Appendix C:

Natural Environment Report

NATURAL ENVIRONMENT IMPACT ASSESSMENT REPORT

Airport Road Improvements
King Street to Huntsmill Drive
Regional Municipality of Peel

January 2020

RIVERSTONE
ENVIRONMENTAL SOLUTIONS INC.

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SUBJECT: Natural Environment Impact Assessment Report
Airport Road Improvements, King Street to Huntsmill Drive
Regional Municipality of Peel

RiverStone Environmental Solutions Inc. is pleased to provide you with the attached report. A summary of the key results and recommendations are provided at the beginning of the report. Detailed descriptions of the work completed and the findings are provided in the subsequent sections.

Please contact us if there are any questions regarding the report, or if further information is required.

Best regards,

RiverStone Environmental Solutions Inc.

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REPORT SUMMARY

Type of Study Natural Environment Impact Assessment Report	**Date** August 12, 2020
Location Airport Road between King Street and Huntsmill Drive	**Application** Schedule "C" EA
Approval Authorities Regional Municipality of Peel Toronto Region Conservation Authority Credit Valley Conservation	**Proponent** Regional Municipality of Peel

Report Summary

As part of a Schedule "C" EA, this study was focused on the completion of an impact assessment based on the available data pertaining to the terrestrial, wetland, and aquatic resources for lands and waterbodies adjacent to Airport Road between King Street and Huntsmill Drive, and along the portion of Old Church Road between Airport Road and Marilyn St. that was collected by the Toronto Region Conservation Authority (TRCA) and Credit Valley Conservation (CVC). The proposed improvements to Airport Road principally consist of local widening at intersections such as turning lanes or roundabouts, a new connection between Ivan Avenue and Airport Road opposite Old Church Road, new or upgraded walking and cycling facilities throughout the corridor and in particular in Caledon East and in Mono Road, and general improvements to drainage, landscaping, and noise protection. No major widening throughout the corridor is proposed as part of this project. Based on a detailed review of the natural heritage information as provided by TRCA and CVC, it was determined that several features and species of conservation interest occurred within or adjacent to the project works area. The following Impact Assessment identifies potential impacts on the identified significant natural features and species. The recommendations contained within this report (below) are intended to mitigate potential negative impacts on the identified features and species and inform the EA process.

RECOMMENDATIONS

SIGNIFICANT WETLANDS

- **All sediment and erosion control measures should be consistent with the Erosion and Sediment Control guidelines for Urban Construction (December 2006) and these works are to be maintained in good working order until completion of this project.**
- **Appropriate sediment and erosion control measures shall be employed to prevent the erosion of unstable soils and the movement of sediment and/or other deleterious substances into any Provincially Significant Wetland (PSW) unit. These measures shall be in place prior to the onset of site preparation.**
- **When native soil is exposed sediment and erosion control works, in the form of heavy-duty sediment fencing, be positioned along the edge of the areas to be developed, graded, and otherwise disturbed.**

- **Sediment fencing must be constructed of heavy material and solid posts, and be properly installed (trenched in) to maintain its integrity during inclement weather events.**
- **Additional sediment fencing and appropriate control measures must be available on site so that any breach can be immediately repaired.**
- **Regular inspection and monitoring will be necessary to ensure that the structural integrity and continued functioning of the sediment control measures is maintained (i.e., proper installation is not the only action necessary to satisfy the mitigation requirements).**
- **An onsite supervisor should be responsible for daily inspections of the sediment and erosion control measures and record the time and date of inspections, the status of the mitigation measures, and any repairs undertaken.**
- **All stockpiled aggregates should be stored in a location that will prevent the movement of sediment laden runoff into the PSW units.**
- **All stockpiled topsoil/overburden should be stabilized as quickly as possible to minimize the potential for runoff.**
- **Machinery should arrive on site in clean condition and is to be checked and maintained free of fluid leaks.**
- **Machinery must be refueled, washed and serviced a minimum of 30 m from wetlands that occur near the subject property boundary on adjacent lands.**
- **Locate all fuel and other potentially deleterious substances a minimum of 30 m from wetlands and drainage features. Minimize fuels and chemicals stored onsite and ensure a spills management plan and the associated spill response equipment is available on-site at all times for implementation in the event of a spill of deleterious material.**
- **Temporary storage locations of aggregate/fill material should be located no less than 30 m from wetlands and drainage features. This material is to be contained by heavy-duty sediment fencing.**
- **Offloading of construction and aggregate/fill materials should be completed during fair weather conditions.**
- **All stockpiled topsoil/overburden should be piled in low piles and stabilized as quickly as possible (e.g., erosion-prone areas covered with textile) to minimize the potential for runoff and wind erosion.**
- **During detailed design, impacts to Locally Significant Wetlands should be avoided to the extent possible.**
- **Final designs should include considerations to maintain flows between wetlands where possible and be consistent with CVC Fish and Wildlife Crossing Guidelines.**

HABITAT OF ENDANGERED AND THREATENED SPECIES

- **During detailed design if the footprint of disturbance is proposed to encroach into potential habitat for Bobolink, additional targeted surveys for this species may be required.**
- **During detailed design, all existing culverts be reviewed to ensure that Barn Swallows are not actively nesting in any of these structures.**

- **Should Barn Swallow be encountered nesting in a culvert, staff from the Ministry of Environment, Conservation, and Parks (MECP) should be contacted to obtain direction on how to proceed.**

- **Tree removal only occur within the Project Area between October 1 and May 1 to avoid the active roosting season for endangered bat species.**

- **The extent of tree removal within the Project Area be limited to the extent possible.**

- **Should tree removal of entire stands of trees be identified as a requirement during detailed design, MECP should be contacted to determine if a permit under the ESA is required.**

- **If any suitable anthropogenic roosting structures (i.e., old houses, barns, etc.) are proposed for removal, exit surveys to confirm presence or absence of SAR bats may be required at the design stage.**

- **During detailed design, a formal health assessment of the identified Butternut be completed to determine if measures are required to protect this individual to ensure compliance with the Provincial *Endangered Species Act, 2007*.**

SIGNIFICANT WILDLIFE HABITAT

- **Development and site alteration within field communities found to contain standing water in the spring, should not occur until water levels have receded.**

- **Grading plans must ensure that alteration to field margins will not result in substantial draining of surface water from these communities.**

- **The recommendations offered herein to protect Endangered Bats (Section 4.2.2), must be implemented in full as they will also serve to protect any significant bat maternity colonies that may occur adjacent to the Project Area.**

- **In general, a 30 m buffer from wetland communities within the project area must be maintained.**

- **Vegetation within the 30 m buffer is to remain in a natural state.**

- **Water balance within wetlands is to be maintained to ensure suitable water levels for turtle hibernation are present and ensure consistency with the Centreville Creek Subwatershed Study (TRCA 2003).**

- **Where construction activities are proposed in proximity to wetland communities, suitable exclusion fencing must be erected to ensure that sediment not be permitted to enter wetlands or their associated buffers.**

- **Where possible, enhancement of existing wetland buffers, between wetlands and the existing roadway should be considered.**

- **Where the Preferred Alternative requires the removal of a portion of wetland, this should occur late in the summer during periods of low water levels to minimize the potential for impacts.**
- **Prior to the onset of construction, the edge of the Treed Sand Barren Community (SBT1) proximate to Airport Rd be isolated using standard sediment and erosion control practices.**
- **No disturbance or site alteration is to occur within the Treed Sand Barren Community (SBT1).**
- **No plantings or installation of additional vegetation is to occur within this community as part of final site stabilization.**
- **All measures outlined in Sections 4.2.1 of this report related to wetland be adhered to.**
- **Direct wetland loss should be reviewed by TRCA and compensation measures to result in no net wetland loss discussed as part of the permitting process.**
- **In general, a 30 m buffer from wetland communities within the project area be maintained.**
- **Vegetation within the 30 m buffer is to remain in a natural state.**
- **Water balance within wetlands is to be maintained to ensure suitable water levels for hibernation are present.**
- **Where construction activities are proposed in proximity to wetland communities, suitable exclusion fencing be erected to ensure that sediment not be permitted to enter wetlands or their associated buffers.**
- **Where possible, enhancement of existing wetland buffers, between wetlands and the existing roadway be considered.**
- **Where the Preferred Alternative requires the removal of a portion of wetland, this should occur late in the summer during periods of low water levels to minimize the potential for impacts.**
- **The extent of tree removal within the Project Area be limited to the extent possible.**
- **Site alteration (i.e., felling of trees, clearing, grading, etc.) not occur within the project area between April 1 and August 31, as this time corresponds to the peak nesting/breeding period for the majority of avian species.**
- **Restoration designs should consider the inclusion of Milkweed in planting plans for areas that are disturbed by construction.**
- **Wildlife Crossing signage be considered at each of the locations identified by TRCA.**
- **During detailed design, where culvert replacements are proposed, and the general structure size permits, RiverStone recommends the following to improve the likelihood of drainage culverts functioning as movement corridors.**

- **The culvert should be backfilled to create a low flow channel with dry "benches" along the edges. Backfill material should include:**
    - **a layer of native soil**
    - **overlaid with coarse gravel (0.01-0.03m)**
    - **overlaid with a 50-50 mix of coarse gravel (0.01-0.03m) and cobble (0.1-0.3m) with interstitial spaces filled with native soil on only the edges of the culvert to create two (2) dry "benches" each approximately one third (1/3) of the width of the culvert.**
- **Backfilling should leave a low flow channel approximately one third (1/3) of the width of the culvert. This channel should meander along the length of the culvert.**
- **Backfilling and imbedding of the culvert should maintain a minimum of 1 m of clearance between substrates and the top of the culvert.**
- **Boulders (300-500mm) should be placed throughout the length of the culvert on the dry "benches" at a density of 1-2 boulders per 2 m of culvert length.**
- **CVC recommends that in order to increase the likelihood of use of a culvert by wildlife, the openness ratio ([height x width] / length) should be no less than 0.1 (ideal is 0.4 or greater).**

Culvert Ends

- **Culvert ends can be constructed using either a retaining wall or wing walls; however, wing walls are preferred as they act to funnel wildlife into the culvert.**
- **Materials used for culvert end treatments should be relatively smooth so as to discourage climbing by wildlife (e.g., precast concrete).**

Fencing Design

- **Fencing should be tied into the end of culvert treatment.**
- **Fencing should extend across the roadside ditch, away from the culvert to the edge of the road right-of-way. Keeping the fencing as far from the road as possible will minimize damage from snow removal activities.**
- **Where the fence crosses the ditch, the gap below the fence should be filled with rip-rap to permit water flow but exclude wildlife.**
- **CVC recommends that fencing be constructed of galvanized steel chain-link fencing that is 1-2 m in height.**
- **To exclude smaller animals (mice, voles, frogs, etc.), panels of galvanized hardware cloth or similar material with a mesh size of 6 mm (0.25 inches) be added to the lower 1 m portion of chain-link fencing.**
- **The bottom of the fencing should be buried between 0.2-0.4 m underground to deter wildlife from digging under the fence.**

FISH HABITAT

- **Minimize riverbank and riverbed hardening to the extent possible (any replacement structures should be designed to maintain the existing natural substrates and gradients with an invert that allows continued fish passage).**
- **Where culvert replacements are required, open bottomed structures are recommended.**
- **Adherence to recommendations provided in Section 4.2.1 will help to ensure that Fish Habitat is protected from deposition of deleterious substances.**
- **During Detailed Design, a Request for Review should be submitted to DFO to demonstrate the proposed works will not result in serious harm to fish as defined by the *Fisheries Act*, 1985.**
- **All in-water and near-water works will be undertaken during the appropriate fisheries timing window.**
    - **Crossings 1, 2, 3, 4, and 7 are identified as coldwater systems and as such in-water works must be undertaken between June 15 and September 15 at these crossings.**
    - **Crossings 5, and 6 were identified as warmwater systems and as such in-water works must be undertaken between July 15 and April 30 at these crossings.**
- **Vegetation within 30 m of watercourses is to be maintained to minimize channel bank erosion and maintain water quality.**
- **All in-water works are to occur 'in the dry' with flows being maintained to downstream reaches of the watercourses.**
- **Where possible, during detailed design consideration for potentially increasing the diameter of the culvert at Crossing 7 should be considered.**
- **Where pumping is to occur, water intakes will be screened to inhibit fish from becoming entrained or impinged by the pumping activities, and the screen face must be oriented in the same direction as flow.**
- **A sediment and erosion control report and plan (including phasing and staging plans) is to be developed that is consistent with the Erosion and Sediment Control guidelines for Urban Construction (December 2006) and these works are to be maintained in good working order until completion of this project.**
- **Appropriate sediment and erosion control measures shall be employed to prevent the erosion of unstable soils and the movement of sediment and/or other deleterious substances into any watercourse. These measures shall be in place prior to the onset of site preparation.**
- **Upon isolation of the work area, and during draw down of water, any fish trapped within the work area will be immediately collected and moved to a suitable habitat downstream by a qualified biologist under a MNRF issued "Licence to Collect Fish for Scientific Purposes".**
- **At construction, Fisheries and Oceans must be notified immediately if a situation occurs or if there is imminent danger of an occurrence that could cause *serious harm* to fish. If there is an occurrence, corrective measures must be implemented.**
- **Stormwater management should be designed to maintain water balance to all identified watercourses that provide fish habitat in order to ensure that existing levels of channel**

instability at sensitive sites downstream are not increased. This is consistent with the management objectives of the Centreville Creek Subwatershed Study (TRCA 2003).

HEADWATER DRAINAGE FEATURES

- **At Crossing 5, replacement of functions is recommended for HUM5-C.**
- **At Crossing 6, replacement of functions is recommended for both HUM6-B and HUM6-D.**

TREES AND NATURAL VEGETATION COMMUNITIES

- **Tree protection fence (or equivalent silt fence) should be placed along the perimeter of the Project Area (i.e., edge of disturbance).**
- **Replacement of trees should occur consistent with a landscaping plan containing native species suitable to site conditions.**
- **Following completion of the project works any disturbed and/or exposed soil should be stabilized and revegetated via a native seed mixture suitable to site conditions. The seed mix should be consistent with CVC/TRCA *Plant Selection Guidelines*.**
- **Prior to applying the seed mix, prepare the areas to be seeded by eliminating uneven areas and low spots, removing weeds to the extent achievable, and removing branches and stones in excess of 50 mm.**
- **In areas of slopes greater than 3:1, jute mat, Bonded Fibre Matrix or equivalent shall be laid on top of the seed mix to further stabilize disturbed soils in these areas. Where slopes are less than 3:1, seeding and mulch should be used to stabilize disturbed soils.**
- **All necessary vegetation removal (e.g., tree/shrub clearing, etc.) should be completed outside of the primary breeding bird nesting window (i.e., between April 1 and August 31). If limited vegetation removal must occur early during this period (i.e., between April 1-April 15), a nest survey should be conducted by a qualified biologist within 5 days of commencement of vegetation removal activities to identify and locate active nests of bird species (where present) covered by the federal *Migratory Bird Convention Act, 1994* or provincial *Fish and Wildlife Conservation Act, 1997*. If a nest is located or evidence of breeding noted, a mitigation plan should be developed to avoid any potential impacts on birds or their active nests. Mitigation may require establishing appropriate buffers around active nests or delaying construction activities until the conclusion of the nesting season.**

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1 BACKGROUND

RiverStone Environmental Solutions Inc. (hereafter, "RiverStone") was retained by IBI Group on behalf of the Regional Municipality of Peel (hereafter, "the Region") to prepare a Natural Environment Report as part of a Schedule C Municipal Class Environmental Assessment (EA). A Municipal Class EA was undertaken to determine the long-term needs of Airport Road between King Street and Huntsmill Drive. In addition, the Region is considering improvements to a portion of Old Church Road between Airport Rd. and Marilyn St. The road serves through traffic and goods movement, while also providing access to the communities of Caledon East and Mono Road. It was determined that infrastructure improvements are required to improve operations and safety for vehicular traffic, goods movement, walking and cycling. The section of Airport Road to be improved is approximately 7.2 km long and passes through the village of Caledon East. Airport Road is a major north-south arterial road under the jurisdiction of the Region. The proposed road improvements principally consist of resurfacing and minor widening of Airport Road and Old Church Road, and improvements at six (6) intersections. The project also consists of constructing potential bike lanes and multi-use trails.

The Project Area is defined herein as Airport Road (i.e., the right-of-way) from 100 m north of Huntsmill Ave to King St. (**Figure 1**), and a 30 m zone on either side of the existing road which generally contains the proposed area of temporary or permanent disturbance (**Figure 1)**. The Project Area also includes the portion of Old Church Road between Airport Road and Marilyn St., and 100 m along side streets intersecting Airport Road where development is proposed. Adjacent lands considered as part of this assessment include the "Project Area" and the areas within 120 m. Overall, the Project Area is situated within a predominantly agricultural landscape to the south, and an urban village in the north.

All background review and collection of onsite data detailing the existing conditions of the natural heritage features within the project area were provided by the Toronto Region Conservation Authority (TRCA) and Credit Valley Conservation (CVC) (see **Section 2.1** for additional details). Data provided by TRCA was limited to within 100 m on either side of Airport Road and 100 m north of Huntsmill Drive. RiverStone has used these data to define the edges of the Project Area (see above). The following report is limited to an impact assessment based on these data and those from publicly available sources (e.g., Ontario Breeding Bird Atlas, Ontario Herpetofaunal Atlas, Natural Heritage Information Centre, etc.).

This report has been prepared to address the requirements of the Municipal Class Environmental Assessment and of both the TRCA and CVC in relation to works within a regulated area pursuant to the *Conservation Authorities Act*. The impact assessment herein is based on the largest extent of disturbance anticipated by the Region. In addition to addressing TRCA and CVC regulatory requirements, this report is guided by other relevant natural heritage policies that may have bearing on project design and implementation, including those contained within the *Endangered Species Act, 2007* (ESA).

2 APPROACH AND METHODS

The approach and methods used to carry out the impact assessment contained in this report are detailed in this section. Broadly speaking, this includes:

1. Review background biophysical information for the Project Area provided by TRCA and CVC to become familiar with existing natural feature mapping and records of features and species of conservation interest.

2. As per the request of the Region of Peel, RiverStone has completed an assessment of Significant Wildlife Habitat. This assessment is based entirely on the data provided by TRCA and CVC.
3. Determining whether implementation of the proposed road improvements will cause negative impacts to any significant natural features within the Project Areas, and to identify ways in which such negative impacts (where present) can be mitigated via avoidance, minimization, and/or compensation measures.
4. Determining whether the proposed road improvements address applicable natural heritage policies including TRCA (O. Reg. 166/06) and CVC (O. Reg. 160/06) regulations and requirements under Section 28 of the *Conservation Authorities Act, 1990*.

RiverStone staff (G. Cunnington) completed a site reconnaissance visit to the project area on August 9, 2018. The purpose of this visit was to familiarize team ecologists with features and issues in the project study area. Portions of the project area identified as containing significant natural heritage features were reviewed in detail while other portions of the study area containing generally homogenous features (e.g., extensive agricultural lands, limited tree or wetland cover, etc.) were given less attention.

2.1 Information Sources Used to Inform Impact Assessment

Information pertaining to the natural features and functions of the Project Area was obtained from the following sources:

- **Municipal Class Environmental Assessment Airport Road from King Street to Huntsmill Drive, Town of Caledon Natural Environment Existing Conditions Report (TRCA 2017).**
- **Municipal Class Environmental Assessment Airport Road from King Street to Huntsmill Drive, Town of Caledon Natural Environment Existing Conditions Report Addendum: Aquatic Habitat Crossing Assessment (TRCA 2018).**
- **Municipal Class Environmental Assessment Airport Road from King Street to Huntsmill Drive, Town of Caledon. Preliminary Review Comments (CVC 2017).**
- **Humber River Watershed Plan (TRCA 2008).**
- **Town of Caledon Official Plan** (April 2018 office consolidation) for natural feature mapping, including:
    - Schedule A – Land Use Plan (including Environmentally Protected Areas)
    - Schedule P – Oak Ridges Moraine Land Use Designations
    - Schedule P1 – Aquifer Vulnerability Areas
    - Schedule P2 – Landform Conservation Areas
- **Regional Municipality of Peel Official Plan** (December 2018 office consolidation) for natural feature mapping, including:
    - Schedule A – Core Areas of the Greenlands System in Peel
    - Schedule D – Regional Structure
    - Figure 2 – Selected Areas of Provincial Interest

- **Ministry of Natural Resources and Forestry (MNRF) Aurora District Information Request** for occurrences of species at risk and natural heritage features within or adjacent to the Project Area. See **Appendix 1**.
- **MNRF Natural Areas Mapping and Natural Heritage Information Centre (NHIC) database** regarding information on occurrences of species at risk (SAR), provincially tracked species, and natural heritage features within or adjacent to the Project Area (squares: 17NJ8958, 17NJ8959, 17NJ9057, 17NJ9058, 17NJ9157, 17NJ9158, 17NJ9454, 17NJ9554; last accessed April 11, 2019, at: http://www.gisapplication.lrc.gov.on.ca/mamnh/Index.html?site=MNR_NHLUPS_NaturalHeritage&viewer=NaturalHeritage&locale=en-US
- **Ontario Breeding Bird Atlas (OBBA) database and the Atlas of the Breeding Birds of Ontario, 2001–2005** (Cadman et al. 2007) regarding birds that were documented to be breeding within or adjacent to the Project Area between 2001–2005 (squares: 17NJ95; accessed at: http://www.birdsontario.org/atlas/squareinfo.jsp).
- **Ontario Reptile and Amphibian Atlas** database regarding reptile and amphibian records within or adjacent to the Project Area (squares: 17NJ95; accessed April 11, 2019, at: http://www.ontarioinsects.org/herpatlas/herp_online.html).
- **Ontario Butterfly Atlas** database regarding butterflies recorded within or adjacent to the Project Area (square: 17NJ95; accessed April 11, 2019, at: http://www.ontarioinsects.org/atlas_online.htm).
- **Aquatic Species at Risk Maps** mapping generated by Fisheries and Oceans Canada (Map 10; accessed April 11, 2019, at: http://www.dfo-mpo.gc.ca/species-especes/fpp-ppp/index-eng.htm)
- **Digital Ontario Base Maps** (OBMs; 1:10,000)
- **Historical and Current Aerial Photographs** of the Project Area.

2.1.1 Endangered and Threatened Species

For the purposes of this impact assessment RiverStone's approach to Endangered and Threatened species is habitat-based. This means that the focus of the evaluation is determining the potential for features within an area of interest to function as habitat for species considered potentially present. An area is considered potential habitat if it satisfies a number of criteria, usually specific to a species, but occasionally characteristic of a broader group (e.g., several turtles of conservation interest use sandy shorelines for nesting, numerous fish species use areas of aquatic vegetation for nursery habitat). Physical attributes of a site that can be used as indicators of its potential to function as habitat for a species include structural characteristics (e.g., physical dimensions of rock fragments or trees, water depth), ecological community (e.g., meadow marsh, rock barren, coldwater stream), and structural connectivity to other habitat features required by the species. Species-specific habitat preferences and/or affinities are determined from provincial recovery strategies produced by the Ministry of Natural Resources and Forestry, and federal status reports produced by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), Cadman et al. (2007), published and unpublished documents, and direct experience.

As outlined above, no targeted field work was completed by RiverStone. The assessment of Endangered and Threatened species is limited to the publicly available data and those provided by TRCA and CVC. For the purposes of identifying species that warrant consideration during design and implementation of the project, we have defined Endangered and Threatened species to include those

designated as *Endangered* or *Threatened* under O. Reg. 230/08 of the provincial *Endangered Species Act, 2007.*

2.1.2 Significant Wildlife Habitat

Neither the TRCA nor CVC provided an assessment of Significant Wildlife Habitat in their existing conditions report. RiverStone completed a habitat-based assessment of Significant Wildlife Habitat supplemented by the results of targeted surveys and the associated data provided by TRCA and CVC. RiverStone's assessment of Significant Wildlife Habitat is based on the criteria schedule for Ecoregion 6e as provided by OMNRF (2015).

2.1.3 Headwater Drainage Features (HDF's)

The objective of the Headwater Drainage Feature Assessment (HDF) is to collect pertinent information related to the physical and biological attributes of the headwater features, assess their relative importance on the landscape, and ultimately determine management options for each. The details of the assessment protocol were based on the Evaluation, Classification and Management of Headwater Drainage Feature Guidelines (Credit Valley Conservation and Toronto and Region Conservation 2014) produced and approved by the Authority.

Similar to the other natural features reviewed for this assessment, data used to classify the HDF's were collected and reported by the TRCA. In the Natural Environment Existing Conditions Report (TRCA 2017) aquatic habitats and features were assessed, including all watercourses and HDFs. A total of six (6) features were assessed in each crossing location, labeled Crossings 1 through 6. Boyces Creek (Crossing 1), Centreville Creek (Crossing 3), and an unnamed Creek (Crossing 2) were recognised as watercourses and were therefore not including in the HDF assessment. Crossings 4, 5 and 6 were classified as HDFs and were assessed as such.

The HDF assessment includes the collection of details pertaining to the following key components: hydrological, riparian, fish and fish habitat, and terrestrial features. It is noted that Crossings 4, 5, and 6 were assessed in accordance with the Evaluation, Classification and Management of Headwater Drainage Features Guidelines (Credit Valley Conservation and Toronto and Region Conservation 2014). The HDF assessment presented in the TRCA report did not include management actions for the drainage features documented. TRCA recommended that the report be used as a complimentary data source to any future decision making regarding land use activities near or around the described HDFs. This portion of the report is intended to use the TRCA data to complete the final step of the HDF assessment, which is to identify the appropriate management option based on the classification of the key components of each HDFs.

2.2 Impact Assessment and Mitigation Measures

In order to carry out a defensible ecological assessment of potential impacts associated with implementation of the proposed development, RiverStone employs the following general approach:

1. *Predict* impacts to existing biophysical features and functions on site based on the proposed development plan (from construction to post-completion), including both direct (e.g., vegetation clearance, etc.) and indirect (e.g., light pollution, encroachment post-development), impacts.

2. *Evaluate the significance* of predicted impacts to existing biophysical features and functions based on their spatial extent, magnitude, timing, frequency (how often), and duration (how long).
3. *Assess the probability or likelihood* that the predicted impacts will occur at the level of significance expected (i.e., high, medium, low probability).
4. Where the potential for negative impacts exists, ecologically meaningful *mitigation measures* are offered to avoid such impacts first, and where impacts cannot be fully avoided to minimize and/or compensate such impacts as appropriate.

2.3 Assessment of Conservation Authority Policies

Based on the impact assessment provided in **Section 4** a review of the proposed project works in the context of relevant TRCA and CVC policies is provided in **Section 5**.

3 SUMMARY OF BIOPHYSICAL FEATURES AND FUNCTIONS

3.1 Landscape Setting and Land-uses

Based on material provided by TRCA and CVC, the Project Area is situated within a predominantly agricultural landscape to the south which transitions into neighbourhood residential and commercial development in the north. TRCA has described the general topography within the Project Area as variable, containing an undulating terrain with several areas of steep slopes. Located in the upper reaches of the Humber River, numerous wetland communities are present, with the largest concentrations of these communities being located at the north end of the Project Area. The Project Area overlaps with the Natural Heritage Systems associated with the Oak Ridges Moraine, the Greenbelt, and the Niagara Escarpment Plan.

3.2 Natural Features of Conservation Interest

Based on the biophysical information collected by TRCA and CVC, **Table 1** below summarizes the status of natural features of Conservation Interest within the Project Area. Key Natural Heritage Features are shown on **Figure 1**. Copies of the reports prepared by TRCA and CVC are provided in **Appendix 2**.

Table 1. Status of Natural Features of Conservation Interest within and adjacent to the Site. See TRCA (2017) for additional details on existing conditions.

Features of Conservation Interest	Status of Natural Feature of Conservation Interest within the Project Area	Status of Natural Feature of Conservation Interest within the Adjacent Lands
Significant Wetlands	*Present*. See **Section 3.2.1**.	*Present*. See **Section 3.2.1**.
Habitat of Endangered and Threatened Species	*Present*. See **Section 3.2.2**.	*Present*. See **Section 3.2.2**.
Significant Areas of Natural and Scientific Interest (ANSI)	*Present*. See **Section 3.2.3**.	*Present*. See **Section 3.2.3**.
Environmentally Significant Areas	*Present*. See **Section 3.2.4.**	*Present*. See **Section 3.2.4.**
Significant Wildlife Habitat	*Present*. See **Section 3.2.5**.	*Present*. See **Section 3.2.5**.

Features of Conservation Interest	Status of Natural Feature of Conservation Interest within the Project Area	Status of Natural Feature of Conservation Interest within the Adjacent Lands
Fish Habitat	*Present*. See **Section 3.2.6**.	*Present*. See **Section 3.2.6**.

[1] - Shaded rows denote features of conservation interest for which negative impacts stemming from implementation of the proposed development plan are possible.

3.2.1 Significant Wetlands

The Widgett-Innis Lakes Wetland Complex is a provincially significant wetland located on the east side of Airport Road in the northern portion of the Project area (**Figure 1**). Additionally, portions of two (2) locally significant wetlands, the Caledon East Wetland Complex, and the Mono Road Wetland Complex fall within the Project Area (**Figure 1**).

3.2.2 Habitat of Endangered and Threatened Species

The results of TRCA's targeted surveys identified the presence of two (2) endangered or threatened species within the Project Area. As the field methods employed by TRCA would not have detected bat species, potential habitat for these species were included in the impact assessment review. Additionally, a single Butternut (*Juglans cinerea*) was identified by RiverStone within the Project Area in 2018 as part of completing a Tree Inventory (see **Figure 2b**). Details pertaining to the Butternut are provided within the Tree Inventory report prepared by RiverStone under a separate cover. A summary of the endangered and threatened species present within the Project Area is provided in **Table 2**. Additional details pertaining to the assessment of endangered and threatened species is provided in **Appendix 3**. An impact assessment is provided for these species in **Section 4.2.2**.

Table 2. Endangered and Threatened species with the potential to be impacted by activities within the Project Area.

Species	Status per the *Endangered Species Act* (O. Reg. 230/08)	Documented locations and/or potential habitat on or adjacent to the Project Area
Barn Swallow (*Hurundo rustica)*	Threatened	Documented by TRCA in agricultural fields at southern end of Project Area
Bobolink (Dolichonyx oryzivorus)	Threatened	Documented by TRCA in agricultural fields at southern end of Project Area
Little Brown Bat (*Myotis lucifugus*)	Endangered	Range Map Overlap
Northern Long-eared Bat (*Myotis septentrionalis)*	Endangered	Range Map Overlap
Tri-colored Bat (*Perimyotis subflavus)*	Endangered	Range Map Overlap
Butternut (*Juglans cinerea*)	Endangered	Documented during RiverStone's tree inventory. Details provided in Tree Inventory report prepared by RiverStone under a separate cover.

3.2.3 Significant Areas of Natural and Scientific Interest

TRCA indicates that portions of the Innis-Gibson Lakes Kettles candidate ANSI are present within the Project Area in proximity to Mountcrest Road. This candidate ANSI is primarily a wetland community

that is part of the larger PSW in this location. Additional details are provided in the TRCA report (**Appendix 2**).

3.2.4 Environmentally Significant Areas

Two (2) environmentally significant areas are present within the Project Area: The Caledon East Complex and the Caledon East Swamp. These areas are in proximity to Walker Road and Larry St. respectively.

3.2.5 Significant Wildlife Habitat

An assessment of Significant Wildlife Habitat (SWH) was not completed by TRCA as part of the collection of existing conditions information. RiverStone has drawn from data provided by TRCA to complete an assessment of Significant Wildlife Habitat based on the Ecoregion 6E Criteria Schedules (OMNRF 2015). Based on the results of this assessment (see **Appendix 4**), no Confirmed Significant Wildlife Habitat was identified; however, RiverStone identified the following Candidate Significant Wildlife Habitat types within the project area:

- Seasonal Concentration Areas of Animals
    - Waterfowl Stopover and Staging Areas (Terrestrial)
    - Bat Maternity Colonies
    - Turtle Wintering Areas
    - Deer Winter Congregation Areas
- Rare Vegetation Communities
    - Sand Barren
- Specialised Habitats for Wildlife
    - Amphibian Breeding Habitat (Woodland)
    - Amphibian Breeding Habitat (Wetland)
- Habitat for Species of Conservation Concern (not including Endangered or Threatened species)
    - Northern Brook Lamprey
    - Snapping Turtle
    - Eastern Ribbon Snake
    - Monarch
- Animal Movement Corridors
    - Amphibian Movement Corridors
    - Deer Movement Corridors

An assessment of the potential for the preferred alternative to result in negative impacts to the ecological features associated with these SWH types and their ecological function is provided below.

3.2.6 Fish Habitat

A total of seven (7) watercourse crossings of Airport Road were identified within the Project Area by TRCA. Two (2) of the watercourses were identified as direct fish habitat (Centreville Creek [Crossing 1], Boyce's Creek [Crossing 3]) with one (1) additional watercourse being identified as indirect fish habitat (Tributary of Centreville Creek [Crossing 2]). All three of these crossings are located in the northern portion of the Project Area with both Centreville Creek and Boyce's Creek being identified as coldwater systems containing Brook Trout (*Salvelinus fontinalis*). TRCA noted that the culvert outlet at Crossing 2 was resulting in a functional barrier to fish passage. Three (3) of the remaining

watercourse crossings were identified as indirect fish habitat (Crossings 5, 6, and 7). Finally, Crossing 4 was identified as not containing fish habitat (i.e., no direct or indirect fish habitat present).

3.2.7 Headwater Drainage Features

Table 3 below summarizes the data collected by TRCA within the framework of the HDF Guideline. In all cases, except Terrestrial Habitat, the assessment results were taken directly from the TRCA report. For terrestrial habitat, Figures 17 and 18 in the TRCA report were used to establish habitat connections that could function as a movement corridor.

Table 3. Headwater Drainage Feature Assessment Results.

HDF Segment	Step 1		Step 2	Step 3	Step 4	Management
Code	Hydrology	Modifier	Riparian	Fish and Fish Habitat	Terrestrial Habitat	Recommendation
Crossing 4						
HUM4-A	Limited	Ag	Limited	Limited	Limited	No Management Required
HUM4-B	Limited	Ag	Limited	Limited	Limited	No Management Required
HUM4-C	Limited	Ag	Limited	Limited	Limited	No Management Required
Crossing 5						
HUM5-A	Limited	Ag	Limited	Limited	Limited	No Management Required
HUM5-B	Limited	Ag	Limited	Limited	Limited	No Management Required
HUM5-C	Contributing	Ag	Limited	Contributing*	Limited	Mitigation
Crossing 6						
HUM6-A	Limited	Ag	Limited	Limited	Limited	No Management Required
HUM6-B	Contributing	Ag	Contributing	Limited	Contributing	Mitigation
HUM6-C	Limited	Ag	Limited	Limited	Limited	No Management Required
HUM6-D	Contributing	Ag	Valued	Contributing*	Contributing	Mitigation

*Classification assumed as formal assessment not completed

3.3 Natural Heritage Systems

Based on RiverStone's review of available background resources, the study area overlaps with the Natural Heritage Systems associated with the Oak Ridges Moraine Conservation Plan (ORMCP) and the Niagara Escarpment Plan (NEP). In the northern portion of the study area, the Niagara Escarpment Plan identifies portions of the Caledon East Wetland complex (**Figure 2**) as being within the Escarpment Natural and Escarpment Protection designations. These lands are located to the northwest of Huntsmill Drive.

The wetland communities, including portions of the Caledon East Wetland complex located immediately to the west of Huntsmill Drive, are part of the Natural Core Area of the ORMCP. Additionally, the wetland communities located north of Huntsmill Drive and the portion of Airport Road between Olde Base Line Road and Boston Mills Road are designated as Natural Linkage Areas in the ORMCP.

4 IMPACT ASSESSMENT AND RECOMMENDATIONS

4.1 Proposed Road Improvements

The general works area (i.e., total area of disturbance) is shown on **Figure 2**. The project works principally consist of:

- local widening at intersections such as turning lanes or roundabouts,
- a potential new connection between Ivan Avenue and Airport Road opposite Old Church Road,
- improvements to a portion of Old Church Road between Airport Road and Marilyn St.,
- new or upgraded walking and cycling facilities throughout the corridor and in particular in Caledon East and in Mono Road, and
- general improvements to drainage, landscaping, and noise protection.

No major widening throughout the corridor is proposed as part of this project.

4.2 Impact Assessment

Based on the data provided by TRCA and CVC, several features of Conservation Interest have been identified within the Project Area. The following impact assessment provides an evaluation of the potential for the proposed road improvements to result in negative impacts to the natural environment and/or significant natural features, ecological functions, and species present. The impact assessment herein is based on the extent of disturbance shown on **Figure 2**.

Where the potential for impacts (direct and indirect) are identified, recommendations are provided for incorporation into project design. Recommendations are provided to avoid (where possible), or mitigate potential impacts to reduce the likelihood of the proposed activities resulting in negative impacts. Our determination of whether the risk of potential impacts on a specific feature is acceptable relies upon the relevant policies and legislation, as well as our assessment of the significance or quality of the respective natural feature.

It should be noted that data provided by TRCA did not identify significant natural heritage features along Old Church Road between Airport Road and Marilyn St. suggesting that improvements to this portion of Old Church Road are unlikely to result in negative impacts to the natural environment features in this area.

Staking of the extent of features (e.g., driplines, crest of slope, etc.) with the applicable Conservation Authority may be required during detailed design should questions pertaining to the extent of features mapped by TRCA arise.

4.2.1 Significant Wetlands

4.2.1.1 Provincially Significant Wetlands

The Widgett-Innis Lakes Wetland Complex is a provincially significant wetland located on the east side of Airport Road in the northern portion of the Project Area. The limit of disturbance associated with the road improvements does not appear to encroach into the PSW boundary as mapped by MNRF. As no direct impacts are proposed, the greatest potential for indirect impacts to the PSW is construction-related, and includes impacts of stormwater runoff, contaminant spills, and sedimentation.

These impacts can largely be addressed via a comprehensive system of erosion and sediment control (ESC) measures. The most effective ESC system incorporates a multi-barrier approach, is adaptive and thereby responds to shifting site conditions, and involves regular inspection and monitoring. To further minimize the potential for negative impacts to the identified wetlands and their functions during construction, RiverStone recommends the following measures:

- **All sediment and erosion control measures should be consistent with the Erosion and Sediment Control guidelines for Urban Construction (December 2006) and these works are to be maintained in good working order until completion of this project.**
- **Appropriate sediment and erosion control measures shall be employed to prevent the erosion of unstable soils and the movement of sediment and/or other deleterious substances into any PSW unit. These measures shall be in place prior to the onset of site preparation.**
- **When native soil is exposed sediment and erosion control works, in the form of heavy-duty sediment fencing, be positioned along the edge of the areas to be developed, graded, and otherwise disturbed.**
- **Sediment fencing must be constructed of heavy material and solid posts, and be properly installed (trenched in) to maintain its integrity during inclement weather events.**
- **Additional sediment fencing and appropriate control measures must be available on site so that any breach can be immediately repaired.**
- **Regular inspection and monitoring will be necessary to ensure that the structural integrity and continued functioning of the sediment control measures is maintained (i.e., proper installation is not the only action necessary to satisfy the mitigation requirements).**
- **An onsite supervisor should be responsible for daily inspections of the sediment and erosion control measures and record the time and date of inspections, the status of the mitigation measures, and any repairs undertaken.**
- **All stockpiled aggregates should be stored in a location that will prevent the movement of sediment laden runoff into the PSW units.**
- **All stockpiled topsoil/overburden should be stabilized as quickly as possible to minimize the potential for runoff.**
- **Machinery should arrive on site in clean condition and is to be checked and maintained free of fluid leaks.**
- **Machinery must be refueled, washed and serviced a minimum of 30 m from wetlands that occur near the subject property boundary on adjacent lands.**
- **Locate all fuel and other potentially deleterious substances a minimum of 30 m from wetlands and drainage features. Minimize fuels and chemicals stored onsite and ensure a spills management plan and the associated spill response equipment is available on-site at all times for implementation in the event of a spill of deleterious material.**
- **Temporary storage locations of aggregate/fill material should be located no less than 30 m from wetlands and drainage features. This material is to be contained by heavy-duty sediment fencing.**
- **Offloading of construction and aggregate/fill materials should be completed during fair weather conditions.**

- **All stockpiled topsoil/overburden should be piled in low piles and stabilized as quickly as possible (e.g., erosion-prone areas covered with textile) to minimize the potential for runoff and wind erosion.**

4.2.1.2 Locally Significant Wetlands

In addition to the Provincially Significant Wetland, portions of two (2) locally significant wetlands, the Caledon East Wetland Complex, and the Mono Road Wetland Complex fall within the Project Area. A review of the Preferred Alternative indicates that the footprint of the proposed improvements is not located within the boundaries of any of the locally significant wetlands (as mapped by Land Information Ontario). As no direct impacts are anticipated, potential for indirect impacts during construction should be addressed during detailed design. As part of this, adherence to the recommendations outlined above for Provincially Significant Wetlands should be included along Airport Rd where works will occur in proximity to Locally Significant Wetlands.

- **During detailed design, impacts to Locally Significant Wetlands should be avoided to the extent possible.**

- **Final designs should include considerations to maintain flows between wetlands where possible and be consistent with CVC Fish and Wildlife Crossing Guidelines.**

4.2.1.3 Unevaluated Wetlands

The Project Area contains a number of unevaluated wetland communities. The Preferred Alternative avoids alterations to the majority of these wetland communities proper; however, a single wetland community located at the intersection of Airport Rd and Olde Base Line Rd will experience direct loss (**Figure 2e**). The Forb Mineral Meadow Marsh (MAM2-10) located on the eastern side of Airport Road at this intersection will have approximately 165 m^2 removed. This wetland community is not associated with any documented Flora or Fauna Species of Concern by TRCA. TRCA documented a Fauna Species of Regional Concern (L3) within this wetland; however, the actual species is not listed. Direct wetland loss should be reviewed by TRCA and compensation measures to result in no net wetland loss discussed as part of the permitting process.

4.2.2 Habitat of Endangered and Threatened Species

As outlined in **Table 2** and **Appendix 3**, six (6) Endangered or Threatened species have the potential to be present within the Project Area. Two (2) bird species, Barn Swallow and Bobolink are primarily associated with the agricultural communities, with Barn Swallow also known to forage over wetlands. Habitat within the Project Area does not appear to be a limiting factor for these species. Numerous agricultural lands are present and, depending on crop rotation cycles, will continue to provide habitat. Improvements to Airport Rd do not appear to extend into the identified agricultural communities and therefore have a limited likelihood of damaging or destroying habitat for these species. Additionally, as Bobolink are known to avoid selecting edge habitat for nesting, the likelihood of this species being impacted is further reduced. From a cautionary prospective, as the final footprint of encroachment into agricultural fields is unknown, RiverStone recommends that:

- **During detailed design if the footprint of disturbance is proposed to encroach into potential habitat for Bobolink, additional targeted surveys for this species may be required.**

Finally, the proposed improvements do not appear to require the removal of any structures that have the potential to function as nesting habitat for Barn Swallow suggesting that this species is unlikely to be impacted, where present. On a cautionary note, Barn Swallows are known to nest in large culverts. RiverStone recommends that:

- **During detailed design, all existing culverts be reviewed to ensure that Barn Swallows are not actively nesting in any of these structures.**

- **Should Barn Swallow be encountered nesting in a culvert, staff from the Ministry of Environment, Conservation, and Parks (MECP) should be contacted to obtain direction on how to proceed.**

The three (3) species of bats are primarily associated with forested communities and, given that, are most likely to be present in the northern portion of the Project Area as these species seek out forested communities for roosting habitat. The *Endangered Species Act, 2007* (ESA) affords protection to both individuals of a species (s.9) and their habitat (s.10). Habitat loss is typically considered a primary source of species declines when considering listing species at Endangered or Threatened. Habitat loss or lack of available roosting sites is not considered to be a threat to the long-term persistence of Myotis species in Ontario. Myotis species declines are the result of White Nose Syndrome (WNS). WNS is caused by a parasitic fungus that grows on hibernating bats causing them to become dehydrated. Infected individuals are awoken from hibernation prematurely, due to dehydration, and leave hibernation sites to forage, often during winter months. However, despite the main cause of decline in bats is the result of a parasite the ESA protects both individual Myotis and their habitat (both overwintering, and active season), thus impacts to individuals and their habitats must be considered. No suitable Myotis hibernation habitat was identified within the Project Area based on the material provided by TRCA. The extent of forest cover present in the northern portion of the Project Area has the potential to contain suitable trees for roosting. Avoidance of roosting habitat will minimize the potential for individual Endangered Bats and their summer roosting habitat to be negatively impacted by the Preferred Alternative. To this end, RiverStone recommends that:

- **Tree removal only occur within the Project Area between October 1 and May 1 to avoid the active roosting season for endangered bat species.**

- **The extent of tree removal within the Project Area be limited to the extent possible.**

- **Should tree removal of entire stands of trees be identified as a requirement during detailed design, MECP should be contacted to determine if a permit under the ESA is required.**

- **If any suitable anthropogenic roosting structures (i.e., old houses, barns, etc.) are proposed for removal, exit surveys to confirm presence or absence of SAR bats may be required at the design stage.**

Finally, Butternut trees have the potential to be present throughout most of the Project Area. TRCA did not identify this species as part of their onsite assessments. A single Butternut was documented by RiverStone in the central portion of the Project Area during the completion of a tree inventory. This tree appears to be approximately 30 m from the edge of disturbance (**Figure 2b**). While impacts to this tree are unlikely from the Preferred Alternative, as it falls within 50 m of the extent of disturbance, RiverStone recommends that:

- **During detailed design, a formal health assessment of the identified Butternut be completed to determine if measures are required to protect this individual to ensure compliance with the Provincial *Endangered Species Act, 2007*.**

4.2.3 Significant Areas of Natural and Scientific Interest

As previously stated, TRCA identified a portion of the Innis-Gibson Lakes Kettles candidate ANSI in proximity to the intersection of Airport Rd and Mountcrest Rd.; this falls within the boundaries of the hamlet of Caledon East. Based on a review of the extent of disturbance associated with the Preferred Alternative, no alteration is proposed within or in proximity to the identified candidate ANSI. As such, no negative impacts to this feature are anticipated. Should changes to the footprint of impact in proximity to the candidate ANSI occur during detailed design, avoidance or mitigation measures should be considered.

4.2.4 Environmentally Significant Areas

As outlined in **Section 3.2.4**, TRCA identified the presence of two (2) Environmentally Significant Areas within the Project Area. One of these areas (Caledon East Complex [ESA #36]) is associated with the locally significant Caledon East Wetland complex and was identified by TRCA as a hydrologic source of the Humber River. Based on RiverStone's review of mapping provided by TRCA and the proximity of ESA#36 to the Project Area, there is a low likelihood of impacts to this area as a result of the Preferred Alternative. To further reduce the potential for negative impacts to ESA#36, RiverStone recommends adherence to the measures provided in **Section 4.2.1** of this report.

The second Environmentally Significant Area identified by TRCA within the Project Area (Caledon East Swamp [ESA#132]) is located in the Hamlet of Caledon East in proximity to Larry St. Based on a review of the extent of disturbance associated with the Preferred Alternative, no alteration is proposed within or in proximity to ESA#132. As such, no negative impacts to this feature are anticipated. Should changes to the footprint of impact in proximity to ESA#132 occur during detailed design, avoidance or mitigation measures should be considered.

4.2.5 Significant Wildlife Habitat

4.2.5.1 Seasonal Concentration Areas of Animals

Waterfowl Stopover and Staging Areas (Terrestrial)

Terrestrial Waterfowl Stopover and Staging Areas are typically associated with open field communities (natural and anthropogenic) that are flooded during spring months. Migrating waterfowl use these flooded fields as 'rest stops' during spring migration. Standing water within the fields provides refugia as well as foraging opportunities for these species. While TRCA did not specifically identify the presence of flooded fields or congregations of waterfowl during their onsite investigations, the prevalence of open field communities within the Project Area suggests that this category of Significant Wildlife Habitat may be present. Based on a review of the extent of disturbance anticipated as part of the Preferred Alternative, minimal encroachment into existing field communities will occur. Given the extent of encroachment, the potential for negative impacts as a result of lost field communities within the Project Area is minimal suggesting that these communities will continue to function as terrestrial Waterfowl Stopover and Staging Areas should these areas currently exist. To further reduce the potential for negative impacts to the ecological form and function of the field communities as they relate to Waterfowl, RiverStone would recommend:

- **Development and site alteration within field communities found to contain standing water in the spring, should not occur until water levels have receded.**

- **Grading plans must ensure that alteration to field margins will not result in substantial draining of surface water from these communities.**

Bat Maternity Colonies

As outlined above, the Project Area contains several potentially suitable maternal roosting sites (e.g., trees with cracks or cavities, snags, etc.) for Big Brown Bat and Silver-haired Bat. The impacts to potential roosting habitat for bats within the Project Area was considered as part of the assessment for *Endangered* Bat species (see **Section 4.2.2**). Recommendations to minimize the potential for impacts to *Endangered* Bats within the Project Area are anticipated to maintain the ecological features and functions as they related to Bat Maternity Colonies. As such, RiverStone recommends the following measure:

- **The recommendations offered herein to protect Endangered Bats (Section 4.2.2), must be implemented in full as they will also serve to protect any significant bat maternity colonies that may occur adjacent to the Project Area.**

Turtle Wintering Areas

Turtles overwinter in ponds, streams, and lakes. Ideal overwintering habitats provide low temperatures and high dissolved oxygen conditions but must not freeze to the bottom. Based on the information provided by TRCA, larger wetland and river communities within the Project Area have the potential to function as overwintering habitat for turtles. Land clearing, changes to water levels, water quality, and alterations to the thermal regime can negatively impact the potential for a site to provide overwintering habitat for turtles. Additionally, maintaining access to overwintering areas by turtles is important to ensure that the ecological form and function of a wintering area is not negatively impacted. To limit the potential for negative impacts to the ecological form and function of these feature's ability to provide habitat for overwintering turtles, RiverStone recommends that:

- **In general, a 30 m buffer from wetland communities within the project area must be maintained.**

- **Vegetation within the 30 m buffer is to remain in a natural state.**

- **Water balance within wetlands is to be maintained to ensure suitable water levels for hibernation are present and ensure consistency with the Centreville Creek Subwatershed Study (TRCA 2003).**

- **Where construction activities are proposed in proximity to wetland communities, suitable exclusion fencing must be erected to ensure that sediment not be permitted to enter wetlands or their associated buffers.**

- **Where possible, enhancement of existing wetland buffers, between wetlands and the existing roadway should be considered.**

- **Where the Preferred Alternative requires the removal of a portion of wetland, this should occur late in the summer during periods of low water levels to minimize the potential for impacts.**

4.2.5.2 Rare Vegetation Communities

Sand Barrens

TRCA identified the presence of a Treed Sand Barren community (SBT1) with Dry Dropseed Sand barren inclusions south of Huntsmill Drive (see Figure 5 in the TRCA report). Sand barren communities contain poor soils dominated by sandy substrates that are typically maintained through disturbance regimes that limit the establishment of successional species and the formation of higher quality soils. Based on a review of the extent of disturbance associated with the Preferred Alternative, no alteration is proposed within the identified Sand Barren Community and as such the potential for negative impacts to this feature is minimal. As the proposed improvements associated with the Preferred Alternative will occur adjacent to this community, RiverStone provides the following recommendations to minimize the potential for negative impacts to this feature and its ecological function:

- **Prior to the onset of construction, the edge of the Treed Sand Barren Community (SBT1) proximate to Airport Rd be isolated using standard sediment and erosion control practices.**
- **No disturbance or site alteration is to occur within the Treed Sand Barren Community (SBT1).**
- **No plantings or installation of additional vegetation is to occur within this community as part of final site stabilization.**

4.2.5.3 Specialised Habitats for Wildlife

Amphibian Breeding Habitat (Woodland)

The results of targeted surveys for calling anurans completed by TRCA within the Project Area indicate the presence of breeding amphibians in several woodland communities, primarily associated with the treed wetland communities (i.e., deciduous and thicket swamps) in the north. While no targeted surveys for breeding salamanders were completed, these species are known to seek out pools in forested communities for breeding. As the proposed improvement activities associated with the Preferred Alternative will avoid impacts to the extensive areas of woodland amphibian breeding habitat in the northern portion of the Project Area, RiverStone does not anticipate any impacts to significant woodland amphibian breeding habitat.

Amphibian Breeding Habitat (Wetland)

Wetland communities suitable to provide wetland (i.e., non-woodland) breeding habitat for amphibians are present within the Project Area. While TRCA did not complete targeted calling surveys during the summer months when many of the species of Anuran associated with this Habitat Category are breeding, it can be assumed that where wetland communities are present, these species are likely to occur as well. Improvements associated with the Preferred Alternative have largely avoided wetland communities with the potential to function as Amphibian Breeding Habitat. As previously stated, a single wetland community located at the intersection of Airport Rd and Olde Base Line Rd will

experience direct loss. The Forb Mineral Meadow Marsh (MAM2-10) located on the eastern side of Airport Road at this intersection will have approximately 165 m^2 removed representing a loss of Amphibian Breeding Habitat. It is anticipated that the remainder of the wetland community will continue to function as breeding habitat for amphibians indicating that the feature and its ecological function will be largely maintained. RiverStone recommends the following to limit the potential for negative impacts to the ecological form and function of wetland providing Amphibian Breeding Habitat within the Project Area:

- **All measures outlined in Sections 4.2.1 of this report related to wetland be adhered to.**
- **Direct wetland loss should be reviewed by TRCA and compensation measures to result in no net wetland loss discussed as part of the permitting process.**
- **In general, a 30 m buffer from wetland communities within the project area be maintained.**
- **Vegetation within the 30 m buffer is to remain in a natural state.**
- **Water balance within wetlands is to be maintained to ensure suitable water levels for hibernation are present.**
- **Where construction activities are proposed in proximity to wetland communities, suitable exclusion fencing be erected to ensure that sediment not be permitted to enter wetlands or their associated buffers.**
- **Where possible, enhancement of existing wetland buffers, between wetlands and the existing roadway be considered.**
- **Where the Preferred Alternative requires the removal of a portion of wetland, this should occur late in the summer during periods of low water levels to minimize the potential for impacts.**

4.2.5.4 Habitat for Species of Conservation Concern (not including Endangered or Threatened species)

TRCA did not document the presence of Special Concern Species as part of their onsite assessments; however, based on the geographic location of the Project Area, a number of these species have the potential to be present. Based on the assessment completed in **Appendix 4**, RiverStone identified the potential for Snapping Turtle (*Chelydra serpentine*), Eastern Ribbonsnake (*Thamnophis sauritus*), Eastern Wood pee-wee (*Contopus virens*), Wood Thrush (*Hylocichla mustelina*), and Monarch (*Danaus plexippus*) to be present.

Both Snapping Turtles and Eastern Ribbonsnakes are primarily associated with wetlands and aquatic communities (including riparian areas). Adherence to recommendations outlined herein that address potential for impacts to wetlands (see **Section 4.2.1**), Turtle Wintering Habitat (see **Section 4.2.5.1**), and Fish Habitat (see **Section 4.2.6**) will ensure that there is a low likelihood of negative impacts to the ecological features and functions of areas with the potential to provide habitat for Snapping Turtles and Eastern Ribbonsnakes.

Eastern Wood pee-wee and Wood Thrush are commonly found in forested communities. While the removal of trees required by the Preferred Alternative is minimal, loss of trees has the potential to

impact habitat for these species. Given the extent of possible nesting habitat within the landscape surrounding the Project Area, the loss of minimal forest habitat is not anticipated to result in negative impacts to these species. Avoidance of vegetation removal during the active nesting season for this and other avian species will further reduce the potential for negative effects arising from the Preferred Alternative. To minimize the potential for negative impacts to the ecological form and function of communities with the potential to provide habitat for these two avian species, RiverStone recommends:

- **The extent of tree removal within the Project Area be limited to the extent possible.**
- **Site alteration (i.e., felling of trees, clearing, grading, etc.) not occur within the project area between April 1 and August 31, as this time corresponds to the peak nesting/breeding period for the majority of avian species.**

Monarch Butterflies have the potential to be present within the Project Area. Although no confirmed breeding was documented (i.e., presence of caterpillars, etc.) this species' host plant Milkweed (*Asclepias* spp.) was noted by TRCA. Without specific details pertaining to the locations of Monarch host plants within the Project Area it is difficult to assess the full extent of potential impacts to this species. Given the extent of disturbance associated with the Preferred Alternative, there is a low likelihood of the proposed improvements removing all of the areas containing Milkweed. As such, the potential for the Preferred Alternative to result in negative impacts to the ecological form and function of habitat for Monarch is likely low. To reduce the potential for negative impacts to Monarch, RiverStone recommends:

- **Restoration designs should consider the inclusion of Milkweed in planting plans for areas that are disturbed by construction.**

4.2.5.5 Animal Movement Corridors

As part of the impact assessment, movement of wildlife across Airport Rd. was considered as part of the assessment of Significant Wildlife Habitat. Data provided by TRCA indicated that both Deer Movement Corridors and Amphibian Movement Corridors are likely present within the Project Area. Most notably, TRCA identified areas in proximity to Huntsmill Drive, Mountcrest Rd, and just north of Bostin Mills Rd as having the potential to contain wildlife movement corridors. Additionally, road-kill data provided by MNRF indicate that this location is a high incident area for wildlife/motor vehicle collisions. In proximity to Huntsmill Dr. this area contains a variety of ecological communities and features that support wildlife populations (e.g., forest, wetland, watercourses). Ideally culverts in this area would be oversized to facilitate passage for the largest number of species. The CVC Fish and Wildlife Crossing Guidelines should be consulted during detailed design. Crossing(s) in proximity to Airport Rd and Mountcrest Rd already contain large culverts and are not currently proposed for replacement; fencing or other structures could be considered in this location to enhance the existing crossing functionality. The crossing located north of Boston Mills links wet portions of an agricultural field and a narrow strip of vegetation in proximity to a commercial Nursery; this area extends into the Mono Road Wetland Complex to the west. The elevated nature of the road in this location may provide opportunities to enhance movement for smaller wildlife (i.e., small mammals and amphibians). RiverStone recommends:

- **Wildlife Crossing signage be considered at each of the locations identified by TRCA.**

- **During detailed design, where culvert replacements are proposed, and the general structure size permits, RiverStone recommends the following to improve the likelihood of drainage culverts functioning as movement corridors.**

- **The culvert should be backfilled to create a low flow channel with dry "benches" along the edges. Backfill material should include:**
    - **a layer of native soil**
    - **overlaid with coarse gravel (0.01-0.03m)**
    - **overlaid with a 50-50 mix of coarse gravel (0.01-0.03m) and cobble (0.1-0.3m) with interstitial spaces filled with native soil on only the edges of the culvert to create two (2) dry "benches" each approximately one third (1/3) of the width of the culvert.**
- **Backfilling should leave a low flow channel approximately one third (1/3) of the width of the culvert. This channel should meander along the length of the culvert.**
- **Backfilling and imbedding of the culvert should maintain a minimum of 1 m of clearance between substrates and the top of the culvert.**
- **Boulders (300-500mm) should be placed throughout the length of the culvert on the dry "benches" at a density of 1-2 boulders per 2 m of culvert length.**
- **CVC recommends that in order to increase the likelihood of use of a culvert by wildlife, the openness ratio ([height x width] / length) should be no less than 0.1 (ideal is 0.4 or greater).**

Culvert Ends

- **Culvert ends can be constructed using either a retaining wall or wing walls; however, wing walls are preferred as they act to funnel wildlife into the culvert.**
- **Materials used for culvert end treatments should be relatively smooth so as to discourage climbing by wildlife (e.g., precast concrete).**

Fencing Design

- **Fencing should be tied into the end of culvert treatment.**
- **Fencing should extend across the roadside ditch, away from the culvert to the edge of the road right-of-way. Keeping the fencing as far from the road as possible will minimize damage from snow removal activities.**
- **Where the fence crosses the ditch, the gap below the fence should be filled with rip-rap to permit water flow but exclude wildlife.**
- **CVC recommends that fencing be constructed of galvanized steel chain-link fencing that is 1-2 m in height.**
- **To exclude smaller animals (mice, voles, frogs, etc.), panels of galvanized hardware cloth or similar material with a mesh size of 6 mm (0.25 inches) be added to the lower 1 m portion of chain-link fencing.**
- **The bottom of the fencing should be buried between 0.2-0.4 m underground to deter wildlife from digging under the fence.**

4.2.6 Fish Habitat

Fish and aquatic habitat conditions within the three (3) crossings of Airport Rd. that were identified as direct or indirect fish habitat were provided by TRCA. Fish habitat in these locations is dominated by coldwater communities. Coldwater communities are considered sensitive to both anthropogenic inputs and alterations to thermal conditions within the watercourse. Centreville Creek (Crossings 2 and 3) and associated tributaries (i.e., Boyce's Creek, Crossing 1) within the study area areclassified as an intermediate coldwater system in the Humber River Fisheries Management Plan (TRCA and OMNR 2005). Target species for Centreville Creek (and other "Zone 1" management areas within the Humber River watershed) include Brook Trout (*Salvelinus fontinalis*), Brown Trout (*Salmo trutta*), and Atlantic Salmon (*Salmo salar*).

In general, negative impacts to fish habitat associated with implementation of the proposed road improvements as described in **Section 4.1** may result via the following pathways:

- Land-based construction activities such as excavation, grading, use of industrial equipment, dewatering, and vegetation clearing. These activities may result in inputs of soil/sediment, nutrients, and/or toxic substances to the drainage features during construction, which may adversely affect water quality and fish habitat via increased turbidity, nutrient enrichment, contamination by toxic substances, changes in pH, etc.
- In-water activities required during culvert replacement, which will temporarily affect flow patterns and could result in the stranding of fish.
- Permanent alterations to channel gradients and culvert lengths.
- Potential fish passage issues if the new crossing structures are undersized.

To protect fish habitat within the Project Area during project implementation, and to ensure consistency with the larger watershed management plan (Humber River), RiverStone recommends:

- **Minimize riverbank and riverbed hardening to the extent possible (any replacement structures should be designed to maintain the existing natural substrates and gradients with an invert that allows continued fish passage).**
- **Where culvert replacements are required, open bottomed structures are recommended.**
- **Adherence to recommendations provided in Section 4.2.1 will help to ensure that Fish Habitat is protected from deposition of deleterious substances.**
- **During Detailed Design, a Request for Review should be submitted to DFO to demonstrate the proposed works will not result in serious harm to fish as defined by the *Fisheries Act*, 1985.**
- **All in-water and near-water works will be undertaken during the relevant fisheries timing window.**
    - **Crossings 1, 2, 3, 4, and 7 are identified as coldwater systems and as such in-water works must be undertaken between June 15 and September 15 at these crossings.**
    - **Crossings 5, and 6 were identified as warmwater systems and as such in-water works must be undertaken between July 15 and April 30 at these crossings.**
- **Vegetation within 30 m of watercourses is to be maintained to minimize channel bank erosion and maintain water quality.**

- **All in-water works are to occur 'in the dry' with flows being maintained to downstream reaches of the watercourses.**
- **Where possible, during detailed design consideration for potentially increasing the diameter of the culvert at Crossing 7 should be considered.**
- **Where pumping is to occur, water intakes will be screened to inhibit fish from becoming entrained or impinged by the pumping activities, and the screen face must be oriented in the same direction as flow.**
- **A sediment and erosion control report and plan (including phasing and staging plans) is to be developed that is consistent with the Erosion and Sediment Control guidelines for Urban Construction (December 2006) and these works are to be maintained in good working order until completion of this project.**
- **Appropriate sediment and erosion control measures shall be employed to prevent the erosion of unstable soils and the movement of sediment and/or other deleterious substances into any watercourse. These measures shall be in place prior to the onset of site preparation.**
- **Upon isolation of the work area, and during draw down of water, any fish trapped within the work area will be immediately collected and moved to a suitable habitat downstream by a qualified biologist under a MNRF issued "Licence to Collect Fish for Scientific Purposes".**
- **At construction, Fisheries and Oceans must be notified immediately if a situation occurs or if there is imminent danger of an occurrence that could cause *serious harm* to fish. If there is an occurrence, corrective measures must be implemented.**
- **Stormwater management should be designed to maintain water balance to all identified watercourses that provide fish habitat in order to ensure that existing levels of channel instability at sensitive sites downstream are not increased. This is consistent with the management objectives of the Centreville Creek Subwatershed Study (TRCA 2003).**

4.2.7 Headwater Drainage Features

The resulting management objective for each of the HDF segments are presented at the conclusion of **Table 3**. These management options are derived from the TRCA HDF assessment guideline. Each management option has a set of criteria describing scenarios for development within or adjacent to the feature. These criteria are as follows, for the No Management Required and Mitigation classifications as noted in **Table 3**:

C. Mitigation – Contributing Functions: e.g. contributing fish habitat with meadow vegetation or limited cover

- Replicate or enhance functions through enhanced lot level conveyance measures, such as well-vegetated swales (herbaceous, shrub and tree material) to mimic online wet vegetation pockets, or replicate through constructed wetland features connected to downstream;
- Replicate on-site flow and outlet flows at the top end of system to maintain feature functions with vegetated swales, bioswales, etc. If catchment drainage has been previously removed due to diversion of stormwater flows, restore lost functions through enhanced lot level controls (i.e. restore original catchment using clean roof drainage);
- Replicate functions by lot level conveyance measures (e.g. vegetated swales) connected to the natural heritage system, as feasible and/or Low Impact Development (LID) stormwater options (refer to Conservation Authority Water Management Guidelines for details);

F. No Management Required – Limited Functions: e.g. features with no or minimal flow; cropped land or no riparian vegetation; no fish or fish habitat; and no amphibian habitat.

- The feature that was identified during desktop pre-screening has been field verified to confirm that no feature and/or functions associated with headwater drainage features are present on the ground and/or there is no connection downstream. These features are generally characterized by lack of flow, evidence of cultivation, furrowing, presence of a seasonal crop, and lack of natural vegetation. No management recommendations required.

The preferred alternative has limited potential to negatively impact the features present at Crossings 4, 5, and 6. No actions or recommendations are required for Crossing 4.

- **At Crossing 5, replacement of functions is recommended for HUM5-C.**
- **At Crossing 6, replacement of functions is recommended for both HUM6-B and HUM6-D.**

4.3 Natural Heritage Systems

As outlined in **Section 3.3**, portions of the study area have been identified as part of the Natural Heritage Systems associated with the ORMCP and the NEP. The NEP Natural Heritage System is located exclusively in the northern portion of the study area to the northwest of Huntsmill Drive. Additionally, wetlands immediately to the west of Huntsmill Drive, are part of the Natural Core Area and Natural Linkage Area of the ORMCP. Recommendations provided in Section 4.2.1 of this report will help to ensure that the natural features associated with the NEP and ORMCP Natural Heritage Systems in proximity to the intersection of Airport Road and Huntsmill Dr. will not be negatively impacted by the proposed alternative. Finally, considerations for additional wildlife crossing structures in this area as per **Section 4.2.5.5** will help to enhance the ecological value of this area.

In the central portion of the study area, wetlands associated with the Mono Road Wetland complex between Olde Base Line Road and Boston Mills Road are designated as Natural Linkage Areas in the ORMCP. This area is largely comprised of open agricultural communities that are proposed to remain. A round about at the intersection of Boston Mills and Airport Road has been considered as part of the preferred alterative and would therefore be on the margin of the Natural Heritage System in this area. The extent of agricultural communities in this area provide much of the linkage function associated with the Natural Heritage System. As these communities will remain, the potential for negative impacts is minimal.

During detailed design, considerations for additional wildlife crossing structures in this area as per **Section 4.2.5.5** may provide improved connectivity for wildlife within the identified Natural Heritage Systems. Additionally, detailed design should consider enhancing existing vegetation (where possible) and increasing the extent of natural cover within the study area. These activities will contribute to the expansion of natural cover as per the goals of the TRCA Terrestrial Natural Heritage System Strategy (TRCA 2007).

4.3.1 Trees and Natural Vegetation Communities

Tree composition within the Project Area has been evaluated as part of a Tree Inventory completed by RiverStone and discussed under a separate cover. In general, to minimize potential impacts to trees beyond the area of disturbance, RiverStone recommends:

- **Tree protection fence (or equivalent silt fence) should be placed along the perimeter of the Project Area (i.e., edge of disturbance).**

- **Replacement of trees should occur consistent with a landscaping plan containing native species suitable to site conditions.**
- **Following completion of the project works any disturbed and/or exposed soil should be stabilized and revegetated via a native seed mixture suitable to site conditions. The seed mix should be consistent with CVC/TRCA *Plant Selection Guidelines*.**
- **Prior to applying the seed mix, prepare the areas to be seeded by eliminating uneven areas and low spots, removing weeds to the extent achievable, and removing branches and stones in excess of 50 mm.**
- **In areas of slopes greater than 3:1, jute mat, Bonded Fibre Matrix or equivalent shall be laid on top of the seed mix to further stabilize disturbed soils in these areas. Where slopes are less than 3:1, seeding and mulch should be used to stabilize disturbed soils.**
- **All necessary vegetation removal (e.g., tree/shrub clearing, etc.) should be completed outside of the primary breeding bird nesting window (i.e., between April 1 and August 31). If limited vegetation removal must occur early during this period (i.e., between April 1-April 15), a nest survey should be conducted by a qualified biologist within 5 days of commencement of vegetation removal activities to identify and locate active nests of bird species (where present) covered by the federal *Migratory Bird Convention Act, 1994* or provincial *Fish and Wildlife Conservation Act, 1997*. If a nest is located or evidence of breeding noted, a mitigation plan should be developed to avoid any potential impacts on birds or their active nests. Mitigation may require establishing appropriate buffers around active nests or delaying construction activities until the conclusion of the nesting season.**

5 APPLICABLE ENVIRONMENTAL LEGISLATION AND POLICIES

The following commentary summarizes the federal, provincial, and municipal environmental legislation and policies, and describes how the recommendations provided in this report will permit the proposed alternative to address these provisions.

5.1 Federal *Species at Risk Act*, S.C. 2002, c. 29

The federal *Species at Risk Act* (SARA) was promulgated in 2002 to protect indigenous species from disappearing, and to recover those identified as Extirpated, Endangered, or Threatened on federal lands. On private lands or those owned by the province, only aquatic species listed as endangered, threatened or extirpated, and migratory birds are protected under SARA. The official list of species at risk under SARA is contained in Schedule 1 of the Act.

The key requirements of SARA – including prohibitions on killing/harming a listed species (s. 32), destroying its "residence" (s. 32), and destroying its "critical habitat (s. 58) – are largely restricted to federal lands. As the study area is located on private or municipally owned lands, these provisions are not applicable to the preferred alternative considered herein. Notwithstanding the above, Endangered and Threatened species listed on Schedule 1 that are either fish or migratory birds are afforded protection from killing/harming and from having their "residence "damaged or destroyed. For birds, a "residence" includes a nest.

Per the assessment in **Appendix 2** and **Appendix 4** and **Section 4** of this report, impacts are not anticipated to Endangered or Threatened species. Further, no fish species listed Endangered or Threatened under Schedule 1 are present within the Study Area (or in any watercourse reaches

immediately downstream) based on publicly-available DFO aquatic SAR mapping (http://www.dfo-mpo.gc.ca/species-especes/sara-lep/map-carte/index-eng.html). Given this, RiverStone has determined that the preferred alternative are consistent with the requirements of SARA (also see RiverStone's recommendations related to protection of migratory bird nests in **Section 5.3**).

5.2 Federal *Fisheries Act*, R.S.C. 1985, c. F-14

The Federal *Fisheries Act* states that:

> *35. (1) 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.*

Per the above subsection 35(1) requirement, project activities must be reviewed to determine if they have the potential to result in *serious harm to fish* that are part of a commercial, recreational, or Aboriginal fishery, or to fish that support such a fishery. Based on guidance documents provided by DFO, *serious harm to fish* includes:

- **direct fish mortality**;
- the **permanent alteration of fish habitat** at a spatial scale, duration or intensity that negatively impacts habitat used to carry out one or more of their life processes (i.e., spawning, nursery, or rearing grounds, food supply areas, mitigation corridors, etc.); and
- **destruction of fish habitat** at a spatial scale, duration or intensity such that fish can no longer utilize habitats necessary to carry out one or more of their life processes (i.e., spawning, nursery, or rearing grounds, food supply areas, mitigation corridors, etc.).

Incorporating the recommendations outlined in **Section 4.2.6** during detailed design will help to ensure that the preferred alternative will be consistent with the Federal Fisheries Act.

5.3 Federal *Migratory Birds Convention Act*, S.C. 1994, c. 22

Section 6 of the Migratory Birds Regulations per the *Migratory Birds Convention Act, 1994* (MBCA) prohibits the disturbance or destruction of nests, eggs, or nest shelters of a migratory bird. The provincial *Fish and Wildlife Conservation Act, 1997* (FWCA) extends the protection of bird nests and eggs to species that are not listed under the Migratory Birds Regulations (e.g., Corvids).

As recommended in **Section 4.3.1**, all clearing of vegetation required within the proposed extraction area should be restricted to times outside of the period April 1 to August 31 inclusive. If limited vegetation clearing must occur early during this period (i.e., April 1 – April 15), a nest survey should be conducted by a qualified avian biologist prior to commencement of construction activities to identify and locate active nests of migratory bird species covered by the MBCA or FWCA. If a nest is located or evidence of breeding noted, then a mitigation plan should be developed to address any potential impacts on migratory birds or their active nests. Mitigation may require establishing appropriate buffers around active nests or delaying construction activities until the conclusion of the nesting season.

5.4 Provincial *Endangered Species Act*, S.O. 2007, c. 6

The *Endangered Species Act, 2007* (ESA) protects designated Endangered and Threatened species in Ontario from being killed, harmed, or harassed (s. 9) or having their habitat damaged or destroyed (s.

10). As indicated in **Section 4.2.2**, several species protected under provisions of the ESA were determined to have confirmed or potential habitat on within the study area. As detailed in **Section 4.2.2**, activities associated with the preferred alternative are not expected to contravene provisions of the ESA for most species evaluated.

5.5 Oak Ridges Moraine Conservation Plan

Section 41 of the Oak Ridges Moraine Conservation Plan (ORMCP) addresses transportation projects. In general, s.41 requires that transportation projects:

- Keep disturbance to a minimum
- Keep right of way widths to a minimum while meeting stormwater management objectives.
- Allow for wildlife movement; and
- Include practices to keep adverse effects to ecological integrity to a minimum.

Incorporation of the recommendations contained in **Section 4** of this report into the detailed design of this project will help to ensure that the improvements to Airport Road are consistent with Section 41 of the ORMCP.

5.6 Greenbelt Plan (2017)

Section 4.2 of the Greenbelt Plan addresses infrastructure within the Protected Countryside areas of the Plan. Incorporating the recommendations provided in **Section 4** of this report will help to improve fish habitat, restore or enhance wildlife movement corridors, and minimize or mitigate impacts associated with runoff quality into the watercourses in the study area. This is consistent with Section 4.2 of the Greenbelt Plan.

5.7 General Requirements of O. Reg. 166/06 and O. Reg. 160/06

Both TRCA and CVC regulatory jurisdictions extend to areas within and adjacent to valley and stream corridors, the Lake Ontario shoreline, hazard lands (i.e., floodplains), watercourses, and wetlands as provided under the *Conservation Authorities Act, 1990*. Within the Project Area, TRCA's regulatory jurisdiction includes all watercourses and drainage features (including their floodplains), along with wetlands (and their 30 m buffers), and the 120 m area from the boundary of the Provincially Significant Wetland Complexes. CVC's regulatory jurisdiction extends to a single tributary of the East Credit River, located proximate to the middle of the Project Area (identified as Crossing 7, see TRCA Addendum report April 2018).

Pursuant to s. 3 of O. Reg. 166/06 and O. Reg. 160/06, permission to undertake "development" within a regulated area must be expressly granted by TRCA and CVC. "Development" as defined under s. 28(25) of the *Conservation Authorities Act* means the following:

- *(a) the construction, reconstruction, erection or placing of a building or structure of any kind,*
- *(b) any change to a building or structure that would have the effect of altering the use or potential use of the building or structure, increasing the size of the building or structure or increasing the number of dwelling units in the building or structure,*
- *(c) site grading, or*

- *(d) the temporary or permanent placing, dumping or removal of any material, originating on the site or elsewhere;*

In addition to regulating development, TRCA and CVC also regulate (under s. 5 of O. Reg. 160/06) the straightening, changing, diverting or interfering in any way with the existing channel of a river, creek, stream, or watercourse, or changing or interfering in any way with a wetland.

The proposed road improvements considered herein constitute "development" within a TRCA and CVC regulated area (e.g., temporary placement of material, etc.). Given the above, the proposed works require a permit from both TRCA and CVC to proceed.

5.7.1 TRCA Regulation Tests

To secure a permit from TRCA to work within a regulated area and/or interfere with a watercourse, several tests apply. Under s. 3(1) of O. Reg. 166/06, permission to develop within a regulated area may be granted if it is the opinion of TRCA that the *control of flooding, erosion, dynamic beaches, pollution or the conservation of land will not be affected by the development*. The permitting process is further clarified in TRCA's *Living City Policies* (TRCA 2014), particularly Section 8 (Policies for the Administration of TRCA's Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Regulation).

To assist TRCA's review, RiverStone has provided an assessment of conformity of the proposed works (i.e., culvert replacement) with relevant policies in Sections 7 and 8 of TRCA's *Living City Policies*. The most relevant policies are:

- Policy 7.4.4: General Policies for Infrastructure
- Policy 8.4: General Regulation Policies
- Policy 8.9: Infrastructure Policies

5.7.1.1 Policy 7.4.4.1: General Policies for Infrastructure

Section 7.4.4.1.2 of TRCA's policies address activities related to transportation infrastructure, specifically the crossing of valley and stream corridors and road widening. As per TRCA policies outlined therein, watercourses crossings are required to result in no upstream or downstream impacts to flooding or erosion, ensure safe conveyance of flood flows, be located to avoid natural hazards, and maintain the ecological functions of the valley or stream corridor crossings (e.g., aquatic or terrestrial habitat and connectivity). Note that portions of Policy 7.4.4.1.2 that deal with geomorphology or stormwater management will be addressed by others.

5.7.1.2 Policy 8.4: General Regulation Policies

General policies that apply to all activities within TRCA's regulated areas are outlined in Policy 8.4. As per Policy 8.4.1, development, interference, or alteration within regulated areas is prohibited without permission from TRCA. The relevant tests that must be met to satisfy TRCA are outlined in clauses a) through o) of Policy 8.4.5. Providing that RiverStone's recommendations for protecting features of conservation interest outlined in **Section 4** are implemented in full during detailed design, it is RiverStone's opinion that the proposed works are consistent with Policy 8.4.5 for the following reasons:

- the control of flooding, erosion, dynamic beaches, pollution or the conservation of land will not be affected by the proposed works;
- negative or adverse hydrological or ecological impacts on natural features and functions will be avoided to the extent possible;
- intrusions on natural features, areas and systems contributing to the conservation of land, including areas providing ecological functions and hydrologic functions, will be avoided to the extent possible; and
- pollution, sedimentation and erosion during construction and post-construction are to be minimized using best management practices.

5.7.1.3 Policy 8.9: Infrastructure Policies

TRCA's transportation infrastructure policies are relevant to the proposed works, which involve a culvert replacement. Policy 8.9.6 states that development, alteration, and interference associated with transportation infrastructure works that cross valley and stream corridors may be permitted if it can be demonstrated to the satisfaction of TRCA that (clause e):

e) the ecological and hydrological functions of the valley and or stream corridor are maintained by considering the following in accordance with TRCA Standards:
  i. the physical characteristics and geomorphic processes of the watercourse;
  ii. aquatic and terrestrial habitat;
  iii. valley or stream corridor form;
  iv. aquatic and terrestrial wildlife passage; and
  v. pedestrian passage (e.g. trails).

Provided that RiverStone's recommendations outlined in **Section 4** are incorporated into the detailed design, the ecological functions of natural heritage features within the Project Area will be maintained or enhanced from implementation to post completion of the proposed works. This should be confirmed by a qualified Geomorphologist.

5.7.2 CVC Regulation Tests

In order to secure a permit from CVC to work within a regulated area and/or interfere with a watercourse, several tests apply. Under s. 3(1) of O. Reg. 160/06, permission to develop within a regulated area may be granted if it is the opinion of CVC that the *control of flooding, erosion, dynamic beaches, pollution or the conservation of land will not be affected by the development*. The permitting process is further clarified in CVC's *Watershed Planning and Regulation Policies* (CVC 2010), particularly Section 7.2.6 (Infrastructure Policies).

CVC's infrastructure policies recognize that "*certain types of interference or development related to infrastructure by their nature must be located within hazardous land, watercourses, wetlands and natural features*". Policies 7.2.6 a(i)(a) through (k) provide a set of criteria infrastructure projects should be consistent with to provide eligibility for a permit, including that the works must be constructed in a manner to prevent unacceptable increases in flood and erosion hazard, and be consistent with CVC standards.

Provided that RiverStone's recommendations for protecting features of conservation interest outlined in **Section 4** are implemented in full as part of detailed design, we believe the ecological functions of

the Project Area will be maintained. In preparing our impact assessment and recommendations, RiverStone also reviewed CVC's *Fish and Wildlife Crossing Guidelines* (Apr. 28, 2017) and *Plant Selection Guidelines* (May 2015) and incorporated their standards/recommendations herein (where relevant).

5.8 Region of Peel Official Plan (December 2018 Office Consolidation)

The Region of Peel Official Plan identifies portions of the planning jurisdiction that have been mapped within the Region's Greenlands System. These lands include Core Areas, Natural Area and Corridors, and Protected Natural Areas and Corridors. These designations are primarily applied to significant coastal wetlands, core woodlands, environmentally sensitive or significant areas Provincial ANSIs, significant habitats of threatened and endangered species, and Escarpment Natural Areas of the Niagara Escarpment Plan.

Generally, the Official Plan polices prohibit development or site alteration within the Greenlands System; however, essential infrastructure that is exempted, pre-approved or authorized under an environmental assessment process is permitted (Policy 2.3.2.6).

5.9 Town of Caledon Official Plan (April 2018 Office Consolidation)

Section 5.7 of the Town of Caledon Official Plan addresses Environmentally Protected Areas (EPA)

> 5.7.3.1.2 The uses permitted in EPA shall be limited to: legally existing residential and agricultural uses; a building permit on a vacant existing lot of record; portions of new lots; activities permitted through approved Forest Management and Environmental Management Plans; limited extractive industrial; non-intensive recreation; and, essential infrastructure. Detailed policies with respect to each of these permitted uses are provided in Sections 5.7.3.2 to 5.7.3.7 inclusive. Within the ORMCPA or the Greenbelt Protected Countryside designation, permitted uses are also subject to the provisions of Sections 7.10 and 7.13, as applicable. Refer to Section 6.6.3.3 of this Plan for further policies respecting conflicts between the policies of this Plan and the PPS and Provincial Plans.

Should the preferred alternative be identified as essential infrastructure, the development may be considered consistent with Policy 5.7.3.1.2 where it overlaps with mapped EPA.

> 5.7.3.1.7 The expansion of existing settlement areas to include EPA will generally be discouraged unless it can be demonstrated that such an expansion would adhere to the Town's ecosystem principle, goal, objectives, policies and performance measures.

> 5.7.3.1.15 Through future municipal planning initiatives, the Town may determine, upon consideration of all relevant planning factors, that specific, developed portions of existing settlement areas, which are located within a valley and stream corridor, should be placed in a land use designation other than EPA. In such instances, appropriate land use designations and policies shall be developed for these lands in consultation with the relevant agencies. Such policies and designations shall address environmental and natural hazard issues to the satisfaction of the Town and other relevant agencies and shall be subject to an appropriate approvals process.

A small area between Airport Rd and Ivan Ave falls within the Environmental Policy Area in the Town of Caledon Official Plan (Schedule D). This portion of the EPA would be lost should the preferred alterative, including the expansion of Ivan Ave be pursued. This process should be consistent with Policy 5.7.3.1.15.

6 CONCLUSIONS

The preceding report provides the results of RiverStone's impact assessment of terrestrial, wetland, and aquatic resources for lands and waterbodies adjacent to the Airport Road improvement area between King Street and Huntsmill Drive, and along Old Church Road between Airport Road and Marilyn St. The preceding impact assessment was based on data provided by the Toronto Region Conservation Authority and Credit Valley Conservation. Based on the results of this assessment, the impacts associated with the Preferred Alterative have a low likelihood of resulting in negative impacts on existing natural heritage features. Incorporation of the recommendations provided herein during detailed design will minimize the potential for impacts to the natural environment (e.g., vegetation communities, wildlife, etc.) and features of conservation interest (e.g., PSWs, Natural Heritage Systems, etc.) within the Project Area during project implementation.

7 REFERENCES

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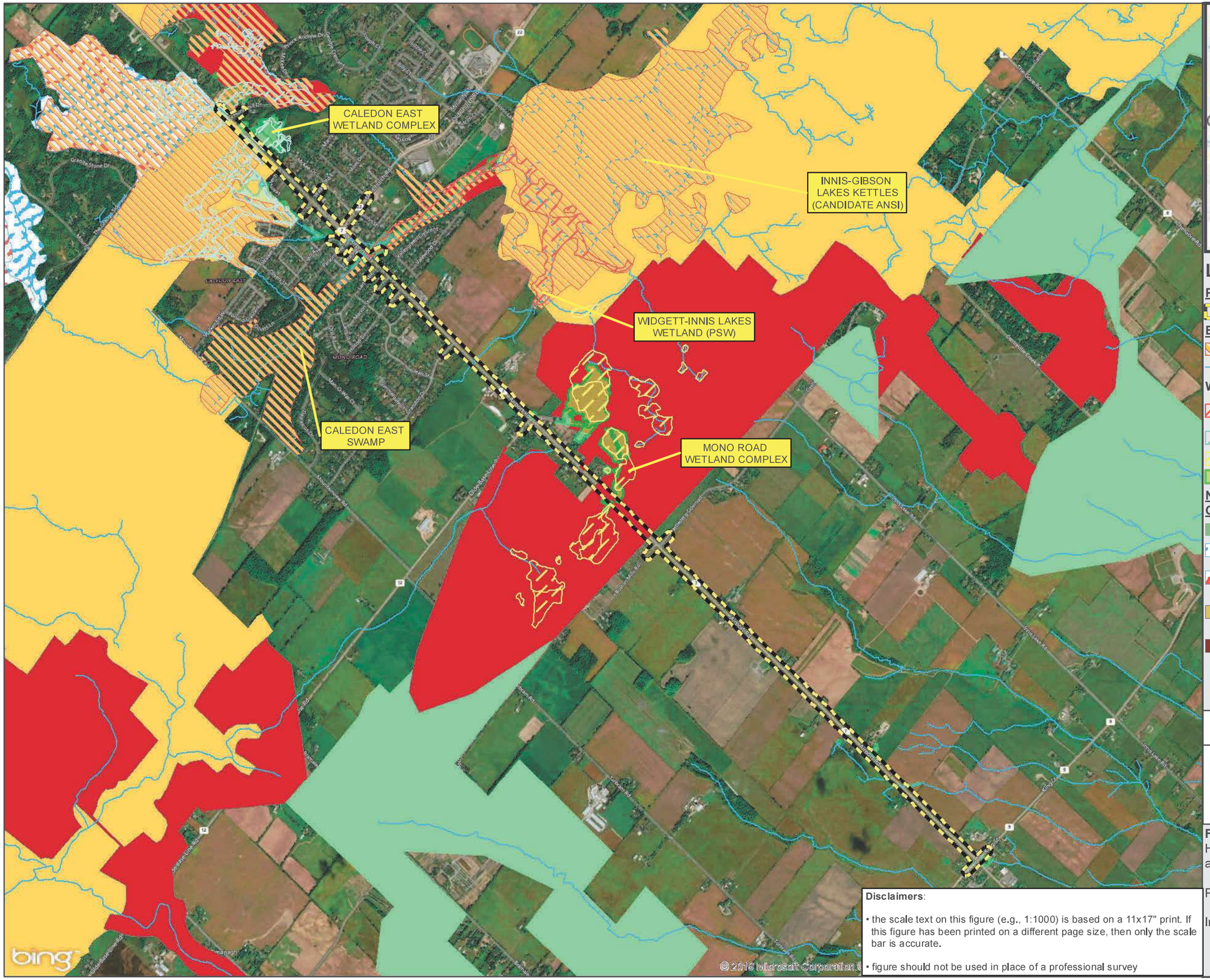


Legend

N

Planning Boundaries

- Project Area

Biophysical Features+Functions-TRCA

- Areas of Natural and Scientific Interest
- Watercourses

Wetlands

- Provincially Significant Widgett-Innis Lakes Wetland Complex
- Locally Significant Caledon East Wetland Complex
- Locally Significant Mono Road Wetland Complex
- Wetlands Mapped by TRCA

Natural Heritage Systems (Land Information Ontario)

- Greenbelt Plan
- Niagara Escarpment Plan, NEP-Escarpment Natural
- Niagara Escarpment Plan, NEP-Escarpment Protection
- Oak Ridges Moraine Conservation Plan, ORM-Natural Core Area
- Oak Ridges Moraine Conservation Plan, ORM-Natural Linkage Area

Orthorectified aerial photo - Bing Imagery

Scale	RS Project No.	Date Last Updated	By
1:25,000	2017-066	Jul 22, 2019	GC

0 375 750 Metres

RIVERSTONE

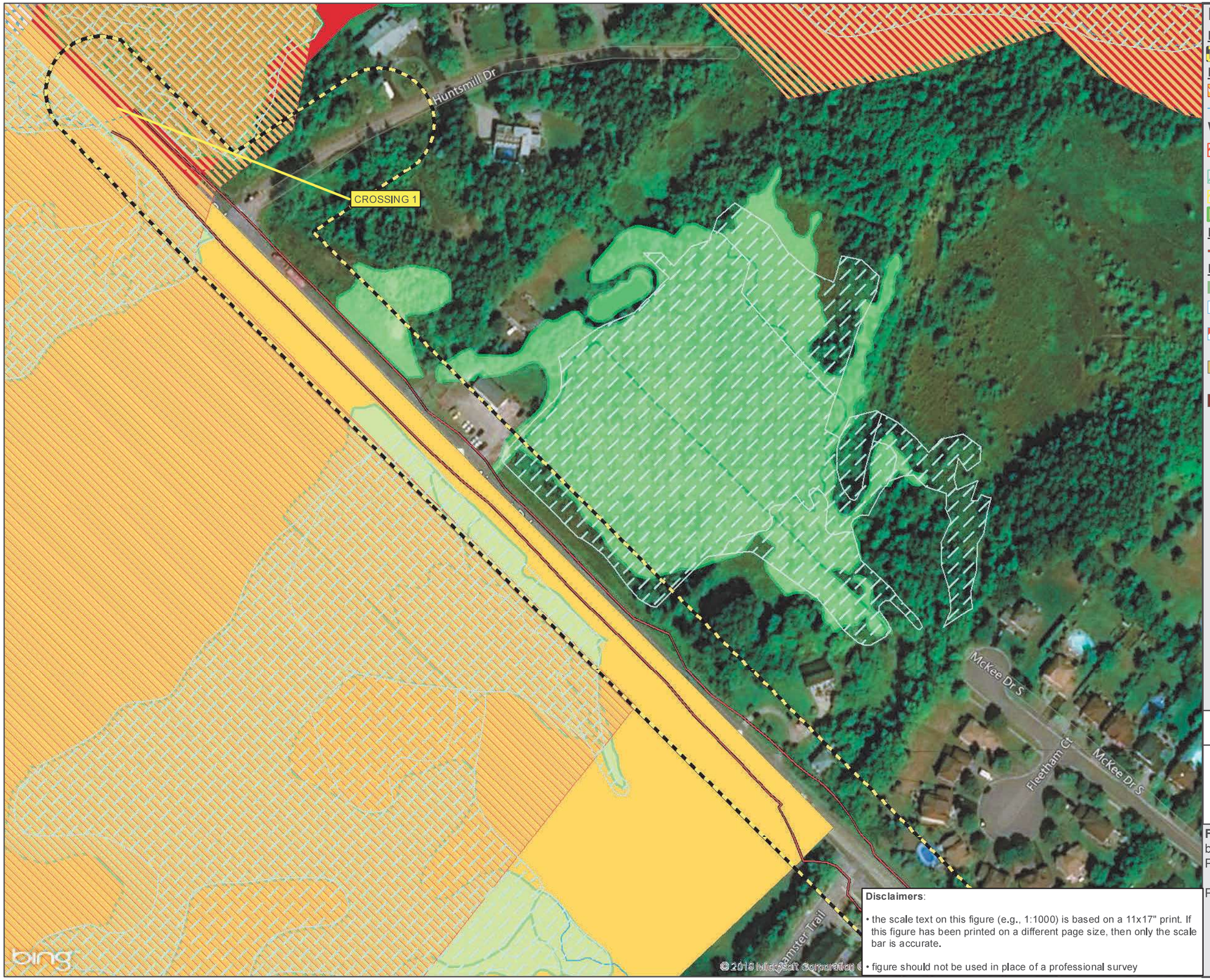
Disclaimers:

- the scale text on this figure (e.g., 1:1000) is based on a 11x17" print. If this figure has been printed on a different page size, then only the scale bar is accurate.
- figure should not be used in place of a professional survey

Figure 1. Location of Project Area and Natural Heritage Features. Airport Road between King Street and Huntsmill Drive, Region of Peel

Prepared for Region of Peel

Inset: General location of Project Area



Legend

N

Planning Boundaries
- Project Area

Biophysical Features+Functions-TRCA
- Areas of Natural and Scientific Interest
- Watercourses

Wetlands
- Provincially Significant Widgett-Innis Lakes Wetland Complex
- Locally Significant Caledon East Wetland Complex
- Locally Significant Mono Road Wetland Complex
- Wetlands Mapped by TRCA

Proposed Development and Site Alteration
- Limit of Disturbance (Preferred Alternative)

Natural Heritage System
- Greenbelt Plan
- Niagara Escarpment Plan, NEP-Escarpment Natural
- Niagara Escarpment Plan, NEP-Escarpment Protection
- Oak Ridges Moraine Conservation Plan, ORM-Natural Core Area
- Oak Ridges Moraine Conservation Plan, ORM-Natural Linkage Area

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Orthorectified aerial photo - Bing Imagery

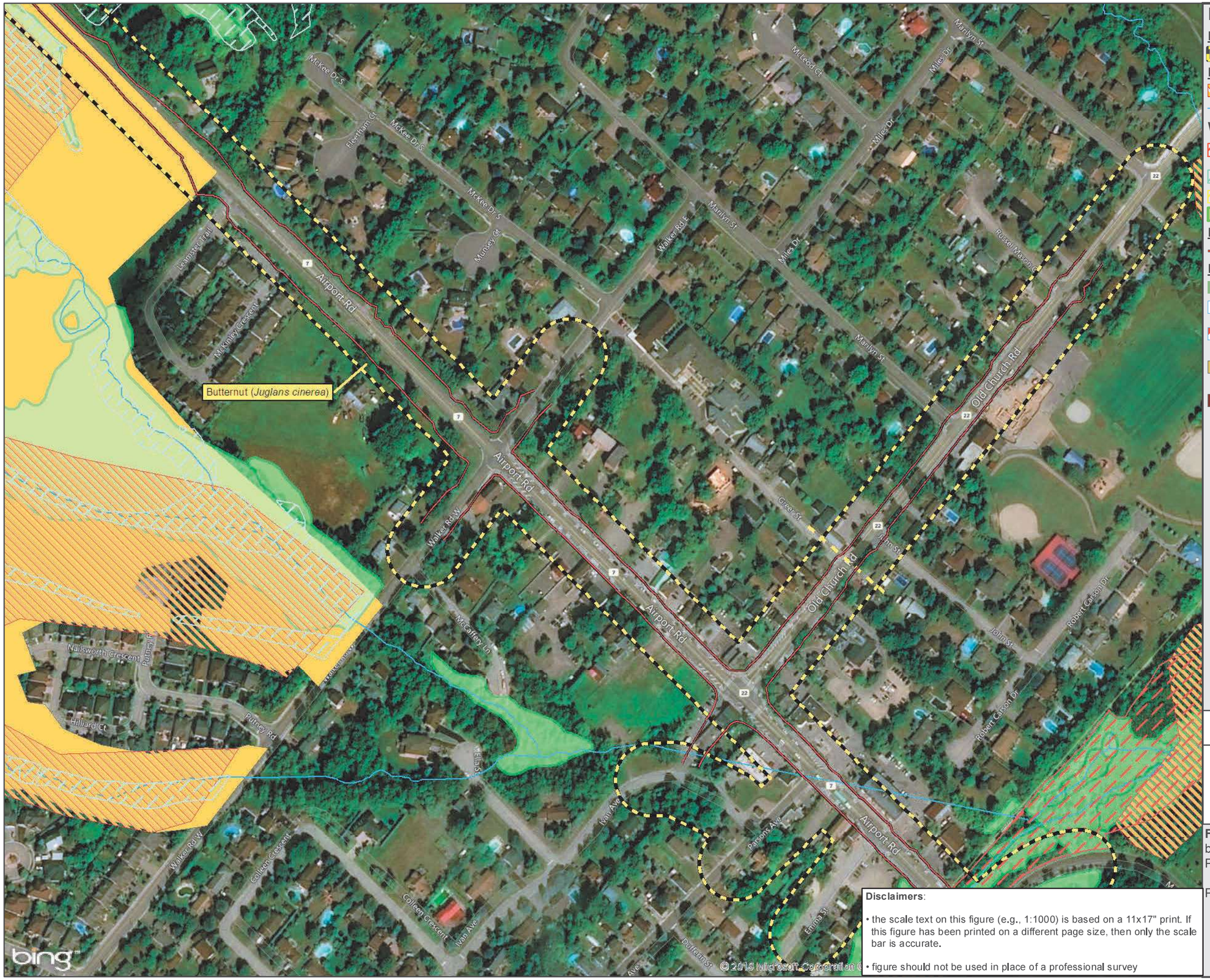
Scale	RS Project No.	Date Last Updated	By
1:2,000	2017-066	Jul 22, 2019	GC

0 30 60 Metres

RIVERSTONE

Figure 2a. Impact Assessment. Airport Road between King Street and Huntsmill Drive, Region of Peel

Prepared for Region of Peel



Legend

Planning Boundaries
- Project Area

Biophysical Features+Functions-TRCA
- Areas of Natural and Scientific Interest
- Watercourses

Wetlands
- Provincially Significant Widgett-Innis Lakes Wetland Complex
- Locally Significant Caledon East Wetland Complex
- Locally Significant Mono Road Wetland Complex
- Wetlands Mapped by TRCA

Proposed Development and Site Alteration
- Limit of Disturbance (Preferred Alternative)

Natural Heritage System
- Greenbelt Plan
- Niagara Escarpment Plan, NEP-Escarpment Natural
- Niagara Escarpment Plan, NEP-Escarpment Protection
- Oak Ridges Moraine Conservation Plan, ORM-Natural Core Area
- Oak Ridges Moraine Conservation Plan, ORM-Natural Linkage Area

N

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- figure should not be used in place of a professional survey

NOTE: As per the approved scope of work, RiverStone's assessment is based on data provided by TRCA and not on data collected on site by RiverStone. Data provided by TRCA was limited to the area within ~100m of Airport Road and does not extend past Greer St. along Old Church Rd., thus not included in RiverStone's impact assessment.

Orthorectified aerial photo - Bing Imagery

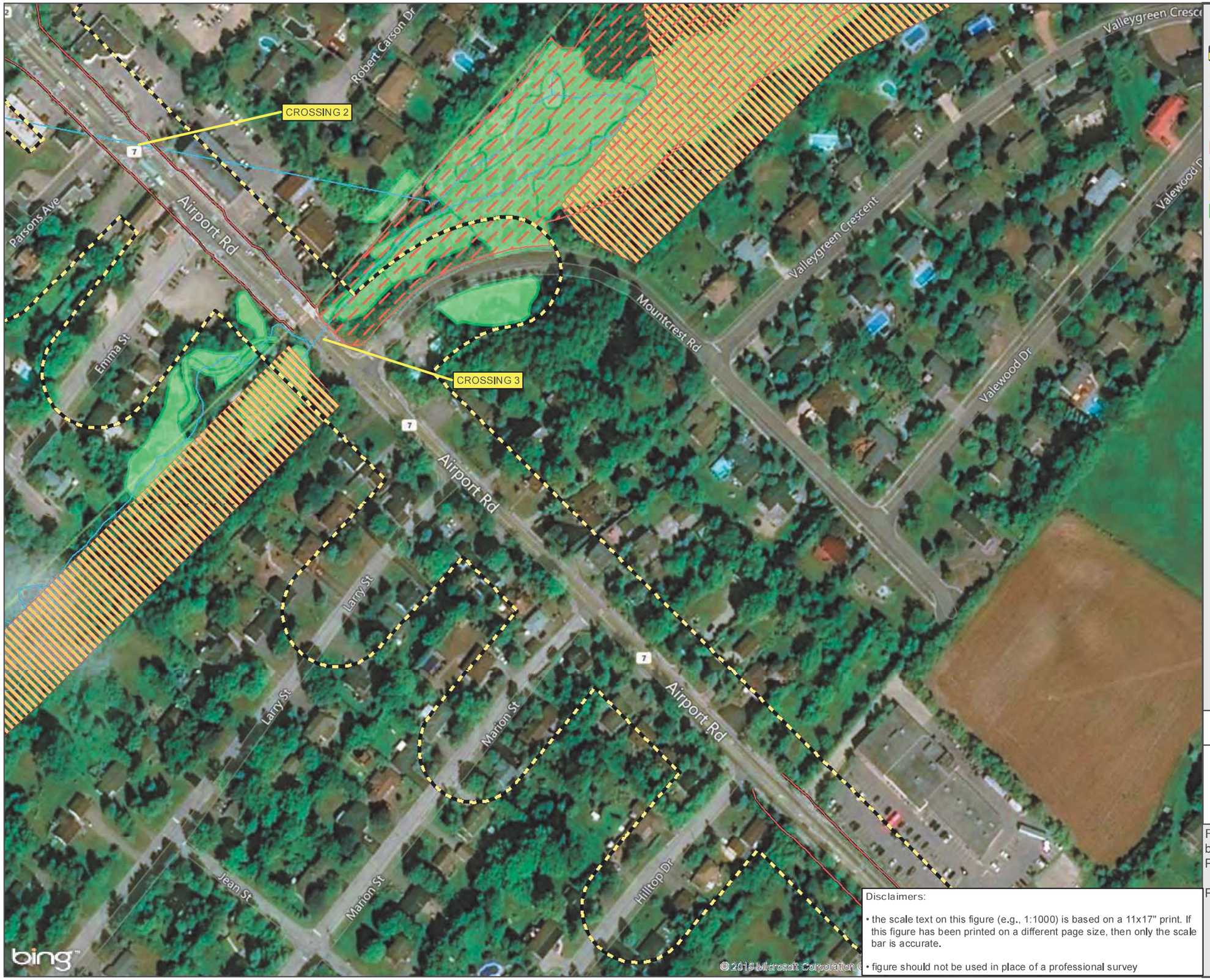
Scale	RS Project No.	Date Last Updated	By
1:3,000	2017-066	Aug 20, 2019	GC

0 40 80 Metres

RiverStone

Figure 2b. Impact Assessment. Airport Road between King Street and Huntsmill Drive, Region of Peel

Prepared for Region of Peel



Legend

N

Planning Boundaries
- Project Area

Biophysical Features+Functions-TRCA
- Areas of Natural and Scientific Interest
- Watercourses

Wetlands
- Provincially Significant Widgett-Innis Lakes Wetland Complex
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Orthorectified aerial photo - Bing Imagery

Scale	RS Project No.	Date Last Updated	By
1:2,000	2017-066	Jul 22, 2019	GC

0 30 60 Metres

RIVERSTONE

Figure 2c. Impact Assessment. Airport Road between King Street and Huntsmill Drive, Region of Peel

Prepared for Region of Peel

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Scale	RS Project No.	Date Last Updated	By
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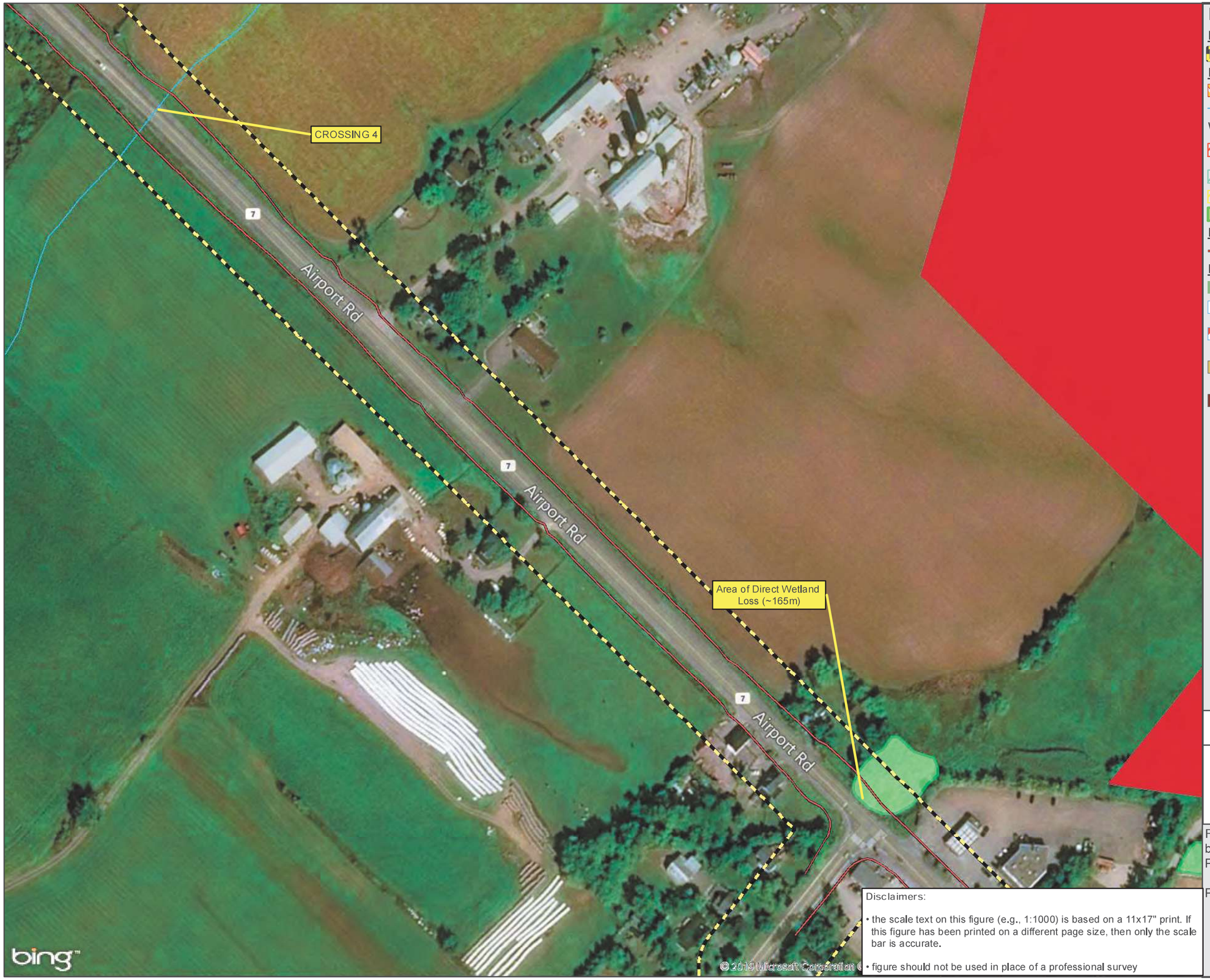
0 30 60 Metres

RIVERSTONE

Figure 2d. Impact Assessment. Airport Road between King Street and Huntsmill Drive, Region of Peel

Prepared for Region of Peel



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N

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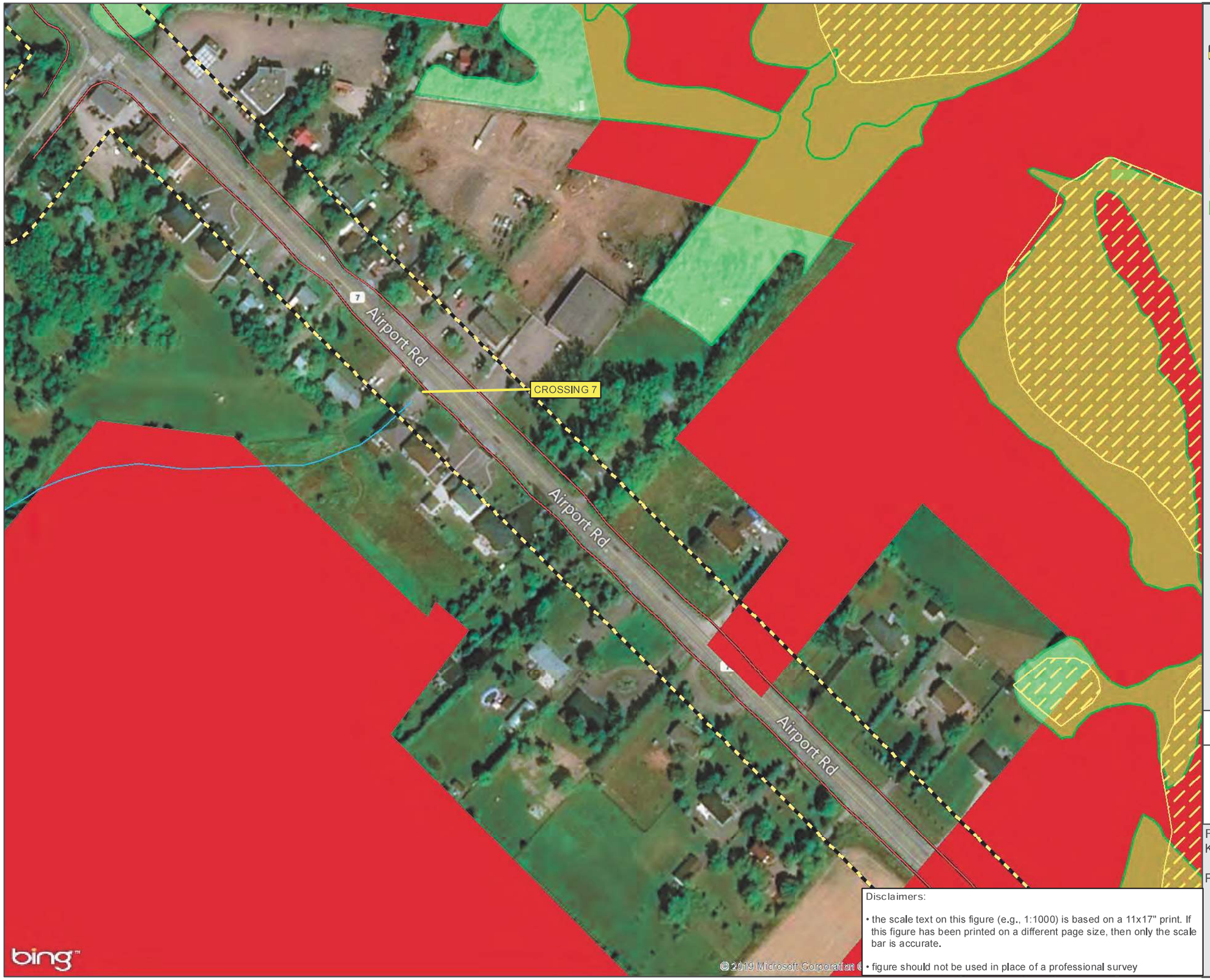
Scale	RS Project No.	Date Last Updated	By
1:2,000	2017-066	Jul 22, 2019	GC

0 30 60 Metres

RIVERSTONE

Figure 2e. Impact Assessment. Airport Road between King Street and Huntsmill Drive, Region of Peel

Prepared for Region of Peel



Legend

N

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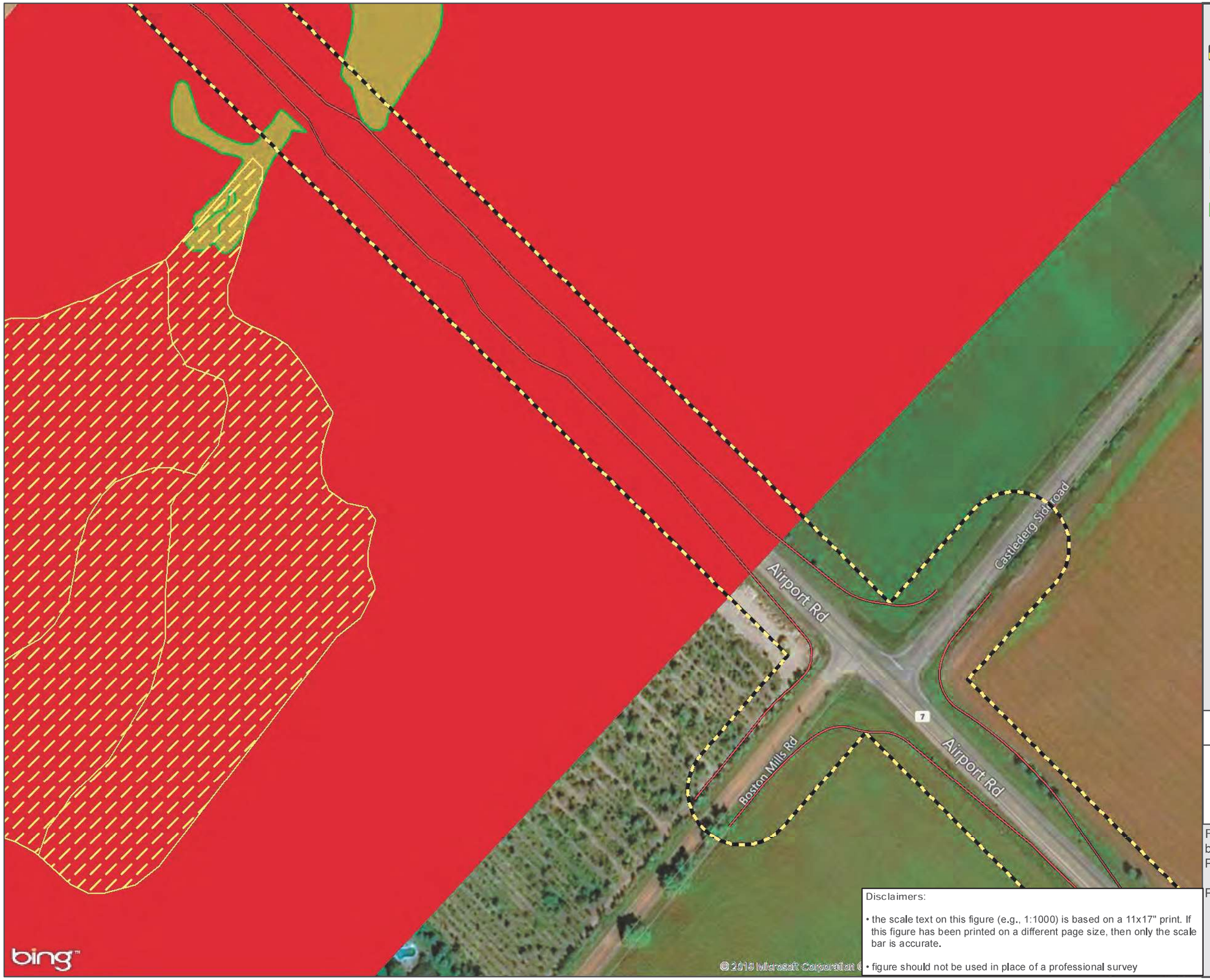
0 30 60 Metres

RIVERSTONE

Figure 2f. Impact Assessment. Airport Road between King Street and Huntsmill Drive, Region of Peel

Prepared for Region of Peel



Legend

N

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Orthorectified aerial photo - Bing Imagery

Scale	RS Project No.	Date Last Updated	By
1:2,000	2017-066	Jul 22, 2019	GC

0 30 60 Metres

RiverStone

Figure 2g. Impact Assessment. Airport Road between King Street and Huntsmill Drive, Region of Peel

Prepared for Region of Peel

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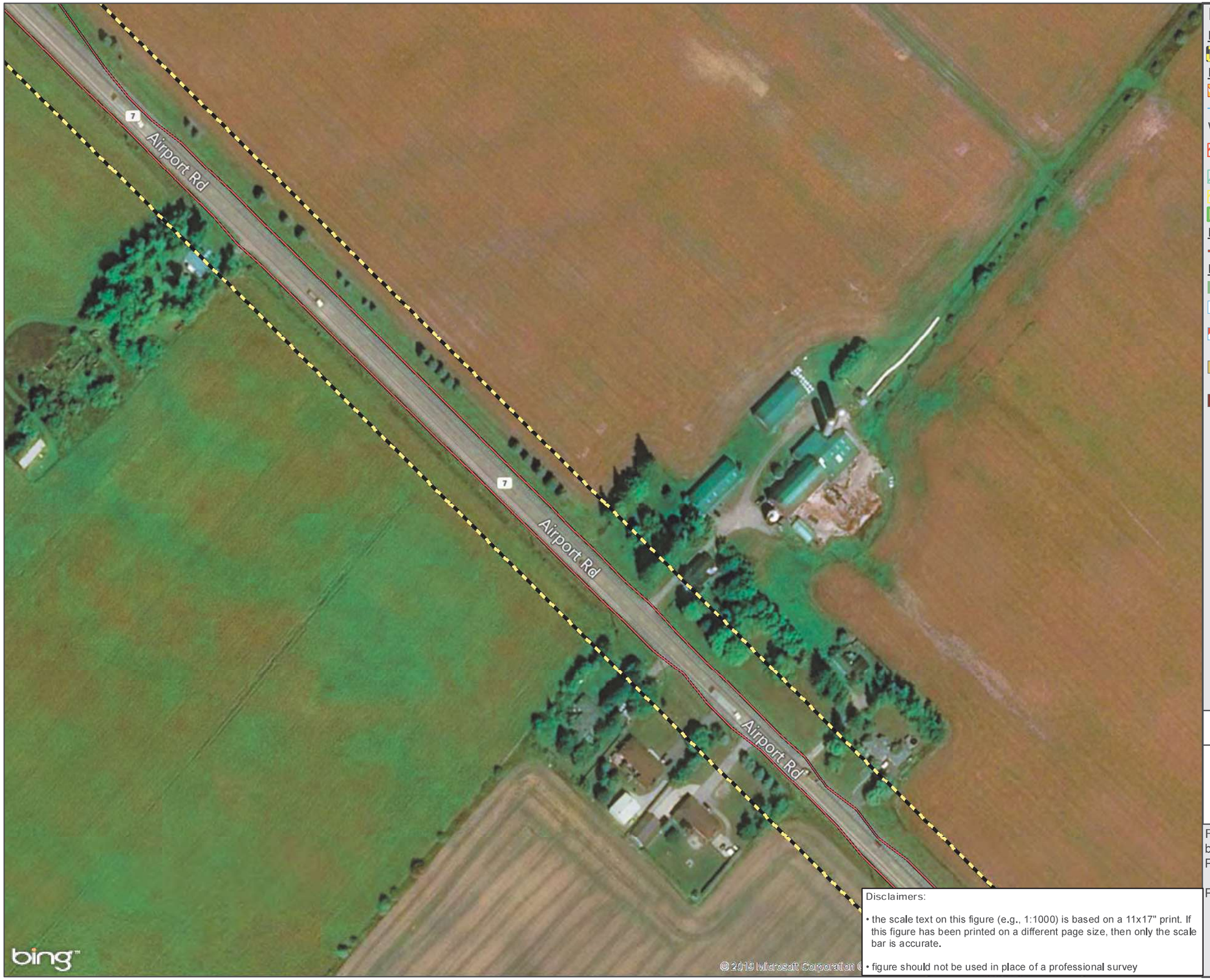

Legend

N

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Orthorectified aerial photo - Bing Imagery

Scale	RS Project No.	Date Last Updated	By
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RiverStone

Figure 2h. Impact Assessment. Airport Road between King Street and Huntsmill Drive, Region of Peel

Prepared for Region of Peel

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Orthorectified aerial photo - Bing Imagery

Scale	RS Project No.	Date Last Updated	By
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0 30 60 Metres		RIVERSTONE	

Figure 2i. Impact Assessment. Airport Road between King Street and Huntsmill Drive, Region of Peel

Prepared for Region of Peel

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Orthorectified aerial photo - Bing Imagery

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Figure 2j. Impact Assessment. Airport Road between King Street and Huntsmill Drive, Region of Peel

Prepared for Region of Peel

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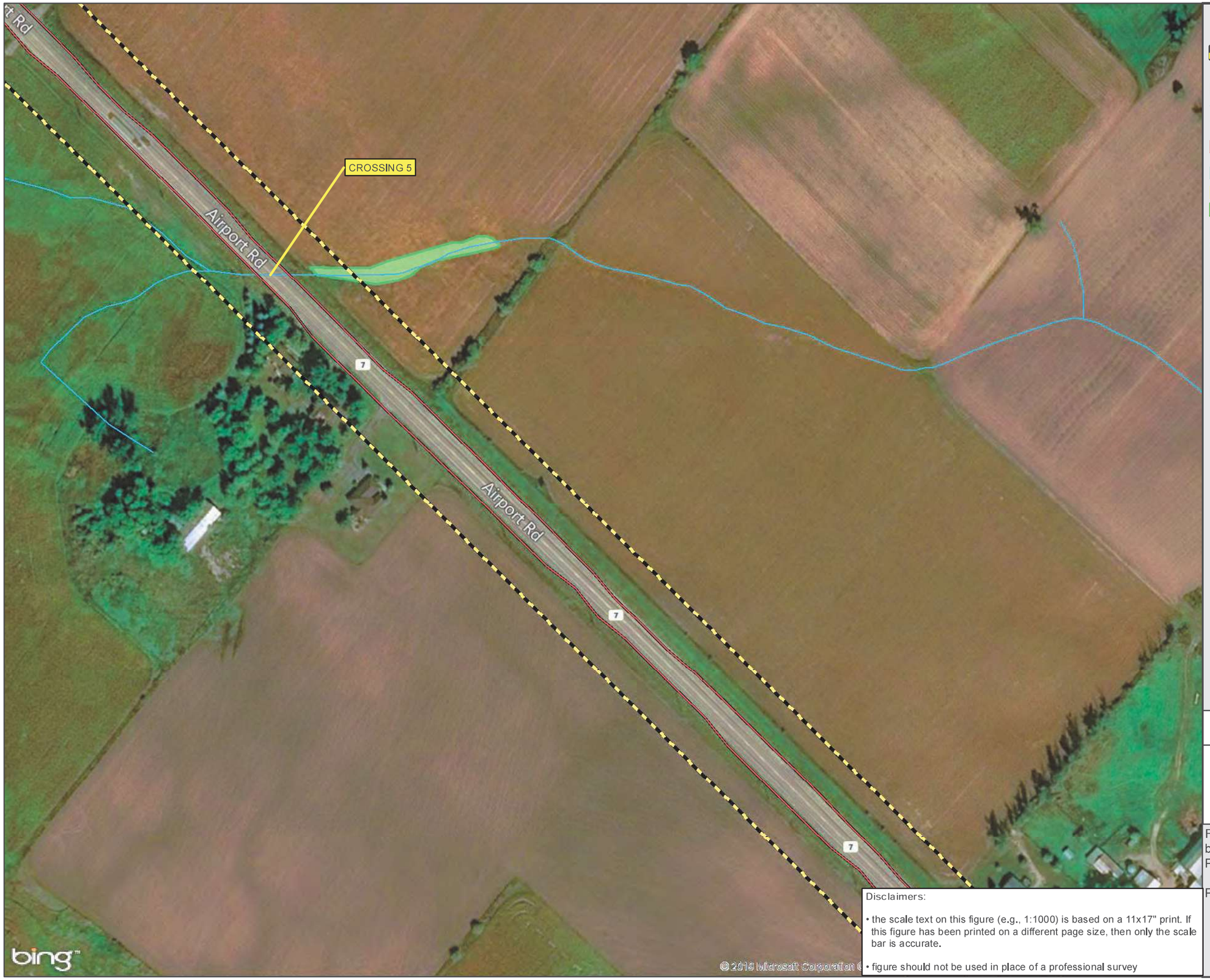

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Orthorectified aerial photo - Bing Imagery

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RIVERSTONE

Figure 2k. Impact Assessment. Airport Road between King Street and Huntsmill Drive, Region of Peel

Prepared for Region of Peel

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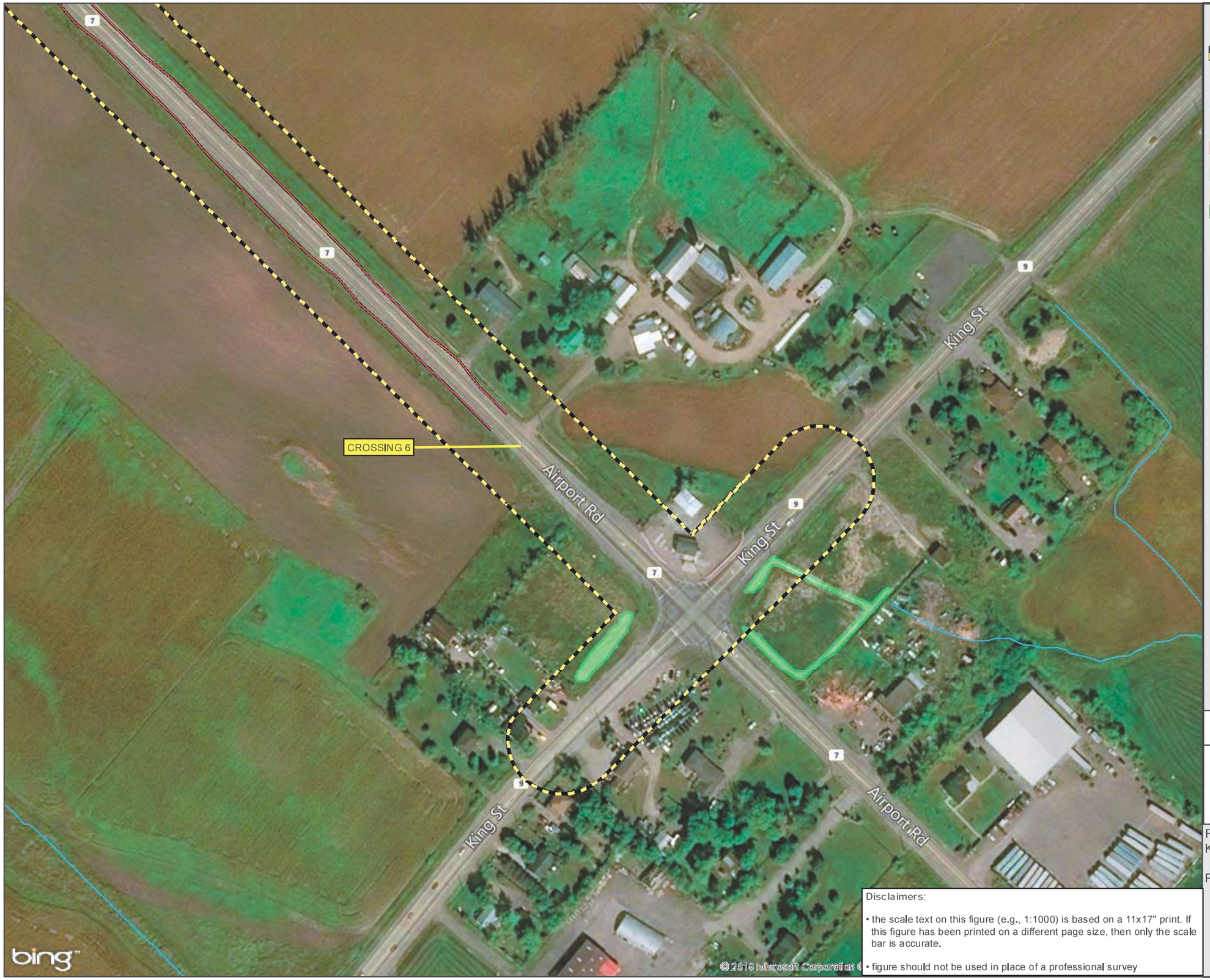

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Orthorectified aerial photo - Bing Imagery

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Figure 2I. Impact Assessment. Airport Road between King Street and Huntsmill Drive, Region of Peel

Prepared for Region of Peel

Appendix 1. Background Natural Heritage Information Request received from MNRF Aurora District.

RIVERSTONE
ENVIRONMENTAL SOLUTIONS INC.

Glenn Cunnington

From: ESA Aurora (MNRF) <ESA.Aurora@ontario.ca>
Sent: July-27-18 15:19
To: Tristan Knight
Cc: Bev Wicks; 217-066 IBI Peel Region Airport Rd King & Huntsmill
Subject: RE: information request

Hello Tristan

MNRF Aurora District has a high volume of requests and the backlog is several months, hence the delay in responding.

Based on what has been shared by the Region of Peel, this information request is no longer required.

Please confirm.

Thank you

Mark Heaton
OMNRF Aurora

From: Tristan Knight [mailto:tristan@rsenviro.ca]
Sent: March 20, 2018 9:17 AM
To: ESA Aurora (MNRF) <ESA.Aurora@ontario.ca>
Cc: Bev Wicks <bev@rsenviro.ca>; 217-066 IBI Peel Region Airport Rd King & Huntsmill <217-066@rsenviro.ca>
Subject: information request

Good Morning,

RiverStone Environmental Solutions Inc. has been retained to prepare a *Natural Environment Report* to support a Schedule C Environmental Assessment associated with improvements to Airport Road between King Street and Huntsmill Drive in the Town of Caledon. By way of this email we request information from MNRF regarding records of species at risk and natural heritage features that may be available for the study area or adjacent lands. Please see the attached Information Request Form and map of the study area.

Thank you,
Tristan.

___
Tristan Knight M.E.S., M.Sc.
Ecologist | Botanist
RiverStone Environmental Solutions Inc.
47 Quebec Street, Bracebridge, ON P1L 2A5
Cell 905.452.4303
Main Office 705.645.9887 | Fax 888.857.4979
Southern Ontario Toll Free 1.866.766.7160
www.rsenviro.ca

Appendix 2. Existing Conditions Reports Prepared by TRCA and CVC.

Municipal Class Environmental Assessment
Airport Road from King Street to Huntsmill Drive, Town of Caledon

Natural Environment Existing Conditions Report

September 2017

Toronto and Region Conservation
for The Living City®

Report prepared by: Paul Prior, Fauna Biologist
Natasha Gonsalves, Flora Biologist
Patricia Moleirinho, GIS Technologist
Alberta D'Souza, GIS Technologist
Jessica Fang, Aquatic Biologist/Taxonomist
Maria Zintchenko, Project Manager

Reviewed by: Sue Hayes, Project Manager, Terrestrial Inventories & Monitoring
Scott Jarvie, Associate Director, Environmental Monitoring and Data Management Section

This report may be referenced as:

Toronto and Region Conservation Authority (TRCA). 2017. Municipal Class Environmental Assessment:
Airport Road from King Street to Huntsmill Drive, Town of Caledon - Natural Environment Existing Conditions Report.

Table of Contents

List of Tables

List of Figures

List of Appendices

1 Introduction

In preparation for the Schedule C Municipal Class Environmental Assessment (EA) for Airport Road from King Street to Huntsmill Drive, Town of Caledon, the Environmental Monitoring & Data Management Section of the Toronto and Region Conservation Authority (TRCA) was contracted to characterize the Project Study Area natural environment existing conditions.

The Airport Road EA Study Area is located within the Town of Caledon in the Region of Peel and runs north from King Street to Huntsmill Drive (Figure 1, Figure 2). The Study Area includes the buffer of approximately 100 m on both sides of Airport Road. The biological data collected will help to guide and inform the EA process on the potential impacts of the proposed work to the natural areas and their associated aquatic and terrestrial features and species.

This report details the 2016 – 2017 inventory methods and findings based on the following assessments:

1. Terrestrial habitat and wildlife
    - Vegetation communities
    - Flora species
    - Frogs
    - Breeding birds

2. Aquatic habitat and communities
    - Crossings assessment (including headwater drainage feature assessment)
    - Fish community
    - Benthic invertebrates

Note that fauna species other than frogs and birds, if observed, were documented concurrently with the vegetation community, flora, frogs and breeding bird surveys.

This report also identifies the designated natural areas overlapping with the project Study Area, and land use designations associated with the Oak Ridges Moraine and Greenbelt.

2 Study Area Description

The Airport Road EA Study Area (Figure 1) is situated in the upper reaches of the Humber River watershed and is bounded to the north by Huntsmill Drive and to the south by King Street. A buffer approximately 100 m to either side of Airport Road was used to demarcate its eastern and western boundaries.

The Study Area lies within the Great Lakes/St.Lawrence floristic region. The topography throughout the site is somewhat variable; spillways to the north lead to areas that are flat and gently sloping while the presence of till and kame moraines through the upper and middle portions of the site lends to an undulating terrain with many steep slopes. Lowland areas in close proximity to the water table have enabled the formation of several wetland communities. The surrounding land use is a combination of agricultural and residential. The rural areas of Caledon consist of small, isolated villages but development (in all directions) due to urbanization has led to extensive land use changes in recent years.

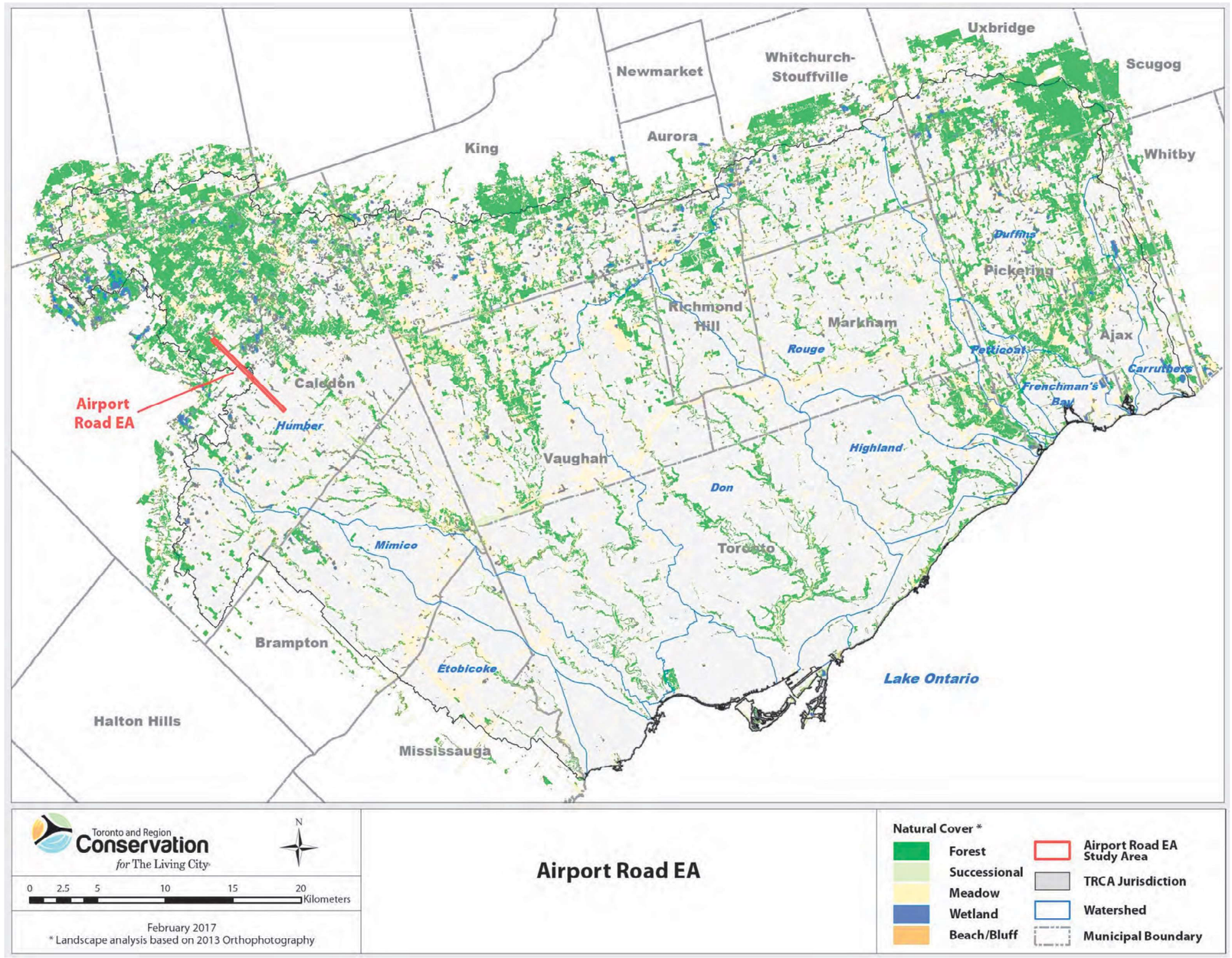


Figure 1. Airport Road EA Study Area in the regional context, including regional natural cover.

3 Land Use Designations – Oak Ridges Moraine and Greenbelt

Land use designations within and adjacent to the Study Area include, but may not be limited to those pertaining to Oak Ridges Moraine as well as the Greenbelt. These are shown in Figure 2 and mainly include the northern portion of the Study Area (north of Castlederg Sideroad).

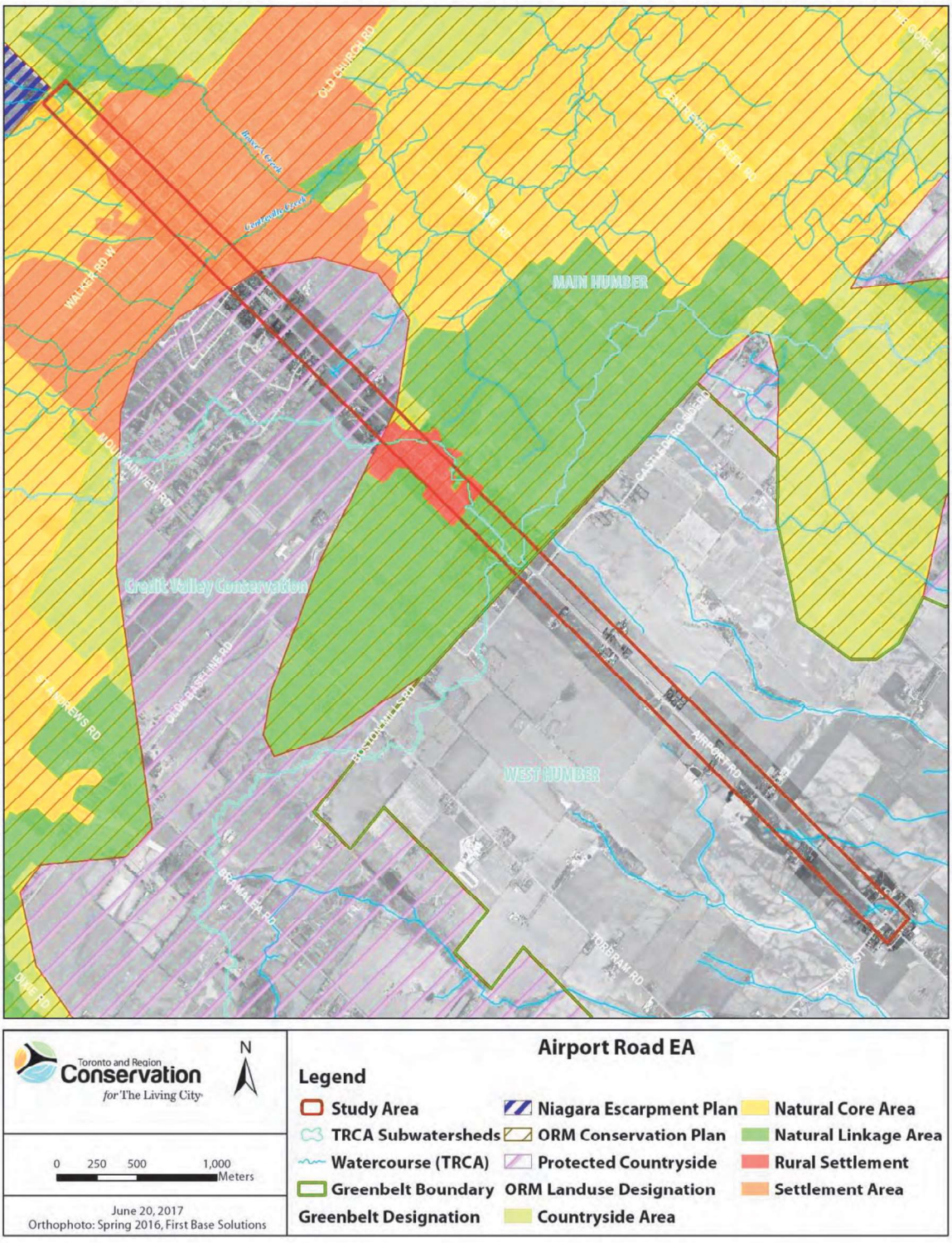


Figure 2. Oak Ridges Moraine (ORM) and Greenbelt land use designation within and adjacent to the Study Area.

4 Designated Natural Areas

A number of designated natural areas - wetlands, Environmentally Significant Areas (ESAs) and an Area of Natural and Scientific Interest (ANSI) - overlap with the Study Area. These areas are discussed in Sections 4.1 to 4.3 below and shown in Figure 3.

4.1 Wetlands

4.1.1 Provincially Significant Wetlands

One provincially significant wetland (PSW) – Widgett-Innis Lakes Wetland Complex – overlaps with the Study Area. This wetland complex is situated on the east side of Airport Road, and only a small portion of it that extends along the Centerville Creek overlaps with the Study Area. The small wetland communities of this complex are mainly dominated by reed canary grass (MAS2-1b).

4.1.2 Locally Significant Wetlands

Two locally significant wetlands - Caledon East Wetland Complex and Mono Road Wetland Complex – overlap with the Study Area.

The Caledon East Wetland Complex is located north of Walker Road and is mainly dominated by swamp communities, though there are also smaller pockets of marsh. The swamp communities are dominated by white cedar *(Thuja occidentalis)* and various hardwood species such as black ash (*Fraxinus nigra*) on mineral soil and in some cases organic soils (White Cedar – Hardwood Organic Mixed Swamp Type SWM4-1).

The Mono Road Wetland Complex that is just inside of the 100 m buffer on both the west and east sides of Airport Road is located approximately 410 m north of Castlederg Sideroad. On the west side the wetland is a swamp community dominated by various willow species (Willow Mineral Thicket Swamp Type - SWT2-2) and on the east it is identified as a marsh community dominated by narrow-leaved cattail (Narrow-Leaved Cattail Mineral Shallow Marsh MAS2-1b).

4.1.3 Unevaluated Wetlands

Two small unevaluated wetlands are located north of Larry Street on the west side of Airport Road. These communities are mainly a variety of thicket swamp (SWT2-5) dominated by red-osier dogwood (*Cornus stolonifera*) and shallow meadow marshes (MAS3-1b) dominated by various cattail species (*Typha angustifolia*, *T. latifolia*, and *T. x glauca*). Four other small unevaluated shallow marsh wetlands are located to the south of Mountcrest Road on the east side of Airport Road dominated by narrow-leaved cattail (*T. angustifolia*), reed canary grass (*Phalaris arundinacea*), and common reed (*Phragmites australis* ssp. *australis*).

4.2 Environmentally Significant Areas

Two ESAs overlap with the Study Area: Caledon East Complex (ESA# 36) and Caledon East Swamp. Caledon East Complex runs along the north-west side of the Study Area (north of Walker Road). This area was designated as an ESA as it is a hydrologic source of the Humber River and has a variety of vegetation community types including the Caledon East Wetland Complex. The

second identified ESA is the Caledon East Swamp (ESA#132) which projects a small finger into the Study Area north of Larry St.

4.3 Areas of Natural and Scientific Interest

Only a small portion of the candidate ANSI Innis-Gibson Lakes Kettles reaches the Study Area just north of Mountcrest Road.

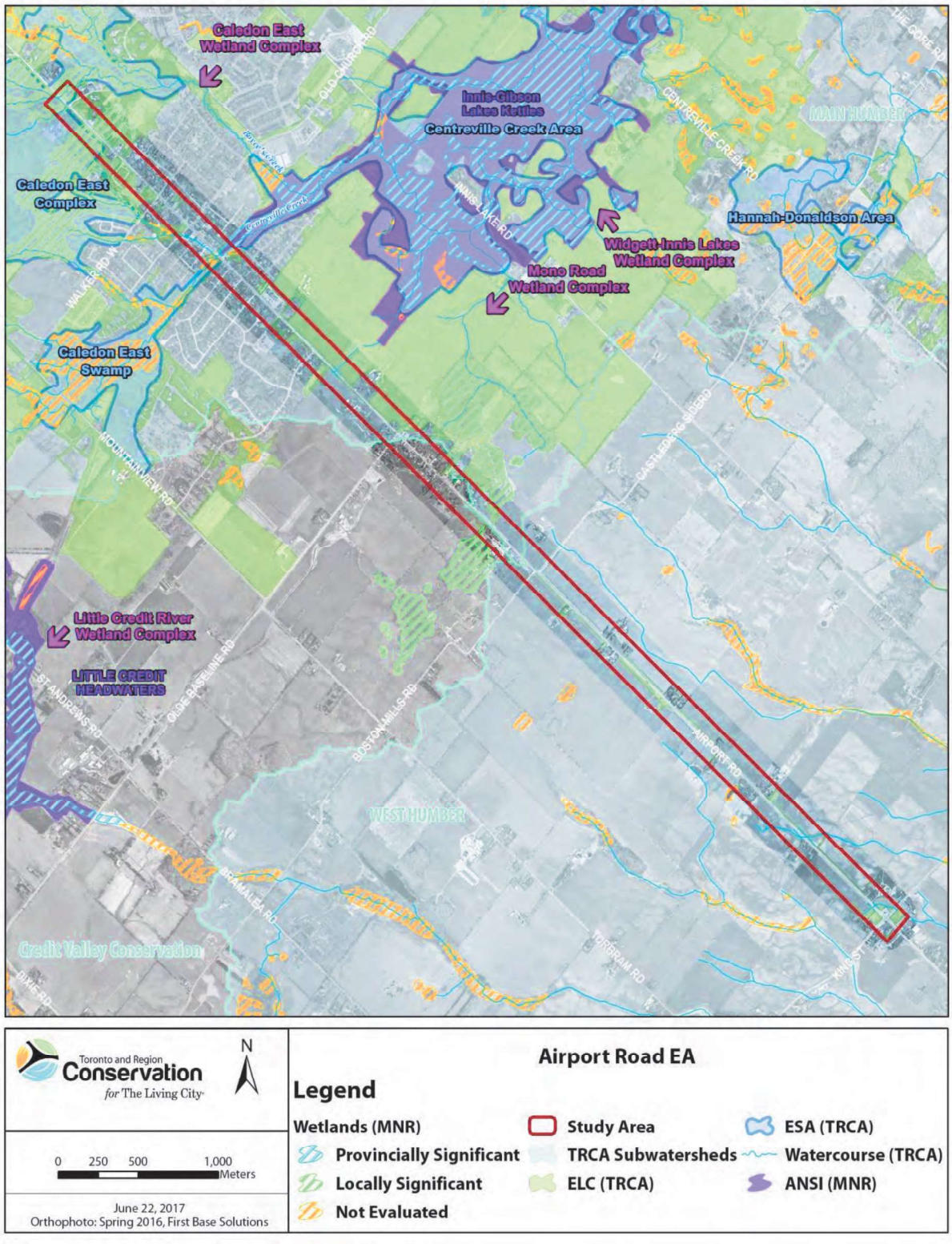


Figure 3. Designated natural areas overlapping with and in proximity to the Study Area.

5 Terrestrial Habitat and Wildlife

5.1 Inventory Methodology

To facilitate terrestrial inventory work, the Study Area was divided into four survey blocks. Survey blocks, depicted in Figure 4, were delineated according to the major roadways that intersect the Study Area. The natural areas inventoried corresponded with Blocks A, B, C, and D. *It is important to note that the scope of the inventory pertained only to those properties that fronted onto Airport Road and which possessed non-manicured natural areas.*

A biological inventory of the Study Area was conducted at the levels of vegetation community, and species (flora) according to the TRCA methodologies for field data collection (TRCA 2007). A key component of the field data collection is the scoring and ranking of vegetation communities and flora and fauna species to generate local "L" ranks (L1 to L5); this process was undertaken in 1996-2000 and ranks are reviewed regularly (TRCA 2016). Vegetation community scores and ranks are based on two criteria: *local occurrence* and the number of *geophysical requirements* or factors on which they depend. Flora species are scored using four criteria: *local occurrence*, *population trend*, *habitat dependence*, and *sensitivity to* impacts associated with *development.* Fauna species are scored based on seven criteria: *local occurrence*, *local population trend*, *continent-wide population trend*, *habitat dependence*, *sensitivity to development*, *area-sensitivity*, and *patch isolation sensitivity*. With the use of this ranking system, communities or species of *regional concern*, ranked L1 to L3, now replace the idea of *rare* communities or species. Rarity (*local occurrence*) is still considered as one of many criteria that make up the L-ranks, making it possible to recognize communities or species of regional concern before they have become rare.

In addition to the L1 to L3 ranked species, a large number of currently common or secure species at the regional level are considered of concern in the urban context. These are the species identified with an L-rank of L4. Although L4 species are widespread and frequently occur in relatively intact urban sites, they are vulnerable to long-term declines.

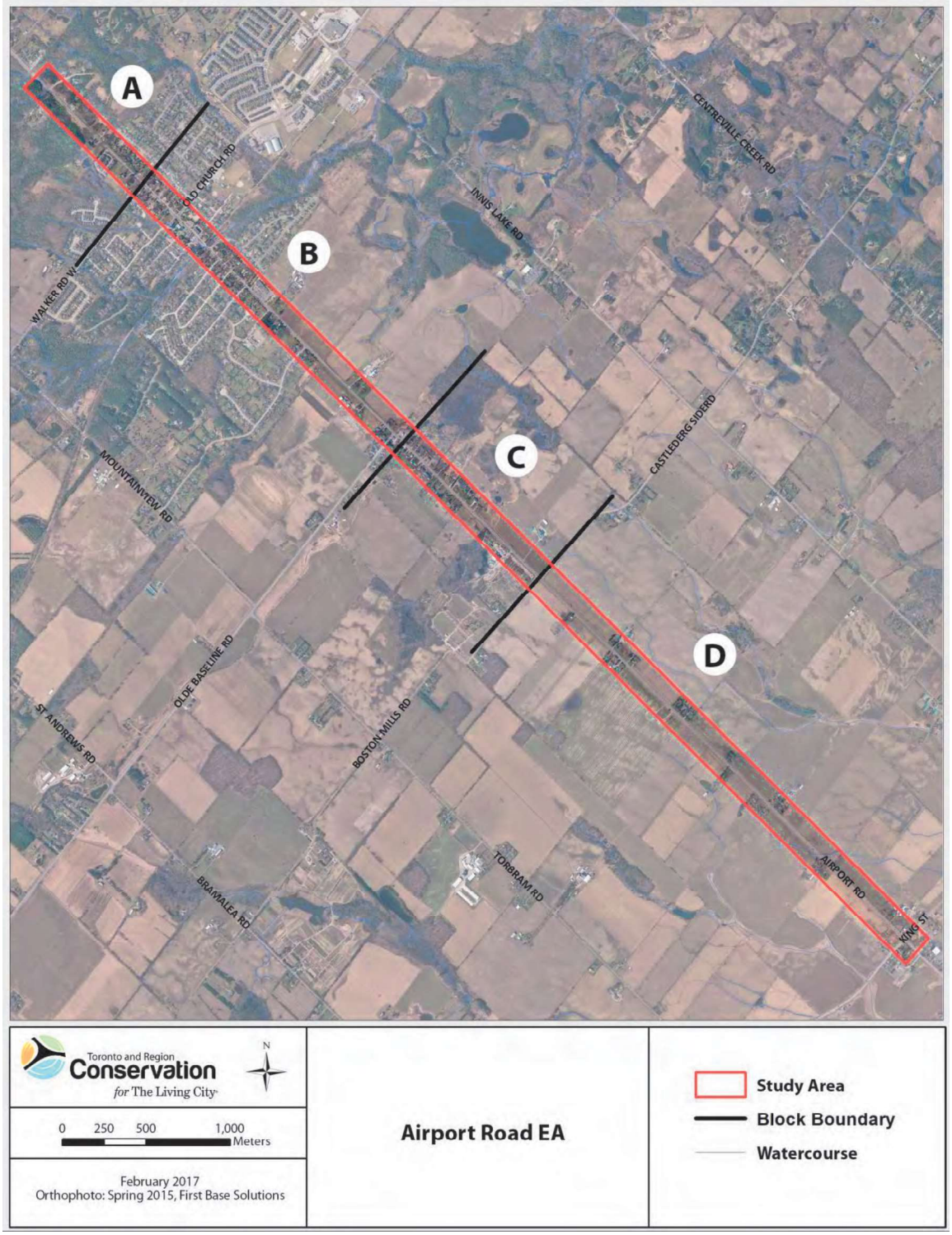


Figure 4. Project Study Area and terrestrial inventory survey blocks.

5.1.1 Vegetation Communities, Flora and Fauna Species

Vegetation community, flora and fauna species data were collected through field surveys. These surveys are completed during the appropriate times of year to capture breeding status in the case of amphibians and birds, and during the optimal growing period of the various plant species and communities. Vegetation communities and flora species are surveyed concurrently.

Table 1. Terrestrial inventory fieldwork schedule.

Survey Item	Survey Dates	Survey Effort (hours)
Vegetation Communities and Flora Species	2016: Aug. 26th, 29th; Sept. 6th, 29th; Oct. 11th	31 hours
Frogs and Nocturnal Spring Birds	2016: Apr. 19th; May 19th	2 hours
Breeding Songbirds	2017: May 29th, 30th; June 15th	14 hours

Botanical fieldwork was conducted in the summer/fall of 2016, between the months of August through October (Table 1).

Vegetation community designations were based on the Ecological Land Classification (ELC) and determined to the level of vegetation type (Lee *et al*. 1998). Community boundaries were outlined onto printouts of 2013 digital ortho-rectified photographs (ortho-photos) to a scale of 1:2000 and then digitized in ArcView. In each survey block, flora regional species of concern (species ranked L1 to L3) along with occasional records of urban species of concern (L4) were mapped as point data with approximate number of individuals seen. A list of all species observed (including those mapped) was documented for each survey block. A list of all vegetation communities and flora species recorded are provided in Appendix 1 and 2.

A partial fauna inventory of the Study Area was conducted by the TRCA in 2016 during the months of April and May 2016 (Table 1). The surveys searched primarily for frog species of regional concern but recorded the presence of any early-spring nocturnal bird species (owls and American woodcocks). Breeding bird surveys were conducted in May and June 2017 (Table 1). Fauna species of regional and urban concern (species ranked L1 to L4) were mapped as point data with each point representing a possible breeding territory.

Frog and toad choruses were assessed using the scoring protocol from the Marsh Monitoring Program (BSC, 2008).

Fauna surveys carried out in 2017 were concerned primarily with the mapping of breeding bird species of conservation concern. As per the TRCA data collection protocol, breeding bird surveys were carried out by visiting the site at least twice during the breeding season (last week of May to mid-July) to determine the breeding status of each mapped point. The methodology for identifying confirmed and possible breeding birds follows Cadman *et al*. (2007).

5.2 Vegetation Community Findings

Vegetation community findings are presented in Figure 5 (Block A), Figure 6 (Block B), Figure 7 (Block C), and Figure 8 (Block D) and described below.

5.2.1 Vegetation Community Representation

In 2016, the botanical inventory covering ~19.2 ha in area documented 51 vegetation communities across 6 habitat types throughout the Study Area: forest (7 natural, and 10 plantation), successional (7), wetland (18), aquatic (4), dynamic (2) and meadow (3). Nine of the communities were found solely as inclusions and/or complexes. Approximately 41% (21) of all community types were deemed to be of conservation concern by TRCA. From the inventory, 13 communities of urban concern (ranked L4) and 8 communities of regional concern (ranked L1 to L3) were recorded. Exotic communities, of which there were 14, varied between forest, successional, wetland and meadow. The vegetation communities and their associated ranks are illustrated on Figures 5 to 8. A list of all vegetation communities classified at the site is provided in Appendix 1.

Natural forest accounts for 5.2 ha (27%) of the natural cover. The majority that exist are limited to the northern half of the Study Area within Blocks A and B. Of those forest types present, Fresh-Moist White Cedar Coniferous Forest (FOC4-1) and Dry-Fresh White-Cedar-Poplar Mixed Forest (FOM4-2) span the greatest area with 1.0 ha and 0.7 ha respectively. The former community type is characterized by a dense canopy dominated by white cedar *(Thuja occidentalis)* while the latter has a canopy comprised of white cedar in association with trembling aspen *(Populus tremuloides),* white birch *(Betula papyrifera)*, black cherry *(Prunus serotina)* and red ash *(Fraxinus pensylvanica)*. Both communities have a sparse ground layer lacking in diversity. Jack-in-the pulpit *(Arisaema triphyllum)*, field horsetail *(Equisetum arvense)*, dandelion *(Taraxacum officinale)* and helleborine *(Epipactis helleborine)* are amongst the short list of species typically observed.

There is a shift in both tree species composition and diversity between the north and south regions of the Study Area. The cedar and native hardwood dominated forests seen in the north transition out into forest patches dominated instead by non-native hardwoods to the south. There is also a noticeable degradation in the quality of natural forest which correlates with patch size. Larger patches are more intact and show less evidence of disturbance as compared to smaller patches. Field inventory work revealed narrow bands of exotic forest communities, namely Fresh-Moist Manitoba Maple Lowland Deciduous Forest (FOD7-a) and Fresh-Moist Exotic Lowland Deciduous Forest (FOD7-c). These forest types were generally encountered in Block B and D along property lines, particularly those regions on moister soils. Manitoba maple *(Acer negundo)*, crack willow *(Salix x fragilis*), black walnut *(Juglans nigra)* and white elm constituted the main canopy species. The understory was notably dense and was frequently dominated by Manitoba maple, European buckthorn *(Rhamnus cathartica)*, choke cherry *(Prunus virginiana)* and shrub honeysuckle *(Lonicera x bella)*. Herbaceous species such as celandine *(Chelindonium majus)*, garlic mustard *(Alliaria petiolata)*, common yellow wood-sorrel *(Oxalis stricta)* and orchard grass *(Dactylis glomerata)* were most frequently encountered.

Plantations in various stages of maturity are scattered throughout the Study Area and collectively occupy 2.4 ha. Most mid-aged to mature plantations occurring along property lines are linear in shape and narrow in width; they appear to function as hedgerows and/or windbreaks. Typical species include Norway spruce *(Picea abies)*, white spruce *(Picea glauca),* Scots pine *(Pinus sylvestris)* red pine *(Pinus resinosa)* and black locust (*(Robinia pseudoacacia)*. Dependant on the dominant conifer, these communities were classified as either, Mixed Conifer Coniferous Plantation (CUP3-H), Norway Spruce Coniferous Plantation (CUP3-e), White Spruce Coniferous Plantation (CUP3-C) Scots Pine Coniferous Plantation (CUP3-3), or Black Locust – Conifer Mixed Plantation (CUP2-b). Younger plantations consist of a mixture of deciduous and coniferous species (both native and exotic) as well as various shrubs species. Those communities whose classifications included Restoration Deciduous Plantation (CUP1-A) and Restoration Mixed Plantation (CUP2-A) were presumably part of an initiative to enhance existing natural features. Examples of chosen planting species included red oak *(Quercus macrocarpa)*, sugar maple *(Acer saccharum ssp. saccharum)*, silver maple *(Acer saccharinum),* black locust, fragrant sumac *(Rhus aromatica)* and red-osier dogwood *(Cornus stolonifera)*.

Wetlands provide 27% (5.2 ha) of the Study Areas' natural cover and are largely represented by rich conifer and mixed swamps, meadow marshes and shallow marshes. An expansive network of high quality wetlands was found to occur to the north in Block A. Wetlands here are highly productive and support a diverse array of sensitive flora species including two-seeded sedge *(Carex disperma)* and bristle-stalked sedge *(Carex leptalea)*; both are species of regional concern. Wetland communities are principally native but a few non-native communities primarily Canary Grass Mineral Shallow Marsh (MAS2-a) and Narrow-Leaved Cattail Mineral Shallow Marsh (MAS2-1b) also exist. The non-native communities tend to occur along the periphery of Airport Road and other disturbed sections of the site. The exotic species supported within these communities are known to tolerate higher level of surface contaminates (e.g. road salts) as compared to their native counterparts.

The distribution of successional communities as represented by woodlands, savannahs and thickets is patchy; however, with 2.1 ha they provide 11% of the total cover within the Study Area. Exotic Successional Woodland (CUW1-b) (0.7 ha) and Native Successional Savannah (CUS1-A1) (0.6 ha) are the two main woodland community types found. Exotic Woodlands are characterized by a combination of Manitoba Maple, black locust, and crack willow while the native woodlands support a mix of black walnut, white elm and red ash. In both woodland types the ground layer is most often a dense collection of aster, goldenrod and grass species. The five savannah, hedgerow and thicket communities described sustained a mix of native successional species such as red ash and black cherry as well as exotic species such as domestic apple *(Malus pumila)*, buckthorn, shrub honeysuckle and lilac *(Syringa vulgaris).* In the absence of mowing and/or clearing from development, it was common to encounter thicket communities such as Exotic Deciduous Thicket (CUT1-c) establishing along fence lines of the Study Area.

Meadow communities are categorized into one of three types: Native Forb Meadow (CUM1-A), Exotic Cool-season Grass Graminoid Meadow (CUM1-b), or Exotic Forb Meadow (CUM1-c). Collectively they provide 33 % (6.4 ha) of the cover within the Study Area. Of that, 5.8 ha (91%) is

Exotic Cool-season Grass Graminoid Meadow. Smooth brome grass *(Bromus inermis),* orchard grass, and reed canary grass *(Phalaris arundinacea)* in combination with various aster *(Symphyotrichum spp.)* and goldenrod species *(Solidago spp.)* are typical.

Also present within the Study Area are small pockets of aquatic communities totaling 0.12 ha (~1%). Four different community types were described, one of which (i.e. Stonewort Submerged Shallow Aquatic – SAS1-3) is found solely as an inclusion. Un-vegetated stream systems are captured as Open Aquatic - OAO1. Healthy populations of aquatic vegetation specifically coontail *(Ceratophyllum demersum),* star duckweed *(Lemna trisulca)* and greater duckweed *(Spirodela polyrhiza)* are supported in Block B in a feature classified as a Coontail Submerged Shallow Aquatic (SAS1-A). Stonewort *(Chara sp.)*, a macro-alga species, and curly pondweed *(Potamogeton crispus),* a non-native pondweed are two other species found within this feature. Stonewort when exposed to high nutrient inputs from sources such as run-off shows a strong tendency to explode leading to eutrophic conditions. For this reason it is important to manage nutrient inputs into this feature as its proximity to the road makes it particularly sensitive to run-off. In Block C, a Duckweed Floating-leaved Shallow Aquatic (SAF1-3) nestled in a larger swamp complex that extends beyond the Study Area is described.

Two dynamic communities occurring within the Study Area contribute ~ 1% of natural cover. They are Treed Sand Barren (SBT1) and Dry Dropseed Sand Barren (SBO1-A). Both communities, found in Block A, are of regional concern (ranked L2). However, the latter occurs only as an inclusion and a complex within larger prevailing community types. Expansive populations of sand dropseed *(Sporobolus cryptandrus)*, a flora species of regional concern (L3) were observed in the Treed Sand Barren on the eastern side of Airport Road.

5.2.2 Vegetation Communities of Concern

Within the Study Area, a total of 8 vegetation communities are deemed to be of regional conservation concern (ranked L1–L3) and another 13 are considered to be of urban conservation concern (ranked L4). Of those listed of regional concern, 6 are ranked L3 and another 2 are ranked L2. Most sensitive are the Treed Sand Barren (SBT1), 0.2 ha in size, and the Dry Dropseed Sandbarren *(dominated by sand dropseed)* that is complexed throughout it. These communities ranked L2 form on nutrient poor sandy soils and are generally maintained by severe environmental constraints. Their geophysical requirements thereby limit their distribution throughout the jurisdiction.

Just over half of the remaining vegetation communities of concern present within the Study Area are wetlands with the vast majority classified as some form of marsh. Broad-leaved Sedge Mineral Shallow Marsh (MAS2-4) and Narrow-leaved Sedge Mineral Meadow Marsh (MAM2-5) are the two largest marsh types found and when combined occupied just over 0.2 ha. Both features support a variety of sedge and herbaceous species but their composition vary according to soil moisture regime and substrate type. By large, organic wetland communities were the most floristically diverse sections of the Study Area, supporting a high number of flora species of concern. Some of the most floristically productive communities are the White Cedar Organic Coniferous Swamp (SWC3-1), (ranked L3) and White Cedar-Hardwood Organic Mixed Swamp (SWM4-1), (ranked L4)

community types. Flora highlights *(all species of regional concern)* discovered within these systems included three-leaved false Solomon's seal *(Maianthemum trifolium),* water horsetail *(Equisetum fluviatile)* and alder-leaved buckthorn *(Rhamnus alnifolia).*

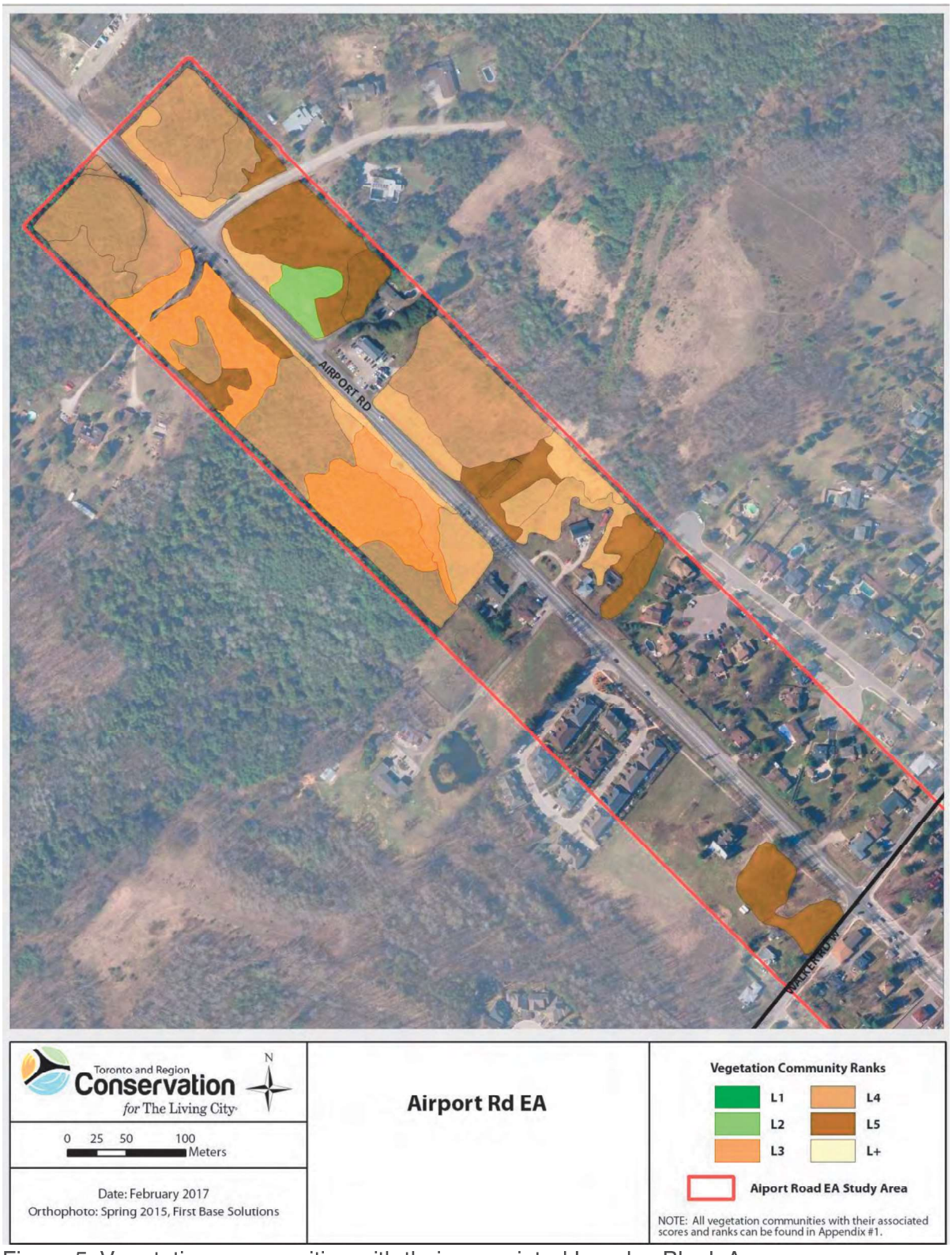


Figure 5. Vegetation communities with their associated L ranks, Block A.

Figure 6. Vegetation communities with their associated L ranks, Block B.

Figure 7. Vegetation communities with their associated L ranks, Block C.

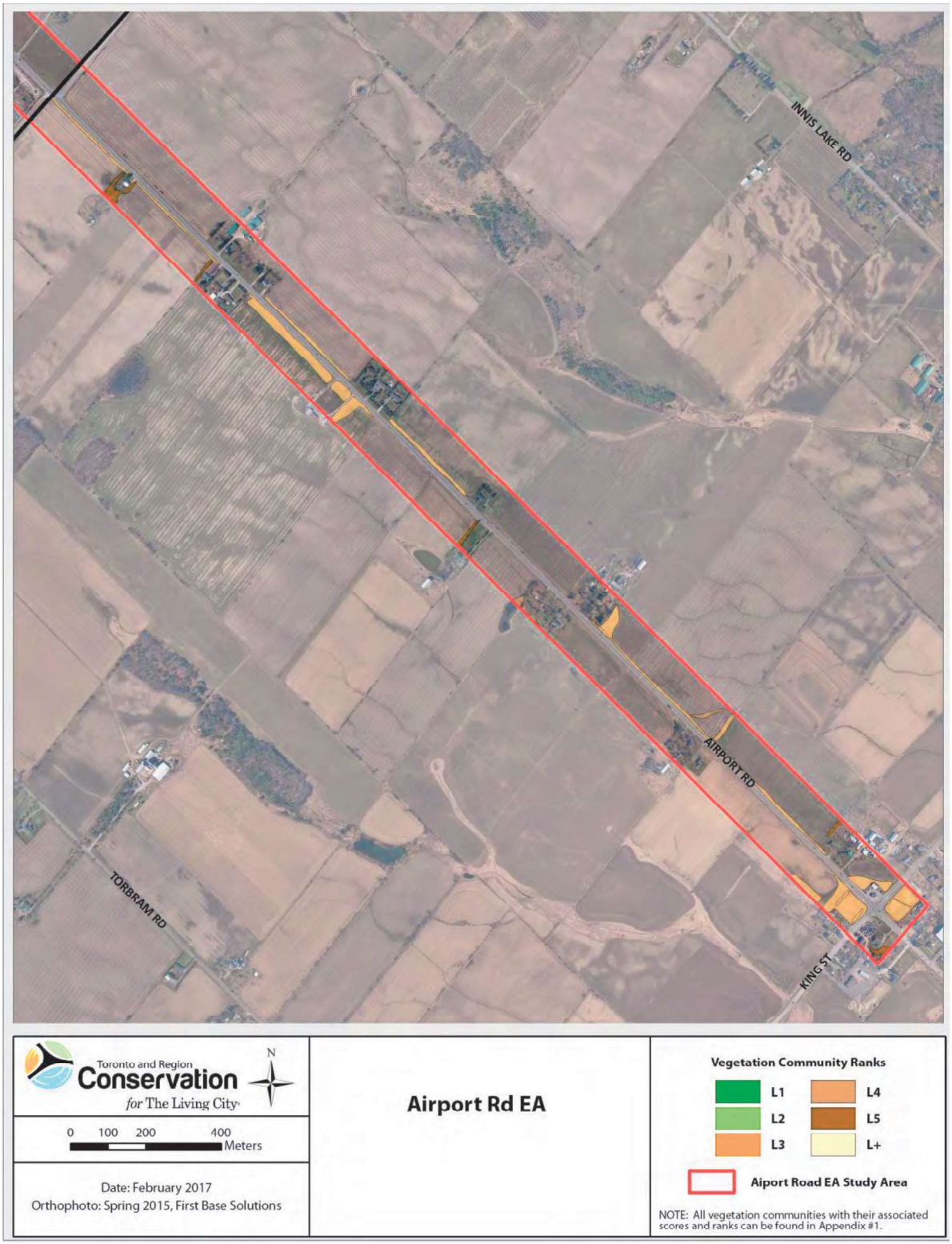


Figure 8. Vegetation communities with their associated L ranks, Block D.

5.3 Flora Species Findings

This section presents the flora species findings. Flora species locations are shown in Figure 10 (Block A), Figure 11 (Block B), Figure 12 (Block C), and Figure 13 (Block D).

5.3.1 Flora Species Representation

A total of 300 vascular plant species were identified within the Study Area in 2016 (Appendix 2). Of this, 277 are naturally occurring; 58% (161) of which are native. In addition, 23 planted species comprised of 9 native and 14 exotic species were found. Flora species abundance and diversity was greatest throughout the northern half of the Study Area with drastically fewer species observed to the south. Habitats to the north are relatively intact and of sufficient quality that they are able to support a high concentration of specialized species whereas areas to the south are predominately agricultural or built up which limits the scope of species able to persist under such conditions.

Forb species are the most prevalent plant type found throughout the Study Area (Figure 9). However, over half (73) were exotic plants typical of roadsides, field and waste places. Examples include chicory *(Cichorium intybus)*, viper's bugloss *(Echium vulgare)* and Queen Anne's lace *(Daucus carota)*. Grass species showed a similar pattern with 21 of the 31 found being non-native species with a preference for meadow and roadside habitats.

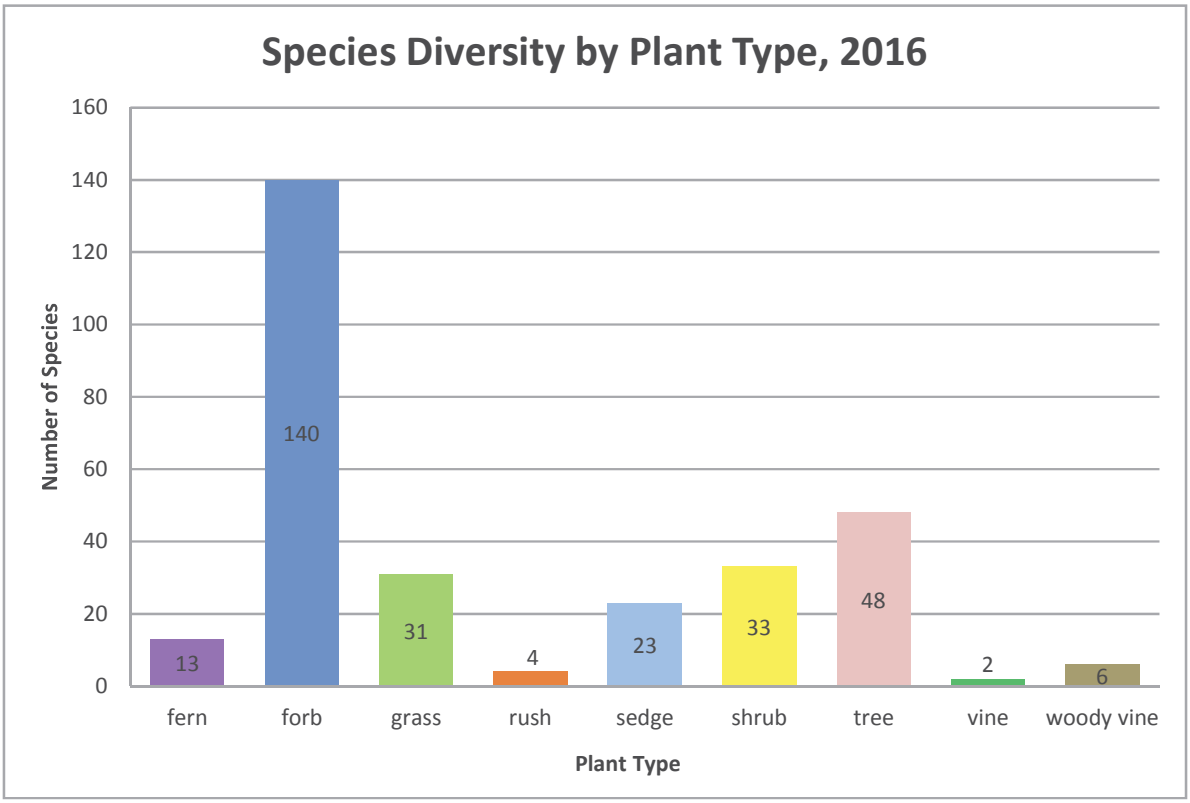


Figure 9. Species diversity (by plant type) within the Study Area.

The abundance and diversity of species largely varied by habitat type; dry coniferous forests (including plantations), particularly those dominated by cedar supported few species and those that were found occurred in small population sizes. Plants suited to acidic conditions, namely common ferns, horsetails and woody vines provide representative examples of established species. The number of tree, herbaceous and shrub species increased in mixed forest communities. In the absence of disturbance native shrubs and herbs prevailed; however, the incidence of weedy herbs and shrubs (both native and exotic) was higher in forests subject to disturbance (particularly those most young).

Sedge species associated with wetlands are perhaps the best represented group. Twenty of the twenty-three species found in the Study Area are facultative or obligate wetland species, many preferring high quality wetlands. Examples of which included: foxtail wood sedge *(Carex alopecoidea)*, interior sedge *(Carex interior)*, and bristle-stalked sedge *(Carex leptalea)*.

5.3.2 Flora Species of Concern

Including planted species, there are 28 (L1-L3) species of regional concern and 45 (L4) species of urban concern found within the Study Area in 2016. Appendix 2 provides the complete list of the species and their associated ranks. A small population of narrow-leaved panic grass *(Dichanthelium linearifolium*) marked a special find for the Study Area. This species is regionally rare (found in 6 or fewer of the forty-four 10x10 km UTM grid squares that cover the TRCA jurisdiction). Narrow-leaved panic grass, ranked L2, is found in dry sandy areas such as barren and or savannah type communities. Past findings for this plant have occurred in the eastern parts of the TRCA jurisdiction.

All of the flora species of concern at the Airport Road EA are sensitive to development, being vulnerable to at least one kind of disturbance that is associated with land use changes. A number of wetland species are sensitive to hydrological changes and surface contamination. The impacts from surrounding development are apparent with disturbance levels ranging from light to severe. Exotics, trails, trash and browse were the most commonly encountered forms of disturbance.

The distribution of exotic species is widespread: they were found in all blocks in both open and closed communities. Recently disturbed sections of the site are particularly sensitive to new invasions as most exotic species are particularly well adapted to colonising disturbed areas.

Trail networks, both formal recreational trails and informal dirt paths run throughout the Study Area. These not only provide opportunities for exotics to travel, but also the soil compaction caused by repeated trampling (regular and motorized) could potentially damage sensitive plant tissue causing declines in local populations.

Trash (including roadside litter) and inappropriate yard-waste disposal were observed on multiple occasions especially when properties backed onto the natural areas. Fortunately, litter observed within forests was not recent (i.e. 2-5 years old). In terms of yard waste, woody debris was seen most often, however, discarded materials sometimes included live non-native plants. This practice is problematic as plants seemingly harmless in a garden environment can become highly

aggressive in the wild should conditions prove favourable. The presence of white-tailed deer *(Odocoileus virginianus)* within the Study Area is evident by visible browse and deer beds.

5.3.3 Flora Species at Risk

No flora Species at Risk (SAR), federally or provincially listed, were found within the Study Area.

Figure 10. Location of flora species of concern, Block A.

Figure 11. Location of flora species of concern, Block B.

Figure 12. Location of flora species of concern, Block C.

Figure 13. Location of flora species of concern, Block D.

5.4 Fauna Species Findings

Due to the late initiation of this project and the time sensitive nature of fauna inventories, there was no opportunity to conduct a full breeding fauna inventory within the Study Area in 2016. As a result, frog surveys were conducted in Spring 2016, and breeding bird surveys were conducted in Spring-early Summer 2017. Note that fauna species other than frogs and birds, if observed, were documented concurrently with the vegetation community, flora, frogs and breeding bird surveys.

In 2016, spring frog surveys were conducted from the roadside along the entire stretch of Airport Road that lies within the Study Area. Given the dispersal and migratory needs of various frog species it was appropriate to also record and map any frog choruses located just outside of the Study Area boundaries (Figure 14), knowing that it is highly likely that animals from such populations will venture into the Study Area and possibly across Airport Road itself.

Potential Amphibian Crossing Hotspots

In this first year of study, with only limited time and effort spent monitoring the stretch of road for signs of amphibian crossings, only one on-road sighting was made. However, the two visits in spring 2016 mapped several frog choruses, and this, in combination with an understanding of the local geography (using current ortho-photos) and reference to previous amphibian records in the area, indicates the following locations as potential crossing hotspots (Figure 15).

Starting at the north end of the Study Area:

1. Choruses of wood frog (Lithobates sylvaticus) and spring peeper (Pseudacris crucifer) were mapped on the east side of Airport Road (2016) and wood frog on the west side (2009). All three choruses were assessed as level “2”, indicating a medium chorus of several individuals. With active frog breeding wetlands on either side of the main road, there is a high potential for crossing between the wetlands (indicated as “A” in Figure 15).

2. Mountcrest Road (located on the east side of Airport Road) runs between two wetland frog populations. To the north of this road there were medium choruses of wood frog and spring peeper in 2016, with additional low choruses (“1”) of green frog (Lithobates clamitans) and American toad (Anaxyrus americana) in 2009. To the south of this road there was a medium chorus of spring peepers in 2009. A potential crossing between these two populations may occur (indicated as “B” in Figure 15).

3. Two dead American toads were observed on Airport Road, 500 m north of the junction with Olde Baseline Road. The ortho photo for this area does not indicate any wetlands, but given that American toad will breed in roadside ditches and very small ponds it is quite possible that these animals were associated with either nearby meadow habitat, or even simply the surrounding agriculture. It should also be understood that paved surfaces provide a very easy terrain for animals to move on and as such, depending on weather conditions, roads are sometimes not simply crossed but actually travelled upon for

considerable distances. This being the case it may be incorrect to consider this roadkill location as an actual crossing hotspot.

4. The strongest choruses for the entire Study Area stretch of Airport Road were mapped for wetlands located to the east and west of the road (both set back about 150 m) at point "C" (Figure 15). In 2016, both wood frogs and spring peepers scored full choruses ("3") from the west side wetland, with wood frog scoring a medium chorus ("2") and spring peepers a full chorus from the east side wetland. The potential for movements between these two wetlands for these species (and other wetland species) is very high and as such the road that bisects the route between these wetlands has the potential for multiple roadkill events.

Other wetlands exist within the landscape local to the Airport Road EA Study Area but given local geography (location of nearby forest habitat or other wetlands) do not appear to possess the same potential for roadkill incidents. These additional wetlands are listed below:

1. In 2002, low choruses ("1") of both wood frog and spring peeper were reported from a wetland located south of Huntsmill Drive, approximately 100m to the east of Airport Road, but separated from the road by buildings. There does not appear to be any reason for frogs to venture towards Airport Road at this location.

2. In 2016, the wetland adjacent to the forest east of the junction at Olde Baseline Road, about 150m to the east of Airport Road, held medium sized choruses ("2") of American toad and wood frog, and a full chorus of spring peepers. Again, the wetland is separated from Airport Road by a series of residential buildings, and given the proximity of extensive suitable wintering and foraging habitat immediately to the east, it seems unlikely that frogs and toads from this wetland will venture onto Airport Road.

3. There are a series of small ponds towards the south end of the Study Area that held small choruses of frogs and toads in 2016. All three of these locations appear to be very isolated with no obvious over-wintering or foraging habitats nearby. Additional searching may discover larger populations of frogs at wetlands set further back from the main road (e.g. at GPS coordinate 594030 4853922, 800 m to the west of Airport Road) which may then indicate that the smaller populations close to Airport Road are satellite groups associated with larger choruses.

The 2017 TRCA fauna surveys in the Airport Road EA Study Area documented a total of 42 bird species, 3 herpetofauna and 6 mammal species for a total of 51 terrestrial vertebrate fauna species.

Based on the 2017 fauna surveys, 2016 spring amphibian surveys, and incidental records from 2008 onwards, 54 species (42 birds, 6 herps and 6 mammals) were documented. All of these records fall within the TRCA's 10 year reporting threshold for current fauna records covering the period from 2008 to 2017. Records from before the 2008 threshold are considered archival and

therefore are regarded as absent and potentially extirpated from the Study Area. Refer to Appendix 3 for the list of the fauna species and their corresponding L-ranks.

5.4.1 Fauna Species of Concern

Fauna species, like vegetation communities and flora species, are considered of regional concern if they rank L1 to L3 based on their scores for the seven criteria mentioned in Section 5.1. Since the subject site is situated entirely in the rural zone this report is primarily concerned with these species but also considers those species ranked as L4, i.e. those species that are of concern in urban landscapes.

The Study Area is situated primarily in a rural landscape and passes through the community of Caledon East. The presence of this community may bring more urban or suburban influences to the site in the near future and as such it is important to also assess the status of the species ranked as L4 - i.e., those species that are of concern in urban landscapes.

Fauna surveys in the Airport Road EA Study Area in 2017 reported four bird species of regional concern (L1 to L3: black and white warbler, *Mniotilta varia*; blue-winged warbler, *Vermivora cyanoptera*; horned lark, *Eremophila alpestris*; and winter wren, *Troglodytes hiemalis*), and 14 of urban concern (L4). In addition, there were three herpetofauna and three mammal species of regional and urban concern, including one L2 species (grey treefrog, *Hyla versicolor*) and one L3 species (midland painted turtle, *Chrysemys picta marginata*). Two species of regional and one species of urban concern can be added from the 2016 inventory: spring peeper, *Pseudacris crucifer crucifer* and wood frog, *Lithobates sylvaticus* (both L2), and American toad, *Anaxyrus americanus* (L4). The total number of L1 to L4 ranked species is 27 species.

Locations of the bird species of regional concern were concentrated in the cedar and hardwood forests in block A (black and white warbler, blue-winged warbler and winter wren) and the agricultural areas and meadows in block D (horned lark). There is one representation of horned lark in block B. Grey treefrog was located in the wetlands adjacent to Mountcrest Road and two midland painted turtles were found dead beside Airport Road near the potential crossing point “C” (Figure 15 of the report). Locations of these breeding fauna are depicted in Figure 14.

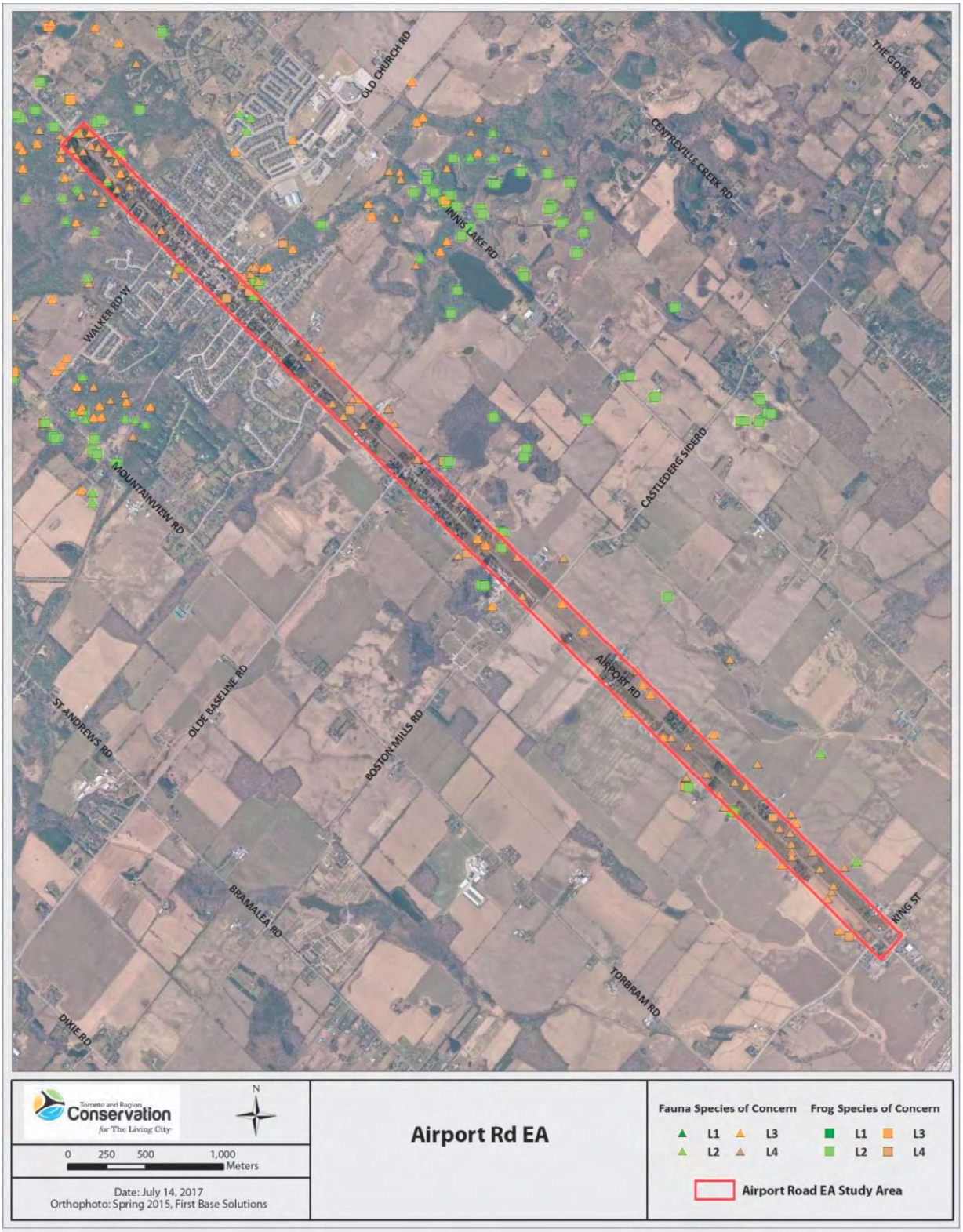


Figure 14. Location of bird and frog observations within and in the vicinity (< 1.5 km) of the Study Area.

Figure 15. Location of frog and toad choruses and potential amphibian crossing locations.

5.4.2 Fauna Species at Risk

One of the species documented at the Airport Road EA Study Area is listed on the Provincial Species at Risk list: barn swallow, *Hirundo rustica* (Threatened) (MNRF, 2017). This aerial forager was observed throughout the majority of the Study Area, from the southern portion of block B, through blocks C and D. This species was observed foraging over the agricultural land and meadows adjacent to Airport Road where there are plentiful nesting opportunities on the various man-made structures along the road.

It should be noted that a second Species at Risk, bobolink, *Dolichonyx oryzivorus* (Threatened), was found about 550m east of the southern portion of block D. Although this is outside the Study Area, this open-country ground-nesting species has the potential to breed closer to Airport Road within the meadows aligning the southern half of the Study Area. This must be taken into account considering the noise of heavy traffic impacted the ability to hear birdsong and calls at distance and therefore more bobolink may be present in the vicinity that were not audible to TRCA staff.

At the time of this report preparation, neither of these species appeared on the Federal Species At Risk Act Schedule 1.

No other fauna SAR, federally or provincially listed, were observed.

5.5 Wildlife Movement Corridors

Wildlife corridors are areas connected on a landscape level that facilitate wildlife movement. Such corridors assist in preserving wildlife populations in the long term, particularly within a landscape where natural communities are fragmented and/or dispersed.

Wildlife movement occurs both within the Study Area boundaries as well as through the Study Area within the larger landscape.

Due to the linear shape and overall small size of the Study Area and its land uses, the movement of wildlife *within* the boundaries is likely limited to movements within/between the local populations of amphibians associated with the nearby wetlands (discussed in Section 5.4) as well as small mammal species well-adapted to and/or dependent on urban environments and areas with active agriculture.

However, the Study Area also contains natural features (particularly in the northern portion) that are part of a larger extensive network of natural cover extending beyond the Study Area boundaries (Figure 1). Therefore, the Study Area serves to facilitate movement beyond its boundaries: the portions of natural cover overlapping with the Study Area can easily serve as corridors for wildlife species such as white-tailed deer that move within the larger landscape.

Movement corridors within the Study Area likely experience direct and indirect impacts from human use, especially vehicular traffic (along Airport Road itself, in particular). While the amphibian crossing hotspots are associated with the wetlands adjacent to the roads (see Section 5.4), larger and more mobile species likely use other areas of natural cover and may also travel

along the roadways and agricultural field hedgerows.

6 Aquatic Habitat and Communities

The project Study Area is located in the Main (northern portion) and West (southern portion of the Study Area) Humber River Subwatersheds (Figure 16). A small central portion of the Study Area is situated in the Credit River Watershed. This portion was not characterized in terms of the aquatic habitat and communities as it does not contain watercourses or headwater drainage features that cross the Study Area.

A total of six crossings of Airport Road within the Study Area were identified by the Region of Peel and TRCA staff. These crossings were later assessed by TRCA staff (see Sections 6.1.1 and 6.2).

Crossings 1 (Centerville Creek) and 3 (Boyce's Creek) provide direct fish habitat. Fish community inhabiting these waterbodies was characterized using available TRCA data collected within and in close proximity to the Study Area (Sections 6.1.2 and 6.3). Likewise, the benthic invertebrates communities of Centerville Creek and Boyce's Creek were also characterized using existing TRCA data (Sections 6.1.3 and 6.4).

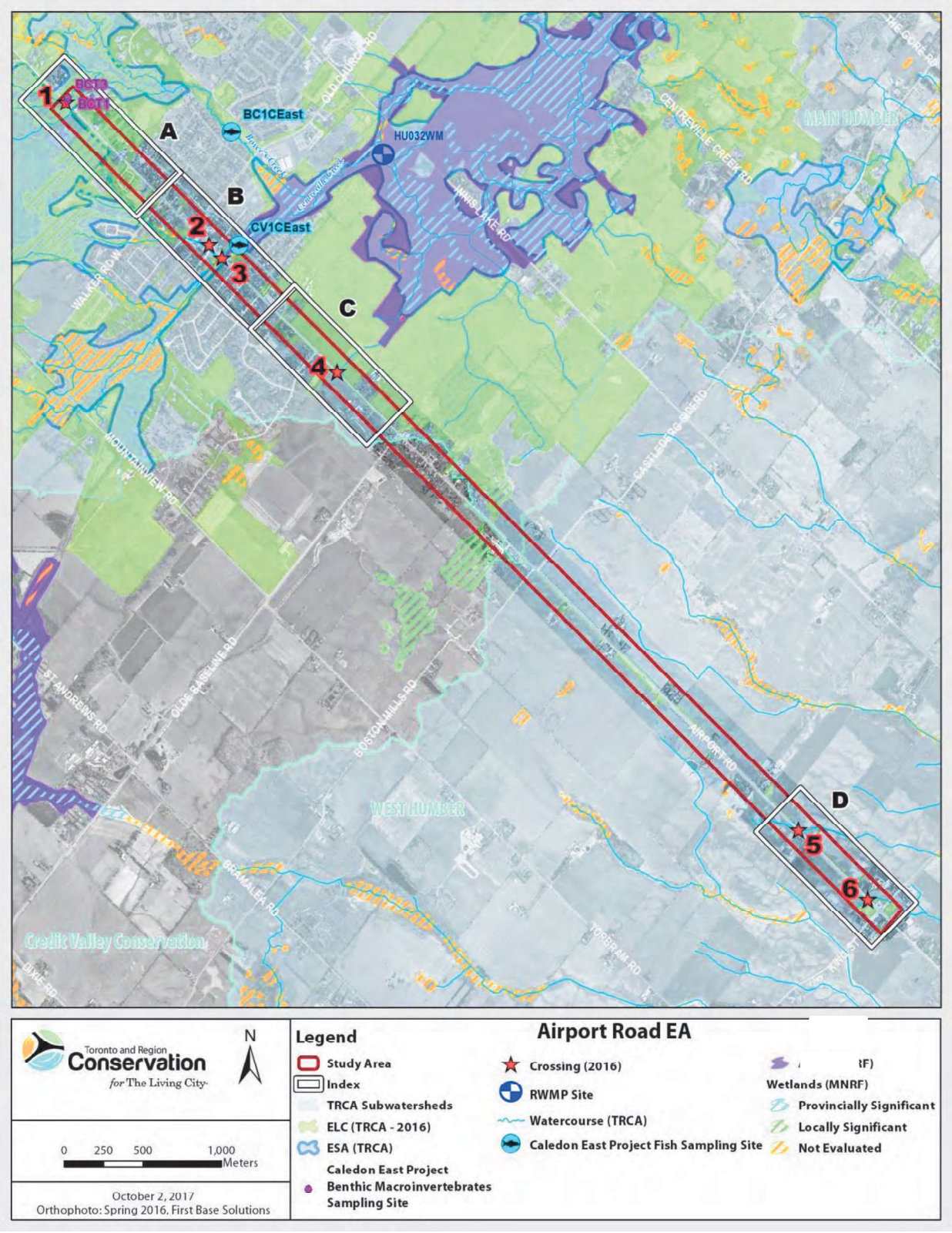


Figure 16. Project Study Area and crossing locations.

6.1 Methodology

6.1.1 Crossings Assessment

Six drainage features cross Airport Road Right-of-Way (ROW) within the Study Area (Figure 16). These drainage features were characterized as either watercourses or headwater drainage features.

Drainage feature is defined as a depression in the ground in which water can be present during some part of the year. Under the *Conservation Authorities Act* Section 28, a watercourse is defined as an identifiable depression in the ground in which flow of water regularly or continuously occurs. A drainage feature defined as a watercourse typically provides direct fish habitat. A headwater drainage feature (HDF) is defined as non-permanently flowing drainage feature that may not have defined bed or banks; they are zero-order and first-order intermittent and ephemeral channels, swales and connected headwater wetlands, but do not include rills or furrows (CVC & TRCA 2014).

Crossings 1, 2 and 3 are situated along watercourses while Crossings 4, 5 and 6 are situated along HDFs.

Assessment of all six crossing structures and associated fish habitat, if such was present, was completed on September 29-30 2016. The assessment included characterization of crossing sites' land use, existing crossing structure, channel structure (if applicable based on flow conditions during the time of the assessment), riparian vegetation (if applicable), and fish migration/movement obstructions (if applicable). Each crossing was documented photographically. Ontario Stream Assessment Protocol (OSAP) (Stanfield 2013) was used to characterize site land use, channel structure and riparian vegetation. Note that, as per OSAP, this was completed only for the crossing sites with flowing water. A short supplementary visit to select crossings was made on November 7, 2016.

Crossings 4, 5 and 6 were also assessed in accordance with the Evaluation, Classification and Management of Headwater Drainage Features Guidelines (CVC and TRCA, 2014). Crossings 1, 2 and 3 are situated along watercourses and did not undergo an assessment under the Headwater Drainage Features Guidelines.

While the HDF assessment presented in this report follows HDF guidelines (CVC & TRCA, 2014), it does not include management actions for the drainage features documented. It is recommended that this report be used as complimentary to any future decision making regarding land use activities near or around the described HDFs.

The HDF assessment of the features present at Crossings 4, 5 and 6 included assessing flow condition and riparian vegetation attributes of the features following the approach outlined in OSAP S4.M10. Fish and fish habitat as well as the terrestrial assessment were not undertaken as these attributes are to be completed when alterations to HDFs are proposed, or if there is likelihood of sensitive species presence and/or high likelihood of sustained (intermittent or perennial) flow.

A constrained point-based approach following OSAP S4.M10 was used. This approach uses a centralized point to identify the feature and sampling of the feature occurs only within the first 40 meters upstream and downstream of the point. Therefore the results are deemed to apply 20 meters up- or downstream of the point.

To account for the seasonal variability in HDF conditions and assess HDF hydrology and riparian conditions accurately, three visits were made:

- Visit #1 on September 29 - 30 2016. This visit coincided with late summer. Though the guideline recommends conducting a visit in July-August, September 2016 had summer-like warm conditions and this visit was therefore deemed acceptable to serve as a Summer visit.
- Visit #2 on April 12 2017. This visit was timed to coincide with the spring freshet (early to mid-April, as per the HDF guidelines).
- Visit #3 on June 1 2017. This visit was timed to coincide with the spring-early summer period defined in the guidelines. Note that a number of rain events over the course of several days preceded this visit, therefore delaying the visit until the 1st of June.

In addition to the site visits, aerial imagery as well as geographic information systems along with Arc Hydro and TRCA's digital elevation model were used to define assessment scope and interpret the findings.

The findings of the HDF assessment over the three visits were used to classify each HDF assessed with respect to the hydrology and the riparian vegetation conditions following the classification procedure outlined in CVC & TRCA (2014).

6.1.2 Fish Community Assessment

Fish community data were available to describe the fish community in Centerville and Boyce's Creeks.
To characterize the local fish community, the following data were used:

- Data obtained at the TRCA's Regional Watershed Monitoring Program site HU032WM (Figure 16). These data were collected in 2001, 2004, 2007, 2010, 2013 and 2016.
- Data obtained at the TRCA's Caledon East monitoring project fish sampling sites CV1CEast and BC1CEast (Figure 16). These data were collected yearly from 2009 to 2016 by Ontario Streams.

Though situated outside of the Study Area boundaries, HU032WM and CV1CEast sites are in close proximity to the Airport Road ROW and provide relevant information as they are characterized by conditions similar to those in Centerville Creek where it crosses Airport Road (Crossing 3). Therefore, no additional fish community data collection was performed.

Fish community data collection was completed according to the Ontario Stream Assessment Protocol Section 3, Module 1: Fish Community Sampling Using Screening, Standard and Multiple Pass Electrofishing Techniques. Single pass standard approach was utilized using an LR-24 Smith-Root Backpack Electrofisher unit. Captured fish were processed on site, which involved

identification to species, length measurement to the nearest millimeter and weight measurement to the nearest gram. Fish were released back into the stream immediately following the processing procedure.

Species composition, richness (number of species detected in a given year), origin (native or non-native to Ontario), and thermal guild (warm-, cool- and coldwater preference) were used to describe the local fish community.

6.1.3 Benthic Invertebrates Community Assessment

Data Collection

To characterize the benthic invertebrate community in Centerville Creek, data collected at the TRCA's Regional Watershed Monitoring Program site HU032WM from 2001 to 2015 were used. Though situated outside of the Study Area boundaries (approximately 1.1 km downstream of Airport Road), HU032WM site provides relevant information as it is characterized by conditions similar to those in Centerville Creek where it crosses Airport Road (Crossing 3). No additional benthic invertebrate samples were collected.

From 2001 to 2012, composite transect sampling method was used. Approximately 100 organisms were collected for 10 transects in each station. Since 2013, benthic macroinvertebrates were sampled following the Ontario Benthos Biomonitoring Network (OBBN) Protocol (OBBN) (Jones *et al*, 2007) developed by the Ontario Ministry of the Environment and Climate Change (OMOECC). Approximately 300 organisms were collected from each station, in both riffles and depositional areas over the same reach where fish community sampling occurred. Samples were preserved in the field and brought back to lab for organism identification. Macroinvertebrates were identified to the lowest practical taxonomic level.

To characterize the benthic macroinvertebrate community in Boyce's Creek, data collected at two sampling sites associated with the Caledon East monitoring project were used (BCT1 and BCT3, Figure 16). Samples were collected on 26 July 2013 and 8 September 2014 in accordance with the OBBN protocol.

Analysis

Five biological metrics (Table 2) spanning a wide scope of ecological attributes were chosen to evaluate the biological integrity of the monitoring site. The 'No. of Families' metric is that for the number of families (number of taxa) of macroinvertebrates sampled at each site. This metric indicates the richness of communities and is known to decrease as water quality deteriorates. The '% EPT' metric is the percentage of Ephemeroptera, Plecoptera and Trichoptera (% EPT).This metric also decreases as disturbances increase stress (e.g., siltation, nutrient enrichment or pesticide inputs), as the EPT families are generally more sensitive to pollution. These families occur abundantly in water bodies of good to excellent quality. The third and fourth metrics – '% Chironomidae' and '% Oligochaeta', respectively - are the percentage of Chironomidae (midge) and percentage of Oligochaetes (worms). Both chironomidae and oligochaetes are known to be highly pollution-tolerant. Their proportions increase as local disturbances increase or water quality decreases. The fifth metric is the Family-level Hilsenhoff Biotic Index (FBI), which is calculated as

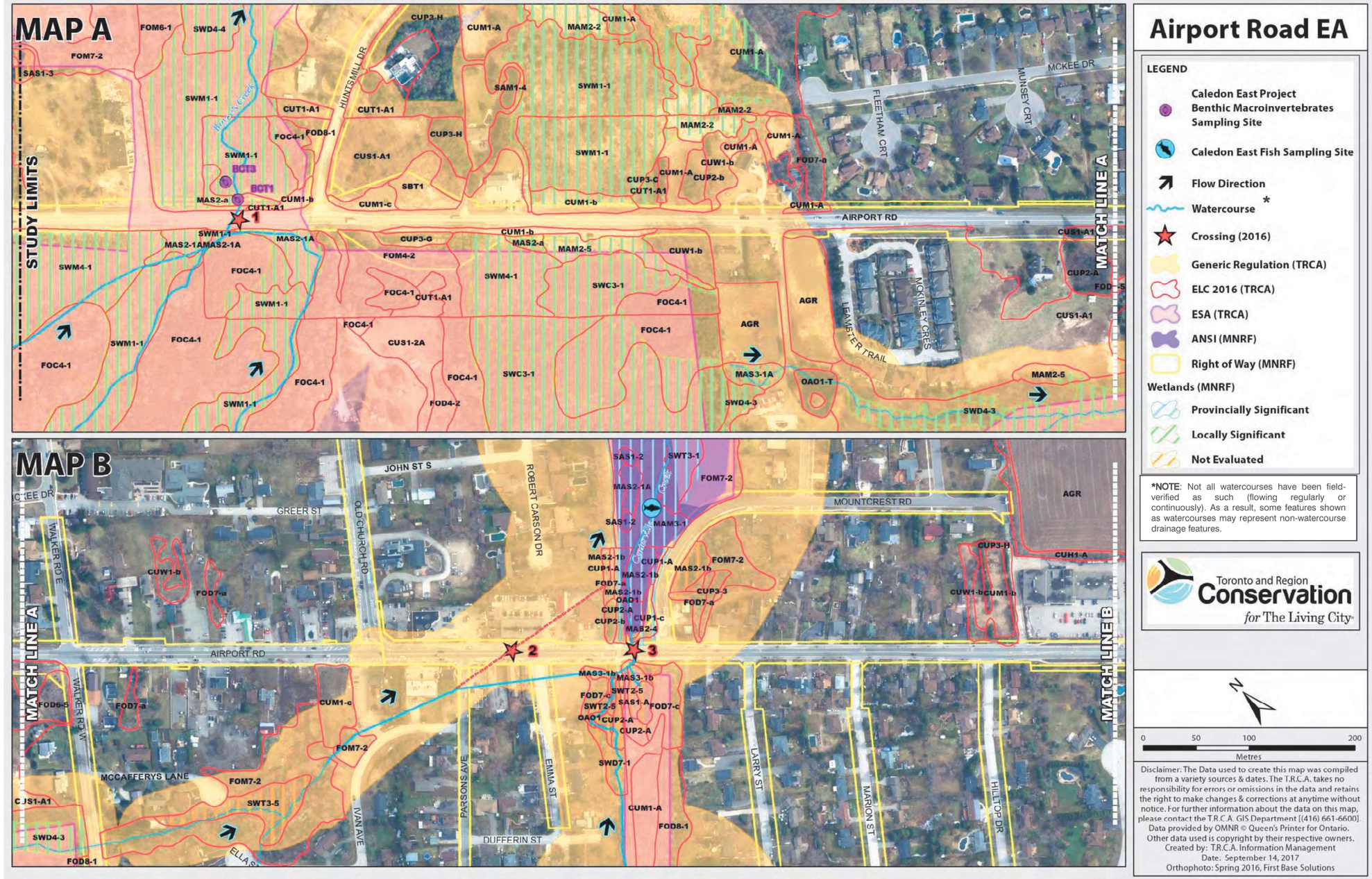
the weighted average of the "tolerance" scores (based on distributions with respect to organic pollution in riffles of Wisconsin streams) of the species in a sample. Higher FBI values reflect increasing organic loadings.

Table 2. Biological metrics selected and their response to decreasing water quality

Metric	Response to decreasing water quality
No. of Families	↓
% EPT	↓
% Chironomidae	↑
% Oligochaeta	↑
Family Biotic Index (FBI)	↑

6.2 Watercourse and Headwater Drainage Features Crossings Assessment Results

Sections 6.2.1 to 6.2.6 describe the results of the watercourse and HDFs crossings assessment. The results are also summarized in Section 7. The crossings are shown in detail in Figure 17 (Crossings 1, 2 and 3) and Figure 18 (Crossings 4, 5, and 6).



Airport Road EA

LEGEND

- Caledon East Project Benthic Macroinvertebrates Sampling Site
- Caledon East Fish Sampling Site
- Flow Direction
- Watercourse *
- Crossing (2016)
- Generic Regulation (TRCA)
- ELC 2016 (TRCA)
- ESA (TRCA)
- ANSI (MNRF)
- Right of Way (MNRF)

Wetlands (MNRF)

- Provincially Significant
- Locally Significant
- Not Evaluated

***NOTE**: Not all watercourses have been field-verified as such (flowing regularly or continuously). As a result, some features shown as watercourses may represent non-watercourse drainage features.

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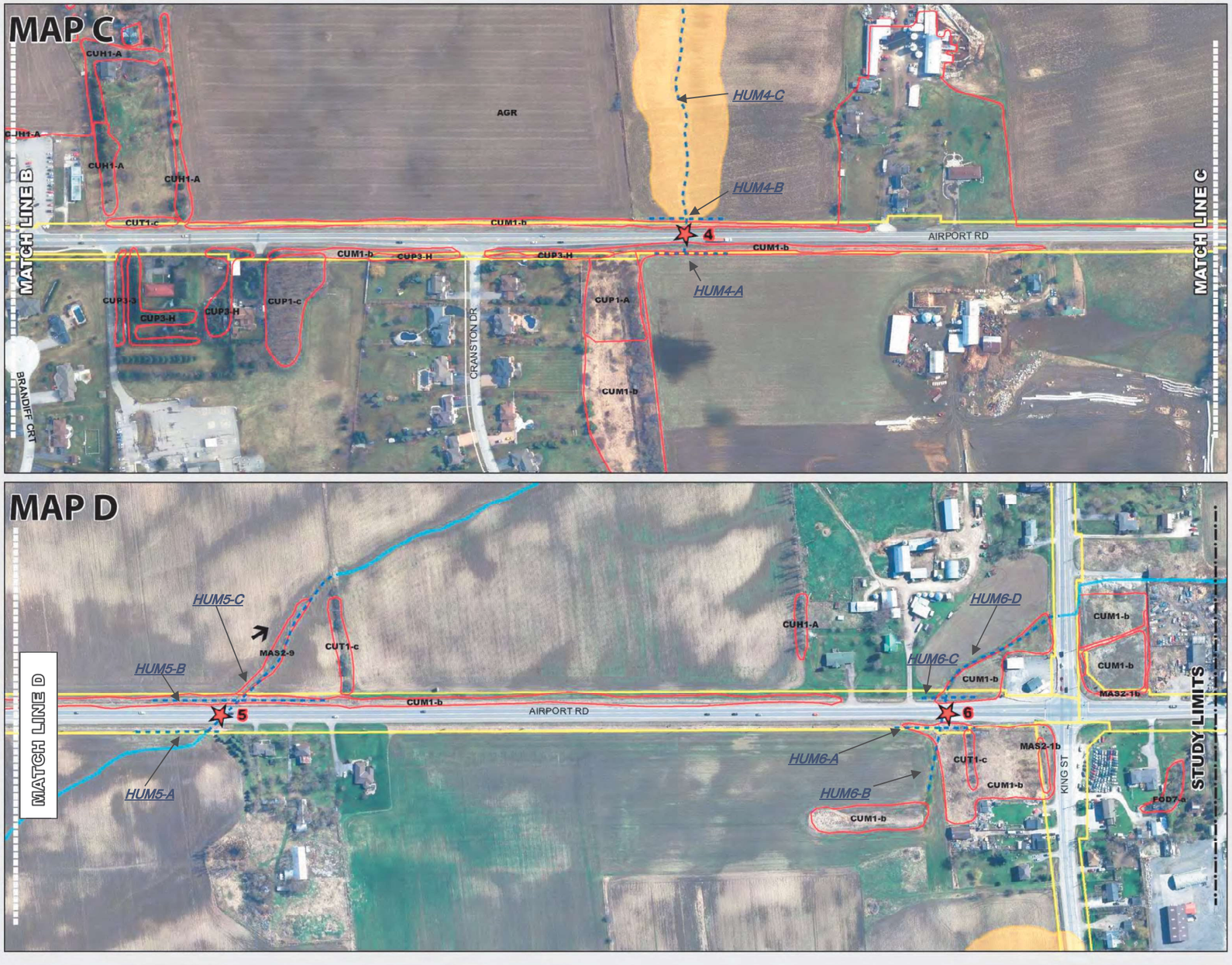
N

0 50 100 200
Metres

Created by: T.R.C.A. Information Management
Date: September 14, 2017
Orthophoto: Spring 2016, First Base Solutions

Figure 17. Crossings 1, 2 and 3 – detailed maps.



Airport Road EA

LEGEND

- Flow Direction
- Headwater Drainage Feature (Field Verified)
- Watercourse (TRCA)*
- Crossing (2016)
- Generic Regulation (TRCA)
- ELC (TRCA - 2016)
- Right of Way (MNRF)

***NOTE**: Not all watercourses have been field-verified as such (flowing regularly or continuously). As a result, some features shown as watercourses may represent non-watercourse drainage features.

Toronto and Region Conservation for The Living City

N

0 50 100 200
Metres

Disclaimer: The Data used to create this map was compiled from a variety sources & dates. The T.R.C.A. takes no responsibility for errors or omissions in the data and retains the right to make changes & corrections at anytime without notice. For further information about the data on this map, please contact the T.R.C.A. GIS Department [(416) 661-6600].
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Created by: T.R.C.A. Information Management
Date: September 14, 2017
Orthophoto: Spring 2016, First Base Solutions

Figure 18. Crossings 4, 5 and 6 – detailed maps. Note that there is no map for the area between map match line C and D as there are no crossings situated along this portion of Airport Road Right-of-Way.

6.2.1 Crossing 1 (75 meters north of Huntsmill Drive)

Crossing 1 is located approximately 75 m north of Huntsmill Drive (Figure 17). Boyce's Creek, Humber River tributary, crosses Airport Road at this location. Crossing structure is a 0.9 m x 22 m CSP culvert. This crossing is adjacent to a locally significant wetland (Figure 16, Section 4.1).

Upstream, water travels through a wetland with abundant cattails, entering a grass-lined roadside ditch between a forested area and Airport Road before it enters the culvert (Figure 19). No defined channel was observed upstream of the crossing.

Downstream, water travels through a *Phragmites*-dominated wetland for approximately 12 m before reaching a forested area. Downstream portion of the watercourse had a defined channel with a mean width of 0.68 m, and a mean depth of 0.07 m. All types of in-stream habitat – pools, glides and riffles – were present. Substrate consisted of fines, cobble and gravel. In-stream cover was available in the form of overhanging banks, aquatic vegetation and flat and round rocks. Evidence of groundwater seeps/springs in the form of watercress and rust seeps was noted downstream of the crossing. Riparian vegetation consisted of wetland and forest.

On the day of the assessment (September 30 2016), there was no water in the crossing structure itself, though water was present in the wetland located upstream, and in the channel located downstream of the crossing structure. Water was flowing on the November 7 2016 site visit.

The watercourse at this location has been determined to provide direct fish habitat (see Section 6.3.2 for the description of the Boyce's Creek fish community).

As Boyce's Creek is a watercourse, the headwaters drainage feature assessment was not performed.

Figure 19. Crossing 1: (A) Wetland area west of Airport Road; (B) View west from where culvert passes under Airport Road; (C) View of the culvert structure from the west side; (D) Forested area east of Airport Road; (E) View of channel from culvert opening on the east side of Airport Road; (F) View of the culvert opening on the west side of Airport Road.

6.2.2 Crossing 2 (spans Airport Road between Parsons Avenue and Caledon Trailway Path)

Crossing 2 (Figure 17) connects a tributary of Centerville Creek to Centerville Creek. Upstream end is located on the north side of Parsons Avenue approximately 34 m west of Airport Road. Downstream end is located approximately 65 m east of Airport Road on the north side of Caledon Trailway Path. Crossing structure is a concrete pipe 1 m in diameter. Pipe length could not be verified as this is an underground crossing, but could be as short as approximately 150 m.

North of the crossing upstream end, a rock-lined swale runs through a manicured area for approximately 15 m before another culvert (Figure 20). The swale and the crossing structure were dry at the time of the crossing assessment on September 29 2016.

Downstream, crossing terminates in a trail-side ditch on the north side of the trail. A small amount of standing water was present in the ditch at the downstream end of the crossing. The ditch is linked to Centreville Creek and a small wetland located between the creek and the trail via a small CSP culvert under the trail. The meeting point of the channel with the creek is elevated. Though the pond was not observed to have a direct connection to the creek, it may overflow into the creek under certain (wet/flood) conditions.

As this tributary of Centerville Creek is considered a watercourse, the headwaters drainage feature assessment was not performed.

Due to the configuration and size of this crossing it represents a barrier to fish movement. No fish were observed at this crossing location during the site visits. While the portion of the feature upstream of the crossing is likely direct fish habitat, the feature at the crossing itself provides indirect fish habitat as this long underground crossing without a direct connection to Centerville Creek is a barrier to fish movement. At the same time, the crossing has the ability to facilitate transport of materials to Centerville Creek.

Figure 20. Crossing 2: (A) View of upstream end from upstream; (B) View upstream towards the adjacent culvert; (C) View of the upstream culvert opening; (D) View of the downstream culvert opening; (E) View downstream from downstream culvert opening; (F) View of the culvert located downstream of the Crossing 2 culvert.

6.2.3 Crossing 3 (35 meters north of Mountcrest Road)

Crossing 3 is located along Centerville Creek where it crosses Airport Road approximately 35 m north of Mountcrest Road (Figure 17). This crossing is a concrete box culvert 4.35 m wide, 1 m high and 16 m long. Downstream side has two outfalls immediately north and south of the box culvert structure (Figure 21). The one on the north side is a CSP culvert 1.45 m in diameter, and the one on the south side, a concrete pipe, is 0.7 m in diameter. Upstream side of the box culvert did not have outfalls. It was not possible to verify whether the outfalls located on the downstream side of the culvert were actively used/in operation.

Upstream, Centerville Creek runs adjacent to a small unevaluated wetland and generally in close proximity to the Caledon Trailway Path. The stream also passes along several private properties with manicured lawns directly adjacent to the stream banks. Watercourse mean width in this section was 2 m, and the mean depth was 0.28 m. Pools and glides were present, though not riffles. The amount of instream cover was low, and consisted of woody debris, vegetation and leaf litter. The substrate was predominantly fines (silt, sand), indicating sediment loading. Little evidence of eroding banks was present. Evidence of groundwater inputs in the form of watercress was present. As this section of the creek runs along the trail, private properties and a wetland, riparian vegetation consisted of wetland, lawn and forest, or wasn't present.

Downstream of the crossing structure, the watercourse runs parallel to the Caledon Trailway Path. This area is a designated natural area: Innis-Gibbs Lakes Kettles ANSI and a Widgett-Innis Lakes Wetland Complex PSW (see Section 4). Channel dimensions in the downstream section are similar to those of the upstream section: mean width of 2 m and mean depth of 0.29 m. Pools, glides and riffles were present. Overhanging banks, round rock and vegetation provided instream cover. Substrate consisted of mainly fines (silt, sand), though cobble and gravel were present. There was some evidence of eroding banks. Habitat modifications in the form of log crib bank protection were noted. Riparian vegetation consisted primarily of meadow.

As Centerville Creek is a flowing watercourse, the headwaters drainage feature assessment was not performed.

The watercourse at this crossing provides direct fish habitat (see Section 6.3.1 for the description of Centerville Creek fish community).

Figure 21. Crossing 3: (A) View upstream of crossing; (B) View of the crossing from upstream; (C) View of the crossing upstream end from the north side; (D) View downstream of the crossing; (E) View of the crossing from downstream.

6.2.4 Crossing 4 (175 meters south of Cranston Drive)

Crossing 4 (Figure 18) is located approximately 175 m south of Cranston Drive. Crossing structure is a 0.6 m x 18 m CSP culvert. Upstream, or on the west side of Airport Road, drainage from agricultural fields and road runoff enter a grass-lined roadside ditch (Figure 22). No defined channel was observed in the agricultural fields adjacent to the crossing. Downstream, or on the east side of Airport Road, a roadside ditch and a swale through an agricultural field with no defined channel are found.

At the time of the assessment on September 30 2016, the crossing and adjacent agricultural fields and roadside ditches were dry. A significant amount of sediment was present in the culvert.

Photographic documentation of the features examined during the HDF assessment visits 2 and 3 is provided in Appendix 4 and 5, respectively. Photos taken during the site visit on September 30 2016 are provided in Figure 22.

Headwater Drainage Feature evaluation and classification results are as follows:

- Summary of Observations:
  - Three headwater drainage features were present at Crossing 4 site: roadside ditch along the west side of Airport Road (HUM4-A), roadside ditch along the east side of Airport Road (HUM4-B), and a swale running through the agricultural field perpendicular to Airport Road on the east side of Airport Road (HUM4-C).
  - No water was present in any of these features during all three site visits.
  - The swale on the east side of Airport Road appears to be connected to the network of drainage features located outside of the Study Area limits. Therefore, this feature may, under certain conditions such as large rain events or freshet events involving high volumes of runoff, facilitate transport of materials downstream provided that no downstream barriers to transport exist.
  - Agricultural cultivation and roads (Airport Road) have been identified as factors potentially impacting the function of the drainage features assessed.

- Hydrology Classification:
  - All three features have been determined to have a limited function due to the features being dry during all flow assessment periods, including the spring freshet, and the features being classified as either roadside ditches or swales.
  - The site is further characterized by fine textured soils, cultivation (agricultural fields), absence of wetland functions and absence of groundwater seepage. Natural vegetation (see below) was limited.

- Riparian Classification:
  - All three features have been determined to have limited functions as the features' riparian corridors are dominated by cropped land or no vegetation. Though the ditches along with a narrow strip of land between the Airport Road ROW and agricultural fields contain

meadow vegetation, the proportion of this type of riparian vegetation within the riparian corridor is small (Figure 18).

No watercourse is found at this crossing, and the HDF features present at this site have limited functions with respect to hydrology and riparian buffer. Though the formal fish and fish habitat assessment was not performed, the fact that the features found at this crossing were dry during all assessment periods indicates that they do not currently provide direct or indirect fish and fish habitat.

Figure 22. Crossing 4: (A) Looking west of the crossing structure; (B) Looking at the crossing structure west end; (C) View east from the crossing structure; (D) Crossing structure east end.

6.2.5 Crossing 5 (725 meters north of King Street)

Crossing 5 (Figure 18) is located approximately 725 meters north of King Street. Crossing structure is a 0.6 m x 22 m CSP. Upstream, or on the west side of Airport Road, drainage from agricultural fields and road runoff enter a grass-lined roadside ditch. No defined channel was observed in the agricultural fields adjacent to the crossing. Downstream, or on the east side of Airport Road, a roadside ditch and a swale through an agricultural field with no defined channel are found.

At the time of the assessment on September 30 2016, the crossing and adjacent agricultural fields and roadside ditches were dry.

Photographic documentation of the features examined during the HDF assessment visits 2 and 3 is provided in Appendix 4 and 5, respectively. Photos made during the September 30 2016 site visit are provided in Figure 23.

Headwater Drainage Feature evaluation and classification results are as follows:

- Summary of Observations:
  - Three headwater drainage features were present at Crossing 4 site: roadside ditch along the west side of Airport Road (HUM5-A), roadside ditch along the east side of Airport Road (HUM5-B), and a swale running southwest through the agricultural field on the east side of Airport Road (HUM5-C).
  - All features were dry on September 30 2016 visit. On April 14 2017 (freshet) visit, roadside ditches had standing water and the swale had minimal flow. On June 1 2017 visit, the conditions were same as those observed on April 14 2017: roadside ditches had standing water and the swale had minimal flow.
  - No wetlands are known to occur upstream (on the west side of Airport Road or upstream of the roadside ditch along the east side of Airport Road) and no groundwater seepage was observed.
  - The swale on the east side of Airport Road appears to connect to other drainage features beyond the Study Area limits. Therefore, this feature may facilitate transport of materials downstream provided that no downstream barriers to transport exist.
  - Agricultural cultivation and roads (Airport Road) have been identified as factors potentially impacting the function of the drainage features assessed.

- Hydrology Classification:
  - Both roadside ditches were determined to have limited functions. No flow or standing water was observed during the September 30 2016 visit, and standing water was observed during the April 14 2017 (freshet) and June 1 2017 visits.
  - The swale on the east side of Airport Road was determined to have contributing functions: provides ephemeral flow or water storage functions during and for a short time after spring freshet and following large rain events only, as confirmed during the three visits.

  - Similar to Crossing 4, this site is further characterized by fine textured soils, cultivation (agricultural fields), absence of wetland functions and absence of groundwater seepage. Natural vegetation (see below) was limited.

- Riparian Classification:
  - All three features at this Crossing site were determined to provide limited functions as their riparian corridors are dominated by cropped land or no vegetation. Though the ditches and the narrow strips of land between the road ROW and agricultural fields on either side of the road have grass cover, the proportion of this vegetation type within the larger riparian corridor is low.

No watercourse is found at this crossing. All three HDFs present have limited riparian function. The swale in the agricultural field east of Airport Road has a contributing hydrological function while the two roadside ditches have limited functions. Though the formal fish and fish habitat assessment was not performed, it is possible that the swale provides contributing functions with respect to fish and fish habitat, where it facilitates transport of materials to downstream fish-bearing reaches.

Figure 23. Crossing 5: (A) Looking west from structure; (B) Looking at crossing structure, west side; (C) Looking east from crossing structure; (D) Crossing structure, east side.

6.2.6 Crossing 6 (100 meters north of King Street)

Crossing 6 (Figure 18) is located approximately 100 m north of King Street. Crossing structure is a 0.6 m x 22 m CSP culvert. Upstream, or on the west side of Airport Road, agricultural field drainage and road run-off enter a grass-lined roadside ditch connected to the culvert. No defined channel was observed in the agricultural field. Downstream, or on the east side of Airport Road, a roadside ditch and a swale running through an agricultural field are found.

At the time of the assessment on September 30 2016, the crossing and adjacent agricultural fields and roadside ditches were dry.

Photographic documentation of the features examined during the HDF assessment visits 2 and 3 is provided in Appendix 4 and 5, respectively. Photos taken during the September 30 2016 visit are provided in
Figure 24.

Headwater Drainage Feature evaluation and classification results are as follows:

- Summary of Observations:
  - Four HDFs are present at Crossing 6 site: one tile drain in the agricultural field (HUM6-B) and one roadside ditch (HUM6-A) on the west side of Airport Road, and one roadside ditch (HUM6-C) and one swale (HUM6-D) through an agricultural field on the east side of Airport Road.
  - All features were dry during the September 30 2016 visit. On April 14 2017 (freshet) visit, all features had standing water; minimal flow was observed only where the water entered the culvert on the west side of Airport Road. On June 1 2017 (following light rain) visit, all features had standing water.
  - No wetlands are known to occur upstream (on the west side of Airport Road or upstream of the roadside ditch along the east side of Airport Road) and no groundwater seepage was observed.
  - The swale on the east side of Airport Road connects to a roadside ditch running along the north side of King Street, and to a culvert crossing under King Street approximately 77 m east of Airport Road. The King Street culvert connects to a ditch on the south side of King Street which, in turn, connects to a drainage feature running south. Though no formal assessment of the King Street crossing was performed as it is outside of the study scope, presence of this connection indicates that the swale HDF associated with Crossing 6 may, at least following large rain events or particularly high flow freshet events, facilitate transport of materials downstream, provided that no barriers to transport exist downstream.
  - Agricultural cultivation and roads (Airport Road) have been identified as factors potentially impacting the function of the drainage features assessed.

- Hydrological Classification:
  - Both roadside ditches (HUM6-A and HUM6-C) were determined to have limited functions. The features were dry on the September 30 2016 visit, and standing water was observed during the April 14 2017 (freshet) and June 1 2017 visits.
  - The tile drain (HUM6-B) on the west side of Airport Road and the swale (HUM6-D) on the east side were determined to have contributing functions: provide ephemeral flow or water storage functions during and for a short time after spring freshet and following large rain events only, as confirmed during the three visits.
  - This site is further characterized by fine textured soils (silt, clay), cultivation (agricultural fields), absence of wetland functions and absence of groundwater seepage. Natural vegetation (see below) was limited.

- Riparian Classification:
  - HUM6-A and HUM6-C, both roadside ditches, were determined to provide limited functions as their riparian corridors are dominated by cropped land or no vegetation (road). Though the ditches and the narrow strips of land between the road ROW and agricultural fields on either side of the road have grass cover, the proportion of this vegetation type within the larger riparian corridor is very low.
  - HUM6-B, tile drain, was determined to provide contributing riparian functions as a major portion of its riparian corridor to the south is dominated by meadow.
  - HUM6-D, a swale on the east side of Airport Road, was determined to provide valued riparian functions as the entire southern portion of its riparian corridor is dominated by meadow.

No watercourse is found at this crossing. HDFs that are roadside ditches have limited riparian function, the tile drain HDF has a contributing function, and the swale has a valued riparian function. With respect to hydrological function, the swale and the tile drain have a contributing hydrological function, while the two roadside ditches have limited functions. Though the formal fish and fish habitat assessment was not performed, the swale likely provides contributing functions with respect to fish and fish habitat, where it may facilitate transport of materials to downstream reaches.

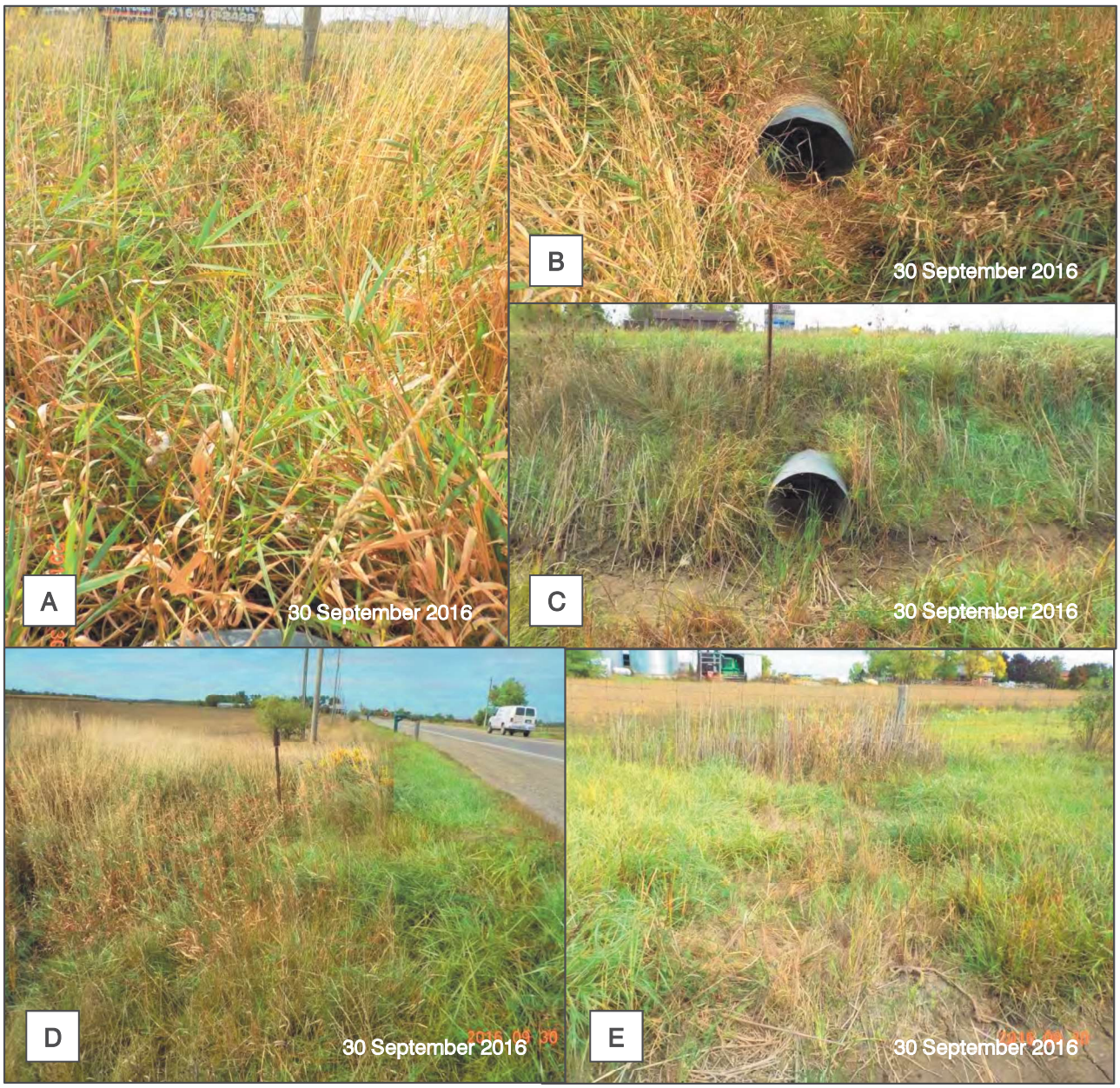

Figure 24. Crossing 6: (A) View west of the crossing; (B) Crossing structure, west end; (C) Crossing structure, east end; (D) View north towards the west end of the crossing; (E) View east of the crossing.

6.3 Fish Community

The portion of the Study Area north of Castlederg Sideroad (including Crossings 1 [Boyce's Creek], 2 [Centerville Creek tributary], 3 [Centerville Creek], and 4) is classified as Small Riverine Coldwater Habitat, and the portion of the Study Area south of Castlederg Sideroad (Crossings 5 and 6) is classified as Small Riverine Warmwater Habitat (OMNR and TRCA 2005).

Fish community data are available for Boyce's Creek and Centerville Creek (see Section 6.1.2), and are summarized below.

6.3.1 Centerville Creek

Seventeen fish species have been captured in Centerville Creek in the vicinity of Airport Road Crossing 3. Yearly species richness varied between four (captured at HU032WM in 2004) and 11 (captured at CV1CEast in 2010) (Table 3 and Table 4). CV1CEast site had higher species richness values (6 – 11) than HU032WM site (4 – 7). This may be attributed to the differences in habitat conditions: the amount of riparian and in-water cover, availability of submerged aquatic vegetation, the degree of sedimentation, presence or proximity of groundwater inputs and/or other variables enabled a wider variety of species to utilize the CV1CEast site.

Coldwater (preferred temperature <19ºC), coolwater (preferred temperature 19-25ºC) and warmwater (preferred temperature >25ºC) thermal guild species were present, with the majority belonging to the coolwater guild. All species captured were native, and no species at risk were encountered.

Notable species present in Centreville Creek include Brook Trout, which rely on groundwater inputs for spawning and are thus used as a biological indicator of habitat condition. Due to their dependence on cold groundwater, Brook Trout are the first to decline in response to water temperature increase as a result of land management activities disrupting the groundwater upwellings and/or resulting in warming of stream temperatures via other means. Brook Trout abundance in Centerville Creek has been declining since the start of the Caledon East monitoring project in 2009 (TRCA, unpublished data).

Table 3. Fish species captured at CV1CEast from 2009 to 2016.

Species Name	Origin	Thermal Regime	Fish Species Presence/Absence							
			2009	2010	2011	2012	2013	2014	2015	2016
Brook Trout	Native	Coldwater	X	X	X	X	X	X	X	X
American Brook Lamprey	Native	Coldwater	X	X	X				X	X
Blacknose Dace	Native	Coolwater	X	X	X		X	X	X	X
Brook Stickleback	Native	Coolwater	X	X	X		X	X	X	X
Brown Bullhead	Native	Warmwater				X				
Central Mudminnow	Native	Coolwater	X	X				X	X	X
Creek Chub	Native	Coolwater	X	X	X	X	X	X	X	X
Fathead Minnow	Native	Warmwater								X
Iowa Darter	Native	Coolwater		X	X				X	
Largemouth Bass	Native	Warmwater				X				
Mottled Sculpin	Native	Coldwater		X	X		X	X	X	X
Northern Redbelly Dace	Native	Coolwater								
Pumpkinseed	Native	Warmwater	X	X	X	X	X			
River Chub	Native	Coolwater			X					
White sucker	Native	Coolwater	X	X		X	X	X	X	
Yellow perch	Native	Coolwater	X	X				X		
Species Richness			**9**	**11**	**9**	**6**	**7**	**9**	**9**	**8**

Table 4. Fish species captured at HU032WM from 2001 to 2016.

Species Name	Origin	Thermal Regime	Fish Species Presence/Absence					
			2001	2004	2007	2010	2013	2016
Blacknose Dace	Native	Coolwater	X	X	X	X	X	X
Brassy Minnow	Native	Coolwater	X					
Brook Stickleback	Native	Coolwater	X		X		X	X
Brook Trout	Native	Coldwater	X	X		X	X	
Brown Bullhead	Native	Warmwater					X	
Central Mudminnow	Native	Coolwater			X			X
Creek Chub	Native	Coolwater	X		X	X		X
Fathead Minnow	Native	Warmwater		X			X	X
Johnny Darter	Native	Coolwater						X
Largemouth Bass	Native	Warmwater				X		
Northern Redbelly Dace	Native	Coolwater	X					
Pumpkinseed	Native	Warmwater				X	X	
White Sucker	Native	Coolwater	X	X	X	X	X	
Yellow Perch	Native	Coolwater				X		
Species Richness			**7**	**4**	**5**	**7**	**7**	**6**

6.3.2 Boyce's Creek

Eight fish species were captured in Boyce's Creek (Table 5). Yearly species richness varied between three (2012 – 2016) and seven (2009). Species richness values declined since the beginning of Boyce's Creek monitoring in 2009, and stayed consistently low (three species) from 2012 to 2016. This may be attributed to changes in water temperature and turbidity levels as a result of sediment input events from the pond on private property located at 16399 Airport Road (TRCA 2015).

Similar to Centerville Creek, coldwater (preferred temperature <19ºC), coolwater (preferred temperature 19-25ºC) and warmwater (preferred temperature >25ºC) thermal guild species were present, with the majority belonging to the coolwater guild. All species captured were native, and no species at risk were encountered.

Boyce's Creek is inhabited by Brook Trout, a notable species whose significance is discussed in Section 6.3.1. Similar to Centerville Creek, Boyce's Creek Brook Trout abundance showed an overall decline since 2009 (TRCA, unpublished data).

Table 5. Fish species captured at BC1CEast from 2009 to 2016.

Species Name	Origin	Thermal Regime	Species Presence/Absence							
			2009	2010	2011	2012	2013	2014	2015	2016
Brook Trout	Native	Coldwater	X	X	X	X	X	X	X	X
American Brook Lamprey	Native	Coldwater	X	X	X	X	X		X	
Blacknose Dace	Native	Coolwater	X	X	X	X	X	X	X	X
Creek Chub	Native	Coolwater	X	X	X			X		
Fathead minnow	Native	Warmwater	X							
Iowa Darter	Native	Coolwater			X					
Northern Redbelly Dace	Native	Coolwater	X							
Pumpkinseed	Native	Warmwater	X		X					
Species Richness			**7**	**4**	**6**	**3**	**3**	**3**	**3**	**3**

6.4 Benthic Invertebrates Community

Aquatic benthic macroinvertebrates (BMI) provide an important ecological link between microscopic food organisms and fish. They are useful indicators of aquatic habitat conditions and changes because of their strict habitat requirements. They tend to be relatively immobile, and as a result are continuously exposed to the constituents of the surface water they inhabit. They reside in an aquatic system long enough to reflect the chronic effects of pollutants, and yet short enough to respond to relatively acute changes in water quality.

6.4.1 Centerville Creek

Most of the metrics used to evaluate the biological integrity of the sampling site suggest it appears to be in a fairly poor condition. Further, data review indicates that the HU032WM site BMI community lacks diversity and sensitive indicator species, likely due to the limited habitat available for benthos.

High percentage of Chironomidae (Table 6) is characteristic of areas where substantial amounts of fine sediment have been deposited. Sediment loading is evident in the photos taken at the sites prior to sampling (Figure 25). Family-level diversity is similar to the jurisdictional average (n=11). The percentage of Ephemeroptera, Plecoptera and Trichoptera (% EPT) (3%) is lower than the jurisdictional average of 19%. Family Biotic Index values indicated that the degree of organic pollution is substantial in this area.

These results could be associated with the area land use, where agricultural fields and roads being the potential major contributors of suspended material and organic enrichment.

Table 6. Macroinvertebrate community composition metric values at HU032WM.

Metric	Average Value	Water Quality	Degree of Organic Pollution
No. of families	11	-	-
% EPT	3	-	-
% Chironomidae	39	-	-
% Oligochaeta	6	-	-
Family Biotic Index	6.32	Fairly Poor	Substantial pollution likely

Figure 25. HU032WM site representative photo.

6.4.2 Boyce's Creek

The community composition metrics used to evaluate biological integrity of the Boyce's Creek sites suggest that the local BMI community is in fair condition.

Based on the number of taxa families found in the samples, the sites provide fairly good quality habitats to support comparatively diverse BMI communities. The average family-level diversity (n=23) is significantly above the jurisdictional average of 11 taxa families (Table 7). Measures of community composition (% EPT, % Chironomidae, % Oligochaeta) were more variable among sampling events, but the presence of EPT groups indicates the availability of suitable quality habitat for these insects. However, the high percentage of Chironomidae suggests that sedimentation could be an issue. Family biotic index (FBI) score indicates fair water quality with likely organic pollution.

Table 7. Macroinvertebrate community composition metric values at Boyce's Creek sites.

Metric	Average Value	Water Quality	Degree of Organic Pollution
No. of Families	23	-	-
% EPT	19.1	-	-
% Chironomidae	31.7	-	-
% Oligochaeta	13.4	-	-
Family Biotic Index	5.49	Fair	Fairly substantial pollution likely

6.5 Species at Risk

No fish SAR, federally or provincially listed, were captured during the fish community and benthic invertebrates surveys described in this report. Although the Humber River watershed does have a number of reaches designated as Redside Dace (fish SAR listed as “Endangered” provincially and “Endangered, Schedule 1” federally) habitat, none of these overlap with the Study Area. The nearest reaches are located approximately 3 km south and south-east of the Study Area southern limit.

7 Summary

The following is a short summary of the Study Area natural environment existing conditions. Regional context is provided where applicable.

- The Study Area is located in the upper-reaches of the West Humber and Main Humber sub-watersheds, along Airport Road between Huntsmill Drive and King Street. The natural features in the north regions of the Study Area are part of a larger extensive network of natural cover that extends beyond the site boundaries.

- Fifty one vegetation types were observed, ranging from coniferous plantation to shallow marsh and aquatic communities. The site includes 4 aquatic, 17 forest, 18 wetland, 7 successional, and 3 meadow vegetation community types. Amongst them were 8 communities of regional concern and 13 communities of urban concern. Treed Sand Barren and Dry Drop Seed Sand Barren are two uncommon L2 communities classified within the Study Area.

- Excluding planted specimens, a total of 277 naturally occurring flora species were observed. Amongst them were 23 species of regional concern (ranked L1-L3) and 42 species of urban concern (ranked L4). Species of concern were associated with wetland, forest and successional habitats. Total species richness is moderate for the size of the site, a reflection in part of habitat quality and microhabitat diversity.

- Three potential amphibian crossing points were identified along Airport Road within the Study Area: north of Huntsmill Drive, in the vicinity of Mountcrest Road and north of Castlederg Sideroad.

- Boyce's and Centerville Creeks fish community is primarily coolwater. Centerville Creek was found to support a higher number of species than Boyce's Creek, particularly in recent years. Both creeks provide habitat for coldwater-dependent Brook Trout. No non-native species and no fish species at risk were captured during the fish community surveys of Boyce's and Centerville Creeks.

- With respect to fish and fish habitat, the six crossing sites of Airport Road by drainage features (watercourses and headwater drainage features) were determined to provide the following conditions:

Crossing 1 - Boyce's Creek	Direct fish habitat
Crossing 2 - tributary of Centerville Creek	Indirect fish habitat (materials transport to Centerville Creek)
Crossing 3 - Centerville Creek	Direct fish habitat
Crossing 4	None (does not provide direct or indirect fish habitat)
Crossing 5 - headwater drainage feature HUM5-C	Indirect fish habitat (materials transport to downstream reaches)
Crossing 6 - headwater drainage feature HUM6-D	Indirect fish habitat (materials transport to downstream reaches)

- Results of the headwater drainage feature assessment carried out at Crossings 4, 5 and 6 are as follows:

Crossing No.	Feature Code	Step 1: Hydrology	Step 1: Modifier	Step 2: Riparian
Crossing 4	HUM4-A	Limited	- Agriculture - Road	Limited
	HUM4-B	Limited	- Agriculture - Road	Limited
	HUM4-C	Limited	- Agriculture - Road	Limited
Crossing 5	HUM5-A	Limited	- Agriculture - Road	Limited
	HUM5-B	Limited	- Agriculture - Road	Limited
	HUM5-C	Contributing	- Agriculture - Road	Limited
Crossing 6	HUM6-A	Limited	- Agriculture - Road	Limited
	HUM6-B	Contributing	- Agriculture - Road	Contributing
	HUM6-C	Limited	- Agriculture - Road	Limited
	HUM6-D	Contributing	- Agriculture - Road	Valued

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Appendix 1. List of vegetation communities found within the Airport Road EA Study Area, 2016.

ELC Code	Vegetation Type *(* indicates present as inclusion and/or complex only)*	Total Area of Community (#ha)	Scores			Local Rank Apr-16
			Local Occurrence	Geophysical Requirements	2016 Score	
	Forest					
FOC4-1	Fresh-Moist White Cedar Coniferous Forest	1.0	2.0	2.0	4.0	**L4**
FOM4-2	Dry-Fresh White Cedar - Poplar Mixed Forest	0.7	3.0	2.0	5.0	**L3**
FOD6-5	Fresh-Moist Sugar Maple - Hardwood Deciduous Forest	0.1	1.5	0.0	1.5	**L5**
FOD7-a	Fresh-Moist Manitoba Maple Lowland Deciduous Forest	0.6	1.5	0.0	1.5	**L5**
FOD7-c	Fresh-Moist Exotic Lowland Deciduous Forest	0.3	2.0	0.0	2.0	**L+**
FOD8-1	Fresh-Moist Poplar Deciduous Forest	0.1	1.5	0.0	1.5	**L5**
FOD8-B	Fresh-Moist Paper Birch Deciduous Forest*	-	3.0	0.0	3.0	**L4**
CUP1-A	Restoration Deciduous Plantation	0.4	2.0	0.0	2.0	**L5**
CUP1-b	Willow Deciduous Plantation*	-	3.0	0.0	3.0	**L5**
CUP1-c	Black Locust Deciduous Plantation	0.4	2.0	0.0	2.0	**L+**
CUP2-A	Restoration Mixed Plantation	0.4	2.0	0.0	2.0	**L5**
CUP2-b	Black Locust - Conifer Mixed Plantation	0.1	3.0	0.0	3.0	**L+**
CUP3-3	Scots Pine Coniferous Plantation	0.1	2.0	0.0	2.0	**L+**
CUP3-C	White Spruce Coniferous Plantation	0.04	2.0	0.0	2.0	**L5**
CUP3-e	Norway Spruce Coniferous Plantation	0.1	2.0	0.0	2.0	**L+**
CUP3-G	White Cedar Coniferous Plantation	0.1	2.0	0.0	2.0	**L5**
CUP3-H	Mixed Conifer Coniferous Plantation	0.7	1.5	0.0	1.5	**L5**
	Successional					
CUT1-1	Sumac Deciduous Thicket*	-	2.0	0.0	2.0	**L5**
CUT1-A1	Native Deciduous Sapling Regeneration Thicket	0.2	2.0	0.0	2.0	**L5**
CUT1-c	Exotic Deciduous Thicket	0.2	2.0	0.0	2.0	**L+**
CUH1-A	Treed Hedgerow	0.4	1.5	0.0	1.5	**L5**
CUS1-A1	Native Deciduous Successional Savannah	0.6	1.5	0.0	1.5	**L5**
CUW1-A3	Native Deciduous Successional Woodland	0.02	1.0	0.0	1.0	**L5**
CUW1-b	Exotic Successional Woodland	0.7	1.0	0.0	1.0	**L+**
	Wetland					
SWC3-1	White Cedar Organic Coniferous Swamp	0.5	2.5	3.0	5.5	**L3**
SWM1-1	White Cedar - Hardwood Mineral Mixed Swamp	1.6	1.5	2.0	3.5	**L4**
SWM4-1	White Cedar - Hardwood Organic Mixed Swamp	0.6	1.5	3.0	4.5	**L4**
SWT2-2	Willow Mineral Thicket Swamp	0.2	2.0	2.0	4.0	**L4**
SWT2-5	Red-osier Mineral Thicket Swamp	0.05	2.0	2.0	4.0	**L4**
MAM2-2	Reed Canary Grass Mineral Meadow Marsh	0.1	1.0	1.0	2.0	**L+**

ELC Code	Vegetation Type *(* indicates present as inclusion and/or complex only)*	Total Area of Community (#ha)	Scores			Local Rank Apr-16
			Local Occurrence	Geophysical Requirements	2016 Score	
MAM2-5	Narrow-leaved Sedge Mineral Meadow Marsh	0.2	3.0	2.0	5.0	**L3**
MAM2-9	Jewelweed Mineral Meadow Marsh*	-	2.5	1.0	3.5	**L4**
MAM2-10	Forb Mineral Meadow Marsh	0.1	2.0	1.0	3.0	**L4**
MAS2-1A	Broad-leaved Cattail Mineral Shallow Marsh	0.2	2.0	1.0	3.0	**L4**
MAS2-1b	Narrow-Leaved Cattail Mineral Shallow Marsh	1.0	1.0	0.0	1.0	**L+**
MAS2-4	Broad-leaved Sedge Mineral Shallow Marsh	0.04	3.0	2.0	5.0	**L3**
MAS2-9	Forb Mineral Shallow Marsh	0.1	2.5	1.0	3.5	**L4**
MAS2-a	Common Reed Mineral Shallow Marsh	0.1	3.0	0.0	3.0	**L+**
MAS2-C	Horsetail Mineral Shallow Marsh*	-	4.0	1.0	5.0	**L3**
MAS2-d	Reed Canary Grass Mineral Shallow Marsh*	-	2.5	1.0	3.5	**L+**
MAS3-1A	Broad-leaved Cattail Organic Shallow Marsh*	-	2.5	3.0	5.5	**L3**
MAS3-1b	Narrow-leaved Cattail Organic Shallow Marsh	0.1	3.0	1.0	4.0	**L+**
	Aquatic					
SAS1-3	Stonewort Submerged Shallow Aquatic*	-	2.0	1.0	3.0	**L4**
SAS1-A	Coon-tail Submerged Shallow Aquatic	0.05	2.5	1.0	3.5	**L4**
SAF1-3	Duckweed Floating-leaved Shallow Aquatic	0.03	2.5	1.0	3.5	**L4**
OAO1	Open Aquatic (deep or riverine unvegetated)	0.04	1.5	0.0	1.5	**L5**
	Dynamic (Beach, Bluff, Barren, Prairie, Savannah)					
SBO1-A	Dry Dropseed Sand Barren*	-	3.5	4.0	7.5	**L2**
SBT1	Treed Sand Barren	0.2	3.5	4.0	7.5	**L2**
	Meadow					
CUM1-A	Native Forb Meadow	0.3	1.0	0.0	1.0	**L5**
CUM1-b	Exotic Cool-season Grass Graminoid Meadow	5.8	1.0	0.0	1.0	**L+**
CUM1-c	Exotic Forb Meadow	0.3	1.0	0.0	1.0	**L+**

Vegetation communities are scored based on two criteria: local occurrence and geophysical requirements. The local occurrence score is derived based on the number of grid squares the vegetation community is found in across the TRCA jurisdiction along with the total area occupied. The geophysical requirements criterion characterizes the habitat requirements of the vegetation community. Parameters such as soil type, pH, hydrology, etc. are considered.

For complete scoring and ranking protocol details please refer to the following:
TRCA 2017. Vegetation Community and Species Ranking and Scoring Method. Toronto and Region Conservation Authority.

Scientific Name	Common Name	Local Occurrence	Population Trend	Habitat Dependence	Sensitivity to Development	Total Score 2-20	Rank TRCA (Apr-16)	Species Presence by Survey Block(s) (presence indicated with 'x' or code - code with * see definitions below)			
								A	B	C	D
Cypripedium reginae	showy lady's slipper	3	4	5	5	17	**L2**	cf *			
Dichanthelium linearifolium	narrow-leaved panic grass	4	3	5	5	17	**L2**	x			
Aralia racemosa ssp. *racemosa*	spikenard	2	4	4	4	14	**L3**	x			
Carex alopecoidea	foxtail wood sedge	2	3	5	4	14	**L3**	x			
Carex disperma	two-seeded sedge	2	3	5	4	14	**L3**	x			
Carex interior	fen star sedge	2	4	4	4	14	**L3**	x			
Carex leptalea	bristle-stalked sedge	2	3	5	4	14	**L3**	x			
Carex utriculata	beaked sedge	2	3	4	5	14	**L3**	x	x		
Chelone glabra	turtlehead	2	3	4	5	14	**L3**	x			
Cypripedium parviflorum var. *pubescens*	larger yellow lady's slipper	3	4	5	4	16	**L3**	cf *			
Eleocharis palustris	Small's spike-rush	2	4	5	3	14	**L3**	x			
Epilobium leptophyllum	narrow-leaved willow-herb	2	5	4	4	15	**L3**	x			
Equisetum fluviatile	water horsetail	2	4	5	4	15	**L3**	x			
Equisetum scirpoides	dwarf scouring-rush	2	4	5	5	16	**L3**	x			
Gymnocarpium dryopteris	oak fern	1	3	5	5	14	**L3**	x			
Iris versicolor	blue flag	1	5	4	5	15	**L3**			x	
Lemna trisulca	star duckweed	2	4	5	3	14	**L3**		x		
Lobelia inflata	Indian tobacco	2	4	4	4	14	**L3**	x			
Maianthemum trifolium	three-leaved false Solomon's seal	3	4	5	4	16	**L3**	x			
Menispermum canadense	moonseed	2	4	4	4	14	**L3**	x			
Rhamnus alnifolia	alder-leaved buckthorn	3	3	4	4	14	**L3**	x			
Salix lucida	shining willow	2	4	5	3	14	**L3**	x			
Sporobolus cryptandrus	sand dropseed	3	3	5	3	14	**L3**	x			
Acer rubrum	red maple	1	4	1	5	11	**L4**		x		
Acer saccharinum	silver maple	1	2	5	3	11	**L4**		p? *		x
Acer saccharum ssp. *nigrum*	black maple	2	3	4	2	11	**L4**		x		
Acer x *freemanii*	hybrid swamp maple	2	3	5	2	12	**L4**				x
Betula alleghaniensis	yellow birch	1	4	3	5	13	**L4**	x			
Betula papyrifera	paper birch	1	4	2	4	11	**L4**	x	p *		
Calamagrostis canadensis	Canada blue joint	1	3	4	4	12	**L4**		x		
Carex aurea	golden-fruited sedge	1	2	4	4	11	**L4**	x			
Carex hystericina	porcupine sedge	1	3	2	5	11	**L4**	x			
Carex lacustris	lake-bank sedge	2	3	3	4	12	**L4**		x	x	
Carex retrorsa	retrorse sedge	1	3	3	4	11	**L4**	x			
Carex stricta	tussock sedge	2	3	3	4	12	**L4**	x	x		
Ceratophyllum demersum	coontail	1	3	5	3	12	**L4**		x		
Cicuta bulbifera	bulblet-bearing water-hemlock	1	3	4	3	11	**L4**			x	
Cuscuta gronovii	swamp dodder	2	3	3	3	11	**L4**		x		

Appendix 2: List of Flora Species found within the Airport Road EA Study Area, 2016

Scientific Name	Common Name	Local Occurrence	Population Trend	Habitat Dependence	Sensitivity to Development	Total Score 2-20	Rank TRCA (Apr-16)	Species Presence by Survey Block(s) (presence indicated with 'x' or code - code with * see definitions below)			
								A	B	C	D
Cystopteris bulbifera	bulblet fern	1	3	4	4	12	**L4**	x			
Danthonia spicata	poverty oat grass	2	3	3	4	12	**L4**	x			
Equisetum variegatum ssp. *variegatum*	variegated scouring-rush	2	2	5	4	13	**L4**	x			
Eupatorium perfoliatum	boneset	1	3	4	3	11	**L4**	x	x		
Fagus grandifolia	American beech	1	4	3	4	12	**L4**	x	x		
Fraxinus nigra	black ash	1	4	4	3	12	**L4**	x			
Hydrocotyle americana	marsh pennywort	2	3	4	4	13	**L4**	x			
Juncus effusus	soft rush	1	4	4	3	12	**L4**	x	x	x	
Lycopus americanus	cut-leaved water-horehound	1	4	3	3	11	**L4**	x			
Myosotis laxa	smaller forget-me-not	1	4	3	4	12	**L4**	x			
Persicaria amphibia var. *stipulacea*	water smartweed	3	2	4	3	12	**L4**			x	
Pteridium aquilinum var. *latiusculum*	eastern bracken	1	4	2	4	11	**L4**	x			
Pyrola elliptica	shinleaf	1	4	4	4	13	**L4**	x			
Quercus rubra	red oak	1	4	2	4	11	**L4**	p *	x		
Rubus pubescens	dwarf raspberry	1	3	3	5	12	**L4**	x			
Rudbeckia hirta	black-eyed Susan	1	4	4	3	12	**L4**	x			
Salix amygdaloides	peach-leaved willow	1	2	5	3	11	**L4**				x
Salix bebbiana	Bebb's willow	1	3	3	4	11	**L4**	x			
Salix discolor	pussy willow	1	3	4	3	11	**L4**	x			
Salix petiolaris	slender willow	2	3	5	3	13	**L4**			x	
Schoenoplectus tabernaemontani	soft-stemmed bulrush	1	2	5	3	11	**L4**		x	x	
Scirpus cyperinus	woolly bulrush	2	3	3	5	13	**L4**	x			
Spiraea alba	wild spiraea	2	4	4	3	13	**L4**		x	x	
Spirodela polyrhiza	greater duckweed	1	4	5	3	13	**L4**		x		
Thelypteris palustris var. *pubescens*	marsh fern	1	4	2	4	11	**L4**	x			
Thuja occidentalis	white cedar	1	4	1	5	11	**L4**	x	p *		p *
Typha latifolia	broad-leaved cattail	1	4	4	4	13	**L4**	x	x		
Acer saccharum ssp. *saccharum*	sugar maple	1	3	0	2	6	**L5**		x	x	
Achillea borealis var. *borealis*	woolly yarrow	1	2	0	1	4	**L5**	x			
Ageratina altissima var. *altissima*	white snakeroot	1	2	2	1	6	**L5**	x			
Agrimonia gryposepala	agrimony	1	2	0	2	5	**L5**	x			
Ambrosia artemisiifolia	common ragweed	1	1	3	0	5	**L5**	x	x	x	x
Ambrosia trifida	giant ragweed	3	1	4	0	8	**L5**		x		
Anemone canadensis	Canada anemone	1	2	2	2	7	**L5**	x	x		
Anemone virginiana	common thimbleweed	1	3	0	3	7	**L5**	x			
Apocynum cannabinum	hemp dogbane (sensu lato)	2	2	2	2	8	**L5**	x			
Aralia nudicaulis	wild sarsaparilla	1	3	1	4	9	**L5**	x			
Arisaema triphyllum	Jack-in-the-pulpit	1	3	2	3	9	**L5**	x			

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								A	B	C	D
Asclepias syriaca	common milkweed	1	2	0	2	5	**L5**		x		x
Athyrium filix-femina var. *angustum*	northeastern lady fern	1	3	1	3	8	**L5**	x			
Bidens cernua	nodding bur-marigold	1	2	3	3	9	**L5**				x
Bidens frondosa	common beggar's-ticks	1	1	4	0	6	**L5**	x	x	x	
Carex arctata	nodding wood sedge	1	4	2	3	10	**L5**	x			
Carex bebbii	Bebb's sedge	1	2	3	3	9	**L5**	x			
Carex gracillima	graceful sedge	1	3	4	2	10	**L5**	x			
Carex granularis	meadow sedge	1	2	1	3	7	**L5**	x			
Carex pedunculata	early-flowering sedge	1	3	3	3	10	**L5**	x			
Carex stipata	awl-fruited sedge	1	3	2	3	9	**L5**	x			
Carex vulpinoidea	fox sedge	1	2	4	1	8	**L5**	x		x	
Circaea canadensis ssp. *canadensis*	enchanter's nightshade	1	1	1	1	4	**L5**	x	x		
Clematis virginiana	virgin's bower	1	2	2	3	8	**L5**	x			
Cornus alternifolia	alternate-leaved dogwood	1	2	1	2	6	**L5**	x	x		
Cornus stolonifera	red osier dogwood	1	2	0	3	6	**L5**	x	x	x	x
Crataegus punctata	dotted hawthorn	1	2	3	3	9	**L5**			x	x
Dryopteris carthusiana	spinulose wood fern	1	3	2	2	8	**L5**	x			
Echinocystis lobata	wild cucumber	1	2	3	1	7	**L5**				x
Eleocharis erythropoda	creeping spike-rush	1	2	4	1	8	**L5**			x	
Epilobium coloratum	purple-leaved willow-herb	1	3	4	2	10	**L5**	x		x	x
Equisetum arvense	field horsetail	1	2	1	1	5	**L5**	x	x		x
Equisetum hyemale ssp. *affine*	scouring-rush	2	2	2	2	8	**L5**	x			
Erigeron annuus	daisy fleabane	1	2	0	1	4	**L5**	x			
Erigeron canadensis	horse-weed	2	1	2	0	5	**L5**		x		
Erigeron philadelphicus var. *philadelphicus*	Philadelphia fleabane	1	2	0	1	4	**L5**	x			
Euthamia graminifolia	grass-leaved goldenrod	1	1	4	1	7	**L5**	x	x	x	x
Eutrochium maculatum var. *maculatum*	spotted Joe-Pye weed	1	2	3	3	9	**L5**	x	x		
Fragaria virginiana	wild strawberry (sensu lato)	1	2	0	2	5	**L5**	x	x	x	x
Fraxinus americana	white ash	1	5	0	3	9	**L5**	x	x		
Fraxinus pennsylvanica	red ash	1	5	0	3	9	**L5**	x	x	x	x
Galium palustre	marsh bedstraw	1	2	3	3	9	**L5**	x	x		
Galium triflorum	sweet-scented bedstraw	2	2	2	2	8	**L5**	x			
Geum aleppicum	yellow avens	1	3	3	2	9	**L5**	x			
Geum canadense	white avens	1	2	1	2	6	**L5**	x	x		
Glyceria grandis	tall manna grass	1	3	4	2	10	**L5**	x			
Glyceria striata	fowl manna grass	1	2	1	2	6	**L5**	x			
Hackelia virginiana	Virginia stickseed	1	2	0	2	5	**L5**	x			
Impatiens capensis	orange touch-me-not	1	2	0	2	5	**L5**	x	x		

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								A	B	C	D
Juglans nigra	black walnut	1	1	2	1	5	L5	x	x		
Juncus articulatus	jointed rush	1	2	4	2	9	L5	x			x
Juncus dudleyi	Dudley's rush	1	2	3	1	7	L5	x			
Leersia oryzoides	rice cut grass	1	2	3	2	8	L5	x	x	x	
Lemna turionifera	turion duckweed	2	2	3	3	10	L5		x	x	
Lycopus uniflorus	northern water-horehound	1	3	3	3	10	L5	x		x	
Matteuccia struthiopteris var. *pensylvanica*	ostrich fern	1	2	2	2	7	L5	x	x		
Muhlenbergia mexicana var. *mexicana*	common muhly grass	2	2	0	1	5	L5	x			
Oenothera biennis	common evening-primrose	1	1	1	1	4	L5	x	x		x
Onoclea sensibilis	sensitive fern	1	3	1	3	8	L5	x	x		
Oxalis stricta	common yellow wood-sorrel	1	1	1	1	4	L5	x	x		
Panicum capillare	panic grass	2	1	4	1	8	L5	x	x		x
Parthenocissus vitacea	thicket creeper	1	2	0	1	4	L5	x	x		x
Persicaria lapathifolia	pale smartweed	1	1	4	0	6	L5	x			x
Pilea pumila	dwarf clearweed	1	2	1	1	5	L5		x		
Poa palustris	fowl meadow-grass	1	2	3	2	8	L5	x			
Populus balsamifera	balsam poplar	1	2	3	2	8	L5	x	x		
Populus deltoides	cottonwood	1	1	4	1	7	L5			x	p *
Populus tremuloides	trembling aspen	1	3	1	3	8	L5	x	x		x
Prunella vulgaris ssp. *lanceolata*	heal-all (native)	1	2	3	2	8	L5	x	x		
Prunus serotina	black cherry	1	2	0	2	5	L5	x			
Prunus virginiana var. *virginiana*	choke cherry	1	2	0	1	4	L5	x	x	x	x
Ranunculus sceleratus	cursed crowfoot	1	2	3	2	8	L5	x			
Rhus typhina	staghorn sumach	1	1	2	2	6	L5	x	x		
Ribes americanum	wild black currant	1	3	2	2	8	L5	x			
Rubus allegheniensis	common blackberry	1	3	0	1	5	L5	x			
Rubus idaeus ssp. *strigosus*	wild red raspberry	1	1	0	1	3	L5	x	x		x
Rubus occidentalis	wild black raspberry	1	1	0	1	3	L5		x		
Salix eriocephala	narrow heart-leaved willow	1	1	3	1	6	L5	x		x	
Scirpus atrovirens	black-fruited bulrush	1	2	4	2	9	L5	x			
Scirpus microcarpus	barber-pole bulrush	1	2	4	3	10	L5	x			
Scutellaria lateriflora	mad-dog skullcap	2	2	3	3	10	L5	x			
Solidago altissima	tall goldenrod	1	2	0	0	3	L5		x	x	x
Solidago canadensis var. *canadensis*	Canada goldenrod	1	2	0	1	4	L5			x	
Solidago nemoralis ssp. *nemoralis*	grey goldenrod	2	2	2	2	8	L5	x	x		
Solidago rugosa ssp. *rugosa*	rough-stemmed goldenrod	2	3	2	3	10	L5	x			
Symphyotrichum cordifolium	heart-leaved aster	1	1	0	2	4	L5		x		x
Symphyotrichum ericoides var. *ericoides*	heath aster	1	1	2	1	5	L5	x			x

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Symphyotrichum lanceolatum var. *lanceolatum*	panicled aster	1	2	3	1	7	L5	x	x	x	x
Symphyotrichum lateriflorum var. *lateriflorum*	calico aster	1	2	3	2	8	L5	x		x	
Symphyotrichum novae-angliae	New England aster	1	2	2	1	6	L5	x	x	x	x
Symphyotrichum puniceum var. *puniceum*	swamp aster	1	2	2	2	7	L5	x	x		
Tilia americana	basswood	1	3	2	3	9	L5	x	p *	x	
Toxicodendron radicans var. *rydbergii*	poison ivy (shrub form)	1	2	0	2	5	L5	x			
Ulmus americana	white elm	1	4	0	2	7	L5	x	x	x	
Viburnum lentago	nannyberry	1	3	1	2	7	L5	x			
Vitis riparia	riverbank grape	1	1	0	0	2	L5	x	x	x	x
Acer negundo	Manitoba maple	1	ns	ns	ns	1	L+?		x	x	x
Agrostis stolonifera	creeping bent grass	1	ns	ns	ns	1	L+?	x			x
Atriplex prostrata	spreading orache	2	ns	ns	ns	2	L+?				x
Geranium robertianum	herb Robert	1	ns	ns	ns	1	L+?	x	x	x	
Phalaris arundinacea	reed canary grass	1	ns	ns	ns	1	L+?	x	x	x	x
Sporobolus neglectus	overlooked dropseed	3	ns	ns	ns	3	L+?	x			
Sporobolus vaginiflorus	ensheathed dropseed	3	ns	ns	ns	3	L+?	x			
Acer platanoides	Norway maple	1	ns	ns	ns	1	L+	p *	x		x
Aegopodium podagraria	goutweed	2	ns	ns	ns	2	L+	x	x		
Aesculus hippocastanum	horse-chestnut	2	ns	ns	ns	2	L+	x			
Agrostis gigantea	redtop	1	ns	ns	ns	1	L+	x			
Alliaria petiolata	garlic mustard	1	ns	ns	ns	1	L+		x		x
Alnus glutinosa	European alder	2	ns	ns	ns	2	L+		x		
Arctium lappa	great burdock	1	ns	ns	ns	1	L+		x		
Arctium minus	common burdock	1	ns	ns	ns	1	L+	x	x		x
Asparagus officinalis	asparagus	2	ns	ns	ns	2	L+	x			x
Bromus inermis	smooth brome grass	1	ns	ns	ns	1	L+	x	x	x	x
Campanula rapunculoides	creeping bellflower	1	ns	ns	ns	1	L+	x	x		
Centaurea stoebe ssp. *micranthos*	spotted knapweed	2	ns	ns	ns	2	L+	x			
Chelidonium majus	celandine	1	ns	ns	ns	1	L+	x	x		
Chenopodium album	lamb's quarters	1	ns	ns	ns	1	L+		x		x
Cichorium intybus	chicory	1	ns	ns	ns	1	L+	x	x	x	x
Cirsium arvense	creeping thistle	1	ns	ns	ns	1	L+	x	x		x
Cirsium vulgare	bull thistle	1	ns	ns	ns	1	L+		x		x
Convallaria majalis	lily-of-the-valley	1	ns	ns	ns	1	L+		x		
Dactylis glomerata	orchard grass	1	ns	ns	ns	1	L+		x	x	x
Daucus carota	Queen Anne's lace	1	ns	ns	ns	1	L+	x	x	x	x
Digitaria ischaemum	smooth crab grass	2	ns	ns	ns	2	L+		x		
Dipsacus fullonum	teasel	2	ns	ns	ns	2	L+				x

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Echinochloa crus-galli	barnyard grass	1	ns	ns	ns	1	L+				x
Echium vulgare	viper's bugloss	2	ns	ns	ns	2	L+	x			
Elaeagnus umbellata	autumn olive	2	ns	ns	ns	2	L+	x			
Elymus repens	quack grass	1	ns	ns	ns	1	L+		x		x
Epilobium parviflorum	small-flowered willow-herb	1	ns	ns	ns	1	L+	x	x		
Epipactis helleborine	helleborine	1	ns	ns	ns	1	L+	x			
Euonymus europaeus	European spindle-tree	2	ns	ns	ns	2	L+		x		
Euonymus fortunei	wintercreeper euonymus	3	ns	ns	ns	3	L+		x		
Euphorbia cyparissias	cypress spurge	3	ns	ns	ns	3	L+				x
Festuca rubra ssp. *rubra*	red fescue	1	ns	ns	ns	1	L+		x		
Forsythia viridissima	forsythia	2	ns	ns	ns	2	L+		x		
Galeopsis tetrahit	hemp-nettle	2	ns	ns	ns	2	L+	x			
Geum urbanum	urban avens	1	ns	ns	ns	1	L+		x		x
Glechoma hederacea	creeping Charlie	1	ns	ns	ns	1	L+	x	x	x	
Hemerocallis fulva	orange day-lily	1	ns	ns	ns	1	L+		x		
Hesperis matronalis	dame's rocket	1	ns	ns	ns	1	L+	x			
Hordeum jubatum ssp. *jubatum*	squirrel-tail barley	2	ns	ns	ns	2	L+				x
Hylotelephium telephium	live-forever	3	ns	ns	ns	3	L+	x			
Hypericum perforatum	common St. John's-wort	1	ns	ns	ns	1	L+	x			
Inula helenium	elecampane	1	ns	ns	ns	1	L+	x	x		
Iris pseudacorus	yellow flag	2	ns	ns	ns	2	L+			x	
Juncus compressus	round-fruited rush	2	ns	ns	ns	2	L+				x
Lactuca serriola	prickly lettuce	1	ns	ns	ns	1	L+	x			
Leonurus cardiaca ssp. *cardiaca*	motherwort	1	ns	ns	ns	1	L+		x		
Lepidium campestre	field pepper-grass	2	ns	ns	ns	2	L+		x		
Leucanthemum vulgare	ox-eye daisy	1	ns	ns	ns	1	L+	x			
Linaria vulgaris	butter-and-eggs	1	ns	ns	ns	1	L+		x		
Lolium pratense	meadow fescue	1	ns	ns	ns	1	L+	x	x	x	x
Lonicera x *bella*	shrub honeysuckle	1	ns	ns	ns	1	L+	x	x	x	x
Lotus corniculatus	bird's foot trefoil	1	ns	ns	ns	1	L+	x	x	x	x
Lythrum salicaria	purple loosestrife	1	ns	ns	ns	1	L+	x	x	x	x
Malus pumila	apple	1	ns	ns	ns	1	L+	x	x	x	x
Malva neglecta	common mallow	2	ns	ns	ns	2	L+		x		
Matricaria discoidea	pineappleweed	2	ns	ns	ns	2	L+	x			x
Medicago lupulina	black medick	1	ns	ns	ns	1	L+	x	x		
Medicago sativa ssp. *sativa*	alfalfa	1	ns	ns	ns	1	L+		x	x	
Melilotus albus	white sweet clover	1	ns	ns	ns	1	L+	x	x		x
Myosotis scorpioides	true forget-me-not	1	ns	ns	ns	1	L+	x	x		

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Nasturtium microphyllum	small-leaved watercress	2	ns	ns	ns	2	L+	x			
Persicaria maculosa	lady's thumb	1	ns	ns	ns	1	L+			x	
Phleum pratense	Timothy grass	1	ns	ns	ns	1	L+	x	x		x
Phragmites australis ssp. *australis*	common reed	1	ns	ns	ns	1	L+	x		x	x
Pilosella aurantiaca	orange hawkweed	3	ns	ns	ns	3	L+	x			
Plantago lanceolata	English plantain	1	ns	ns	ns	1	L+	x	x	x	
Plantago major	common plantain	1	ns	ns	ns	1	L+			x	
Poa compressa	flat-stemmed blue grass	1	ns	ns	ns	1	L+	x			
Poa nemoralis	woodland spear grass	2	ns	ns	ns	2	L+		x		
Poa pratensis ssp. *pratensis*	Kentucky blue grass	1	ns	ns	ns	1	L+	x	x	x	x
Polygonum aviculare ssp. *aviculare*	prostrate knotweed	2	ns	ns	ns	2	L+	x			
Populus alba	white poplar	2	ns	ns	ns	2	L+			x	
Potamogeton crispus	curly pondweed	2	ns	ns	ns	2	L+		x		
Ranunculus acris	tall buttercup	1	ns	ns	ns	1	L+	x			
Reynoutria japonica var. japonica	Japanese knotweed	2	ns	ns	ns	2	L+		x		
Rhamnus cathartica	common buckthorn	1	ns	ns	ns	1	L+	x	x	x	x
Ribes rubrum	garden red currant	1	ns	ns	ns	1	L+	x	x		
Robinia pseudoacacia	black locust	1	ns	ns	ns	1	L+	x	pr *		x
Rumex acetosella	sheep sorrel	3	2	5	4	14	L+	x			
Rumex crispus	curly dock	1	ns	ns	ns	1	L+	x			x
Rumex obtusifolius	bitter dock	2	ns	ns	ns	2	L+	x	x		
Salix x *fragilis*	crack willow	1	ns	ns	ns	1	L+		x	x	
Salix x *sepulcralis*	weeping willow	1	ns	ns	ns	1	L+	x	x	x	
Saponaria officinalis	bouncing Bet	2	ns	ns	ns	2	L+	x	x		
Securigera varia	crown vetch	1	ns	ns	ns	1	L+	x	x		
Setaria pumila ssp. *pumila*	yellow foxtail	2	ns	ns	ns	2	L+		x		x
Setaria viridis	green foxtail	2	ns	ns	ns	2	L+	x	x	x	x
Silene vulgaris	bladder campion	2	ns	ns	ns	2	L+		x		
Solanum dulcamara	bittersweet nightshade	1	ns	ns	ns	1	L+	x	x		x
Solanum nigrum	black nightshade	5	1	4	ns	10	L+		x		
Sonchus arvensis ssp. *arvensis*	glandular perennial sow-thistle	1	ns	ns	ns	1	L+			x	x
Sonchus arvensis ssp. *uliginosus*	smooth perennial sow-thistle	3	ns	ns	ns	3	L+	x	x	x	x
Sonchus asper	spiny sow-thistle	2	ns	ns	ns	2	L+		x		
Sonchus oleraceus	annual sow-thistle	2	ns	ns	ns	2	L+	x	x		x
Sorbus aucuparia	European mountain-ash	1	ns	ns	ns	1	L+	x	x		
Symphytum officinale	common comfrey	2	ns	ns	ns	2	L+	x			
Syringa vulgaris	common lilac	1	ns	ns	ns	1	L+	x	x		
Taraxacum officinale	dandelion	1	ns	ns	ns	1	L+	x	x		x

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Trifolium pratense	red clover	1	ns	ns	ns	1	L+	x	x	x	x
Trifolium repens	white clover	1	ns	ns	ns	1	L+	x			x
Tussilago farfara	coltsfoot	1	ns	ns	ns	1	L+	x	x		x
Typha angustifolia	narrow-leaved cattail	1	ns	ns	ns	1	L+	x	x	x	x
Typha x *glauca*	hybrid cattail	1	ns	ns	ns	1	L+	x	x	x	
Ulmus pumila	Siberian elm	1	ns	ns	ns	1	L+		x		x
Verbascum thapsus	common mullein	1	ns	ns	ns	1	L+	x	x		x
Veronica officinalis	common speedwell	1	ns	ns	ns	1	L+	x			
Viburnum opulus ssp. *opulus*	European highbush cranberry	1	ns	ns	ns	1	L+	x			
Vicia cracca	cow vetch	1	ns	ns	ns	1	L+	x	x	x	x
Vinca minor	periwinkle	2	ns	ns	ns	2	L+	x	x		
Pinus resinosa	red pine	5	5	5	5	20	L1	p *	p *		
Cornus obliqua	silky dogwood	3	3	5	3	14	L3		p *		
Larix laricina	tamarack	2	4	4	4	14	L3		p *		
Picea glauca	white spruce	3	5	4	4	16	L3	p *	p *	p *	p *
Quercus alba	white oak	2	5	4	5	16	L3	p *			
Abies balsamea	balsam fir	1	3	4	5	13	L4		p *		
Amelanchier laevis	smooth serviceberry	2	2	4	3	11	L4		p *		
Pinus strobus	white pine	1	4	3	4	12	L4	p *			
Cornus racemosa	grey dogwood	2	2	3	2	9	L5		p *		
Alnus incana ssp. *incana*	grey alder	3	ns	ns	ns	3	L+		pcf *		
Catalpa speciosa	northern catalpa	3	ns	ns	ns	3	L+				p *
Celtis occidentalis	hackberry	4	ns	ns	ns	4	L+		p *		
Euonymus alatus	winged spindle-tree	3	ns	ns	ns	3	L+		p *		
Glycine max	soya bean						L+				p *
Hosta ventricosa	hosta	4	ns	ns	ns	4	L+		p *		
Larix decidua	European larch	3	ns	ns	ns	3	L+	p *			
Picea abies	Norway spruce	3	ns	ns	ns	3	L+		p *	p *	p *
Picea pungens	Colorado spruce	5	ns	ns	ns	5	L+		p *		p *
Pinus nigra	Austrian pine	4	ns	ns	ns	4	L+		p *		p *
Pinus sylvestris	Scots pine	1	ns	ns	ns	1	L+	pr *	p *		
Rhus aromatica	fragrant sumach	4	ns	ns	ns	4	L+		p *		
Spiraea x *vanhouttei*	bridalwreath spiraea	4	ns	ns	ns	4	L+		p *		
Tilia cordata	little-leaf linden	2	ns	ns	ns	2	L+		p *		

Appendix 2: List of Flora Species found within the Airport Road EA Study Area, 2016

Scientific Name	Common Name	Local Occurrence	Population Trend	Habitat Dependence	Sensitivity to Development	Total Score 2-20	Rank TRCA (Apr-16)	Species Presence by Survey Block(s) (presence indicated with 'x' or code - code with * see definitions below)			
								A	B	C	D

Total # of Species in Study Area (includes planted)	
Extant native species	170
Exotic species	130
L1 to L3 native species	28
L4 native species	45
L5 native species	97

Legend	
L1-L3: species of regional conservation concern	ns: criterion not scored
L4: species of conservation concern in urban area	e: extirpated from site
L5: species not of conservation concern at this time	cf: identification not certain
LX: species is extirpated from TRCA	p: planted only
L+: introduced species, not native to TRCA	pr: regenerating but of planted origin
L+?: species is probably introduced	pn: both natural origin and planted

For complete scoring and ranking protocol details please refer to the following:
TRCA 2017. Vegetation Community and Species Ranking and Scoring Method. Toronto and Region Conservation Authority.

Appendix 3: List of Fauna Species found within the Airport Road EA Study Area, 2017

Common Name	Scientific Name	Code	Species Presence by Survey Block(s) (numbers represent breeding territories for all mapped species; 'x' indicates presence for species not mapped)				LO	PTn	PTt	AS	PIS	SD	HD	Add. Points	Total Score	L-Rank
			A	B	C	D										
Survey Species: species for which the TRCA protocol effectively surveys.																
Birds																
black and white warbler	*Mniotilta varia*	BAWW	1				2	3	3	4	2	5	2	1	22	**L2**
blue-winged warbler	*Vermivora cyanoptera*	BWWA	1				3	2	2	3	1	5	2	1	19	**L3**
horned lark	*Eremophila alpestris*	HOLA		1		5	1	4	2	2	1	3	2	0	15	**L3**
winter wren	*Troglodytes hiemalis*	WIWR	1				1	1	2	3	2	5	3	1	18	**L3**
barn swallow	*Hirundo rustica*	BARS		1		2	0	4	2	1	1	1	2	0	11	**L4**
common yellowthroat	*Geothlypis trichas*	COYE	2		1		0	4	2	1	2	4	1	0	14	**L4**
Cooper's hawk	*Accipiter cooperii*	COHA	1				0	2	2	4	1	2	3	0	14	**L4**
eastern kingbird	*Tyrannus tyrannus*	EAKI	1	2			0	4	2	2	1	3	1	0	13	**L4**
grey catbird	*Dumetella carolinensis*	GRCA	1				0	3	2	1	1	3	1	0	11	**L4**
indigo bunting	*Passerina cyanea*	INBU	2				0	3	2	1	1	4	2	0	13	**L4**
killdeer	*Charadrius vociferus*	KILL			1	3	0	4	2	1	2	2	0	0	11	**L4**
northern flicker	*Colaptes auratus*	NOFL	1			1	0	4	2	1	1	3	2	0	13	**L4**
pine warbler	*Setophaga pinus*	PIWA	1				0	1	2	4	1	3	3	0	14	**L4**
red-breasted nuthatch	*Sitta canadensis*	RBNU	1				0	1	2	3	1	2	1	0	10	**L4**
red-eyed vireo	*Vireo olivaceus*	REVI	1	1			0	1	2	2	1	3	1	0	10	**L4**
rose-breasted grosbeak	*Pheucticus ludovicianus*	RBGR			1		0	3	2	3	1	3	2	0	14	**L4**
savannah sparrow	*Passerculus sandwichensis*	SAVS		2	1	10	0	4	2	1	1	4	1	0	13	**L4**
white-breasted nuthatch	*Sitta carolinensis*	WBNU	1				0	2	2	3	1	2	2	0	12	**L4**
American Crow	*Corvus brachyrhynchos*	AMCR	x	x		x	0	1	1	1	1	0	0	0	4	**L5**
American goldfinch	*Carduelis tristis*	AMGO	x	x	x	x	0	3	1	1	1	1	0	0	7	**L5**
American robin	*Turdus migratorius*	AMRO	x	x	x	x	0	1	1	1	1	1	0	0	5	**L5**
Baltimore oriole	*Icterus galbula*	BAOR			x		0	4	2	1	1	1	0	0	9	**L5**
black-capped chickadee	*Parus atricapillus*	BCCH	x	x			0	1	1	1	1	1	0	0	5	**L5**
blue jay	*Cyanocitta cristata*	BLJA	x	x		x	0	3	1	1	1	1	0	0	7	**L5**
brown-headed cowbird	*Molothrus ater*	BHCO			x		0	3	1	1	1	1	0	0	7	**L5**
Canada goose	*Branta canadensis*	CANG		x			0	0	1	1	2	0	1	0	5	**L5**

Appendix 3: List of Fauna Species found within the Airport Road EA Study Area, 2017

Common Name	Scientific Name	Code	Species Presence by Survey Block(s) (numbers represent breeding territories for all mapped species; 'x' indicates presence for species not mapped)				LO	PTn	PTt	AS	PIS	SD	HD	Add. Points	Total Score	L-Rank
			A	B	C	D										
cedar waxwing	*Bombycilla cedrorum*	CEDW	x	x	x		0	2	1	1	1	1	0	0	6	L5
chipping sparrow	*Spizella passerina*	CHSP	x	x	x	x	0	3	2	1	1	2	0	0	9	L5
common grackle	*Quiscalus quiscula*	COGR	x	x	x	x	0	4	1	1	1	1	0	0	8	L5
house wren	*Troglodytes aedon*	HOWR	x	x	x		0	1	2	1	2	1	1	0	8	L5
mallard	*Anas platyrhynchos*	MALL			x		0	1	1	1	2	1	0	0	6	L5
mourning dove	*Zenaida macroura*	MODO	x	x	x	x	0	3	1	1	1	0	0	0	6	L5
northern cardinal	*Cardinalis cardinalis*	NOCA	x		x	x	0	1	1	1	1	2	1	0	7	L5
red-tailed hawk	*Buteo jamaicensis*	RTHA			x		0	2	1	2	1	1	1	0	8	L5
red-winged blackbird	*Agelaius phoeniceus*	RWBL	x	x	x	x	0	4	1	1	1	1	0	0	8	L5
song sparrow	*Melospiza melodia*	SOSP	x	x	x	x	0	3	1	1	1	2	0	0	8	L5
warbling vireo	*Vireo gilvus*	WAVI		x	x	x	0	1	1	1	1	2	1	0	7	L5
yellow warbler	*Setophaga petechia*	YEWA	x	x			0	3	2	1	1	2	0	0	9	L5
European starling	*Sturnus vulgaris*	EUST	x	x	x	x	0									L+
house finch	*Carpodacus mexicanus*	HOFI			x		0									L+
house sparrow	*Passer domesticus*	HOSP		x	x	x	0									L+
rock dove	*Columba livia*	ROPI		x	x	x	0									L+
Herpetofauna																
grey treefrog	*Hyla versicolor*	TGTF		1			0	3	2	3	4	5	2	1	20	L2
spring peeper	*Pseudacris crucifer crucifer*	SPPE	1	2		1	1	2	2	3	4	5	3	1	21	L2
wood frog	*Lithobates sylvatica*	WOFR			1	1	0	2	2	3	4	5	3	1	20	L2
American toad	*Anaxyrus americanus*	AMTO		1		1	0	3	2	1	4	4	0	0	14	L4
green frog	*Lithobates clamitans*	GRFR		2			0	2	2	1	3	4	1	0	13	L4
Incidental Species: species that are reported on as incidental to the TRCA protocol.																
Mammals																
eastern chipmunk	*Tamias striatus*	EACH				1	0	2	1	2	3	3	1	0	12	L4
mink	*Mustela vison*	MINK				1	1	2	2	3	3	3	0	0	14	L4
red squirrel	*Tamiasciurus hudsonicus*	RESQ	1				0	2	1	1	3	2	1	0	10	L4
grey squirrel	*Sciurus carolinensis*	GRSQ	x	x		x	0	2	1	1	3	0	0	0	7	L5

Appendix 3: List of Fauna Species found within the Airport Road EA Study Area, 2017

Common Name	Scientific Name	Code	Species Presence by Survey Block(s) (numbers represent breeding territories for all mapped species; 'x' indicates presence for species not mapped)				LO	PTn	PTt	AS	PIS	SD	HD	Add. Points	Total Score	L-Rank
			A	B	C	D										
striped skunk	*Mephitis mephitis*	STSK		x			0	2	2	1	3	0	0	0	8	L5
domestic cat	*Felis catus*	DOCA		x			3									L+
Herpetofauna																
midland painted turtle	*Chrysemys picta marginata*	MPTU			2		0	2	2	1	5	4	1	1	16	L3

LEGEND

LO = local occurrence
PTn = National population trend
PTt = TRCA population trend
AS = area sensitivity
SD = sensitivity to development
HD = habitat dependence
Add. points = additional points
TS = total score
PIS = Patch Isolation Sensitivity
L-rank = TRCA Rank, February, 2016 - based on data up to 2015 inclusive

L1 = Species of Regional Conservation Concern, regionally scarce due to either accidental occurrence or extreme sensitivity to human impacts
L2 = Species of Regional Conservation Concern, somewhat more abundant and generally slightly less sensitive than L1 species
L3 = Species of Regional Conservation Concern, generally less sensitive and more abundant than L1 and L2 ranked species
L4 = Species of Urban Concern; occur throughout the region but could show declines if urban impacts are not mitigated effectively
L5 = species that are considered secure throughout the region
L+ = introduced species, not native to the Toronto region and not given scores for criteria
LX = extirpated species; species not recorded in the region in the past 10 years

Headwater Drainage Feature Assessment

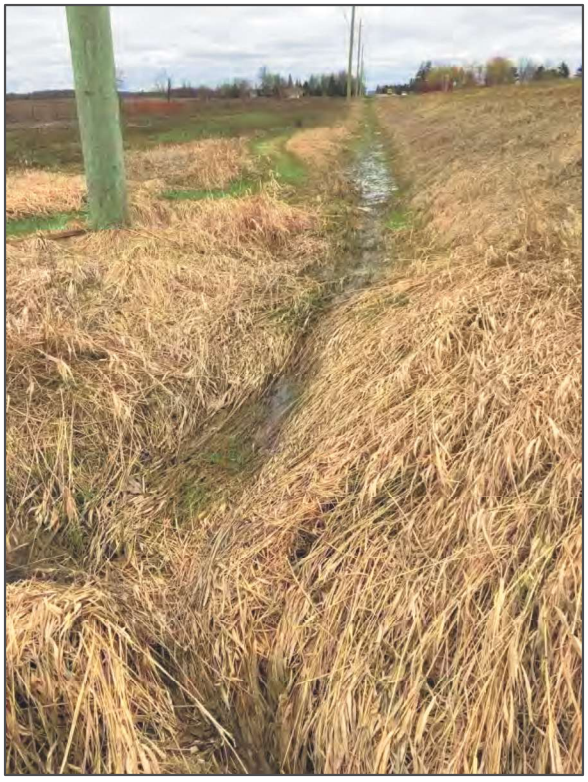
Visit 2 (April 12, 2017)
Photographs

Crossing 4: View west of the crossing structure

Crossing 4: HUM4-B (roadside ditch on east side of Airport Road), looking north

Crossing 4: HUM4-B (roadside ditch on east side of Airport Road), looking south

Crossing 4: HUM4-C, or view east of the crossing structure



Crossing 5: HUM5-A (roadside ditch on west side of Airport Road), looking north

Crossing 5: HUM5-A (roadside ditch on west side of Airport Road), looking south

Crossing 5: HUM5-B (roadside ditch on east side of Airport Road), looking north

Crossing 5: HUM5-B (roadside ditch on east side of Airport Road), looking south

Crossing 5: HUM5-C, or view south-east of the crossing structure

Crossing 6: HUM6-A (roadside ditch on the west side of Airport Road), looking north

Crossing 6: HUM6-A (roadside ditch on the west side of Airport Road), looking south

Crossing 6: HUM6-B (undefined feature on the west side of Airport Road), or looking west from the crossing structure

Crossing 6: HUM6-C (roadside ditch on east side of Airport Road), looking north

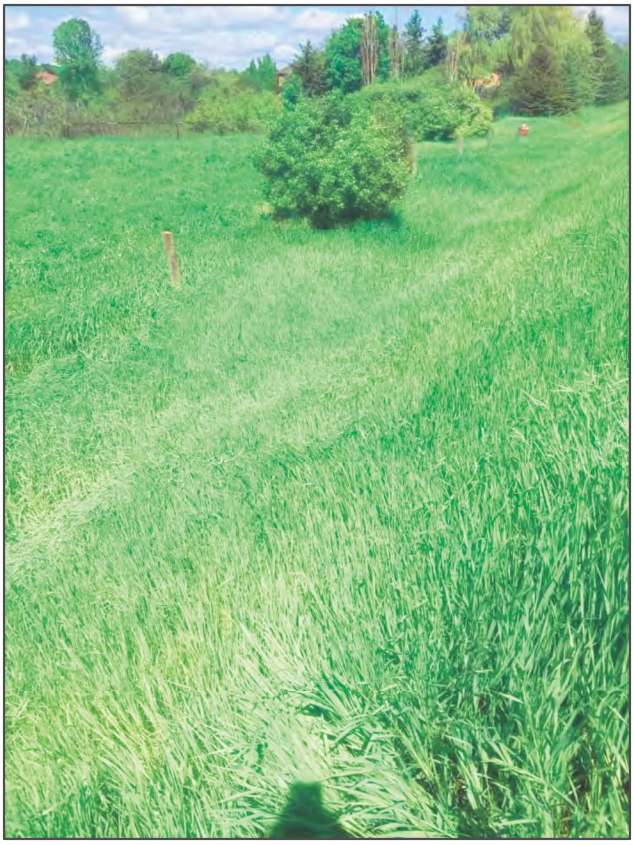
Crossing 6: HUM6-C (roadside ditch on east side of Airport Road), looking south

Crossing 6: HUM6-D (swale on east side of Airport Road), or looking south-east from the crossing structure

Crossing 6: HUM6-C (roadside ditch on east side of Airport Road), looking north-west from King Street towards Airport Road along HUM6-C

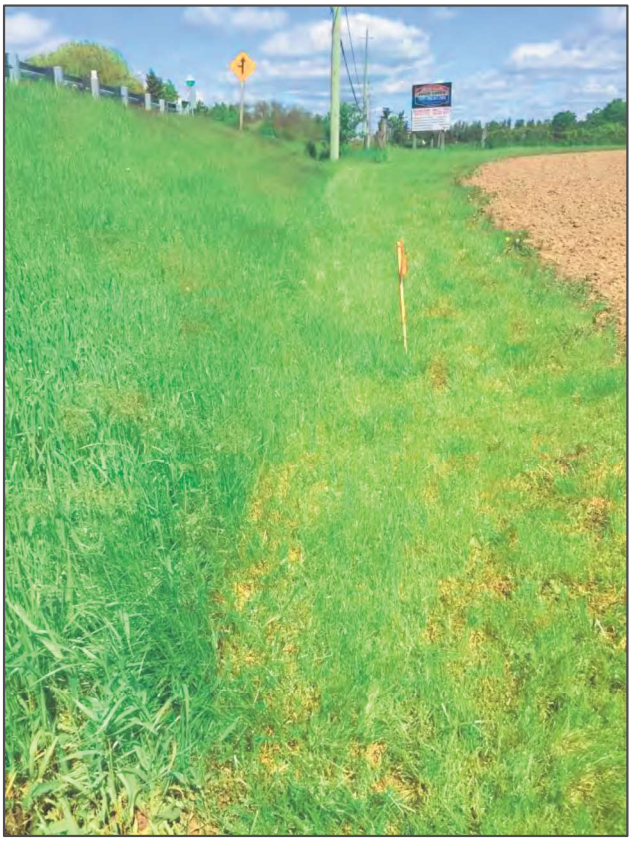
Headwater Drainage Feature Assessment

Visit 3 (June 1, 2017)
Photographs

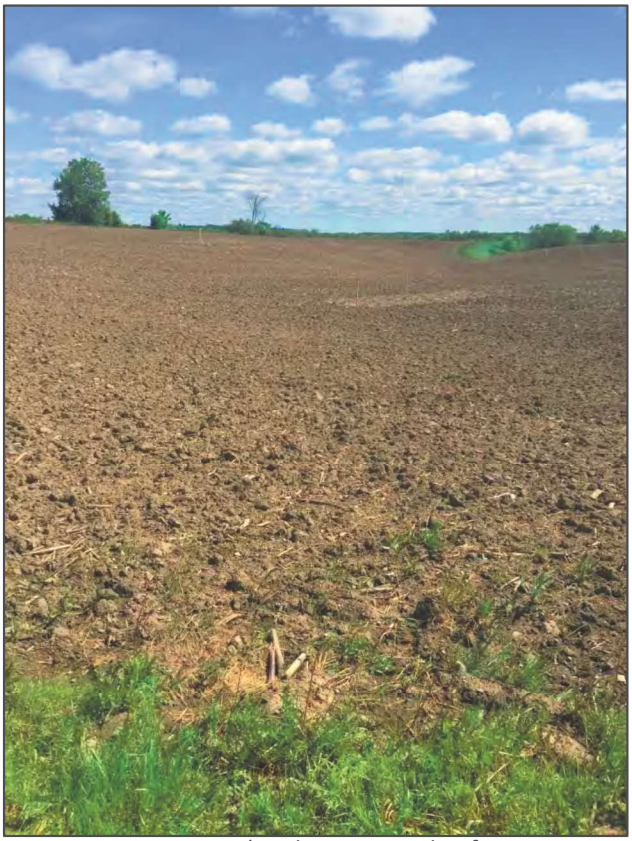


Crossing 4: HUM4-A (roadside ditch on west side of Airport Road), looking north

Crossing 4: HUM4-A (roadside ditch on west side of Airport Road), looking at the crossing structure

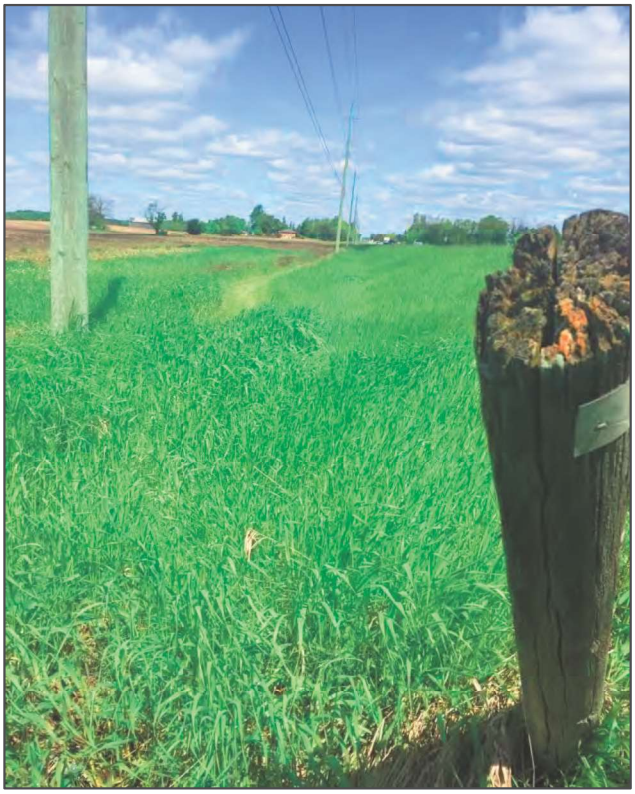


Crossing 4: HUM4-B (roadside ditch on east side of Airport Road), looking north

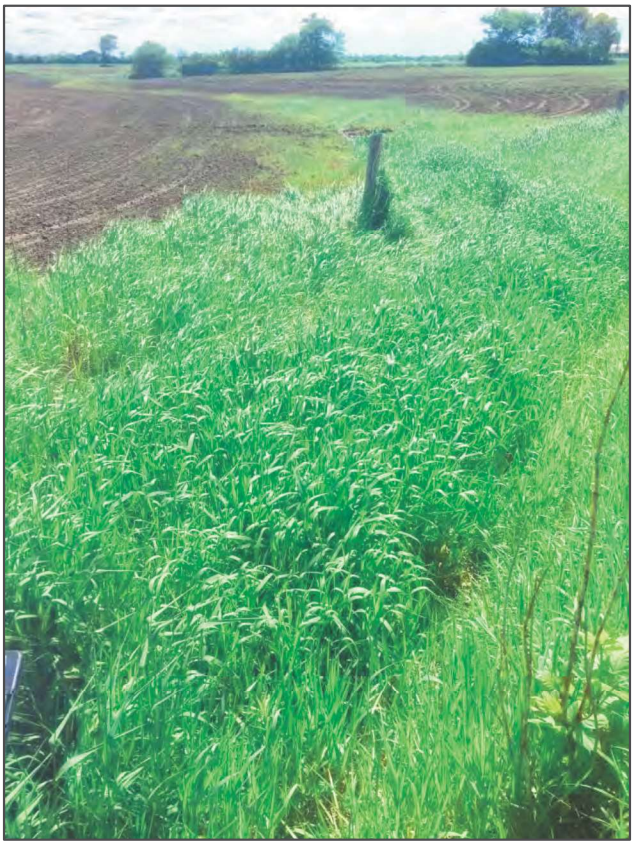


Crossing 4: HUM4-C (swale on east side of Airport Road), or looking east from Airport Road

Crossing 5: HUM5-A (roadside ditch on west side of Airport Road), looking north from crossing structure



Crossing 5: HUM5-A (roadside ditch on west side of Airport Road), looking north from crossing structure



Crossing 5: HUM5-B (roadside ditch on east side of Airport Road), looking south from crossing structure

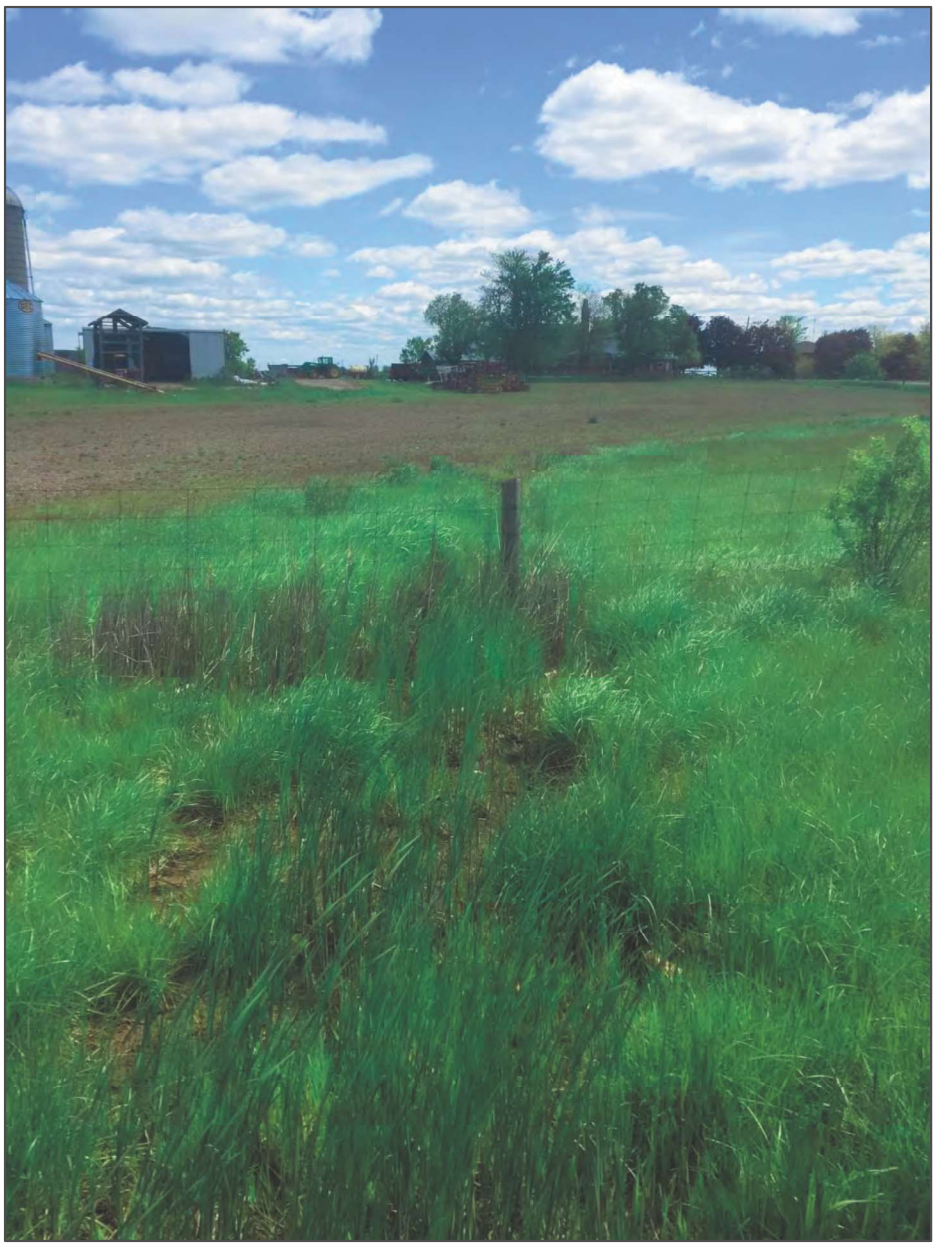
Crossing 5: HUM5-C (swale on east side of Airport Road), looking south-east in direction of the swale

Crossing 6: HUM6-A (roadside ditch on west side of Airport Road), looking north from crossing structure

Crossing 6: HUM6-B (undefined feature on west side of Airport Road), looking west from crossing structure

Crossing 6: HUM6-B (undefined feature on west side of Airport Road), looking west from crossing structure

Crossing 6: HUM6-C (roadside ditch on east side of Airport Road), looking north from crossing structure



Crossing 6: HUM6-D (swale on the east side of Airport Road), looking east from crossing structure

Addendum: Aquatic Habitat Crossing Assessment

Municipal Class Environmental Assessment
Airport Road from King Street to Huntsmill Drive, Town of Caledon

Natural Environment Existing Conditions Report

April 05 2018

Toronto and Region Conservation for The Living City

Background:

On March 9th 2018 the Region of Peel together with the Toronto and Region Conservation Authority (TRCA), IBI Group, and the Credit Valley Conservation Authority (CVC) conducted a site visit to Airport Road between King Street to Huntsmill Drive as part of the ongoing Municipal Class Environmental Assessment study. The project study area is located in the main (northern portion) and west (southern portion of the study area) Humber River Subwatersheds. A small central portion of the study area is situated in the Credit River Watershed (**Figure 16a**). This portion was not originally characterized in terms of the aquatic habitat and communities existing conditions. During the site visit, an additional watercourse, within the CVC portion of the study area, was identified for aquatic habitat assessment. Attached is a summary of the natural environmental existing conditions. The additional watercourse from now on will be referred to as crossing 7.

Crossing 7 (245 meters south of Old Baseline Road HWY12)

Crossing 7 is located approximately 250 meters south of Old Baseline Road between crossings 4 and 5 (**Figure 16a**). Water flows downstream from northeast to southwest direction and crosses Airport Road through a box culvert (2m wide by 1m high) (**Figure 16b**). Upstream of Airport road, the watercourse terminates and is presumably piped underground stemming from a wetland. Downstream of Airport road, the watercourse collects drainage from road side ditches running parallel to Airport Road. As it exits the box culvert it flows in the southwest direction and travels through a series of private properties, agriculture fields and wetland features. The watercourse continues to flow parallel to Old Base Line Road and branches in the southeast direction prior to Mountainview Road where it continues to meander through wetland features and agricultural fields (**Figure 16c**). A branch of the watercourse continues to flow parallel to Old Base Line Road eventually crossing it approximately 500 meters downstream of Mountainview Road and continues to flow parallel to Old Base Line Road. CVC has an aquatic sampling site (501130012) at the intersection of Old Base Line Road and St. Andrews Road. The watercourse eventually drains to the East Credit River.

Through personal communication with CVC staff during the site visit on March 9th and a second site visit on March 20th 2018 as well as through email correspondence, it was confirmed that this feature is a watercourse and contributes to downstream features and habitats (fish habitat, wetlands and other tributaries). As such, the head water drainage feature assessment was not performed. Given the proposed scope of work (i.e. no road widening), CVC does not feel any extensive survey work is required for the feature. Nonetheless it is a regulated watercourse the same as crossings 1, 2, and 3. As such, impacts should be avoided and existing drainage maintained.

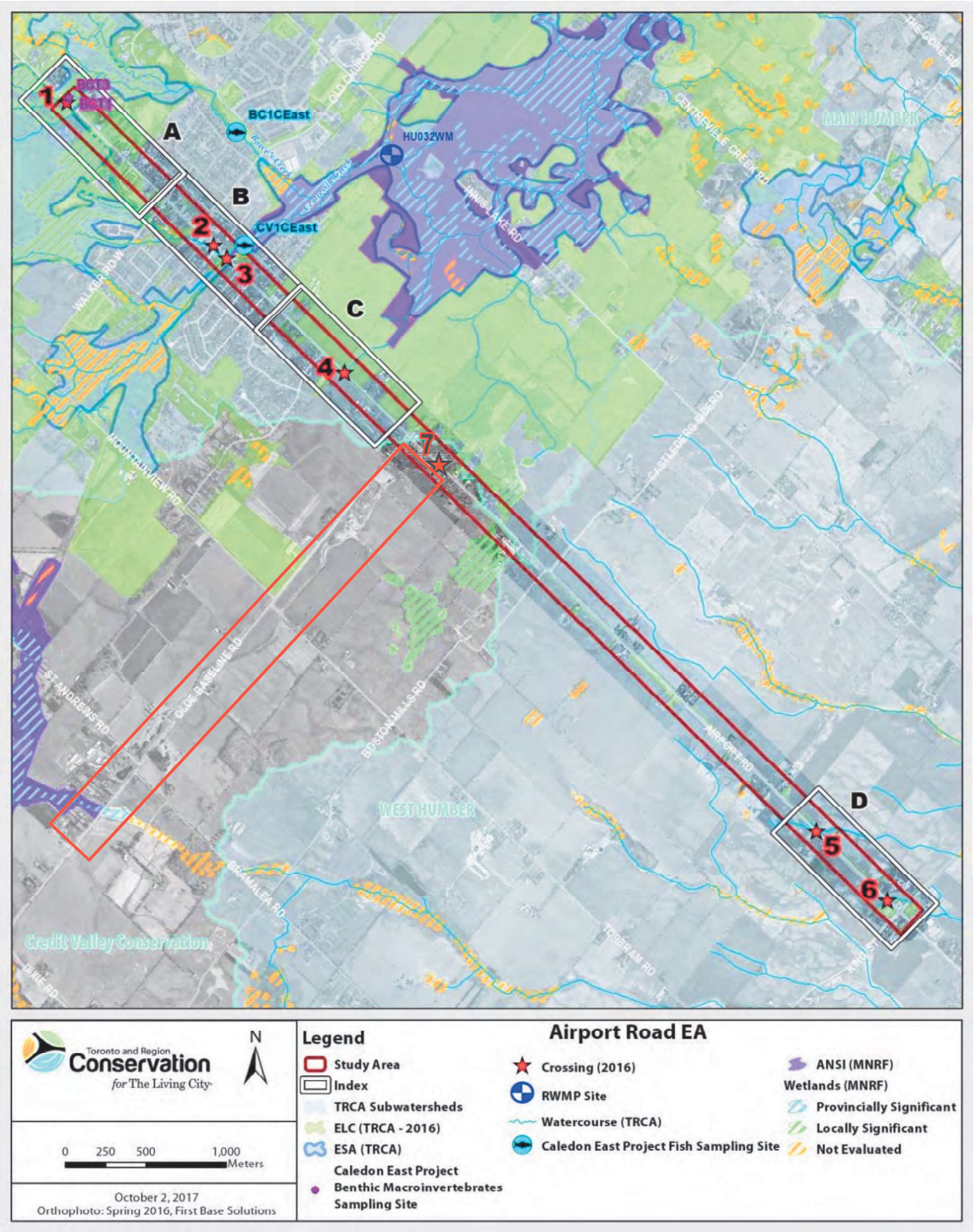


Figure 16a: Project Study area and crossing locations. Red box indicates approximate CVC watercourse.

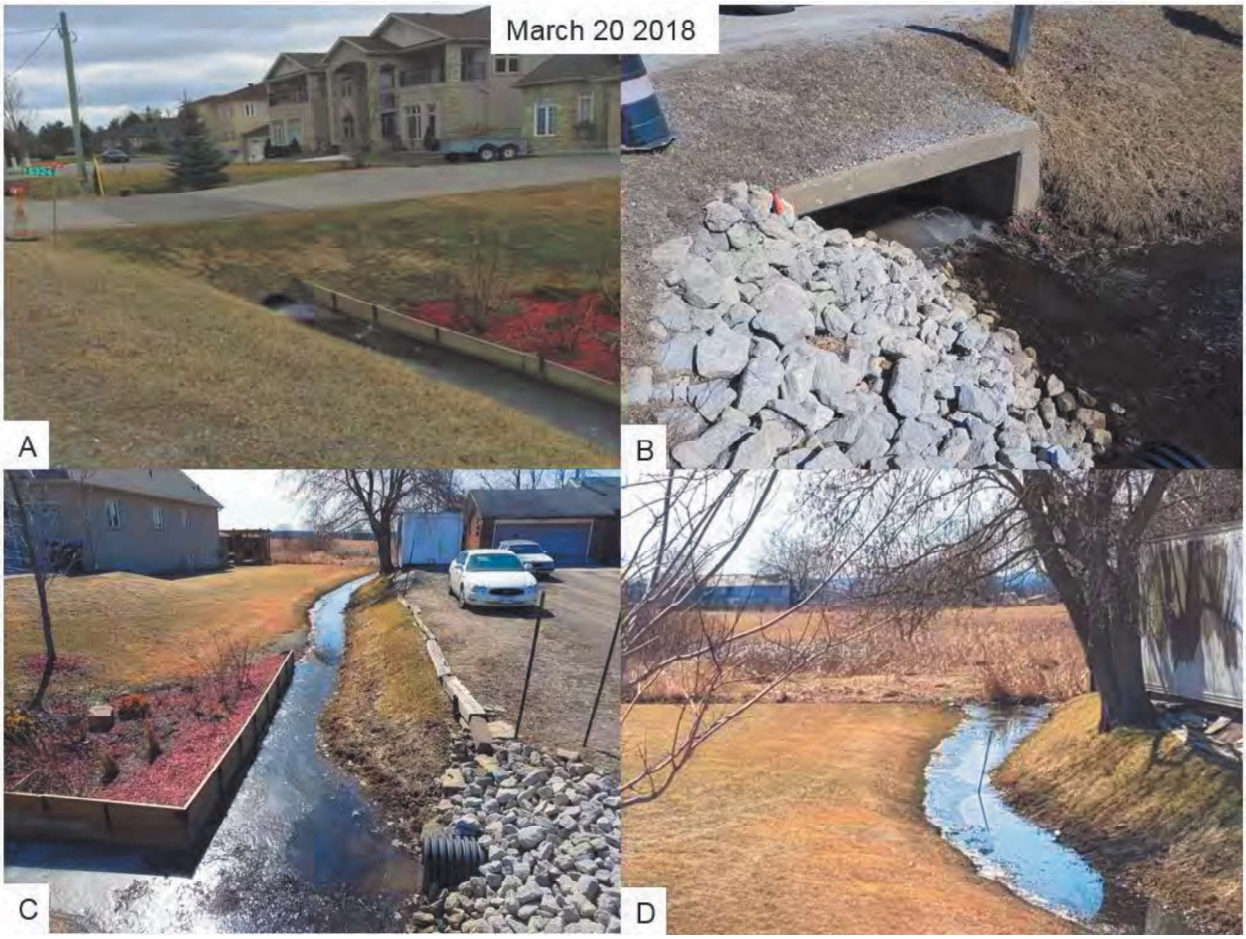


Figure 16b: Crossing 7: (A) Looking upstream towards Airport Road where the watercourse crosses underneath the road. (B) Box culvert at Airport road water flowing southwest. (C) Standing on top of box culvert looking downstream in the southwest direction. Watercourse is flowing through private residential property (D) View of wetland on private property downstream of box culver

Figure 16c: Credit Valley Conservation mapping of Crossing 7

Credit Valley Conservation
inspired by nature

November 24, 2017

Sonya Bubas
Project Manager, Transportation Infrastructure Programming and Studies
Region of Peel
10 Peel Centre Dr., Suite B
Brampton, ON L6T 4B9

Dear Ms. Bubas,

Re: Municipal Class Environmental Assessment Study
Airport Road from 100 m north of King Street to 300 m north of Huntsmill Drive, Town of Caledon
CVC File No: EA 17/006

It is the understanding of CVC staff that the Region of Peel has initiated a Schedule 'C' Municipal Class Environmental Assessment (EA) for improvements to Airport Road from 100 m north of King Street to 300 m north of Huntsmill Drive, in the Town of Caledon. CVC staff has completed a preliminary review of the project area and the Natural Environment Existing Conditions Report, prepared by TRCA and dated September 2017.

Preliminary Review Comments

Site Characteristics

REGULATED AREA

The study area is located partially within the Regulated Area. A permit may be required from CVC for any grading or construction works within this area.

WATERCOURSE

The study area is adjacent to a tributary of the East Credit River. Any alteration to a watercourse (i.e: culverts, bridges, ponds etc.) requires a permit issued by CVC. Our concerns for new construction would include maintaining setbacks to address channel bank erosion, sediment control during construction, and to ensure no degradation to water quality.

FLOODPLAIN

The study area may be located partially within the Regulatory Storm Floodplain. A permit may be required from CVC for any construction activity in this area. Our primary concern is the protection of life and property from the flood hazard. We have specific criteria and requirements for construction in the floodplain.

CREDIT RIVER WATERSHED NATURAL HERITAGE SYSTEM

A portion of the study area is located within the Credit River Watershed Natural Heritage System (CRWNHS). The CRWNHS consists of High Functioning and Supporting terrestrial and aquatic natural heritage features, buffers, and complementary natural heritage areas (Centres for Biodiversity). Based on a watershed scale, the CRWNHS is intended to support Provincial, Regional and local municipal natural heritage systems as identified in their respective Strategies or Plans. As a watershed based management agency and landowner

CVC intends to implement the CRWNHS by using it as a strategic program guidance tool; to inform further development of CVC projects and policies; to assist CVC staff in providing technical advice to landowners and stakeholders at a watershed scale; and to promote a more consistent approach to natural heritage system planning across CVC's jurisdiction. For more detailed information or questions please contact the undersigned to discuss further.

Wetland

The study area is adjacent to the Mono Road Wetland Complex. Wetlands are diverse and productive ecosystems that are hydrologically significant to a watershed. They store water during flood events and provide low flow augmentation during dry periods. The vegetation and organic soils of wetlands aid in the filtration of nutrients and sediments that enhances water quality and assists in the maintenance of cool water temperatures. Wetlands also provide habitat for diverse and uncommon species of flora and fauna. CVC does not typically support new development in wetlands.

Oak Ridges Moraine (ORM)

The study area is partially within the Oak Ridges Moraine and is subject to the Oak Ridges Moraine Conservation Plan (ORMCP). Given that municipalities are the designated approval authority under the Oak Ridges Moraine Conservation Act, we recommend that you consult with your local municipality for further information.

Caledon EPA

Portions of the study area have been designated by the Town of Caledon as Environmental Policy Area (EPA). It is the policy of the Town of Caledon to protect and maintain these important natural areas. Credit Valley Conservation provides technical support with respect to the review of development within and adjacent to lands that have been designated EPA. We suggest you contact the Town of Caledon if you have questions on this matter.

Provincial Greenbelt

According to Schedule 1 of the Province of Ontario's Greenbelt Plan 2005, a portion of the study area falls within the Protected Countryside of the Greenbelt Plan Area. We recommend that you contact the Town of Caledon for further information with respect to these designations as certain polices of the Greenbelt Plan apply to the future use of the property.

Jurisdiction

The study area is located within the jurisdiction of two Conservation Authorities. In addition to falling within the CVC's Watershed, the study area also falls within the jurisdiction of Toronto and Region Conservation Authority (TRCA). Please contact TRCA for requirements within their jurisdiction.

EA Study Objectives

The EA Study must clearly identify and quantify the environmental constraints and enhancement opportunities within the study area, including the following:

Aquatic Habitat and Valleylands

The project needs to evaluate alternatives that minimize impacts to the form and function of the East Credit River tributary and if possible include opportunities for enhancement. The EA should list and describe the natural features (fish habitat, etc.) and site characteristics (e.g. Rolling topography, high water table, buffering vegetation, etc.) in the study area that may pose constraints to the project.

STORMWATER MANAGEMENT
The project should include quality and quantity control measures to treat stormwater runoff in accordance with Ministry of Environment and Climate Change and CVC guidelines. Typically we request that the proponent provide treatment for all new proposed impervious areas and where possible existing road surfaces.

HYDRAULICS AND MEANDER BELT
Any alterations to any watercourse may require a hydraulic analysis to ensure that there are no negative impacts. In addition, the road improvements or reconstruction should ensure that the road is flood free under Regional Storm conditions.

SUBWATERSHED STUDY
The EA should ensure that the subwatershed study environmental targets and objectives are identified and identify proposed measures that implement these targets and objectives.

EROSION AND SEDIMENT CONTROLS
During the detailed design phase of this project, all proposed methods to control sedimentation during construction and potential erosion following the completion of the project must be detailed. Furthermore, as means of minimizing impacts to aquatic habitat all works must be completed in the dry.

RESTORATION
All disturbed areas will need to be stabilized and restored with native/non-invasive seed mixes and woody species.

Comments on Existing Conditions Report

1. Page 33 - Aquatic Habitat and Communities: This section of the report indicates that there are no watercourses or headwater drainage features within the section of the project in the Credit River watershed. CVC notes that a regulated watercourse (as per CVC mapping) does exist within the project scope in CVC's jurisdiction. While this feature likely doesn't provide direct habitat for fish in the area adjacent to the study site, it likely contributes to downstream habitat including other tributaries and wetlands. Please revise the report to include this feature. This feature is located on the west side of Airport Road south of Olde Base Line. The final EA, including proposed SWM and detailed design, should ensure existing drainage is maintained to retain hydrology to downstream features.

2. The report does not include municipal land use designations (Peel Greenlands, Caledon Environmental Protection Areas) as defined within municipal official plan policies. CVC recommends inclusion of all relevant environmental designations within the report.

3. A significant wildlife habitat evaluation does not appear to have been completed for the study area. While some candidate SWH designations are covered in other sections of the report, CVC recommends the completion of a comprehensive SWH assessment including confirmed and candidate SWH criteria within the project limits. Mitigation measures for SWH with potential to be impacted by the proposed works are to be included in the final ESR.

4. The report identifies several areas in which future road works may impact wildlife migration/movement corridors. The area within CVC jurisdiction (point C on Figure 15) is indicated to have high potential for amphibian movement between the two wetlands. CVC acknowledges that the existing conditions report is not intended to discuss proposed mitigation strategies of the overall EA but notes that wildlife crossing systems and improvements should be evaluated and considered within the ESR in order to be carried forward into detailed design. Please refer to CVC Fish and Wildlife Crossing Guidelines for more information on best management practices and mitigation strategies for improving fish and wildlife passage.

5. CVC notes the presence of forest/woodland communities within the study limits; however the report does not discuss these communities as potential habitat for Species at Risk bats. Please contact MNRF for further direction

Given CVC's interest staff would like to be kept informed of future meetings and proceedings through the Environmental Assessment process. Please forward any information or reports when available to ensure that this Authority's policy and program interest are reflected in the planning and design components for this project. Please also forward an invitation to attend the Technical Advisory Committee (TAC) meetings.

Should you have any further questions please contact the undersigned at (905) 670-1615 extension 287 or jkilis@creditvalleyca.ca.

Regards,

Jakub Kilis
Senior Planner, Environmental Assessment

cc: Asha Saddi, Technical Analyst, Region of Peel (by email only)

Appendix 3. Assessment of Endangered and Threatened Species

RIVERSTONE
ENVIRONMENTAL SOLUTIONS INC.

Habitat-based Approach

Properly assessing whether an area is likely to contain Endangered or Threatened species for the purposes of determining whether a proposed development is likely to have a negative impact is becoming more difficult as the number of listed species increases. Approaches that depend solely on documenting the presence of individuals of a species in an area almost always underrepresent the biodiversity actually present because of the difficulty of observing species that are usually rare and well camouflaged. Given these difficulties, and the importance of protecting habitats of Endangered and Threatened species, RiverStone's primary approach to site assessment is habitat-based. This means that our field investigations focus on *evaluating the potential for features within an area of interest to function as habitat for species considered potentially present*, *rather than searching for live specimens*. An area is considered potential habitat if it satisfies a number of criteria, usually specific to a species, but occasionally characteristic of a broader group (e.g., several turtles use sandy shorelines for nesting, multiple bat species use dead or dying trees for roosting habitat). Physical attributes of a site that can be used as indicators of its potential to function as habitat for a species include structural characteristics (e.g., physical dimensions of rock fragments or trees, water depth), ecological community (e.g., meadow marsh, rock barren), and structural connectivity to other habitat features required by the species. Species-specific habitat preferences and/or affinities are determined from status reports produced by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), Cadman et al. (2007), published and unpublished documents, and direct experience.

Table 1 provides RiverStone's desktop screening and on-site assessment for Endangered and Threatened species. RiverStone measures species- and feature-specific distances from the boundaries of proposed lots or development area(s)—rather than from the boundary of the significant natural heritage feature—and refers to this area as *adjoining lands* (AL). Evaluating the likelihood of species' presence and the potential for negative impacts using this approach ensures that the Adjacent Lands test of the Provincial Policy Statement (2014) will be met.

For the purposes of RiverStone's assessment, the *Project Area* as shown in **Figure 1** is referred to as the Area of Interest (AOI) and the adjoining lands (AL) extents were measured from the boundaries of the AOI.

Common Name[1]	Scientific Name	Step 1 (Desktop): Rationale for considering	Step 2 (Desktop): Do site-specific attributes (e.g., ecological system and landscape configuration) assessed from aerial photography and other information sources indicate that potential habitat or communities might be present? Area of Interest (AOI)	Step 2 (Desktop): Adjoining Lands (AL)	Step 3 (On Site): Potential and/or confirmed habitat documented during on-site assessment Area of Interest (AOI)	Step 3 (On Site): Adjoining Lands (AL)	Step 4: Is there potential for the species, its habitat, or ecological community to be negatively impacted by the activities that would be permissible within the AOI?
Endangered & Threatened (Provincially): status from Species at Risk in Ontario List (O Reg 230/08) updated November 2018; **(Federally)** Schedule 1 SARA							
Bobolink	*Dolichonyx oryzivorus*	OBBA	YES, suitable grassland or agricultural communities may be present.	YES, suitable grassland or agricultural communities may be present.	NO, species not detected within the study area during targeted surveys completed by TRCA.	YES, species observed approximately 550m east of the study area by TRCA staff.	POSSIBLE.
Barn Swallow	*Hirundo rustica*	OBBA	YES, man-made or natural structures suitable for nesting may be present.	YES, man-made or natural structures suitable for nesting may be present.	YES, species was observed foraging over agricultural lands by TRCA staff.	YES, suitable man-made nesting structures are present within the larger landscape.	YES.
Eastern Meadowlark	*Sturnella magna*	OBBA	YES, suitable grassland or agricultural communities may be present.	YES, suitable grassland or agricultural communities may be present.	NO, species not detected during targeted surveys completed by TRCA.	YES, suitable grassland or agricultural communities are present.	NO, impacts from development within AOI unlikely to affect breeding habitat on AL, if present.
Chimney Swift	*Chaetura pelagica*	OBBA	YES, dark sheltered hollow vertical structures (chimneys, smoke stacks, silos, large trees with cavities and rock crevices) suitable for nesting or roosting may be present.	YES, dark sheltered hollow vertical structures (chimneys, smoke stacks, silos, large trees with cavities and rock crevices) suitable for nesting or roosting may be present.	NO, species not detected during targeted surveys completed by TRCA.	YES, silos are present in the larger landscape.	NO, impacts from development within AOI unlikely to affect breeding habitat on AL, if present.
Prothonotary Warbler	*Protonotaria citrea*	OBBA	YES, cavity trees in flooded woodlands or swamps may be present.	YES, cavity trees in flooded woodlands or swamps may be present.	NO, species not detected during targeted surveys completed by TRCA.	YES, suitable wetland (swamp) communities are present.	NO, impacts from development within AOI unlikely to affect breeding habitat on AL, if present.
Bank Swallow	*Riparia riparia*	OBBA	YES, man-made or natural structures suitable for nesting may be present.	YES, man-made or natural structures suitable for nesting may be present.	NO, while northern portions of the AOI contain areas of steep slopes, these areas lack vertical faces suitable for nesting.	NO, while AL may contain suitable structures for nesting, these were not documented within a distance that would be impacted by the proposed improvements within the AOI.	NO.
Eastern Small-footed Myotis	*Myotis leibii*	range map	NO, natural structures (talus slopes, rocky ridges, rock outcrops, cliff crevices, rock fields) suitable for roosting are absent.	NO, natural structures (talus slopes, rocky ridges, rock outcrops, cliff crevices, rock fields) suitable for roosting are absent.	NO, AOI lacks tallus slopes, open rock barrens, or other communities suitable for use as habitat by this species.	NO, AL lack tallus slopes, open rock barrens, or other communities suitable for use as habitat by this species.	NO, potential habitat not identified.
Little Brown Bat	*Myotis lucifugus*	range map	YES, dark sheltered hollow vertical structures (e.g., large trees with cavities) suitable for gestating or roosting may be present.	YES, dark sheltered hollow vertical structures (e.g., large trees with cavities) suitable for gestating or roosting may be present.	YES, trees suitable for roosting are present.	YES, trees suitable for roosting are present.	YES, destruction of gestating or roosting trees may have negative impacts on individuals or habitat.
Northern Long-eared Bat	*Myotis septentrionalis*	range map	YES, dark sheltered hollow vertical structures (e.g., large trees with cavities) suitable for gestating or roosting may be present.	YES, dark sheltered hollow vertical structures (e.g., large trees with cavities) suitable for gestating or roosting may be present.	YES, trees suitable for roosting are present.	YES, trees suitable for roosting are present.	YES, destruction of gestating or roosting trees may have negative impacts on individuals or habitat.
Tri-colored Bat	*Perimyotis subflavus*	range map	YES, trees suitable for roosting and open-canopy areas suitable for foraging (e.g., riparian and/or early successional communities) may be present.	YES, trees suitable for roosting and open-canopy areas suitable for foraging (e.g., riparian and/or early successional communities) may be present.	YES, trees suitable for roosting are present.	YES, trees suitable for roosting are present.	YES, destruction of gestating or roosting trees may have negative impacts on individuals or habitat.
Butternut	*Juglans cinerea*	NHIC Databases	YES, difficult to rule out without on-site assessment.	YES, difficult to rule out without on-site assessment.	YES, a single individual was identified on private property in the northern portion of the AOI.	POSSIBLE, entire area not surveyed.	YES. Development and site alteration adjacent to individuals has the potential to damage root zones of trees.

[1]Shaded rows denote species or communities for which negative impacts have been deemed possible.

Appendix 4. Assessment of Significant Wildlife Habitat

Ecoregion 6E	Candidate Significant Wildlife Habitat	Ecosystem Land Classification (ELC) Ecosites[1]	Do site-specific attributes (e.g., ecological system and landscape configuration) assessed from available information sources and on-site assessment indicate that candidate Significant Wildlife Habitat (SHW) might be present?
Seasonal Concentration Areas of Animals			
Waterfowl Stopover and Staging Areas (Terrestrial)	Fields with sheet water during Spring (mid March to May) Fields flooding during spring melt and run-off provide important invertebrate foraging habitat for migrating waterfowl. Agricultural fields with waste grains are commonly used by waterflow, these are not considered SWH unless they have spring sheet water available.	CUM1 , CUT1 Plus evidence of annual spring flooding from melt water or run-off within these Ecosites.	POSSIBLE, meadow communities associated with this category of SWH are present within the study area. Based on available data it is not possible to determine if these areas are flooded during spring melt/run-off.
Waterfowl Stopover and Staging Areas (Aquatic)	Ponds, marshes, lakes, bays, coastal inlets, and watercourses used during migration. Sewage treatment Ponds and storm water Ponds do not qualify as a SWH, however a reservoir managed as a large wetland or pond/lake does qualify. These habitats have an abundance food supply (mostly aquatic invertebrates and vegetation in shallow water)	MAS1 , MAS2, MAS3, SAS1, SAM1, SAF1, SWD1, SWD2, SWD3, SWD4, SWD5, SWD6, SWD7	NO, while marsh ecosites associated with this SWH category are present within the study area, they are generally small in area (i.e., 0.2 ha or less) limiting their significance as waterfowl stopover or staging areas (aquatic).
Shorebird Migratory Stopover Areas	Shorelines of lakes, rivers and wetlands, including beach areas, bars and seasonally flooded, muddy and un-vegetated shoreline habitats. Great Lakes coastal shorelines, including groynes and other forms of armour rock lakeshores, are extremely important for migratory shorebirds in May to mid-June and early July to October. Sewage treatment ponds and storm water ponds do not qualify as a SWH.	BBO1, BBO2, BBS1, BBS2, BBT1, BBT2, SDO1, SDS2, SDT1, MAM1 , MAM2, MAM3, MAM4, MAM5	NO, ecosites associated with the SWH types are not present within the study area.
Raptor Wintering Areas	The habitat provides a combination of fields and woodlands that provide roosting, foraging and resting habitats for wintering raptors. Raptor wintering sites (hawk/owl) need to be >20 ha with a combination of forest and upland. Least disturbed sites, idle/fallow or lightly grazed field/meadow (>15ha) with adjacent woodlands Field area of the habitat is to be wind swept with limited snow depth or accumulation. Eagle sites have open water, large trees and snags available for roosting.	Hawks/Owls: Combination of ELC Community Series; need to have present one Community Series from each land class; Forest: FOD, FOM, FOC. Upland: CUM; CUT; CUS; CUW. Bald Eagle: Forest community Series: FOD, FOM, FOC, SWD, SWM or SWC on shoreline areas adjacent to large rivers or adjacent to lakes with open water (hunting area).	NO, while ecosites associated with this SWH type are present within the study area, only the edges of these features fall within the study area. Additionally, the upland communities required for this SWH type are not present in sufficient sizes to function as SWH.
Bat Hibernacula	Hibernacula may be found in caves, mine shafts, underground foundations and Karsts. Active mine sites are not SWH. The locations of bat hibernacula are relatively poorly known.	Bat Hibernacula may be found in these ecosites: CCR1, CCR2, CCA1, CCA2. (Note: buildings are not considered to be SWH).	NO, ecosites associated with the SWH types are not present within the study area.

*as per Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E (January 2015)

[1]as per Lee et al. 1998 and Banton et al. 2009

Ecoregion 6E	Candidate Significant Wildlife Habitat	Ecosystem Land Classification (ELC) Ecosites[1]	Do site-specific attributes (e.g., ecological system and landscape configuration) assessed from available information sources and on-site assessment indicate that candidate Significant Wildlife Habitat (SHW) might be present?
Bat Maternity Colonies	Maternity colonies can be found in tree cavities, vegetation and often in buildings (buildings are not considered to be SWH). Maternity roosts are not found in caves and mines in Ontario Maternity colonies located in Mature (dominant trees > 80yrs old) deciduous or mixed forest stands with >10/ha large diameter (>25cm dbh) wildlife trees Female Bats prefer wildlife trees (snags) in early stages of decay, class 1-3 . Silver-haired Bats prefer older mixed or deciduous forest and form maternity colonies in tree cavities and small hollows. Older forest areas with at least 21 snags/ha are preferred.	Maternity colonies considered SWH are found in forested Ecosites. All ELC Ecosites in ELC Community Series: FOD, FOM, SWD, SWM.	YES, forest communities with the potential to provide maternity roosting habitat are present.
Turtle Wintering Areas	For most turtles, wintering areas are in the same general area as their core habitat. Water has to be deep enough not to freeze and have soft mud substrates. Over-wintering sites are permanent water bodies, large wetlands, and bogs or fens with adequate Dissolved Oxygen Man-made ponds such as sewage lagoons or storm water ponds should not be considered SWH.	Snapping and Midland Painted Turtles; ELC Community Classes; SW, MA, OA and SA, ELC Community Series; FEO and BOO. Northern Map Turtle; Open Water areas such as deeper rivers or streams and lakes with current can also be used as overwintering habitat.	YES, suitable wetland communities are present.
Reptile Hibernaculum	For snakes, hibernation takes place in sites located below frost lines in burrows, rock crevices and other natural or naturalized locations. The existence of features that go below frost line; such as rock piles or slopes, old stone fences, and abandoned crumbling foundations assist in identifying candidate SWH. Areas of broken and fissured rock are particularly valuable since they provide access to subterranean sites below the frost line Wetlands can also be important over-wintering habitat in conifer or shrub swamps and swales, poor fens, or depressions in bedrock terrain with sparse trees or shrubs with sphagnum moss or sedge hummock ground cover. Five-lined skink prefer mixed forests with rock outcrop openings providing cover rock overlaying granite bedrock with fissures.	For all snakes, habitat may be found in any ecosite other than very wet ones. Talus, Rock Barren, Crevice and Cave, and Alvar sites may be directly related to these habitats. Observations or congregations of snakes on sunny warm days in the spring or fall is a good indicator. For Five-lined Skink, ELC Community Series of FOD and FOM and Ecosites: FOC1, FOC3.	NO, while sufficient data are not available to definitively rule out this SWH category, hibernation sites for reptiles do not typically persist adjacent to high traffic roads due to road mortality. As such, there is a low likelihood that reptile hibernaculum are present within the study area.
Colonially - Nesting Bird Breeding Habitat (Bank and Cliff)	Any site or areas with exposed soil banks, sandy hills, borrow pits, steep slopes, and sand piles that are undisturbed or naturally eroding that is not a licensed/permitted aggregate area. Does not include man-made structures (bridges or buildings) or recently (2 years) disturbed soil areas, such as berms, embankments, soil or aggregate stockpiles. Does not include a licensed/permitted Mineral Aggregate Operation.	Eroding banks, sandy hills, borrow pits, steep slopes, and sand piles. Cliff faces, bridge abutments, silos, barns. Habitat found in the following ecosites: CUM1, CUT1, CUS1, BLO1, BLS1, BLT1, CLO1, CLS1, CLT1.	NO, areas of exposed soil banks, sandy hills, borrow pits, steep slopes, and sand piles that are undisturbed or naturally eroding are not present within the study area.
Colonially - Nesting Bird Breeding Habitat Breeding Habitat (Tree/Shrubs)	Nests in live or dead standing trees in wetlands, lakes, islands, and peninsulas. Shrubs and occasionally emergent vegetation may also be used. Most nests in trees are 11 to 15 m from ground, near the top of the tree.	SWM2, SWM3, SWM5, SWM6, SWD1, SWD2, SWD3, SWD4, SWD5, SWD6, SWD7, FET1.	NO, while the ecosites associated with this SWH category are present, neither TRCA or CVC documented colonial nesting birds as part of their onsite assessments.

*as per Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E (January 2015)

[1]as per Lee et al. 1998 and Banton et al. 2009

Ecoregion 6E	Candidate Significant Wildlife Habitat	Ecosystem Land Classification (ELC) Ecosites[1]	Do site-specific attributes (e.g., ecological system and landscape configuration) assessed from available information sources and on-site assessment indicate that candidate Significant Wildlife Habitat (SHW) might be present?
Colonially - Nesting Bird Breeding Habitat (Ground)	Nesting colonies of gulls and terns are on islands or peninsulas (natural or artificial) associated with open water, marshy areas, lake or large river (two-lined on a 1:50,000 NTS map). Brewers Blackbird colonies are found loosely on the ground in or in low bushes in close proximity to streams and irrigation ditches within farmlands.	Any rocky island or peninsula (natural or artificial) within a lake or large river (two-lined on a 1:50,000 NTS map). Close proximity to watercourses in open fields or pastures with scattered trees or shrubs (Brewer's Blackbird) MAM1 – 6, MAS1 – 3, CUM, CUT, CUS	NO, no evidence of high densities of nesting birds were identified by TRCA or CVC.
Migratory Butterfly Stopover Areas	A butterfly stopover area will be a minimum of 10 ha in size with a combination of field and forest habitat present, and will be located within 5 km of Lake Ontario. The habitat is typically a combination of field and forest, and provides the butterflies with a location to rest prior to their long migration south. The habitat should not be disturbed, fields/meadows with an abundance of preferred nectar plants and woodland edge providing shelter are requirements for this habitat. Staging areas usually provide protection from the elements and are often spits of land or areas with the shortest distance to cross the Great Lakes.	Combination of ELC Community Series; need to have present one Community Series from each landclass: <u>Field:</u> CUM, CUT, CUS <u>Forest:</u> FOC, FOD, FOM, CUP Anecdotally, a candidate site for butterfly stopover will have a history of butterflies being observed.	NO, while the study area contains forest and field communities, these areas are not located within 5 km of Lake Ontario.
Landbird Migratory Stopover Areas	Woodlots need to be > 10 ha in size and within 5 km of Lake Ontario. If multiple woodlands are located along the shoreline of those woodlands <2 km from Lake Ontario are more significant. Sites have a variety of habitats; forest, grassland and wetland complexes. The largest sites are more significant. Woodlots and forest fragments are important habitats to migrating birds, these features located along the shore and located within 5 km of Lake Ontario are Candidate SWH.	All Ecosites associated with these ELC Community Series; FOC, FOM, FOD, SWC, SWM, SWD.	NO, while the study area contains woodlots, these communities are not within 5 km of Lake Ontario.
Deer Yarding Areas	Deer wintering areas or winter concentration areas (yards) are areas deer move to in response to the onset of winter snow and cold. This is a behavioural response and deer will establish traditional use areas. The yard is composed of two areas referred to as Stratum I and Stratum II. Stratum II covers the entire winter yard area and is usually a mixed or deciduous forest with plenty of browse available for food. Agricultural lands can also be included in this area. Deer move to these areas in early winter and generally, when snow depths reach 20 cm, most of the deer will have moved here. If the snow is light and fluffy, deer may continue to use this area until 30 cm snow depth. In mild winters, deer may remain in the Stratum II area the entire winter. The Core of a deer yard (Stratum I) is located within Stratum II and is critical for deer survival in areas where winters become severe. It is primarily composed of coniferous trees (pine, hemlock, cedar, spruce) with a canopy cover of more than 60%. OMNRF determines deer yards following methods outlined in "Selected Wildlife and Habitat Features: Inventory Manual". -Woodlots with high densities of deer due to artificial feeding are not significant.	Note: OMNRF to determine this habitat. ELC Community Series providing a thermal cover component for a deer yard would include; FOM, FOC, SWM and SWC. Or these ELC Ecosites; CUP2, CUP3, FOD3, CUT	NO, while TRCA does indicate deer movement corridors may be present in the northern portion of the study area, they do not indicate yarding areas are present.

*as per Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E (January 2015)

[1]as per Lee et al. 1998 and Banton et al. 2009

Ecoregion 6E	Candidate Significant Wildlife Habitat	Ecosystem Land Classification (ELC) Ecosites[1]	Do site-specific attributes (e.g., ecological system and landscape configuration) assessed from available information sources and on-site assessment indicate that candidate Significant Wildlife Habitat (SHW) might be present?
Deer Winter Congregation Areas	Woodlots will typically be >100 ha in size. Woodlots <100 ha may be considered as significant based on MNRF studies or assessment. Deer movement during winter in the southern areas of Ecoregion 6E are not constrained by snow depth, however deer will annually congregate in large numbers in suitable woodlands. If deer are constrained by snow depth refer to the Deer Yarding Area habitat within this table. Large woodlots > 100 ha and up to 1500 ha are known to be used annually by densities of deer that range from 0.1-1.5 deer/ha. Woodlots with high densities of deer due to artificial feeding are not significant.	All Forested Ecosites with these ELC Community Series; FOC , FOM, FOD, SWC, SWM, SWD . Conifer plantations much smaller than 50 ha may also be used.	POSSIBLE, TRCA indicates deer movement corridors may be present in the northern portion of the study area. Given the extent of forest in this area, deer winter congregation areas may be present.
Rare Vegetation Communities			
Cliffs and Talus Slopes	A Cliff is vertical to near vertical bedrock >3m in height. A Talus Slope is rock rubble at the base of a cliff made up of coarse rocky debris	Any ELC Ecosite within Community Series: TAO, TAS, TAT, CLO, CLS, CLT	NO, ecosites associated with the SWH types are not present within the study area.
Sand Barren	Sand Barrens typically are exposed sand, generally sparsely vegetated and caused by lack of moisture, periodic fires and erosion. They have little or no soil and the underlying rock protrudes through the surface. Usually located within other types of natural habitat such as forest or savannah. Vegetation can vary from patchy and barren to tree covered but less than 60%.	ELC Ecosites: SBO1, SBS1, SBT1 Vegetation cover varies from patchy and barren to continuous meadow (SBO1), thicket-like (SBS1), or more closed and treed (SBT1). Tree cover always < 60%.	YES, TRCA identified two (2) small areas of sand barrens within the study area.
Alvar	An alvar is typically a level, mostly unfractured calcareous bedrock feature with a mosaic of rock pavements and bedrock overlain by a thin veneer of soil. The hydrology of alvars may be complex, with alternating periods of inundation and drought. Vegetation cover varies from sparse lichen-moss associations to grasslands and shrublands and comprising a number of characteristic or indicator plant. Undisturbed alvars can be phyto- and zoogeographically diverse, supporting many uncommon or are relict plant and animals species. Vegetation cover varies from patchy to barren with a less than 60% tree cover.	ALO1, ALS1, ALT1, FOC1, FOC2, CUM2, CUS2, CUT2-1, CUW2 Five Alvar Indicator Species: 1) Carex crawei, 2) Panicum philadelphicum, 3) Eleocharis compressa, 4) Scutellaria parvula, 5) Trichostema brachiatum These indicator species are very specific to Alvars within Ecoregion 6E	NO, ecosites associated with the SWH types are not present within the study area.
Old Growth Forest	Old Growth forests are characterized by exhibiting the greatest number of old-growth characteristics, such as mature forest with large trees that has been undisturbed. Heavy mortality or turnover of overstorey trees resulting in a mosaic of gaps that encourage development of a multi-layered canopy and an abundance of snags and downed woody debris.	Forest Community Series: FOD, FOC, FOM, SWD, SWC, SWM	NO, while TRCA mapping shows the ELC communities associated with this SWH category are present, a review of these areas during onsite tree inventories did not identify areas of old growth forest.
Savannah	A Savannah is a tallgrass prairie habitat that has tree cover between 25–60%.	TPS1, TPS2, TPW1, TPW2, CUS2	NO, ecosites associated with the SWH types are not present within the study area.
Tallgrass Prairie	Tallgrass Prairie is an open vegetation with less than 25% tree cover, and dominated by prairie species, including grasses.	TPO1, TPO2	NO, ecosites associated with the SWH types are not present within the study area.
Other Rare Vegetation Community	ELC Ecosite codes that have the potential to be a rare ELC Vegetation Type as outlined in Appendix M. The OMNRF/NHIC will have up to date listing for rare vegetation communities.	Provincially Rare S1, S2 and S3 vegetation communities are listed in Appendix M of the Significant Wildlife Habitat Technical Guide. Any ELC Ecosite Code that has a possible ELC Vegetation Type that is Provincially Rare is Candidate SWH.	NO, none of the ELC communities present in the study area, as identified by TRCA, are provincially rare communities as listed in Appendix M of the SWHTG.

*as per Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E (January 2015)

[1]as per Lee et al. 1998 and Banton et al. 2009

Ecoregion 6E	Candidate Significant Wildlife Habitat	Ecosystem Land Classification (ELC) Ecosites[1]	Do site-specific attributes (e.g., ecological system and landscape configuration) assessed from available information sources and on-site assessment indicate that candidate Significant Wildlife Habitat (SHW) might be present?
Specialized Habitats for Wildlife			
Waterfowl Nesting Area	A waterfowl nesting area extends 120 m from a wetland (> 0.5 ha) or a cluster of 3 or more small (<0.5 ha) wetlands within 120 m of each individual wetland where waterfowl nesting is known to occur. Upland areas should be at least 120 m wide so that predators such as raccoons, skunks, and foxes have difficulty finding nests. Wood Ducks, Bufflehead, Common Goldeneye and Hooded Mergansers utilize large diameter trees (>40cm dbh) in woodlands for cavity nest sites.	All upland habitats located adjacent to these wetland ELC Ecosites are Candidate SWH: MAS1, MAS2, MAS3, SAS1, SAM1, SAF1, MAM1, MAM2, MAM3, MAM4, MAM5, MAM6, SWT1, SWT2, SWD1, SWD2, SWD3, SWD4 Note: includes adjacency to provincially Significant Wetlands	NO, while the ecosites associated with this SWH category are present, none of the species associated with this category were documented in sufficient numbers by TRCA during targeted surveys.
Bald Eagle and Osprey Nesting, Foraging and Perching Habitat	Nests are associated with lakes, ponds, rivers or wetlands along forested shorelines, islands, or on structures over water. Osprey nests are usually at the top a tree whereas Bald Eagle nests are typically in super canopy trees in a notch within the tree's canopy. Nests located on man-made objects are not to be included as SWH (e.g. telephone poles and constructed nesting platforms).	ELC Forest Community Series: FOD, FOM, FOC, SWD, SWM and SWC directly adjacent to riparian areas – rivers, lakes, ponds and wetlands.	NO, while forest communities are present within the study area, no stick nests were documented in proximity to the wetland or aquatic communities within the study area.
Woodland Raptor Nesting Habitat	All natural or conifer plantation woodland/forest stands >30ha with >10ha of interior habitat. Interior habitat determined with a 200m buffer. In disturbed sites, nests may be used again, or a new nest will be in close proximity to old nest.	May be found in all forested ELC Ecosites. May also be found in SWC, SWM, SWD and CUP3.	NO, given the location of the study area, no portions of forested communities will be greater than 200m from the forest edge indicating that woodland raptor nesting habitat is not present.
Turtle Nesting Areas	Best nesting habitat for turtles are close to water and away from roads and sites less prone to loss of eggs by predation from skunks, raccoons or other animals. For an area to function as a turtle nesting area, it must provide sand and gravel that turtles are able to dig in and are located in open, sunny areas. Nesting areas on the sides of municipal or provincial road embankments and shoulders are not SWH. Sand and gravel beaches adjacent to undisturbed shallow weedy areas of marshes, lakes, and rivers are most frequently used.	Exposed mineral soil (sand or gravel) areas adjacent (<100m) or within the following ELC Ecosites: MAS1, MAS2, MAS3, SAS1, SAM1, SAF1, BOO1	NO, areas of exposed mineral soils (not roadsides) adjacent to wetland communities were not documented by TRCA or CVC.
Seeps and Springs	Any forested area (with <25% meadow/field/pasture) within the headwaters of a stream or river system. Seeps and springs are important feeding and drinking areas especially in the winter will typically support a variety of plant and animal species.	Seeps/Springs are areas where groundwater comes to the surface. Often they are found within headwater areas within forested habitats. Any forested Ecosite within the headwater areas of a stream could have seeps/springs.	NO, seeps or springs were not identified by TRCA or CVC.
Amphibian Breeding Habitat (Woodland)	Presence of a wetland or pond >500 m^2 (about 25 m diameter) within or adjacent (within 120m) to a woodland (no minimum size). The wetland, lake or pond and surrounding forest, would be the Candidate SWH. Some small wetlands may not be mapped and may be important breeding pools for amphibians. Woodlands with permanent ponds or those containing water in most years until mid-July are more likely to be used as breeding habitat.	All Ecosites associated with these ELC Community Series; FOC, FOM, FOD, SWC, SWM, SWD Breeding pools within the woodland or the shortest distance from forest habitat are more significant because they are more likely to be used due to reduced risk to migrating amphibians.	YES, amphibian call surveys completed by TRCA in the spring of 2016 identified the presence of five (5) species of amphibians. Four (4) of these species typically use woodland ponds or wetlands for breeding suggesting that Amphibian Breeding Habitat (woodland) is present.

*as per Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E (January 2015)

[1]as per Lee et al. 1998 and Banton et al. 2009

Ecoregion 6E	Candidate Significant Wildlife Habitat	Ecosystem Land Classification (ELC) Ecosites[1]	Do site-specific attributes (e.g., ecological system and landscape configuration) assessed from available information sources and on-site assessment indicate that candidate Significant Wildlife Habitat (SHW) might be present?
Amphibian Breeding Habitat (Wetlands)	Wetlands and pools (including vernal pools) >500 m^2 (about 25 m diameter), supporting high species diversity are significant; some small or ephemeral habitats may not be identified on MNRF mapping and could be important amphibian breeding habitats. Presence of shrubs and logs increase significance of pond for some amphibian species because of available structure for calling, foraging, escape and concealment from predators. Bullfrogs require permanent water bodies with abundant emergent vegetation.	ELC Community Classes SW, MA, FE, BO, OA and SA. Typically these wetland ecosites will be isolated (>120m) from woodland ecosites, however larger wetlands containing predominantly aquatic species (e.g. Bull Frog) may be adjacent to woodlands.	YES, while TRCA did not complete breeding amphibian surveys during late spring or summer that would detect the majority of wetland breeding amphibians, the wetlands present within the project area have a high likelihood of functioning as Amphibian Breeding Habitat (wetlands).
Area-Sensitive Bird Breeding Habitat	Habitats where interior forest breeding birds are breeding, typically large mature (>60 yrs old) forest stands or woodlots >30 ha. Interior forest habitat is at least 200 m from forest edge habitat.	All Ecosites associated with these ELC Community Series; FOC, FOM, FOD, SWC, SWM, SWD.	NO, while the ecosites associated with this SWH category are present, they were not documented in sufficient size to function as SWH.
Habitat for Species of Conservation Concern (not including Endangered or Threatened Species)			
Marsh Bird Breeding Habitat	Nesting occurs in wetlands. All wetland habitat is to be considered as long as there is shallow water with emergent aquatic vegetation present. For Green Heron, habitat is at the edge of water such as sluggish streams, ponds and marshes sheltered by shrubs and trees. Less frequently, it may be found in upland shrubs or forest a considerable distance from water.	MAM1, MAM2, MAM3, MAM4, MAM5, MAM6, SAS1, SAM1, SAF1, FEO1, BOO1. For Green Heron: All SW, MA and CUM1 sites.	NO, while the ecosites associated with this SWH category are present, none of the species associated with this category were documented by TRCA during targeted surveys.
Open Country Bird Breeding Habitat	Large grassland areas (includes natural and cultural fields and meadows) >30 ha Grasslands not Class 1 or 2 agricultural lands, and not being actively used for farming (i.e., no row cropping or intensive hay or livestock pasturing in the last 5 years). Grassland sites considered significant should have a history of longevity, either abandoned fields, mature hayfields and pasturelands that are at least 5 years or older. The Indicator bird species are area sensitive requiring larger grassland areas than the common grassland species.	CUM1, CUM2	NO, while the ecosites associated with this SWH category are present, they were not documented in sufficient size to function as SWH.
Shrub/Early Successional Bird Breeding Habitat	Large field areas succeeding to shrub and thicket habitats >30 ha in size. Shrub land or early successional fields, not class 1 or 2 agricultural lands, not being actively used for farming (i.e., no row-cropping, haying or livestock pasturing in the last 5 years). Shrub thicket habitats (>10 ha) are most likely to support and sustain a diversity of these species. Shrub and thicket habitat sites considered significant should have a history of longevity, either abandoned fields or lightly grazed pasturelands.	CUT1, CUT2, CUS1, CUS2, CUW1, CUW2. Patches of shrub ecosites can be complexed into a larger habitat for some bird species.	NO, while the ecosites associated with this SWH category are present, they were not documented in sufficient size to function as SWH.

*as per Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E (January 2015)

[1]as per Lee et al. 1998 and Banton et al. 2009

Ecoregion 6E	Candidate Significant Wildlife Habitat	Ecosystem Land Classification (ELC) Ecosites[1]	Do site-specific attributes (e.g., ecological system and landscape configuration) assessed from available information sources and on-site assessment indicate that candidate Significant Wildlife Habitat (SHW) might be present?
Terrestrial Crayfish	Wet meadow and edges of shallow marshes (no minimum size) should be surveyed for terrestrial crayfish. Constructs burrows in marshes, mudflats, meadows, the ground cannot be too moist. Can often be found far from water. Both species are a semi-terrestrial burrower which spends most of its life within burrows consisting of a network of tunnels. Usually the soil is not too moist so that the tunnel is well formed.	MAM1, MAM2, MAM3, MAM4, MAM5, MAM6, MAS1, MAS2, MAS3, SWD, SWT, SWM, CUM1 with inclusions of above meadow marsh or swamp ecosites can be used by terrestrial crayfish.	NO, while wetland communities are present within the study area, terrestrial crayfish were not documented by TRCA or CVC.
Special Concern and Rare Wildlife Species	When an element occurrence is identified within a 1 or 10 km grid for a Special Concern or Provincially Rare species; linking candidate habitat on the site needs to be completed to ELC Ecosites	All Special Concern and Provincially Rare (S1-S3, SH) plant and animal species. All plant and animal element occurrences (EO) within a 1 or 10 km grid. Older element occurrences were recorded prior to GPS being available, therefore location information may lack accuracy	**YES.** See Table 2.
Animal Movement Corridors			
Amphibian Movement Corridors	Movement corridors between breeding habitat and summer habitat. Movement corridors must be determined when Amphibian breeding habitat is confirmed as SWH (Amphibian Breeding Habitat –Wetland) in this Table.	Corridors may be found in all ecosites associated with water. Corridors will be determined based on identifying the significant breeding habitat for these species (see above).	POSSIBLE, TRCA indicates amphibian movement corridors may be present in the northern portion of the study area.
Deer Movement Corridors	Corridors may be found in all forested ecosites. A Project Proposal in Stratum II Deer Wintering Area has potential to contain corridors.	Movement corridor must be determined when Deer Wintering Habitat is confirmed as SWH (see above). A deer wintering habitat identified by the OMNRF as SWH will have corridors that the deer use during fall migration and spring dispersion. Corridors typically follow riparian areas, woodlots, areas of physical geography (ravines, or ridges).	POSSIBLE, TRCA indicates deer movement corridors may be present in the northern portion of the study area.

*as per Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E (January 2015)

[1]as per Lee et al. 1998 and Banton et al. 2009

Appendix 4: Table 2. Results of desktop screening and on-site assessment for species of conservation interest.

Common Name[1]	Scientific Name	Step 1 (Desktop): Rationale for considering	Step 2 (Desktop): Do site-specific attributes (e.g., ecological system and landscape configuration) assessed from aerial photography and other information sources indicate that potential habitat or communities might be present? Area of Interest (AOI)	Adjoining Lands (AL)	Step 4: Is there potential for the species, its habitat, or ecological community to be negatively impacted by the activities that would be permissible within the AOI?
Special Concern (Provincially): status from Species at Risk in Ontario List (O Reg 230/08); updated November 2018					
Snapping Turtle	*Chelydra serpentina*	range map	YES, suitable wetland and/or aquatic communities may be present.	YES, suitable wetland and/or aquatic communities may be present.	POSSIBLE, impacts to wetlands and surrounding communities may result in negative impacts to species and their habitats.
Eastern Ribbonsnake	*Thamnophis sauritus*	range map	YES, open-canopy areas adjacent to wetlands are present.	YES, open-canopy areas adjacent to wetlands are present.	POSSIBLE, impacts to wetlands and surrounding communities may result in negative impacts to species and their habitats.
Wood Thrush	*Hylocichla mustelina*	range map	YES, areas with well-developed understorey within deciduous and/or mixed forest may be present.	YES, areas with well-developed understorey within deciduous and/or mixed forest may be present.	YES, tree removal may result in negative impacts to individuals and their habitats.
Eastern Wood Pewee	*Contopus virens*	range map	YES, suitably sized area of intact forest is present.	YES, suitably sized area of intact forest is present.	YES, tree removal may result in negative impacts to individuals and their habitats.
Monarch	*Danaus plexippus*	range map	YES, both natural and anthropogenic openings in canopy could provide suitable breeding and foraging habitat.	YES, both natural and anthropogenic openings in canopy could provide suitable breeding and foraging habitat.	YES, loss of species host plants (Milkweed) has the potential to negatively impact species.

[1]Shaded rows denote species or communities for which negative impacts have been deemed possible.