

COUNTY OF SIMCOE

BARRIE TO COLLINGWOOD RAILWAY MULTI-USE TRAIL

NATURAL ENVIRONMENT PRELIMINARY DESIGN REPORT

OCTOBER 26, 2018

DRAFT





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1 INTRODUCTION

WSP Canada Group Limited (WSP) has been retained by the County of Simcoe to complete a Preliminary Design of the Barrie-Collingwood Railway Multi-Use Trail. This preliminary design involves the conversion of an approximately 23 km long portion of an abandoned railway corridor into a multi-use trail from Stayner to Angus. The proposed trail crosses Clearview and Essa Townships and connects through Stayner, Sunnidale, New Lowell, and Angus. The project limits are shown on Map 1. Detailed maps have been included in Appendix A.

WSP's Ecology Group completed the natural environment component of this work, encompassing preliminary characterization of the existing natural features; assessing potential impacts of the preferred alternative on natural environment features; developing preliminary mitigation measures to address those impacts; and developing and providing recommendations to be completed through to the subsequent Detailed Design stage. The natural environment component of this work included high-level field investigations to document vegetation communities, fish and wildlife habitat, and potential Species at Risk (SAR) or their habitat within the project limits.



Map 1: Project Limits

2 STUDY APPROACH

2.1 DESKTOP AND BACKGROUND DATA REVIEW

A variety of background information sources were reviewed and agencies were contacted to update the information database and prepare for field investigations. The primary sources of information are listed below:

- Topographic mapping and Land Information Ontario (LIO) database;
- Fisheries and Oceans Canada (DFO) Aquatic SAR mapping;
- Ministry of Natural Resources and Forestry (MNR) Natural Heritage Information Centre (NHIC) database and direct communication with the MNR Midhurst District office (Jodi Benvenuti, Management Ecologist, pers. comm. October 4, 2018) for significant species and designated natural features within, adjacent to, or in the vicinity of the project limits;
- Ontario Reptile and Amphibian Atlas (ORAA; Ontario Nature, no date), the Ontario Breeding Bird Atlas (OBBA; Bird Studies Canada, 2006), eBird.org data (Audubon and Cornell Lab of Ornithology, no date), and Atlas of the Mammals of Ontario (Dobbyn, 1994);
- County of Simcoe Official Plan (2016), Township of Essa Official Plan (2001), and the Township of Clearview Official Plan (2001);
- Aerial photography.

2.2 AGENCY CONSULTATION

The Midhurst District MNR was contacted on May 23, 2018 to obtain information concerning significant species and designated natural features within, or adjacent to the project limits. Communication with the MNR SAR Biologist confirmed no SAR records within the project limits, however the Ministry recommended a habitat inventory and SAR screening to identify SAR that have the potential to occur within the area (Jodi Benvenuti, Management Ecologist, pers. comm. October 4, 2018).

The Nottawasaga Valley Conservation Authority (NVCA) was contacted on May 23, 2018 to obtain available natural heritage information pertinent to the project limits such as regulated areas or features of significance (e.g. wetlands, woodlands). In response to the request for data / information, NVCA indicated that unevaluated wetlands are present adjacent to the rail corridor and that the rail bed may provide turtle nesting habitat in these areas. Additionally, NVCA indicated that Butternut trees (*Juglans cinerea*) and Bat Maternity Colony habitat are likely to be present within the project limits and the immediate vicinity.

All records of agency liaison can be found in Appendix B.

2.3 FIELD SURVEYS

Preliminary field surveys, which included Ecological Land Classification (ELC), a botanical inventory, incidental wildlife, visual aquatic habitat assessments and SAR habitat surveys were conducted on May 30 and 31, 2018.

Detailed descriptions of the field survey methodologies are provided under relevant subsections below.

3 POLICY ANALYSIS

Planning legislation and policies pertinent to the project area are summarized in the following sections. An overview of key policies and implications is provided along with an assessment of the policy as it relates to natural heritage features within the project limits.

3.1 FEDERAL

- **Fisheries Act (Fisheries and Oceans Canada, 1985)** – The focus of the *Fisheries Act* is to protect the productivity of recreational, commercial and Aboriginal fisheries by focusing protection on real and significant threats to the fisheries and the habitat that supports them. Section 35 (1) of the *Fisheries Act* states: “No person shall carry on any work, undertaking or activity that results in serious harm to fish that are part of a commercial, recreational or Aboriginal fishery, or to fish that support such a fishery.” The Act interprets ‘serious harm to fish’ as “the death of fish or any permanent alteration to, or destruction of, fish habitat”. Proponents that plan to undertake activities in or near water have potential to negatively affect fisheries, as such, are responsible for avoiding, mitigating, and offsetting ‘serious harm to fish’. Avoidance is achieved by undertaking measures which completely prevent serious harm to fish. These measures include project design considerations, location of activity, and timing of works. Mitigation is implemented by following best practices such as those described in the ‘measures to avoid harm to fish and fish habitat’. Any residual impacts are then required to be addressed by offsetting. An offsetting measure is one that counterbalances serious harm to fish resulting from a project, where serious harm remains after all feasible mitigation measures have been applied.
- **Migratory Birds Convention Act, MBCA (1994) and Migratory Birds Regulations, MBR (2014)** – This Act protects most species of migratory birds and their nests and eggs anywhere they are found in Canada, regardless of property ownership. General prohibitions under the MBCA and MBR protect migratory birds, their nests and eggs and prohibit the deposit of harmful substances in waters / areas frequented by them. The MBR includes an additional prohibition against incidental take, defined by Environmental Canada as “The inadvertent harming, killing, disturbance or destruction of migratory birds, nests and eggs.”

Environment Canada implements policies and guidelines to protect migratory birds, their eggs and their nests. There is guidance on the Environment Canada website to minimize the risk of incidental take effects to migratory birds, to achieve compliance with the law and to maintain sustainable populations of migratory birds. Compliance with the MBCA and MBR is best achieved through a due diligence approach, which identifies potential risk, based on a site-specific analysis in consideration of the Avoidance Guidelines and Best Management Practices information on the Environment Canada website.

Works with potential MBCA implications may occur during the construction phase of the project when vegetation is removed for project activities, potentially removing nests of migratory birds. Compliance with the MBCA will be achieved using the due diligence approach outlined in **Section 7.2.1**.

3.2 PROVINCIAL

- **Endangered Species Act (Ontario Ministry of Natural Resources and Forestry, 2007)** – SAR definitions are discussed in **Section 4.4** below. All species listed as SAR under the ESA (2007) have protection from being killed, harmed, or harassed. Species listed as Endangered or Threatened also have habitat protection either under the general habitat definition, or as regulated habitat under the ESA. To balance social and economic considerations with protection and recovery goals, the ESA also enables the MNRF to issue permits or enter into agreements with proponents in order to authorize activities that would otherwise be prohibited by subsections 9(1) or 10(1) of the Act, provided the legal requirements of the Act are met.

Seven species afforded protection under the ESA (2007) and their habitats have been confirmed within the project area, and an additional 14 species have potential to occur based on habitat conditions (see **Section 4.5** for details). Based on the nature of the project and the preferred alternative, it is not anticipated that permitting or registration will be required under the ESA (to be confirmed at Detailed Design).

- **Conservation Authorities Act (1990)** – The NVCA regulates development and / or interference with wetlands and alterations to shorelines and watercourses in accordance with Ontario Regulation 172/06 made under the Conservation Authorities Act. The regulation applies to natural or hazardous areas (i.e., areas in and near rivers, streams, floodplains, wetlands and slopes). Generally, the regulation applies to the watercourses and wetlands present within the project area. To ensure that development has regard for natural hazard features and the natural environment, while conforming to watershed development policies, the NVCA is authorized under Section 28 of the Conservation Authorities Act to implement and enforce their own regulation. Under the regulation, no person shall undertake development or permit another person to undertake development in, or on, the areas within the jurisdiction of a Conservation Authority. A permit to undertake development within the regulated area may be granted by the governing Conservation Authority.

Regulated areas are present within the project limits, and generally follow the natural watercourses and wetlands. Development within these areas will likely require a permit from the NVCA.

- **The Ontario Provincial Policy Statement, PPS (2014)** was issued under Section 3 of the Ontario Planning Act. Section 3 of the Planning Act requires that decisions affecting planning matters “shall be consistent with” policy statements issued under the Act (OMMAH 1990). The PPS provides policy direction on land use planning and development matters that are of provincial interest which protect the natural environment as well as public health and safety. Unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions, development and site alteration shall not be permitted in or directly adjacent to:
 - Significant wetlands in Ecoregions 5E, 6E and 7E1;
 - Significant coastal wetlands;
 - Significant wetlands in the Canadian Shield north of Ecoregions 5E, 6E and 7E1;
 - Significant woodlands in Ecoregions 6E and 7E;
 - Significant valleylands in Ecoregions 6E and 7E;
 - Significant wildlife habitat;
 - Significant areas of natural and scientific interest;
 - Fish habitat;
 - Habitat of endangered species and threatened species.

Such natural features are present within the project area and are addressed through the Official plans, as described below.

3.3 REGIONAL / MUNICIPAL

- **Natural Heritage System** – County of Simcoe Official Plan (2016), Township of Essa Official Plan (2001), and the Township of Clearview Official Plan (2001) classify several features within the project limits and adjacent areas either as ‘Greenlands’ or as part of the ‘Natural Heritage System’ (NHS) (these are generally used interchangeably within the plans). The components are the key natural heritage features and key hydrologic features. The regional / municipal policies require that their form and functions be protected, and where possible, enhanced. The key features within the project limits are: significant habitat of endangered species, threatened species and special concern species; fish habitat; wetlands; significant woodlands; significant wildlife habitat (SWH); and permanent and intermittent streams. The Official Plans also enforce a tree cutting bylaw which regulates the cutting, burning or removal of trees by any other means.

As per policies of the official plans, development or site alteration within or adjacent to the NHS requires the completion of an Environmental Impact Study (EIS) to evaluate potential impacts and demonstrate that the activity will not result in a negative impact on the associated natural features or functions. The construction of the trail does not require a development application, but may be considered site alteration depending on the preferred alternative and the requirements for grading, excavation and/or placement of fill. If the proposed works are considered site alteration, an EIS may be required.

4 EXISTING CONDITIONS

4.1 DESIGNATED NATURAL FEATURES

Based on information available in the NHIC and LIO databases, consultation with MNRF Midhurst District and NVCA, as well as review of the County of Simcoe Official Plan (2016), Township of Essa Official Plan (2001), and the Township of Clearview Official Plan (2001), the project limits contain no Areas of Natural and Scientific Interest (ANSI's), Provincial Parks, or Environmentally Sensitive Areas (ESA's).

A portion of the Minesing Swamp Complex Provincially Significant Wetland (PSW) crosses the rail corridor as identified on Schedule 5.2.2 of the County of Simcoe OP. No Locally Significant Wetlands (LSW) have been mapped along the project limits (per Simcoe County OP), however Unevaluated Wetlands are identified along the project limits and may qualify as Locally Significant if they are greater than 2.0 ha. Development and site alteration may be permitted within LSWs and within 120 m of LSW and PSW if demonstrated that there will be no negative impacts on the feature or function. Impacts within 120 m of wetlands are anticipated to require a permit from NVCA. Encroachment into wetlands should be avoided to the extent possible.

Areas that are designated as part of the Natural Heritage System in Simcoe County, identified as Greenlands on Schedule 5.1 of the County of Simcoe OP and Schedule A3 of the Township of Clearview Official Plan (2001), occur frequently along the rail corridor. These areas may include Significant Valleylands, Hazard Lands, Woodlands, and non-PSW wetlands. The objectives of the Greenlands System include to protect and restore the natural character, function, and connectivity of the natural heritage system of the County of Simcoe. Site alteration within an area designated as Greenlands may require an EIS.

4.2 VEGETATION

4.2.1 APPROACH AND METHODOLOGY

Vegetation surveys were conducted by WSP biologists within the project limits on May 30 and 31, 2018. These surveys documented the characteristics of the natural and culturally influenced vegetation communities, with a focus on the natural features along the rail corridor. Vegetation field work and associated data assessment involved:

- A high-level botanical inventory intended to screen for rare or sensitive vegetation species. This includes the preparation of a preliminary vascular plant species list (**Appendix C1**);
- Classifying and mapping vegetation communities according to the Ecological Land Classification (ELC) System for Southern Ontario (Lee et. al. 1998). Classification was completed primarily from the edge of the rail corridor due to Permission to Enter (PTE) restrictions (communities shown in **Appendix A**);
- Evaluating the sensitivity and significance of vegetation species and vegetation communities using the MNRF's NHIC database and SAR websites (updated periodically), the Central Region Significant Species List (Riley et. al. 1989), and the Natural Heritage Resources of Ontario: Vegetation Communities of Southern Ontario (Bakowsky 1996);
- Evaluating habitat potential for vegetation SAR known or thought to exist in the vicinity of the project limits.

4.2.2 VEGETATION COMMUNITIES AND FLORA

The general character of terrestrial environments within, and in the vicinity of the project limits is highly varied. The most common land use is large scale agriculture planted with cash crops such as corn, soy and wheat, however hay fields and pasture are also common. Agricultural areas are commonly interspersed with natural or semi-natural areas that vary in size from small hedgerows to large tracts of forest. Much of the forested area consists of lowland popular forest, or poplar swamp, however occasional mixed forest with significant portions of conifer are also present. Marsh and open water wetlands are also present in smaller amounts. Closer to the urban centres associated with the trail (Stayner, New Lowell, and Angus) low and medium density residential and commercial areas are common, as well as their associated sidewalks / roadsides, with mown grass and planted landscape trees and shrubs.

A total of 64 vascular plants were identified during the field surveys, one of which was identified to genus level only. Of the 63 identified to species, 40 (63%) are native and 23 (37%) are non-native. All species are listed as either S4 (uncommon, but not rare in the province) or S5 (common and widespread within the province). None are listed as SAR, federally or provincially. All vascular plants recorded are listed in the Vascular Plant Species List (**Appendix C1**).

Thirty-three community types were classified using the ELC system and delineated within the project limits. All communities are considered common in Ontario (Bakowsky 1996 / NHIC). Vegetation communities are delineated in **Appendix A**.

- Commercial and Institutional (CVC)
- Residential (CVR)
- Annual Row Crops (OAGM1)
- Perennial Cover Crops (Hay; OAMG2)
- Mineral Cultural Meadow (CUM1-1)
- Mineral Cultural Plantation (CUP)
- Mineral Coniferous Plantation (CUP3)
- Mineral Cultural Savannah (CUS1)
- Mineral Cultural Thicket (CUT1)
- Mineral Cultural Woodland (CUW1)
- Coniferous Forest (FOC)
- Fresh-Moist White Cedar Coniferous Forest (FOC4)
- Deciduous Forest (FOD)
- Dry-Fresh Poplar-White Birch Forest (FOD3)
- Dry-Fresh Deciduous Forest (FOD4)
- Dry-Fresh Sugar Maple Deciduous Forest (FOD5)
- Mixed Forest (FOM)
- Open Pasture (OAMG4)
- Ash Mineral Deciduous Swamp (SWD2)
- Maple Mineral Deciduous Swamp (SWD3)

- Mineral Deciduous Swamp (SWD4)
- Willow Mineral Deciduous Swamp (SWD4-1)
- White Birch - Poplar Mineral Deciduous Swamp (SWD4-3)
- Mixed Swamp (SWM)
- Birch - Poplar Mineral Mixed Deciduous Swamp (SWM3)
- Swamp Thicket (SWT)
- Willow Mineral Thicket Swamp (SWT2-2)
- Red-osier Mineral Thicket Swamp (SWT2-5)
- Willow Organic Thicket Swamp (SWT3-2)
- Mineral Meadow Marsh (MAM2)
- Reed-canary Mineral Meadow Marsh (MAM2-2)
- Organic Meadow Marsh (MAM3)
- Cattail Organic Shallow Marsh (MAS3-1)

4.3 WILDLIFE

General wildlife and wildlife habitat surveys were completed concurrently with the vegetation surveys from within the rail corridor. All direct wildlife observations and wildlife signs (including animal browse, track / trails, scat, nests, tree cavities, burrows, excavated holes and vocalizations) made during the field surveys were recorded. Particular attention was also paid to assessing SAR habitat, SAR habitat potential and potential SWH features, which are discussed in **Sections 4.5** and **4.6** respectively.

Birds

Sixty-three bird species were recorded during the single field visit conducted during the breeding bird season (May 30 and 31, 2018.) (Appendix C2). The species variety and abundance were expected given the habitat conditions. The most commonly recorded species were disturbance-tolerant and associated with forest edge habitats (e.g., American Goldfinch [*Spinus tristis*], American Robin [*Turdus migratorius*], Black-capped Chickadee [*Poecile atricapillus*], European Starling [*Sturnus vulgaris*], and Song Sparrow [*Melospiza melodia*]). Species associated with a variety of other habitats were also recorded, including: agricultural fields / cultural meadows (e.g., Vesper Sparrow [*Pooecetes gramineus*], Savannah Sparrow [*Passerculus sandwichensis*], Bobolink [*Dolichonyx oryzivorus*]); forest interior habitats or riparian forest areas (e.g., American Redstart [*Setophaga ruticilla*], Ovenbird [*Seiurus aurocapilla*], Hairy Woodpecker [*Picoides villosus*], Red-eyed Vireo [*Vireo olivaceus*]); and marshes / wetlands or open aquatic (e.g., Canada Goose [*Branta canadensis*], Common Yellowthroat [*Geothlypis trichas*], Red-winged Blackbird [*Agelaius phoeniceus*]).

Six of the observed avian species are considered Area Sensitive per the MNR Significant Wildlife Habitat Technical Guide Area Sensitive Species List (MNR 2000); Broad-winged Hawk (*Buteo platypterus*), Ovenbird, Red-breasted Nuthatch (*Sitta canadensis*), Savannah Sparrow, Veery (*Catharus fuscescens*), and Vesper Sparrow. Additionally, four of the observed avian species are species listed and regulated under the ESA [2007]; Bobolink, Eastern Meadowlark (*Sturnella magna*), Eastern Wood-pewee (*Contopus virens*), and Barn Swallow (*Hirundo rustica*). These species are discussed further in **Section 4.5**. All remaining species are considered common and widespread throughout Southern Ontario (Cadman et al. 2007).

No avian nests were observed within surveyed vegetated areas of the project limits at the time of the surveys; however, given that these surveys were undertaken during the Regional Nesting Period identified by Environment Canada (approximately end of March to end of August), and suitable nesting habitat exists within the project limits, nesting

activity and nests were likely present. One Eastern Phoebe nest was observed on the bridge over the Mad River, and all the bridges within the project limits provide suitable nesting habitat for Barn Swallow nesting.

Mammals

Observations and / or signs of three mammal species (Eastern Chipmunk [*Tamias striatus*], Raccoon [*Procyon lotor*], and White-tailed Deer [*Odocoileus virginianus*]) were recorded in the project limits during the field surveys. However, the general area likely supports a range of mammals often found in similar habitats, including: Groundhog (*Marmota monax*), Eastern Cottontail (*Sylvilagus floridanus*), Grey Squirrel (*Sciurus carolinensis*), Red Squirrel (*Tamiasciurus hudsonicus*), Striped Skunk (*Mephitis mephitis*), Red Fox (*Vulpes vulpes*), and several small mammals that often go undetected (e.g., shrews, voles, mice, bats) (Dobbyn 1994).

Herpetofauna

Observations and / or signs of four herpetofauna species (American Toad [*Anaxyrus americanus*], Green Frog [*Lithobates clamitans*], Snapping Turtle [*Chelydra serpentina*], and Eastern Ribbonsnake (aka. Northern Ribbonsnake) [*Thamnophis sauritus septentrionalis*]) were observed during the field surveys, however, the general area contains habitat for, and may support, several herpetofauna species found in similar habitats, including: Dekay's Brownsnake (*Storeria d. dekayi*), and Eastern Gartersnake (*Thamnophis sauritus sirtalis*) (Ontario Nature, 2017). The presence of specialized habitat features that were directly observed, or are likely to occur in or adjacent to the project limits (e.g. amphibian breeding, or reptile overwintering habitat) are discussed in **Section 4.6**.

4.4 AQUATIC RESOURCES

Aquatic field investigations were conducted concurrently with the vegetation and wildlife surveys at watercourse crossings within the project limits. WSP biologists visually assessed the aquatic habitat conditions for 32 watercourses within the project limits. These assessments included identifying the presence of flow, any barriers to fish movement, the structural conditions of the crossing structures, any incidental observations of fish as well as a general assessment of the habitat conditions present at each crossing (e.g., substrates, channel morphology, opportunities for cover, etc.).

Of the 32 watercourse crossings assessed:

- Thirteen (13) were confirmed to support direct fish use within the project limits. Small schools of baitfish were observed in eight watercourses. In addition to baitfish, an adult Rainbow Trout (*Oncorhynchus mykiss*) was observed in one watercourse (WC-11). Direct fish use was confirmed in the remaining four watercourses via the LIO database.
- Six were determined to support fish habitat indirectly (no direct fish habitat within the project limits). These watercourses conveyed roadside and agricultural drainage and had no defined banks or evidence of refuge habitat. These watercourses are classified as indirect fish habitat as they may provide nutrients and allochthonous (e.g., insects and plant debris) material to receiving waterbodies downstream of the project limits.
- The remaining 13 watercourses have habitat present to support fish within the project limits, however direct fish use could not be confirmed through the background review or visual assessments.

See Appendix D for descriptions of the existing aquatic habitat conditions as well as representative photographs at each of the assessed watercourses.

4.5 SPECIES AT RISK

The NHIC database, DFO Aquatic SAR mapping, MNRF Simcoe County Regional SAR List, and MNRF Midhurst District were consulted for information on local SAR, defined here as species that are “designated” by the Committee on the Status of Endangered Wildlife in Canada [COSEWIC] and / or listed under the *Species at Risk Act* [SARA] and species “designated” by the Committee on the Status of Species at Risk in Ontario [COSSARO], including those Endangered and Threatened species listed and regulated under Ontario's *ESA* [2007]).

Through a background review, four SAR were identified as having potential to occur within the project limits (through review of the NHIC database and DFO Aquatic SAR mapping) with an additional 59 identified as having potential to occur within the broader landscape (through communication with the MNR). Forty-two of these species were deemed to have no possibility of occurring within the project limits based on extremely limited and / or well documented species range, or the absence of suitable habitat conditions and are not discussed further in this document. All 63 species identified in the background review are listed in **Appendix B**.

The majority of both confirmed, and potential species are not anticipated to be impacted by the preferred trail design alternative, however some (ex. multiple endangered bat species), may require further consultation with the MNR at detailed design to determine if further surveys or compensation will be required. See **Section 8** for recommended next steps regarding SAR.

4.5.1 CONFIRMED SPECIES AT RISK

The following seven SAR species were confirmed within the project area:

- Monarch (*Danaus plexippus* – Special Concern, COSSARO and Endangered, COSEWIC);
- Eastern Wood-pewee (*Contopus virens* - Special Concern, COSEWIC and COSSARO);
- Eastern Ribbonsnake (*Thamnophis sauritus septentrionalis* – Special Concern, COSEWIC and COSSARO);
- Snapping Turtle (*Chelydra serpentina* - Special Concern, COSEWIC and COSSARO);
- Bobolink (*Dolichonyx oryzivorus* – Threatened, COSEWIC and COSSARO);
- Eastern Meadowlark (*Sturnella magna* – Threatened, COSEWIC and COSSARO);
- Barn Swallow (*Hirundo rustica* – Threatened, COSEWIC and COSSARO).

Locations of all species are indicated on **Figures 1-1 to 1-20**, in **Appendix A**.

4.5.2 POTENTIAL SPECIES AT RISK

Fourteen SAR are moderately to highly likely to occur within or adjacent to the project area:

- Canada Warbler (*Cardellina Canadensis* - Special Concern, COSEWIC and COSSARO);
- Grasshopper Sparrow (*Ammodramus savannarum* – Special Concern, COSEWIC and COSSARO);
- Red-headed Woodpecker (*Melanerpes erythrocephalus* – Threatened, COSEWIC; Special Concern, COSSARO);
- Wood Thrush (*Hylocichla mustelina* - Special Concern, COSEWIC and COSSARO);
- Little Brown Bat (*Myotis lucifugus*), Northern Myotis (*Myotis septentrionalis*), Small-footed Bat (*Myotis leibii*) and Tri-coloured Bat (*Perimyotis subflavus*) (Endangered, COSEWIC and COSSARO);
- Butternut (*Juglans cinerea* – Endangered, COSEWIC, COSSARO);
- Map Turtle (*Graptemys geographica* - Special Concern, COSEWIC and COSSARO);
- Blanding’s Turtle (*Emydoidea blandingii* - Endangered COSEWIC, and Threatened COSARRO);
- Eastern Musk Turtle (*Sternotherus odoratus* - Special Concern, COSEWIC and COSSARO);
- Spotted Turtle (*Clemmys guttata* - Endangered, COSEWIC and COSSARO);

- Northern Brook Lamprey (*Ichthyomyzon fossor* - Special Concern, COSEWIC and COSSARO).
-

4.6 SIGNIFICANT WILDLIFE HABITAT

"Significant Wildlife Habitat" (SWH) is identified by MNRF or other relevant planning authorities. As outlined in their Significant Wildlife Habitat Technical Guide (OMNR 2000), SWH is broadly categorized as:

- Seasonal concentration areas (i.e., conifer forests for deer wintering);
- Rare vegetation communities or specialized habitats for wildlife;
- Habitats of species of conservation concern, excluding the habitats of endangered and threatened species;
- Animal movement corridors.

Six types of candidate (unconfirmed) SWH have been identified during field investigations within the project limits, as well as three confirmed SWH types. Detail on these habitat types are provided in **Table 1** below.

Table 1: Candidate and confirmed Significant Wildlife Habitat within the project area.

HABITAT TYPE	LOCATION WITHIN STUDY LIMITS	HABITAT CRITERIA MET BY HABITAT FEATURES IN VICINITY OF THE STUDY CORRIDOR	CONCLUSIONS
Bat Maternity Colonies	All mature treed areas, including swamps	Bat maternity colonies are day roosts inhabited by females and juveniles and are used for giving birth and raising young. Maternity colonies can be located in human structures, tree hollows and rock faces. Mature forest habitat supporting snags is important. Large tracts of mature forest, that most likely support snag, are present within the project area. Further, correspondence with the NVCA indicates that the areas surrounding Stayner support a relatively high concentration of bat maternity roost habitat.	Candidate SWH is present along the rail corridor where mature forest or swamp is present
Turtle Wintering Areas	Nottawasaga and Mad Rivers and the Minesing Swamp PSW	Turtle wintering areas must provide pools deep enough not to freeze in the winter (≥ 0.5 m) that contain sandy or muddy substrates suitable for turtle burrowing. Such habitat is present along the rivers in the project area, the Nottawasaga River in particular where one snapping turtle was observed, as well as the portion of the Minesing Swamp Complex adjacent to the rail corridor (shown on Figure 1-15, Appendix A)	Candidate SWH is present in multiple locations
Turtle Nesting Areas	Nottawasaga River and the Minesing Swamp PSW along the rail corridor	Turtles use open areas of sand or gravel in close proximity to a waterbody. This includes beaches and bank, such as those present along the Nottawasaga River, as well as the naturalized embankment along the rail corridor.	Candidate SWH is present in multiple locations
Woodland Raptor Nesting Habitat	Four large forested tracts (see Figure 1-3, 1-8, 1-12, 1-13, and 1-15, Appendix A)	Criteria for confirmed woodland raptor nesting habitat include the presence of natural forest / wooded or conifer plantation greater than 30 ha in size, with at least 10 ha of interior forest habitat determined with a 200 m buffer. Three large forested tracts that fit this description are present adjacent to the rail corridor. One Broad-winged Hawk (<i>Buteo platypterus</i>) was observed in one of these forested areas, however no evidence of nesting was observed	Candidate SWH is present in four locations
Woodland Amphibian Breeding Habitat	All forested wetland tracts	Woodland amphibians require the presence of a wetland, pond, or vernal pool within or adjacent to a woodland for reproduction. Few pools, and no vernal pools were observed during the field investigations, however given the predominance of forested wetlands in the project area it is likely that these pools are present within the vicinity of the rail corridor.	Candidate SWH is present in multiple locations
Wetland Amphibian Breeding Habitat	Minesing Swamp PSW	Criteria for wetland amphibian breeding habitat includes the presence of wetlands greater than 500 m ² supporting high species diversity. The presence of shrubs and logs increases habitat quality. Additionally, Bullfrogs require permanent water. While many of the wetlands identified along the length of the rail corridor are small, the Minesing Swamp Complex (shown on Figure 1-15, Appendix A) likely supports stand water year-round, as well as snags, floating logs, tussocks, and floating vegetation. This likely provides high quality SWH.	Candidate SWH is present within the Minesing Swamp Complex

Area-Sensitive Breeding Bird Habitat	Forest Tract depicted on Figure 1-12 , and 1-13 , Appendix A)	Large forest tracts, typically over 60 years of age, with interior forest habitat determined with a 200 m buffer provide breeding habitat to area sensitive species. Confirmed habitat required the observation of three or more breeding pairs of area sensitive species. Red-breasted Nuthatch, Veery, and Ovenbird were observed singing during the breeding bird period in the large tract as shown on Figure 1-12 , and 1-13)	Confirmed SWH is present within one of the large forested tracts
Special Concern and Rare Wildlife Species	Locations of Special Concern Species (identified in Figure 1 , Appendix A)	Four Special Concern (SC) species were observed within the project area; <ul style="list-style-type: none"> • One Snapping Turtle was confirmed using habitat at WC-32 identified on Figure 1-20, Appendix A. Foraging, basking habitat, and possibly overwintering habitat is present within the vicinity of the turtle observation and is therefore considered confirmed as SWH. • Monarch were observed in within cultural areas of the rail corridor. These areas also supported milkweed (<i>Asclepias syriaca</i>), which provides critical larval life stage habitat, as well as other nectar-producing species adult Monarch used for foraging. • Eastern Wood-pewee was observed singing in appropriate breeding habitat (the large tracts as shown on Figure 1-2, 1-3, 1-13 and 1-19) during the breeding season. • Eastern Ribbonsnake was observed along the unnamed watercourse shown on Figure 1-6, Appendix A, in appropriate habitat (along a watercourse with abundant amphibians). 	Confirmed SWH is present throughout the project area
Deer Winter Congregation Areas	Mixed coniferous/deciduous Forest (see Figure 1-15 , Appendix A)	During winter in the southern areas of Ecoregion 6E are not constrained by snow depth, however deer will annually congregate in large numbers in suitable woodlands to reduce or avoid the impacts of winter conditions. A Deer Wintering Congregation area has been identified by the MNRF.	Confirmed SWH is present in mixed forest.

5 OPPORTUNITIES AND CONSTRAINTS

This section presents the sensitive terrestrial and aquatic features and associated constraints identified in the above sections. These features may be impacted depending on details of the final design and construction of the multiuse trail and may require the use of timing window or other mitigation measures to address impacts. The following is a list of these features.

5.1 TERRESTRIAL

Constraints

- **Nesting migratory birds:** Migratory birds are protected under the Migratory Birds Conventions Act (MBCA; 1994) and cannot be disturbed (including vegetation removals) during the nesting period (April 1 to August 31). If removals during the nesting period are required, nest searches may be required to ensure compliance under the MBCA. This also applies to any birds found nesting on bridge structures.
- **Wetlands:** No development or site alteration is permitted within PSWs. Unevaluated wetlands are identified along the project limits and may qualify as Locally Significant if they are greater than 2.0 ha. Development and site alteration may be permitted within Locally Significant Wetlands and within 120 m of Locally and PSWs if demonstrated that there will be no negative impacts on the feature or function. Impacts within 120 m of wetlands are anticipated to require a permit from NVCA. Encroachment into wetlands should be avoided to the extent possible.
- **Woodlands:** Woodlands occur frequently along the trail alignment and may qualify as Significant. Development and site alteration within 120 m of significant woodlands is prohibited unless it has been demonstrated that there will be no negative impacts on the features or functions. Tree removals should be avoided in significant woodlands to the extent possible.
- **Habitat of endangered and threatened species:** Several confirmed and potential SAR listed in **Section 4.5** are not anticipated to be impacted by the preferred alternative, and therefore do not pose constraints on the project. This is due to lack of breeding evidence or breeding habitat, low likelihood of nesting in edge habitat adjacent to the rail corridor, impact to such a minute amount of habitat as to not require registration under the ESA (Bobolink and Eastern Meadowlark), or the ability to leave the area of impact (ex. Monarch). A number of SAR bat and turtle species, however, may pose constraints to the project:
 - **SAR Bats (Little Brown Bat, Northern Myotis, Small-footed Bat and Tri-coloured Bat):** All mature forested units likely support endangered bat habitat. Where tree removals cannot be avoided, impacts are anticipated to be confined to the forest edges and are anticipated to be minimal. Where tree removals in bat habitat are unavoidable, the MNRF should be contacted and further studies (i.e. roost habitat surveys, acoustic monitoring) as well as ESA registration / permitting may be required.
 - **SAR Turtles (Snapping Turtle, Map Turtle, Blanding's Turtle, Eastern Musk Turtle and Spotted Turtle):** These species have potential to nest and hibernate in the Mad River, Nottawasaga River, and Minesing Swamp PSW. Where works in these habitat features are unavoidable, further correspondence with the MNRF is required, and further basking / emergence surveys may be requested. Timing windows associated with these habitats also apply; in-water works are not permitted September 1 to April 30 to avoid harm to potentially hibernating turtles, and permanent or temporary exclusion fencing may be required to avoid impacts to nesting turtles.
- **Significant Wildlife Habitat (SWH):** Development and site alteration within 120 m of significant wildlife habitat is prohibited unless it has been demonstrated that there will be no negative impacts on the features.

While outside the scope of this study, some significant wildlife habitat features were incidentally identified during field investigations and include the following: Candidate Bat Maternity Colonies, Candidate Turtle Wintering Areas, Candidate Turtle Nesting Areas, Candidate Woodland Raptor Nesting Habitat, Candidate Woodland and Wetland Amphibian Breeding Habitat, Confirmed Area-Sensitive Breeding Bird Habitat, Confirmed Special Concern and Rare Wildlife Species, Confirmed Deer Winter Congregation Areas

If direct impacts to natural features, SAR or SWH are identified during detailed design, additional mitigation or timing windows may be required.

Opportunities

The following is a list of potential opportunities to further protect or enhance the terrestrial environment that may be considered at Detailed Design:

Re-vegetation

- To control the establishment and / or proliferation of non-native or invasive species during construction (for example, avoiding the movement of garlic mustard from the rail corridor into interior forest), consider adhering to the Clean Equipment Protocol for Industry.
- Post construction, areas of temporary disturbance from construction may be re-stabilized and vegetated with a native seed mix to out-compete non-native species (e.g., roadside edge mix; bee forage meadow mix etc.) and plantings compatible with the local flora composition. Additional seeding could occur in open areas.
- Compensation plantings for tree removals could be considered.

Wildlife habitat creation / enhancement

- Consider the installation of permanent turtle exclusion fencing in suitable areas, for example, along the Minesing Swamp PSW. This would prevent turtles from being attracted to limestone screening paths for nesting, where they are vulnerable to trampling / harm from maintenance activities.
- If culvert works are proposed in the Minesing Swamp PSW area, opportunities for turtle passage within the culverts may be considered to compliment permanent fencing to deter turtles from moving into the trail and guide them to the potential crossing point. Potential crossing points should consider size, length, water level in culvert, and light infiltration in terrestrial (dry) culverts.
- Plant milkweed and nectar plants for improved Monarch habitat and other butterfly species' habitat.
- Design river crossings to maintain nesting habitat on bridges for Eastern Phoebe and potentially for Barn Swallow.
- Retain cut tree stems on the ground and in stacked piles for improved snake habitat.

5.2 AQUATIC

Constraints

- Based on background information available in the LIO database as well as data gathered by WSP biologists, the following preliminary timing windows should be adhered to if any in-water works are required as part of the trail construction process. These timing windows should be accounted for during the planning, design and construction phase of the project as they may limit when construction can occur. Any watercourse in the project area identified by LIO as coldwater: no in-water work from October 1st to July 15th of any given year. Any watercourse in the project area not identified as coldwater: no in-water work from March 15th to July 15th of any given year. Note that these timing windows are preliminary and may change based on the results of detailed aquatic habitat assessments as well as any input from MNRF during Detailed Design.

- If for purposes of trail construction, any watercourse crossings require work below the high-water mark (repair, replacement, etc.) a Request for Review of the proposed works by DFO may be required to ensure that no serious harm to fish and fish habitat will result and that the works are in compliance with *Fisheries Act*. Section 35(1) of the Act states: “No person shall carry on any work, undertaking or activity that results in serious harm to fish that are part of a commercial, recreational or Aboriginal fishery, or to fish that support such a fishery.” The Act interprets ‘serious harm to fish’ as “the death of fish or any permanent alteration to, or destruction of, fish habitat”. Each watercourse crossing in the study either supports, or is a Commercial, Recreation or Aboriginal Fishery. Habitat impact assessments will be required at the detail design stage of the project for any crossings requiring work below the high-water mark in order to determine fish passage design requirements and if serious harm may result from the proposed works. Measures to avoid causing harm to fish and fish habitat can be found on DFO’s Self-assessment website and should be incorporated into the planning, design and construction phases of the project.
- One watercourse (WC-32) has been identified as having the potential to support Northern Brook Lamprey (Special Concern provincially and federally). As this species is currently listed as Special Concern, no additional mitigation measures or permitting requirements beyond what is mentioned in this report are required. However, if the designation of this species is up-listed to Threatened or Endangered prior to construction taking place, and in-water works are required at this watercourse, additional permitting and mitigation measures under the ESA and / or SARA may be required.

Opportunities

- If any culverts are to be replaced, consider embedding replacement culverts within substrates to transition the new culverts smoothly with the upstream and downstream reaches to help minimize the potential formation of barriers to fish movement through the crossings.
- Any culverts that are to be replaced should span the bankfull width of the channel to improve fish passage through the trail corridor. Spanning the bankfull width will also help to minimize erosion and scour issues that are present at some of the existing crossings.
- Several crossings had perched outlets and debris jams present, which act as barriers to upstream fish movement through the crossings. These barriers could be addressed through either removal (for the debris jams) and the perched culverts could either be replaced or addressed through other means (i.e., rocky riffles) in order to reconnect the upstream and downstream fish communities.

6 DESIGN ALTERNATIVES AND EVALUATION

Viable design alternatives were investigated in order to recommend alignment, typical sections, and areas of special interest and connections for the multi-use trail. The design alternatives considered in this exercise included:

- Placing the trail on the existing rail bed and disposing of the rails and ties;
- Placing the trail on the existing rail bed and disposing of the rails and burying the ties in place;
- Benching the trail on the side of the existing rail bed;
- Benching the trail on the side of the existing rail bed and salvaging the rails;
- Constructing the trail off the existing rail bed, beside the property line.

Each of the design alternatives were examined and ranked against the following criteria:

- Constructability;
- Comfort and Accessibility;
- Private Property Impacts;
- Natural Environment;
- Capital Cost;
- Maintenance Cost.

The purpose of the analysis is to select a preferred alternative and offer cost estimates within 25% accuracy including annual operational and maintenance estimates, provide a preliminary schedule for design, identify potential approval requirements, construction, commissioning, and post-construction services of the project.

The evaluation of the design alternatives is presented under separate cover. The preferred design alternative is to place the trail on the existing rail bed and dispose of the rails and bury the ties in place. The detailed design process will confirm the exact improvements, alignment adjustments / alignment of new links, additional study, consultation and approval requirements and provide a more detailed construction cost estimate.

7 IMPACT ASSESSMENT OF PREFERRED ALTERNATIVE

7.1 VEGETATION

Direct and indirect impacts to the vegetation will be largely confined to the existing rail corridor; however, the grading limits directly adjacent to the proposed trail have not been finalized at this stage of design. Vegetation communities within or adjacent to the rail corridor consist primarily of Cultural Meadow, an anthropogenic habitat considered common and widespread across the broader landscape which is not known to support sensitive species. None of the potentially impacted vegetation communities contain rare species. Following construction, similar vegetation is expected to regenerate naturally in those areas of the corridor temporarily disturbed for construction and staging.

Some potentially sensitive vegetation features exist in the vicinity of proposed works, including:

- Significant Woodlands;
- The Greenlands / Natural Heritage System;
- The Minesing Swamp PSW;
- Unevaluated potentially Locally Significant Wetlands.

Based on the preferred alternative, negative impacts from construction and staging of the proposed works on these features are likely to be temporary, with minimal encroachment and tree removal. Nevertheless, opportunities to protect these features should be considered where at all possible.

As with most construction activities, there is potential for indirect impacts to adjacent retained vegetation features during and following construction, including, but not limited to, the following:

- Vegetation clearing / damage beyond the working area / rail corridor;
- Spills of contaminants, fuels and other materials that may reach semi-natural areas;
- Impacts of trail use (increase anthropogenic disturbance including disruption to wildlife, trash, introduction of invasive species, etc.) and maintenance (ongoing vegetation clearing, use of salt in slippery conditions if maintained in the winter, etc.).

These potential indirect impacts to vegetation and habitat features can be managed through implementation of standard mitigation measures, as outlined below.

7.1.1 VEGETATION MITIGATION

The following mitigation measures are recommended to minimize effects to the local vegetation communities and their associated habitat functions:

- Stabilize and re-vegetate exposed surfaces within 45 days of completion of works at those locations;
- Clearly delineate vegetation clearing zones and vegetation retention zones (i.e., using fencing) on both the construction drawings and in the field with the Contract Administrator prior to clearing and grading. Equipment, materials and other construction activities will not be permitted in vegetation retention zones;
- The Contract Administrator will be notified in the event the Contractor needs to clear additional vegetation beyond the above limits, as specified in the Contract documents, and these limits will be reviewed in the field for acceptability;

- If tree removals are necessary, fell trees and shrubs to be removed into the existing work area, to avoid disturbance to retained vegetation and habitats;
- Dispose of cut material through chipping or other appropriate means;
- Avoid all unnecessary traffic, dumping and storage of materials over tree root zones adjacent to the rail corridor;
- Conduct vehicle maintenance and fueling at the designated and properly contained maintenance areas in the works yards or at commercial garages located well away from retained vegetation areas;
- Remove and dispose of all spoil and other construction-related debris following construction in appropriately designated areas;
- Implement environmental inspection during construction to ensure that all mitigation measures are implemented properly, maintained and repaired, and remedial measures are initiated where warranted;
- Consider the use of salt alternatives for path maintenance in icy weather.

7.2 WILDLIFE

Impacts to wildlife and wildlife habitat are limited to local incremental impacts since the works are confined to the rail corridor, which is already disturbed from previous clearing and rail use. As outlined above in the vegetation discussion, there is likely to be some direct removals within and possibly adjacent to the rail corridor of primarily cultural and tolerant vegetation communities and the wildlife habitat associated with these communities will therefore also be removed. However, most of the wildlife species observed in the project limits are common, tolerant species, impacts to which can be managed through the implementation of the mitigation measures outlined below.

There is potential for other wildlife (e.g., snakes, small mammals, etc.) to move through or use the rail corridor habitat incidentally from the surrounding adjacent habitats and therefore some potential for harm to these animals if they enter the work area. Specifically, turtles may nest on the rail corridor embankments near suitable habitat, including the Nottawasaga River, the Mad River, and the Minesing Swamp PSW. Works on or near these embankment areas during the nesting and incubation / dispersal period (May through August) could impact nesting turtles or their eggs / nests or emerging and dispersing young, and in-water works could impact hibernating turtles. More detailed impacts and the most appropriate form of mitigation will be developed during Detailed Design.

The vegetation surrounding the rail corridor provides ample nesting opportunity within the project limits. Additionally, one Eastern Phoebe nest was observed on the Mad River Bridge, and all bridges in the project limits provide suitable nesting habitat for Barn Swallow. Potential impacts to birds and their nests protected by the federal Migratory Birds Convention Act (MBCA, 1994) include disturbance to nesting activity or possibly loss of any nests present in the year of construction, depending on timing. Mitigations measures are discussed below.

In addition, there is potential for other wildlife (e.g., snakes, small mammals, etc.) to enter the proposed work areas. The majority of the wildlife species with potential to occur in the project limits are common, tolerant species, impacts to which can be managed through the implementation of the mitigation measures outlined below.

7.2.1 WILDLIFE MITIGATION

The mitigation measures outlined above for vegetation will protect the associated wildlife habitat functions. However, it is also necessary to ensure the protection of breeding birds and wildlife in general that may nest or otherwise use areas where construction is proposed.

Nesting migratory birds are protected under the Migratory Birds Convention Act (MBCA, 1994). No work is permitted to proceed that would result in the destruction of active nests (nests with eggs or young birds), or the wounding or killing of bird species protected under the MBCA and / or Regulations under that Act.

To protect nesting migratory birds, in accordance with the MBCA, the Contract Administrator will:

- Ensure that no active nests (nests with eggs or young birds) will be removed or disturbed in accordance with the MBCA. The “Regional Nesting Period” for this area is early April to late August, as identified on the Environment Canada website by “nesting zone” C: http://www.ec.gc.ca/paom-itmb/default.asp?lang=En&n=4F39A78F-1#_01_6.

For the protection of wildlife in general, the Contract Administrator will ensure that:

- Any wildlife incidentally encountered during construction will not be knowingly harmed and will be allowed to move away from the construction area on its own if possible;
- In the event that an animal encountered during construction does not move from the construction zone, or is injured, the Contract Administrator will be notified.

The refinement of mitigation measures at Detailed Design, and proper implementation of the mitigation measures will ensure that potential impacts on wildlife and wildlife habitat are minimized.

7.3 AQUATIC RESOURCES

As mentioned in Sections 7.1 and 7.2, impacts will be confined mostly to the rail corridor. However, if the proposed works are unmitigated, the potential for negative impacts to watercourses along the project limits due to construction activities exists. Potential impacts could include:

- Potential sedimentation and erosion associated with the excavation, removal and/or placement of material along the trail corridor;
- Addition of deleterious substances such as, sediment, fuel, oil and lubricants to the watercourses associated with the use of heavy machinery;
- Removal of riparian vegetation;
- Harm or death of fish.

7.3.1 AQUATIC MITIGATION

The following mitigation measures should be implemented as a minimum to avoid causing harm to fish and aquatic habitat during construction.

General Mitigation Measures

- Work should be scheduled to avoid wet, windy and rainy periods that may increase erosion and sedimentation;
- Erosion and Sediment Control (ESC) measures should be installed around all watercourses prior to the initiation of construction works along the trail corridor to prevent encroachment and transfer of deleterious substances into aquatic habitat;
- The size of disturbed areas should be limited by minimizing non-essential clearing and grading;
- All ESC measures that are non-biodegradable should be removed from the site once work is completed and the site is stabilized;
- Machinery should be operated on land in a manner that minimizes disturbance to the banks of the watercourses;
- Vehicle and equipment maintenance and refueling should be undertaken in designated areas at least 30 m away from any watercourse and will be controlled to prevent discharge of fuels and fluids onto the ground or into watercourses;
- Machinery should arrive on site in a clean condition and maintained free of fluid leaks;

- No equipment should be allowed to ford or otherwise enter any watercourse except as specified in the contract documents or unless authorized by the appropriate environmental agencies / permits.

In-water Work Specific Mitigation Measures

The following mitigation measures apply to any project works that will need to take place below the high-water mark of any watercourse within the project limits. As mentioned in Section 5.2, if works will occur below the high-water mark, detailed aquatic habitat and impact assessments will need to take place in order to inform site specific mitigation measures as well as determine the potential for serious harm to fish and aquatic habitat as well as any permitting requirements that may result from the proposed works.

- Any watercourse identified as coldwater: no in-water work from October 1st to July 15th of any given year. Any watercourse in the project limits not identified as coldwater: no in-water work from March 15th to July 15th of any given year. Note that these timing windows are preliminary and may change based on the results of detailed aquatic habitat assessments as well as any input from MNRF during Detailed Design;
- All in-water works should be undertaken in isolation to avoid introducing deleterious substances into the watercourses. Additionally, flow should be maintained during construction and the isolation measures should not completely restrict flow. Any pumps / hoses conveying water should be screened to prevent entrainment of fish;
- Any materials and equipment to be used in the watercourses should be handled and treated in a manner that prevents the release or leaching of deleterious substances into the watercourses;
- If dewatering is required, sediment laden discharge water should be pumped into a vegetated area > 30 m from a watercourse or into a settling basin or similar measure to prevent the entry of deleterious substances into watercourses;
- Fish and mussel relocations will be required during the construction phase prior to de-watering of the work areas. Any fish and mussel relocations will require permits from, and consultation with MNRF and should be taken into account during the planning and design phases of the project. Consultation and permit applications should be initiated as early as possible to avoid any construction delays.

7.4 SPECIES AT RISK

As discussed in **Section 4.5**, the following 21 species have been confirmed, or have potential to occur within the project area. At this stage of design, the proposed works are expected to have minimal or no impacts on terrestrial or aquatic SAR. Only those species listed as Endangered or Threatened receive species and habitat protection under the Endangered Species Act (ESA). If the species or their habitat are impacted by the proposed works, authorization under the ESA may be required (i.e., ESA registration or permitting).

- Monarch (Special Concern) - suitable foraging and breeding habitat is available along much of the rail corridor and within larger cultural meadow and thicket units. This species is unlikely to be affected by the proposed works, however the inclusion of milkweed and nectar plants in planting plans should be considered at Detailed Design. Note that this species is currently under review for up-listing. If up-listed, Monarch and its habitat would be protected under the ESA would require consultation with the MNRF to confirm need for additional surveys, mitigation and ESA authorization requirements.
- Eastern Wood-pewee (Special Concern), Wood Thrush (Special Concern) and Canada Warbler (Special Concern) - These interior forest bird species are considered area sensitive and are unlikely to nest within the edges of the forests or to move within the project limits to forage or defend territory. Impacts to the forest edge within the project limits are unknown at this stage of design, but are anticipated to be minimal and are not anticipated to affect to these species. This will be confirmed at Detailed Design.
- Bobolink (Threatened), Eastern Meadowlark (Threatened) and Grasshopper Sparrow (Special Concern) – Suitable breeding habitat for these grassland bird species is present adjacent to the project area in Perennial

Cover Crops (hayfields; OAGM2) and Open Pasture (OAMG4). These species are however unlikely to nest within the edges of the habitat. Impacts to the habitat edge are unknown at this stage of design, but are anticipated to be minimal and are not likely to affect these species. Given that impacts are likely to be significantly less than 30 ha, registration and habitat compensation under the ESA for Bobolink and Eastern Meadowlark will likely not be required. This will be confirmed at Detailed Design.

- Barn Swallow (Threatened) – This species was observed foraging only. This species is widespread, and foraging habitat is not limited in the project area or broader landscape. There is possibility for this species to occur as a foraging visitant throughout the project limits, however they are unlikely to be affected by the proposed works. However, suitable nesting habitat is present on all bridges and should be considered at Detailed Design.
- Red-headed Woodpecker (Special Concern) – This species is rare within the broader landscape, however suitable habitat is present in pastures, Cultural Savannahs, woodlands, and hedgerows. While this species has potential to nest or forage within the study area, they are unlikely to be impacted as foraging visitants, and they do not currently receive habitat protection. The protection for migratory species outlined above is likely sufficient to protect this species at this time. Note that this species is currently under review for up-listing. If up-listed, Red-headed Woodpecker and its habitat would be protected under the ESA would require consultation with the MNRF to confirm need for additional surveys, mitigation and ESA authorization requirements.
- Northern Brook Lamprey (Special Concern) – This species has been identified through DFO’s Aquatic SAR mapping has having the potential to occur in WC-32. As the watercourse crossing was only visually assessed, habitat suitability for this species cannot be ruled out at this stage. Impacts to Northern Brook Lamprey habitat are expected to be mitigated with standard design and construction mitigation measures (i.e., silt fencing, no in-water works). However, if works below the high-water mark are proposed at this watercourse crossing, a detailed aquatic habitat and impact assessment will be required to ensure that no serious harm results from the proposed works.
- Eastern Ribbonsnake (Special Concern) - This species is widespread within the broader landscape, and suitable habitat is present near water features and forests. While this species is likely to be present within the rail corridor (basking on the exposed embankments), they are unlikely to be impacted as they are highly mobile. Additionally, this species does not receive habitat protection. The protection for general wildlife outlined above is likely sufficient to protect this species.
- Snapping Turtle (Special Concern), Map Turtle (Special Concern), Blanding’s Turtle (Threatened), Eastern Musk Turtle (Special Concern) and Spotted Turtle (Endangered) – Given the availability of wetlands and slow-flowing watercourses in the study area, there is potential for these turtle species to occur within the project area and potentially to pass through the rail corridor, particularly Blanding’s Turtles, which are highly mobile and known to make terrestrial excursions of several kilometers between habitats. The Minesing Swamp Complex is particularly high-quality habitat for Snapping Turtle, Blanding’s Turtle, Eastern Musk Turtle and Spotted Turtle, and the Nottawasaga and Mad Rivers are quality habitat for Snapping Turtle and Map Turtle. The following mitigation measures are to be considered / refined during detailed design:
 - Consult with the MNRF to determine appropriate mitigation measures for turtles that are likely utilizing the rail corridor as nesting habitat, particularly in the Minesing Swamp PSW area.
 - Additional mitigation may include (if applicable) avoidance of in-water works during the turtle hibernation period (September 1 – April 30), particularly in the Minesing Swamp PSW area where high quality overwintering habitat was identified.

- Temporary exclusion fencing may also be considered to prevent turtles (and other wildlife) from entering construction zones located adjacent to watercourses and wetlands. It may be feasible to combine exclusion fencing with silt fencing requirements, by modifying the latter to use wire-backed silt fencing and flaring out the ends of the fencing to redirect wildlife away from the construction zones / roads and back towards the habitat side of the fence. MNRF Best Practices guidelines are available at: http://files.ontario.ca/environment-and-energy/species-at-risk/mnr_sar_tx_rptl_amp_fnc_en.pdf
- If culvert works are proposed in this area, opportunities for turtle passage within the culverts should be considered along with permanent fencing to deter turtles from nesting on the trail and guide them to the potential crossing point. Potential crossing points should consider size, length, water level in culvert, and light infiltration in terrestrial (dry) culverts.
- Further studies may be required to demonstrate that SAR turtles will not be impacted by the proposed works (to be determined through consultation with MNRF at Detailed Design). This may include further emergence or basking surveys to determine species presence / absence in several potential habitat areas including the Nottawasaga and Mad Rivers and the Minesing Swamp PSW.
- Little Brown Bat (Endangered), Northern Myotis (Endangered), Small-footed Bat (Endangered), and Tri-coloured Bat (Endangered) - Suitable foraging habitat is present over natural areas, and day roosting habitat is abundant throughout the project area. Suitable cavity trees are likely present in all mature forested areas beyond the rail corridor however quality maternity roosts are unlikely to occur within the forest edge and potential areas of vegetation removal. Impacts to maternity colonies are therefore anticipated to be minimal. Correspondence with the MNRF is recommended at Detailed Design to confirm that any removals at the forest edges would not be considered a contravention of Section 10 of the ESA (prohibition on damage or destruction of habitat).
- Butternut (Endangered) - Although not observed during the 2018 field investigations, this species is common in the landscape and may be discovered during subsequent field investigations. Particular attention should be paid to this species during any subsequent Detailed Design field investigations.

8 RECOMMENDED NEXT STEPS

This report addresses the proposed development of the Barrie-Collingwood Railway Multi-Use Trail from Stayner to Angus. Construction is proposed to take place within, and possibly beyond, the rail corridor, to accommodate the development of the trail. This will result in some incremental encroachment and/or temporary disturbance of the land in and around the existing rail corridor.

Potential impacts associated with the anticipated construction activities include localized temporary removal or disturbance of the predominantly cultural meadow communities, as well as possible encroachment into sensitive features such as Significant Woodlands, watercourses, unevaluated wetland communities, the Minesing Swamp PSW, and the regional Natural Heritage System. These sensitive features extend beyond the existing rail corridor where they are more intact and of higher quality. The remaining affected vegetation community types, species and associated habitats are cultural in character and tolerant of disturbance.

Based on the available background information and field survey findings, several SAR are present or have potential to use habitat locally and potentially be impacted by the construction activities. Impacts to SAR birds are anticipated to be limited to potential for incidental encounters of birds along the rail corridor from adjacent habitat, as they are unlikely to nest within the corridor. Potential SAR bat, turtle and aquatic habitat was identified during the background review and field surveys.

A series of standard mitigation measures directed at avoiding and minimizing impacts to vegetation and habitat, protecting features adjacent to the rail corridor, limiting areas to be cleared or disturbed within the corridor, and protecting wildlife generally are recommended for implementation during construction. Specific measures are recommended regarding protection of SAR. With the implementation of the recommended mitigation measures outlined above, potential impacts of the proposed works on environmental features can be avoided or minimized. The specific impacts of the proposed works on ecological features are recommended to be refined further once the Detail Design is confirmed, and encroachment impacts beyond the rail corridor are confirmed. The mitigation measures will then be refined accordingly. Once finalized, all the mitigation measures should be incorporated into the contract documents. The following future works and associated commitments are recommended for Detailed Design:

- ▶ Depending on the length of time between the approval of the Preliminary Design and the start of the Detailed Design, the study area should be reviewed to determine changes in the landscape or newly listed SAR that may warrant additional surveys to update currently documented existing conditions. Note that Monarch's status under the ESA is currently under review and may be up-listed soon. If up-listed, Monarch and its habitat would be protected under the ESA.
- ▶ Consult with NVCA to determine the need for a permit under the Development, Interference with Wetlands and Alterations to Shorelines and Watercourse Regulation (O. Reg. 172/06) and the documentation and supporting studies required.
- ▶ Consult with NVCA to determine the need for an Environmental Impact Study (EIS) based on the anticipated impacts of the preliminary design and confirm the required scope of work.
- ▶ Update the impact assessment based on the detail design and update/refine the standard, site-specific and design related mitigation measures. It is recommended that this be documented in a scoped EIS or similar report to ensure that Species at Risk and protected features have been appropriately addressed and that all related mitigation measures are identified so they can be implemented during construction.
- ▶ Any project works that will involve work below the high-water mark of any watercourse (i.e., culvert rehabilitation or replacement, or infilling of aquatic habitat to accommodate an expansion of the rail / trail embankment) will require detailed investigations (including fish community sampling, specifically on watercourses with limited fish community information) and impact assessments. These impact assessments will ensure that no serious harm to fish and fish habitat will result and that the works are in compliance with the Fisheries Act.

- ▶ If it is determined that serious harm cannot be avoided, a Request for Review by Fisheries and Oceans Canada will be required. Additionally, the impact assessments will inform the selection and implementation of appropriate planning, design and construction mitigation measures to minimize impacts to fish and fish habitat.
- ▶ Develop a rigorous Erosion and Sediment Control plan, encompassing temporary flow management requirements where appropriate.
- ▶ Consult with MNRF on the need for additional Species at Risk surveys based on the detail design and to confirm mitigation approaches. This includes:
 - ▶ need for cavity tree assessment and/or acoustic monitoring surveys for SAR bats, and confirm suitability of mitigation measures;
 - ▶ need for SAR turtle emergence or basking surveys and / or mitigation measures, particularly near the Minesing Swamp PSW, Nottawasaga River and Mad River; and
 - ▶ confirm impacts to potential Bobolink and Eastern Meadowlark habitat.
- ▶ If impacts to SAR or their habitat are identified during detail design, consult with MNRF on the need for permits or registration under the Endangered Species Act or a Letter of Advice.
- ▶ Consider opportunities for vegetation compensation / enhancement plantings to address vegetation removals. This could include incorporating removal of invasive species and planting native species.
- ▶ If culvert works are proposed in the Minesing Swamp PSW area where there is suitable SAR turtle habitat, consider opportunities for turtle passage within the culverts along with permanent fencing to deter turtles from nesting on the trail.
- ▶ Consider incorporation of milkweed and nectar plants in plantings plans / reseeding plans to support Monarch habitat.

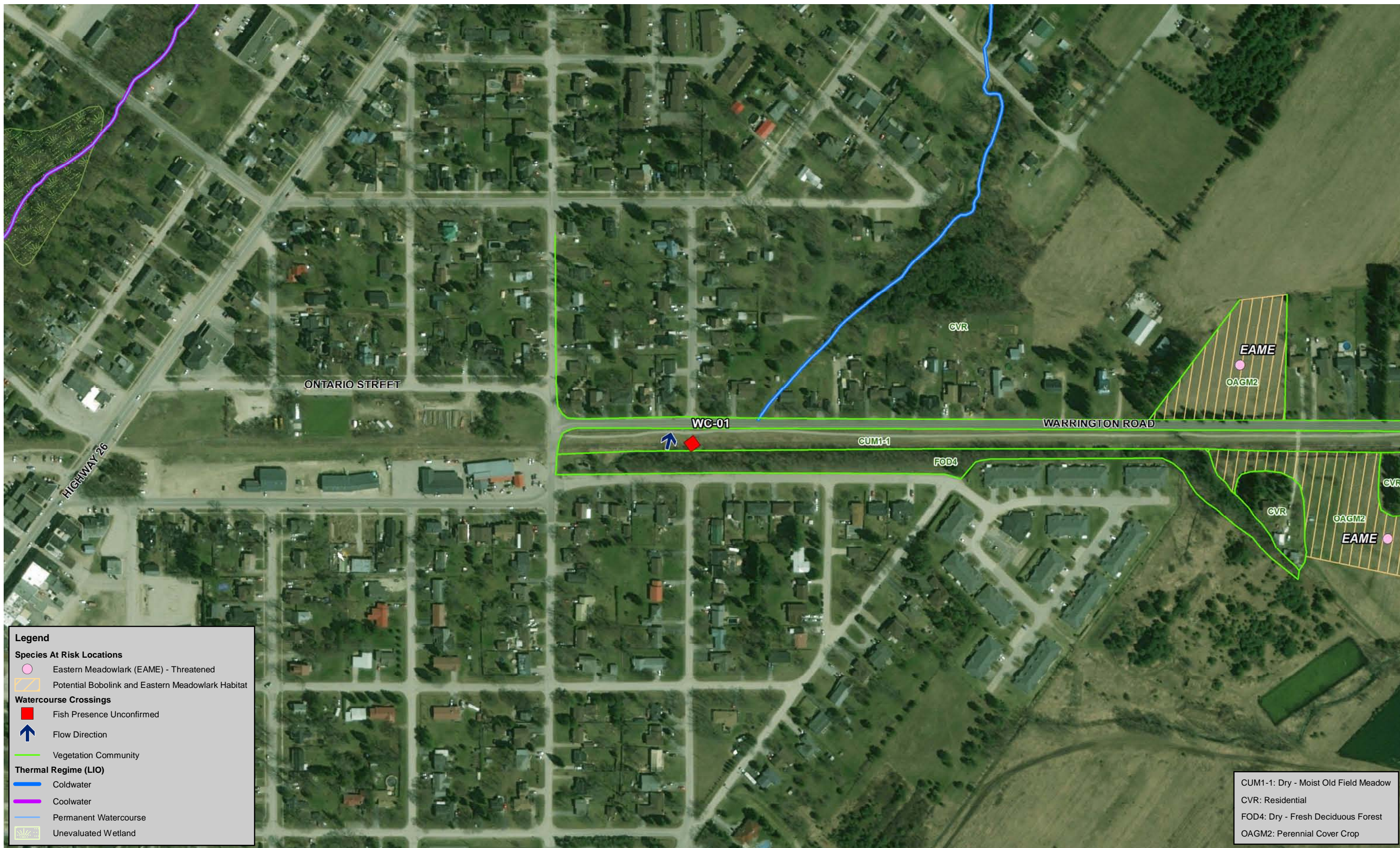
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APPENDIX

A FIGURES





Legend

Species At Risk Locations

- Eastern Meadowlark (EAME) - Threatened
- Potential Bobolink and Eastern Meadowlark Habitat

Watercourse Crossings

- Fish Presence Unconfirmed
- Flow Direction

Vegetation Community

- Coldwater
- Coolwater
- Permanent Watercourse
- Unevaluated Wetland

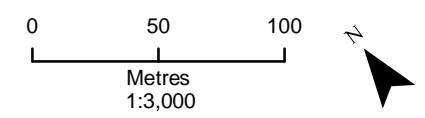
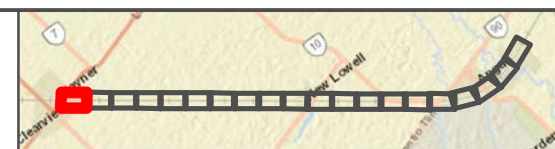
Thermal Regime (LIO)

- Coldwater
- Coolwater
- Permanent Watercourse
- Unevaluated Wetland

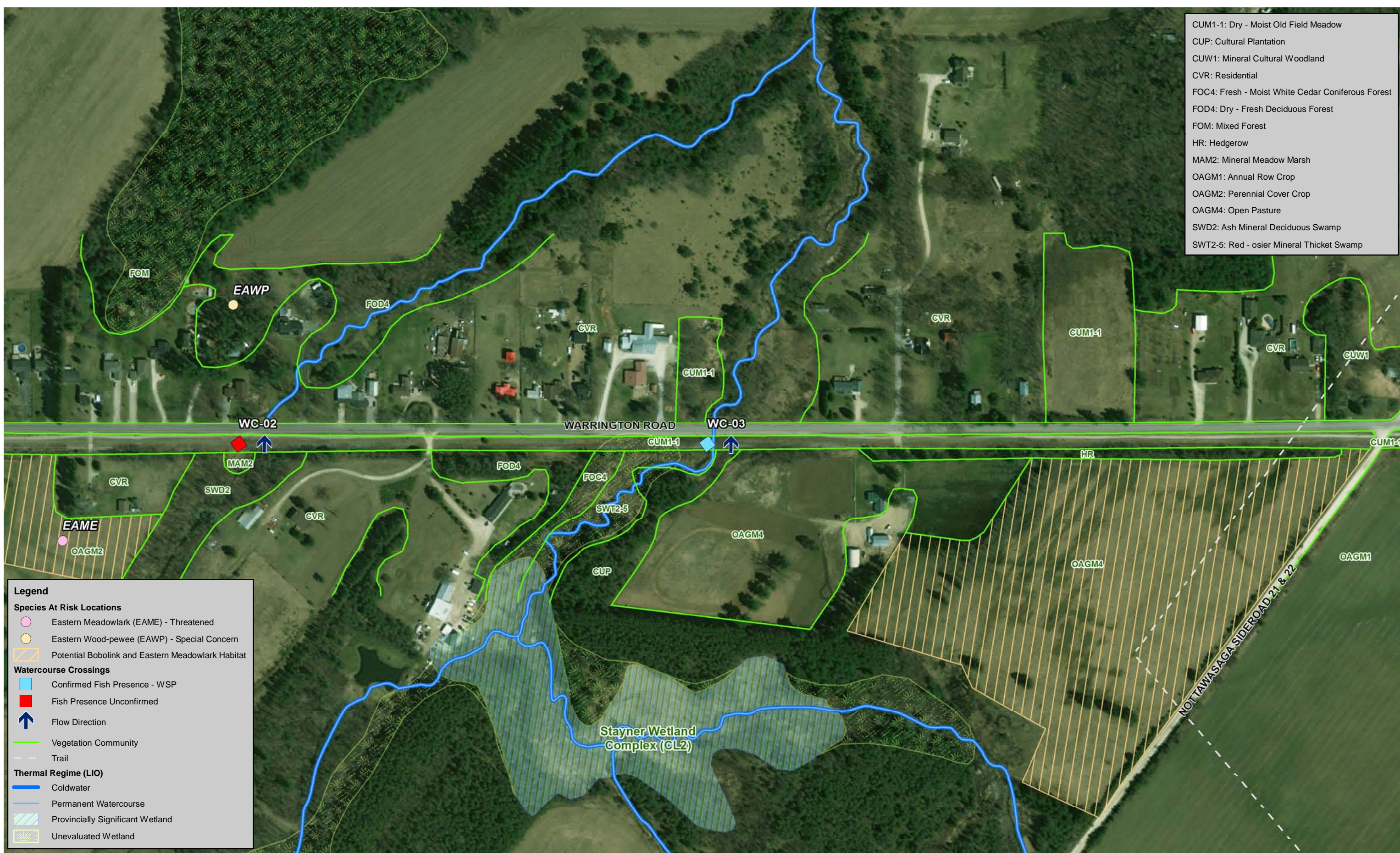
CUM1-1: Dry - Moist Old Field Meadow
 CVR: Residential
 FOD4: Dry - Fresh Deciduous Forest
 OAGM2: Perennial Cover Crop



**BARRIE TO COLLINGWOOD RAIL TRAIL
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- CUM1-1: Dry - Moist Old Field Meadow
- CUP: Cultural Plantation
- CUW1: Mineral Cultural Woodland
- CVR: Residential
- FOC4: Fresh - Moist White Cedar Coniferous Forest
- FOD4: Dry - Fresh Deciduous Forest
- FOM: Mixed Forest
- HR: Hedgerow
- MAM2: Mineral Meadow Marsh
- OAGM1: Annual Row Crop
- OAGM2: Perennial Cover Crop
- OAGM4: Open Pasture
- SWD2: Ash Mineral Deciduous Swamp
- SWT2-5: Red - osier Mineral Thicket Swamp

Legend

Species At Risk Locations

- Eastern Meadowlark (EAME) - Threatened
- Eastern Wood-pewee (EAWP) - Special Concern
- Potential Bobolink and Eastern Meadowlark Habitat

Watercourse Crossings

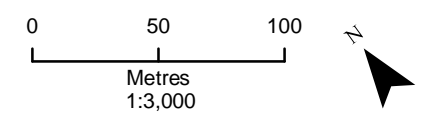
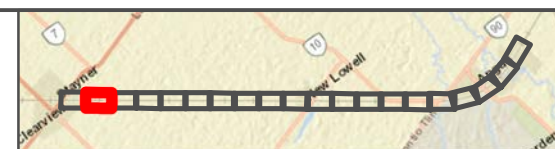
- Confirmed Fish Presence - WSP
- Fish Presence Unconfirmed
- ↑ Flow Direction
- Vegetation Community
- Trail

Thermal Regime (LIO)

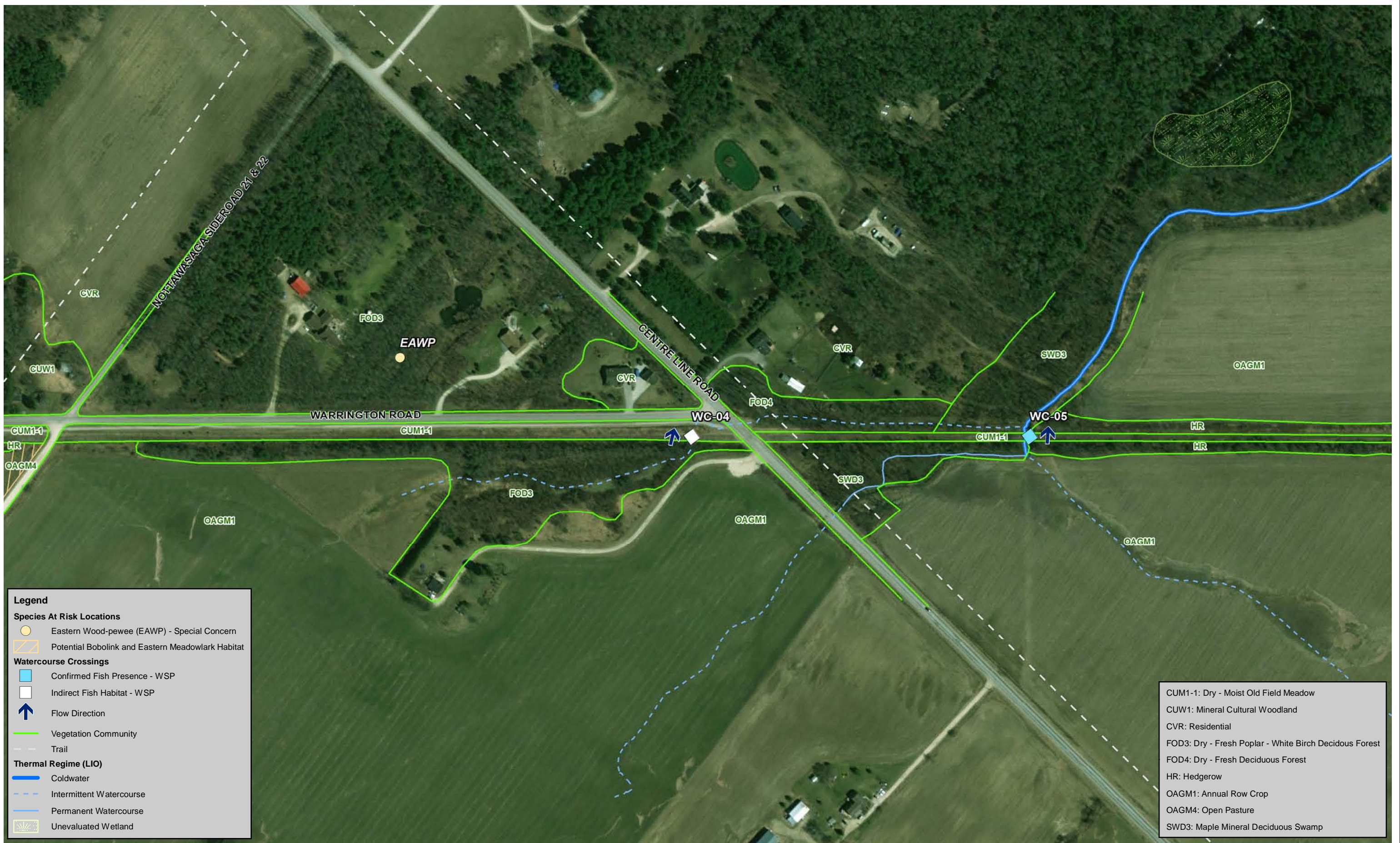
- Coldwater
- Permanent Watercourse
- Provincially Significant Wetland
- Unevaluated Wetland



**BARRIE TO COLLINGWOOD RAIL TRAIL
Environmental Features**



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Legend

Species At Risk Locations

- Eastern Wood-pewee (EAWP) - Special Concern
- Potential Bobolink and Eastern Meadowlark Habitat

Watercourse Crossings

- Confirmed Fish Presence - WSP
- Indirect Fish Habitat - WSP
- Flow Direction

Vegetation Community

- Vegetation Community
- Trail

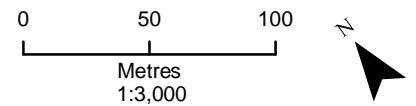
Thermal Regime (LIO)

- Coldwater
- Intermittent Watercourse
- Permanent Watercourse
- Unevaluated Wetland

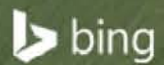
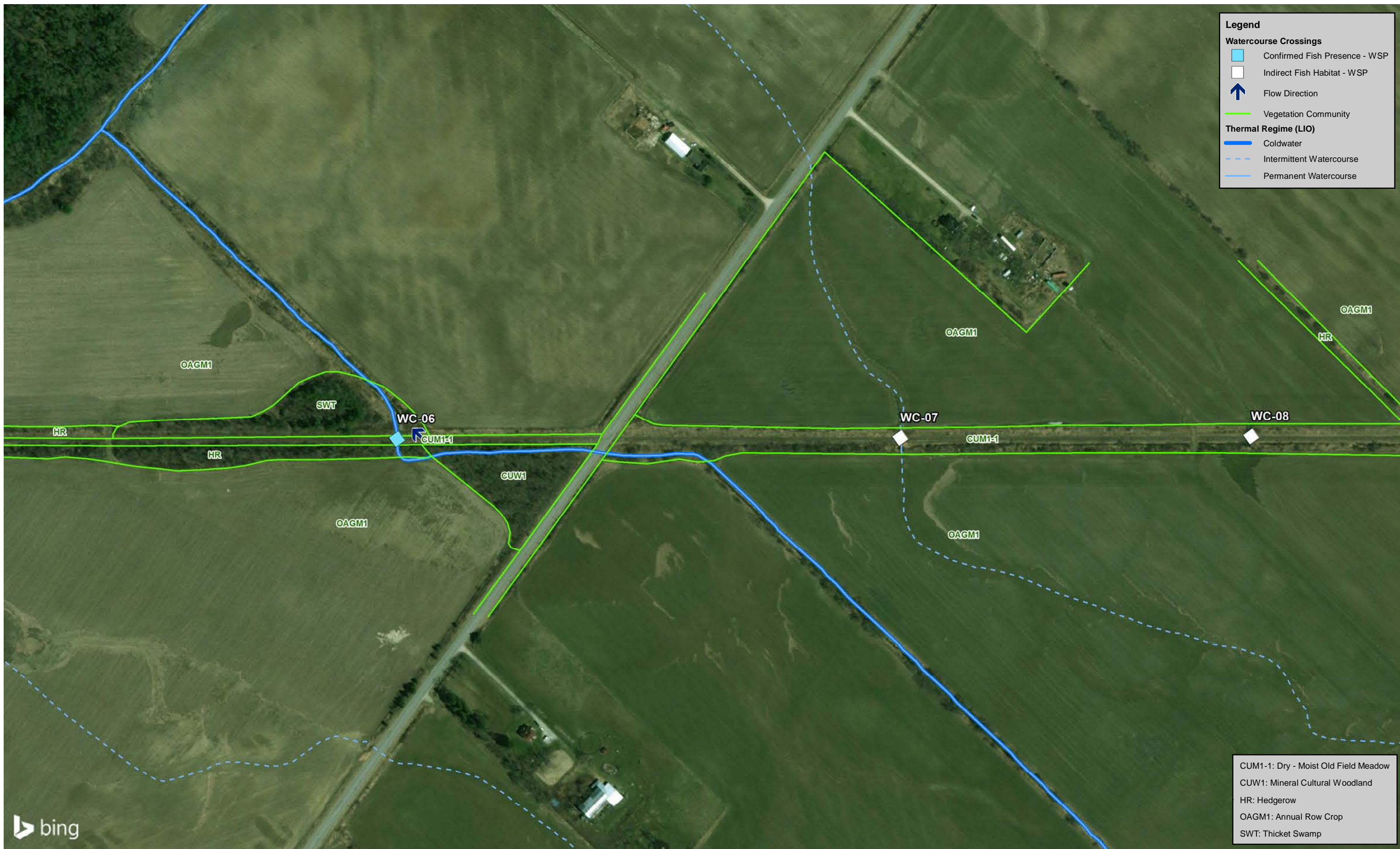
- CUM1-1: Dry - Moist Old Field Meadow
- CUW1: Mineral Cultural Woodland
- CVR: Residential
- FOD3: Dry - Fresh Poplar - White Birch Deciduous Forest
- FOD4: Dry - Fresh Deciduous Forest
- HR: Hedgerow
- OAGM1: Annual Row Crop
- OAGM4: Open Pasture
- SWD3: Maple Mineral Deciduous Swamp



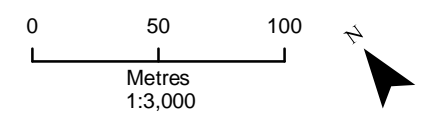
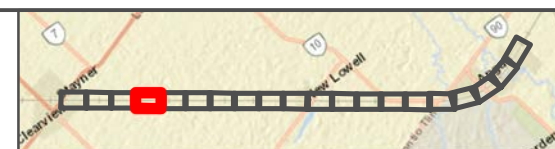
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Environmental Features**



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**BARRIE TO COLLINGWOOD RAIL TRAIL
Environmental Features**



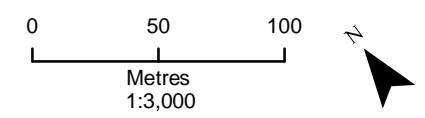
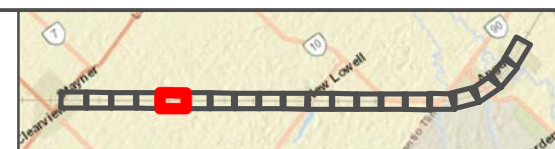
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 Figure No: 1-4



CUM1-1: Dry - Moist Old Field Meadow
 HR: Hedgerow
 OAGM1: Annual Row Crop
 OAGM2: Perennial Cover Crop
 SWD4: Mineral Deciduous Swamp



**BARRIE TO COLLINGWOOD RAIL TRAIL
 Environmental Features**



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CUM1-1: Dry - Moist Old Field Meadow
 OAGM1: Annual Row Crop
 OAGM2: Perennial Cover Crop
 SWD4: Mineral Deciduous Swamp
 SWM3: Birch - Poplar Mineral Mixed Swamp

Legend

Species At Risk Locations

- Bobolink (BOBO) - Threatened
- Eastern Ribbonsnake (EARI) - Special Concern
- Potential Bobolink and Eastern Meadowlark Habitat

Watercourse Crossings

- Confirmed Fish Presence - WSP
- Indirect Fish Habitat - WSP
- ↑ Flow Direction

Vegetation Community

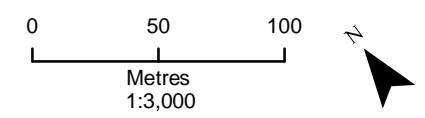
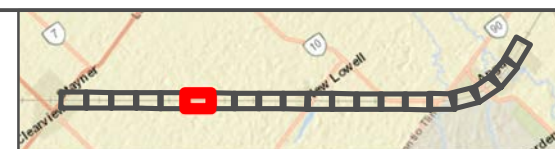
- Vegetation Community

Thermal Regime (LIO)

- Coldwater
- Intermittent Watercourse
- Permanent Watercourse
- Unevaluated Wetland








**BARRIE TO COLLINGWOOD RAIL TRAIL
 Environmental Features**



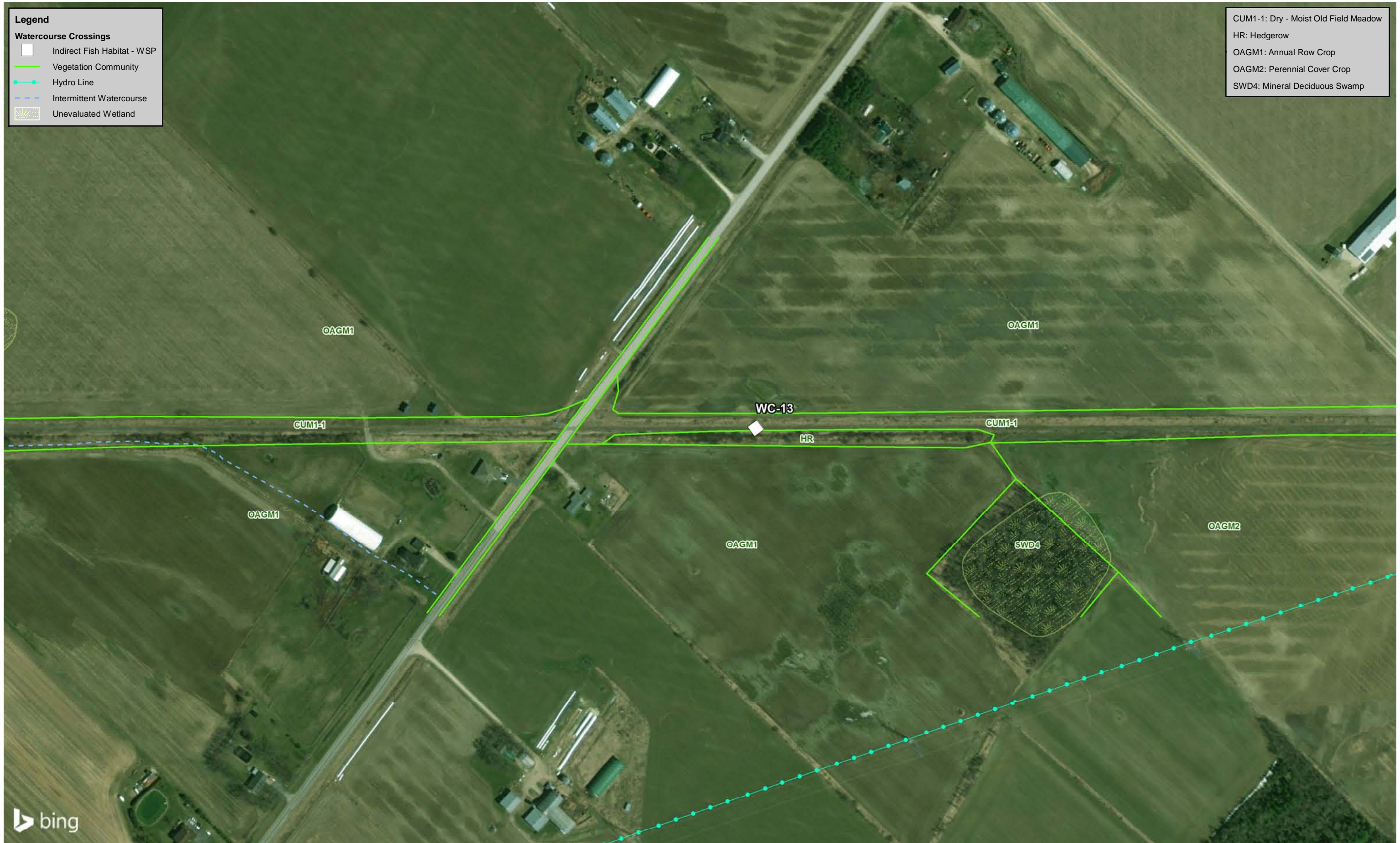
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Legend

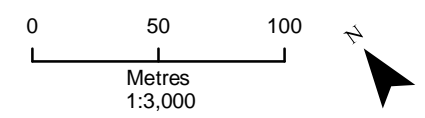
Watercourse Crossings

-  Indirect Fish Habitat - WSP
-  Vegetation Community
-  Hydro Line
-  Intermittent Watercourse
-  Unevaluated Wetland

- CUM1-1: Dry - Moist Old Field Meadow
- HR: Hedgerow
- OAGM1: Annual Row Crop
- OAGM2: Perennial Cover Crop
- SWD4: Mineral Deciduous Swamp



**BARRIE TO COLLINGWOOD RAIL TRAIL
Environmental Features**



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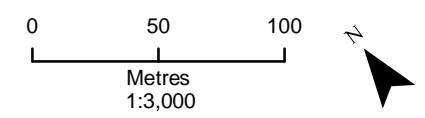
Legend

- Potential Bobolink and Eastern Meadowlark Habitat
- Watercourse Crossings**
- Confirmed Fish Presence - WSP
- Flow Direction
- Vegetation Community
- Hydro Line
- Permanent Watercourse
- Unevaluated Wetland

CUM1-1: Dry - Moist Old Field Meadow
 CUP3: Cultural Plantation
 CVR: Residential
 FOD: Deciduous Forest
 HR: Hedgerow
 OAGM1: Annual Row Crop
 OAGM2: Perennial Cover Crop
 OAGM4: Open Pasture
 SWM: Mixed Swamp
 SWT2-2: Willow Mineral Thicket Swamp












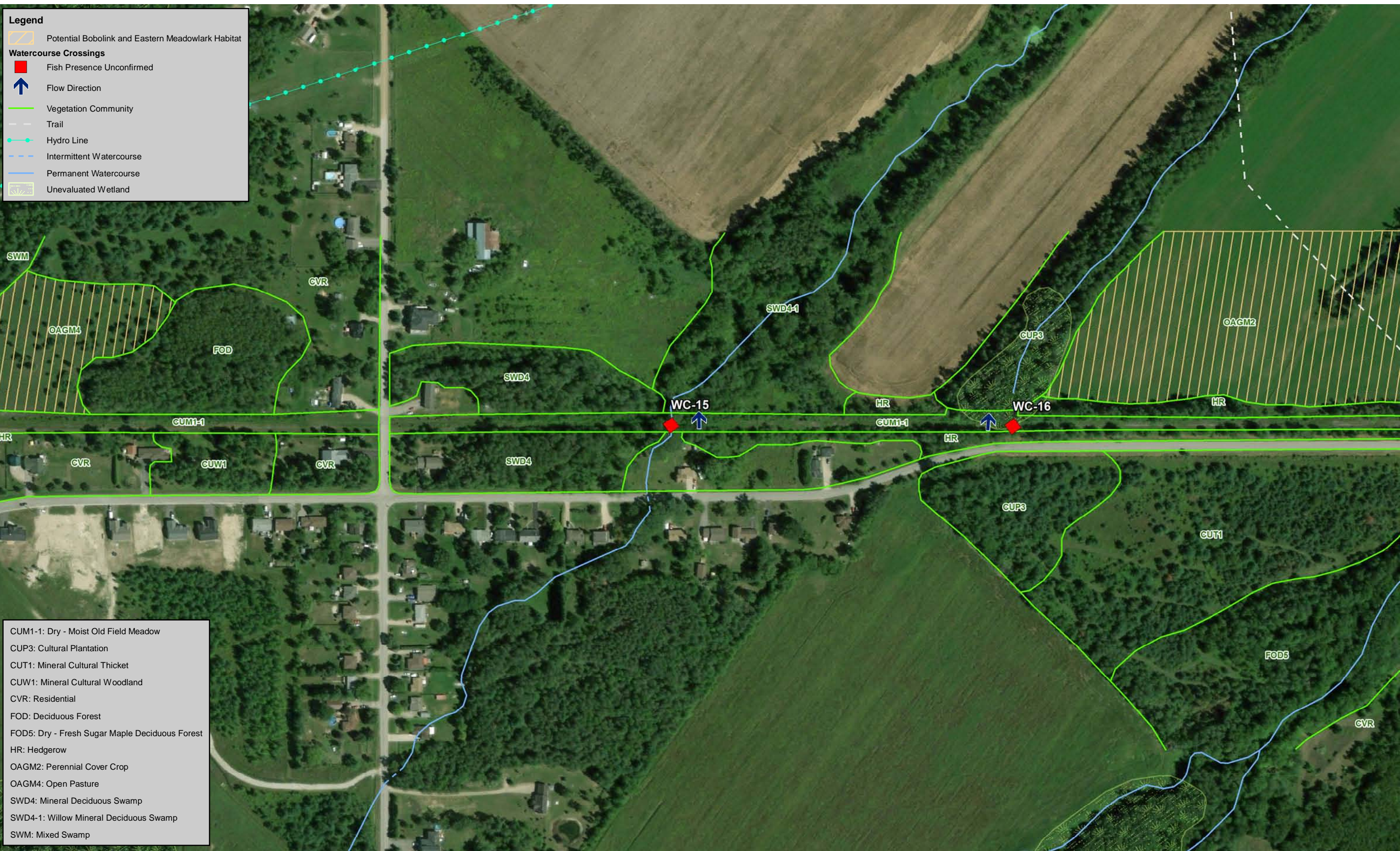
**BARRIE TO COLLINGWOOD RAIL TRAIL
 Environmental Features**



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Legend

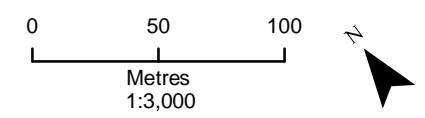
-  Potential Bobolink and Eastern Meadowlark Habitat
- Watercourse Crossings**
-  Fish Presence Unconfirmed
-  Flow Direction
-  Vegetation Community
-  Trail
-  Hydro Line
-  Intermittent Watercourse
-  Permanent Watercourse
-  Unevaluated Wetland



CUM1-1: Dry - Moist Old Field Meadow
 CUP3: Cultural Plantation
 CUT1: Mineral Cultural Thicket
 CUW1: Mineral Cultural Woodland
 CVR: Residential
 FOD: Deciduous Forest
 FOD5: Dry - Fresh Sugar Maple Deciduous Forest
 HR: Hedgerow
 OAGM2: Perennial Cover Crop
 OAGM4: Open Pasture
 SWD4: Mineral Deciduous Swamp
 SWD4-1: Willow Mineral Deciduous Swamp
 SWM: Mixed Swamp



**BARRIE TO COLLINGWOOD RAIL TRAIL
 Environmental Features**



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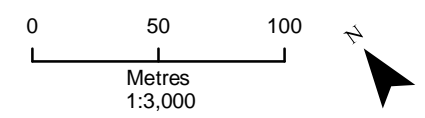
Legend

- Potential Bobolink and Eastern Meadowlark Habitat
- Watercourse Crossings**
- Fish Presence Unconfirmed
- Flow Direction
- Vegetation Community
- Trail
- Intermittent Watercourse
- Permanent Watercourse
- Unevaluated Wetland

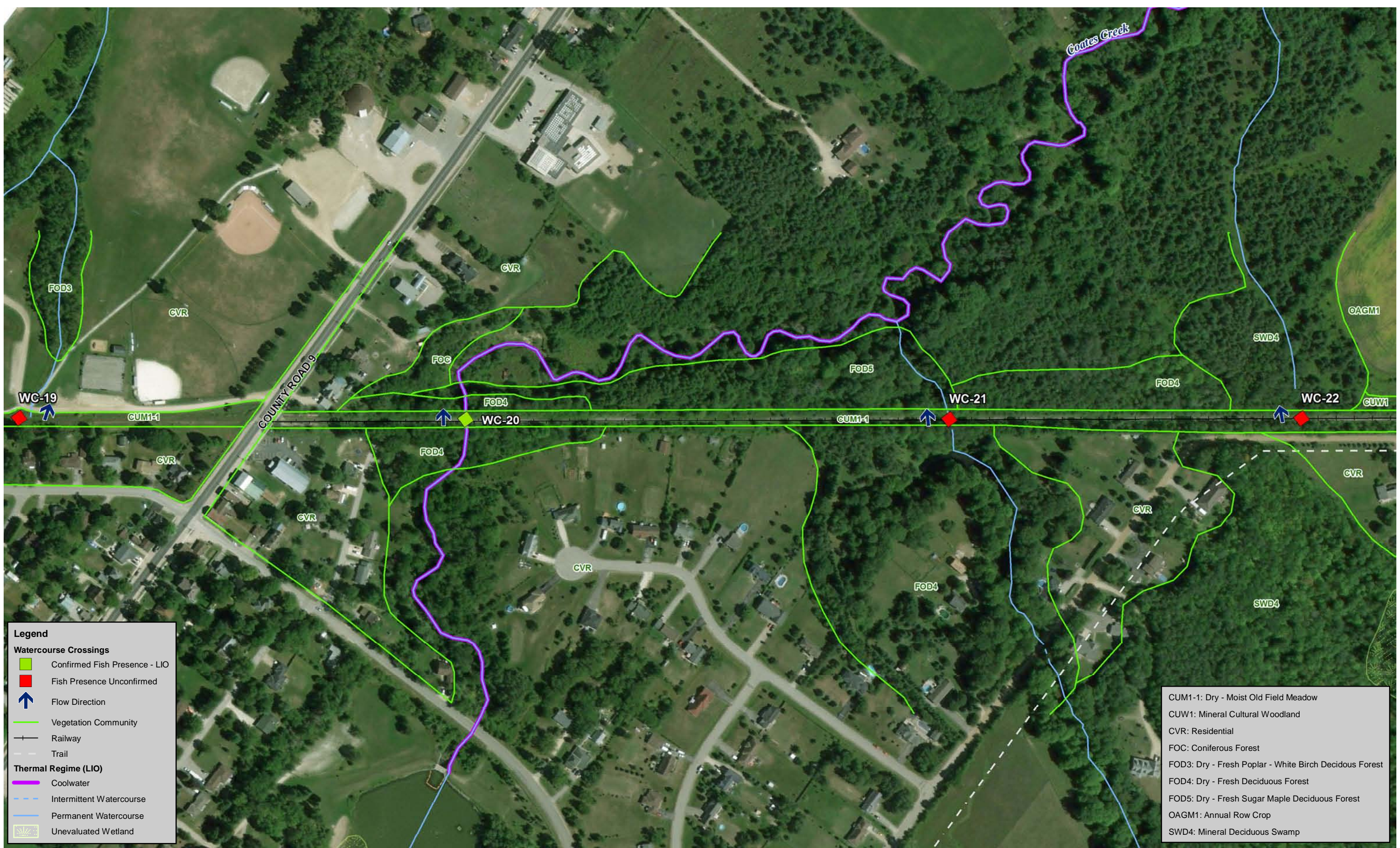
- CUM1-1: Dry - Moist Old Field Meadow
- CUT1: Mineral Cultural Thicket
- CVC: Commercial
- CVR: Residential
- FOD3: Dry - Fresh Poplar - White Birch Deciduous Forest
- FOD5: Dry - Fresh Sugar Maple Deciduous Forest
- HR: Hedgerow
- MAM2-2: Reed - canary Grass Mineral Meadow Marsh
- OAGM1: Annual Row Crop
- OAGM2: Perennial Cover Crop
- OAGM4: Open Pasture
- SWD2: Ash Mineral Deciduous Swamp
- SWD3: Maple Mineral Deciduous Swamp
- SWD4-1: Willow Mineral Deciduous Swamp
- SWD4-3: White Birch - Poplar Mineral Deciduous Swamp



BARRIE TO COLLINGWOOD RAIL TRAIL
Environmental Features



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Legend

Watercourse Crossings

- Confirmed Fish Presence - LIO
- Fish Presence Unconfirmed
- ↑ Flow Direction
- Vegetation Community
- Railway
- - - Trail

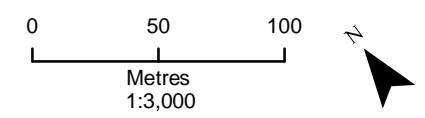
Thermal Regime (LIO)

- Coolwater
- - - Intermittent Watercourse
- Permanent Watercourse
- Unevaluated Wetland

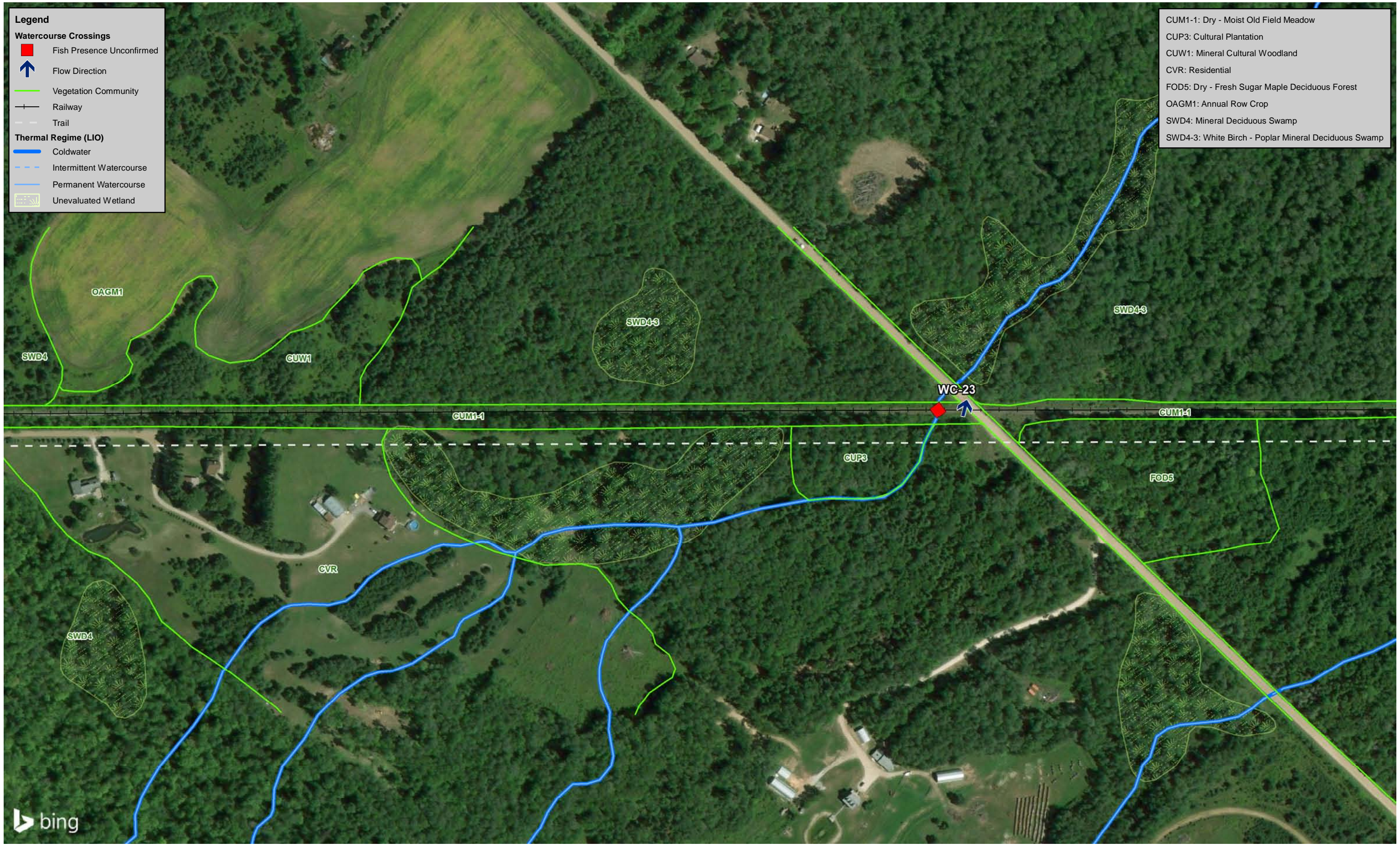
- CUM1-1: Dry - Moist Old Field Meadow
- CUW1: Mineral Cultural Woodland
- CVR: Residential
- FOC: Coniferous Forest
- FOD3: Dry - Fresh Poplar - White Birch Deciduous Forest
- FOD4: Dry - Fresh Deciduous Forest
- FOD5: Dry - Fresh Sugar Maple Deciduous Forest
- OAGM1: Annual Row Crop
- SWD4: Mineral Deciduous Swamp



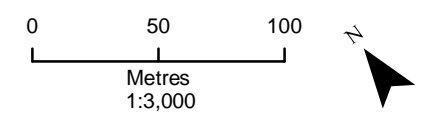
**BARRIE TO COLLINGWOOD RAIL TRAIL
Environmental Features**



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BARRIE TO COLLINGWOOD RAIL TRAIL
Environmental Features



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Figure No: 1-12



Legend

Species At Risk Locations

- Eastern Wood-pewee (EAWP) - Special Concern

Watercourse Crossings

- Confirmed Fish Presence - WSP
- Fish Presence Unconfirmed
- Flow Direction

Vegetation Community

- Railway
- Trail

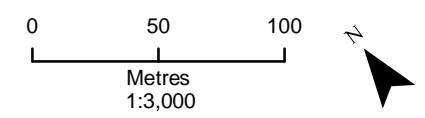
Thermal Regime (LIO)

- Coldwater
- Intermittent Watercourse
- Permanent Watercourse
- Unevaluated Wetland

CUM1-1: Dry - Moist Old Field Meadow
 CUP3: Cultural Plantation
 CVR: Residential
 FOD3: Dry - Fresh Poplar - White Birch Deciduous Forest
 MAM3: Organic Meadow Marsh
 SWD4-3: White Birch - Poplar Mineral Deciduous Swamp
 SWT: Thicket Swamp



**BARRIE TO COLLINGWOOD RAIL TRAIL
 Environmental Features**



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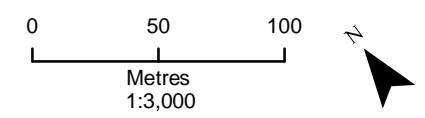
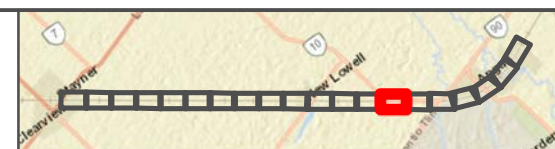
Legend

- Potential Bobolink and Eastern Meadowlark Habitat
- Vegetation Community
- Railway
- Trail
- Intermittent Watercourse
- Permanent Watercourse
- Provincially Significant Wetland
- Unevaluated Wetland

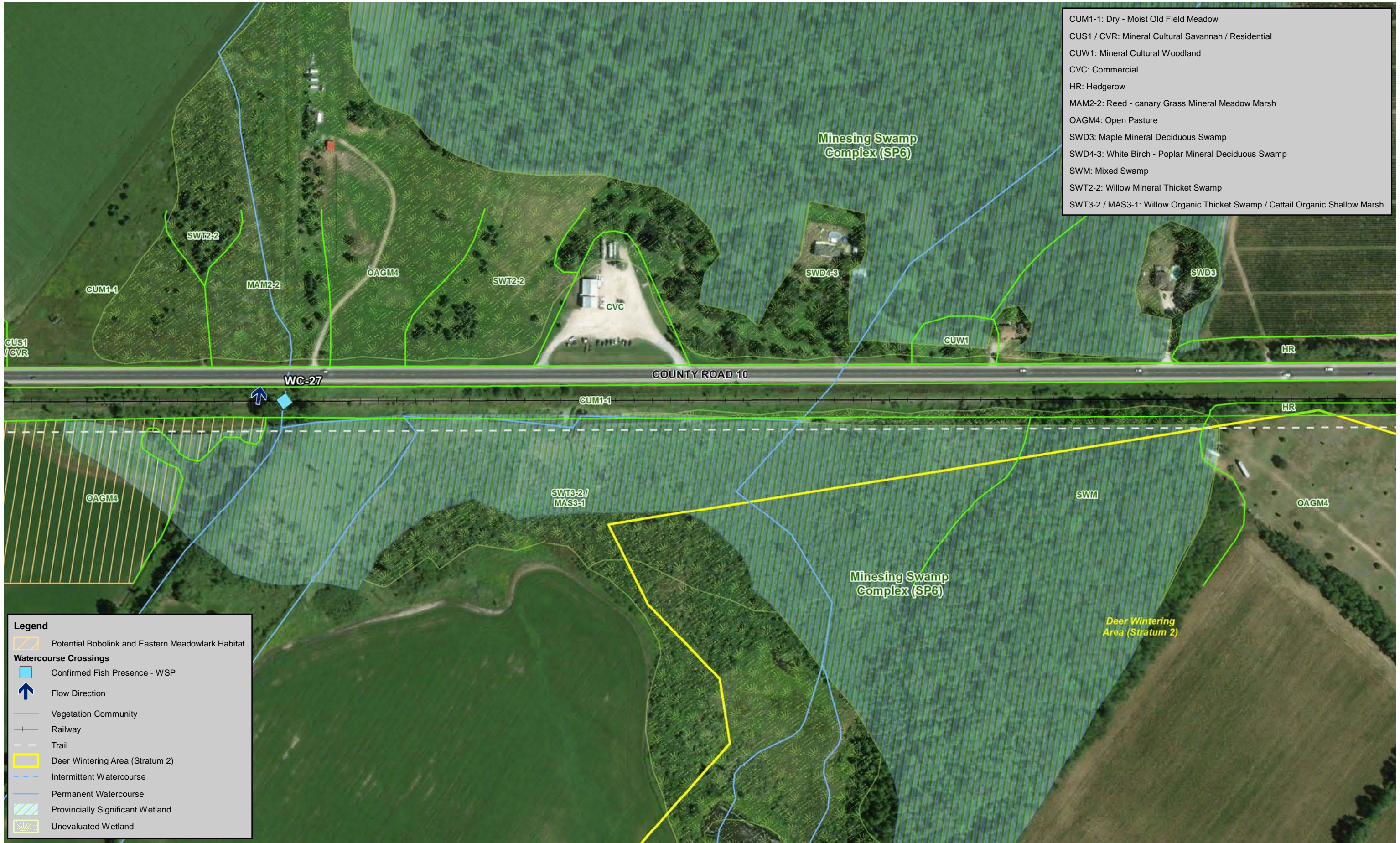
CUM1-1: Dry - Moist Old Field Meadow
 CUP3: Cultural Plantation
 CUS1 / CVR: Mineral Cultural Savannah / Residential
 CVR: Residential
 OAGM1: Annual Row Crop
 OAGM4: Open Pasture
 SWT: Thicket Swamp



BARRIE TO COLLINGWOOD RAIL TRAIL
 Environmental Features



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 Figure No: 1-14



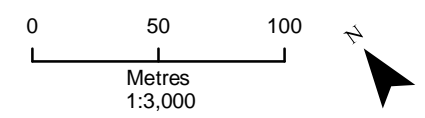
- CUM1-1: Dry - Moist Old Field Meadow
- CUS1 / CVR: Mineral Cultural Savannah / Residential
- CUW1: Mineral Cultural Woodland
- CVC: Commercial
- HR: Hedgerow
- MAM2-2: Reed - canary Grass Mineral Meadow Marsh
- OAGM4: Open Pasture
- SWD3: Maple Mineral Deciduous Swamp
- SWD4-3: White Birch - Poplar Mineral Deciduous Swamp
- SWM: Mixed Swamp
- SWT2-2: Willow Mineral Thicket Swamp
- SWT3-2 / MAS3-1: Willow Organic Thicket Swamp / Cattail Organic Shallow Marsh

Legend

- Potential Bobolink and Eastern Meadowlark Habitat
- Watercourse Crossings**
- Confirmed Fish Presence - WSP
- Flow Direction
- Vegetation Community
- Railway
- Trail
- Deer Wintering Area (Stratum 2)
- Intermittent Watercourse
- Permanent Watercourse
- Provincially Significant Wetland
- Unevaluated Wetland



**BARRIE TO COLLINGWOOD RAIL TRAIL
Environmental Features**



Date: October 2018
 Project No: 18M-00965-00
 Figure No: 1-15



Legend

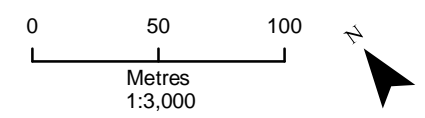
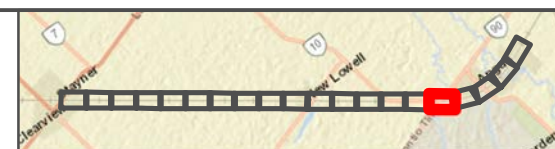
Watercourse Crossings

- Confirmed Fish Presence - LIO
- ↑ Flow Direction
- Vegetation Community
- Railway
- - - Trail
- Deer Wintering Area (Stratum 2)
- Deer Yard (Stratum 1)
- Permanent Watercourse
- Provincially Significant Wetland
- Unevaluated Wetland

- CUM1-1: Dry - Moist Old Field Meadow
- CUP3: Cultural Plantation
- CUW1: Mineral Cultural Woodland
- CVR: Residential
- FOD4: Dry - Fresh Deciduous Forest
- HR: Hedgerow
- OAGM4: Open Pasture
- SWD3: Maple Mineral Deciduous Swamp
- SWD4: Mineral Deciduous Swamp



**BARRIE TO COLLINGWOOD RAIL TRAIL
Environmental Features**



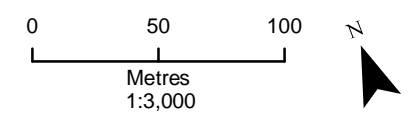
Date: October 2018
 Project No: 18M-00965-00
 Figure No: 1-16

Legend

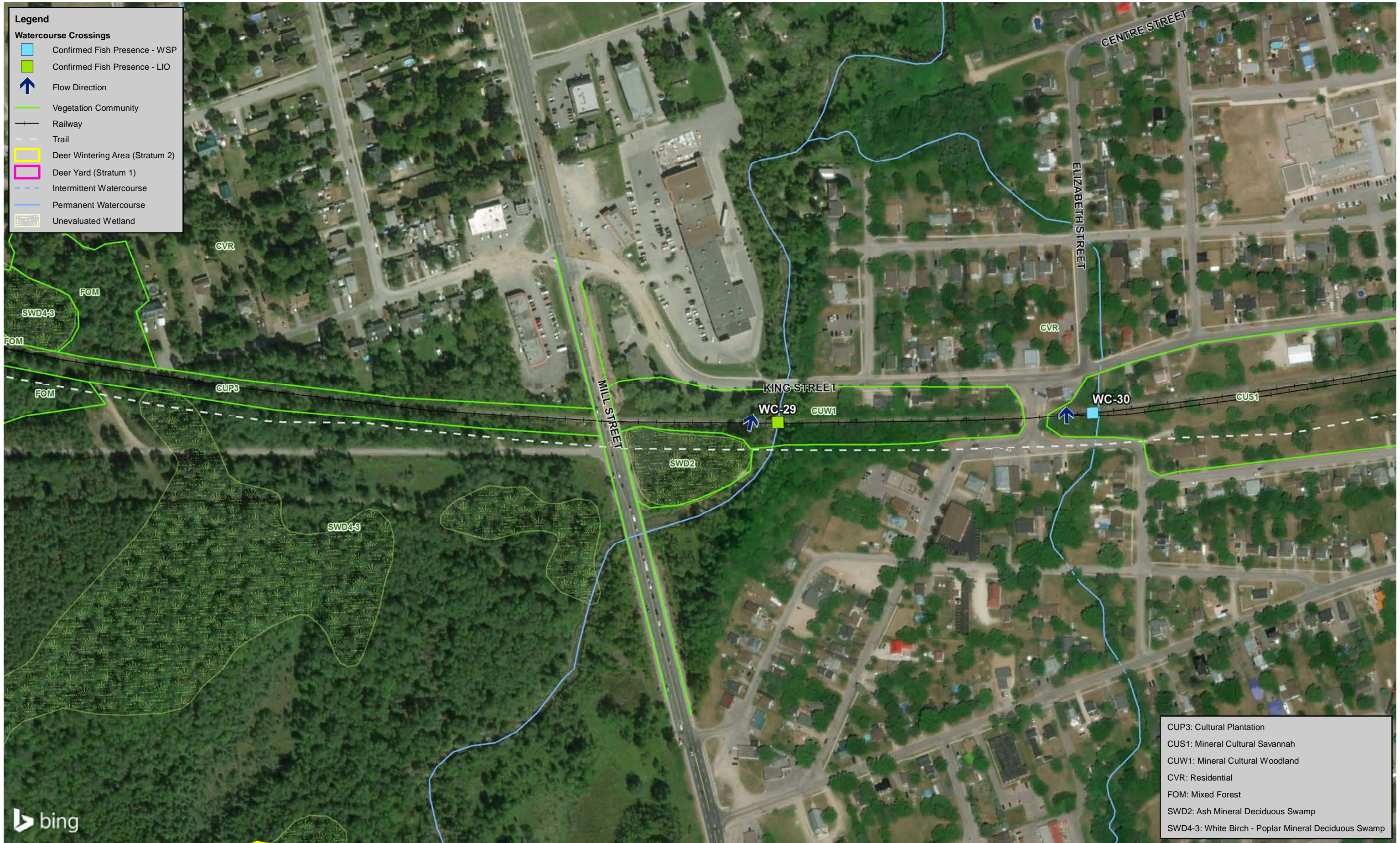
- Vegetation Community
- Railway
- Trail
- Unevaluated Wetland



**BARRIE TO COLLINGWOOD RAIL TRAIL
Environmental Features**



Date: October 2018
Project No: 18M-00965-00
Figure No: 1-17

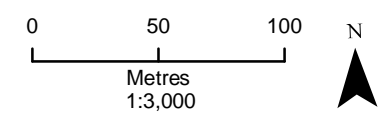
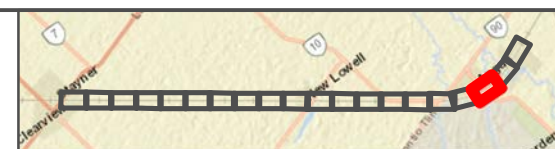


- Legend**
- Watercourse Crossings**
- Confirmed Fish Presence - WSP
 - Confirmed Fish Presence - LIO
 - ↑ Flow Direction
 - Vegetation Community
 - Railway
 - - - Trail
 - Deer Wintering Area (Stratum 2)
 - Deer Yard (Stratum 1)
 - Intermittent Watercourse
 - Permanent Watercourse
 - Unevaluated Wetland

- CUP3: Cultural Plantation
- CUS1: Mineral Cultural Savannah
- CUW1: Mineral Cultural Woodland
- CVR: Residential
- FOM: Mixed Forest
- SWD2: Ash Mineral Deciduous Swamp
- SWD4-3: White Birch - Poplar Mineral Deciduous Swamp



BARRIE TO COLLINGWOOD RAIL TRAIL
Environmental Features



Date: October 2018
Project No: 18M-00965-00
Figure No: 1-18



Legend

Species At Risk Locations

- Eastern Wood-pewee (EAWP) - Special Concern
- Monarch (MONA) - Special Concern

Watercourse Crossings

- Confirmed Fish Presence - LIO
- Flow Direction

Vegetation Community

Railway

Trail

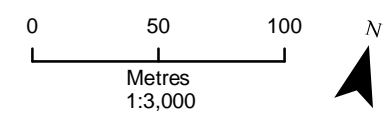
Permanent Watercourse

Unevaluated Wetland

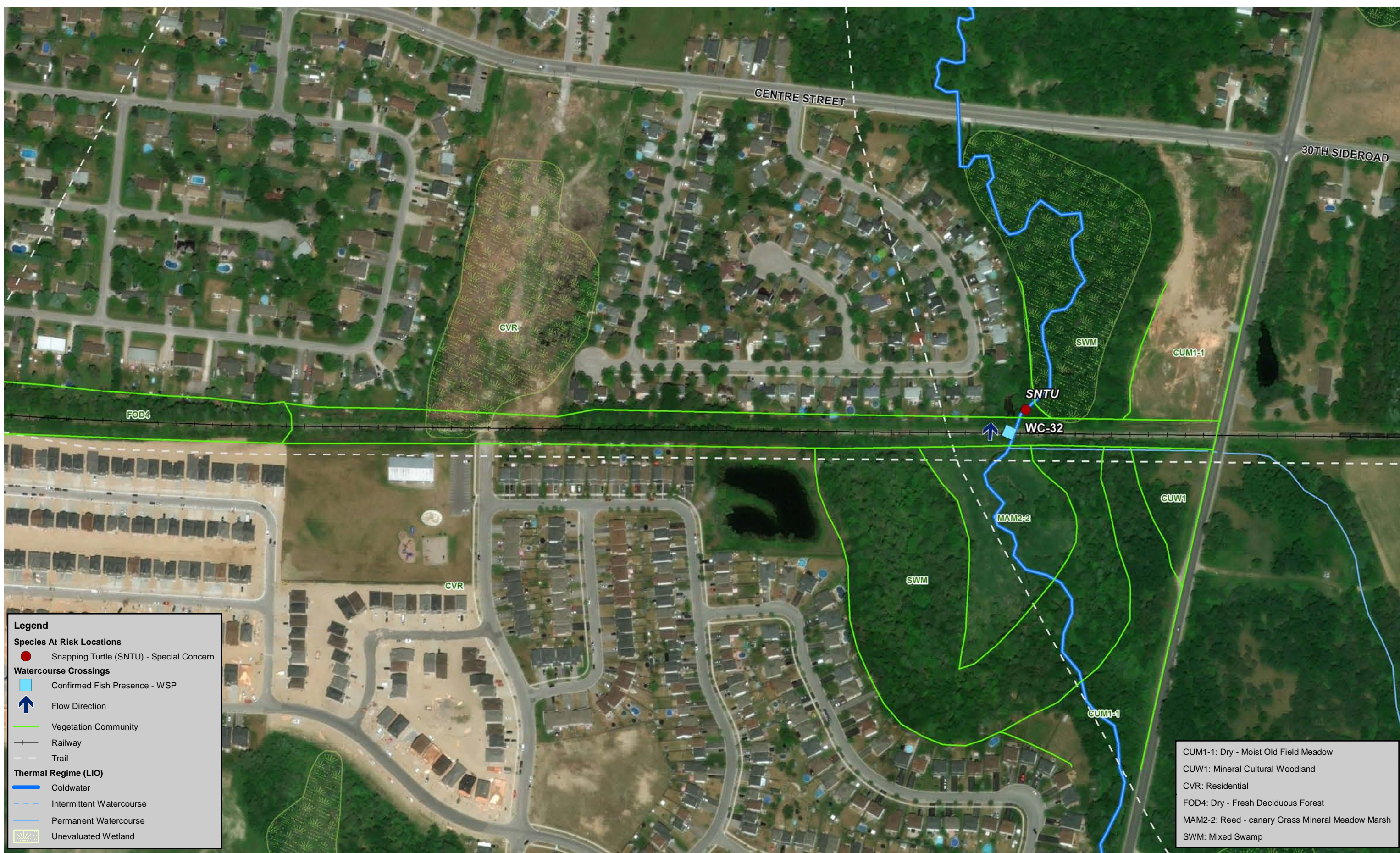
CUM1-1: Dry - Moist Old Field Meadow
 CUS1: Mineral Cultural Savannah
 CUW1: Mineral Cultural Woodland
 CVR: Residential
 FOD4: Dry - Fresh Deciduous Forest
 FOD5: Dry - Fresh Sugar Maple Deciduous Forest



**BARRIE TO COLLINGWOOD RAIL TRAIL
 Environmental Features**



Date: October 2018
 Project No: 18M-00965-00
 Figure No: 1-19



Legend

Species At Risk Locations

- Snapping Turtle (SNTU) - Special Concern

Watercourse Crossings

- Confirmed Fish Presence - WSP
- ↑ Flow Direction

Vegetation Community

- (Green outline)

Railway

- (Black dashed line)

Trail

- (Grey dashed line)

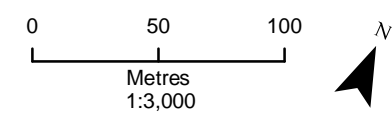
Thermal Regime (LIO)

- (Blue line) Coldwater
- (Light blue dashed line) Intermittent Watercourse
- (Blue line) Permanent Watercourse
- (Yellow with green pattern) Unevaluated Wetland

CUM1-1: Dry - Moist Old Field Meadow
 CUW1: Mineral Cultural Woodland
 CVR: Residential
 FOD4: Dry - Fresh Deciduous Forest
 MAM2-2: Reed - canary Grass Mineral Meadow Marsh
 SWM: Mixed Swamp



**BARRIE TO COLLINGWOOD RAIL TRAIL
 Environmental Features**



Date: October 2018
 Project No: 18M-00965-00
 Figure No: 1-20

APPENDIX

B

AGENCY
CORRESPONDENCE



2018-05-23

Shawn Carey – District Manager
Ontario Ministry of Natural Resources and Forestry, Midhurst District
2284 Nursery Road
Midhurst, ON, L9X 1N8

Dear Mr. Carey:

WSP Canada Group Limited (WSP) has been retained by the County of Simcoe to complete the preliminary design to convert a portion of a railway corridor that is no longer in use to a multi-use trail. The study area is located between Angus and Stayner and is situated within the jurisdiction of the Ontario Ministry of Natural Resources, Midhurst District. We are contacting you as a first step in gathering any available natural heritage information pertinent to the study area.

In fulfillment of the preliminary design tasks, updated ecological background information is required for the study area (see attached map). As such, we are formally contacting you to request any available natural heritage information pertinent to the study area.

Information we are seeking includes:

Terrestrial

- Wildlife and vegetation species observation records;
- Sensitive wildlife habitat locations (nesting/breeding/hibernation);
- Sensitive avian nesting sites;
- ELC community information

Aquatics

- Fish/mussel species information within the waterbodies that traverse the study area;
- Thermal regimes of watercourse traversing the study area;
- Potential sensitive habitats (spawning/rearing/foraging) in the vicinity of the study area;
- Any management plans, watershed reports or other background reports relevant to the study area

Species at Risk (SAR)

- Locations, observation dates and any other relevant information about SAR – if possible, please provide the UTM's/accuracy codes; and
- Locally rare species lists or species records known from the study area.



If further information is required, please feel free to contact the undersigned at 519-904-1798 or through email at steven.leslie2@wsp.com. Thank you for your assistance, it is greatly appreciated.

Yours sincerely,

A handwritten signature in black ink that reads "Steven Leslie".

Steven Leslie
Ecologist

cc: Rebecca Hay, WSP



Barrie-Collingwood Railway Multi-Use Trail Preliminary Design

MAY 2018



CONTEXT

From: **Benvenuti, Jodi (MNRF)** <jodi.benvenuti@ontario.ca>
To: **Leslie, Steven** <Steven.Leslie2@wsp.com>
Subject: RE: Barrie - Collingwood Rail Trail - Natural Heritage Information Request
Date: 04.10.2018 14:54:15 (+0000)
Attachments: Barrie-Collingwood Trail - MNRF Information Request.pdf (6 pages),
SimcoeCounty_SAR-2018-10-04.xlsx (1 page)

Hello Steven,

Midhurst District has no additional information for this area other than what can be found online using the following data sources and tools:

Land Information Ontario : <https://www.ontario.ca/page/land-information-ontario>

Make a Map: Natural Heritage Areas :

[http://www.gisapplication.lrc.gov.on.ca/mamnh/Index.html?](http://www.gisapplication.lrc.gov.on.ca/mamnh/Index.html?site=MNR_NHLUPS_NaturalHeritage&viewer=NaturalHeritage&locale=en-US)

[site=MNR_NHLUPS_NaturalHeritage &viewer=NaturalHeritage &locale=en-US](http://www.gisapplication.lrc.gov.on.ca/mamnh/Index.html?site=MNR_NHLUPS_NaturalHeritage&viewer=NaturalHeritage&locale=en-US) . Natural Heritage Information Centre (NHIC) data is also available through this interactive map tool.

With respect to species at risk, given the context of the private landscape the project falls within, the Ministry of Natural Resources and Forestry (MNRF) rarely has species at risk (SAR) records on individually owned private parcels. The SAR records we do have, which are also available to the public through the Natural Heritage Information Centre, are for known or reported observations only and therefore do not provide a complete picture of where SAR occur on the landscape. As a result, although there may be no records or confirmation of SAR on a property it does not mean they are not present if appropriate habitat exists . The onus is on the proponent to identify potential SAR, potential SAR habitats and the potential impacts to SAR of their project based on its scale and scope and to carry out any appropriate further studies. MNRF is willing and available to advise proponents if their information is complete, to provide additional information/knowledge the District office might be in possession of, and to advise on mitigation strategies or actions moving forward.

Attached for your reference is a table of SAR known to occur in Simcoe County.

Jodi Benvenuti
Management Biologist
Ministry of Natural Resources and Forestry
Midhurst District
Phone: (705) 725-7513

From: Leslie, Steven [mailto:Steven.Leslie2@wsp.com]
Sent: May 23, 2018 10:31 AM
To: Carey, Shawn (MNRF)
Cc: Hay, Rebecca
Subject: Barrie - Collingwood Rail Trail - Natural Heritage Information Request

Hello Mr. Carey,

My name is Steven Leslie and I am an ecologist with WSP. I found your contact information on the MNRF website, if this request should be sent to someone else at your organization please let me know.

Our firm has been hired to complete the preliminary design for the creation of a new trail along a rail corridor that

is no longer in use between Angus and Stayner. As part of the natural environment component of this work, our group requires updating ecological information pertinent to the study area. The attached letter and map details the information that we are requesting, if available.

If there are any questions or concerns, please do not hesitate to contact me.

Thank you,

Steven Leslie, B.E.S.

Ecologist

Ecology & Environmental Impact Assessment (EIA)



T + 1 519-904-1798

582 Lancaster Street West
Kitchener, Ontario,
N2K 1M3 Canada

wsp.com

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-LAEmHhHzdJzBITWfa4Hgs7pbKI

SPECIES AT RISK IN SIMCOE COUNTY

Status for species as per the provincial ****Species at Risk in Ontario (SARO) List**

SARO List - <https://www.ontario.ca/environment-and-energy/species-risk-ontario-list>

END - Endangered, **THR** - Threatened, **SC** - Special Concern

TAXA	SPECIES	STATUS	HABITAT PROTECTION UNDER ESA
Amphibian	Jefferson Salamander	THR	Regulated
Bird	Bald Eagle	SC	N/A
Bird	Barn Swallow	THR	General
Bird	Bank Swallow	THR	General
Bird	Black Tern	SC	N/A
Bird	Bobolink	THR	General
Bird	Canada Warbler	SC	N/A
Bird	Cerulean Warbler	THR	General
Bird	Chimney Swift	THR	General
Bird	Common Nighthawk	SC	N/A
Bird	Eastern Meadowlark	THR	General
Bird	Eastern Wood-Pewee	SC	N/A
Bird	Evening Grosbeak	SC	N/A
Bird	Golden-winged Warbler	SC	N/A
Bird	Grasshopper Sparrow	SC	N/A
Bird	Henslow's Sparrow	END	General
Bird	Hooded Warbler	SC	N/A
Bird	King Rail	END	General
Bird	Least Bittern	THR	General
Bird	Loggerhead Shrike	END	General
Bird	Louisiana Waterthrush	SC	N/A
Bird	Olive-sided Flycatcher	SC	N/A
Bird	Piping Plover	END	General
Bird	Red-headed Woodpecker	SC	N/A
Bird	Short-eared Owl	SC	N/A
Bird	Whip-poor-will	THR	General
Bird	Wood Thrush	SC	N/A
Bird	Yellow Rail	SC	N/A
Fish	American Eel	END	General
Fish	Grass Pickerel	SC	N/A
Fish	Lake Sturgeon	END	General
Fish	Northern Brook Lamprey	SC	N/A
Insect	Hine's Emerald	END	General
Insect	Monarch Butterfly	SC	N/A
Insect	West Virginia White	SC	N/A
Insect	Lake Huron Grasshopper	THR	General
Mammal	American Badger	END	Regulated

Mammal	Eastern Small-footed Bat	END	General
Mammal	Little Brown Bat	END	General
Mammal	Northern Long-eared Bat	END	General
Mammal	Tri-coloured Bat	END	General
Plant	*American Ginseng	END	General
Plant	American Hart's-tongue Fern	SC	N/A
Plant	Butternut	END	General
Plant	Eastern Prairie-fringed Orchid	END	Regulated
Plant	Engelmann's Quillwort	END	Regulated
Plant	Forked Three-awned Grass	END	General
Plant	Hill's Thistle	THR	General
Plant	Spotted Wintergreen	END	General
Reptile	Blanding's Turtle	THR	General
Reptile	Eastern Foxsnake (Georgian Bay Population)	THR	General
Reptile	Eastern Hog-nosed Snake	THR	General
Reptile	Eastern Musk Turtle (Stinkpot)	SC	N/A
Reptile	Eastern Ribbonsnake	SC	N/A
Reptile	Five-lined Skink (Georgian Bay Pop.)	SC	N/A
Reptile	Massasauga (Great Lakes - St. Lawrence population)	THR	General
Reptile	Northern Map Turtle	SC	N/A
Reptile	Snapping Turtle	SC	N/A
Reptile	*Spotted Turtle	END	General
Reptile	*Wood Turtle	END	Regulated

IMPORTANT NOTES AND DEFINITIONS:

This list is based on known occurrences of species at risk or species that MNR believes there is a strong likelihood of being present and may therefore not be completely exhaustive.

**Species at Risk in Ontario (SARO) List - This list is subject to change and should therefore be checked periodically for updates.

* Information for these species is provided on a County-wide basis only due to the sensitive nature of the specific locations. For additional information please contact Midhurst District Biologists.

General Habitat Protection - areas that a species currently depends on to carry out its life processes. These areas may include dens and nests, wetlands, forests and other areas essential for breeding, rearing, feeding, hibernation and migration.

Regulated Habitat - species specific habitat regulations can be found on the SARO List

N/A = Habitat protection is not provided for Special Concern species under the *Endangered Species Act* however approval authorities should ensure that Planning Act decisions consider the significant habitat of Special Concern species as potential significant wildlife habitat (as per the Provincial Policy Statement).



2018-10-03

Mike Francis
Nottawasaga Valley Conservation Authority
8195 8th Line
Utopia, ON, L0M 1T0

Dear Mr. Francis:

WSP Canada Group Limited (WSP) has been retained by the County of Simcoe to complete the preliminary design to convert a portion of a railway corridor that is no longer in use to a multi-use trail. The study area is located between Angus and Stayner and is situated within the jurisdiction of the Nottawasaga Valley Conservation Authority (NVCA). We are contacting you to gather any available natural heritage information pertinent to the study area.

In fulfillment of the preliminary design tasks, updated ecological background information is required for the study area (see attached map). As such, we are formally contacting you to request any available natural heritage information pertinent to the study area.

Information we are seeking includes:

Terrestrial

- Wildlife and vegetation species observation records;
- Sensitive wildlife habitat locations (nesting/breeding/hibernation);
- Sensitive avian nesting sites;
- ELC community information

Aquatics

- Fish/mussel species information within the waterbodies that traverse the study area;
- Thermal regimes of watercourse traversing the study area;
- Potential sensitive habitats (spawning/rearing/foraging) in the vicinity of the study area;
- Any management plans, watershed reports or other background reports relevant to the study area

Species at Risk (SAR)

- Locations, observation dates and any other relevant information about SAR – if possible, please provide the UTM's/accuracy codes; and
- Locally rare species lists or species records known from the study area.

582 Lancaster Street West
Kitchener, ON
Canada N2K 1M3

T: +1 519 743-8778
wsp.com



If further information is required, please feel free to contact the undersigned at 519-904-1798 or through email at steven.leslie2@wsp.com. Thank you for your assistance, it is greatly appreciated.

Yours sincerely,

A handwritten signature in black ink that reads "Steven Leslie".

Steven Leslie
Ecologist

cc: Rebecca Hay, WSP



Barrie-Collingwood Railway Multi-Use Trail Preliminary Design

MAY 2018



CONTEXT

From:
To: **Leslie, Steven** <Steven.Leslie2@wsp.com>
Subject: RE: Barrie to Collingwood Rail Trail - Natural Heritage Information Request
Date:

From: Mike Francis [<mailto:mfrancis@nvca.on.ca>]
Sent: Tuesday, October 09, 2018 9:16 AM
To: Leslie, Steven < Steven.Leslie2@wsp.com >
Cc: Sarah Campbell < scampbell@nvca.on.ca >
Subject: FW: Barrie to Collingwood Rail Trail - Natural Heritage Information Request

Hi Steven:

Thanks for your email. Unfortunately, I have minimal information to offer in terms of location-specific natural heritage data. Couple notes:

- You'll want to ensure due diligence in regards to SAR habitat, including some outreach to MNR staff.
- Most of your study area will represent candidate habitat for this Butternut. I am aware of several forest communities in and around Stayner which contain pockets of high-quality Butternut trees, although nothing specifically within your study area.
- The Stayner area also apparently hosts a relatively high concentration of bat maternity roosting habitat. This may be of minimal importance if trail creation would not require tree removal?
- Your study area passes through several wetland polygons. The edges of the historic rail bed may contain some suitable nesting substrates for turtles, particularly in areas adjacent to wetlands. I've attached a map of NVCA's unevaluated wetland layer.

Feel free to call if you'd like to discuss further. I've also cc'd Sarah Campbell in case she has any additional information to provide related to fisheries/aquatic communities.

Mike Francis, H.B.Sc., M.E.S. | Planning Ecologist

Nottawasaga Valley Conservation Authority

8195 8th Line, Utopia, ON L0M 1T0
T 705-424-1479 ext. 236 · F 705-424-2115

mfrancis@nvca.on.ca · nvca.on.ca

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From: Leslie, Steven [<mailto:Steven.Leslie2@wsp.com>]
Sent: Wednesday, October 3, 2018 10:58 AM
To: Mike Francis < mfrancis@nvca.on.ca >
Cc: Hay, Rebecca < Rebecca.Hay@wsp.com >
Subject: Barrie to Collingwood Rail Trail - Natural Heritage Information Request

Hello Mr. Francis,

My name is Steven Leslie and I am an ecologist with WSP. I found your contact information on the NVCA website, if this request should be sent to someone else at your organization please let me know. I originally contacted Sarah Campbell in May of this year but have not received a response from her.

Our firm has been hired to complete the preliminary design for the creation of a new trail along a rail corridor that is no longer in use between Angus and Stayner. As part of the natural environment component of this work, our group requires updating ecological information pertinent to the study area. The attached letter and map details

the information that we are requesting, if available.

If there are any questions or concerns, please do not hesitate to contact me.

Thank you,

Steven Leslie, B.E.S.

Ecologist

Ecology & Environmental Impact Assessment (EIA)



T+ 1 519-904-1798

582 Lancaster Street West
Kitchener, Ontario,
N2K 1M3 Canada

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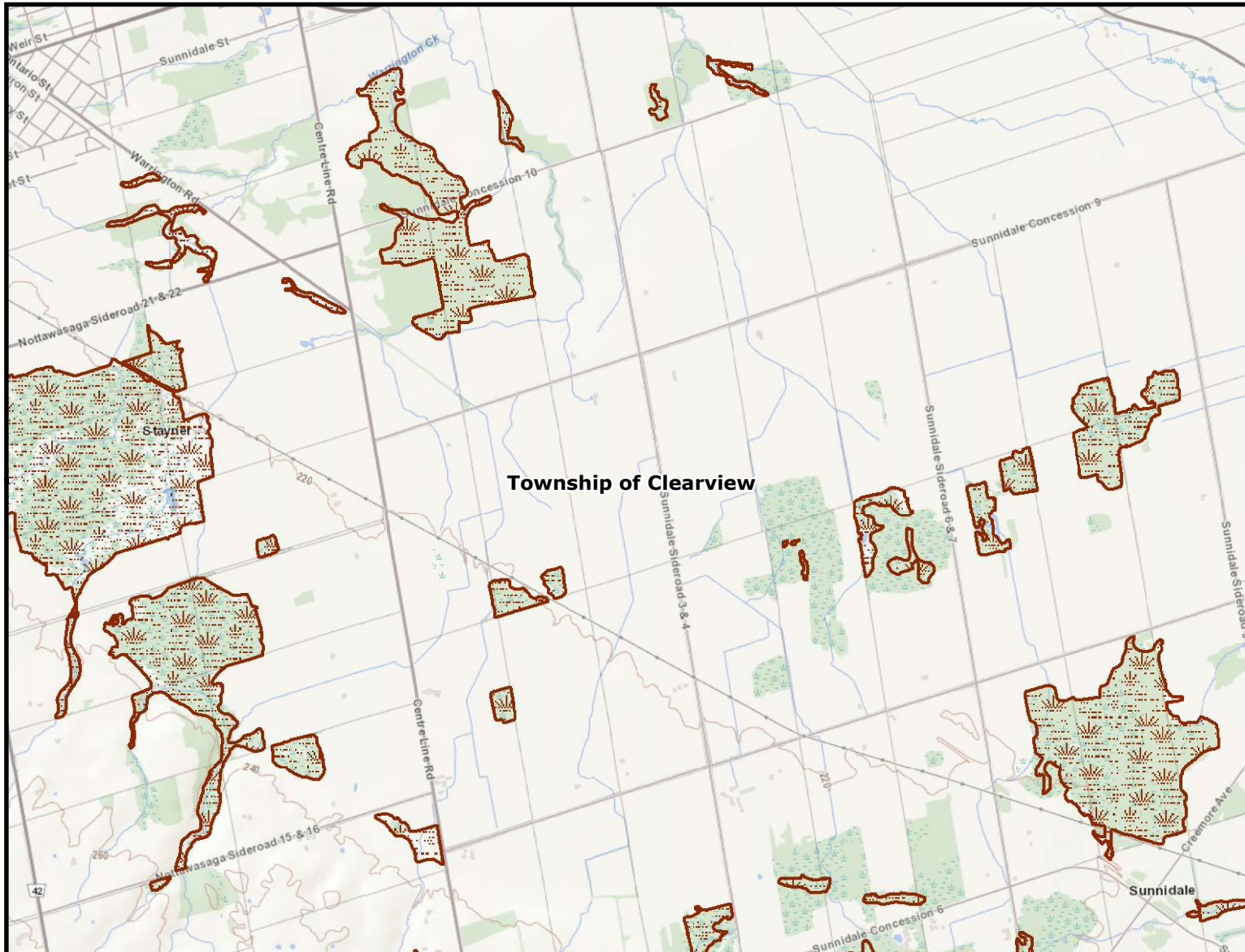
-LAEmHhHzdJzBITWfa4Hgs7pbKI



Barrie-Collingwood Trail_NVCA Wetlands(1)



Date: 09-Oct-2018

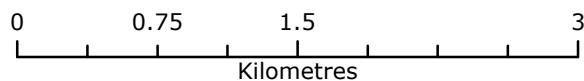


Legend

- Jurisdiction Boundary
- ▭ Municipality
- ▭ Lakes
- ▭ NVCA Properties
- ▭ Neighbouring CAs
- ▨ Unevaluated Wetlands (NVCA)

Notes

Nottawasaga Valley Conservation Authority
 8195 8th Line
 Utopia, ON L0M 1T0
 www.nvca.on.ca



1:40,513

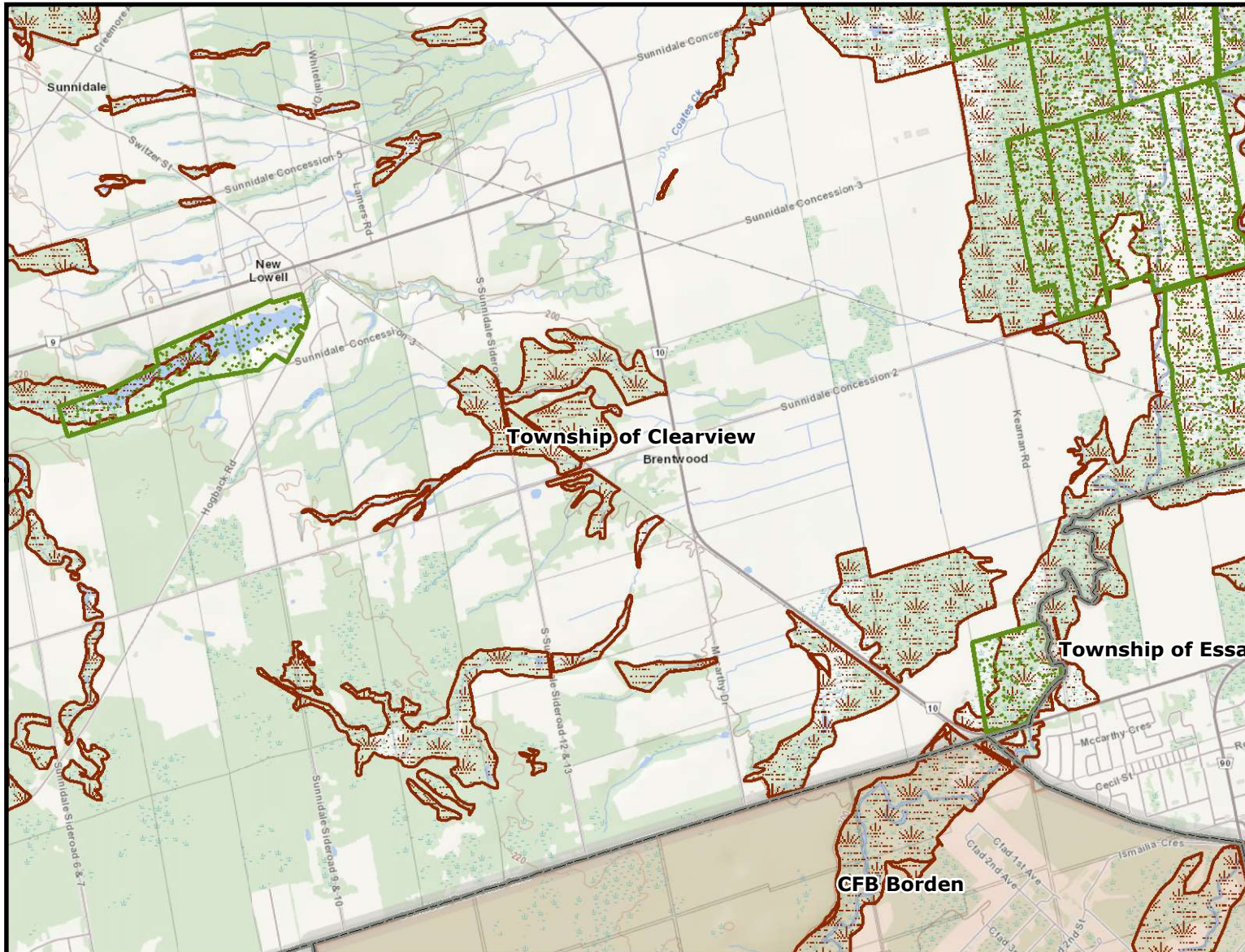
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Barrie-Collingwood Trail_NVCA Wetlands(2)



Date: 09-Oct-2018

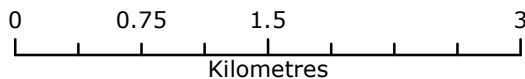


Legend

- Jurisdiction Boundary
- Municipality
- Lakes
- NVCA Properties
- Neighbouring CAs
- Unevaluated Wetlands (NVCA)

Notes

Nottawasaga Valley Conservation Authority
 8195 8th Line
 Utopia, ON L0M 1T0
 www.nvca.on.ca



1:44,951

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APPENDIX

C VASCULAR PLANT AND WILDLIFE SPECIES LISTS

Appendix C1: Plant Species List

SCIENTIFIC NAME	COMMON NAME	CC ¹	CW ¹	OWES WETLAND PLANT LIST ²	G_RANK ³	S_RANK ⁴	COSEWIC ⁵	SARA STATUS ⁶	SARA SCHEDULE ⁶	SARO ⁷	SIMCOE (Riley et al. 1989) ⁸	NATIVE STATUS ⁹
<i>Acer negundo</i>	Manitoba Maple	0	-2	X	G5	S5					X	N
<i>Acer platanoides</i>	Norway Maple	*	5		GNR	SNA					X	I
<i>Acer saccharum</i>	Sugar Maple	4	3		G5	S5					X	N
<i>Acer × freemanii</i>	Freeman's Maple			X	GNA	SNA						N
<i>Alliaria petiolata</i>	Garlic Mustard	*	0		GNR	SNA					X	I
<i>Alnus glutinosa</i>	European Black Alder	*	-2	X	GNR	SNA						I
<i>Anaphalis margaritacea</i>	Pearly Everlasting	3	5		G5	S5					X	N
<i>Anemonastrum canadense</i>	Canada Anemone	3	-3	X	G5	S5					X	N
<i>Asclepias syriaca</i>	Common Milkweed	0	5		G5	S5					X	N
<i>Bromus inermis</i>	Smooth Brome	*	5		G5TNR	SNA					X	I
<i>Celtis occidentalis</i>	Common Hackberry	8	1		G5	S4					X	N
<i>Clematis virginiana</i>	Virginia Clematis	3	0	X	G5	S5						N
<i>Cornus sericea</i>	Red-osier Dogwood	2	-3	X	G5	S5					X	N
<i>Crataegus sp.</i>	Hawthorn sp.											
<i>Daucus carota</i>	Wild Carrot	*	5		GNR	SNA					X	I
<i>Dipsacus fullonum</i>	Common Teasel	*	5		GNR	SNA					X	I
<i>Euthamia graminifolia</i>	Grass-leaved Goldenrod	2	-2		G5	S5					X	N
<i>Fraxinus americana</i>	White Ash	4	3		G5	S4					X	N
<i>Fraxinus nigra</i>	Black Ash	7	-4	X	G5	S4					X	N
<i>Fraxinus pennsylvanica</i>	Green Ash	3	-3	X	G5	S4					X	N
<i>Impatiens capensis</i>	Spotted Jewelweed	4	-3	X	G5	S5					X	N

SCIENTIFIC NAME	COMMON NAME	CC ¹	CW ¹	OWES WETLAND PLANT LIST ²	G_RANK ³	S_RANK ⁴	COSEWIC ⁵	SARA STATUS ⁶	SARA SCHEDULE ⁶	SARO ⁷	SIMCOE (Riley et al. 1989) ⁸	NATIVE STATUS ⁹
<i>Juniperus virginiana</i>	Eastern Red Cedar	4	3		G5	S5					X	N
<i>Lemna minor</i>	Small Duckweed	2	-5	X	G5	S5					X	N
<i>Lythrum salicaria</i>	Purple Loosestrife	*	-5	X	G5	SNA					X	I
<i>Maianthemum canadense ssp. canadense</i>	Wild Lily-of-the-valley	5	0		G5T5	S5					X	N
<i>Matteuccia struthiopteris</i>	Ostrich Fern	5	-3	X	G5	S5					X	N
<i>Medicago sativa</i>	Alfalfa											I
<i>Monarda fistulosa</i>	Wild Bergamot	6	3								X	N
<i>Myosotis arvensis</i>	Field Forget-me-not	*	0		GNR	SNA					X	I
<i>Nasturtium officinale</i>	Common Watercress	*	-5		GNR	SNA						I
<i>Nepeta cataria</i>	Catnip	*	1		GNR	SNA					X	I
<i>Onoclea sensibilis</i>	Sensitive Fern	4	-3	X	G5	S5					X	N
<i>Parthenocissus vitacea</i>	Thicket Creeper	3	3		G5	S5					X	N
<i>Pastinaca sativa</i>	Wild Parsnip	*	5		GNR	SNA					X	I
<i>Phalaris arundinacea var. arundinacea</i>	Reed Canarygrass	0	-4	X	GNR	S5					X	N
<i>Phleum pratense</i>	Common Timothy	*	3		GNR	SNA					X	I
<i>Picea glauca</i>	White Spruce	6	3	X	G5	S5					X	N
<i>Pinus strobus</i>	Eastern White Pine	4	3	X	G5	S5					X	N
<i>Pinus sylvestris</i>	Scots Pine	*	5		GNR	SNA					X	I
<i>Populus balsamifera</i>	Balsam Poplar	4	-3	X	G5	S5					X	N
<i>Populus grandidentata</i>	Large-toothed Aspen	5	3		G5	S5					X	N
<i>Populus tremuloides</i>	Trembling Aspen	2	0		G5	S5					X	N

SCIENTIFIC NAME	COMMON NAME	CC ¹	CW ¹	OWES WETLAND PLANT LIST ²	G_RANK ³	S_RANK ⁴	COSEWIC ⁵	SARA STATUS ⁶	SARA SCHEDULE ⁶	SARO ⁷	SIMCOE (Riley et al. 1989) ⁸	NATIVE STATUS ⁹
<i>Reynoutria japonica</i>	Japanese Knotweed	*	3		GNR	SNA					X	I
<i>Rhamnus cathartica</i>	European Buckthorn	*	3	X	GNR	SNA					X	I
<i>Rhus typhina</i>	Staghorn Sumac	1	5		G5	S5					X	N
<i>Rubus idaeus ssp. idaeus</i>	European Red Raspberry	*	0		G5T5	SNA						I
<i>Rubus pubescens</i>	Dwarf Raspberry	4	-4	X	G5	S5					X	N
<i>Salix amygdaloides</i>	Peach-leaved Willow	6	-3	X	G5	S5					X	N
<i>Salix euxina</i>	Crack Willow	*			GNR	SNA						I
<i>Salix interior</i>	Sandbar Willow	3	-5	X	GNR	S5					X	N
<i>Solidago altissima var. altissima</i>	Eastern Tall Goldenrod	1	3		GNR	S5					R-4	N
<i>Sonchus arvensis ssp. arvensis</i>	Field Sow-thistle	*	1		GNRTNR	SNA					X	I
<i>Taraxacum officinale</i>	Common Dandelion	*	3		G5	SNA					X	I
<i>Thuja occidentalis</i>	Eastern White Cedar	4	-3	X	G5	S5					X	N
<i>Tiarella cordifolia</i>	Heart-leaved Foamflower	6	1	X	G5	S5					X	N
<i>Tilia americana</i>	Basswood	4	3		G5	S5					X	N
<i>Toxicodendron radicans var. rydbergii</i>	Western Poison Ivy	0	0		G5	S5					X	N
<i>Typha latifolia</i>	Broad-leaved Cattail	3	-5	X	G5	S5					X	N
<i>Ulmus americana</i>	White Elm	3	-2	X	G5	S5					X	N
<i>Verbascum thapsus</i>	Common Mullein	*	5		GNR	SNA					X	I
<i>Viburnum lentago</i>	Nannyberry	4	-1	X	G5	S5					X	N
<i>Vicia cracca</i>	Tufted Vetch	*	5		GNR	SNA					X	I
<i>Vitis riparia</i>	Riverbank Grape	0	-2		G5	S5					X	N

SCIENTIFIC NAME	COMMON NAME	CC ¹	CW ¹	OWES WETLAND PLANT LIST ²	G_RANK ³	S_RANK ⁴	COSEWIC ⁵	SARA STATUS ⁶	SARA SCHEDULE ⁶	SARO ⁷	SIMCOE (Riley et al. 1989) ⁸	NATIVE STATUS ⁹
<i>Zanthoxylum americanum</i>	Northern Prickly-ash	3	5		G5	S5					X	N

Appendix C2: Wildlife Species List

COMMON NAME	SCIENTIFIC NAME	GRANK ³	SRANK ⁴	COSEWIC ⁵	MNR ⁷	SARA Status ⁶	Schedule ⁶	Area Sensitive Birds - Ecoregion 6E Schedule 6 ¹⁰	Protected Under MBCA
Alder Flycatcher	<i>Empidonax alnorum</i>	G5	S5B						✓
American Crow	<i>Corvus brachyrhynchos</i>	G5	S5B						
American Goldfinch	<i>Spinus tristis</i>	G5	S5B						✓
American Redstart	<i>Setophaga ruticilla</i>	G5	S5B						✓
American Robin	<i>Turdus migratorius</i>	G5	S5B						✓
Baltimore Oriole	<i>Icterus galbula</i>	G5	S4B						✓
Barn Swallow	<i>Hirundo rustica</i>	G5	S4B	THR	THR	THR	1		✓
Black-and-white Warbler	<i>Mniotilta varia</i>	G5	S5B						✓
Black-capped Chickadee	<i>Poecile atricapillus</i>	G5	S5						✓
Blue Jay	<i>Cyanocitta cristata</i>	G5	S5						
Bobolink	<i>Dolichonyx oryzivorus</i>	G5	S4B	THR	THR	THR	1		✓
Broad-winged Hawk	<i>Buteo platypterus</i>	G5	S5B,SZN					X	
Brown-headed Cowbird	<i>Molothrus ater</i>	G5	S4B						
Canada Goose	<i>Branta canadensis</i>	G5	S5						✓
Cedar Waxwing	<i>Bombycilla cedrorum</i>	G5	S5B						✓

COMMON NAME	SCIENTIFIC NAME	GRANK ³	SRANK ⁴	COSEWIC ⁵	MNR ⁷	SARA Status ⁶	Schedule ⁶	Area Sensitive Birds - Ecoregion 6E Schedule 6 ¹⁰	Protected Under MBCA
Chipping Sparrow	<i>Spizella passerina</i>	G5	S5B						✓
Common Grackle	<i>Quiscalus quiscula</i>	G5	S5B						
Common Yellowthroat	<i>Geothlypis trichas</i>	G5	S5B						✓
Eastern Kingbird	<i>Tyrannus tyrannus</i>	G5	S4B						✓
Eastern Meadowlark	<i>Sturnella magna</i>	G5	S4B	THR	THR	THR	1		✓
Eastern Phoebe	<i>Sayornis phoebe</i>	G5	S5B						✓
Eastern Wood-pewee	<i>Contopus virens</i>	G5	S4B	SC	SC	SC	1		✓
European Starling	<i>Sturnus vulgaris</i>	G5	SNA						
Gray Catbird	<i>Dumetella carolinensis</i>	G5	S4B						✓
Great Blue Heron	<i>Ardea herodias</i>	G5	S4						✓
Great Crested Flycatcher	<i>Myiarchus crinitus</i>	G5	S4B						✓
Hairy Woodpecker	<i>Picoides villosus</i>	G5	S5						✓
Hermit Thrush	<i>Catharus guttatus</i>	G5	S5B						✓
Horned Lark	<i>Eremophila alpestris</i>	G5	S5B,SZN						✓
House Wren	<i>Troglodytes aedon</i>	G5	S5B						✓
Indigo Bunting	<i>Passerina cyanea</i>	G5	S4B						✓
Killdeer	<i>Charadrius vociferus</i>	G5	S5B,S5N						✓
Least Flycatcher	<i>Empidonax minimus</i>	G5	S4B						✓
Mourning Dove	<i>Zenaida macroura</i>	G5	S5						✓
Mourning Warbler	<i>Geothlypis philadelphia</i>	G5	S4B						✓
Nashville Warbler	<i>Oreothlypis ruficapilla</i>	G5	S5B						✓
Northern Cardinal	<i>Cardinalis cardinalis</i>	G5	S5						✓
Northern Flicker	<i>Colaptes auratus</i>	G5	S4B						✓
Ovenbird	<i>Seiurus aurocapilla</i>	G5	S4B					X	✓
Pine Warbler	<i>Setophaga pinus</i>	G5	S5B						✓
Red-bellied Woodpecker	<i>Melanerpes carolinus</i>	G5	S4						✓
Red-breasted Nuthatch	<i>Sitta canadensis</i>	G5	S5					X	✓
Red-eyed Vireo	<i>Vireo olivaceus</i>	G5	S5B						✓

COMMON NAME	SCIENTIFIC NAME	GRANK ³	SRANK ⁴	COSEWIC ⁵	MNR ⁷	SARA Status ⁶	Schedule ⁶	Area Sensitive Birds - Ecoregion 6E Schedule 6 ¹⁰	Protected Under MBCA
Red-winged Blackbird	<i>Agelaius phoeniceus</i>	G5	S4						
Ring-billed Gull	<i>Larus delawarensis</i>	G5	S5B,SZN						✓
Rock Pigeon	<i>Columba livia</i>	G5	SNA						
Rose-breasted Grosbeak	<i>Pheucticus ludovicianus</i>	G5	S4B						✓
Ruby-throated Hummingbird	<i>Archilochus colubris</i>	G5	S5B						✓
Ruffed Grouse	<i>Bonasa umbellus</i>	G5	S4						
Savannah Sparrow	<i>Passerculus sandwichensis</i>	G5	S4B					X	✓
Song Sparrow	<i>Melospiza melodia</i>	G5	S5B						✓
Swamp Sparrow	<i>Melospiza georgiana</i>	G5	S5B						✓
Tree Swallow	<i>Tachycineta bicolor</i>	G5	S4B						✓
Turkey Vulture	<i>Cathartes aura</i>	G5	S5B						
Veery	<i>Catharus fuscescens</i>	G5	S4B					X	✓
Vesper Sparrow	<i>Poocetes gramineus</i>	G5	S4B					X	✓
Warbling Vireo	<i>Vireo gilvus</i>	G5	S5B						✓
White-breasted Nuthatch	<i>Sitta carolinensis</i>	G5	S5						✓
White-throated Sparrow	<i>Zonotrichia albicollis</i>	G5	S5B						✓
Wild Turkey	<i>Meleagris gallopavo</i>	G5	S5						
Willow Flycatcher	<i>Empidonax traillii</i>	G5	S5B,SZN						✓
Yellow Warbler	<i>Setophaga petechia</i>	G5	S5B						✓
Yellow-rumped Warbler	<i>Setophaga coronata</i>	G5	S5B						✓
American Toad	<i>Anaxyrus americanus</i>	G5	S5						
Eastern Ribbonsnake (aka. Northern Ribbonsnake)	<i>Thamnophis sauritus septentrionalis</i>	G5	S3	SC	SC	SC	1		
Green Frog	<i>Lithobates clamitans</i>	G5	S5						
Snapping Turtle	<i>Chelydra serpentina</i>	G5	S3	SC	SC	SC	1		
Cabbage White	<i>Pieris rapae</i>	G5	SNA						
Monarch	<i>Danaus plexippus</i>	G5	S2N,S4B	END	SC	SC	1		
Eastern Chipmunk	<i>Tamias striatus</i>	G5	S5						
Raccoon	<i>Procyon lotor</i>	G5	S5						
White-tailed Deer	<i>Odocoileus virginianus</i>	G5	S5						

SPECIES LIST LEGEND

Scientific Name, Common Name, and Family (Appendix C1 only)

Based on Vascan (Dec. 2017) and NHIC (Apr. 18, 2017)

Vascan: <http://data.canadensys.net/vascan/search>

NHIC: http://www.sse.gov.on.ca/sites/MNR-PublicDocs/EN/ProvincialServices/Ontario_Vascular_Plants.xlsx

¹ Coefficient of Conservatism, Coefficient of Wetness, Weediness, and Physiology/Habit

Oldham, M. J., W. D. Bakowsky and D. A. Sutherland. 1995. *Floristic Quality Assessment System for Southern Ontario*. Natural Heritage Information Centre, Ministry of Natural Resources. Peterborough, Ontario.

CC: Coefficient of Conservatism. Rank of 0 to 10 based on plants degree of fidelity to a range of synecological parameters: (0-3) Taxa found in a variety of plant communities; (4-6) Taxa typically associated with a specific plant community but tolerate moderate disturbance; (7-8) Taxa associated with a plant community in an advanced successional stage that has undergone minor disturbance; (9-10) Taxa with a high fidelity to a narrow range of synecological parameters.

CW: Coefficient of Wetness. Value between 5 and -5. A value of -5 is assigned to Obligate Wetland (OBL) and 5 to Obligate Upland (UPL), with intermediate values assigned to the remaining categories.

Weediness: Assigned to all non-native species and range from -1 (low impact of the species on natural areas) to -3 (high impact of the species on natural areas).

Habit: Physiology/Habit. The growth form of the species (e.g. forb, shrub, tree).

² OWES Wetland Plant List

Ontario Ministry of Natural Resources. 2013. *Ontario Wetland Evaluation System Southern Manual*. 3rd Edition, Version 3.3; Ontario Ministry of Natural Resources. 2013. *Ontario Wetland Evaluation System Northern Manual*. 1st Edition, Version 1.3

Species presence or absence from the Ontario Wetland Evaluation System (OWES) Wetland Plant List.

Codes are defined as follows:

X: Present on the list

³ G-Rank (Global)

Global Status from Nature Serve (via NHIC, 2017)

Nature Serve: <http://explorer.natureserve.org/>

NHIC: http://www.sse.gov.on.ca/sites/MNR-PublicDocs/EN/ProvincialServices/Ontario_Vascular_Plants.xlsx

Global ranks are assigned by a consensus of the network of Conservation Data Centres (CDCs), scientific experts, and the Nature Conservancy to designate a rarity rank based on the range-wide status of a species, subspecies, or variety.

Global (G) Conservation Status Ranks

G1: Extremely rare – usually 5 or fewer occurrences in the overall range or very few remaining individuals; or because of some factor(s) making it especially vulnerable to extinction.

G2: Very rare – usually between 5 and 20 occurrences in the overall range or with many individuals in fewer occurrences; or because of some factor(s) making it vulnerable to extinction.

G3: Rare to uncommon – usually between 20 and 100 occurrences; may have fewer occurrences, but with a large number of individuals in some populations; may be susceptible to large-scale disturbances.

G4: Common – usually more than 100 occurrences; usually not susceptible to immediate threats.

G5: Very common – demonstrably secure under present conditions.

G#G#: Range Rank – A numeric range rank (e.g., G2G3, G1G3) is used to indicate the range of uncertainty about the exact status of a taxon or ecosystem type. Ranges cannot skip more than two ranks (e.g., GU should be used rather than G1G4).

GU: Unrankable – Currently unrankable due to lack of information or due to substantially conflicting information about status or trends. NOTE: Whenever possible (when the range of uncertainty is three consecutive ranks or less), a range rank (e.g., G2G3) should be used to delineate the limits (range) of uncertainty.

- GNR: Unranked – Global rank not yet assessed
- GNA: Not Applicable – A conservation status rank is not applicable because the species is not a suitable target for conservation activities.
- ?: Inexact Numeric Rank – Denotes inexact numeric rank; this should not be used with any of the Variant Global Conservation Status Ranks or GX or GH.
- Q: Questionable taxonomy that may reduce conservation priority – Distinctiveness of this entity as a taxon or ecosystem type at the current level is questionable; resolution of this uncertainty may result in change from a species to a subspecies or hybrid, or inclusion of this taxon or type in another taxon or type, with the resulting taxon having a lower priority (numerically higher) conservation status rank. The “Q” modifier is only used at a global level and not at a national or subnational level.
- C: Captive or Cultivated Only – Taxon or ecosystem at present is presumed or possibly extinct or eliminated in the wild across their entire native range but is extant in cultivation, in captivity, as a naturalized population (or populations) outside their native range, or as a reintroduced population or ecosystem restoration, not yet established. The “C” modifier is only used at a global level and not at a national or subnational level. Possible ranks are GXC or GHC. This is equivalent to “Extinct” in the Wild (EW) in IUCN’s Red List terminology (IUCN 2001).

⁴ S-Ranks (Provincial)

Provincial Status from the NHIC (2017)

NHIC: http://www.sse.gov.on.ca/sites/MNR-PublicDocs/EN/ProvincialServices/Ontario_Vascular_Plants.xlsx

Provincial (or Subnational) ranks are used by the Natural Heritage Information Centre (NHIC) to set protection priorities for rare species and natural communities. These ranks are not legal designations. Provincial ranks are assigned in a manner similar to that described for global ranks, but consider only those factors within the political boundaries of Ontario.

Provincial/Sub-national (S) Conservation Status Ranks

- S1: Critically Imperiled – Critically imperiled in the nation or state/province because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the state/province.
- S2: Imperiled – Imperiled in the nation or state/province because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the nation or state/province.
- S3: Vulnerable – Vulnerable in the nation or state/province due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.
- S4: Apparently Secure – Uncommon but not rare; some cause for long-term concern due to declines or other factors.
- S5: Secure – Common, widespread, and abundant in the nation or state/province.
- 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 or community. Ranges cannot skip more than one rank (e.g., SU is used rather than S1S4).
- SX: Presumed Extirpated – Species or community is believed to be extirpated from the nation or state/province. Not located despite intensive searches of historical sites and other appropriate habitat, and virtually no likelihood that it will be rediscovered.
- SH: Possibly Extirpated (Historical) – Species or community occurred historically in the nation or state/province, and there is some possibility that it may be rediscovered. Its presence may not have been verified in the past 20-40 years. A species or community could become NH or SH without such a 20-40 year delay if the only known occurrences in a nation or state/province were destroyed or if it had been extensively and unsuccessfully looked for. The NH or SH rank is reserved for species or communities for which some effort has been made to relocate occurrences, rather than simply using this status for all elements not known from verified extant occurrences.
- SE: Species is considered exotic in Ontario
- SNR: Unranked – Nation or state/province conservation status not yet assessed.
- SU: Unrankable – Currently unrankable due to lack of information or due to substantially conflicting information about status or trends.
- SNA: Not Applicable – A conservation status rank is not applicable because the species is not a suitable target for conservation activities.
- ?: Inexact or Uncertain - Denotes inexact or uncertain numeric rank.

⁵ COSEWIC (Committee on the Status of Endangered Wildlife in Canada)

The federal review process is implemented by COSEWIC (Status as of Feb. 2018)

The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) is an independent advisory panel to the Minister of Environment and Climate Change Canada that meets twice a year to assess the status of wildlife species at risk of extinction.

<https://www.canada.ca/en/environment-climate-change/services/committee-status-endangered-wildlife.html>

COSEWIC Conservation Status Ranks

- EXT: Extinct – A species that no longer exists.
EXP: Extirpated – A species no longer existing in the wild in Canada, but occurring elsewhere.
END: Endangered – A species facing imminent extirpation or extinction.
THR: Threatened – A species likely to become endangered if limiting factors are not reversed.
SC: Special Concern (formerly vulnerable) – A species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats.
NAR: Not At Risk – A species that has been evaluated and found to be not at risk of extinction given the current circumstances.
DD: Data Deficient (formerly Indeterminate) – Available information is insufficient to resolve a species' eligibility for assessment or to permit an assessment of the species' risk of extinction.

Implied COSEWIC Status Notations (Status Due to Taxonomic Relationships)

Value (Flagged Value) – The taxon itself is not named in the Canadian Species at Risk list, however, it does have status as a result of its taxonomic relationship to a named entity. For example, if a species has a COSEWIC status of “threatened”, then by default, all of its recognized subspecies that occur in Canada also have a threatened status. The subspecies in this example would have the value “T(2)” under COSEWIC. Likewise, if all of a species’ infraspecific taxa occurring in Canada have the same COSEWIC status, then that status appears in the entry for the “full” species as well. In this case, if the species name is not mentioned in the Canadian Species at Risk list, the status appears with a flag (2) in NatureServe Explorer.

Value, Value: (Combination values with flags) – The taxon itself is not named in the Canadian Species at Risk list, however, all of its infraspecific taxa occurring in Canada do have status but two or more of the taxa do not have the same status. In this case, a combination of statuses shown with a flag (7) indicates the statuses that apply to infraspecific taxa or populations within this taxon.

PS: Indicates “partial status” – in only a portion of the species’ range in Canada. Typically indicated for a “full” species where at least one but not all of a species’ infraspecific taxa or populations has COSEWIC status.

PSvalue: Indicates “partial status” – status in only a portion of the species’ range. The value of that status appears because the entity with status (usually a population defined by geopolitical boundaries within Canada) does not have an individual entry in NatureServe Explorer. Information about the entity with status can be found in reports for the associated species.

6 SARA (Species at Risk Act) Status and Schedule

Federal status from the Government of Canada's Species at Risk Public Registry (Status as of Feb. 2018)

<http://www.registrelep-sararegistry.gc.ca/>

The Act establishes Schedule 1, as the official list of species at risk in Canada. It classifies those species as being either Extirpated, Endangered, Threatened, or a Special Concern. Once listed, the measures to protect and recover a listed species are implemented.

SARA Conservation Status Ranks

- EXT: Extinct – A species that no longer exists.
EXP: Extirpated – A species that no longer exists in the wild in Canada, but exists elsewhere in the wild.
END: Endangered – A species that is facing imminent extirpation or extinction.
THR: Threatened – A species that is likely to become endangered if nothing is done to reverse the factors leading to its extirpation or extinction.
SC: Special Concern – A species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats.

Schedule 1: is the official list of species that are classified as extirpated, endangered, threatened, and of special concern.

Schedule 2: species listed in Schedule 2 are species that had been designated as endangered or threatened, and have yet to be re-assessed by COSEWIC using revised criteria. Once these species have been re-assessed, they may be considered for inclusion in Schedule 1.

Schedule 3: species listed in Schedule 3 are species that had been designated as special concern, and have yet to be re-assessed by COSEWIC using revised criteria. Once these species have been re-assessed, they may be considered for inclusion in Schedule 1.

The Act establishes Schedule 1 as the official list of species at risk. However, please note that while Schedule 1 lists species that are extirpated, endangered, threatened and of special concern, the prohibitions do not apply to species of special concern. Species that were designated at risk by COSEWIC prior to October 1999 (Schedule 2 & 3) must be reassessed using revised criteria before they can be considered for addition to Schedule 1 of SARA. After they have been assessed, the Governor in Council may on the recommendation of the Minister, decide on whether or not they should be added to the List of Species at Risk.

⁷ SARO (Species at Risk in Ontario)

Provincial status from MNRF (Status as of Feb. 2018)

<https://www.ontario.ca/environment-and-energy/species-risk-ontario-list>

The provincial review process is implemented by the MNR's Committee on the Status of Species at Risk in Ontario (COSSARO). COSSARO is an independent advisory panel to the Ontario Ministry of Natural Resources and Forestry that assesses the status of species at risk of extinction.

MNRF Conservation Status Ranks

EXT: Extinct – A species that no longer exists anywhere.

EXP: Extirpated – A species that no longer exists in the wild in Ontario but still occurs elsewhere.

END: Endangered – A species facing imminent extinction or extirpation in Ontario which is a candidate for regulation under Ontario's Endangered Species Act (ESA).

THR: Threatened – A species that is at risk of becoming endangered in Ontario if limiting factors are not reversed.

SC: Special Concern (formerly Vulnerable) – A species with characteristics that make it sensitive to human activities or natural events.

NAR: Not at Risk – A species that has been evaluated and found to be not at risk.

DD: Data Deficient (formerly Indeterminate) – A species for which there is insufficient information for a provincial status recommendation.

⁸ Regional Status: Simcoe, Hamilton-Brant-Wentworth-Oxford, Wellington-Dufferin, Durham (Pickering-Uxbridge-Brock-Oshawa-Whitby-Ajax-Scugog-Clarington), Peterborough-Durham-Victoria-Northumberland

Riley, J. et al. 1989. The Distribution and Status of the Vascular Plants of Central Region. Ontario Ministry of Natural Resources, Central Region, Richmond Hill, ON.

Codes are defined as follows:

E: Endangered- "For the purposes of this checklist, an endangered species is considered to be one regulated under Ontario's Endangered Species Act. The only species so regulated is the Cucumber Tree (*Magnolia acuminata*)."

N: Nationally Rare – rare in every province in which it occurs. A rare species is one that because of biological characteristics, occurs at edge of range, exists in low numbers, or in very restricted areas in the region under consideration.

P: Provincially Rare – a species S-ranked (S1-SX) from the National Museum's "Atlas of Rare Vascular Plants of Ontario" (Argus et.al. 1982-88).

R: Regionally Rare – Native species are considered regionally rare if the species is considered rare wherever it occurs in Central Region especially in areas where recent local determinations of rarity have been made and/or if it is considered provincially rare in the portions in which species' status is insufficiently documented. Only naturally occurring populations are considered.

X: Occurs within the region.

+ or I: Introduced species.

⁹ Native Status

Based on Vascan (Dec. 2017) and NHIC (Apr. 18, 2017)

Vascan: <http://data.canadensys.net/vascan/search>

NHIC: http://www.sse.gov.on.ca/sites/MNR-PublicDocs/EN/ProvincialServices/Ontario_Vascular_Plants.xlsx

Codes are defined as follows:

N: Native
I: Introduced

¹⁰ MNR Significant Wildlife Habitat Technical Guide Area Sensitive Species



Area Sensitivity is defined as species requiring large areas of suitable habitat in order to sustain population numbers
From: Ministry of Natural Resources. 2000. Significant Wildlife Habitat Technical Guide. Fish and Wildlife Branch, Wildlife Section. Science Development and Transfer Branch, Southcentral Science Section. 151pp. + appendices.

APPENDIX



D

AQUATIC
RESOURCES
EXISTING
CONDITIONS
SUMMARY TABLE



Appendix D: Aquatic Resources Existing Conditions Summary Table

Crossing ID (WSP)	Flow	Physical Characteristics	Fish Species Present	Constraints and Opportunities	Representative Photographs
WC-01	Permanent	<ul style="list-style-type: none"> - ~ 1.0 m wetted width; 0.08 m depth - Silt, cobble and gravel substrates 	<ul style="list-style-type: none"> - None observed 	<ul style="list-style-type: none"> - Dense woody debris at outlet - LIO identifies watercourse as having a coldwater thermal regime ~ 60 m downstream of culvert outlet 	
WC-02	Permanent	<ul style="list-style-type: none"> - ~ 0.75 m wetted width; 0.2 m depth - Muck and silt substrates 	<ul style="list-style-type: none"> - None observed 	<ul style="list-style-type: none"> - LIO identifies watercourse as having a coldwater thermal regime 	



Appendix D: Aquatic Resources Existing Conditions Summary Table

Crossing ID (WSP)	Flow	Physical Characteristics	Fish Species Present	Constraints and Opportunities	Representative Photographs
WC-03	Permanent	<ul style="list-style-type: none"> - 2 – 3 m wetted width; > 0.3 m depth - Sand and silt substrates 	<ul style="list-style-type: none"> - Yes, cyprinid species observed at crossing 	<ul style="list-style-type: none"> - Dense woody debris jam at inlet - Outlet perched ~10 cm – barrier to fish movement - LIO identifies watercourse as having a coldwater thermal regime 	
WC-04	Intermittent	<ul style="list-style-type: none"> - No defined channel, conveys agricultural and roadside drainage 	<ul style="list-style-type: none"> - Dry at time of survey - Indirect fish habitat 	<ul style="list-style-type: none"> - N/A 	



Appendix D: Aquatic Resources Existing Conditions Summary Table

Crossing ID (WSP)	Flow	Physical Characteristics	Fish Species Present	Constraints and Opportunities	Representative Photographs
WC-05	Permanent	<ul style="list-style-type: none"> - ~ 2.0 m wetted width; ~ 0.1 – 0.15 m depth - Sand, silt, gravel and cobble substrates 	<ul style="list-style-type: none"> - Yes, cyprinid species observed at crossing 	<ul style="list-style-type: none"> - ~ 15 cm Knickpoint just D/S of outlet – barrier to fish movement - LIO identifies watercourse as having a coldwater thermal regime 	
WC-06	Permanent	<ul style="list-style-type: none"> - ~ 2.5 m wetted width; ~ 0.3 m depth - Sand and silt substrates; cobble riffle downstream of outlet 	<ul style="list-style-type: none"> - Yes, young of year cyprinid species observed at crossing, additional schools observed further upstream 	<ul style="list-style-type: none"> - LIO identifies watercourse as having a coldwater thermal regime 	



Appendix D: Aquatic Resources Existing Conditions Summary Table

Crossing ID (WSP)	Flow	Physical Characteristics	Fish Species Present	Constraints and Opportunities	Representative Photographs
WC-07	Intermittent	<ul style="list-style-type: none"> - No defined channel, conveys agricultural drainage 	<ul style="list-style-type: none"> - Dry at time of survey - Indirect fish habitat due to proximity of other watercourses and potential drainage along rail corridor 	<ul style="list-style-type: none"> - N/A 	
WC-08	Intermittent	<ul style="list-style-type: none"> - No defined channel, conveys agricultural drainage 	<ul style="list-style-type: none"> - Dry at time of survey - Indirect fish habitat due to proximity of other watercourses and potential drainage along rail corridor 	<ul style="list-style-type: none"> - N/A 	



Appendix D: Aquatic Resources Existing Conditions Summary Table

Crossing ID (WSP)	Flow	Physical Characteristics	Fish Species Present	Constraints and Opportunities	Representative Photographs
WC-09	Permanent	<ul style="list-style-type: none"> - ~ 1 m wetted width; ~ 0.15 m depth - Pool at culvert outlet, water was stagnant at time of survey 	<ul style="list-style-type: none"> - None observed 	<ul style="list-style-type: none"> - Heavily choked with Reed-canary Grass 	
WC-10	Permanent	<ul style="list-style-type: none"> - Stagnant pool downstream - Dry upstream 	<ul style="list-style-type: none"> - None observed 	<ul style="list-style-type: none"> - N/A 	



Appendix D: Aquatic Resources Existing Conditions Summary Table

Crossing ID (WSP)	Flow	Physical Characteristics	Fish Species Present	Constraints and Opportunities	Representative Photographs
WC-11	Permanent	<ul style="list-style-type: none"> - ~ 7 x 10 m flat area upstream where watercourse branches converge; ~ 0.15 – 0.3 m depth upstream and downstream - Large pool at outlets, transitioning into riffle further downstream 	<ul style="list-style-type: none"> - Yes, cyprinid species and adult Rainbow Trout observed at crossing 	<ul style="list-style-type: none"> - LIO identifies watercourse as having a coldwater thermal regime - Sportfish observed at crossing by WSP 	
WC-12	Intermittent	<ul style="list-style-type: none"> - No defined channel, conveys agricultural drainage 	<ul style="list-style-type: none"> - Dry at time of survey - Indirect fish habitat due to proximity of other watercourses and potential drainage along rail corridor 	<ul style="list-style-type: none"> - N/A 	



Appendix D: Aquatic Resources Existing Conditions Summary Table

Crossing ID (WSP)	Flow	Physical Characteristics	Fish Species Present	Constraints and Opportunities	Representative Photographs
WC-13	Intermittent	<ul style="list-style-type: none"> - No defined channel, conveys agricultural drainage 	<ul style="list-style-type: none"> - Dry at time of survey - Indirect fish habitat due to proximity of other watercourses and potential drainage along rail corridor 	<ul style="list-style-type: none"> - N/A 	
WC-14	Permanent	<ul style="list-style-type: none"> - ~ 3 m wetted width upstream; ~ 0.3 – 1 m downstream - ~ 0.05 – 0.4 m depth - Sand, silt and gravel substrates 	<ul style="list-style-type: none"> - Yes, cyprinid species observed at outlet 	<ul style="list-style-type: none"> - Outlet perched ~ 10 cm – barrier to fish movement, flowing into ~ 0.3 deep plunge pool - Very slow flow 	



Appendix D: Aquatic Resources Existing Conditions Summary Table

Crossing ID (WSP)	Flow	Physical Characteristics	Fish Species Present	Constraints and Opportunities	Representative Photographs
WC-15	Permanent	<ul style="list-style-type: none"> - ~ 0.4 m wetted width upstream; wide pool downstream - ~ 0.15 – 0.25 m depth - Stagnant flow 	- None observed	- N/A	
WC-16	Intermittent	- Stagnant, shallow pools on either side	- None observed	- N/A	



Appendix D: Aquatic Resources Existing Conditions Summary Table

Crossing ID (WSP)	Flow	Physical Characteristics	Fish Species Present	Constraints and Opportunities	Representative Photographs
WC-17	Permanent	<ul style="list-style-type: none"> - ~ 1 – 3 m wetted width; ~ 0.05 – 0.15 m depth - Silt, muck and gravel substrates - Dense instream and overhanging vegetation upstream - ~ 5 m wide pool downstream 	<ul style="list-style-type: none"> - None observed 	<ul style="list-style-type: none"> - Outlet perched ~ 10 cm 	
WC-18	Permanent	<ul style="list-style-type: none"> - ~ 0.3 – 1.5 m wetted width; 0.05 – 0.15 m depth - Sand and gravel substrates - Dense instream vegetation 	<ul style="list-style-type: none"> - None observed 	<ul style="list-style-type: none"> - ~ 20 cm boulder knickpoint immediately upstream of inlet – barrier to fish movement 	



Appendix D: Aquatic Resources Existing Conditions Summary Table

Crossing ID (WSP)	Flow	Physical Characteristics	Fish Species Present	Constraints and Opportunities	Representative Photographs
WC-19	Permanent	- Shallow pools on either side	- None observed	- Culvert totally buried	
WC-20 (Coates Creek)	Permanent	- Physical characteristics could not be assessed because of access issues due to steep embankment	- LIO indicates direct fish use including: White Sucker, Common Carp, Johnny Darter, Tessellated Darter, Pumpkinseed, Fathead Minnow, Longnose Dace	- LIO identifies watercourse as having a coolwater thermal regime	



Appendix D: Aquatic Resources Existing Conditions Summary Table

Crossing ID (WSP)	Flow	Physical Characteristics	Fish Species Present	Constraints and Opportunities	Representative Photographs
WC-21	Permanent	<ul style="list-style-type: none"> - ~ 0.3 – 1.5 m wetted width; trickle flow 	<ul style="list-style-type: none"> - None observed 	<ul style="list-style-type: none"> - Culvert totally buried, embankments above culvert completely collapsed, only trickle flow through corridor at bottom of embankment 	
WC-22	Permanent	<ul style="list-style-type: none"> - ~ 0.1 m wetted width; 0.04 m depth - Narrow, shallow drainage feature 	<ul style="list-style-type: none"> - None observed 	<ul style="list-style-type: none"> - N/A 	



Appendix D: Aquatic Resources Existing Conditions Summary Table

Crossing ID (WSP)	Flow	Physical Characteristics	Fish Species Present	Constraints and Opportunities	Representative Photographs
WC-23	Permanent	<ul style="list-style-type: none"> - Small wetland pockets on either side - Heavily choked with willows and grasses 	<ul style="list-style-type: none"> - None observed 	<ul style="list-style-type: none"> - LIO identifies watercourse as having a coldwater thermal regime 	
WC-24	Permanent	<ul style="list-style-type: none"> - ~ 1 – 3 m wetted width; ~ 0.3 m depth - Pools at inlet and outlet, flats further from culvert 	<ul style="list-style-type: none"> - None observed 	<ul style="list-style-type: none"> - Few small woody debris jams upstream - LIO identifies watercourse has having a coldwater thermal regime 	



Appendix D: Aquatic Resources Existing Conditions Summary Table

Crossing ID (WSP)	Flow	Physical Characteristics	Fish Species Present	Constraints and Opportunities	Representative Photographs
WC-25	Permanent	<ul style="list-style-type: none"> - ~ 5 – 6 m wide pools on either side; ~ 0.3 – 0.4 m depth 	<ul style="list-style-type: none"> - Yes, cyprinid species observed at crossing 	<ul style="list-style-type: none"> - N/A 	
WC-26	Permanent	<ul style="list-style-type: none"> - ~ 4 – 5 m wide; ~ 0.15 – 0.3 m depth - Sand upstream; gravel and cobble downstream - Plunge pool at outlet 	<ul style="list-style-type: none"> - None observed 	<ul style="list-style-type: none"> - Outlet perched ~ 50 cm 	


Appendix D: Aquatic Resources Existing Conditions Summary Table

Crossing ID (WSP)	Flow	Physical Characteristics	Fish Species Present	Constraints and Opportunities	Representative Photographs
WC-27	Permanent	<ul style="list-style-type: none"> - ~ 4 – 5 m wetted width upstream where branches converge; ~ 2 m wetted width downstream and through culvert - > 0.5 m depth 	<ul style="list-style-type: none"> - Yes, cyprinid species observed at crossing 	<ul style="list-style-type: none"> - Woody debris jam at inlet 	
WC-28 (Mad River)	Permanent	<ul style="list-style-type: none"> - ~ 13 m wetted width; depth likely > 1 m 	<ul style="list-style-type: none"> - LIO indicates direct fish use, including migratory and resident sportfish 	<ul style="list-style-type: none"> - LIO identifies watercourse as having a coldwater thermal regime 	

Appendix D: Aquatic Resources Existing Conditions Summary Table

Crossing ID (WSP)	Flow	Physical Characteristics	Fish Species Present	Constraints and Opportunities	Representative Photographs
WC-29 (Pine River)	Permanent	<ul style="list-style-type: none"> - ~ 15 m wetted width; depth likely > 1 m 	<ul style="list-style-type: none"> - LIO indicates direct fish use, including migratory and resident sportfish 	<ul style="list-style-type: none"> - LIO identifies watercourse as having a coldwater thermal regime 	
WC-30	Permanent	<ul style="list-style-type: none"> - ~ 2 – 4 m wetted width; ~ 0.15 – 0.4 m depth - Sand and gravel substrates - Long riffle / run morphology 	<ul style="list-style-type: none"> - Yes, cyprinid species observed at crossing 	<ul style="list-style-type: none"> - ~ 30 cm knickpoint, ~ 55 m downstream of crossing – barrier to fish movement 	

Appendix D: Aquatic Resources Existing Conditions Summary Table

Crossing ID (WSP)	Flow	Physical Characteristics	Fish Species Present	Constraints and Opportunities	Representative Photographs
WC-31 (Nottawasaga River)	Permanent	<ul style="list-style-type: none"> - ~ 43 m wetted width at crossing; depth likely > 1 m 	<ul style="list-style-type: none"> - LIO indicated direct fish use, including migratory and resident sportfish 	<ul style="list-style-type: none"> - LIO identifies watercourse as having a warmwater thermal regime 	
WC-32	Permanent	<ul style="list-style-type: none"> - ~ 1.5 – 3 m wetted width upstream; large pool downstream - ~ 0.3 – 0.5 m depth - Sand and gravel substrates 	<ul style="list-style-type: none"> - Yes, cyprinid species observed at crossing 	<ul style="list-style-type: none"> - Small (~ 5 cm) knickpoint at inlet - Dense LWD jam across inlet - Outlet perched ~ 30 cm – barrier to fish movement 	