Ministry of Transportation

Hanlon Expressway / Wellington Road 34 Midblock Interchange (G.W.P. 3059-20-00) Terrestrial Ecosystem Existing Conditions and Impact Assessment Report

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AECOM: 2015-04-13

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Table of Contents

List of Figures

List of Tables

Appendices

1. Introduction

1.1 Project Overview

AECOM Canada Limited (AECOM) has been retained by the Ontario Ministry of Transportation (MTO) to undertake a Preliminary Design Review and Detailed Design (to a Design-Build-Ready status) under the Class Environmental Assessment (EA) for Provincial Transportation Facilities (2000) for improvements to Highways 6 and 401 in the Township of Puslinch, Wellington County, and the City of Hamilton (GWP 3042-14-00). The planned transportation improvements will provide a better connection between the Highways 6 and 401 corridors, reducing road congestion, collision potential, and associated costs while encouraging the utilization of the Hanlon Expressway (Highway 6 north of Highway 401), which will support municipal planning initiatives.

The first phase of implementing the GWP 3042-14-00 improvements will include improvements along the Hanlon Expressway north of Highway 401. This first phase, henceforth referred to as the Hanlon Expressway / Wellington Road 34 Midblock Interchange project (GWP 3059-20-00) herein after called 'the Project', includes the new Wellington Road 34 flyover structure at Hanlon Expressway, the new interchange on Hanlon Expressway midway between Wellington Road 34 and Maltby Road, and other associated connecting roadways.

The Project includes the following key elements:

- New Midblock Interchange on Hanlon Expressway midway between Wellington Road 34 and Maltby Road, linking Wellington Road 34 on the west side of Hanlon Expressway to Concession Road 7 on the east side of Hanlon Expressway with County Road 34 Connection Road;
- Removal of two (2) at-grade intersections on Hanlon Expressway at Wellington Road 34 and Maltby Road/Concession Road 4;
- New flyover of Hanlon Expressway at Wellington Road 34;
- New T-intersection at Maltby Road and Concession Road 7;
- New cul-de-sac on Concession Road 4 (west side of Hanlon Expressway);
- Reconstruction and realignment of Concession Road 7 to the east between Maltby Road and Wellington Road 34;

- New left-turn lanes at County Road 34 Connection Road and Wellington Road 34, and at Wellington Road 34 and Concession Road 7, resulting in road widenings at these intersections;
- New overhead sign structures associated with the interchange;
- Stormwater management facilities, including drainage ditches, two (2) infiltration ponds (within the interchange loop ramps) and one (1) stormwater management pond in the southwest quadrant of Wellington Road 34 and Hanlon Expressway;
- Traffic signals and illumination at five (5) intersections;
- Partial illumination on Hanlon Expressway at off-ramps;
- Various utility relocations to accommodate the improvements.

These design elements evolved through several previous environmental assessment studies, including:

- Environmental Assessment and Preliminary Design One Stage Submission, Highway 6 from Freelton Northerly 16.9 km to Guelph, WP 65-76-05 (MTO, 1995);
- Addendum - Environmental Assessment and Preliminary Design One Stage Submission, Highway 6 from Freelton Northerly 16.9 km to Guelph, WP 65-76-05 (MTO, 1997);
- Review and Approval of Preliminary Design, Highway 6 from Freelton Northerly 16.9 km to Guelph, WP 65-76-05 (MECP, 2009); and,
- Preliminary Design and Class Environmental Assessment Study, Highway 401 from 1.0 km west of Hespeler Road easterly to the Wellington County / Halton Region Boundary, GWP 8-00-00

1.2 Purpose of this Terrestrial Ecosystems Existing Conditions and Impact Assessment Report

This ‘Terrestrial Ecosystems Existing Conditions and Impact Assessment Report’ has been prepared in accordance with the *MTO Environmental Reference for Highway Design* (ERHD; 2013) to provide a summary of the existing terrestrial ecosystem features within the Study Area (as defined in **Section 1.3**) based on the review of background information and up-to-date field investigations, as well as provide a preliminary assessment of potential impacts associated with the project and proposed mitigation measures. Recommendations for the enhancement and restoration of specific natural features are also provided.

1.3 Project Study Area and Limits of Work

The Study Area for the Project includes the proposed and existing infrastructure described in **Section 1.1** plus an additional 200 m. The application of a 200 m buffer is considered a conservative approach, considering a 120 m buffer is the recommendation identified in the *Natural Heritage Reference Manual* (MNRF, 2010) and requirement in the ERHD. The Limits of Work include the proposed and existing infrastructure described in **Section 1.1** plus MTO road right-of-way (ROW) and MTO owned properties where work associated with the project may occur. An illustration of the Limits of Work and the Study Area are provided in **Figure 1.**

1.4 Environmental Protection Requirements

Table 1 provides an outline of the current legislation and policies relevant to terrestrial ecosystems as they relate to the proposed project.

Figure 1: Study Area

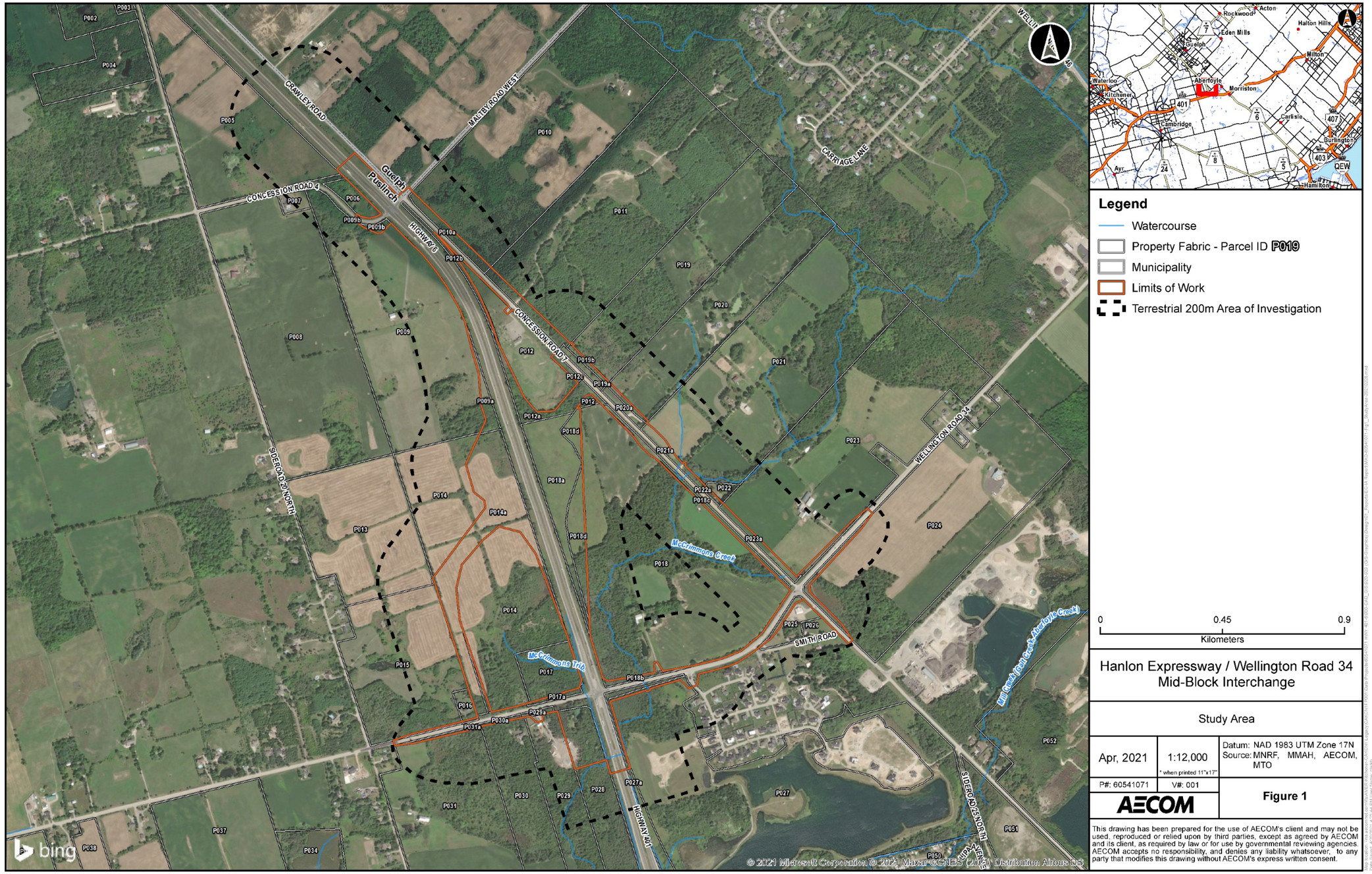


Table 1: Environmental Protection Requirements

Legislation	Governing Authority	Relevant Information
Endangered Species Act (2007)	Ontario Ministry of the Environment, Conservation and Parks	■ Under the Endangered Species Act (*ESA*), Species at Risk (SAR) are listed as Extirpated, Endangered, Threatened and Special Concern. ■ The ESA prohibits the killing, harming or harassment of Endangered or Threatened species and the damage or destruction of their habitat. ■ The Ministry of Natural Resource and Forestry (MNRF) may grant a permit, or other authorization, for activities that would otherwise not be allowable under the *ESA*. ■ For the purposes of this report Special Concern species are considered *Species of Conservation Concern (SOCC).* ■ In April 2019, administrative control of the ESA was transferred from the MNRF to the Ministry of the Environment, Conservation and Parks (MECP). The MECP no longer issues formal Letter of Advice (LOA) under the ESA. Considering this change, it should be noted that early agency correspondence with respect to SAR, for this project was undertaken with MNRF.
Species at Risk Act (2002)	Environment and Climate Change Canada - Canadian Wildlife Services	■ The Species at Risk Act (SARA) protects and ensures the recovery of SAR listed on Schedule 1 as Extirpated, Endangered and Threatened, and their critical habitats at a federal level. These species are protected on federal lands (First Nations reserves, national parks, etc.). Schedule 1 of the SARA classifies SAR as follows: – Extirpated - a wildlife species that no longer exists in the wild in Canada, but exists elsewhere in the wild (SARA Registry, 2012). – Endangered - a wildlife species that is facing imminent extirpation or extinction (SARA Registry, 2012). – Threatened - a wildlife species that is likely to become endangered if nothing is done to reverse the factors leading to its extirpation or extinction (SARA Registry, 2012). – Special Concern - a wildlife species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats (SARA Registry, 2012). ■ SARA also manages species of Special Concern by identifying proactive measures to prevent them from becoming endangered or threatened. ■ This Act includes prohibitions against killing, harming, harassing, capturing or taking an individual of a SAR listed as Extirpated, Endangered or Threatened, prohibits the destruction of their critical habitats and can impose restrictions on development and construction projects. ■ Species listed as Extirpated, Endangered or Threatened under SARA are only protected on federal lands unless they are aquatic species or migratory birds listed on Schedule 1. The Governor and Council may issue an order for additional species listed as SAR under SARA to be protected on non-federal lands where critical habitat has been identified and other provincial or municipal legislation does not adequately protect the species. ■ For the purposes of this report, SOCC includes migratory birds listed as Extirpated, Endangered or Threatened under Schedule 1 of the *SARA (2002)*.

Legislation	Governing Authority	Relevant Information
Planning Act (1990) and Provincial Policy Statement (2020)	Ministry of Municipal Affairs and Housing	■ The *Ontario Provincial Policy Statement*, *2020* (PPS) was issued under Section 3 of the *Ontario Planning Act, 1990*. ■ PPS identifies seven (7) types of natural heritage features to be protected: – Significant habitat of endangered or threatened species; – Significant wetlands; – Coastal wetlands; – Significant woodlands in Ecoregions 6E and 7E; – Significant valleylands in Ecoregions 6E and 7E; – Significant wildlife habitat (SWH), including habitat of SOCC; and – Significant Areas of Natural and Scientific Interest (ANSI). ■ Policies in the PPS are used to guide decision making in the Class EA for Provincial Transportation Facilities process. Under the PPS, development and site alteration are prohibited in significant wetlands. In addition, development and site alteration are not permitted within the remaining natural heritage features unless it can be shown that there will be no negative impact.
Migratory Birds Convention Act (1994)	Environment and Climate Change Canada	■ Intended to protect migratory birds, their eggs and their nests. ■ Includes more than 700 species of birds. ■ Prohibits the possession, destruction and harm of migratory birds and / or their nests.

1.4.1 Notice of Approval to Proceed with the Undertaking – Conditions of Approval Regarding Henslow's Sparrow

A Notice of Approval to Proceed with the Undertaking was granted on January 22, 2009. The notice included various conditions to be addressed during further stages of design, one of which relates to the potential presence of Henslow's sparrow (*Ammodramus henslowii*) in the Study Area. This species is designated as Endangered on the Species at Risk in Ontario (SARO) list. **Table 2** below includes the specific conditions of approval and how this study addresses them.

Table 2: Notice of Approval to Proceed with the Undertaking – Condition 5: Henslow's Sparrow

#	Condition
5.1	The proponent shall update and verify the Henslow's sparrow (*Ammodramus henslowii*) habitat investigations documented in the Addendum issued November 1997 to confirm that the proposed highway ROW continues to have no potential impacts on the habitat for Henslow's Sparrow.
5.2	The proponent shall update the investigations described in Condition 5.1 by conducting additional investigations within appropriate time periods (i.e., during nesting and breeding season) during the detailed design phase. If the above investigation is undertaken within one year of construction, an additional investigation would not be required immediately prior to construction.
5.3	In the event that the investigations do demonstrate potential impacts, the proponent shall notify the MNRF and Environment Canada and consider all direction provided by the MNRF and Environment Canada.

2. Preliminary Design Review

2.1 Environmental Assessment and Preliminary Design Report

A summary of terrestrial ecosystems existing conditions previously identified within the Study Area as outlined in the Environmental Assessment and Preliminary Design Report for Highway 6 Freelton Northerly 16.9 km to Guelph W.P. 65-76-05 (MTO, 1995); henceforth referred to as the Preliminary Design Report, are summarized herein. It should be noted that there has been greater than 20-years time elapsed between the original EA and Preliminary Design Study and the current Preliminary Design Review and Detailed Design (to a Design-Build-Ready status). During that time there have been considerable changes to provincial policies and legislative requirements, particularly concerning the establishment of the *ESA,* which protects SAR and SAR habitat. Furthermore, the existing conditions within the Study Area for the Preliminary Design Report have also changed, particularly with respect to urban development in and around the Study Area for the Preliminary Design Report. AECOM has completed a background information review and extensive field investigation to assess the current existing conditions of the Project Study Area; these will be described in detail in **Section 4** of this report.

2.1.1 Designated Natural Areas

The Preliminary Design Report, identified a total of Five (5) Environmentally Sensitive Areas, these include:

- Beverly Swamp – which is designated as both a regional ANSI and a Provincially Significant Wetland (PSW), Class 1;
- Fletchers Creek Swamp Forest – which is designated as a Regional ANSI and a PSW Class 1;
- Crieff Old Field Complex – which is a municipality designated ESA;
- Galt Creek and Forest - which is designated as a Regional ANSI and a PSW Class 1; and,
- Aberfoyle Woods- which is a PSW Class 1.

In addition, the report also cites the identification of eight (8) other wetlands (Class 4-7) and several unclassified wetlands present within the Study Area for the Preliminary Design Report. It should be noted that wetlands are no longer evaluated using class

designations, rather a wetland can be unevaluated, evaluated as not significant or evaluated as significant (i.e., a PSW). The most current designations of natural areas, including wetlands, are provided in **Section 4.1** of this report.

2.1.2 Vegetation

Background information review and field investigation to evaluate forestry resources and wetlands were undertaken by Fenco Maclaren Inc. in 1987 and 1992 as described in Volume 3 of the Preliminary Design Report. These investigations confirmed that the Study Area for the Preliminary Design Report straddled two (2) Forest Regions, the Niagara Section of the Deciduous Forest Region and the Ontario Section of the Great Lakes-St. Lawrence Forest Region (Rowe, 1972). A total of 18% of the Study Area for the Preliminary Design Report was identified as forested. Generally, forests within the Study Area for the Preliminary Design Report were described as:

- Mature red maple (*Acer rubrum*) and silver maple (*Acer saccharinum*) wetland forest;
- Lowland and wetland succession forest dominated by white cedar (*Thuja occidentalis*), trembling aspen (*Populus tremuloides*) and balsam poplar (*Populus balsamifera*);
- Upland mature woods dominated by sugar maple (*Acer saccharum*); and,
- the Morrison Tract, a MNRF managed plantation on MTO lands which consists largely of plantation.

Since the introduction of *Ecological Land Classification for Southern Ontario* (Lee *et al.* 1998), the study and classification of vegetation have been systematized to provide a more comprehensive analysis of vegetation communities. The entirety of the Project Study Area has received Ecological Land Classification (ELC) and is discussed in further detail in **Section 4.2** of this report.

2.1.3 Wildlife

Given the prevalence of Environmentally Sensitive Areas, the Study Area for the Preliminary Design Report was noted as both topographically and floristically diverse, providing a diversity of wildlife habitat. A summary of wildlife species present within the Study Area for the Preliminary Design Report was not given; however the Preliminary Design Report identified the following wildlife resources deemed important to MNRF:

- Three (3) waterfowl areas;
- Three (3) deer winter ranges; and
- One (1) west Virginia white (*Pieris viginiensis*) butterfly site.

Due to the changes in provincial policy; how wildlife and wildlife habitat is assessed also changed. Wildlife habitat is assessed following several guidance documents such as the Natural Heritage Reference Manual (MNRF, 2010) the Significant Wildlife Habitat Technical Guide (MNRF, 2000) and the Ecoregion Criterion Schedule specific to the project location. Determination of significance of SWH is linked to the results of the ELC and observations of wildlife during field investigations. Vegetation classification, wildlife surveys and determination of SWH for the entirety of the Project Study Area will be discussed in detail throughout **Section 4** of this Report.

3. Methods

3.1 Background Information

Prior to the initiation of field investigations, a background review was conducted to obtain information on natural features, wildlife and wildlife habitat and species records within the Study Area. The following sources were utilized:

- National Heritage Information Centre (NHIC) rare species records (MNRF, 2021);
- Ontario Breeding Bird Atlas (OBBA) (Cadman *et al.*, 2007);
- Ontario Reptile and Amphibian Atlas (ORAA) (Ontario Nature, 2019);
- Ontario Butterfly Atlas (OBA) (TEA, 2020);
- Bat Conservation International (BCI) Species Profiles (BCI, 2021a, b, c, d);
- The Preliminary Design Report (MTO, 1995); and,
- Addendum to the Preliminary Design Report (MTO, 1997).

In addition, a request for SAR information was made to the MNRF Guelph District office on April 27, 2017 and a response was received on June 30, 2017. Since this time, correspondence with the MNRF was ongoing through April 1, 2019. Thereafter, the administration of the *ESA* became the responsibility of the MECP. Since April 2019, correspondence with the MECP regarding this project has been ongoing. A copy of agency correspondence, as it pertains to the information request is provided in **Appendix A**.

3.2 Field Investigations

3.2.1 Vegetation Communities and Plant Inventory

Natural areas (i.e., areas with naturalized vegetation) within the Study Area were visited during the growing season to determine vegetation community boundaries and classification. Surveys took place throughout 2017 to 2019 during the growing seasons. Sites within the Study Area that could not be visited due to site access constraints were assessed either by roadside surveys or air photo interpretation. More consideration was given to identifying provincially or regionally rare flora and the presence of SAR plants.

3.2.1.1 Data Analysis

Ecological Land Classifications

Each vegetation community within the Study Area was assessed and classified into ELC units as per the *Ecological Land Classification System for Southern Ontario* (Lee et al. 1998). This system provides a standard for comparing similar communities across Ontario. This protocol classifies vegetation communities through the completion of a multilayer (canopy, sub-canopy and ground cover) vegetation inventory. A summary of disturbance factors, community conditions, vascular plant species list and representative photographs were also recorded for each vegetation patch. When wetland communities were observed, their boundaries were refined using the 50/50 rule as per the *Wetland Evaluation Guidelines for Southern Ontario* (MNRF, 2013).

Community Sensitivity

Vegetation community sensitivity was determined based on calculating the 'Mean Coefficient of Conservatism', the 'Floristic Quality Index' and the 'Weediness Index' for all vegetation communities present within the Study Area. These three (3) parameters are intended to be used together to assign an ecological community sensitivity ranking based on plant species composition, not the actual value of a particular community. This method applies a metric to describe a community's overall sensitivity towards disturbance based on the groupings of plants present within the community using:

- Co-efficient of Conservatism (CC)*:* These values, range from 0 (low) to 10 (high), and are based on species tolerance of disturbance and fidelity to a specific habitat.

  Vegetation species and community sensitivity were assessed through the application of CC values, assigned to each native species in southern Ontario (Oldham, et. al, 1995). These values range from 0 (low) to 10 (high), and the occurrence of species with a CC of 9 or 10 can be good indicators of undisturbed conditions such as mature forests, fens or bogs. General habitat values associated with the CC values are:

  - 0-3: species found in a wide variety of communities, including disturbed sites
  - 4-6: species associated with a specific community, but tolerate moderate disturbance
  - 7-8: species associated with a community in an advanced successional stage, tolerant of minor disturbances

  - 9-10: species with a high degree of fidelity to a narrow range of synecological parameters

- Floristic Quality index: The floristic quality of an area is reflected in the mean value of CC. For example, an old field or grazed woodlot would tend have a low mean CC; these habitats are dominated by opportunistic species that occur in a wide range of site conditions and are tolerant of disturbance. A bog, prairie or intact forest would have a higher value, reflecting the specific habitat requirements of many of the species and a generally undisturbed condition.
- Weediness Index: These values range from -1 (low) to -3 (high) and quantify the potential invasiveness of non-native plants. In combination with the percentage of non-native plants, this index was used as an indicator of disturbance and assessed natural areas' sensitivity. The Weediness Index was used to quantify the potential invasiveness of non-native plants. In combination with the percentage of non-native plants, it can be used as an indicator of disturbance. Values (ranging from -1 to -3) have been assigned to most non-native species based on the potential impact each species can have in natural areas:
  - -1: Little or no impact on natural areas (most non-native plants are in this category)
  - -2: Occasional impacts on natural areas, generally infrequent or localized
  - -3: Major potential impacts on natural areas

3.2.2 Wildlife and Wildlife Passage

3.2.2.1 Breeding Birds

Breeding bird surveys were conducted in the Study Area using a combination of area searches and point counts. Due to the large size of the Study Area, aerial photo interpretation and ELC data were used to determine which properties presented the best location to conduct breeding bird surveys.

Survey areas consisted of property parcels. At the start of each survey, the time and weather conditions (temperature, wind, and precipitation) were recorded. The portion of the property containing suitable habitat within approximately 200 m of the proposed highway alignment was surveyed, where site access was granted. All encountered birds exhibiting breeding or territorial behaviour (e.g., singing males, pairs, alarm calls) were marked at the appropriate location on an aerial photo map. The type of breeding behaviour was recorded on a field form.

Point count surveys were conducted at representative locations to provide additional quantitative data. OBBA (2001) and Environment Canada – Canadian Wildlife Service (EC-CWS) (2009) protocols recommend two (2) point-count surveys to be completed at each station at least a week apart during the breeding bird period between May 24 and July 10. However, for the purposes of this report, and given the large size of the Study Area, only one (1) round of surveys was completed for each point. Surveys were completed between 5:30 am and 10:00 am under appropriate weather conditions (i.e., no precipitation, calm to light wind) (EC-CWS, 2009). Each point-count consisted of a 5-minute survey in 2017 and a 10-minute survey in 2018. The information recorded included species, the number of individuals, breeding behaviour, habitat, and location of the observed bird within or outside a radius of 100 m from the observer. Birds flying over during point count surveys were recorded as flyovers.

Furthermore, when suitable grasslands habitats were identified (i.e., CUM1, CUM2, or agricultural lands not currently farmed) through ELC classification or aerial photo interpretation, a grassland survey was conducted. These surveys were initiated to target potential grassland SAR within the area, such as bobolink (*Dolichonyx oryzivorus)*, and eastern meadowlark (*Sturnella magna*). They were completed in accordance with the Bobolink Survey Methodology, dated April 2012 from the MNRF Guelph District. These surveys are discussed further in **Section 3.2.3 and 4.4** and under a separate technical memorandum (Refer to **Appendix B**).

3.2.2.2 Structure Survey for Nesting Birds

All structures (e.g., culverts) that may be affected by construction activities in the Study Area were surveyed for the presence of birds that build nests on or in anthropogenic structures, including but not limited to barn swallow (*Hirundo rustica*). In addition to checking structures for the presence of birds, details of the structures that may affect their likelihood to be used by birds (i.e., material, shape, size, water levels and relative noise level) were also documented. Structures identified within the Study Area were assessed at least once during the breeding bird season. Results of the structure surveys are presented in **Section 4.3.2** below.

3.2.2.3 Amphibian Surveys: Vernal Pool Assessment and Amphibian Calling Surveys

A daytime site visit was conducted in conjunction with ELC surveys to identify suitable amphibian breeding habitat within the Study Area, confirm the initial amphibian survey locations.

The following parameters were used to identify potentially suitable amphibian breeding vernal pools:

- Small, isolated pools (lacking the presence of fish populations);
- Potential to hold water at least until July or have water depths of at least 30 cm in early spring. The 30 cm depth criterion is consistent with the recommendations of Calhoun and deMaynadier (2004); and,
- Were in proximity to deciduous or mixed upland forest (Linton et al. 2018);

Each viable vernal pool was mapped and marked using a GPS, as the identified pools served as the amphibian/salamander survey stations. Water depth, classification of surrounding vegetation, in water characteristics (i.e., %vegetation vs % open water), and evidence of breeding amphibians (egg masses) was recorded.

Amphibian call surveys were conducted at survey locations confirmed through daytime site visits described above. Three (3) site visits were conducted during the breeding season (April to July) to detect early and late anuran breeders. Following the Ontario Marsh Monitoring Program Participant's Handbook for Surveying Amphibians (Bird Studies Canada 2009), surveys did not begin until at least one-half hour after sunset and were completed before midnight. In addition, surveys were only conducted during suitable weather conditions, which included winds less than 19 km/hr (0-4 on the Beaufort wind scale) and minimum night-time air temperatures of at least 5°C for the first survey, 10°C for the second survey and 17°C for the third survey. It should be noted that surveys were conducted at lower temperatures, in accordance with the protocol if there was strong calling activity observed. Species observed and call frequencies were recorded by biologists during each three (3) minute point count. The frequency categories of anuran calls are as follows:

- 0 – None heard.
- 1 – Individuals can be counted, calls not overlapping.
- 2 – Numbers of some individuals can be estimated or counted, others overlapping.
- 3 – Full chorus, calls continuous and overlapping, and individuals not distinguishable.

Sites that were deemed unsuitable during the amphibian call surveys due to a change in habitat characteristics (i.e., insufficient water present) were eliminated.

3.2.2.4 Significant Wildlife Habitat

A SWH screening exercise was conducted using the Wildlife Habitat Ecoregion Criteria Schedule 6E (MNRF, 2015a) to determine the presence of candidate SWH within the Study Area. The presence of candidate habitat for all five (5) SWH categories was determined by comparing existing conditions based on ELC site investigations to criterion listed within the 6E schedule. SWH features were confirmed using data obtained from targeted wildlife surveys and incidental wildlife observations as discussed in **Section 4.3.2** and the listed criteria in Schedule 6E. Those habitats that met the required criteria were identified as confirmed. Those that could not be confirmed based on the available data were considered candidate SWH. SWH is described in further detail in **Section 4.3.2 .**

3.2.2.5 Incidental Wildlife Observations

Incidental wildlife observations were recorded during all field investigations. Incidental wildlife observations included species sightings, calls, tracks, scat, or other wildlife activity evidence.

3.2.2.6 Wildlife Passage

Wildlife passage was assessed via desktop analysis and considered results of the field investigations within the Study Area. Wildlife passage tends to occur along watercourses and riparian areas. As such, the culverts within the Study Area were considered potential wildlife passages areas. As well, the presence of any noted wildlife as dead upon or near the road also indicated locations of wildlife movement.

3.2.3 Species at Risk

3.2.3.1 Species at Risk Habitat Assessment

A SAR habitat assessment was conducted based on the results of the background information review, consultation with the MNRF, as well as the results of the field investigations. The SAR habitat assessment was conducted for these SAR identified through the background review as having the potential to be present within the Study Area. Potentially suitable SAR habitat within the Study Area was determined by reviewing aerial photography, examining existing conditions onsite, and comparing those to habitat descriptions of each SAR species. Results of the SAR habitat assessment are discussed in **Section 4.4**.

3.2.3.2 Targeted Species at Risk Surveys

Several targeted SAR surveys were undertaken within the Limits of Work, resulting from the SAR Habitat Assessment, correspondence with the MNRF regarding SAR potentially present within the Study Area, and to meet conditions outlined in the Notice of Approval to Proceed with the Undertaking. A brief description of the survey methods of each survey type is provided below. Further details pertaining to survey methods are provided in the SAR Survey Memos in **Appendix B**. It should be noted that these memoranda were prepared for the entirety of The Highways 6 and 401 Improvements from Hamilton North Limits to Guelph South Limits, including the New Alignment of a Segment of Highway 6 (G.W.P. 3042-14-00) Project; therefore they include areas beyond the Study Area described in **Section 1.3.**

Bat Species at Risk: Little Brown Myotis, Northern Myotis, Eastern Small-footed Myotis and Tricolored Bat

Field investigations to identify bat SAR and bat SAR habitat were conducted following the *Survey Protocol for Species at Risk Bats within Treed Habitats: Little Brown Myotis, Northern Myotis & Tri-colored Bat* (MNRF, 2017) with minor protocol modifications that were approved by MNRF Guelph District.

The investigations included desktop analyses and field investigations to identify suitable ELC vegetation communities known to be potentially suitable bat habitats within the Limits of Work. Following which field investigations were undertaken to identify suitable maternity roosting habitat for bat SAR within the Limits of Work. Rock outcrops or rock piles that may represent potentially suitable roosting habitat for Eastern Small-footed Myotis (*Myotis leibii*) were also searched for during the bat SAR habitat field investigations. Finally, acoustic monitoring was undertaken in suitable wooded habitat areas within the Limits of Work to determine the presence of bat SAR. Further details pertaining to survey methods and the protocol modifications mentioned above are provided in the SAR Survey Memos in **Appendix B**.

Crepuscular Bird Species at Risk: Eastern Whip-poor-will and Common Nighthawk

Field investigations to confirm the presence or absence of two (2) crepuscular birds, eastern whip-poor-will (*Antrostomus vociferus*) and common nighthawk (*Chordeiles minor*) were conducted within the Limits of Work, following the Eastern Whip-poor-will and Common Nighthawk Survey Protocol (MNRF, 2018). Eastern whip-poor-will is Threatened under the ESA and therefore considered SAR for this report, whereas Common Nighthawk is Special Concern under the ESA and considered SOCC.

These surveys involved an initial habitat assessment for eastern whip-poor-will and common nighthawk habitat, which was generally followed by three (3) rounds of surveys

during the appropriate lunar cycle windows (i.e., May 25 to June 6, 2018, June 23-July 7, 2018 and June 10 – 20, 2019). Each survey was conducted when the moon is visible between 30 minutes after sunset and 30 minutes before sunrise and under suitable weather conditions (i.e., little or no cloud cover, calm or light winds, no precipitation and temperatures above 10°C). Further details pertaining to survey methods are provided in the SAR Survey Memos in **Appendix B**.

Grassland Bird Species at Risk; Bobolink and Eastern Meadowlark

Field investigations to confirm the presence or absence of bobolink and eastern meadowlark, referred to as grassland bird SAR, were conducted within the Limits of Work following the Bobolink Survey Methodology (MNRF Guelph District, 2012).

These surveys involved an initial habitat assessment of each potential grassland bird SAR habitat followed by three (3) rounds of surveys at each potential grassland habitat from June 1 to the first week of July. Each survey was separated by a week or more from the previous surveys. Surveys were undertaken from 30 min after dawn to 9:00 am with no rain, no to low wind speed and good visibility. Further details pertaining to survey methods are provided in the SAR Survey Memos in **Appendix B**.

Henslow's Sparrow

Field investigations to confirm the presence or absence of Henslow's sparrow and the habitat of Henslow's sparrow within the Limits of Work were conducted during breeding bird surveys and grassland bird SAR surveys as described in **Sections 3.2.2** and **3.2.3**, respectively**.**

Further details pertaining to survey methods are provided in the SAR Survey Memos in **Appendix B**.

Jefferson Salamander/ Unisexual Ambystoma (Jefferson Salamander dependant population)

Field investigations to confirm the presence or absence of Jefferson salamander (*Ambystoma jeffersonianum*) and the habitat of Jefferson salamander within the Limits of Work were conducted in accordance with the following documents and permits:

- Sampling Protocol for Determining the Presence of Jefferson Salamanders (*Ambystoma jeffersonianum*) in Ontario prepared by the Jefferson Salamander Recovery Team (JSRT) (June, 2013);
- Wildlife Animal Care Protocol (18-417, 19-417 & 20-417);
- Wildlife Scientific Collectors Authorization (1088798, 1092951 & 1095107); and,
- ESA 17(2)(b) permit (GU-B-004-18).

These surveys involved an initial habitat assessment of each potential vernal pool followed by five (5) rounds of trapping and visual surveys for egg masses. Trapping and visual egg mass surveys were required to be completed for a total of three (3) years. Surveys were completed in 2018, 2019 and 2020. Any captured salamander suspected of being a Jefferson salamander or unisexual ambystoma (Jefferson salamander dependent population) was photographed. A 0.3 – 0.5 mm portion of the tail tip was removed as a tissue sample. Tissue samples were provided to the Dr. Bogart's laboratory at the University of Guelph, for genetic testing to confirm the specimen's genetic complement. Genetic testing is necessary in order to determine if the species captured are afforded protection under the *ESA*. Further details pertaining to survey methods are provided in the SAR Survey Memos in **Appendix B**.

Monarch

Monarch (*Danaus plexippus)* is currently designated as *Special Concern on the SARO list. At the request of MNRF Guelph District, additional f*ield investigations to confirm the presence or absence of the breeding habitat for the species were undertaken. MNRF's request was made based on the *possibility for monarch to become up-listed under the ESA before project completion.*

There is no formal protocol from the MNRF, which outlined a standard method to survey for the species. AECOM field staff primarily searched for and documented patches of milkweed during the vegetation communities and plant inventory investigations as described in **Section 3.2.1** above. When patches of milkweed were identified, visual surveys to determine presence/absence of monarch/larvae (June-August) under suitable weather conditions (i.e., temps >15°C, sunny skies, light to calm winds) were undertaken.

As noted, Special Concern species are considered as SOCC for this report; therefore, monarch and monarch habitat will be considered SWH for Habitats for SOCC. Refer to ***Sections 3.2.2, 4.3*** *and* ***5.3*** *for further details pertaining to SWH and monarch.*

Turtle Species at Risk: Blanding's Turtle and Snapping Turtle

Field investigations to confirm the presence or absence of Blanding's turtle (*Emydoidea blandingii*) and snapping turtle (*Chelydra serpentina*) herein referred to as turtle SAR, were conducted within the Limits of Work, following the methods for Identification of Survey Sites and Visual Encounter Surveys as outlined in Section 3.4 and Section 3.5 of the Survey Protocol for Blanding's Turtle *(Emydoidea blandingii)* in Ontario (MNRF, 2015b).

These surveys involved an initial habitat assessment of each potential wetland followed by five (5) visual encounter surveys at each potential wetland spread over at least three

(3) weeks during the survey window (ice-off to June 15). Each survey was carried out between 8:00 am and 5:00 pm under suitable weather conditions. Suitable weather conditions were considered when the air temperature was warmer than the water temperature and above 5°C during sunny periods or was above 15°C on partially cloudy or overcast days. Further details pertaining to survey methods are provided in the SAR Survey Memos in **Appendix B**.

*As noted, Special Concern species are considered SOCC for this report; therefore, snapping turtle and snapping turtle habitat will be considered as SWH for Habitats for SOCC. Refer to **Sections 3.2.2, 4.3** and **5.3** for further details pertaining to SWH and snapping turtle.*

4. Existing Conditions

4.1 Designated Natural Areas

4.1.1 Background Data

Through background review and correspondence with the MNRF (2017) , the following natural heritage features have been identified within the Study Area. These features are illustrated on **Figure 2.**

- Deer wintering areas (Stratum 2)
- Mill Creek Puslinch PSW Complex

4.1.2 Field Investigation

Deer wintering areas and the Mill Creek Puslinch PSW Complex received field investigation through the investigations described in Sections **4.2**, **4.3** and **4.4**.

4.1.3 Determination of Significance

The MNRF assesses deer wintering areas and PSWs. As such, these features are identified as confirmed SWH and an evaluated PSW, respectively.

4.2 Vegetation Communities and Plants

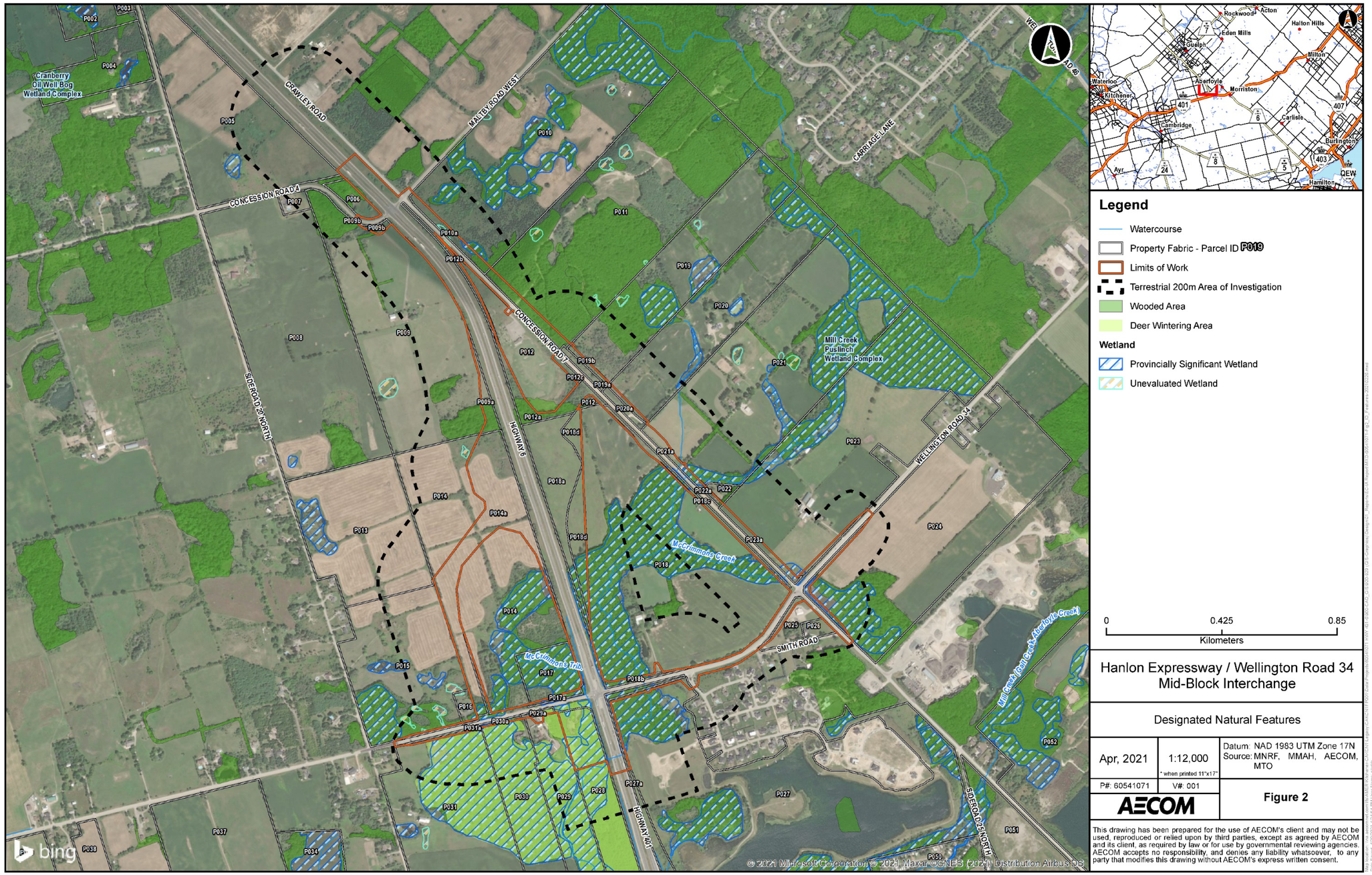
4.2.1 Background Data

No SAR plants were identified through correspondence with the MNRF(2017); however, butternut (*Juglans cinera*) was considered potentially present given the known range of this species.

4.2.2 Field Investigations

The Study Area is largely represented by agricultural lands interspersed with remnant woodlands and wetlands. Some commercial and residential properties are also present. Natural areas throughout the Study Area are generally limited; however, within the vicinity of Highway 6 and Wellington Road 34 intersection, an extensive naturalized woodland is present. This feature has been fragmented by existing infrastructure.

Figure 2: Designated Natural Features



Field investigations confirmed the following vegetation communities within the Study Area:

- deciduous forests (FOD);
- deciduous, coniferous, mixed and thicket swamps (SWD, SWC, SWM and SWT);
- cultural plantations, woodlands, thickets and meadows (CUP, CUW, CUT, and CUM); and,
- marshes and open water communities (MAM, MAS, and OAO).

A detailed description of each community can be found in **Appendix C1.** Vegetation communities found within the Study Area are illustrated in **Figure 3**. **Table 3** below summarizes the location of the ELC polygons delineated throughout the Study Area.

Table 3: Vegetation Communities

Communities	ELC Code	Property ID's
Cultural Communities (CU)	CUM1-1: Dry – Moist Old Field Meadow	P005, P006, P009, P009a, P012, P012a, P012b, P012c, P014, P014a, P015, P016, P018, P018a, P018c, P018d, P019, P019a, P019b, P020, P020a, P021, P021a, P023a, P027, P027a, P031 and the ROW
Cultural Communities (CU)	CUP3: Coniferous Plantation	P010, P010a, P011, P028, P028, P029, P029a
Cultural Communities (CU)	CUP3-2: White Pine Coniferous Plantation	P010 and P011
Cultural Communities (CU)	CUP3-3: Scotch Pine Coniferous Plantation	P011, P012a, P019, P019a, and P019b
Cultural Communities (CU)	CUT1: Mineral Cultural Thicket Ecosite	P010 and P010a
Cultural Communities (CU)	CUW1: Mineral Cultural Woodland Ecosite	P014, 015, P017, P017a, P019, P019b, P020, P025 and P026
Forested Communities (FO)	FOC2-2: Dry – Fresh White Cedar Coniferous Forest	P015, P016, P018a and P018d
Forested Communities (FO)	FOD5-2: Dry – Fresh Sugar Maple Deciduous Forest	P011 and P019
Forested Communities (FO)	FOD5-2: Dry – Fresh Sugar Maple – Beech Deciduous Forest	P005, P006, P007, P008, P009, P009a, P009b, P014, and P014a
Forested Communities (FO)	FOD5-6: Dry – Fresh Sugar Maple-Basswood Deciduous Forest	P012, P012a, P018a and P018d
Forested Communities (FO)	FOD6-4: Fresh-Moist Sugar Maple-White Elm Deciduous Forest	P012, P012a, P018 and P018d
Forested Communities (FO)	FOD7: Fresh – Moist Lowland Deciduous Forest	P018, P018c, P021, P021a, P022, P022a and P023
Marsh Communities (MA)	MAM2-2: Reed-canary Grass Mineral Meadow Marsh	P014a, P015, P016, P023 and P023a

Communities	ELC Code	Property ID's
Marsh Communities (MA)	MAS: Shallow Marsh	P023
Marsh Communities (MA)	MAS2-1: Cattail Mineral Shallow Marsh	P014, P014a, P018, P018c, P021, P021a and P024
Marsh Communities (MA)	Open water communities (OA)	**Open water communities (OA)**
Marsh Communities (MA)	OAO: Open Aquatic	P028
Swamp Communities (SW)	SWC: Coniferous Swamp	P018 and P023
Swamp Communities (SW)	SWC3-1: White Cedar Organic Coniferous Swamp	P028 and P029
Swamp Communities (SW)	SWD: Deciduous Swamp	P014
Swamp Communities (SW)	SWD3: Maple Mineral Deciduous Swamp	P018, P018c and P024
Swamp Communities (SW)	SWD3-2: Silver Maple Mineral Deciduous Swamp	P010
Swamp Communities (SW)	SWD6-2: Silver Maple Organic Deciduous Swamp	P028, P029
Swamp Communities (SW)	SWD7: Birch – Poplar Organic Deciduous Swamp	P018, P018d
Swamp Communities (SW)	SWD7-1: White Birch-Poplar Organic Deciduous Swamp	P027, P027a
Swamp Communities (SW)	SWM: Mixed Swamp	P015 , P029, P030, P031
Swamp Communities (SW)	SWM3: Birch – Poplar Mineral Mixed Swamp	P031
Swamp Communities (SW)	SWM4-1: White Cedar-Hardwood Organic Swamp	P014, P014a, P015, P016, P017, P017a, P018, P018b, P028, P029, P030, P030a, P031 and P031a
Swamp Communities (SW)	SWT: Thicket Swamp	P015
Swamp Communities (SW)	SWT2: Mineral Thicket Swamp	P028
Swamp Communities (SW)	SWT2-5: Red-osier Mineral thicket Swamp	P021 and P021a
Swamp Communities (SW)	SWT3: Organic Thicket Swamp	P018, P018a, P018d, P027, and P027a
Swamp Communities (SW)	SWT3-1: Alder Organic Thicket Swamp	P018 and P018b

Figure 3: Field Investigations

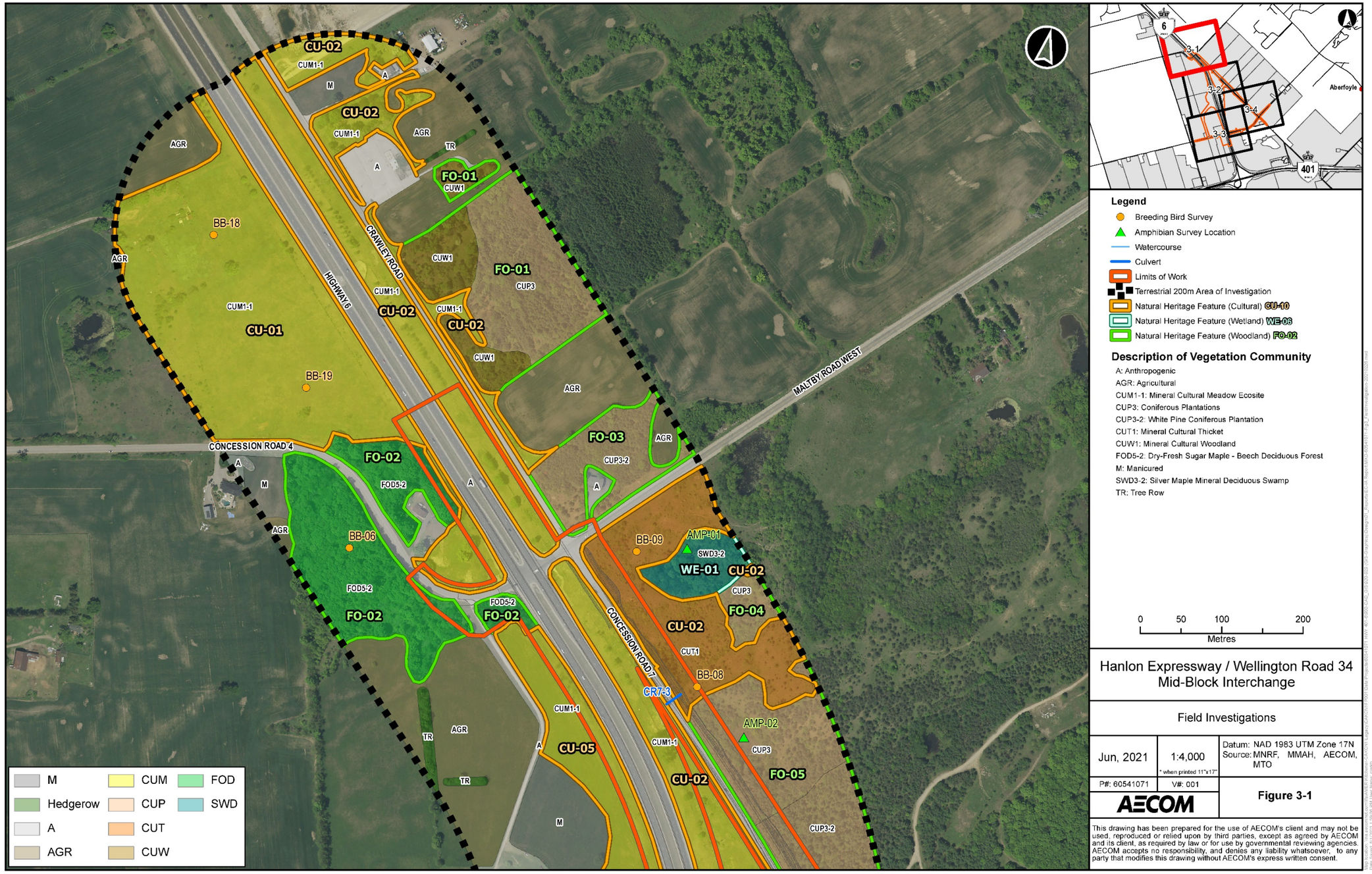


Figure 3: Field Investigations

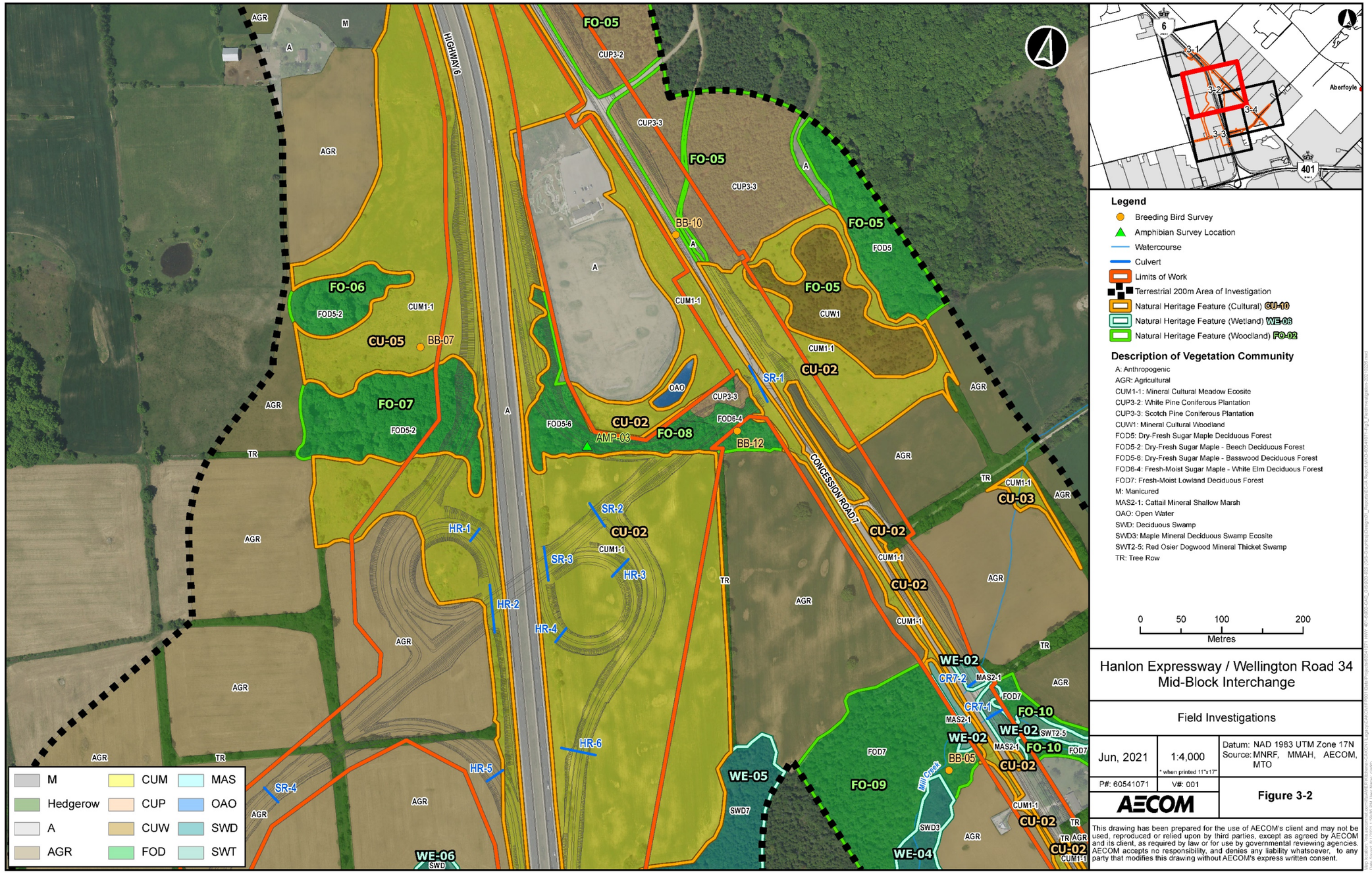


Figure 3: Field Investigations