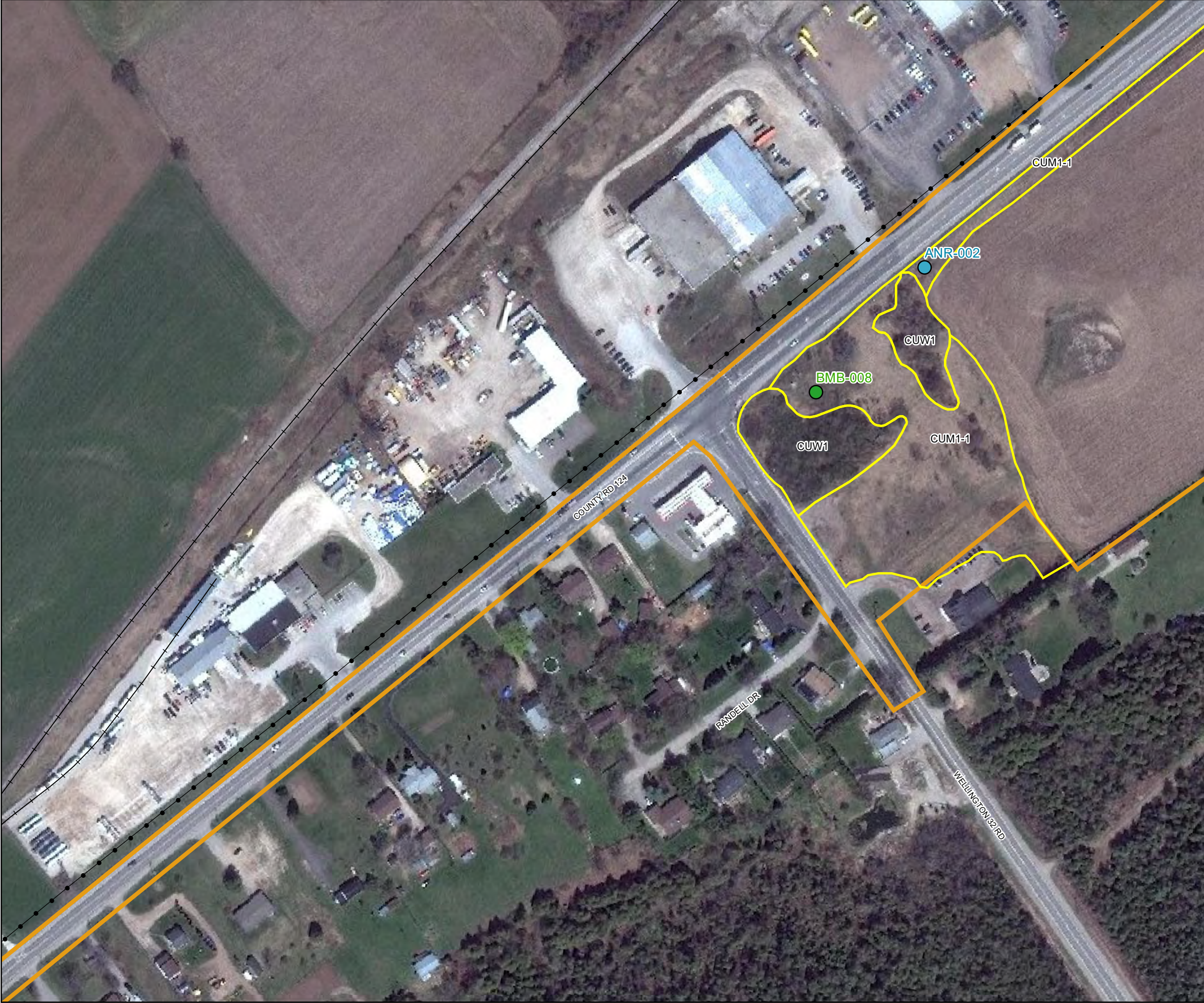
- Legend**
- Study Area
  - Railway
  - Utility Line
  - Permanent Watercourse
- Monitoring Stations**
- Aquatic Habitat Point (AHP)
  - Anuran Monitoring Station (ANR)
  - Breeding Bird Monitoring (BMB)
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Project: 2085 Date: August 1, 2018	NAD83 - UTM Zone 17 Size: 11x17" 1:2,000
0    25    50    75    100 Metres	

# County Road 124 Class B EA Vegetation Communities and Monitoring Station Locations

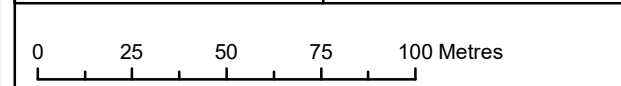


- Legend**
- Study Area
  - Railway
  - Utility Line
- Monitoring Stations**
- Anuran Monitoring Station (ANR)
  - Breeding Bird Monitoring (BMB)
  - Ecological Land Classifications (ELC)
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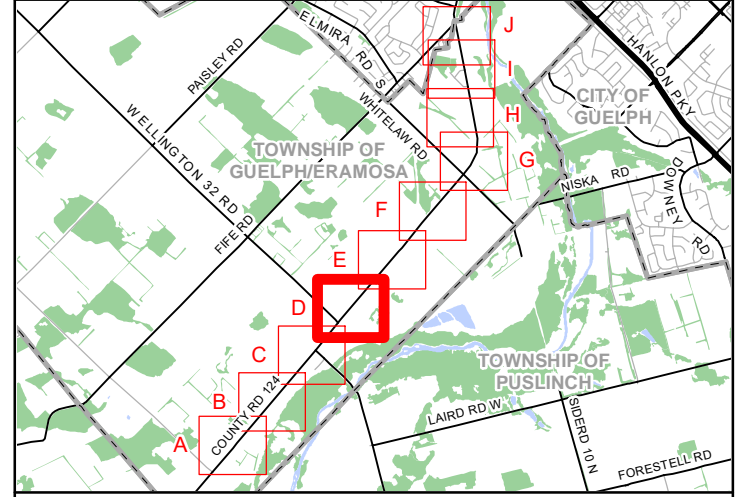


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Project: 2085 Date: August 1, 2018	NAD83 - UTM Zone 17 Size: 11x17" 1:2,000
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# County Road 124 Class B EA Vegetation Communities and Monitoring Station Locations

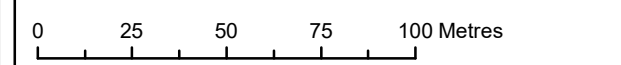


- Legend**
- Study Area
  - Railway
  - Utility Line
- Monitoring Stations**
- Breeding Bird Monitoring (BMB)
  - Ecological Land Classifications (ELC)
    - (CUM1-1) Dry - Moist Old Field Meadow Type
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    - (SWD4-1) Willow Mineral Deciduous Swamp Type

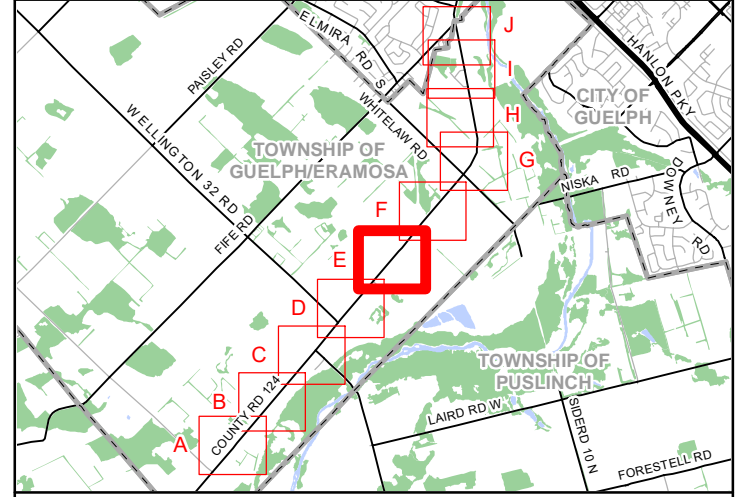
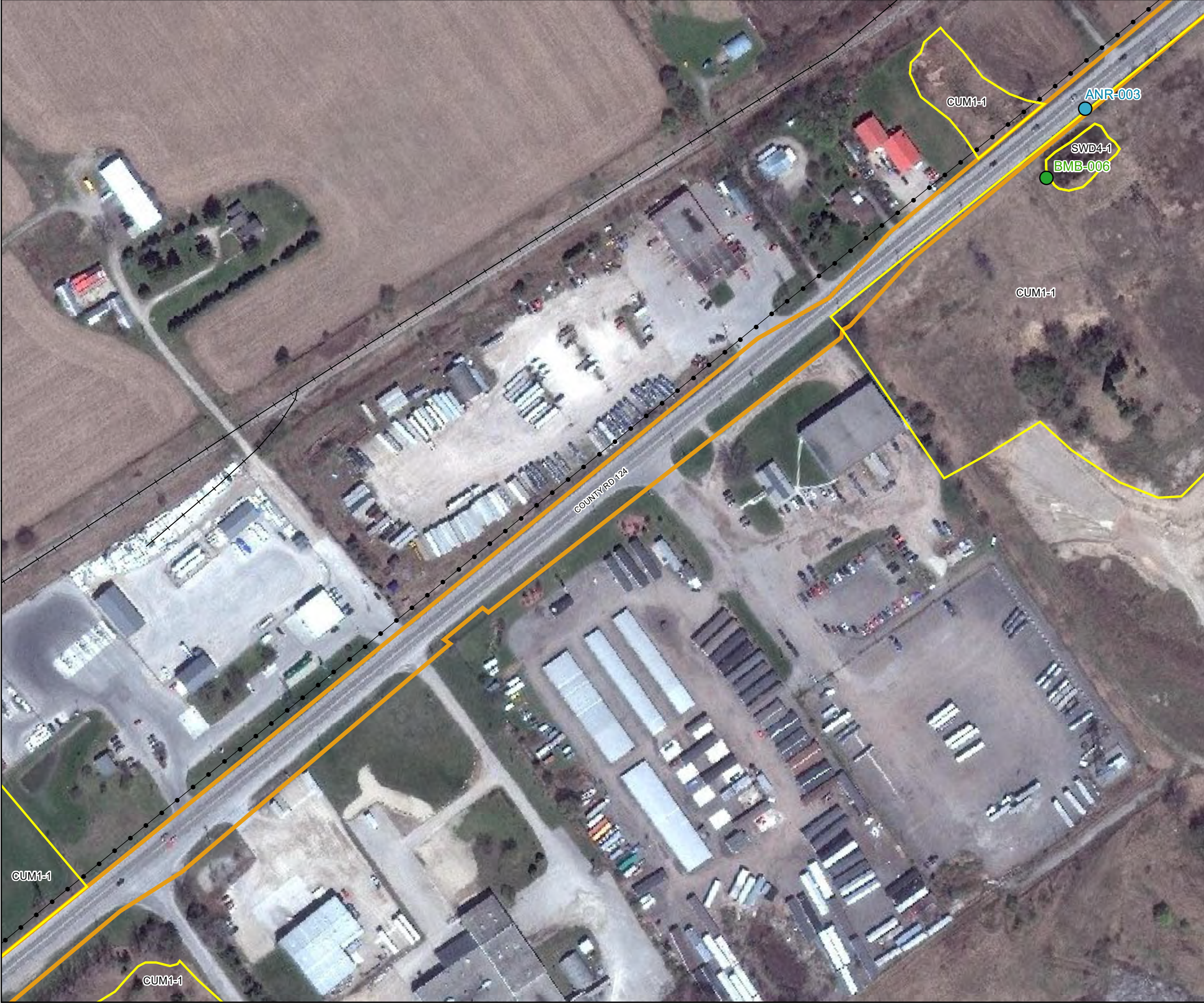


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# County Road 124 Class B EA Vegetation Communities and Monitoring Station Locations

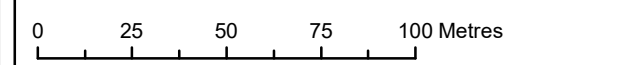


- Legend**
- Study Area
  - Railway
  - Utility Line
- Monitoring Stations**
- Anuran Monitoring Station (ANR)
  - Breeding Bird Monitoring (BMB)
- Ecological Land Classifications (ELC)**
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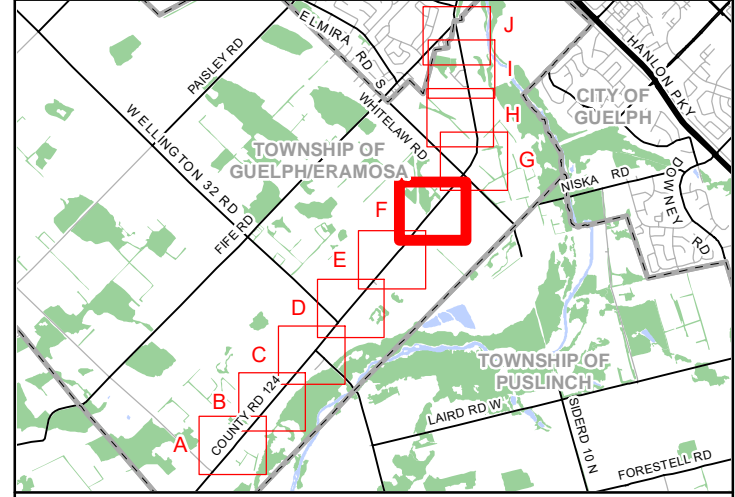
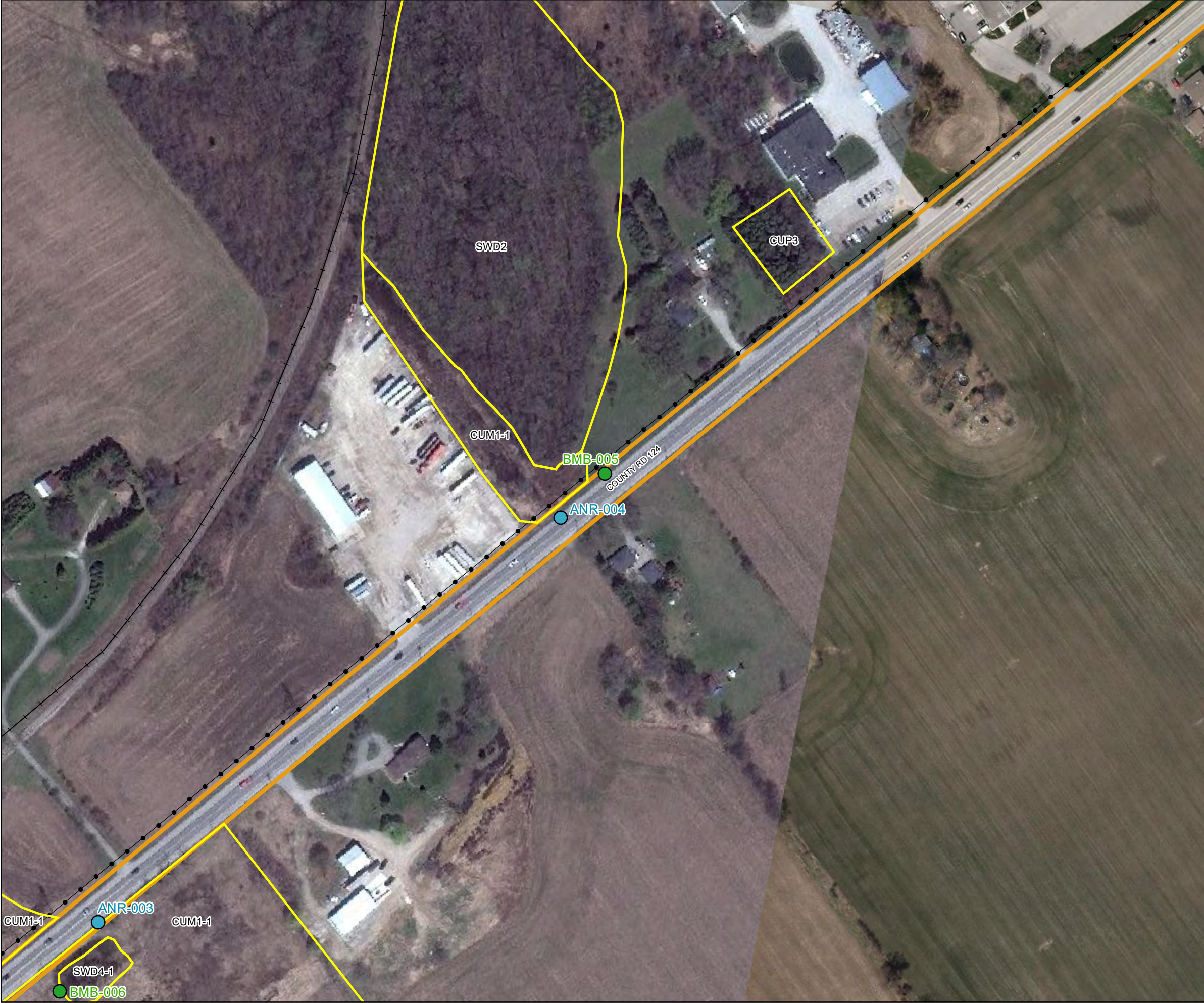


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# County Road 124 Class B EA Vegetation Communities and Monitoring Station Locations

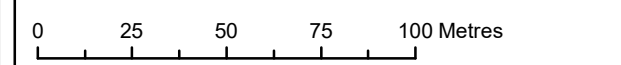


- Legend**
- Study Area
  - Railway
  - Utility Line
- Monitoring Stations**
- Anuran Monitoring Station (ANR)
  - Breeding Bird Monitoring (BMB)
- Ecological Land Classifications (ELC)**
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  - (SWD3) Maple Mineral Deciduous Swamp Ecosite
  - (SWD4-1) Willow Mineral Deciduous Swamp Type

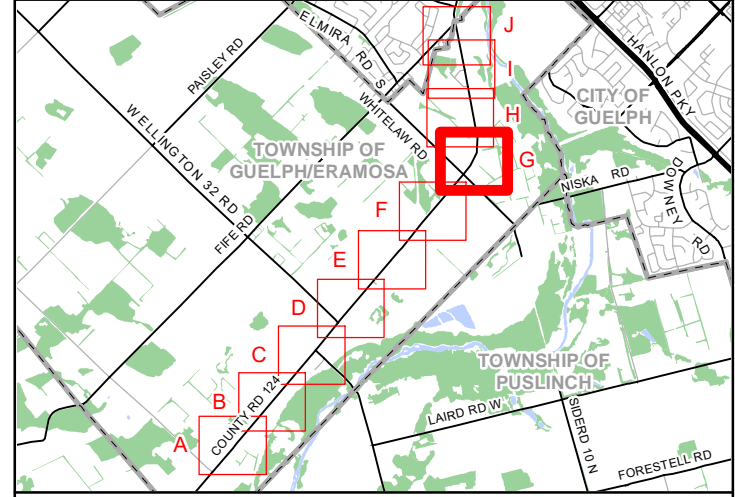


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Project: 2085 Date: August 1, 2018	NAD83 - UTM Zone 17 Size: 11x17" 1:2,000
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# County Road 124 Class B EA Vegetation Communities and Monitoring Station Locations

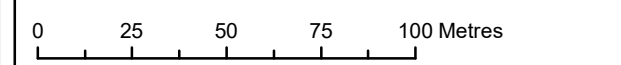


- Legend**
- Study Area
  - Utility Line
  - Permanent Watercourse
- Monitoring Stations**
- Aquatic Habitat Point (AHP)
  - Anuran Monitoring Station (ANR)
  - Breeding Bird Monitoring (BMB)
- Ecological Land Classifications (ELC)**
- (CUM1-1) Dry - Moist Old Field Meadow Type
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Project: 2085 Date: August 1, 2018	NAD83 - UTM Zone 17 Size: 11x17" 1:2,000
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Map 1 H

## County Road 124 Class B EA Vegetation Communities and Monitoring Station Locations

**Legend**

- Study Area
- Utility Line
- Breeding Bird Monitoring (BMB)
- Ecological Land Classifications (ELC)

**Monitoring Stations**

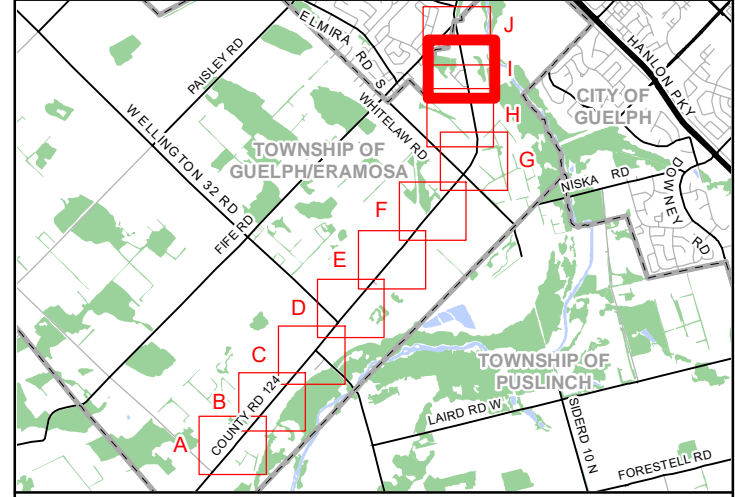
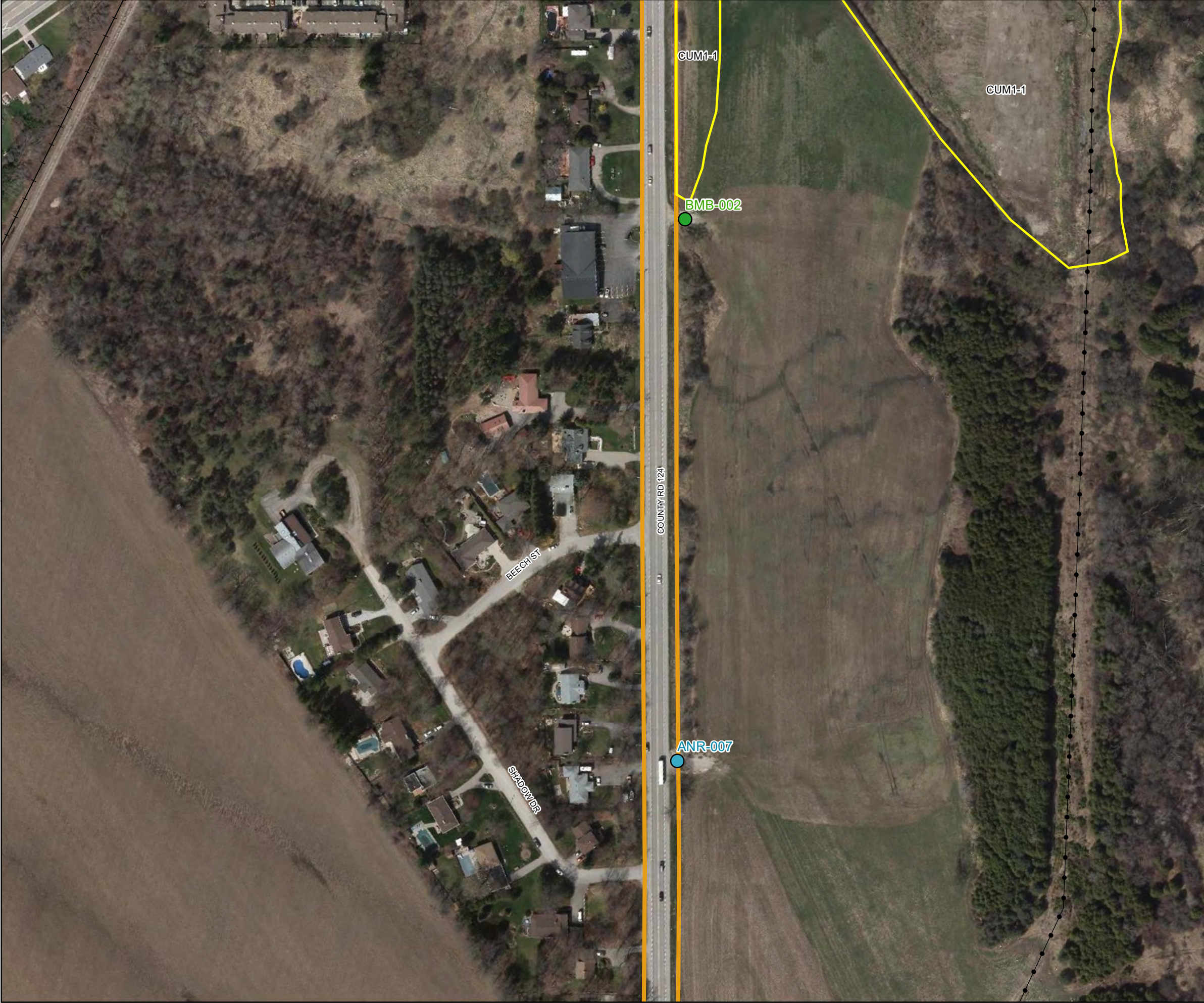
- (CUM1-1) Dry - Moist Old Field Meadow Type
- (CUP3) Coniferous Plantations
- (CUW1) Mineral Cultural Woodland Ecosite
- (MAS2-1) Cattail Mineral Shallow Marsh Type
- (SWD2) Ash Mineral Deciduous Swamp Ecosite
- (SWD3) Maple Mineral Deciduous Swamp Ecosite
- (SWD4-1) Willow Mineral Deciduous Swamp Type

**NATURAL RESOURCE SOLUTIONS INC.**  
Aquatic, Terrestrial and Wetland Biologists

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Project: 2085 Date: August 1, 2018	NAD83 - UTM Zone 17 Size: 11x17" 1:2,000
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# County Road 124 Class B EA Vegetation Communities and Monitoring Station Locations

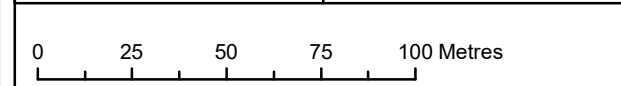


- Legend**
- Study Area
  - Railway
  - Utility Line
- Monitoring Stations**
- Anuran Monitoring Station (ANR)
  - Breeding Bird Monitoring (BMB)
- Ecological Land Classifications (ELC)**
- (CUM1-1) Dry - Moist Old Field Meadow Type
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  - (SWD4-1) Willow Mineral Deciduous Swamp Type

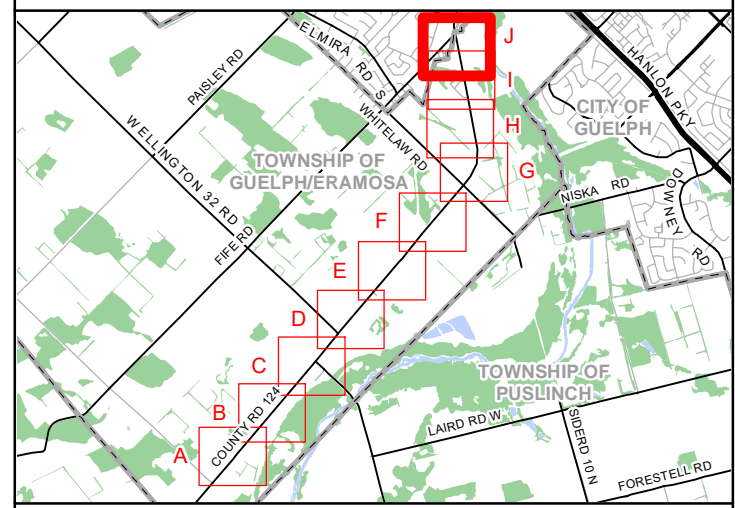
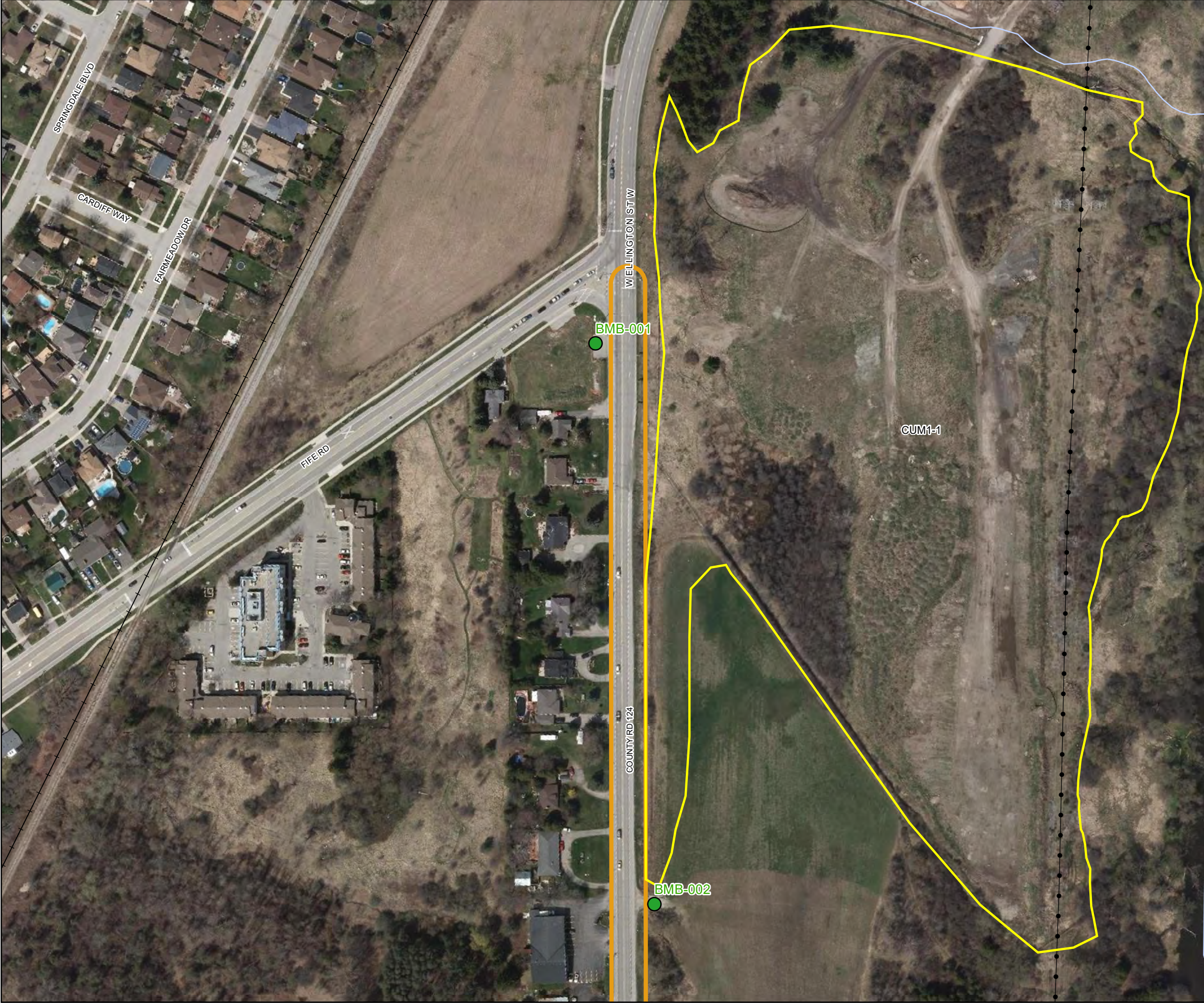


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# County Road 124 Class B EA Vegetation Communities and Monitoring Station Locations

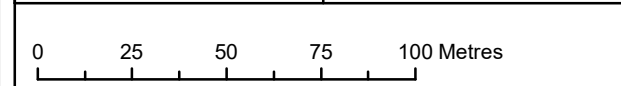


- Legend**
- Study Area
  - Railway
  - Utility Line
  - Permanent Watercourse
- Monitoring Stations**
- Breeding Bird Monitoring (BMB)
  - Ecological Land Classifications (ELC)
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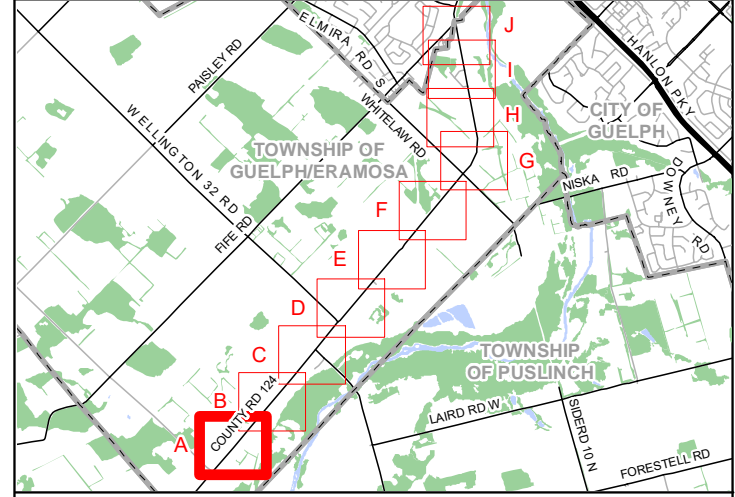


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Project: 2085 Date: August 1, 2018	NAD83 - UTM Zone 17 Size: 11x17" 1:2,000
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# County Road 124 Class B EA Environmental Constraints

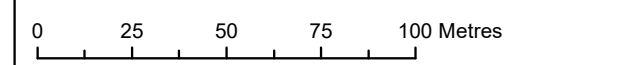


- Legend**
- Study Area
  - Railway
  - Utility Line
  - Permanent Watercourse
  - Fish Habitat
  - Watercourse Buffer (30m)
  - Provincially Significant Wetland (PSW)
  - Wetland (PSW) Buffer (30m)
  - Wooded Area
  - Greenlands System**
  - Core Greenlands
  - SAR Habitat**
  - Potentially Suitable Bat Cavity
- Species Observations**
- SAR
  - 1, Barn Swallow (*Hirundo rustica*) (THR)
  - SCC
  - 3, Monarch (*Danaus plexippus*) (SC)

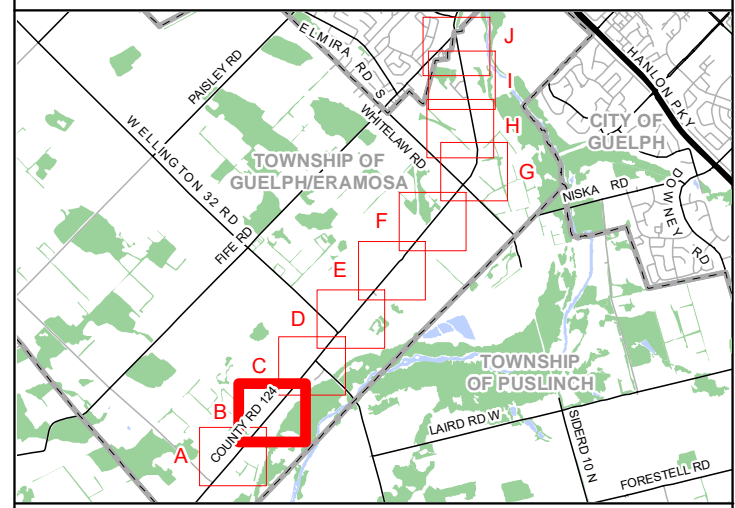


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Project: 2085 Date: August 17, 2018	NAD83 - UTM Zone 17 Size: 11x17" 1:2,000
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# County Road 124 Class B EA Environmental Constraints



**Legend**

- Study Area
- Railway
- Utility Line
- Permanent Watercourse
- Fish Habitat
- Watercourse Buffer (30m)
- Provincially Significant Wetland (PSW)
- Wetland (PSW) Buffer (30m)
- Wooded Area

**Greenlands System**

- Core Greenlands

**SAR Habitat**

- Potentially Suitable Bat Cavity

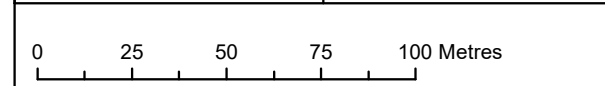
**Species Observations**

- SAR
- 1, Barn Swallow (*Hirundo rustica*) (THR)
- SCC
- 3, Monarch (*Danaus plexippus*) (SC)

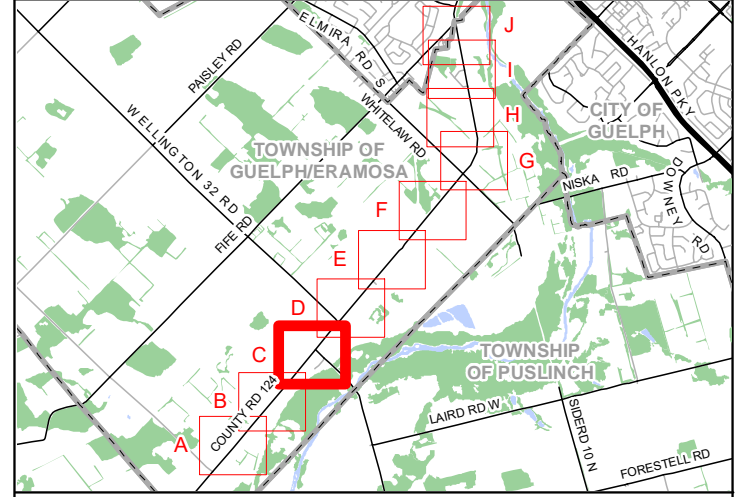


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# County Road 124 Class B EA Environmental Constraints

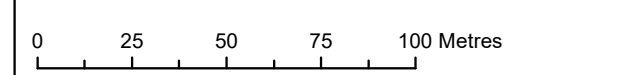


- Legend**
- Study Area
  - Railway
  - Utility Line
  - Provincially Significant Wetland (PSW)
  - Wetland (PSW) Buffer (30m)
  - Wooded Area
  - Greenlands System**
    - Core Greenlands
    - Greenlands
  - Candidate SWH**
    - Snake Hibernaculum
  - Species Observations**
    - SCC
    - 3, Monarch (*Danaus plexippus*) (SC)



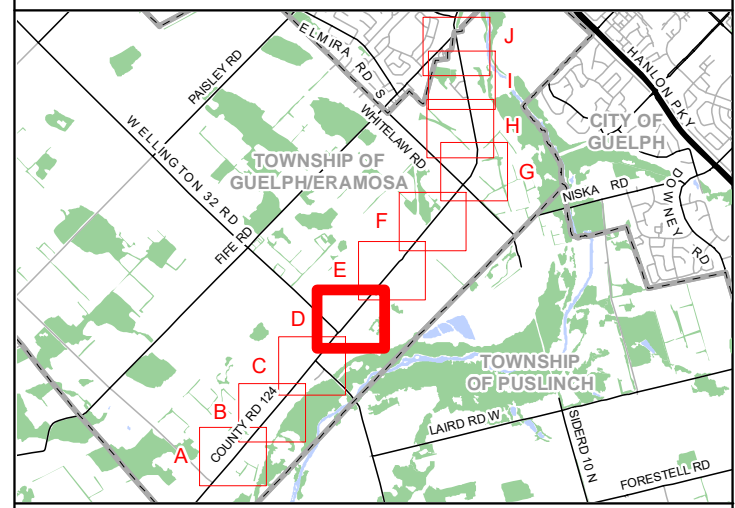
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# County Road 124 Class B EA Environmental Constraints

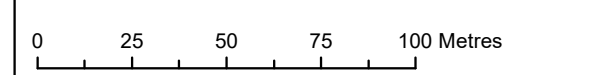


- Legend**
- Study Area
  - Railway
  - Utility Line
  - NRSI Surveyed Wetland Boundary
  - Wetland (Non-PSW) Buffer (15m)
  - Wooded Area
- Species Observations**
- SAR
  - 1, Barn Swallow (*Hirundo rustica*) (THR)
  - SCC
  - 3, Monarch (*Danaus plexippus*) (SC)
  - Locally Significant Species
  - 7, Savannah Sparrow (*Passerculus sandwichensis*)
  - 9, Willow Flycatcher (*Empidonax traillii*)



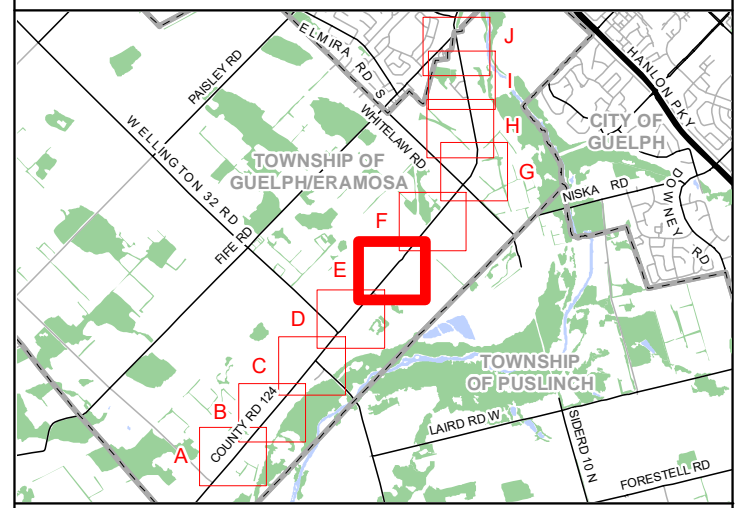
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# County Road 124 Class B EA Environmental Constraints

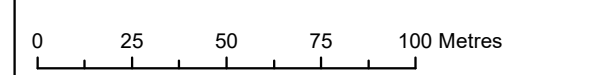


- Legend**
- Study Area
  - Railway
  - Utility Line
  - Potentially Suitable Bat Cavity
  - Locally Significant Species
- Species Observations**
- 4, Baltimore Oriole (*Icterus galbula*)
  - 7, Savannah Sparrow (*Passerculus sandwichensis*)
- SAR Habitat**

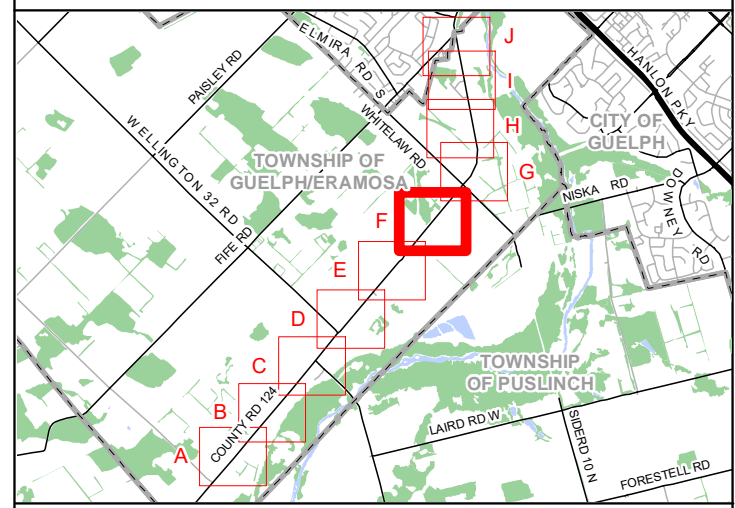


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Project: 2085 Date: August 17, 2018	NAD83 - UTM Zone 17 Size: 11x17" 1:2,000
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# County Road 124 Class B EA Environmental Constraints

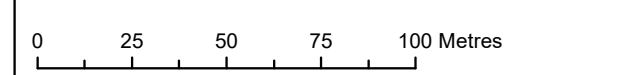


- Legend**
- Study Area
  - Railway
  - Utility Line
  - Other Wetland (Non-PSW)
  - Wetland (Non-PSW) Buffer (15m)
  - Wooded Area
  - Core Greenlands
  - SAR Habitat
  - Potentially Suitable Bat Cavity
- Species Observations**
- Locally Significant Species
  - 4, Baltimore Oriole (*Icterus galbula*)
  - 7, Savannah Sparrow (*Passerculus sandwichensis*)

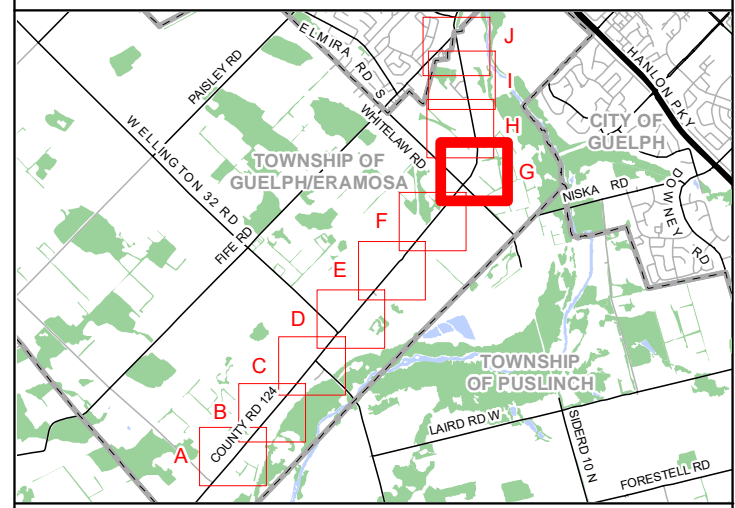


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Project: 2085 Date: August 17, 2018	NAD83 - UTM Zone 17 Size: 11x17" 1:2,000
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# County Road 124 Class B EA Environmental Constraints



**Legend**

- Study Area
- Utility Line
- Permanent Watercourse
- Watercourse Buffer (15m)
- Wooded Area
- Greenlands System**
- Core Greenlands
- Candidate SWH**
- Habitat for SCC - Eastern Wood-Pewee
- SAR Habitat**
- Potentially Suitable Bat Cavity

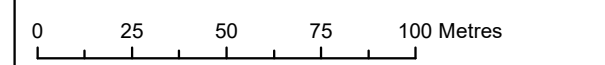
**Species Observations**

- SCC  
2, Eastern Wood-Pewee (*Contopus virens*) (SC)
- Locally Significant Species  
4, Baltimore Oriole (*Icterus galbula*)  
6, Eastern Wood-Pewee (*Contopus virens*)  
7, Savannah Sparrow (*Passerculus sandwichensis*)

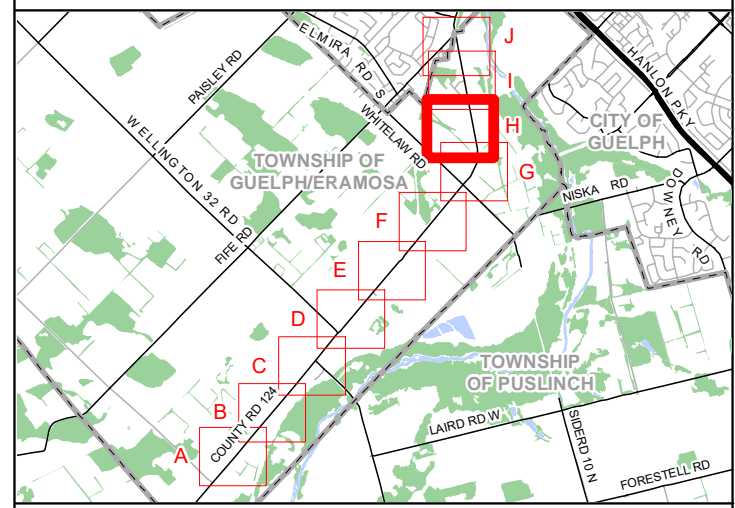


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Project: 2085 Date: August 17, 2018	NAD83 - UTM Zone 17 Size: 11x17" 1:2,000
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# County Road 124 Class B EA Environmental Constraints

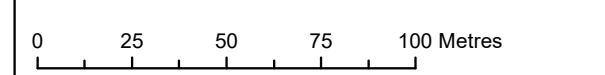


- Legend**
- Study Area
  - Utility Line
  - Wooded Area
  - Core Greenlands
  - SAR Habitat
  - Potentially Suitable Bat Cavity
- Species Observations**
- Locally Significant Species
  - 5, Eastern Kingbird (*Tyrannus tyrannus*)
  - 8, Vesper Sparrow (*Poocetes gramineus*)



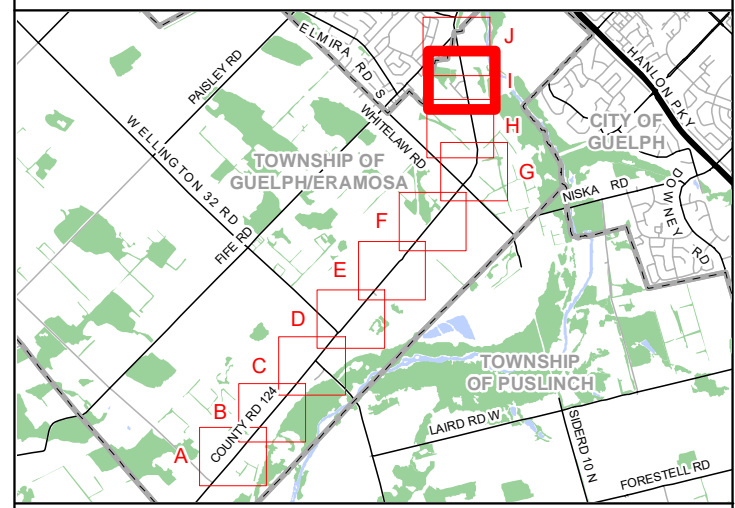
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Project: 2085 Date: August 17, 2018	NAD83 - UTM Zone 17 Size: 11x17" 1:2,000
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# County Road 124 Class B EA Environmental Constraints



**Legend**

- Study Area
- Railway
- Utility Line
- Provincially Significant Wetland (PSW)
- Wetland (PSW) Buffer (30m)
- Wooded Area
- Core Greenlands
- Greenlands
- SAR Habitat
- Potentially Suitable Bat Cavity

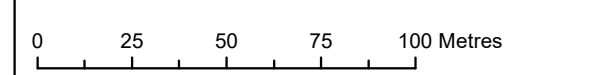
**Species Observations**

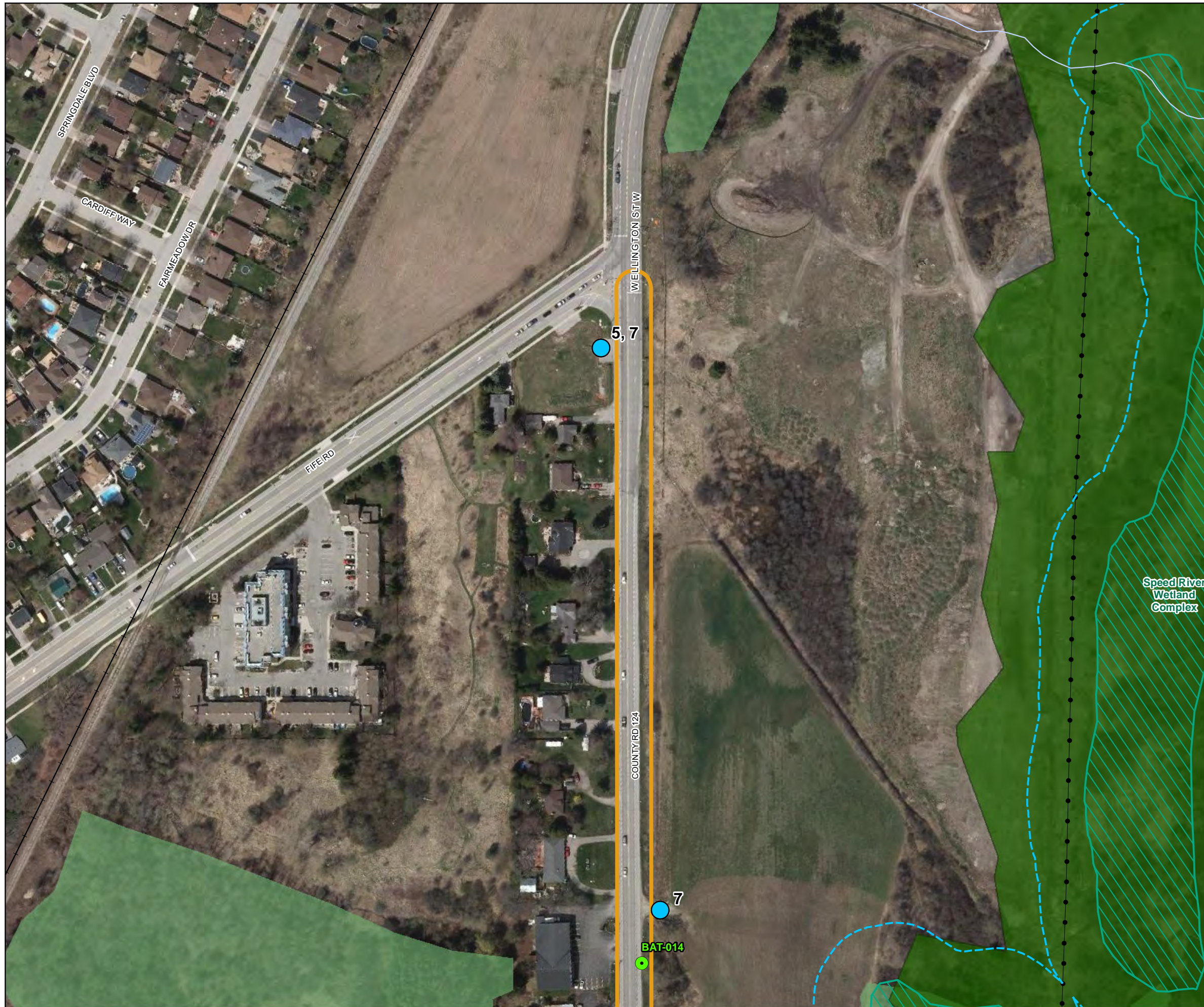
- Locally Significant Species
- 7, Savannah Sparrow (*Passerculus sandwichensis*)
- 10, Black Maple (*Acer saccharum ssp. nigrum*)



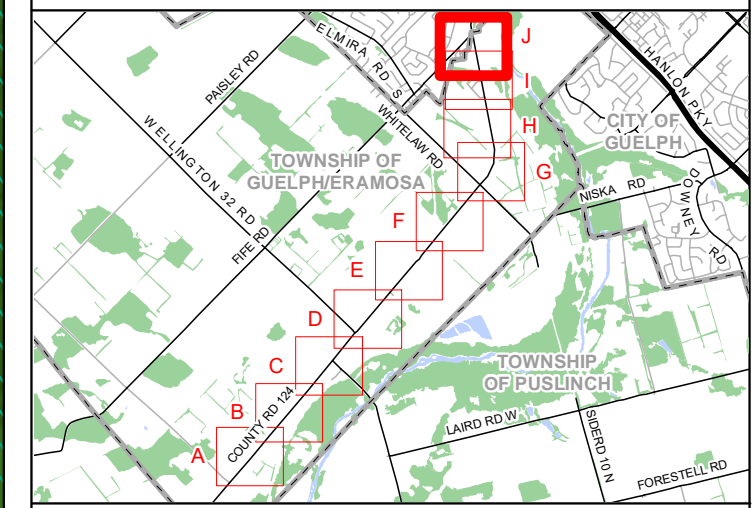
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Project: 2085 Date: August 17, 2018	NAD83 - UTM Zone 17 Size: 11x17" 1:2,000
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# County Road 124 Class B EA Environmental Constraints

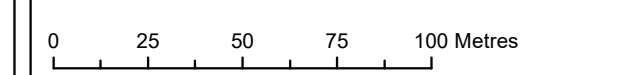


- Legend**
- Study Area
  - Railway
  - Utility Line
  - Permanent Watercourse
  - Provincially Significant Wetland (PSW)
  - Wetland (PSW) Buffer (30m)
  - Wooded Area
- Greenlands System**
- Core Greenlands
- SAR Habitat**
- Potentially Suitable Bat Cavity
- Species Observations**
- Locally Significant Species
  - 5, Eastern Kingbird (*Tyrannus tyrannus*)
  - 7, Savannah Sparrow (*Passerculus sandwichensis*)



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Project: 2085 Date: August 17, 2018	NAD83 - UTM Zone 17 Size: 11x17" 1:2,000
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**APPENDIX I**  
Plant Species Observed in the Study Area

## Appendix II

Project Name/Location: County Road 124

Appendix Title: Vascular Plant Species Reported From the Study Area

Scientific Name	Common Name	SRANK <sup>1</sup>	SARO <sup>2</sup>	COSEWIC <sup>3</sup>	SARA Schedule <sup>3</sup>	Wellington County <sup>4</sup>	City of Guelph <sup>6</sup>	NHIC Data <sup>5</sup>	NRSI Observed							
									All Areas	SWD2	SWD3	SWD4-1	MAS2-1	CUM1-1	CUW1	CUP3
<i>Onoclea sensibilis</i>	Sensitive Fern	S5							X	X						
<i>Equisetum arvense</i>	Field Horsetail	S5							X			X	X			
<i>Thuja occidentalis</i>	White Cedar	S5							X							X
<i>Picea abies</i>	Norway Spruce	SE3							X							X
<i>Picea glauca</i>	White Spruce	S5							X		X					X
<i>Pinus strobus</i>	Eastern White Pine	S5							X							X
<i>Pinus sylvestris</i>	Scots Pine	SE5							X					X		X
<i>Acer negundo</i>	Manitoba Maple	S5							X						X	
<i>Acer platanoides</i>	Norway Maple	SE5							X							
<i>Acer saccharinum</i>	Silver Maple	S5							X		X					
<i>Acer saccharum ssp. saccharum</i>	Sugar Maple	S5							X							X
<i>Acer saccharum ssp. nigrum</i>	Black Maple	S4?				R-A	SG		X							
<i>Rhus hirta</i>	Staghorn Sumac	S5							X					X		X
<i>Daucus carota</i>	Wild Carrot	SE5							X					X		X
<i>Asclepias syriaca</i>	Common Milkweed	S5							X					X		
<i>Ambrosia artemisiifolia</i>	Common Ragweed	S5							X					X		
<i>Arctium minus ssp. minus</i>	Common Burdock	SE5							X							X
<i>Cichorium intybus</i>	Chicory	SE5							X					X		
<i>Cirsium arvense</i>	Canada Thistle	SE5							X					X		
<i>Erigeron annuus</i>	Daisy Fleabane	S5							X					X		
<i>Eupatorium perfoliatum</i>	Perfoliate Thoroughwort	S5							X				X			
<i>Eupatorium maculatum ssp. maculatum</i>	Spotted Joe-pye-weed	S5							X	X						
<i>Euthamia graminifolia</i>	Flat-topped Bushy Goldenrod	S5							X							
<i>Leucanthemum vulgare</i>	Ox-eye Daisy	SE5							X		X			X		X
<i>Solidago canadensis</i>	Canada Goldenrod	S5							X		X			X		X
<i>Taraxacum officinale</i>	Common Dandelion	SE5							X						X	
<i>Tragopogon pratensis ssp. pratensis</i>	Meadow Goat's-beard	SE5							X					X		
<i>Tussilago farfara</i>	Coltsfoot	SE5							X			X		X		
<i>Impatiens capensis</i>	Spotted Touch-me-not	S5							X	X						
<i>Betula papyrifera</i>	White Birch	S5							X							
<i>Hesperis matronalis</i>	Dame's Rocket	SE5							X		X					X
<i>Lonicera tatarica</i>	Tartarian Honeysuckle	SE5							X						X	
<i>Viburnum trilobum</i>	High Bush Cranberry	S5							X						X	
<i>Silene latifolia</i>	Bladder Campion	SE5							X					X		
<i>Cornus foemina ssp. racemosa</i>	Red Panicked Dogwood	S5							X	X						
<i>Cornus stolonifera</i>	Red-osier Dogwood	S5							X	X	X					
<i>Euphorbia esula</i>	Leafy Spurge	SE5							X					X		
<i>Lotus corniculatus</i>	Bird's-foot Trefoil	SE5							X		X			X		
<i>Robinia pseudo-acacia</i>	Black Locust	SE5							X							X
<i>Vicia cracca</i>	Tufted Vetch	SE5							X			X	X	X		
<i>Fagus grandifolia</i>	American Beech	S5							X							
<i>Quercus macrocarpa</i>	Bur Oak	S5							X							
<i>Quercus rubra</i>	Red Oak	S5							X							
<i>Juglans cinerea</i>	Butternut	S2?	END	E	Schedule 1	R	SG		X		X					
<i>Juglans nigra</i>	Black Walnut	S4							X		X					
<i>Leonurus cardiaca ssp. cardiaca</i>	Common Motherwort	SE5							X							X
<i>Prunella vulgaris ssp. vulgaris</i>	Common Heal-all	SE3							X					X		
<i>Fraxinus americana</i>	White Ash	S5							X		X				X	
<i>Fraxinus nigra</i>	Black Ash	S5							X	X						
<i>Fraxinus pennsylvanica</i>	Green Ash	S5							X	X	X	X				
<i>Syringa vulgaris</i>	Common Lilac	SE5							X		X			X		X
<i>Rumex crispus</i>	Curly-leaf Dock	SE5							X					X		
<i>Anemone canadensis</i>	Canada Anemone	S5							X	X						
<i>Thalictrum pubescens</i>	Tall Meadow-rue	S5							X	X						
<i>Rhamnus cathartica</i>	European Buckthorn	SE5							X	X				X	X	X
<i>Agrimonia gryposepala</i>	Tall Hairy Agrimony	S5							X				X			
<i>Crataegus punctata</i>	Large-fruited Thorn	S5							X						X	
<i>Malus pumila</i>	Common Crabapple	SE5							X							
<i>Rubus occidentalis</i>	Black Raspberry	S5							X							X
<i>Populus alba</i>	Silver Poplar	SE5							X					X		
<i>Populus balsamifera ssp. balsamifera</i>	Balsam Poplar	S5							X			X				

Appendix II

Project Name/Location: County Road 124

Appendix Title: Vascular Plant Species Reported From the Study Area

Scientific Name	Common Name	SRANK <sup>1</sup>	SARO <sup>2</sup>	COSEWIC <sup>3</sup>	SARA Schedule <sup>3</sup>	Wellington County <sup>4</sup>	City of Guelph <sup>6</sup>	NHIC Data <sup>5</sup>	NRSI Observed								
									All Areas	SWD2	SWD3	SWD4-1	MAS2-1	CUM1-1	CUW1	CUP3	
<i>Populus tremuloides</i>	Trembling Aspen	S5							X	X		X					
<i>Salix alba var. alba</i>	White Willow	SE4							X			X	X				
<i>Salix amygdaloides</i>	Peach-leaved Willow	S5							X				X				
<i>Salix eriocephala</i>	Heart-leaved Willow	S5							X			X					
<i>Salix fragilis</i>	Crack Willow	SE5							X			X				X	
<i>Salix purpurea</i>	Basket Willow	SE4							X				X				
<i>Linaria vulgaris</i>	Butter-and-eggs	SE5							X				X				
<i>Verbascum thapsus</i>	Common Mullein	SE5							X					X			
<i>Solanum dulcamara</i>	Bitter Nightshade	SE5							X				X				
<i>Tilia americana</i>	American Basswood	S5							X		X					X	
<i>Ulmus americana</i>	White Elm	S5							X	X						X	
<i>Ulmus rubra</i>	Slippery Elm	S5							X								
<i>Vitis riparia</i>	Riverbank Grape	S5							X					X	X		
<i>Scirpus atrovirens</i>	Dark-green Bulrush	S5							X				X				
<i>Hemerocallis fulva</i>	Orange Day-lily	SE5							X								X
<i>Cypripedium calceolus var. pubescens</i>	Large Yellow Lady's Slipper	S5							X	X							
<i>Phalaris arundinacea</i>	Reed Canary Grass	S5							X		X	X					
<i>Typha angustifolia</i>	Narrow-leaved Cattail	S5							X		X						
<i>Typha latifolia</i>	Broad-leaved Cattail	S5							X				X				
<b>Total</b>						<b>2</b>	<b>2</b>	<b>0</b>	<b>80</b>	<b>13</b>	<b>14</b>	<b>15</b>	<b>11</b>	<b>23</b>	<b>15</b>	<b>19</b>	

<sup>1</sup>MNRF 2015a; <sup>2</sup>MNRF 2017; <sup>3</sup>Government of Canada 2017; <sup>4</sup>Dougan & Associates 2009; <sup>5</sup>City of Guelph 2012; <sup>6</sup>MNRF 2014

LEGEND	
<b>SRANK</b>	
S1	Critically Imperiled
S2	Imperiled
S3	Vulnerable
S4	Apparently Secure
S5	Secure
SU	Unrankable
SNA	Unranked
SX	Presumed Extirpated
SH	Possibly Extirpated (Historical)
S#?	Rank Uncertain
<b>COSSARO</b>	
END	Endangered
THR	Threatened
SC	Special Concern
NAR	Not at Risk
DD	Data Deficient
EXP	Extirpated
<b>COSEWIC</b>	
E	Endangered
T	Threatened
SC	Special Concern
NAR	Not at Risk
DD	Data Deficient
XT	Extirpated
<b>SARA Schedule</b>	
Schedule 1 Officially Protected under SARA	
Schedule 2 Threatened/endangered; may be reassessed for consideration for inclusion to Schedule 1	
Schedule 3 Special concern; may be reassessed for consideration for inclusion to Schedule 1	

**APPENDIX II**  
Fish and Wildlife Species Reported From the Study Area

Appendix III

Project Name/Location: County Road 124

Appendix Title: Bird Species Reported From the Study Area

Scientific Name	Common Name	SRANK <sup>1</sup>	SARO <sup>2</sup>	COSEWIC <sup>3</sup>	SARA Schedule <sup>3</sup>	Wellington County Status <sup>4</sup>	City of Guelph Status <sup>5</sup>	MNR SAR for Wellington County <sup>7</sup>	OBBA <sup>8</sup>	NHIC Data <sup>9</sup>	NRSI Observed			
											All Observations	Breeding Bird Survey 1	Breeding Bird Survey 2	Incidentals
<i>Branta canadensis</i>	Canada Goose	S5							CO		CO	OB	CO	
<i>Anas platyrhynchos</i>	Mallard	S5							CO		CO	PR	CO	
<i>Columba livia</i>	Rock Pigeon	SNA							CO		PO		OB	
<i>Zenaidura macroura</i>	Mourning Dove	S5							CO		PR	PO	PR	
<i>Charadrius vociferus</i>	Killdeer	S5B, S5N							CO		PR	PO	PO	
<i>Ardea herodias</i>	Great Blue Heron	S4B				**	X		CO		OB		OB	
<i>Butorides virescens</i>	Green Heron	S4B				**	X		PR		OB		OB	
<i>Cathartes aura</i>	Turkey Vulture	S5B				√			PR		OB	OB		
<i>Picoides pubescens</i>	Downy Woodpecker	S5							CO		CO		CO	
<i>Contopus virens</i>	Eastern Wood-Pewee	S4B	SC	SC		√	X		PR	X	PO		PO	
<i>Empidonax alnorum</i>	Alder Flycatcher	S5B							PO		PO	PO		
<i>Empidonax traillii</i>	Willow Flycatcher	S5B				√	X		PR		PO		PO	
<i>Sayornis phoebe</i>	Eastern Phoebe	S5B							CO		PR	PO	PO	
<i>Myiarchus crinitus</i>	Great Crested Flycatcher	S4B							CO		PO		PO	
<i>Tyrannus tyrannus</i>	Eastern Kingbird	S4B				√*	X		CO		CO	PO	PO	CO
<i>Vireo gilvus</i>	Warbling Vireo	S5B							CO		PR	PO	PO	
<i>Vireo olivaceus</i>	Red-eyed Vireo	S5B							CO		PR	PO	PO	
<i>Cyanocitta cristata</i>	Blue Jay	S5							CO		PR	PR	PO	
<i>Corvus brachyrhynchos</i>	American Crow	S5B							CO		PR	PO	PO	
<i>Tachycineta bicolor</i>	Tree Swallow	S4B							CO		PO	PO		
<i>Stelgidopteryx serripennis</i>	Northern Rough-winged Swallow	S4B							CO		PO		OB	
<i>Hirundo rustica</i>	Barn Swallow	S4B	THR	T				X	CO	X	PR		PR	
<i>Poecile atricapillus</i>	Black-capped Chickadee	S5							CO		PR	PO	PO	
<i>Sitta carolinensis</i>	White-breasted Nuthatch	S5							CO		PO	OB		
<i>Troglodytes aedon</i>	House Wren	S5B							CO		PR	PO	PO	
<i>Turdus migratorius</i>	American Robin	S5B							CO		CO	PR	CO	X
<i>Dumetella carolinensis</i>	Gray Catbird	S4B							CO		PR	PO	PO	
<i>Sturnus vulgaris</i>	European Starling	SNA							CO		CO	PO	CO	
<i>Bombus cederorum</i>	Cedar Waxwing	S5B							CO		PR	PO	PO	
<i>Passer domesticus</i>	House Sparrow	SNA							CO		PR	PO	PO	
<i>Spinus tristis</i>	American Goldfinch	S5B							CO		PR	PR	PR	
<i>Geothlypis trichas</i>	Common Yellowthroat	S5B							CO		PR	PO	PO	
<i>Setophaga petechia</i>	Yellow Warbler	S5B							CO		PR	PO	PO	
<i>Spizella passerina</i>	Chipping Sparrow	S5B							CO		PO	PO		
<i>Poocetes gramineus</i>	Vesper Sparrow	S4B				√*	X		PR		PO	PO		
<i>Passerculus sandwichensis</i>	Savannah Sparrow	S4B				√*	X		CO		PR	PO	PO	
<i>Melospiza melodia</i>	Song Sparrow	S5B							CO		PR	PO	PO	
<i>Cardinalis cardinalis</i>	Northern Cardinal	S5							CO		PR	PO	PO	X
<i>Passerina cyanea</i>	Indigo Bunting	S4B							CO		PR	PO	PO	
<i>Agelaius phoeniceus</i>	Red-winged Blackbird	S4							CO		CO	PR	PR	CO
<i>Quiscalus quiscula</i>	Common Grackle	S5B							CO		PR	PO	PR	
<i>Molothrus ater</i>	Brown-headed Cowbird	S4B							CO		PR	PR	PR	
<i>Icterus galbula</i>	Baltimore Oriole	S4B				√*	X		CO		CO	PO	CO	
<b>Total</b>									<b>43</b>	<b>2</b>	<b>43</b>	<b>34</b>	<b>37</b>	<b>4</b>

1MNR 2015a; 2MNR 2017; 3Government of Canada 2018; 4Dougan & Associates 2009; 5City of Guelph 2012; 6MNR 2016; 7 MNR 2018; 8BSC et al. 2008; 9MNR 2014

**Appendix VI**

**Project Name/Location: County Road 124**

**Appendix Title: Butterfly Species Reported From the Study Area**

Scientific Name	Common Name	SRANK <sup>1</sup>	SARO <sup>2</sup>	COSEWIC <sup>3</sup>	SARA Schedule <sup>3</sup>	Wellington County Status <sup>4</sup>	City of Guelph Status <sup>5</sup>	TEA Atlas <sup>6</sup>	NHIC Data <sup>7</sup>	NRSI Observed
<i>Battus philenor</i>	Pipevine Swallowtail	SNA						X		
<i>Papilio cresphontes</i>	Giant Swallowtail	S4				X		X		
<i>Papilio glaucus</i>	Eastern Tiger Swallowtail	S5						X		
<i>Papilio polyxenes</i>	Black Swallowtail	S5						X		
<i>Pieris rapae</i>	Cabbage White	SNA						X		
<i>Lycaena hyllus</i>	Bronze Copper	S5						X		
<i>Aglais milberti</i>	Milbert's Tortoiseshell	S5						X		
<i>Coenonympha tullia</i>	Common Ringlet	S5						X		
<i>Danaus plexippus</i>	Monarch	S2N, S4B	SC	SC	Schedule 1	X*		X		X
<i>Euptoieta claudia</i>	Variiegated Fritillary	SNA						X		
<i>Junonia coenia</i>	Common Buckeye	SNA						X		
<i>Limnitis archippus</i>	Viceroy	S5						X		
<i>Limnitis arthemis astyanax</i>	Red-spotted Purple	S5						X		
<i>Nymphalis antiopa</i>	Mourning Cloak	S5						X		
<i>Polygonia comma</i>	Eastern Comma	S5						X		
<i>Polygonia comma</i>	Eastern Comma/Hop Merchant	S5						X		
<i>Vanessa atalanta</i>	Red Admiral	S5						X		
<i>Vanessa cardui</i>	Painted Lady	S5						X		
<b>Total</b>						<b>22</b>	<b>6</b>	<b>18</b>	<b>0</b>	<b>1</b>

<sup>1</sup>MNRF 2015a; <sup>2</sup>MNRF 2017; <sup>3</sup>Government of Canada 2017; <sup>4</sup>Dougan & Associates 2009; <sup>5</sup>City of Guelph 2012; <sup>6</sup>MacNaughton et al. 2017; <sup>7</sup>MNRF 2014

**Appendix VIII**

**Project Name/Location: County Road 124**

**Appendix Title: Fish Species Reported from the Study Area**

Scientific Name	Common Name	SRANK <sup>1</sup>	SARO <sup>2</sup>	COSEWIC <sup>3</sup>	SARA Schedule <sup>4</sup>	NHIC Data <sup>#</sup>	NRSI Observed	Ellis Creek	Tributary A
<i>Rhinichthys atratulus</i>	Blacknose Dace	SNR					X	X	
<i>Semotilus atromaculatus</i>	Creek Chub	S5					X	X	
<i>Salvelinus fontinalis</i>	Brook (Speckled) Trout	S5					X	X	
<b>Total</b>							<b>3</b>	<b>3</b>	<b>0</b>

<sup>1</sup>MNRF 2014; <sup>2</sup>MNRF 2016; <sup>3</sup>COSEWIC 2016; <sup>4</sup>Government of Canada 2016; #Hamilton Conservation Authority 2014

Legend	
<b>SRANK</b>	
S1	Critically Imperiled
S2	Imperiled
S3	Vulnerable
S4	Apparently Secure
S5	Secure
SU	Unrankable
SNA	Unranked
SX	Presumed Extirpated
SH	Possibly Extirpated (Historical)
S#?	Rank Uncertain

Appendix IV

Project Name/Location: County Road 124

Appendix Title: Reptile and Amphibian Species Reported From the Study Area

Scientific Name	Common Name	SRANK <sup>1</sup>	SARO <sup>2</sup>	COSEWIC <sup>3</sup>	SARA Schedule <sup>3</sup>	Wellington County Status <sup>4</sup>	City of Guelph Status <sup>5</sup>	MNRF SAR for Wellington County <sup>6</sup>	Ontario Reptile and Amphibian Atlas <sup>7</sup>	NHIC Data <sup>8</sup>	NRSI Observed
<i>Chelydra serpentina serpentina</i>	Snapping Turtle	S3	SC	SC	Schedule 1	R		X	X		
<i>Chrysemys picta marginata</i>	Midland Painted Turtle	S5				X			X		
<i>Lampropeltis taylori triangulum</i>	Eastern Milksnake	S4	NAR	SC		R			X		
<i>Storeria dekayi dekayi</i>	Northern Brownsnake	S5	NAR	NAR		R	X		X		
<i>Storeria occipitomaculata occipitomaculata</i>	Northern Red-bellied Snake	S5				R	X		X		
<i>Thamnophis sauritus septentrionalis</i>	Eastern Ribbonsnake	S3	SC	SC	Schedule 1	R		X	X	X	
<i>Thamnophis sirtalis sirtalis</i>	Eastern Gartersnake	S5				X			X		X
<i>Ambystoma hybrid</i> pop. 3	Salamander Complex	S2				R			X		
<i>Ambystoma laterale</i>	Blue-spotted Salamander	S4				R	X		X		
<i>Notophthalmus viridescens viridescens</i>	Red-spotted Newt	S5				R	X		X		
<i>Plethodon cinereus</i>	Eastern Red-backed Salamander	S5				X			X		
<i>Anaxyrus americanus</i>	American Toad	S5				X			X		X
<i>Hyla versicolor</i>	Tetraploid Gray Treefrog	S5				X			X		X
<i>Pseudacris triseriata</i> pop. 2	Western Chorus Frog ( <i>Great Lakes/St. Lawrence - Canadian Shield Population</i> )	S3	NAR	T	Schedule 1	R			X		
<i>Pseudacris crucifer</i>	Spring Peeper	S5				X			X		X
<i>Lithobates catesbeiana</i>	American Bullfrog	S4				R	X		X		
<i>Lithobates clamitans melanota</i>	Northern Green Frog	S5				X			X		X
<i>Lithobates palustris</i>	Pickerel Frog	S4	NAR	NAR		R	X		X		
<i>Lithobates pipiens</i>	Northern Leopard Frog	S5	NAR	NAR		X			X		
<i>Lithobates sylvatica</i>	Wood Frog	S5				X			X		
<b>Total</b>									<b>20</b>	<b>1</b>	<b>5</b>

<sup>1</sup>MNRF 2015a; <sup>2</sup>MNRF 2017; <sup>3</sup>Government of Canada 2017; <sup>4</sup>Dougan & Associates 2009; <sup>5</sup>City of Guelph 2012; <sup>6</sup>MNRF 2018; <sup>7</sup>Ontario Nature 2013; <sup>8</sup>MNRF 2014

Appendix V

Project Name/Location: County Road 124

Appendix Title: Mammal Species Reported From the Study Area

Scientific Name	Common Name	SRANK <sup>1</sup>	SARO <sup>2</sup>	COSEWIC <sup>3</sup>	SARA Schedule <sup>3</sup>	Wellington County Status <sup>4</sup>	City of Guelph Status <sup>5</sup>	MNRF SAR for Wellington County <sup>6</sup>	Ontario Mammal Atlas <sup>7</sup>	NHIC Data <sup>8</sup>	NRSI Observed
<i>Didelphis virginiana</i>	Virginia Opossum	S4				X			X		
<i>Blarina brevicauda</i>	Northern Short-tailed Shrew	S5				X			X		
<i>Condylura cristata</i>	Star-nosed Mole	S5				X			X		
<i>Parascalops breweri</i>	Hairy-tailed Mole	S4				R	X		X		
<i>Sorex cinereus</i>	Masked Shrew	S5				X			X		
<i>Sorex fumeus</i>	Smoky Shrew	S5				X			X		
<i>Sorex palustris</i>	Water Shrew	S5				R	X		X		
<i>Eptesicus fuscus</i>	Big Brown Bat	S4				X			X		
<i>Lasionycteris noctivagans</i>	Silver-haired Bat	S4				X			X		
<i>Lasiurus borealis</i>	Eastern Red Bat	S4				X			X		
<i>Lasiurus cinereus</i>	Hoary Bat	S4				X			X		
<i>Myotis leibii</i>	Eastern Small-footed Myotis	S2S3	END			R		X	X		
<i>Myotis lucifugus</i>	Little Brown Myotis	S4	END	E	Schedule 1	X		X	X		
<i>Myotis septentrionalis</i>	Northern Myotis	S3	END	E	Schedule 1	R		X	X		
<i>Perimyotis subflavus</i>	Tri-colored Bat	S3?	END	E	Schedule 1	R		X	X		
<i>Lepus americanus</i>	Snowshoe Hare	S5				R	X		X		
<i>Lepus europaeus</i>	European Hare	SNA				X			X		
<i>Sylvilagus floridanus</i>	Eastern Cottontail	S5				X			X		X
<i>Castor canadensis</i>	Beaver	S5				X			X		
<i>Erethizon dorsatum</i>	Porcupine	S5				X			X		
<i>Glaucomys sabrinus</i>	Northern Flying Squirrel	S5				R	X		X		
<i>Glaucomys volans</i>	Southern Flying Squirrel	S4	NAR	NAR		R	X		X		
<i>Marmota monax</i>	Woodchuck	S5				X			X		
<i>Microtus pennsylvanicus</i>	Meadow Vole	S5				X			X		
<i>Microtus pinetorum</i>	Woodland Vole	S3?	SC	SC	Schedule 1	R			X		
<i>Mus musculus</i>	House Mouse	SNA				X			X		
<i>Napaeozapus insignis</i>	Woodland Jumping Mouse	S5				R	X		X		
<i>Ondatra zibethicus</i>	Muskrat	S5				X			X		
<i>Peromyscus leucopus</i>	White-footed Mouse	S5				X			X		
<i>Peromyscus maniculatus</i>	Deer Mouse	S5				X			X		
<i>Rattus norvegicus</i>	Norway Rat	SNA				X			X		
<i>Sciurus carolinensis</i>	Eastern Gray Squirrel	S5				X			X		X
<i>Synaptomys cooperi</i>	Southern Bog Lemming	S4				R	X		X		
<i>Tamiasciurus hudsonicus</i>	Red Squirrel	S5				X			X		
<i>Tamias striatus</i>	Eastern Chipmunk	S5				X			X		X
<i>Zapus hudsonius</i>	Meadow Jumping Mouse	S5				X			X		
<i>Canis latrans</i>	Coyote	S5				X			X		
<i>Mephitis mephitis</i>	Striped Skunk	S5				X			X		
<i>Mustela erminea</i>	Ermine	S5				X			X		

Scientific Name	Common Name	SRANK <sup>1</sup>	SARO <sup>2</sup>	COSEWIC <sup>3</sup>	SARA Schedule <sup>3</sup>	Wellington County Status <sup>4</sup>	City of Guelph Status <sup>5</sup>	MNRF SAR for Wellington County <sup>6</sup>	Ontario Mammal Atlas <sup>7</sup>	NHIC Data <sup>8</sup>	NRSI Observed
<i>Mustela frenata</i>	Long-tailed Weasel	S4				R	X		X		
<i>Mustela vison</i>	American Mink	S4				X			X		
<i>Procyon lotor</i>	Northern Raccoon	S5				X			X		
<i>Taxidea taxus taxus</i>	American Badger			SC					X		
<i>Vulpes vulpes</i>	Red Fox	S5				X			X		
<i>Odocoileus virginianus</i>	White-tailed Deer	S5				X			X		X
<b>Total</b>						<b>45</b>	<b>9</b>	<b>5</b>	<b>46</b>	<b>1</b>	<b>5</b>

<sup>1</sup>MNRF 2015a; <sup>2</sup>MNRF 2017; <sup>3</sup>Government of Canada 2017; <sup>4</sup>Dougan & Associates 2009; <sup>5</sup>City of Guelph 2012; <sup>6</sup>MNRF 2018; <sup>7</sup>Dobbyn 1994, <sup>8</sup>MNRF 2014

Legend
<b>SRANK</b>
S1 Critically Imperiled
S2 Imperiled
S3 Vulnerable
S4 Apparently Secure
S5 Secure
SU Unrankable
SNA Unranked
SX Presumed Extirpated
SH Possibly Extirpated (Historical)
S#? Rank Uncertain
<b>COSSARO</b>
NAR Not at Risk
SC Special Concern
THR Threatened
END Endangered
EXP Extirpated
DD Data Deficient
<b>COSEWIC</b>
NAR Not at Risk
SC Special Concern
T Threatened
E Endangered
XT Extirpated
DD Data Deficient
<b>SARA Schedule</b>
Schedule 1 Officially Protected under SARA
<b>Wellington County (Natural Heritage Strategy)</b>
X Present
R Rare
<b>City of Guelph Status</b>
X Locally Significant

Appendix VII

Project Name/Location: County Road 124

Appendix Title: Dragonfly and Damselfly Species Reported From the Study Area

Scientific Name	Common Name	SRANK <sup>1</sup>	SARO <sup>2</sup>	COSEWIC <sup>3</sup>	SARA Schedule <sup>4</sup>	Wellington County Status <sup>7</sup>	City of Guelph Status <sup>8</sup>	Odonate Atlas <sup>10</sup>	NRSI Observed
<i>Calopteryx aequabilis</i>	River Jewelwing	S5						X	
<i>Calopteryx maculata</i>	Ebony Jewelwing	S5						X	
<i>Hetaerina americana</i>	American Rubyspot	S4						X	
<i>Lestes disjunctus</i>	Common Spreadwing	S5						X	
<i>Lestes dryas</i>	Emerald Spreadwing	S5						X	
<i>Lestes eurinus</i>	Amber-winged Spreadwing	S3				PR		X	
<i>Lestes rectangularis</i>	Slender Spreadwing	S5						X	
<i>Lestes unguiculatus</i>	Lyre-tipped Spreadwing	S5						X	
<i>Argia fumipennis violacea</i>	Violet Dancer	S5						X	
<i>Argia moesta</i>	Powdered Dancer	S5						X	
<i>Enallagma antennatum</i>	Rainbow Bluet	S4						X	
<i>Enallagma boreale</i>	Boreal Bluet	S5						X	
<i>Enallagma carunculatum</i>	Tule Bluet	S5						X	
<i>Enallagma civile</i>	Familiar Bluet	S5						X	
<i>Enallagma ebrium</i>	Marsh Bluet	S5						X	
<i>Enallagma exsulans</i>	Stream Bluet	S5						X	
<i>Enallagma geminatum</i>	Skimming Bluet	S4				PR		X	
<i>Enallagma signatum</i>	Orange Bluet	S4						X	
<i>Ischnura verticalis</i>	Eastern Forktail	S5						X	
<i>Anax junius</i>	Common Green Darner	S5						X	
<i>Celithemis elisa</i>	Calico Pennant	S5						X	
<i>Erythemis simplicicollis</i>	Eastern Pondhawk	S5						X	
<i>Ladona julia</i>	Chalk-fronted Corporal	S5				X	X	X	
<i>Leucorrhinia intacta</i>	Dot-tailed Whiteface	S5						X	
<i>Leucorrhinia proxima</i>	Red-waisted (Belted) Whiteface	S5				X	X	X	
<i>Libellula luctuosa</i>	Widow Skimmer	S5						X	
<i>Libellula pulchella</i>	Twelve-spotted Skimmer	S5						X	
<i>Pachydiplax longipennis</i>	Blue Dasher	S5						X	
<i>Perithemis tenera</i>	Eastern Amberwing	S4				X	X	X	
<i>Plathemis lydia</i>	Common Whitetail	S5						X	
<i>Sympetrum obtrusum</i>	White-faced Meadowhawk	S5						X	
<i>Tramea lacerata</i>	Black Saddlebags	S4						X	

<b>Total</b>	<b>5</b>	<b>3</b>	<b>32</b>	<b>0</b>
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<sup>1</sup>MNRF 2014; <sup>2</sup>MNRF 2016; <sup>3</sup>COSEWIC 2016; <sup>4</sup>Government of Canada 2016; <sup>5</sup>Regional Municipality of Waterloo 1985; <sup>6</sup>Conservation Halton 2007; <sup>7</sup>Dougan & Associates 2009; <sup>8</sup>City of Guelph 2012; <sup>9</sup>Hamilton Conservation Authority 2014; <sup>10</sup>OMNR 2005

<b>LEGEND</b>	
<b>SRANK</b>	
S1	Critically Imperiled
S2	Imperiled
S3	Vulnerable
S4	Apparently Secure
S5	Secure
SU	Unrankable
SNA	Unranked
SX	Presumed Extirpated
SH	Possibly Extirpated (Historical)
S#?	Rank Uncertain
<b>Wellington County Status</b>	
X	Significant
<b>City of Guelph Status</b>	
X	Significant