# Terrestrial Ecosystems Existing Conditions Report - Highway 401 Expansion from Cobourg to Colborne

Final Report

Preliminary Design and Class Environmental Assessment
Agreement 4015-E-0033
Assignment 5

October 31, 2018

Prepared for:
Ministry of Transportation
Eastern Region
355 John Counter Boulevard
Postal Bag 4000
Kingston, ON K7L 5A3

Prepared by:
Stantec Consulting Ltd.
835 Paramount Drive, Suite 200
Stoney Creek, ON L8J 0B4

165001057

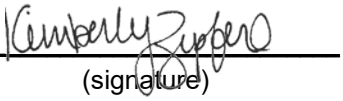
This page left blank intentionally

# Sign-off Sheet

This document entitled Terrestrial Ecosystems Existing Conditions Report - Highway 401 Expansion from Cobourg to Colborne was prepared by Stantec Consulting Ltd. for the account of the Ontario Ministry of Transportation. The material in it reflects Stantec's best judgment in light of the information available to it at the time of preparation. Any use which a third party makes of this report, or any reliance on or decisions made based on it, are the responsibilities of such third parties. Stantec Consulting Ltd. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

Prepared by

**Brandon Holden**
Terrestrial Ecologist

Prepared by 
(signature)

**Kimberly Zupfer, M.Sc.**
Ecologist

Reviewed by 
(signature)

**Debra Giesbrecht, M.Sc.**
Senior Ecologist

This page left blank intentionally

# Table of Contents



**LIST OF TABLES**



**LIST OF FIGURES**



**LIST OF APPENDICES**

This page left blank intentionally

# 1.0 INTRODUCTION

The Ontario Ministry of Transportation (MTO) retained Stantec Consulting Ltd. to undertake a Planning, Preliminary Design, and Class Environmental Assessment (Class EA) Study on Highway 401 for the replacement and rehabilitation of structures, interchange modifications, future widening of the highway, and commuter parking lot expansions, from 2 km east of Nagle Road to Percy Street (approximately 18 km). The purpose of the study is to identify a Recommended Plan that addresses current and future transportation needs in the study area as part of the Ministry's ongoing review of safety and operational needs for the provincial highway network. This study includes a review of existing conditions, development and evaluation of alternatives, identification of appropriate improvements, and development of environmental protection / mitigation measures. A Recommended Plan will be confirmed and designated (protected) at the completion of the study. An additional study is being undertaken for a new interchange near Nagle Road (GWP 4059-17-00). The Nagle Road interchange area is also covered in this report.

This Terrestrial Ecosystems Existing Conditions Report provides supporting documentation for the project, including a characterization of the terrestrial environment and terrestrial species for lands within 120 m of the highway right-of-way and within 400 m around interchanges (the Study Area). The report was completed in accordance with Section 3.2 - Terrestrial Ecosystems and Section 4 – Wildlife and Wildlife Management contained within the *Environmental Reference for Highway Design* (MTO 2013). With the exception of **Figure 1**, all figures referenced in this report are provided in **Appendix A**.

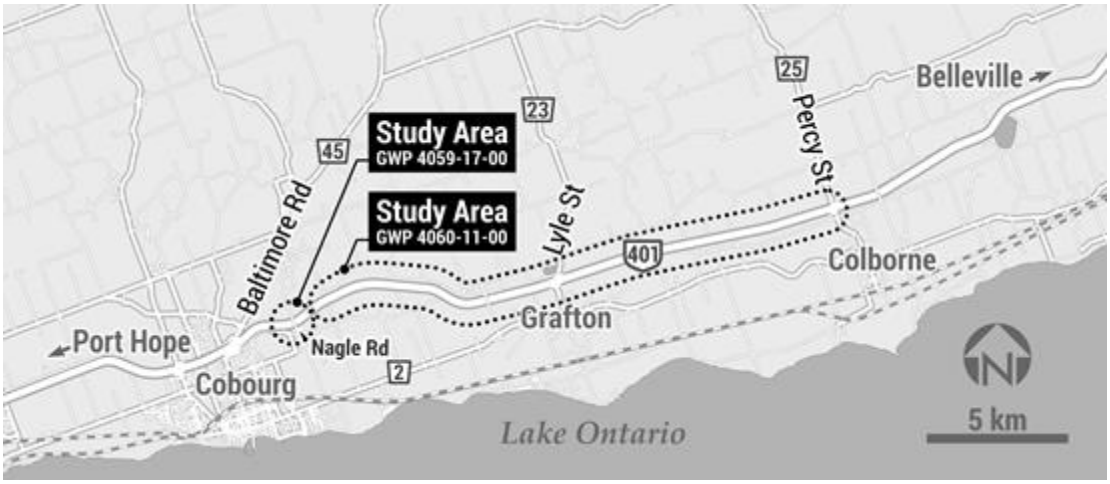



**Figure 1: Highway 401 Planning Study from Cobourg to Colborne – Study Area**

# 2.0 METHODS

## 2.1 BACKGROUND DATA AND AGENCY CONSULTATION

The Study Area is located within the Peterborough District of the Ministry of Natural Resources and Forestry (MNRF) in Northumberland County. Consultation with MNRF is required to obtain available data for terrestrial ecosystems within the Study Area that is not available in public databases. Consultation has not occurred at this time but is necessary to confirm available public data and determine future requirements for significant features and Species at Risk (SAR). Aquatic resources are documented in *Fish and Fish Habitat Existing Conditions Report* (Stantec 2018). Background information was obtained from the following resources:

- MNRF's Natural Heritage Information Centre (NHIC) online database (MNRF 2018a)
- Land Information Ontario Natural Heritage Area Mapping tool (MNRF 2018b)
- Species at Risk Act (SARA), Schedule 1(Government of Canada 2018)
- Species at Risk in Ontario (SARO) List (MNRF 2018c)
- The 2nd Ontario Breeding Bird Atlas (OBBA; Cadman et al. 2007)
- Atlas of Mammals of Ontario (AMO; Dobbyn 1994)
- Ontario Reptile and Amphibian Atlas (ORAA; Ontario Nature 2018)

## 2.2 FIELD DATA COLLECTION

Stantec conducted field investigations within the Study Area from August 12 – 16, 2017. Data was collected according to the *Environmental Reference for Highway Design* (MTO 2013). Field investigations focused on identifying and describing vegetation communities, wildlife habitat, flora and fauna species, and areas of potential Significant Wildlife Habitat. Investigations of adjacent private lands were conducted from the edge of the Highway 401 right-of-way (ROW). Investigations in the area extending 800 m east of Percy Road were restricted to desktop assessments.

### 2.2.1 Vegetation Communities and Floristic Survey

Detailed vegetation community mapping and botanical inventories were conducted using the Ecological Land Classification (ELC) system for southern Ontario (Lee et al. 1998). Vegetation communities were delineated on aerial photographs and then verified in the field. Investigations were conducted from within the highway ROW and publicly accessible lands.

Scientific nomenclature and English names of plant species generally followed Newmaster *et al.* (2005), with updates taken from published volumes of the Flora of North America Editorial Committee (2000+) and Michigan Flora Online (Reznicek et al. 2015).

## 2.2.2 Wildlife and Wildlife Habitat

### 2.2.2.1 Nesting Bird Surveys

Bridges and other structures located in the Study Area were searched for signs of nesting by migratory birds, as defined by the *Migratory Bird Convention Act, 1994* (MBCA).

### 2.2.2.2 Significant Wildlife Habitat

The Significant Wildlife Habitat Technical Guide (MNRF 2000) divides Significant Wildlife Habitat (SWH) in four categories:

1. Seasonal concentrations of wildlife
2. Rare vegetation communities or specialized habitat for wildlife
3. Habitat for species of conservation concern
4. Wildlife movement corridors

Field assessments for wildlife habitat focused on identifying candidate SWH following guidance provided in the Significant Wildlife Habitat Technical Guide and Ecoregion Criterion 6E Schedule (MNRF 2015). Investigations focused on features that may be associated with roads and road structures or nearby lands: including bat maternity colonies, snake hibernaculum, and turtle nesting and wintering areas. We documented all candidate SWH**.**

## 2.2.3 Significant Species

Significant species are considered at a number of levels, including globally, nationally and provincially. In Ontario, significant species include species that are provincially rare (with a Provincial S-rank of S1 to S3) or listed as Endangered, Threatened or Special Concern on the SARO list and/or Schedule 1 of the federal *Species at Risk Act, 2002.*

The Ontario *Endangered Species Act, 2007* (ESA) prohibits harm or harassment to Threatened or Endangered species, and damage or disturbance to their habitat. The ESA applies on all private and Crown owned lands in Ontario. Habitat protection under the ESA typically includes all habitats that directly or indirectly support SAR.

Federally protected Endangered, Threatened and Special Concern species are listed in Schedule 1 of SARA and apply only to federally owned lands. Fish species are protected under the *Fisheries Act, 1985* and migratory bird species are protected under the MBCA, both of which are afforded protection on all lands.

Provincial ranks (S-ranks) are used by the NHIC to set protection priorities for rare species and vegetation communities. They are based on the number of occurrences in Ontario and are not legal designations. By comparing the global and provincial ranks, the status, rarity and the urgency of conservation needs can be determined. Species with provincial ranks of S1 to S3, and those tracked by the MNRF, are considered species of conservation concern. Provincial S-ranks are defined as follows:

S1: Critically imperiled; usually fewer than 5 occurrences
S2: Imperiled; usually fewer than 20 occurrences
S3: Vulnerable; usually fewer than 100 occurrences
S4: Apparently secure; uncommon but not rare, usually more than 100 occurrences
S5: Secure, common, widespread and abundant

S-rank followed by a “?” indicates the rank is uncertain

We assessed the probability that a Significant Species would be present within the Study Area by comparing preferred habitat types to existing conditions as documented in the background review and field investigations. Significant Species with preferred habitat in the Study Area were considered likely to be present. Significant Species with no preferred habitat in the Study Area were assumed to be absent.

Identification of potentially sensitive plant species was based on the coefficient of conservatism value (C) assigned to each native species in southern Ontario (Oldham et al. 2001). The value of CC, ranging from 0 (low) to 10 (high), is based on a species’ tolerance of disturbance and fidelity to natural habitats. Species with a CC value of 9 or 10 generally exhibit a high degree of fidelity to a narrow range of habitat parameters and undisturbed environments.

# 3.0 EXISTING ECOLOGICAL CONDITIONS

## 3.1 BACKGROUND DATA

### 3.1.1 Physiography and vegetation

The Study Area is located within the Lake Simcoe-Rideau Ecoregion (6E), specifically Ecodistrict 6E-13 (Oshawa-Cobourg), which is made up of the Iroquois Sand Plain. Approximately 27% of the ecodistrict consists of natural forest cover (deciduous, coniferous and mixed forests). Nearly 25% of the remaining natural cover is wetland, primarily swamp (Henson and Brodribb 2005).

The vegetation is in this region is relatively diverse. Characteristic hardwood forest species dominated by sugar maple, American beech, white ash, eastern hemlock, and numerous other species (Crins et al. 2009).

### 3.1.2 Significant Natural Areas

There was one provincially significant natural area located within Study Area within 1km of the Study Area, the Cranberry Lake Provincially Significant Wetland (PSW). This feature is mapped on **Figure 7, Appendix A.**

### 3.1.3 Species at Risk and Provincially Rare Species

There were records of 19 SAR, Species of Special Concern, and Provincially Rare (S1-S3) Species with ranges that overlap with the Study Area (**Table 3.1**). There were four recent (1998+) records of SAR in the NHIC database (MNRF 2018a) within 1 km of the Study Area. Consultation with MNRF will be required to confirm which SAR have potential to be present in the Study Area.

**Table 3.1: Atlas Review, Species of Conservation Concern**

| Common Name | Scientific Name | S-Rank | Provincial Status (COSSARO) | Federal Status (COSEWIC) | Source |
|---|---|---|---|---|---|
| **REPTILES** | | | | | |
| Snapping Turtle | *Chelydra serpentine* | S3 | SC | SC | ORAA |
| Blanding's Turtle | *Emydoidea blandingi* | S3 | THR | THR | ORAA |
| Northern Map Turtle | Graptemys geographica | S3 | SC | SC | NHIC |
| **BIRDS** | | | | | |
| Eastern Whip-poor-will | *Antrostomus vociferus* | S4B | THR | THR | OBBA |
| Chimney Swift | *Chaetura pelagica* | S4B, S4N | THR | THR | OBBA |
| Least Bittern | Ixobrychus exilis | S4B | THR | THR | OBBA |
| Red-headed Woodpecker | Melanerpes erythrocephalus | S4B | SC | THR | OBBA |

**Table 3.1: Atlas Review, Species of Conservation Concern**

| Common Name | Scientific Name | S-Rank | Provincial Status (COSSARO) | Federal Status (COSEWIC) | Source |
|---|---|---|---|---|---|
| Eastern Wood-Pewee | *Contopus virens* | S4B | SC | SC | OBBA |
| Bank Swallow | *Riparia riparia* | S4B | THR | THR | OBBA |
| Wood Thrush | *Hylocichla mustelina* | S4B | SC | THR | OBBA |
| Barn Swallow | *Hirundo rustica* | S4B | THR | THR | OBBA |
| Grasshopper Sparrow | Ammodramus savannarum | S4B | SC | SC | OBBA |
| Bobolink | *Dolichonyx oryzivorus* | S4B | THR | THR | NHIC |
| Eastern Meadowlark | *Sturnella magna* | S4B | THR | THR | NHIC |
| Canada Warbler | *Cardellina canadensis* | S4B | SC | THR | OBBA |
| Louisiana Waterthrush | *Parkesia motacilla* | S3B | THR | SC | NHIC |
| **MAMMALS** | | | | | |
| Little Brown Myotis | *Myotis lucifugus* | S4 | END | END | AMO |
| Small-footed Myotis | *Myotis leibii* | S2, S3 | END | - | AMO |
| Northern Myotis | *Myotis septentrionalis* | S3? | END | END | AMO |
| Tri-coloured Bat | *Perimyotis subflavus* | S3? | END | END | AMO |

The reptile, bird, mammal and amphibian range maps do not contain precise locations or information on concentrations / densities of records (e.g. the Ontario Breeding Bird Atlas records are provided in 10 km by 10 km square grids). The NHIC database provides more precise mapping (1 km by 1km squares) and is a better indicator of occurrence of significant species, particularly when used in combination with MNRF correspondence. Results of Stantec's search of available wildlife atlases are provided in **Appendix B**.

## 3.2 FIELD INVESTIGATIONS

Results of field investigations of vegetation communities, flora, wildlife and wildlife habitat are presented below.

### 3.2.1 Vegetation Communities

Sixteen vegetation communities were observed within the Study Area. The locations of these vegetation communities are shown in **Figures 2-13, Appendix A**. Vegetation communities identified are discussed below. ELC data sheets were completed for every vegetation unit identified and are included in **Appendix C**. There were no vegetation communities of conservation concern or provincially rare vegetation communities

within the Study Area. Because field investigations were restricted to the ROW and the area east of Percy Street was assessed by desktop, additional field investigations during detailed design may be warranted.

MEADOWS (ME):

- **Linear Meadow (MEMM3 & MEMM4)** communities dominated the highway ROW and often extended past the ROW fencing into adjacent natural features (e.g. regeneration thickets). Trees and shrubs were occasional, but sparse in the meadow ROW. European swallowwort (dog-strangling vine) was occasional to abundant throughout the ROW, often to the exclusion of other species. Various other common old field grasses, asters, goldenrods and weeds such as knapweed and sow-thistle dominated the meadow areas. Many steep dry slopes were present in the ROW (MEMM3), as well as lower meadows (MEMM4).

REGENERATION THICKETS (TH):

Regeneration thickets were common features in the Study Area and typically included areas of young regenerating tree species. Meadow was frequently mixed in with regenerating trees.

- **Coniferous Regeneration area (THC)** were typically dominated by Scots pine, eastern white cedar, eastern white pine and to a lesser extent eastern red cedar.
- **Mixed Regeneration area (THM)** were dominated by a mixture of eastern white cedar, ash and trembling aspen.
- **Deciduous Regeneration area (THD)** were mainly dominated by ash in the Study Area. Aspens and other poplars are also present in regen areas.

FOREST COMMUNITIES (FO):

- **Coniferous Forests (FOC)** – were typically dominated by eastern white cedar in the Study Area with associates such as eastern white pine, Scots pine, trembling aspen and ash. Coniferous forests dominated by eastern white pine and eastern hemlock were uncommon.
- **Mixed Forests (FOM)** – were similar to FOC forests in the prevalence of eastern white cedar. However, there was more a greater variety and abundance of hardwood species such as paper birch, sugar maple, trembling aspen, ash and basswood.
- **Deciduous Forest (FOD)** – upland forests in Study Area were dominated by sugar maple with associates of white ash, basswood, American beech, ironwood and red oak. Lowland deciduous forests in Study Area were dominated by red ash with associates of trembling aspen, basswood and paper birch.

PLANTATION COMMUNITIES (TAG):

- **Coniferous Plantations (TAGM1)** were dominated by eastern white pine, red pine, Scots pine or white spruce in the Study Area
- **Mixed Plantations (TAGM2)** were rare in the Study Area. Scots pine, black locust and white spruce were present in the identified plantation.
- **Deciduous Plantations (TAGM3)** were rare in the Study Area. The one example of this plantation was dominated by eastern cottonwood or a hybrid of eastern cottonwood.

SWAMP COMMUNITIES (SW):

- **Thicket Swamps (SWT)** were rare in the Study Area. There was only one example of this community present.
- **Coniferous Swamps (SWC)** were dominated by eastern white cedar in the Study Area.
- **Mixed Swamps (SWM)** were similar to coniferous swamps in their prevalence of eastern white cedar. In mixed swamps, hardwoods such as paper birch and trembling aspen were more abundant.
- **Deciduous Swamps (SWD)** were rare in the Study Area. The lone example was somewhat disturbed and dominated by red ash, exotic willows, Manitoba maple, and to a lesser extent, eastern white cedar.

MARSH COMMUNITIES (MA):

- **Marshes (MA)** in the Study Area were mainly small and restricted to low areas in the ROW. Marshes were dominated by cattails and/or common reed (Phragmites) and in fewer cases by sedges. One exception was a large natural cattail marsh east of Shelter Valley Road on the north side of the highway. Another atypical marsh in the Study Area is a small seepage area on the south side of the highway at the bottom of a steep slope. This community is immediately west of Shelter Valley Road. Various sedges, rushes, shrub willows, cattail and spotted Joe Pye weed are dominant.

Common Reed, also known as Invasive Phragmites (*Phragmites australis australis*) was abundant within marsh communities along the ROW. Mapping specific locations and extent of phragmites occurrences was beyond the scope of this study. If phragmites control is being considered for this area, then detailed mapping of occurrences is recommended during detailed design.

### 3.2.2 Flora

A total of 212 species of vascular plants were recorded in the Study Area. This total includes taxa identified to species, subspecies (ssp.) and variation (var.) levels. One hundred and thirty-six of the recorded species are native to Ontario; 76 are exotic species not native to Ontario. One hundred and twenty-three native species had a provincial rank of S5, indicating they are common with a secure population in Ontario. Twelve native species have a provincial rank of S4, indicating they are uncommon, but not rare in the province and populations are apparently secure. One native species (grey-headed coneflower) is provincially rare with a

rank of S3. It is rare in the Study Area, found only at the Danforth Road East overpass on the south side of the highway.

Three highly sensitive native species with a high C value of 8 or 9 were observed; red pine, butterfly milkweed and grey-headed coneflower. Red pine likely does not occur naturally in the Study Area; the species was present due to planted specimens. Butterfly milkweed occurred sparsely throughout the Study Area on dry slopes in the ROW meadow. Grey-headed coneflower was found only at the Danforth Road East overpass on the south side of the highway.

No Butternut or other SAR flora were observed in the Study Area. A detailed list of all plant species recorded is provided in **Appendix D**.

### 3.2.3 Wildlife and Wildlife Habitat

Nineteen migratory birds, five mammals, two amphibians, one reptile, 16 butterflies and 15 dragonflies were incidentally recorded in the Study Area. Most species that were observed were common species, which were expected in their respective habitat types. One SAR, a Barn Swallow was observed. The observation was of a single Barn Swallow flying over the ROW. A list of wildlife species observed is provided in **Appendix D**.

The following sections discuss wildlife and wildlife habitat results under separate headers for migratory bird nests, mammals and significant wildlife habitat.

#### 3.2.3.1 Migratory Bird Nests

Two Eastern Phoebe were found at the Shelter Valley Creek bridge within the Study Area. Documentation of nests is provided in **Appendix C** on the Bridge-nesting Bird Datasheets.

#### 3.2.3.2 Significant Wildlife Habitat

##### Seasonal Concentration Areas

Seasonal concentration areas are those sites where large numbers of a species gather together at one time of the year, or where several species congregate. Examples include deer yards, snake and bat hibernacula, waterfowl staging and molting areas, raptor roosts, bird nesting colonies, shorebird staging areas, and passerine migration concentrations. Only the best examples of these concentration areas are usually designated as SWH. Areas that support a SAR, or areas where a large proportion of the population may be lost if the habitat is destroyed, are examples of seasonal concentration areas which should be designated as significant (MNRF 2000).

Turtle Wintering Areas was the only type of candidate habitat for seasonal concentration areas that was identified within the Study Area. Open aquatic features with permanent water may provide habitat for wintering individuals. Confirmation of Turtle wintering habitat within the ROW of Highway 401 would require targeted surveys, which were beyond the scope of this report.

### Rare or Specialized Habitat

Rare or specialized habitats are two separate components. Rare habitats are those with vegetation communities that are considered rare in the province. Specialized habitats are microhabitats that are critical to some wildlife species. The SWH Ecoregion 6E Criteria Schedule (MNRF 2015) identifies features that could be considered specialized habitats, such as habitat for area-sensitive species, forests providing a high diversity of habitats, amphibian woodland breeding ponds, turtle nesting habitat, highly diverse sites, seeps and springs. The following candidate habitats for rare or specialized habitat were identified within the Study Area:

Amphibian Breeding Habitat: Ponds, wetlands and other temporary pools throughout the Study Area may provide suitable habitat for breeding amphibians. Targeted breeding surveys were not conducted. The highest quality candidate breeding features are located at the periphery or outside of the highway ROW.

Turtle Nesting Habitat: Suitable turtle nesting areas were present on road shoulders throughout the length of the Study Area when near aquatic features. Such areas contained loose gravel and exposed sand. Although gravel roadsides are generally suitable for turtles nesting, they do not qualify as candidate SWH. The highest quality candidate turtle nesting features are anticipated to occur outside of the highway ROW.

Animal Movement Corridors: Migration corridors are areas that are traditionally used by wildlife to move from one habitat to another, often in response to different seasonal habitat requirements. The SWH Region 6E Criterion (MNRF 2015) speaks specifically to amphibian movement corridors. These corridors are only considered when wetland breeding amphibian habitat is identified for Eastern Newt (*Notophthalmus viridescens*), American Toad (*Anaxyrus americanus*), Spotted Salamander (*Ambystoma maculatum*), Four-toed Salamander (*Hemidactylium scutatum*), Blue-spotted Salamander (*Ambystoma laterale*), Gray Treefrog (*Hyla versicolor*), Western Chorus Frog (*Pseudacris triseriata*), Northern Leopard Frog (*Lithobates pipiens*), Pickerel Frog (*Lithobates palustris*), Green Frog (*Rana clamitans*), Mink Frog (*Lithobates septentrionalis*) or American Bullfrog (*Lithobates catesbeianus*). Documentation of amphibian movement corridors is beyond the scope of this study; however, given the proximity of suitable breeding wetlands to the road, and random dispersal patterns of amphibians, regular road mortality is expected.

Documentation of movement corridors for mammals and reptiles was beyond the scope of this study. However, consultation with MNRF is recommended during future phases of this project to identify opportunities to enhance wildlife connectivity and reduce risks associated with the highway.

Special Concern and Rare Species:

The potential presence of habitat for special concern or rare species is discussed in **Table 3.2**.

## Table 3.2: Habitat Potential for Special Concern or Rare Species in the Study Area

| Species Name | Provincial Status (ESA) | Habitat Requirements | Habitat Potential in the Study Area | Habitat Potential in the ROW |
|---|---|---|---|---|
| REPTILES | | | | |
| Snapping Turtle (*Chelydra serpentine*) | SC | Snapping Turtles inhabit ponds, sloughs, streams, rivers, and shallow bays with slow moving water, aquatic vegetation, and soft bottoms. Females show strong nest site fidelity and nest in sand or gravel banks at waterway edges in late May or early June (COSEWIC 2008). | Suitable aquatic features are present in the Study Area. | Suitable aquatic features are generally absent; however, wetlands that are in close proximity to the ROW and drainage features or low lying areas may support this species in the ROW. |
| Northern Map Turtle (*Graptemys geographica*) | SC | Map turtles are highly aquatic and inhabit slow moving, large rivers and lakes with soft bottoms and abundant aquatic vegetation. Basking sites include rocks and deadheads adjacent to deep water (COSEWIC 2002) Nesting occurs in soft sand or soil and at a distance from the water, hibernation is communal and occurs at the bottoms of lakes (MacCulloch 2002). Females leave the water in June to nest (MacCulloch 2002). | Suitable aquatic habitat was not recorded during field investigations but may be present in the Study Area in areas that were not surveyed. | Suitable aquatic habitat was not present. |
| BIRDS | | | | |
| Red-headed Woodpecker (*Melanerpes erythrocephalus*) | SC | The Red-headed Woodpecker occupies a wide range of habitats, but most are characterized by open areas for feeding; snags for roosting, and a secure food supply. This species requires multiple snags for nesting, roosting, and foraging. Some of the habitats used are open deciduous and riparian woodlands, orchards, parks, agricultural lands, savanna-like grasslands, beaver ponds with snags, forest edges, burned forests, and flooded bottomland forests (National Audubon Society 2012, Smith et al. 2000). | Suitable nesting habitat was not recorded during field investigations but may be present in the Study Area. | Breeding is not anticipated to occur in the ROW due to disturbance from Highway 401. |

## Table 3.2: Habitat Potential for Special Concern or Rare Species in the Study Area

| Species Name | Provincial Status (ESA) | Habitat Requirements | Habitat Potential in the Study Area | Habitat Potential in the ROW |
|---|---|---|---|---|
| Eastern Wood-Pewee (*Contopus virens*) | SC | The Eastern Wood-Pewee is a forest bird of deciduous and mixed woods. Nest-site selection favors open space near the nest, typically provided by clearings, roadways, water, and forest edges. Nests are cryptic as they are covered with lichens, typically appearing like a knot on top of a branch and little is known about nesting behavior (McLaren 2007). | Woodland features within the Study Area are anticipated to provide breeding habitat. | Suitable nesting habitat was not present. |
| Wood Thrush (*Hylocichla mustelina*) | SC | Wood Thrush prefer deciduous and mixed forests in southern Ontario, ranging from small and isolated to large and contiguous woodlots. The presence of tall trees and a thick understory are preferred (Friesen 2007). | Woodland features within the Study Area are anticipated to provide breeding habitat. | Suitable nesting habitat was not present. |
| Grasshopper Sparrow (*Ammodramus savannarum*) | SC | The Grasshopper Sparrow inhabits drier more open grasslands than most other sparrows. It prefers short, sparse grass with patches of exposed ground. The Grasshopper sparrow prefers to nest rough or unimproved pastures and in drier, sparsely vegetated grasslands at least 30 ha in size (Earley 2007). | Grassland features within the Study Area are anticipated to provide breeding habitat. | Suitable breeding habitat is not anticipated to occur in the ROW due to disturbance from Highway 401. |
| Canada Warbler (*Cardellina canadensis*) | SC | The Canada Warbler is usually found in moist mixed deciduous-coniferous forests with a well-developed understorey. It may also occur in shrub marshes, red maple stands, coniferous riparian woodlands, ravines and steep brushy slopes, and regenerating forests. Although relatively abundant in Ontario, this species has been identified at risk due to a steady decline in the breeding population (COSEWIC 2008, COSSARO 2009). | Woodland features within the Study Area are anticipated to provide breeding habitat. | Suitable nesting habitat was not present. |

### 3.2.4 Habitat for Threatened or Endangered Species

The potential presence of habitat for threatened or endangered species is discussed in **Table 3.3**.

**Table 3.3: Habitat Potential for Threatened or Endangered Species**

| Species Name | Provincial Status (ESA) | Habitat Requirements | Habitat Potential in the Study Area | Habitat Potential in the ROW |
|---|---|---|---|---|
| REPTILES | | | | |
| Blanding's Turtle (*Emydoidea blandingi*) | THR | Blanding's Turtles frequent lakes, ponds, and marshes, and prefer shallow water with abundant aquatic vegetation and a soft bottom (MacCulloch 2002). They prefer shallow water that is rich in nutrients, organic soil and dense vegetation. Adults usually occupy open or partially vegetated sites, whereas juveniles occupy areas with thick aquatic vegetation including sphagnum, water lilies and algae. Nesting occurs in dry conifer or mixed hardwood forests, up to 410 m from any body of water, in loose substrates including sand, organic soil, gravel and cobblestone. Nesting may also occur along gravel roadways (COSEWIC 2005). | Suitable wetland features with abundant aquatic vegetation are present; however, it is unknown if these features support the species. | Suitable wetland features with abundant aquatic vegetation are generally absent; however, they occur in proximity to the ROW. Consultation with MNRF or targeted investigations may be needed to determine presence or absence during detailed design. |
| BIRDS | | | | |
| Eastern Whip-poor-will (*Antrostomus vociferous)* | THR | Whip-poor-will favour open woodlands with frequent clearings. Its preferred nesting sites contain shaded leaf litter or pine needles and generally occur along wooded edges or in clearings without any herbaceous growth (Cadman et al. 1987). The species is area-sensitive, preferring 100 hectares of suitable habitat for breeding. Reasons for the decline in population are currently unknown and speculative with habitat loss and degradation, automobile collisions and changes in food supply listed as the leading threats (COSEWIC 2009). | Open woodlands within the Study Area may provide breeding habitat for this species. Disturbance from Highway 401 may be a limiting factor. | Disturbance from the highway is anticipated to prevent use of the ROW by this species. |

## Table 3.3: Habitat Potential for Threatened or Endangered Species

| Species Name | Provincial Status (ESA) | Habitat Requirements | Habitat Potential in the Study Area | Habitat Potential in the ROW |
|---|---|---|---|---|
| Chimney Swift (*Chaetura pelagica*) | THR | Chimney Swift use chimneys for roosting and breeding, as well as walls, rafters, or gables of buildings and, less frequently, natural structures such as hollow trees, tree cavities and cracks in cliffs (Cadman 2007). Possible threats to this species include a loss of habitat, reduction in food supply, changes in weather patterns, and pesticide use (COSEWIC 2007). | Suitable nesting structures are anticipated to provide breeding habitat. | No suitable nesting habitat was recorded during field investigations. |
| Least Bittern (*Ixobrychus exilis*) | THR | The Least Bittern is a relatively small bird that nests in freshwater marshes where dense aquatic vegetation occurs with woody vegetation and open water. They are found most commonly in marshes greater than 5 ha in size (Gibbs et al. 1992). Most Least Bitterns that breed in Canada are found in Ontario. The species is designated threatened due to its very small and declining population that depends on high quality marsh habitats that are being lost and degraded across the species' range (NHIC 2007). | Suitable marsh habitat was not recorded during field investigations but may be present in the Study Area. | Suitable marsh habitat was not recorded during field investigations. |
| Bank Swallow (*Riparia riparia*) | THR | The Bank Swallow excavate nests in exposed earth banks along watercourses and lakeshores, roadsides, stockpiles of soil, and the sides of sand and gravel pits. Single nests may occur, although colonies are typical and range from two to several thousand. Adjacent grasslands and watercourses are used for foraging habitat (Sandilands 2007). | Suitable open sandy bluffs were not recorded during field investigations but may be present in the Study Area. | Suitable nesting habitat was not recorded during field investigations. |
| Barn Swallow (*Hirundo rustica*) | THR | Barn Swallows nest on walls or ledges of barns as well as on other human-made structures such as bridges, culverts or other buildings (Lepage 2007). Barn Swallows feed on aerial insects while foraging in open habitat (Heagy et al. 2014). Barn Swallows are generally considered grassland species, foraging over meadows, hay, pasture or even mown lawn. They will also frequently forage in woodland clearings, over wetland habitats or open water where insect prey is abundant. | Suitable nesting structures are anticipated to provide breeding habitat. | There were no Barn Swallow nests documented but structures may provide suitable habitat. |

## Table 3.3: Habitat Potential for Threatened or Endangered Species

| Species Name | Provincial Status (ESA) | Habitat Requirements | Habitat Potential in the Study Area | Habitat Potential in the ROW |
|---|---|---|---|---|
| Louisiana Waterthrush (*Parkesia motacilla*) | THR | In Ontario, this species prefers deciduous and mixed forests with a strong Eastern Hemlock component, in deeply incised ravines (McCracken 2007). It will also inhabit large flooded tracts of mature deciduous swamp forest. It shows a preference for nesting along pristine headwater streams and associated wetlands occurring in large expanses of mature forest and less frequently inhabits wooded swamps (COSEWIC 2006). | Deep forest ravines are present; however, breeding densities are anticipated to be low in the Study Area. | Suitable nesting habitat was not recorded during field investigations. |
| Bobolink (*Dolichonyx oryzivorus*) | THR | The Bobolink is generally referred to as a "grassland species". It nests primarily in forage crops with a mixture of grasses and broad-leaved forbs, predominantly hayfields and pastures. Preferred ground cover species include grasses such as Timothy and Kentucky bluegrass and forbs such as clover and dandelion (COSEWIC 2010). Bobolink is an area-sensitive species, with reported lower reproductive success in small habitat fragments (Kuehl and Clark 2002, Winter et al. 2004). | Grassland features within the Study Area are anticipated to provide breeding habitat. | Breeding is not anticipated to occur in the ROW due to disturbance from Highway 401. |
| Eastern Meadowlark (*Sturnella magna*) | THR | Meadowlarks are ground nesting birds (Harrison 1975), which are often associated with human-modified habitats where they sing from prominent perches such as roadside wires, trees, and fenceposts. As a grassland species, they typically occur in meadows, hayfields and pastures. However, it will utilize a wider range of habitat than most grassland species, including mown lawn (e.g. golf course, parks), wooded city ravines, young conifer plantations and orchards (Peck and James 1983, Leckie 2007). | Grassland features within the Study Area are anticipated to provide breeding habitat. | Breeding is not anticipated to occur in the ROW due to disturbance from Highway 401. |

## Table 3.3: Habitat Potential for Threatened or Endangered Species

| Species Name | Provincial Status (ESA) | Habitat Requirements | Habitat Potential in the Study Area | Habitat Potential in the ROW |
|---|---|---|---|---|
| Little Brown Myotis (*Myotis lucifugus)* | END | This species up until recently was considered the most common bat species in Ontario, and most frequently found bat species in North America. The recent change in status is due to significant declines in recent years attributed to a condition referred to as White-nose Syndrome (WNS). The Little Brown Myotis is commonly found near waterbodies in buildings, attics, roof crevices and loose bark on trees or under bridges (COSEWIC 2013). | Structures or mature trees with associated cavities or peeling bark are anticipated to provide maternity roost habitat. | Mature trees with associated cavities or peeling bark occur irregularly at the periphery of the ROW. |
| Small-footed Myotis (*Myotis leibii*) | END | The Small-footed Myotis inhabits rocky features including crevices or outcroppings, and hibernates in caves and mines (Reid 2006). | Suitable rocky features may be present in the Study Area. | Suitable rocky features were not recorded during field investigations. |
| Northern Myotis (*Myotis septentrionalis*) | END | The Northern Myotis is a resident bat of upland forests of eastern North America, typically foraging for aerial insects in the forest understory. Maternity roosts are typically located under the bark of large trees and are rarely found in human-made structures. Hibernating colonies typically reside in cave crevices (COSEWIC, 2013). The precipitous population decline of this species in recent years is attributed to WNS. | Structures or mature trees with associated cavities or peeling bark are anticipated to provide maternity roost habitat. | Mature trees with associated cavities or peeling bark occur irregularly at the periphery of the ROW. |

## Table 3.3: Habitat Potential for Threatened or Endangered Species

| Species Name | Provincial Status (ESA) | Habitat Requirements | Habitat Potential in the Study Area | Habitat Potential in the ROW |
|---|---|---|---|---|
| Tri-Coloured Bat (*Perimyotis subflavus*) | END | The Tri-coloured Bat prefers partly open habitat such as fields with large trees or woodland edges while avoiding both denser and more open areas. In the summer, Tri-coloured Bats roost in trees or dead clusters of leaves on trees. In the winter, they often hibernate in the deepest part of the caves where temperature is the least variable and the humidity is high. Maternity colonies are usually found either in tree cavities or man-made structures, but in at least parts of their range they have also been recorded in large clumps of arboreal lichen (COSEWIC 2013). Populations have recently declined precipitously due to the rapid spread of WNS. | Mature trees with associated leaf clusters are anticipated to provide maternity roost habitat. | Mature trees with associated leaf clusters were not recorded during field investigations; however, new clusters may form on an annual basis. |

# 4.0 CONCLUSION

This Terrestrial Ecosystems Existing Conditions Report documented the natural heritage features and evaluated the potential species of conservation concern within the Study Area in accordance with the Environmental Reference for Highway Design (MTO 2013). The Study Area extends from 2 km east of Nagle Road, Cobourg, easterly to Percy Street/County Road 45/IC 497, Colborne, for a total distance of approximately 18 km.

One candidate Area of Natural and Scientific Interest (ANSI) was present within the Study Area, the Cranberry Lake PSW. None of the vegetation communities observed were considered provincially at risk or of conservation concern. A single Barn Swallow was observed (a provincially Threatened species), but it was a transient individual. Two Eastern Phoebe nests were found at the Shelter Valley Creek culvert. No Barn Swallow nests were found but the species may colonize structures in the area in future years.

There were no observations or evidence of SAR or provincially rare species. Candidate SWH identified in the ROW included turtle wintering and nesting areas, amphibian breeding habitat, animal movement corridors and Snapping Turtle habitat. Further investigations of these candidate features are recommended during detailed design.

An Impact Assessment report will be produced when design details are available. The Impact Assessment report will provide site specific mitigation recommendations to reduce the likelihood of negative impacts to significant natural features within the Study Area.

# 5.0 REFERENCES

Cadman, M.D., P.F.J. Eagles, and F.M. Helleiner. 1987. Atlas of the Breeding Birds of. Ontario. University of Waterloo Press.

Cadman, M.D., D.A. Sutherland, G.G. Beck, D. Lepage, and A.R. Couturier (eds.). 2007. Atlas of the Breeding Birds of Ontario, 2001 – 2005. Bird Studies Canada, Environment Canada, Ontario Field Ornithologists, Ontario Ministry of Natural Resources, and Ontario Nature, Toronto, xxii + 706 pp.

Cadman, M.D., 2007. Chimney Swift, pp. 314-315, in Cadman, M.D., D.A. Sutherland, G.G. Beck, D. Lepage, A.R. Couturier, eds. Atlas of the Breeding Birds of Ontario, 2001-2005. Bird Studies Canada, Environment Canada, Ontario Field Ornithologists, Ontario Ministry of Natural Resources, and Ontario Nature, Toronto, xxii +706pp.

COSEWIC 2002. COSEWIC assessment and status report on the northern map turtle *Graptemys geogrphica* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 34 pp.

COSEWIC. 2005. COSEWIC assessment and update status report on the Blanding's Turtle *Emydoidea blandingii* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. viii + 40 pp

COSEWIC 2006. COSEWIC assessment and update status report on the Louisiana Waterthrush *Seiurus motacilla* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 26 pp

COSEWIC. 2007. COSEWIC assessment and status report on the Chimney *Swift Chaetura pelagica* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 49pp.

COSEWIC. 2008. COSEWIC assessment and status report on the Canada Warbler *Wilsonia Canadensis* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 35 pp.(www.sararegistry.gc.ca/status/status_e.cfm).

COSEWIC. 2008. COSEWIC assessment and status report on the Snapping Turtle *Chelydra serpentine* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 47 pp.

COSEWIC. 2009. COSEWIC assessment and status report on the Whip-poor-will *Caprimulgus vociferous* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. Vi + 28 pp.

COSEWIC. 2010. COSEWIC assessment and status report on the Bobolink *Dolichonyx oryzivorus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. Vi + 42pp.

COSEWIC. 2013. COSEWIC assessment and status report on the Little Brown Myotis *Myotis lucifugus*, Northern Myotis *Myotis septentrionalis* and Tri-colored Bat *Perimyotis subflavus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xxiv + 93 pp. (www.registrelep-sararegistry.gc.ca/default_e.cfm).

COSSARO. 2009. COSSARO classifications from March 24-25 and May 27-29, 2009, reported to the Minister on June 11, 2009.

Crins, W.J., P.A. Gray, P.W.C.Uhlig, and M.C. Wester. 2009. The Ecosystems of Ontario, Part 1: Ecozones and Ecoregions. Ontario Ministry of Natural Resources, Science and Information Branch, Inventory, Monitoring and Assessment Section. Technical Report SIB TER IMA TR-01.

Department of Justice. 1994. Migratory Bird Convention Act. (http://laws-lois.justice.gc.ca/eng/acts/M-7.01/).

Department of Justice. 2007. Endangered Species Act. (http://www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_07e06_e.htm).

Dobbyn, J. 1994. Atlas of the Mammals of Ontario. Federation of Ontario Naturalists.

Earley, C.G., 2007. Grasshopper Sparrow, pp. 550-551, in Cadman, M.D., D.A. Sutherland, G.G. Beck, D. Lepage, A.R. Couturier, eds. Atlas of the Breeding Birds of Ontario, 2001-2005. Bird Studies Canada, Environment Canada, Ontario Field Ornithologists, Ontario Ministry of Natural Resources, and Ontario Nature, Toronto, xxii +706pp.

Friesen, L. 2007. Wood Thrush, pp. 440-441, in Cadman, M.D., D.A. Sutherland, G.G. Beck, D. Lepage, A.R. Couturier, eds. Atlas of the Breeding Birds of Ontario, 2001-2005. Bird Studies Canada, Environment Canada, Ontario Field Ornithologists, Ontario Ministry of Natural Resources, and Ontario Nature, Toronto, xxii +706pp.

Gibbs, J. P., F. A. Reid, and S. M. Melvin. 1992. Least Bittern. In The Birds of North America, No. 17 (A. Poole, P. Stettenheim, and F. Gill, Eds.). Philadelphia: The Academy of Natural Sciences; Washington, DC: The American Ornithologists' Union

Government of Canada. 2018. Schedule 1 List of Wildlife Species at Risk. Species at Risk Public Registry, available online (accessed January 2018): http://www.registrelep-sararegistry.gc.ca/species/schedules_e.cfm?id=1

Harrison, H.H. 1975. A Field Guide to Birds' Nests. Hougton Mifflin Company, New York, New York. 257 pp.

Heagy, A., D. Badzinski, D. Bradley, M. Falconer, J. McCracken, R.A. Reid and K. Richardson. 2014. Recovery Strategy for the Barn Swallow (*Hirundo rustica*) in Ontario. Ontario Recovery Strategy

Series. Prepared for the Ontario Ministry of Natural Resources and Forestry, Peterborough, Ontario. vii + 64 pp.

Henson, B.L. and K.E. Brodribb. 2005. Great Lakes Conservation Blueprint for Terrestrial Biodiversity. Vol 2: Ecodistrict Summaries. Nature Conservancy of Canada and Ontario Ministry of Natural Resources.

Kuehl, A.K., and W. R. Clark. 2002. Predator activity related to landscape features in northern Iowa. Journal of Wildlife Management 66: 1224-1234

Leckie, S. 2007. Eastern Meadowlark, pp. 590-591, in Cadman, M.D., D.A. Sutherland, G.G. Beck, D. Lepage, A.R. Couturier, eds. Atlas of the Breeding Birds of Ontario, 2001-2005. Bird Studies Canada, Environment Canada, Ontario Field Ornithologists, Ontario Ministry of Natural Resources, and Ontario Nature, Toronto, xxii +706pp.

Lee, H.T., W.D. Bakowsky, J. Riley, J. Bowles, M. Puddister, P. Uhlig and S. McMurray. 1998. Ecological Land Classification for Southwestern Ontario: first approximation and its application.

Lepage, D. 2007. Barn Swallow, pp. 398-399, in Cadman, M.D., D.A. Sutherland, G.G. Beck, D. Lepage, A.R. Couturier, eds. Atlas of the Breeding Birds of Ontario, 2001-2005. Bird Studies Canada, Environment Canada, Ontario Field Ornithologists, Ontario Ministry of Natural Resources, and Ontario Nature, Toronto, xxii +706pp.

MacCulloch, R.D. 2002. The ROM field guide to Amphibians and Reptiles of Ontario. McClelland & Steward Ltd. Toronto, Ontario. 168pp.

McCracken, J. 2007. Louisiana Waterthrush, pp. 514-515, in Cadman, M.D., D.A. Sutherland, G.G. Beck, D. Lepage, A.R. Couturier, eds. Atlas of the Breeding Birds of Ontario, 2001-2005. Bird Studies Canada, Environment Canada, Ontario Field Ornithologists, Ontario Ministry of Natural Resources, and Ontario Nature, Toronto, xxii +706pp.

McLaren, M. A. 2007. Eastern Wood-Pewee, pp. 340-341, in Cadman, M.D., D.A. Sutherland, G.G. Beck, D. Lepage, A.R. Couturier, eds. Atlas of the Breeding Birds of Ontario, 2001-2005. Bird Studies Canada, Environment Canada, Ontario Field Ornithologists, Ontario Ministry of Natural Resources, and Ontario Nature, Toronto, xxii +706pp.

Minister of Justice. 2002. Species at Risk Act. (http://laws-lois.justice.gc.ca/eng/acts/S-15.3/).

Minister of Justice. 1994. Fisheries Act. (http://laws-lois.justice.gc.ca/PDF/F-14.pdf).

MTO 2013. Environmental Reference for Highway Design.

MNRF. 2018a. Ministry of Natural Resources Natural Heritage Information Centre, Biodiversity database, including provincial species rankings (S-ranks). Accessed January 2018. Available online at http://www.gisapplication.lrc.gov.on.ca/mamnh/Index.html?site=MNR_NHLUPS_NaturalHeritage&viewer=NaturalHeritage&locale=en-US

MNRF. 2018b. Ontario Ministry of Natural Resources and Forestry, Land information Ontario database. Accessed January 2018. Available online at http://www.gisapplication.lrc.gov.on.ca/mamnh/Index.html?site=MNR_NHLUPS_NaturalHeritage&viewer=NaturalHeritage&locale=en-US

MNRF. 2018c. Species at Risk in Ontario List. Accessed January 2018. Available online at https://www.ontario.ca/environment-and-energy/species-risk-ontario-list

MNRF. 2015. Significant Wildlife Habitat Ecoregion 6E Criterion Schedule. http://www.ebr.gov.on.ca/ERS-WEB External/displaynoticecontent.do?noticeId=MTE1ODc5&statusId=MTczNDGY

MNRF. 2000. Significant wildlife habitat technical guide. 151pp.

National Audubon Society. 2012. Red-headed Woodpecker *Melanerpes erythrosephalus*. Available Online at: http://birds.audubon.org/species/redwoo

Natural Heritage Information Centre (NHIC). 2007. Provincial status of plants, wildlife and vegetation communities database. http://www.mnr.gov.on.ca/MNR/nhic/nhic.html. OMNR, Peterborough; and general background information checks, 2007.

Newmaster, S.G., A. Lehela, P.W.C Uhlig, S. McMurray and M.J. Oldham. 2005. Ontario Plant List. Ontario Ministry of Natural Resources, Ontario Forest Research Institute, Sault Ste. Marie, ON, Forest Research Information Paper No. 123. 550 pp. + appendices.

Oldham, M.J., W.D. Bakowsky and D.A. Sutherland. 2001. Floristic quality assessment for southern Ontario. OMNR, Natural Heritage Information Centre, Peterborough. 68 pp.

Ontario Nature. 2018. Ontario Reptile and Amphibian Atlas [web application]. Toronto, Ontario. Available online at www.ontarionature.org/atlas<http://www.ontarionature.org/atlas> Accessed January 2018.

Peck, G. K. and R. D. James. 1983. Breeding Birds of Ontario: Nidiology and Distribution. Volume 1: Nonpasserines. Royal Ontario Museum, Toronto, Ontario.

Reid, F. 2006. The Peterson Field Guide Series: A Field Guide to Mammals of North America, 4th ed. Houghton Mifflin Company, New York, New York. 579 p.

Reznicek, A. A., Voss, E.G., and B. S. Walters. 2015. Michigan flora online. University of Michigan. Available online at http://michiganflora.net/

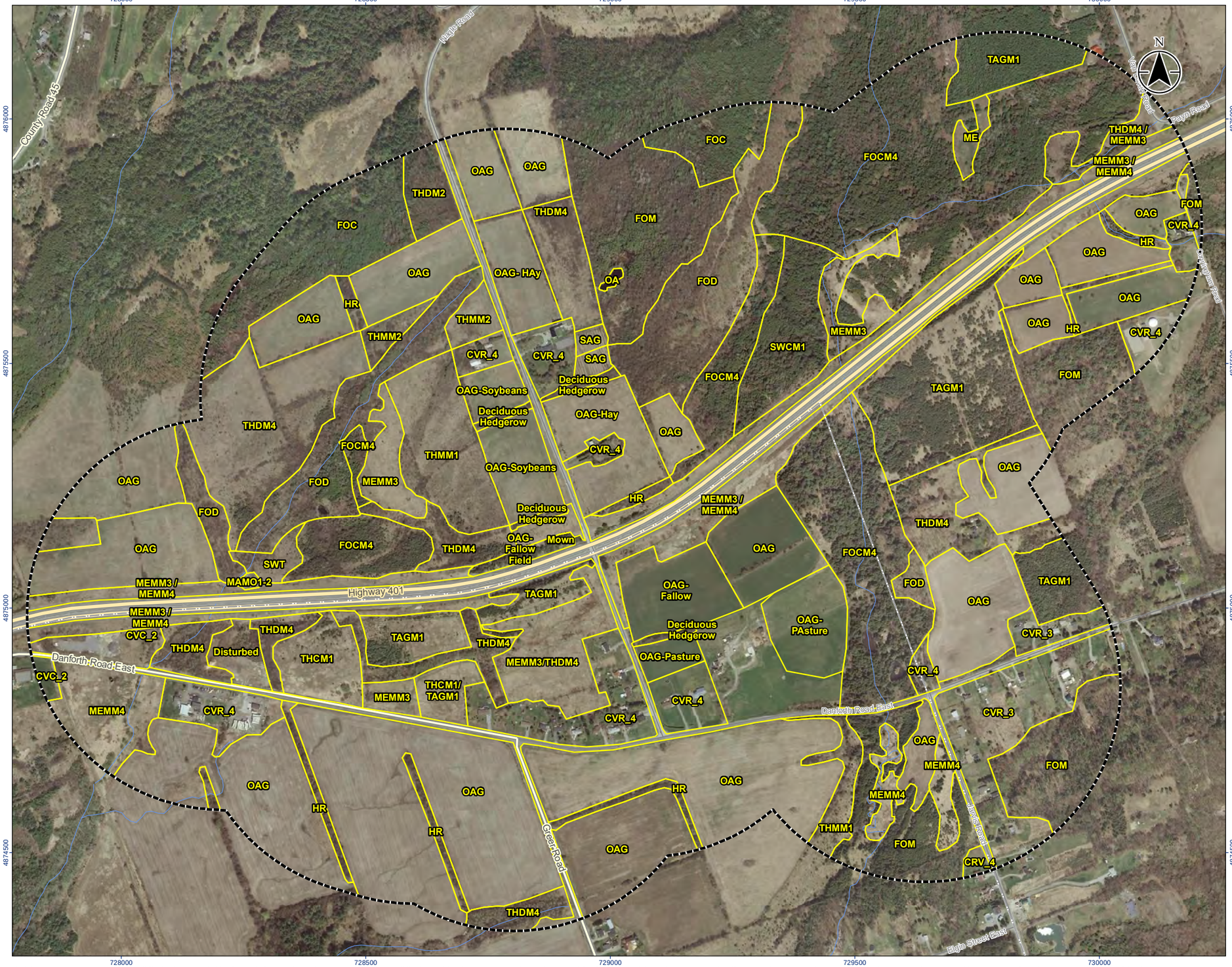
Sandilands, A. 2007. Bank Swallow, pp. 394-395, in Cadman, M.D., D.A. Sutherland, G.G. Beck, D. Lepage, A.R. Couturier, eds. Atlas of the Breeding Birds of Ontario, 2001-2005. Bird Studies Canada, Environment Canada, Ontario Field Ornithologists, Ontario Ministry of Natural Resources, and Ontario Nature, Toronto, xxii +706pp.

Stantec. 2018. Draft Aquatic Ecosystems Existing Conditions Report - Highway 401 Expansion from Cobourg to Colborne. *In prep.*

Smith, K. G., J. H. Withgott, and P. G. Rodewald. 2000. Red-headed Woodpecker (*Melanerpes erythrocephalus*). In The Birds of North America, No. 518 (A. Poole and F. Gill, eds.). The Birds of North America, Inc., Philadelphia, PA

Winter, M., D.H. Johnson, J.A. Shaffer, and W.D. Svedarsky. 2004. Nesting biology of three grassland passerines in the northern tallgrass prairie. Wilson Bulletin 116:211-223.

# APPENDIX A:
## Figures




Stantec

Legend

- Zone of Investigation (120 m)
- ELC Boundary
- Highway
- Major Road
- Minor Road
- Watercourse (Intermittent)
- Watercourse (Permanent)

ELC

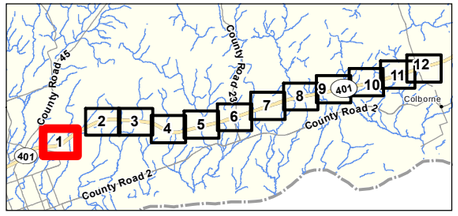
- CVC_2: Light Industry
- CVR_3: Single Family Residential
- CVR_4: Rural Property
- FOC: Coniferous Forest
- FOCM4: Fresh – Moist White Cedar Coniferous Forest Ecosite
- FOD: Deciduous Forest
- FOM: Mixed Forest
- HR: Hedge Row
- MAMO1-2: Cattail Graminoid Organic Meadow Marsh Type
- ME: Meadow
- MEMM3 / MEMM4: Dry - Fresh Mixed Meadow/ Fresh - Moist Mixed Meadow
- MEMM3/THDM4: Dry - Fresh Mixed Meadow Ecosite/ Dry - Fresh Deciduous Regeneration Thicket Ecosite
- MEMM3/THDM4: Dry - Fresh Mixed Meadow Ecosite/ Dry Lowshrub Tallgrass Thicket Ecosite
- MEMM3: Dry - Fresh Mixed Meadow Ecosite
- MEMM4: Fresh - Moist Mixed Meadow
- OA: Open Water
- OAG: Open Agriculture
- SAG: Shrub Agriculture
- SWCM1: White Cedar Mineral Coniferous Swamp Ecosite
- SWT: Thicket Swamp
- TAGM1: Coniferous Plantation
- THCM1/ TAGM1: Dry - Fresh Coniferous Regeneration Thicket Ecosite/ Coniferous Plantation
- THCM1: Dry - Fresh Coniferous Regeneration Thicket Ecosite
- THDM4: Dry - Fresh Deciduous Regeneration Thicket Ecosite
- THMM1: Dry - Fresh Mixed Regeneration Thicket Ecosite
- THMM2: Fresh - Moist Mixed Thicket Ecosite

0 50 100 200 Metres

1:8,000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2017.
3. Orthoimagery © First Base Solutions, 2017. Imagery Date, 2008.




Project Location
County of Northumberland

165001057 REVA
Prepared by DH on 2018-10-31
Technical Review by PW on 2017-04-27
Independent Review by ABC on yyyy-mm-dd

Client/Project
MTO
HIGHWAY 401 WIDENING FROM COBOURG TO COLBORNE

Figure No.
**2**

Title
ELC Mapbook

V:\0169\active_Other_PCI_Active\650 - Hamilton\165001057\drawing MXD\Terrestrial\ReportFigures\165001057_ELC_Mapbook_20181030.mxd Revised: 2018-10-31 By: dharvey

730500 731000 731500 732000

4877000 4876500 4876000

N

OAG
THDM4-1
MEMM3 / MEMM4
OAG-Row Crop
HR
FODM5
OAG
Highway 401
MEMM3 / MEMM4
TAGM1
MEMM3/ THMM1
FODM5
FOCM2-2
MEMM3/ THMM1
MEMM3 / MEMM4
MEMM3/ THCM1
FOM
Payne Road

Legend

- Zone of Investigation (120 m)
- ELC Boundary
- Highway
- Minor Road
- Watercourse (Permanent)

ELC

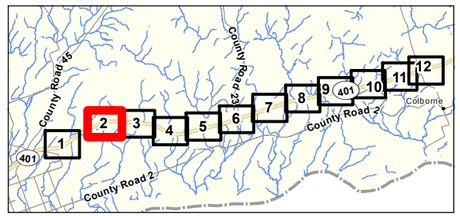
- FOCM2-2: Dry – Fresh White Cedar Coniferous Forest Type
- FODM5: Dry – Fresh Sugar Maple Deciduous Forest Ecosite
- FOM: Mixed Forest
- HR: Hedge Row
- MEMM3 / MEMM4: Dry - Fresh Mixed Meadow/ Fresh - Moist Mixed Meadow
- MEMM3/ THCM1: Dry - Fresh Mixed Meadow Ecosite/ Dry - Fresh Coniferous Regeneration Thicket Ecosite
- MEMM3/ THMM1: Dry - Fresh Mixed Meadow Ecosite/ Dry - Fresh Coniferous Regeneration Thicket Ecosite
- OAG: Open Agriculture
- TAGM1: Coniferous Plantation
- THDM4-1: Native Deciduous Regeneration Thicket Type

0 50 100 200 Metres

1:6,000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2017.
3. Orthoimagery © First Base Solutions, 2017. Imagery Date, 2008.




Project Location
County of Northumberland

165001057 REVA
Prepared by DH on 2018-10-31
Technical Review by PW on 2017-04-27
Independent Review by ABC on yyyy-mm-dd

Client/Project
MTO
HIGHWAY 401 WIDENING FROM COBOURG TO COLBORNE

Figure No.
**3**

Title
ELC Mapbook

V:\01809\active_Other_PCs_Active\650 - Hamilton\650105?\drawing\MXD\Terrestrial\Report\Figures\165001057_ELC_Mapbook_20181030.mxd Revised: 2018-10-31 By: dharvey


Stantec

Legend

- Zone of Investigation (120 m)
- ELC Boundary
- Highway
- Minor Road
- Watercourse (Intermittent)
- Watercourse (Permanent)

ELC

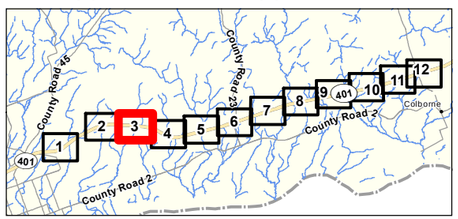
- CVR_4: Rural Property
- FOCM2-2: Dry – Fresh White Cedar Coniferous Forest Type
- FOD: Deciduous Forest
- FODM4-12: Dry - Fresh Exotic Deciduous Forest Type
- FODM7: Fresh – Moist Lowland Deciduous Forest Ecosite
- FOM: Mixed Forest
- FOMM4: Dry – Fresh White Cedar Mixed Forest Ecosite
- HR: Hedge Row
- MEMM3 / MEMM4: Dry - Fresh Mixed Meadow/ Fresh - Moist Mixed Meadow
- MEMM3/ THMM1: Dry - Fresh Mixed Meadow Ecosite/ Dry - Fresh Coniferous Regeneration Thicket Ecosite
- MEMM3/THDM4: Dry - Fresh Mixed Meadow Ecosite/ Dry - Fresh Deciduous Regeneration Thicket Ecosite
- OAG: Open Agriculture
- SWCM1: White Cedar Mineral Coniferous Swamp Ecosite
- SWDM4: Mineral Deciduous Swamp Ecosite
- THCM1: Dry - Fresh Coniferous Regeneration Thicket Ecosite
- THMM1: Dry - Fresh Mixed Regeneration Thicket Ecosite

0 50 100 200 Metres

1:6,000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2017.
3. Orthoimagery © First Base Solutions, 2017. Imagery Date, 2008.




Project Location
County of Northumberland

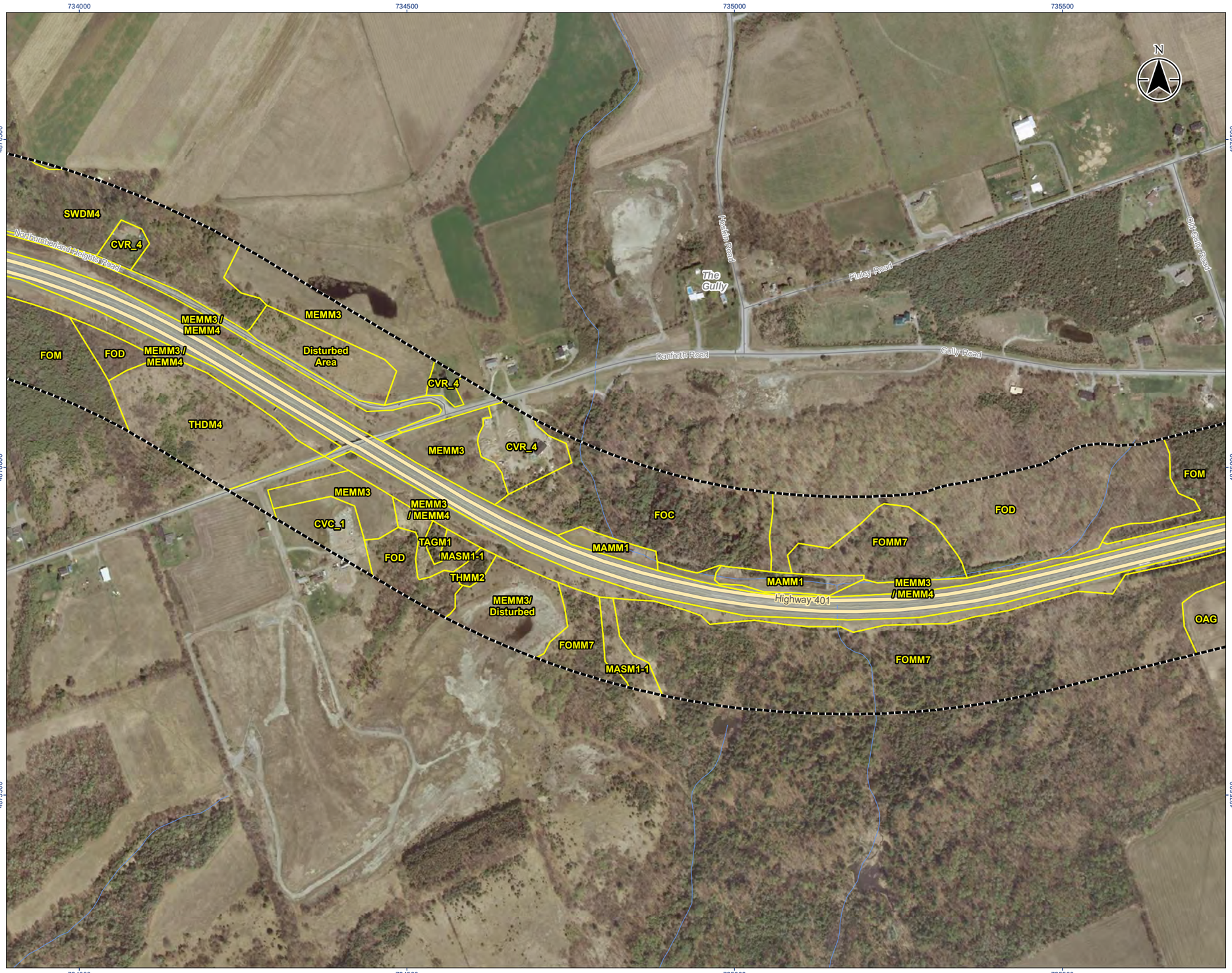
165001057 REVA
Prepared by DH on 2018-10-31
Technical Review by PW on 2017-04-27
Independent Review by ABC on yyyy-mm-dd

Client/Project
MTO
HIGHWAY 401 WIDENING FROM COBOURG TO COLBORNE

Figure No.
**4**

Title
ELC Mapbook

V:\1016091\active_Other_PGs_Active\650 - Hamilton\650\01057\drawing \MXD\Terrestrial\Report\Figure\165001057_ELC_Mapbook_20181030.mxd Revised: 2018-10-31 By: dharvey




Stantec

Legend

- Zone of Investigation (120 m)
- ELC Boundary
- Highway
- Minor Road
- Watercourse (Intermittent)
- Watercourse (Permanent)

ELC

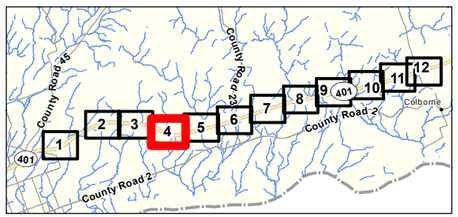
- CVC_1: Business Sector
- CVR_4: Rural Property
- FOC: Coniferous Forest
- FOD: Deciduous Forest
- FOM: Mixed Forest
- FOMM7: Fresh – Moist White Cedar – Hardwood Mixed Forest Ecosite
- MAMM1: Graminoid Mineral Meadow Marsh Ecosite
- MASM1-1: Cattail Mineral Shallow Marsh Type
- MEMM3 / MEMM4: Dry - Fresh Mixed Meadow/ Fresh - Moist Mixed Meadow
- MEMM3/ Disturbed: Dry - Fresh Mixed Meadow Ecosite
- MEMM3: Dry - Fresh Mixed Meadow Ecosite
- OAG: Open Agriculture
- SWDM4: Mineral Deciduous Swamp Ecosite
- TAGM1: Coniferous Plantation
- THDM4: Dry - Fresh Deciduous Regeneration Thicket Ecosite
- THMM2: Fresh - Moist Mixed Thicket Ecosite

0 50 100 200 Metres

1:6,000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2017.
3. Orthoimagery © First Base Solutions, 2017. Imagery Date, 2008.




Project Location
County of Northumberland

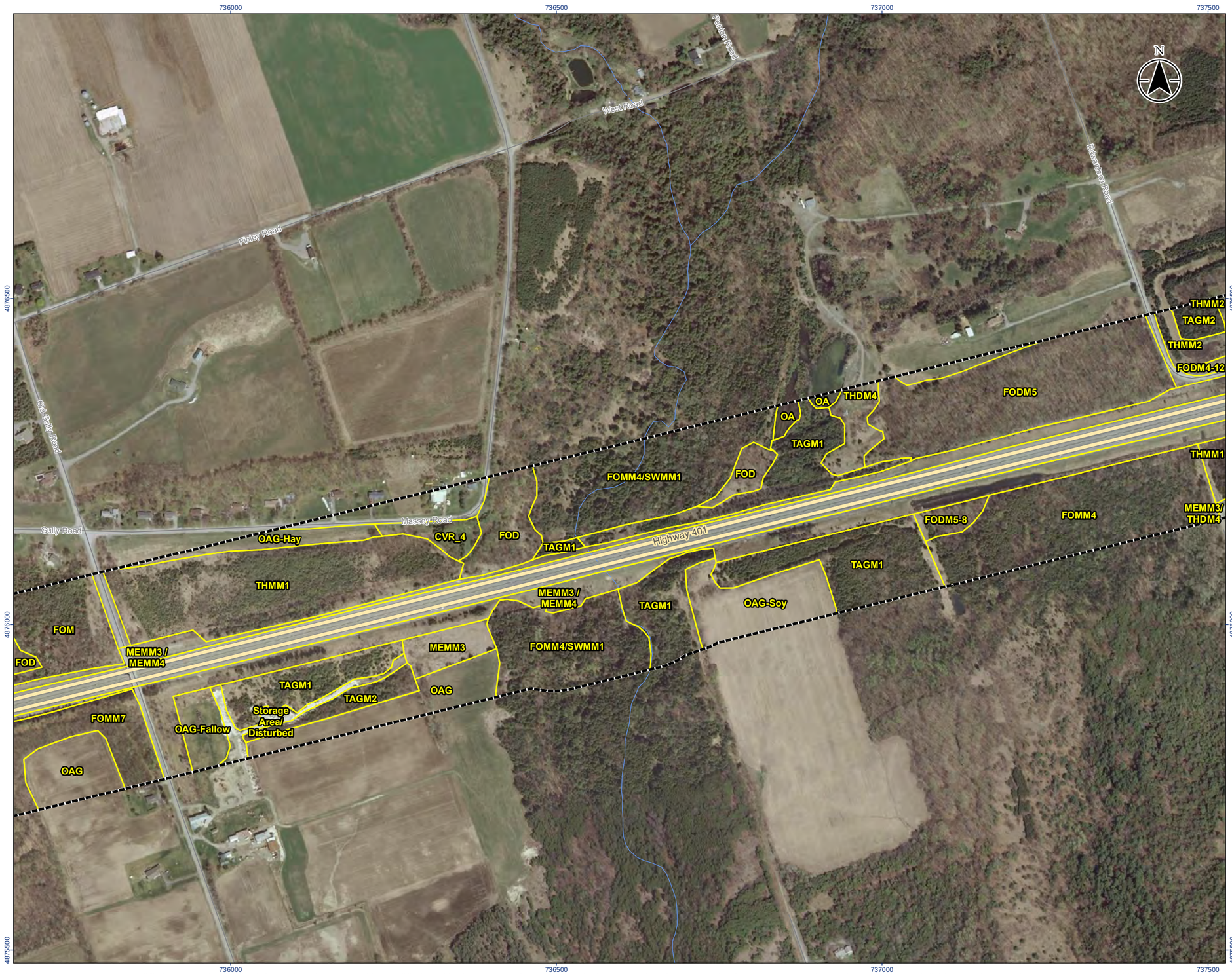
165001057 REVA
Prepared by DH on 2018-10-31
Technical Review by PW on 2017-04-27
Independent Review by ABC on yyyy-mm-dd

Client/Project
MTO
HIGHWAY 401 WIDENING FROM COBOURG TO COLBORNE

Figure No.
**5**

Title
ELC Mapbook

V:\01609\active_Other_PCI_Active\650 - Hamilton\165001057\drawing\MXD\Terrestrial\Report\Figures\165001057_ELC_Mapbook_20181030.mxd Revised: 2018-10-31 By: dharvey




Stantec

Legend

- Zone of Investigation (120 m)
- ELC Boundary
- Highway
- Minor Road
- Watercourse (Intermittent)
- Watercourse (Permanent)

ELC

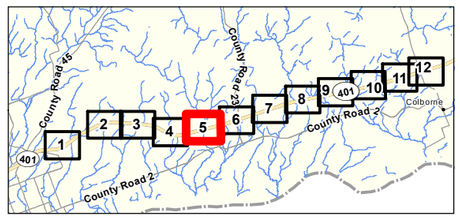
- CVR_4: Rural Property
- FOD: Deciduous Forest
- FODM4-12: Dry - Fresh Exotic Deciduous Forest Type
- FODM5-8: Dry – Fresh Sugar Maple – White Ash Deciduous Forest Type
- FODM5: Dry – Fresh Sugar Maple Deciduous Forest Ecosite
- FOM: Mixed Forest
- FOMM4/SWMM1: Dry – Fresh White Cedar Mixed Forest Ecosite/ White Cedar Mineral Mixed Swamp Ecosite
- FOMM4: Dry – Fresh White Cedar Mixed Forest Ecosite
- FOMM7: Fresh – Moist White Cedar – Hardwood Mixed Forest Ecosite
- MEMM3 / MEMM4: Dry - Fresh Mixed Meadow/ Fresh - Moist Mixed Meadow
- MEMM3/ THDM4: Dry - Fresh Mixed Meadow Ecosite/ Dry - Fresh Deciduous Regeneration Thicket Ecosite
- MEMM3: Dry - Fresh Mixed Meadow Ecosite
- OA: Open Water
- OAG: Open Agriculture
- TAGM1: Coniferous Plantation
- TAGM2: Mixed Plantation
- THDM4: Dry - Fresh Deciduous Regeneration Thicket Ecosite
- THMM1: Dry - Fresh Mixed Regeneration Thicket Ecosite
- THMM2: Fresh - Moist Mixed Thicket Ecosite

0 50 100 200 Metres

1:6,000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2017.
3. Orthoimagery © First Base Solutions, 2017. Imagery Date, 2008.




Project Location
County of Northumberland

165001057 REVA
Prepared by DH on 2018-10-31
Technical Review by PW on 2017-04-27
Independent Review by ABC on yyyy-mm-dd

Client/Project
MTO
HIGHWAY 401 WIDENING FROM COBOURG TO COLBORNE

Figure No.
6

Title
ELC Mapbook

V:\01609\active_Other_PCs_Active\650 - Hamilton\165001057\drawing \MXD\Terrestrial\Report\Figures\165001057_ELC_Mapbook_20181030.mxd Revised: 2018-10-31 By: dharvey


Revised: 2018-10-31 By: dharvey

V:\01609\active_Other_PCs_Active\650 - Hamilton\165001057\drawing \MXD\Terrestrial\Report\Figures\165001057_ELC_Mapbook_20181030.mxd

Stantec

Legend

- Zone of Investigation (120 m)
- ELC Boundary
- Highway
- Major Road
- Minor Road
- Watercourse (Intermittent)
- Watercourse (Permanent)
- Waterbody
- Wetland, Provincially Significant

ELC

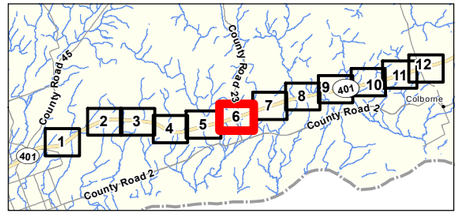
- CVC_2: Light Industry
- CVI: Transportation and Utilities
- CVR_4: Rural Property
- FOC: Coniferous Forest
- FOCM2-2: Dry – Fresh White Cedar Coniferous Forest Type
- FOD: Deciduous Forest
- FODM4-12: Dry - Fresh Exotic Deciduous Forest Type
- FODM5: Dry – Fresh Sugar Maple Deciduous Forest Ecosite
- FOM: Mixed Forest
- FOMM4: Dry – Fresh White Cedar Mixed Forest Ecosite
- ME: Meadow
- MEMM3 / MEMM4: Dry - Fresh Mixed Meadow Ecosite/ Fresh - Moist Mixed Meadow Ecosite
- MEMM3 / MEMM4: Dry - Fresh Mixed Meadow/ Fresh - Moist Mixed Meadow
- MEMM3/ THDM4: Dry - Fresh Mixed Meadow Ecosite/ Dry - Fresh Deciduous Regeneration Thicket Ecosite
- MEMM3: Dry - Fresh Mixed Meadow Ecosite
- OAG: Open Agriculture
- SWMO4: Conifer - Hardwood Organic Mixed Swamp Ecosite
- TAGM1: Coniferous Plantation
- TAGM2: Mixed Plantation
- THDM4: Dry - Fresh Deciduous Regeneration Thicket Ecosite
- THMM1: Dry - Fresh Mixed Regeneration Thicket Ecosite
- THMM2: Fresh - Moist Mixed Thicket Ecosite

0 50 100 200 Metres

1:6,000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2017.
3. Orthoimagery © First Base Solutions, 2017. Imagery Date, 2008.



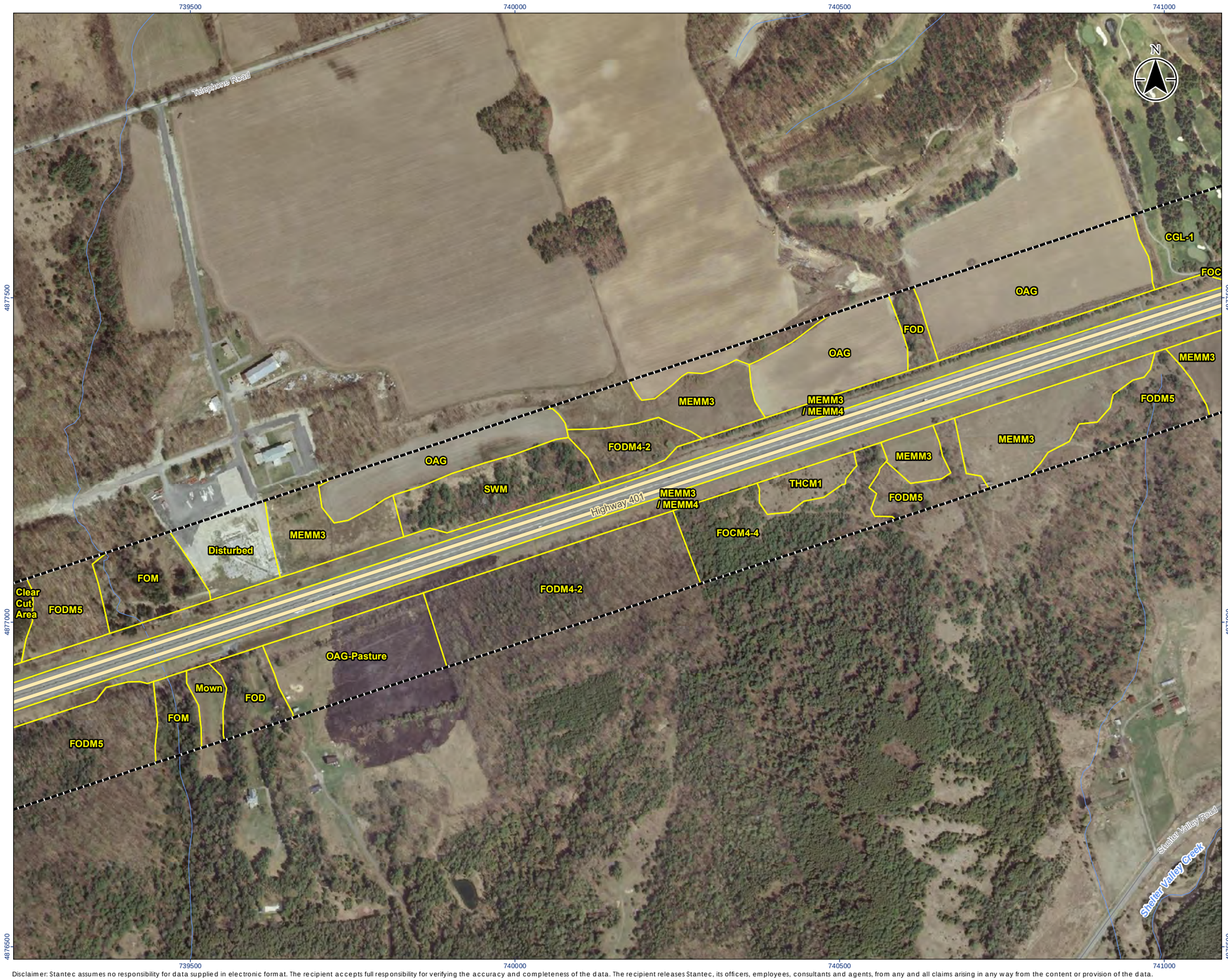

Project Location
County of Northumberland

165001057 REVA
Prepared by DH on 2018-10-31
Technical Review by PW on 2017-04-27
Independent Review by ABC on yyyy-mm-dd

Client/Project
MTO
HIGHWAY 401 WIDENING FROM COBOURG TO COLBORNE

Figure No.
**7**

Title
ELC Mapbook




Stantec

Legend

- Zone of Investigation (120 m)
- ELC Boundary
- Highway
- Minor Road
- Watercourse (Intermittent)
- Watercourse (Permanent)

ELC

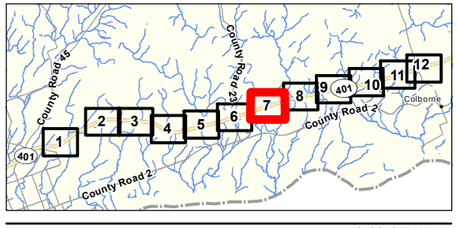
- CGL-1: Golf Course
- FOC: Coniferous Forest
- FOCM4-4: Fresh - Moist White Cedar - White Pine Coniferous Forest Type
- FOD: Deciduous Forest
- FODM4-2: Dry - Fresh White Ash - Hardwood Deciduous Forest Type
- FODM5: Dry – Fresh Sugar Maple Deciduous Forest Ecosite
- FOM: Mixed Forest
- MEMM3 / MEMM4: Dry - Fresh Mixed Meadow/ Fresh - Moist Mixed Meadow
- MEMM3: Dry - Fresh Mixed Meadow Ecosite
- OAG: Open Agriculture
- SWM: Mixed Swamp
- THCM1: Dry - Fresh Coniferous Regeneration Thicket Ecosite

0 50 100 200 Metres

1:6,000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2017.
3. Orthoimagery © First Base Solutions, 2017. Imagery Date, 2008.




Project Location
County of Northumberland

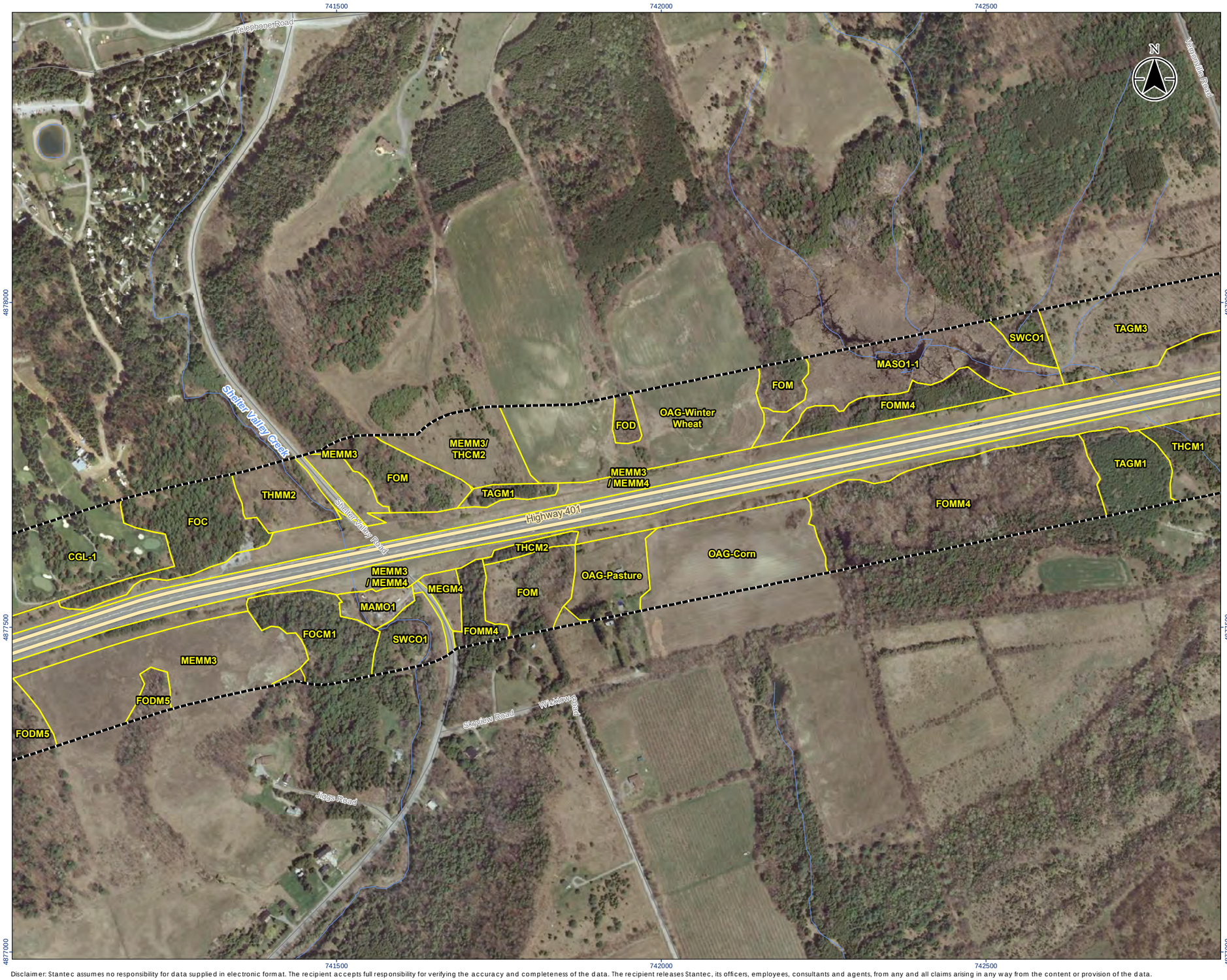
165001057 REVA
Prepared by DH on 2018-10-31
Technical Review by PW on 2017-04-27
Independent Review by ABC on yyyy-mm-dd

Client/Project
MTO
HIGHWAY 401 WIDENING FROM COBOURG TO COLBORNE

Figure No.
**8**

Title
ELC Mapbook

V:\01809\active_Other_PCs_Active\650 - Hamilton\165001057\drawing\MXD\Terrestrial\ReportFigures\165001057_ELC_Mapbook_20181030.mxd Revised: 2018-10-31 By: dharvey




Legend

- Zone of Investigation (120 m)
- ELC Boundary
- Highway
- Minor Road
- Watercourse (Intermittent)
- Watercourse (Permanent)
- Waterbody

ELC

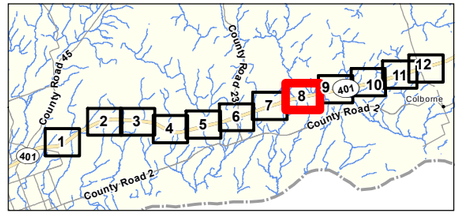
- CGL-1: Golf Course
- FOC: Coniferous Forest
- FOCM1: Dry – Fresh Pine Coniferous Forest Ecosite
- FOD: Deciduous Forest
- FODM5: Dry – Fresh Sugar Maple Deciduous Forest Ecosite
- FOM: Mixed Forest
- FOMM4: Dry – Fresh White Cedar Mixed Forest Ecosite
- MAMO1: Graminoid Organic Meadow Marsh Ecosite
- MASO1-1: Cattail Organic Shallow Marsh Type
- MEGM4: Fresh - Moist Graminoid Meadow Ecosite
- MEMM3 / MEMM4: Dry - Fresh Mixed Meadow/ Fresh - Moist Mixed Meadow
- MEMM3/ THCM2: Dry - Fresh Mixed Meadow Ecosite/ Fresh - Moist Coniferous Thicket Ecosite
- MEMM3: Dry - Fresh Mixed Meadow Ecosite
- OAG: Open Agriculture
- SWCO1: White Cedar Organic Coniferous Swamp Ecosite
- TAGM1: Coniferous Plantation
- TAGM3: Deciduous Plantation
- THCM1: Dry - Fresh Coniferous Regeneration Thicket Ecosite
- THCM2: Fresh - Moist Coniferous Thicket Ecosite
- THMM2: Fresh - Moist Mixed Thicket Ecosite

0 50 100 200 Metres

1:6,000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2017.
3. Orthoimagery © First Base Solutions, 2017. Imagery Date, 2008.




Project Location
County of Northumberland

165001057 REVA
Prepared by DH on 2018-10-31
Technical Review by PW on 2017-04-27
Independent Review by ABC on yyyy-mm-dd

Client/Project
MTO
HIGHWAY 401 WIDENING FROM COBOURG TO COLBORNE

Figure No.
**9**

Title
ELC Mapbook

V:\01609\active_Other_PCs_Active\650 - Hamilton\165001057\drawing \MXD\Terrestrial\ReportFigures\165001057_ELC_Mapbook_20181030.mxd Revised: 2018-10-31 By: dharvey


Stantec

Legend

- Zone of Investigation (120 m)
- ELC Boundary
- Highway
- Minor Road
- Watercourse (Intermittent)
- Watercourse (Permanent)
- Waterbody

ELC

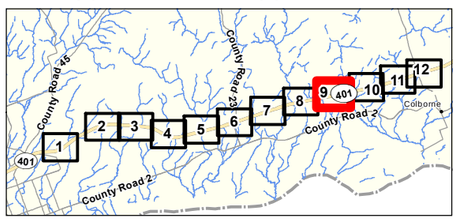
- CVR_4: Rural Property
- FOCM4-1: Fresh – Moist White Cedar Coniferous Forest Type
- FOCM4-2: Fresh – Moist White Cedar – Hemlock Coniferous Forest Type
- FODM8-1: Fresh – Moist Poplar – Sassafras Sucessional Deciduous Forest Ecosite
- MAM: Meadow Marsh
- MEMM3 / MEMM4: Dry - Fresh Mixed Meadow/ Fresh - Moist Mixed Meadow
- MEMM3/THCM1: Dry - Fresh Mixed Meadow Ecosite/ Dry - Fresh Coniferous Regeneration Thicket Ecosite
- MEMM3: Dry - Fresh Mixed Meadow Ecosite
- OA: Open Water
- OAG: Open Agriculture
- SWM: Mixed Swamp
- TAGM1: Coniferous Plantation
- TAGM3: Deciduous Plantation
- THCM1: Dry - Fresh Coniferous Regeneration Thicket Ecosite
- THDM4: Dry - Fresh Deciduous Regeneration Thicket Ecosite
- THMM2: Fresh - Moist Mixed Thicket Ecosite

0 50 100 200 Metres

1:6,000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2017.
3. Orthoimagery © First Base Solutions, 2017. Imagery Date, 2008.




Project Location
County of Northumberland

165001057 REVA
Prepared by DH on 2018-10-31
Technical Review by PW on 2017-04-27
Independent Review by ABC on yyyy-mm-dd

Client/Project
MTO
HIGHWAY 401 WIDENING FROM COBOURG TO COLBORNE

Figure No.
**10**

Title
ELC Mapbook

V:\0169\active_Other_PCS_Active\650 - Hamilton\650x0057\drawing \MXD\Terrestrial\ReportFigures\165001057_ELC_Mapbook_20181030.mxd Revised: 2018-10-31 By: dharvey


Stantec

Legend

- Zone of Investigation (120 m)
- ELC Boundary
- Highway
- Minor Road
- Watercourse (Intermittent)
- Watercourse (Permanent)

ELC

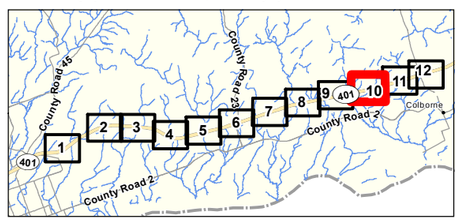
- CVR_4: Rural Property
- FOC: Coniferous Forest
- FOCM6-3: Dry - Fresh Scotch Pine Naturalized Coniferous Plantation Type
- FOD: Deciduous Forest
- FOMM4: Dry – Fresh White Cedar Mixed Forest Ecosite
- MEMM3 / MEMM4: Dry - Fresh Mixed Meadow/ Fresh - Moist Mixed Meadow
- MEMM3/ THCM1: Dry - Fresh Mixed Meadow Ecosite/ Dry - Fresh Coniferous Regeneration Thicket Ecosite
- MEMM3/THCM1: Dry - Fresh Mixed Meadow Ecosite/ Dry - Fresh Coniferous Regeneration Thicket Ecosite
- MEMM3: Dry - Fresh Mixed Meadow Ecosite
- MEMM4: Fresh - Moist Mixed Meadow Ecosite
- OAG: Open Agriculture
- SWCM1: White Cedar Mineral Coniferous Swamp Ecosite
- SWM: Mixed Swamp
- THCM1: Dry - Fresh Coniferous Regeneration Thicket Ecosite
- THMM1: Dry - Fresh Mixed Regeneration Thicket Ecosite

0 50 100 200 Metres

1:6,000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2017.
3. Orthoimagery © First Base Solutions, 2017. Imagery Date, 2008.




Project Location
County of Northumberland

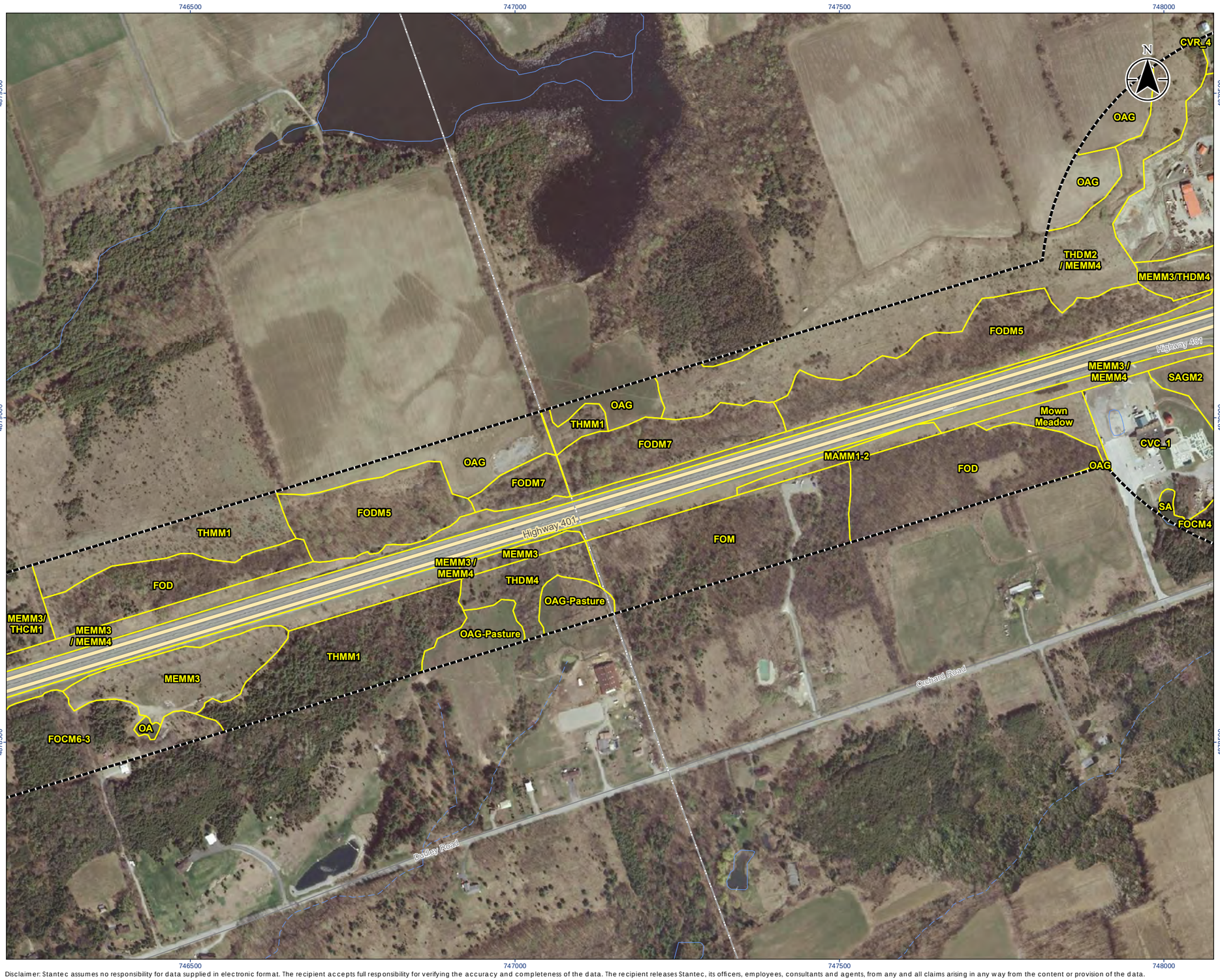
165001057 REVA
Prepared by DH on 2018-10-31
Technical Review by PW on 2017-04-27
Independent Review by ABC on yyyy-mm-dd

Client/Project
MTO
HIGHWAY 401 WIDENING FROM COBOURG TO COLBORNE

Figure No.
11

Title
ELC Mapbook

V:\101609\active_Other_PCs_Active\650 - Hamilton\650.01057\drawing\MXD\Terrestrial\Report\Figure\165001057_ELC_Mapbook_20181030.mxd Revised: 2018-10-31 By: dharvey




V:\01809\active_Other_PCs_Active\650 - Hamilton\165001057\drawing\MXD\Terrestial\Report\Figures\165001057_ELC_Mapbook_20181030.mxd Revised: 2018-10-31 By: dharvey

Disclaimer: Stantec assumes no responsibility for data supplied in electronic format. The recipient accepts full responsibility for verifying the accuracy and completeness of the data. The recipient releases Stantec, its officers, employees, consultants and agents, from any and all claims arising in any way from the content or provision of the data.

Stantec

Legend

- Zone of Investigation (120 m)
- ELC Boundary
- Highway
- Minor Road
- Watercourse (Intermittent)
- Watercourse (Permanent)
- Waterbody

ELC

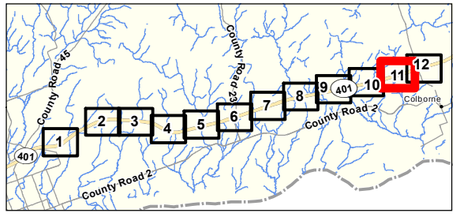
- CVC_1: Business Sector
- CVR_4: Rural Property
- FOCM4: Fresh – Moist White Cedar Coniferous Forest Ecosite
- FOCM6-3: Dry - Fresh Scotch Pine Naturalized Coniferous Plantation Type
- FOD: Deciduous Forest
- FODM5: Dry – Fresh Sugar Maple Deciduous Forest Ecosite
- FODM7: Fresh – Moist Lowland Deciduous Forest Ecosite
- FOM: Mixed Forest
- MAMM1-2: Cattail Graminoid Mineral Meadow Marsh Type
- MEMM3 / MEMM4: Dry - Fresh Mixed Meadow/ Fresh - Moist Mixed Meadow
- MEMM3/ THCM1: Dry - Fresh Mixed Meadow Ecosite/ Dry - Fresh Coniferous Regeneration Thicket Ecosite
- MEMM3/THDM4: Dry - Fresh Mixed Meadow Ecosite/ Dry - Fresh Deciduous Regeneration Thicket Ecosite
- MEMM3: Dry - Fresh Mixed Meadow Ecosite
- OA: Open Water
- OAG: Open Agriculture
- SA: Shallow Water
- SAGM2: Orchard
- THDM2 / MEMM4: Dry - Fresh Deciduous Shrub Thicket Ecosite/ Fresh - Moist Mixed Meadow Ecosite
- THDM4: Dry - Fresh Deciduous Regeneration Thicket Ecosite
- THMM1: Dry - Fresh Mixed Regeneration Thicket Ecosite

0 50 100 200 Metres

1:6,000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2017.
3. Orthoimagery © First Base Solutions, 2017. Imagery Date, 2008.




Project Location
County of Northumberland

165001057 REVA
Prepared by DH on 2018-10-31
Technical Review by PW on 2017-04-27
Independent Review by ABC on yyyy-mm-dd

Client/Project
MTO
HIGHWAY 401 WIDENING FROM COBOURG TO COLBORNE

Figure No.
12

Title
ELC Mapbook

748000 748500 749000

4879500 4879000 4878500

N

CVR_4
MEGM4
SWM
OAG
CVR_4
THDM2 / MEMM4
THDM2/MEMM3
OAG
MEGM4
MEMM3 / MEMM4
THDM4
Percy Street
MEMM3 / MEMM4
THDM4
FOM
OAG
Highway 401
Tree Grouping (Siberian Elm)
Tree Grouping (Austrian Pine)
THDM2 / MEMM4
MEMM3/THDM4
MEMM3 / MEMM4
Tree Grouping (Siberian Elm)
MEMM3 / MEMM4
FODM5
THCM1
THMM1 / MEMM3
CVC_2
Highway 401
Tree Grouping (Large Cottonwood)
MEMM3 / MEMM4
MAMM1-2
SAGM2
MEMM3
Mown Meadow
CVL_1
CVC_1
MAMM1-2
CVC_1
SWMO4
FOD
OAG
FOCM4
SA
CGL
CVC_1
FOCM4
OAG
CVC_1
CRV_4
Purdy Corners
Purdy Road
Elgin Street
Orchard Road
Industrial Park Road
Percy Street

748000 748500 749000

Disclaimer: Stantec assumes no responsibility for data supplied in electronic format. The recipient accepts full responsibility for verifying the accuracy and completeness of the data. The recipient releases Stantec, its officers, employees, consultants and agents, from any and all claims arising in any way from the content or provision of the data.

V:\01609\active_Other_PCs_Active\650 - Hamilton\60010057\drawing\MXD\Terrestrial\ReportFigures\165001057_ELC_Mapbook_20181030.mxd Revised: 2018-10-31 By: dharvey

Stantec

Legend

- Zone of Investigation (120 m)
- ELC Boundary
- Highway
- Major Road
- Minor Road
- Watercourse (Intermittent)
- Watercourse (Permanent)
- Waterbody

ELC

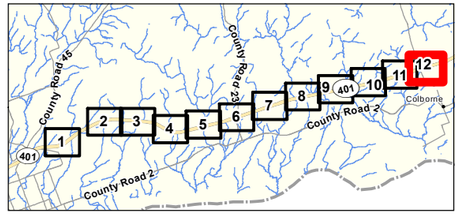
- CGL: Cemetery
- CVC_1: Business Sector
- CVC_2: Light Industry
- CVI: Transportation and Utilities
- CVR_4: Rural Property
- FOCM4: Fresh – Moist White Cedar Coniferous Forest Ecosite
- FOD: Deciduous Forest
- FODM5: Dry – Fresh Sugar Maple Deciduous Forest Ecosite
- FOM: Mixed Forest
- MAMM1-2: Cattail Graminoid Mineral Meadow Marsh Type
- MEGM4: Fresh - Moist Graminoid Meadow Ecosite
- MEMM3 / MEMM4: Dry - Fresh Mixed Meadow/ Fresh - Moist Mixed Meadow
- MEMM3 / MEMM4: Dry - Fresh Mixed Meadow Ecosite/ Fresh - Moist Mixed Meadow Ecosite
- MEMM3/THDM4: Dry - Fresh Mixed Meadow Ecosite/ Dry - Fresh Deciduous Regeneration Thicket Ecosite
- MEMM3: Dry - Fresh Mixed Meadow Ecosite
- OAG: Open Agriculture
- SA: Shallow Water
- SAGM2: Orchard
- SWM: Mixed Swamp
- SWMO4: Conifer - Hardwood Organic Mixed Swamp Ecosite
- THCM1: Dry - Fresh Coniferous Regeneration Thicket Ecosite
- THDM2 / MEMM4: Dry - Fresh Deciduous Shrub Thicket Ecosite/ Fresh - Moist Mixed Meadow Ecosite
- THDM2/MEMM3: Dry - Fresh Deciduous Shrub Thicket Ecosite/ Dry - Fresh Mixed Meadow Ecosite
- THDM4: Dry - Fresh Deciduous Regeneration Thicket Ecosite
- THMM1 / MEMM3: Dry - Fresh Mixed Regeneration Thicket Ecosite/ Dry - Fresh Mixed Meadow Ecosite

0 50 100 200 Metres

1:6,000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2017.
3. Orthoimagery © First Base Solutions, 2017. Imagery Date, 2008.




Project Location
County of Northumberland

165001057 REVA
Prepared by DH on 2018-10-31
Technical Review by PW on 2017-04-27
Independent Review by ABC on yyyy-mm-dd

Client/Project
MTO
HIGHWAY 401 WIDENING FROM COBOURG TO COLBORNE

Figure No.
13

Title
ELC Mapbook

# APPENDIX B:
## Atlas Review

| Species Common Name | Species Scientific Name | S-Rank | Provincial Status (COSSARO) | National Status (COSEWIC) | Source |
|---|---|---|---|---|---|
| Northern Map Turtle | Graptemys geographica | S3 | SC | SC | NHIC |
| Bobolink | *Dolichonyx oryzivorus* | S4B | THR | THR | NHIC |
| Eastern Meadowlark | *Sturnella magna* | S4B | THR | THR | NHIC |
| Eastern Whip-poor-will | *Antrostomus vociferus* | S4B | THR | THR | OBBA |
| Chimney Swift | *Chaetura pelagica* | S4B, S4N | THR | THR | OBBA |
| Least Bittern | Ixobrychus exilis | S4B | THR | THR | OBBA |
| Red-headed Woodpecker | Melanerpes erythrocephalus | S4B | SC | THR | OBBA |
| Eastern Wood-pewee | *Contopus virens* | S4B | SC | SC | OBBA |
| Bank Swallow | *Riparia riparia* | S4B | THR | THR | OBBA |
| Wood Thrush | *Hylocichla mustelina* | S4B | SC | THR | OBBA |
| Barn Swallow | *Hirundo rustica* | S4B | THR | THR | OBBA |
| Grasshopper Sparrow | Ammodramus savannarum | S4B | SC | SC | OBBA |
| Canada Warbler | Cardellina canadensis | S4B | SC | THR | OBBA |
| Snapping Turtle | *Chelydra serpentine* | S3 | SC | SC | ORAA |
| Blanding's Turtle | *Emydoidea blandingi* | S3 | THR | THR | ORAA |
| Little Brown Myotis | *Myotis lucifugus* | S4 | END | END | AMO |
| Small-footed Myotis | *Myotis leibii* | S2, S3 | END | - | AMO |
| Northern Myotis | *Myotis septentrionalis* | S3? | END | END | AMO |
| Tri-coloured Bat | *Perimyotis subflavus* | S3? | END | END | AMO |

COSSARO: Committee on the Status of Species at Risk in Ontario
COSEWIC: Committee on the Status of Endangered Wildlife in Canada
S3: Vulnerable—Vulnerable in the province, relatively few populations (often 80 or fewer)
S4: Apparently Secure—Uncommon but not rare
S5: Secure—Common, widespread, and abundant in the province
S#B- Breeding status rank
S#N- Non Breeding status rank
END: Endangered
THR: Threatened
SC: Special Concern
NHIC: Natural Heritage Information Centre
OBBA: Ontario Breeding Bird Atlas
ORAA: Ontario Reptile and Amphibian Atlas
AMO: Atlas of Mammals of Ontario

# APPENDIX C:
## Field Forms

**BOTANICAL INVENTORY FORM**

PROJECT: Highway 401 → Cobourg to Colborne (#16500105?)

SURVEY AREA: Species observed in Right-of-Way

UTM:

| 1st Survey: August 14, 2017 | 2nd Survey: | 3rd Survey: |
|---|---|---|
| SURVEYOR(S): Brian Miller, Brandon Holden | SURVEYOR(S): | SURVEYOR(S): |

| PLANT SPECIES | CANOPY | SUB-CANOPY | UNDERSTORY | GROUND LAYER |
|---|---|---|---|---|
| **TREES, SHRUBS & WOODY VINES** | | | | |
| ULMUS PUMILA | x | x | x | |
| PINUS NIGRA | | x | x | |
| Populus bals. | | | x | x |
| FRAX. PENS | | | | x |
| THUSA OCCI. | | | x | |
| Populus delt. | x | | | |
| Tilia amer. | | | x | |
| Pinus sylv. | | x | | |
| FRAX. AMER. | | x | | |
| Acer. negu. | | | | x |
| Picea glauca | | x | | |
| Ulmus amer. | | | | x |
| Picea abies | | x | | |
| RHUS TYPH. | | | x | x |
| Vitis ripa. | | | | |
| Rhamnus cath. | | | x | x |
| TOX. RADI. | | | | |
| Crataegus sp. | | | | x |
| Salix bebb. | | | | x |
| Cornus stol. | | | | x |
| LONI. TATA | | | | x |
| PRUNUS PENS? | | | x | |
| VIB. LENT. | | | x | |
| Salix erio. | | | | |
| SOL. DULC. | | | | |
| SYR. VULG. | | | | |
| PINUS STRO. | | | x | x |
| Alnus inca. | | | x | |
| CORNUS ALTE. | | | x | |
| Acer-Silver | x | | | |
| | | | | |
| | | | | |
| | | | | |

| PLANT SPECIES |
|---|
| HERBACEOUS FLORA |
| Vince. ross |
| Knapweed |
| BROM INER. |
| Ratibida pinn. |
| Verbena stricta |
| Vicia cracca |
| ASCL. SYRI. |
| DAUC. CARO |
| SYM. NOVA. |
| SYM. LANC. |
| SYM. ERIC. |
| AGRO. GIGA. |
| LYTH. SALI. |
| Phalaris arun. |
| Carex cf. granularis |
| Mentha cana. |
| Sonchus arve. |
| ASPA. OFFI. |
| Verbena hast. |
| Anemone virg. |
| Solidago nemo. |
| Solidago cana. |
| Penstemon cf. digi. |
| POA COMP. |
| Chicory |
| EUTH. GRAM. |
| ECH. VULG. |
| PLAN. LANC. |
| MEL. ALBA. |
| Phragmites |
| EQU. ARVE. |
| ACH. MILL. |
| EQU. HYEM. |

| PLANT SPECIES |
|---|
| CHENO. GLAUC. |
| SCHOEN. |
| PLANT SPECIES |
| Anemone cyli. |
| PRUN. VULG. VULG. |
| TRAG. DUBI. |
| TYPHA ANGU. |
| HYP. PERF. |
| LEUC. VULG. |
| Cirsium vulg. |
| TUSS. FARF. |
| IMPA. CAPE. |
| URTI. DIOI. |
| SYM. PUNI. |
| PODO. PELT. |
| CIRS. ARVE. |
| PHLEUM PRAT. |
| MEL. OFFI. |
| CORO. VARI. |
| CON. CANA. |
| OEN. cf. BIEN |
| APOC. ANDR. |
| TARA. OFFI. |
| AMB. ARTE. |
| LOTUS CORN. |
| APOC. CANN |
| Plantago psyl.? |
| POT. RECTA |
| ECHINO. LOBA. |
| SOLI. GIGA. |
| SYM. LATE. |
| TANA. VULG. |
| POA PRAT. |
| SCIR. ATRO. |
| EUP. PERF. |
| Carex hyst. |
| Juncus dudl. |

| |
|---|
| LYCO. AMER. |
| Carex flava |
| RUDB. HIRTA |
| LOL. ARUN. |
| SYM. UROP. |
| LIN. VULG. |
| ERIG. STRI. |
| RUM. CRISP. |
| DIA. ARME. |
| Carex spic. |
| AGRO. STOL. |
| PAST. SATI. |
| EUTR. MACU |
| ONO. SENS. |
| JUNC. COMP. |
| EPIL. HIRS. |
| DACT. GLOM. |
| Alfalfa. |
| THEL. PALU. |
| MED. LUPU. |
| JUN. ARTI. |
| SCHO. TABE. |
| ECHI. MURI. |
| CIC. MACU. |
| BIDENS. CERN. |
| VERO. AQUA. |
| AMPH. BRAC. |
| LAPO. CANA |
| TRIF. REPE. |
| SAPO. OFFI. |
| [redacted] |
| JUN. BUFO. |
| SCIR. PEND. |
| [redacted] |

Signature: Brian Miller (Field Personnel)

Signature: _____ (Project Manager)

**Relative Species Abundance:** D = Dominant; A = Abundant; O = Occasional; R = Rare

**Vegetation Height:** Canopy = > 20m; Sub-canopy = 10 – 20m; Understory = 2 – 10m; Ground Layer = < 2m

**BOTANICAL INVENTORY FORM**

PROJECT: Highway 401 → Cobourg to Colborne (#16500105?)

SURVEY AREA: [redacted] Plant Species Observed in Highway Right-of-Way

UTM:

1st Survey: August 15, 2017 Brian Miller

2nd Survey:

3rd Survey:

SURVEYOR(S):

SURVEYOR(S):

SURVEYOR(S):

August 16, 2017 Brandon Holden

| VASCULAR PLANT SPECIES | CANOPY | SUB-CANOPY | UNDERSTORY | GROUND LAYER |
|---|---|---|---|---|
| **TREES, SHRUBS & WOODY VINES** | | | | |
| CRAT. MONO. | | | x | x |
| Juniperus comm. | | | | x |
| Prunus virg. | | | | x |
| Juniperus virg. | | | x | |
| Populus grand. | | | x | |
| Carya cord. | | | x | |
| Rubus occi. | | | | x |
| ROBI. PSUE. | | | x | |
| Acer x free. | x | | | |
| Cornus race. | | | x | x |
| Rubus strig. | | | | x |
| Salix petio. | | | | x |
| Salix cf. alba | x | | | |
| Picea pungens | | | x | |
| Salix amyg. | | | x | |
| Acer negundo | | | x | |
| Russian Olive | | | x | |
| Parthenocissus | | | | x |
| Rosa cf. blanda | | | | R |
| Larix laricina | | | | |
| Salix interior | | | xR | |
| SPIRAEA ALBA | | | | R |

| VASCULAR PLANT SPECIES | GROUND LAYER |
|---|---|
| **HERBACEOUS FLORA** | |
| Verbena stricta | |
| Pteridium aquil. | |
| SYM. UROP. | |
| ASCL. TUBE. | |
| Hieracium spp. | |
| Silene ant | |
| Panicum capi. | |
| Lactuca serr. | |
| Carduus acanth. | |
| TRIF. PRAT. | |
| Inula hele. | |
| Lysimachia arve.? | |
| Carex granularis | |
| Juncus cf. torreyi | |
| Epilobium cf. parv. | |
| Monarda fist. | |
| Carex vulpinoidea | |
| Desmodium cf. cana | |
| Physalis cf. hete. | |
| MELI. OFFI. | |
| Eragrostis sp. | |
| Euphorbia cf. virg. | |
| Bidens fron. or. vulg. | |
| Silene vulg. | |
| HORDEUM JUBA. | |
| EQUIS. VARI.? | |
| URTICA DIOI | |
| Lycopus unif. | |
| Convolvulus arve. | |
| Carex cf. bebbii | |
| Carex retrorsa | |
| Onoclea sens. | |
| Carex cristatella | |

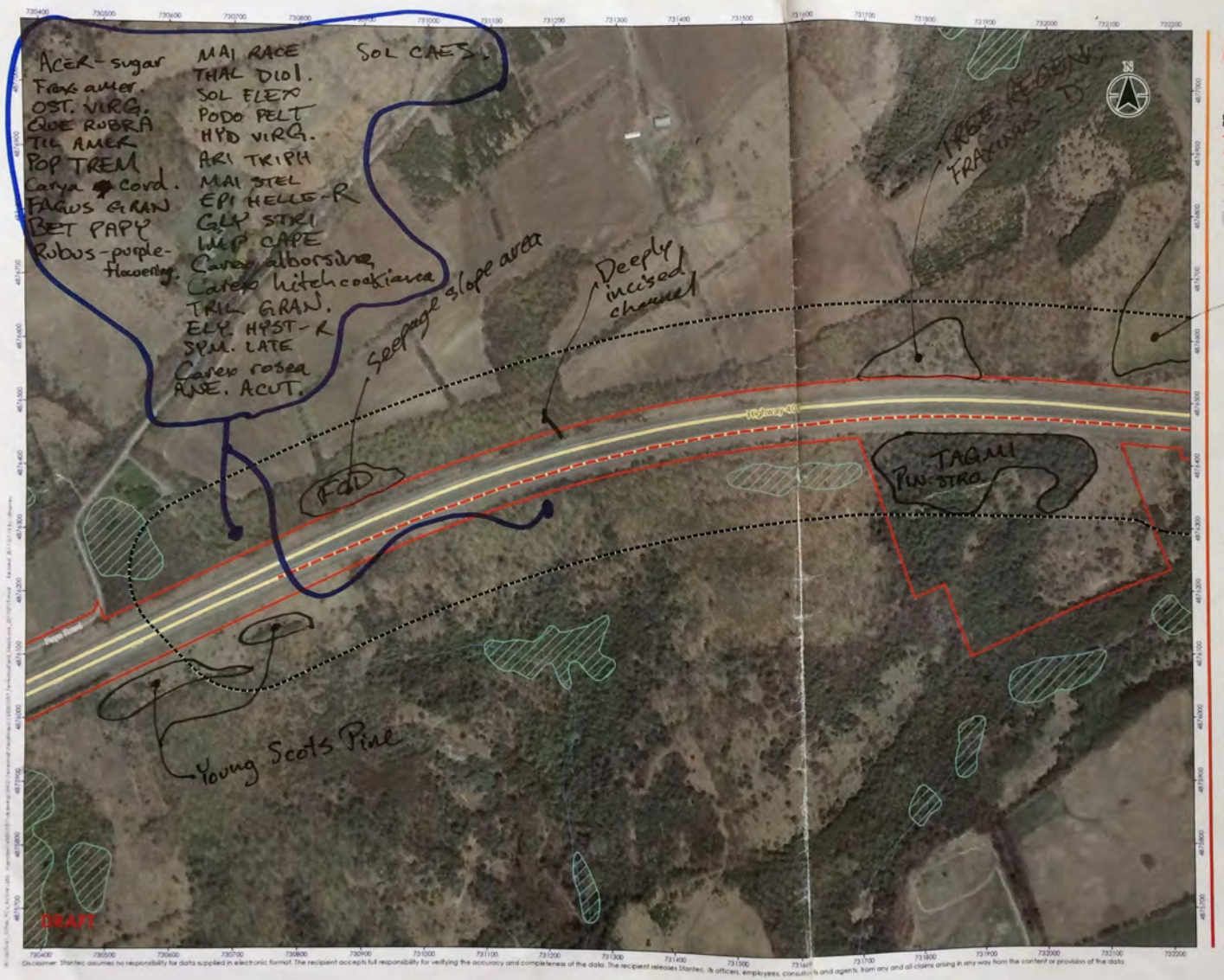
| VASCULAR PLANT SPECIES | GROUND LAYER |
|---|---|
| [redacted] | |
| THEL. PALU. | |
| Scirpus cyperinus | |
| Epipactis helle. | |
| Juncus alpino. | |
| EUPH. MACU. | |
| Agalinis tenuifolia | |
| Carex brevior | |
| Centaurium pulchellum | |
| Euphorbia davidii | |
| Juncus cf. marginatus | |
| 53 → [redacted] → To Be Confirmed | |

Signature: _____ (Field Personnel)

Signature: _____ (Project Manager)

**Relative Species Abundance:** D = Dominant; A = Abundant; O = Occasional; R = Rare

**Vegetation Height:** Canopy = > 20m; Sub-canopy = 10 – 20m; Understory = 2 – 10m; Ground Layer = < 2m



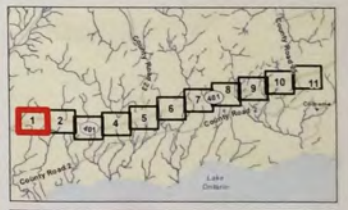

Stantec

Legend
- Zone of Investigation (120 m)
- Hwy 401 MTO Right of Way
- Site Location
- Highway
- Minor Road
- Watercourse (Permanent)
- Wetland, Not evaluated per OWES

0 0.35 km

1:6,000 (At original document size of 11x17)

**Notes**
1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2017.
3. Orthoimagery © First Base Solutions, 2017. Imagery Date: 2008



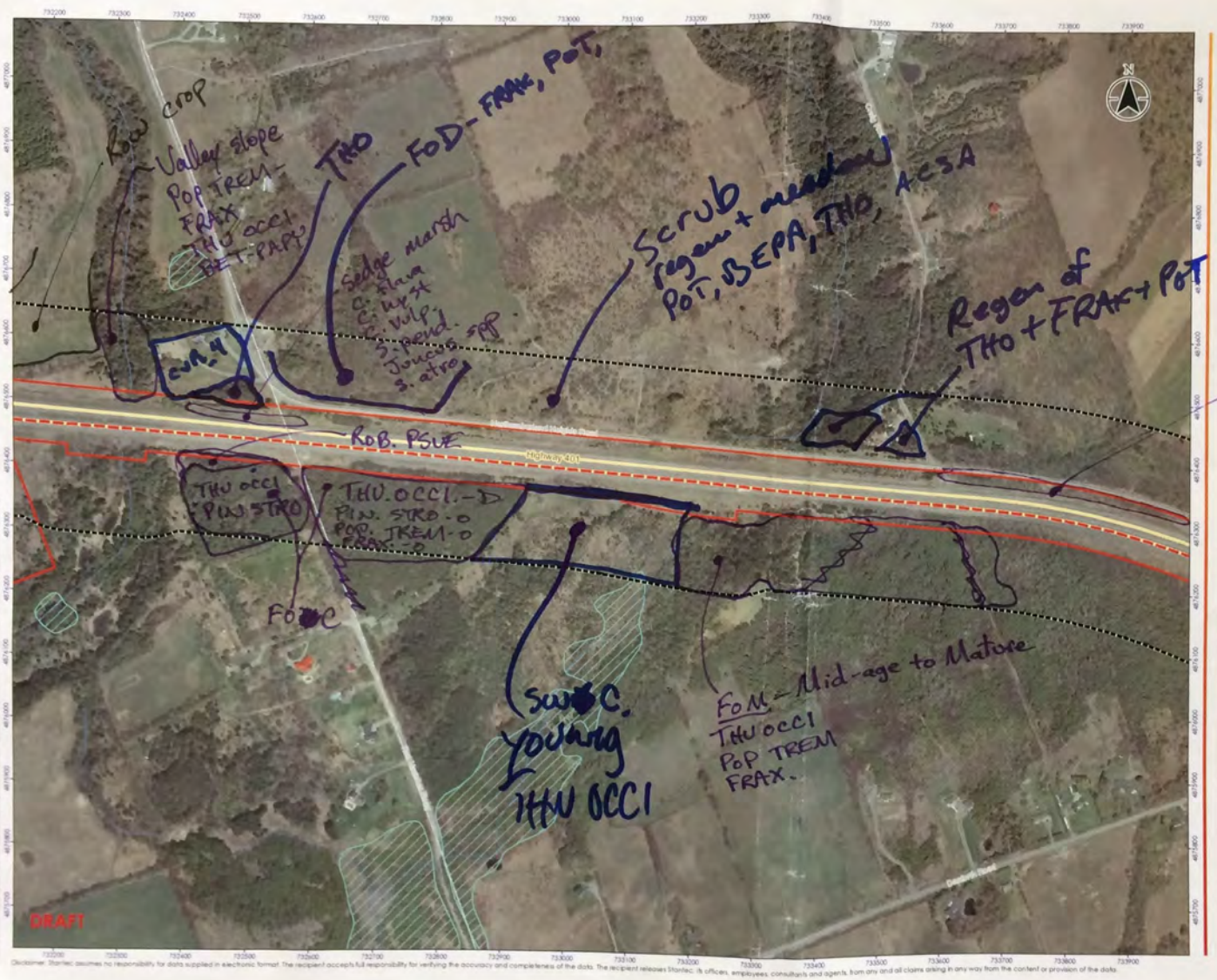

Project Location
County of Northumberland

165001057 REVA
Prepared by DH on 2017-07-19
Technical Review by PW on 2017-04-27
Independent Review by ABC on yyyy-mm-dd

Client/Project
MTO
HIGHWAY 401 WIDENING FROM COBOURG TO COLBORNE

Figure No.
1

Title
**Terrestrial Field Mapbook**



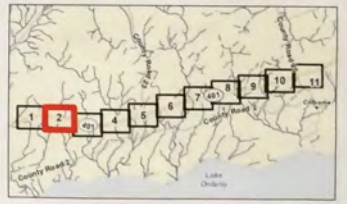

Stantec

Legend
- Zone of Investigation (120 m)
- Hwy 401 MTO Right of Way
- Site Location
- Highway
- Minor Road
- Watercourse (Intermittent)
- Watercourse (Permanent)
- Wetland, Not evaluated per OWES

0 0.35 km

1:6,000 (At original document size of 11x17)

Notes
1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2017
3. Orthoimagery © First Base Solutions, 2017. Imagery Date, 2008.



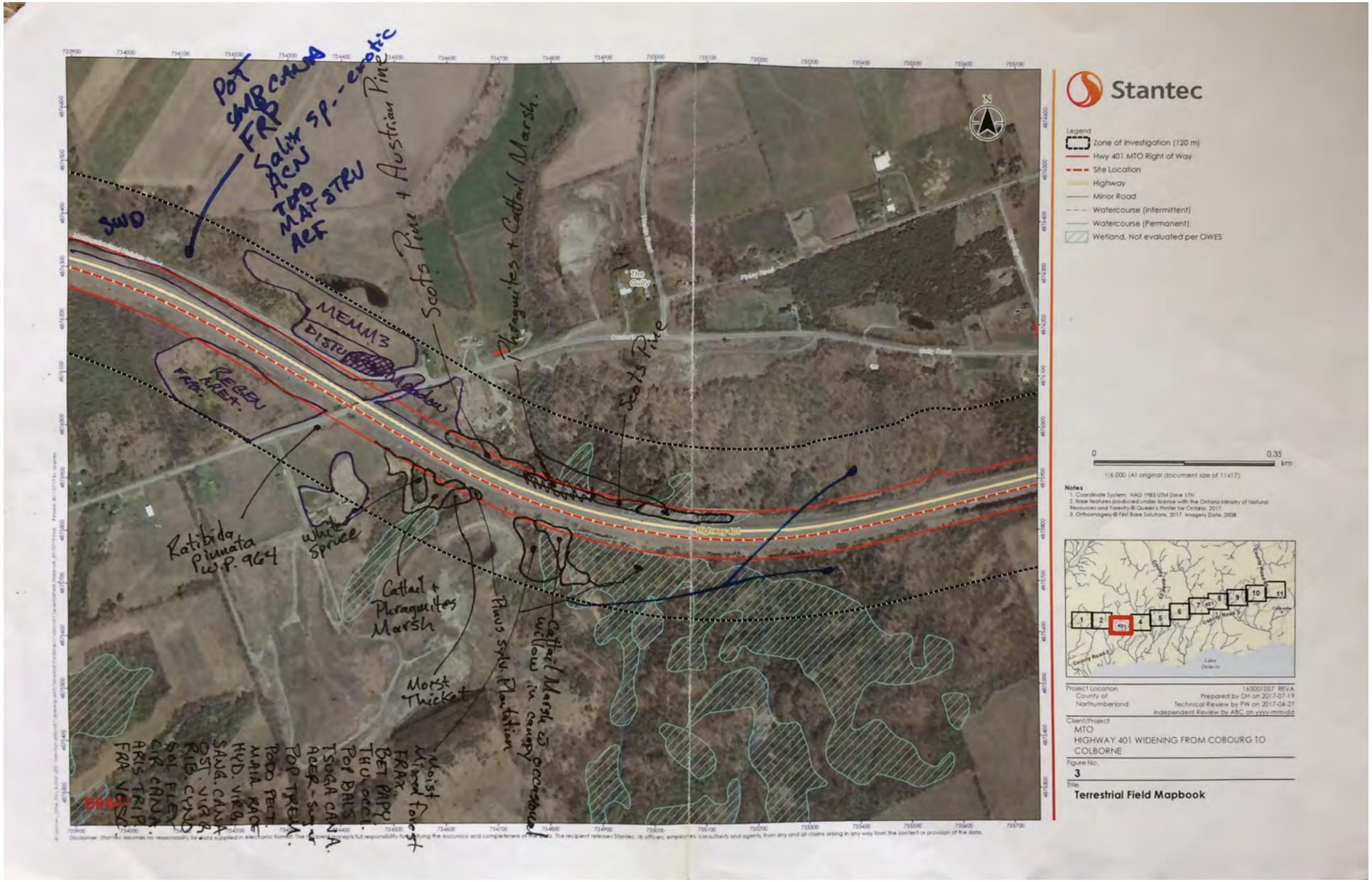

Project Location
County of Northumberland

165001057 REVA
Prepared by DH on 2017-07-19
Technical Review by PW on 2017-04-27
Independent Review by ABC on yyyy-mm-dd

Client/Project
MTO
HIGHWAY 401 WIDENING FROM COBOURG TO COLBORNE

Figure No.
2

Title
**Terrestrial Field Mapbook**



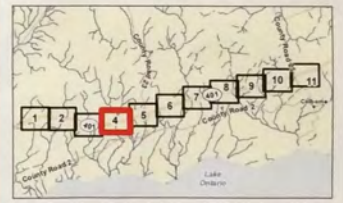

Stantec

Legend
- Zone of Investigation (120 m)
- Hwy 401 MTO Right of Way
- Site Location
- Highway
- Minor Road
- Watercourse (Intermittent)
- Watercourse (Permanent)
- Wetland, Not evaluated per OWES

0 0.35 km

1:6,000 (At original document size of 11x17)

**Notes**
1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2017.
3. Orthoimagery © First Base Solutions, 2017. Imagery Date, 2008.




Project Location
County of Northumberland

165001057 REVA
Prepared by DH on 2017-07-19
Technical Review by PW on 2017-04-27
Independent Review by ABC on yyyy-mm-dd

Client/Project
MTO
HIGHWAY 401 WIDENING FROM COBOURG TO COLBORNE

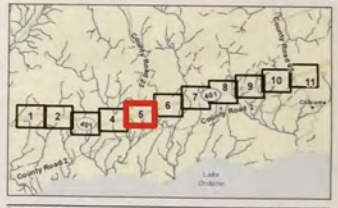
Figure No.
**4**

Title
**Terrestrial Field Mapbook**


Stantec

Legend
- Zone of Investigation (120 m)
- Hwy 401 MTO Right of Way
- Site Location
- Highway
- Major Road
- Minor Road
- Watercourse (Intermittent)
- Watercourse (Permanent)
- Waterbody
- Wetland, Provincially Significant
- Wetland, Not evaluated per OWES

Notes
1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2017.
3. Orthoimagery © First Base Solutions, 2017. Imagery Date: 2008



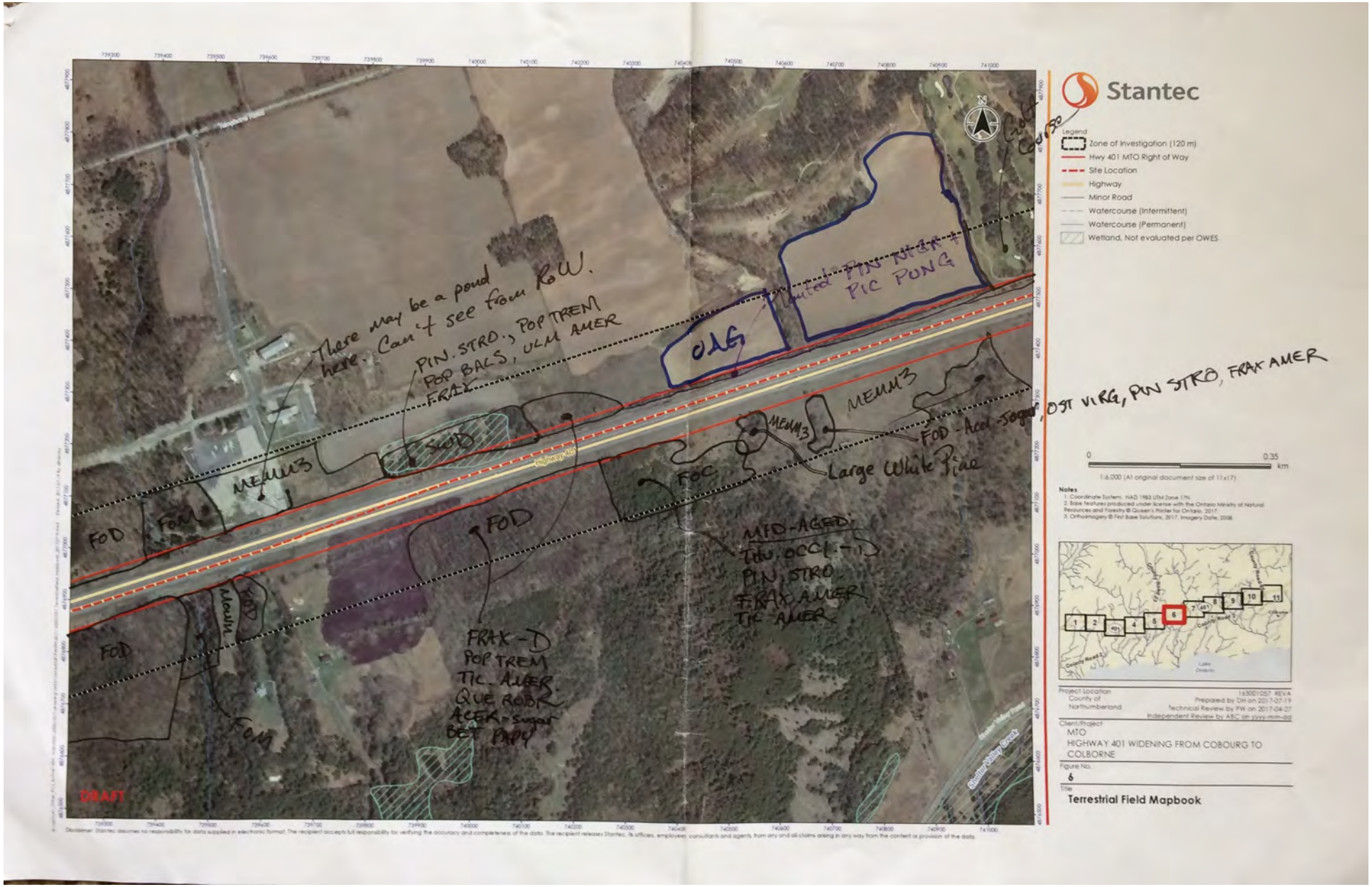

Project Location
County of Northumberland

165001057 REVA
Prepared by DH on 2017-07-19
Technical Review by PW on 2017-04-27
Independent Review by ABC on yyyy-mm-dd

Client/Project
MTO
HIGHWAY 401 WIDENING FROM COBOURG TO COLBORNE

Figure No.
5

Title
**Terrestrial Field Mapbook**




Stantec

Legend
- Zone of Investigation (120 m)
- Hwy 401 MTO Right of Way
- Site Location
- Highway
- Minor Road
- Watercourse (Intermittent)
- Watercourse (Permanent)
- Wetland, Not evaluated per OWES

0 0.35 km

1:6,000 (At original document size of 11x17)

Notes
1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2017.
3. Orthoimagery © First Base Solutions, 2017. Imagery Date: 2008

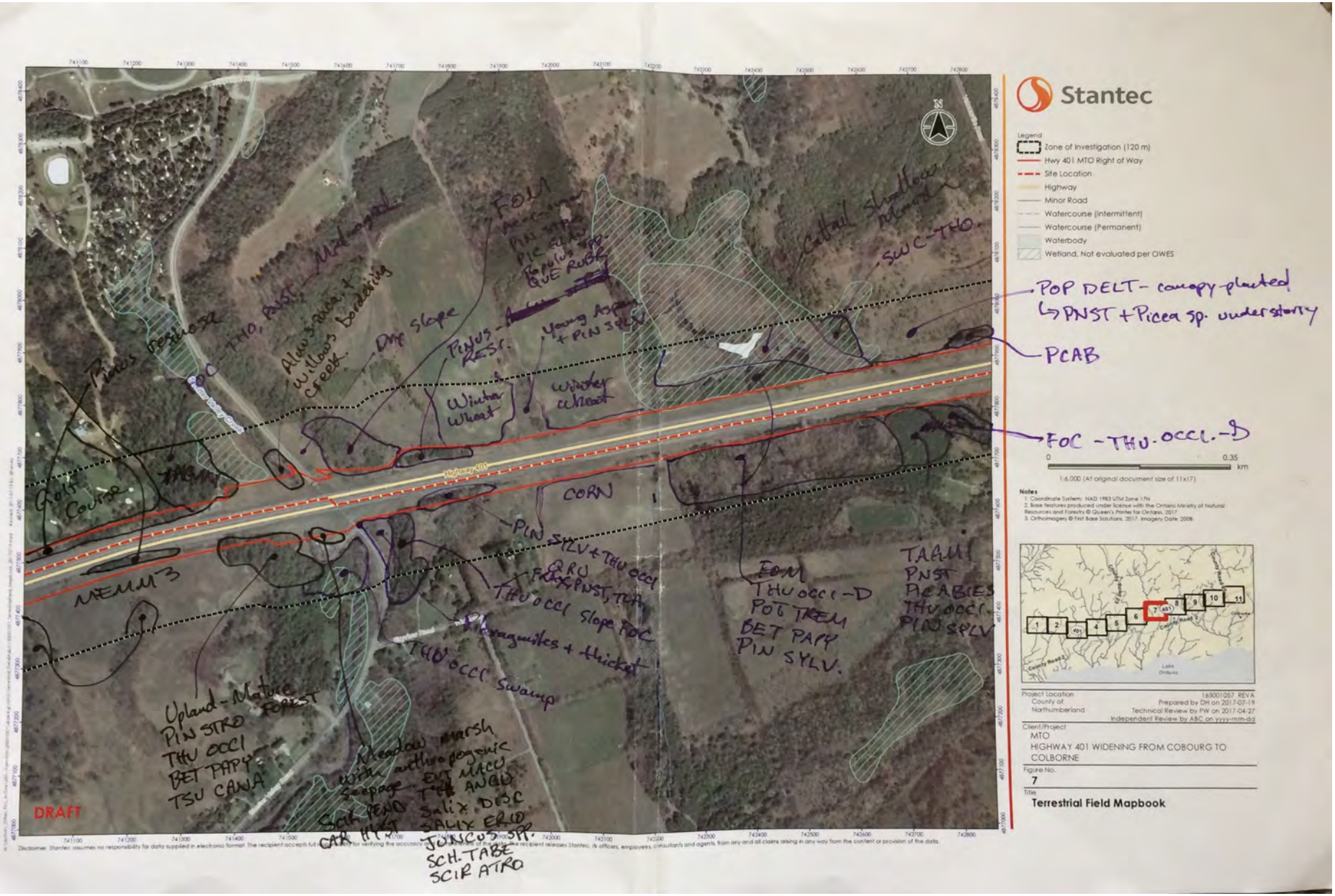
Project Location
County of Northumberland

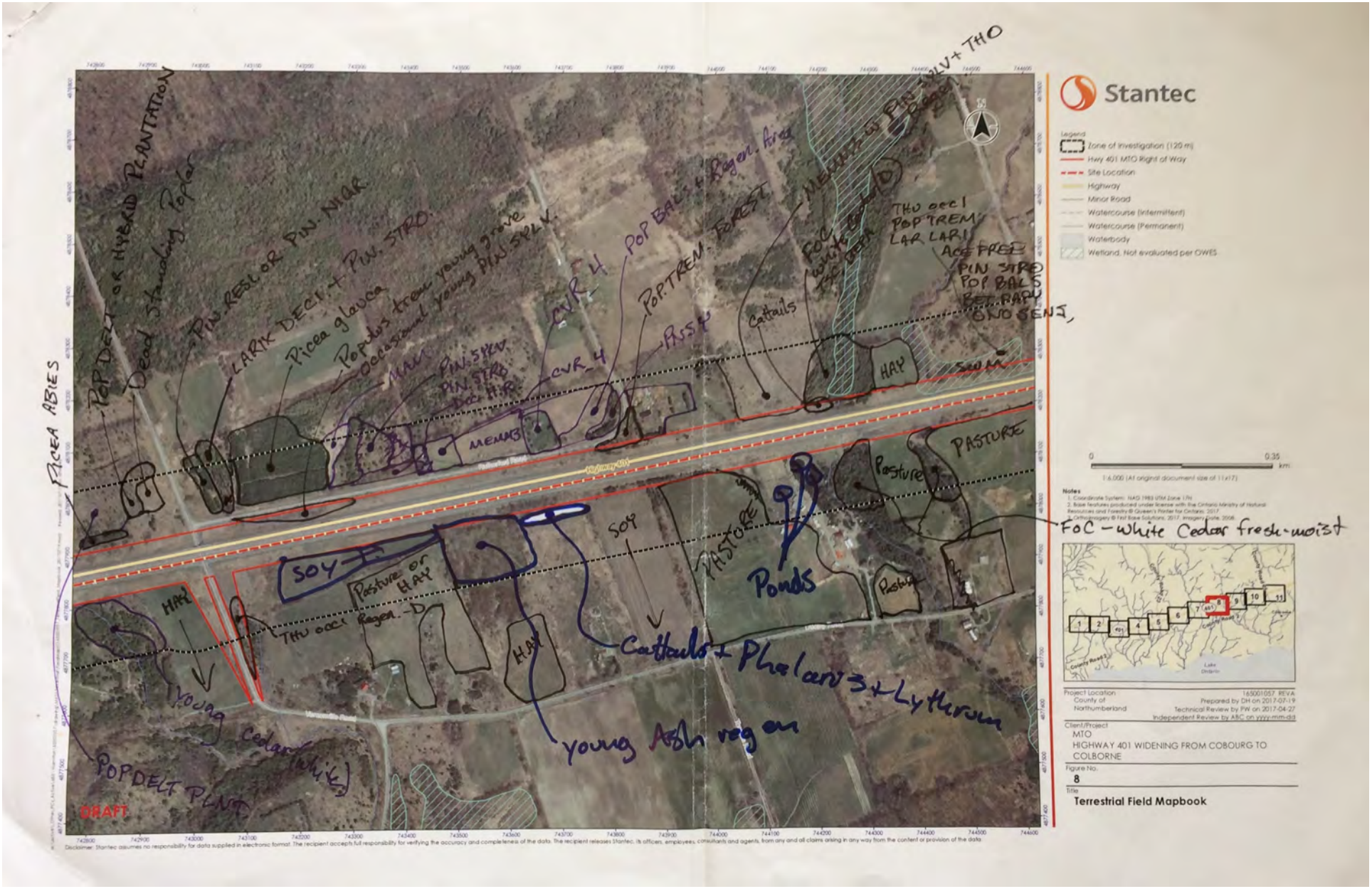
165001057 REV.A
Prepared by DH on 2017-07-19
Technical Review by PW on 2017-04-27
Independent Review by ABC on yyyy-mm-dd

Client/Project
MTO
HIGHWAY 401 WIDENING FROM COBOURG TO COLBORNE

Figure No.
6

Title
**Terrestrial Field Mapbook**


Stantec
Legend
Zone of Investigation (120 m)
Hwy 401 MTO Right of Way
Site Location
Highway
Minor Road
Watercourse (Intermittent)
Watercourse (Permanent)
Waterbody
Wetland, Not evaluated per OWES
POP DELT - canopy-planted
↳ PNST + Picea sp. understory
PCAB
FOC - THU. OCCI. - D
0
0.35
km
1:6,000 (At original document size of 11x17)
Notes
1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2017.
3. Orthoimagery © First Base Solutions, 2017. Imagery Date: 2008
Project Location
County of Northumberland
165001057 REVA
Prepared by DH on 2017-07-19
Technical Review by PW on 2017-04-27
Independent Review by ABC on yyyy-mm-dd
Client/Project
MTO
HIGHWAY 401 WIDENING FROM COBOURG TO COLBORNE
Figure No.
7
Title
Terrestrial Field Mapbook
DRAFT
Golf Course
CORN
Upland - Mature Forest
Meadow marsh with anthropogenic seepage
Thicket
Swamp
Highway 401
County Road 2
Lake Ontario




Stantec

Legend
- Zone of Investigation (120 m)
- Hwy 401 MTO Right of Way
- Site Location
- Highway
- Minor Road
- Watercourse (Intermittent)
- Watercourse (Permanent)
- Waterbody
- Wetland, Not evaluated per OWES

0 0.35 km

1:6,000 (At original document size of 11x17)

Notes
1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2017.
3. Orthoimagery © First Base Solutions, 2017. Imagery Date: 2008.

Project Location
County of Northumberland

165001057 REV A
Prepared by DH on 2017-07-19
Technical Review by PW on 2017-04-27
Independent Review by ABC on yyyy-mm-dd

Client/Project
MTO
HIGHWAY 401 WIDENING FROM COBOURG TO COLBORNE

Figure No.
8

Title
Terrestrial Field Mapbook

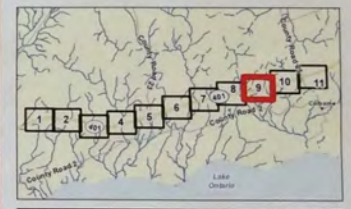

Stantec

Legend
- Zone of Investigation (120 m)
- Hwy 401 MTO Right of Way
- Site Location
- Highway
- Minor Road
- Watercourse (Intermittent)
- Watercourse (Permanent)
- Wetland, Not evaluated per OWES

0 0.35 km

1:6,000 (At original document size of 11x17)

**Notes**
1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2017.
3. Orthoimagery © First Base Solutions, 2017. Imagery Date: 2008.




Project Location
County of Northumberland

165001057 REVA
Prepared by DH on 2017-07-19
Technical Review by PW on 2017-04-27
Independent Review by ABC on yyyy-mm-dd

Client/Project
MTO
HIGHWAY 401 WIDENING FROM COBOURG TO COLBORNE

Figure No.
9

Title
**Terrestrial Field Mapbook**


Disclaimer: Stantec assumes no responsibility for data supplied in electronic format. The recipient accepts full responsibility for verifying the accuracy and completeness of the data. The recipient releases Stantec, its officers, employees, consultants and agents, from any and all claims arising in any way from the content or provision of the data.

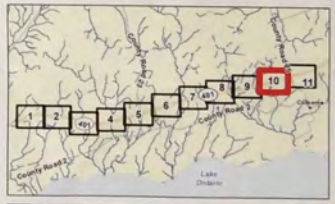
Stantec

Legend
- Zone of Investigation (120 m)
- Hwy 401 MTO Right of Way
- Site Location
- Highway
- Minor Road
- Watercourse (Intermittent)
- Watercourse (Permanent)
- Waterbody
- Wetland, Not evaluated per OWES

0 0.35 km

1:6,000 (At original document size of 11x17)

Notes
1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2017.
3. Orthoimagery © First Base Solutions, 2017. Imagery Date, 2008.




Project Location
County of Northumberland

165001057 REVA
Prepared by DH on 2017-07-19
Technical Review by PN on 2017-04-27
Independent Review by ABC on yyyy-mm-dd

Client/Project
MTO
HIGHWAY 401 WIDENING FROM COBOURG TO COLBORNE

Figure No.
10

Title
**Terrestrial Field Mapbook**

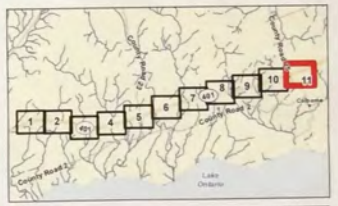

Stantec

Legend
- Zone of Investigation (120 m)
- Hwy 401 MTO Right of Way
- Site Location
- Highway
- Major Road
- Minor Road
- Watercourse (Intermittent)
- Watercourse (Permanent)
- Waterbody
- Wetland, Not evaluated per OWES

0 0.35 km

1:6,000 (At original document size of 11x17)

**Notes**
1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2017.
3. Orthoimagery © First Base Solutions, 2017. Imagery Date: 2008




Project Location
County of Northumberland

165001057 REVA
Prepared by DH on 2017-03-19
Technical Review by PW on 2017-04-27
Independent Review by ABC on yyyy-mm-dd

Client/Project
MTO
HIGHWAY 401 WIDENING FROM COBOURG TO COLBORNE

Figure No.
11

Title
**Terrestrial Field Mapbook**

Stantec

# Culvert-nesting Birds Datasheet

Project Number: 165001057 | Project Name: MTO Hwy 401 Cobourg

Date: 12-16 August 2017 | Field Personnel: B Holden, B Miller

| Weather Conditions: | TEMP (°C) | WIND | CLOUD | PPT (current) | PPT (last 24 hrs) |
|---|---|---|---|---|---|
| | | | | | |

Watercourse Name: Unnamed Tributary 0 | Start/End times (24 hr): /

Location: See map | Orientation (0 to 179°): ~180

Feature ID: See map (indicate on map) | UTM Coordinates: See map (Zone / Easting / Northing)

## CULVERT DATA

Culvert runs under: Highway 401 (road, rail, other)

Construction: ☐Open-bottom arch ☐Enclosed arch ☐Cylindrical ☒Open-bottom box ☐Enclosed box ☐Other

Number of arches or boxes: 1

Material: Concrete (wood, metal, concrete, stone, or other)

Culvert Dimensions: 30 (Total Culvert LENGTH (m)) x 3 (Maximum Culvert HEIGHT (m)) x 3 (Maximum Culvert WIDTH (m))

### Culvert Suitability for Nesting

Suitable horizontal ledges? ☐YES / ☒NO | Suitable vertical surface? ☐YES / ☐NO

Other suitable surfaces? ☒YES / ☐NO | ☐Bolts / ☐Holes / ☐Other

Artificial nest platform/ledge? ☐YES / ☒NO | If yes, describe:

Visibility of potential nest sites: 100 (HORIZONTAL (%)) | 100 (VERTICAL (%)) | 100 (HOLES (%))

## BIRD DATA

Species Detected: **BARS** = ☐YES / ☒NO **CLSW** = ☐YES / ☒NO **NRWS** = ☐YES / ☒NO

Nests Observed: **BARS** = ☐YES / ☒NO **CLSW** = ☐YES / ☒NO **NRWS** = ☐YES / ☒NO

| Number of: | CLSW | BARS | EAPH | AMRO | ROPI | HOSP | NRWS |
|---|---|---|---|---|---|---|---|
| Birds (5 min observation): | | | | | | | |
| Apparently active nests: | | | | | | | |
| Old nests: | | | | | | | |
| Nest scars: | | | | | | | |
| Nest holes observed active: | | | | | | | |
| Nest Holes not observed active: | | | | | | | |

Within 50m of culvert

Other species observed nesting:

## HABITAT DATA

Water in culvert? ☒YES / ☐NO | Maximum width of water in culvert: Same as culvert (metres)

## COMMENTS:

PAGE 1 OF 1

Quality Control: This form is complete ☐ & legible ☐

Print Name & Initial: Brandon Holden (field notes author)

Print Name & Initial: (field notes QA/QC personnel)

Stantec

# Culvert-nesting Birds Datasheet

Project Number: 165001057 | Project Name: MTO Hwy 401 Cobourg

Date: 12-16 August 2017 | Field Personnel: B Holden, B Miller

| Weather Conditions: | TEMP (°C) | WIND | CLOUD | PPT (current) | PPT (last 24 hrs) |
|---|---|---|---|---|---|
| | | | | | |

Watercourse Name: Unnamed Tributary 02 | Start/End times (24 hr): / 

Location: See map | Orientation (0 to 179°): ~180

Feature ID: See map (Indicate on map) | UTM Coordinates: See map (Zone / Easting / Northing)

## CULVERT DATA

Culvert runs under: Highway 401 (road, rail, other)

Construction: ☐Open-bottom arch ☐Enclosed arch ☐Cylindrical ☒Open-bottom box ☐Enclosed box ☐Other

Number of arches or boxes: 1

Material: Concrete (wood, metal, concrete, stone, or other)

Culvert Dimensions: 30 (Total Culvert LENGTH (m)) x 3 (Maximum Culvert HEIGHT (m)) x 3 (Maximum Culvert WIDTH (m))

### Culvert Suitability for Nesting

Suitable horizontal ledges? ☐YES / ☒NO | Suitable vertical surface? ☐YES / ☐NO

Other suitable surfaces? ☒YES / ☐NO | ☐Bolts / ☐Holes / ☐Other

Artificial nest platform/ledge? ☐YES / ☒NO | If yes, describe:

Visibility of potential nest sites: 100 (HORIZONTAL (%)) | 100 (VERTICAL (%)) | 100 (HOLES (%))

## BIRD DATA

Species Detected: **BARS** = ☐YES / ☒NO **CLSW** = ☐YES / ☒NO **NRWS** = ☐YES / ☒NO

Nests Observed: **BARS** = ☐YES / ☒NO **CLSW** = ☐YES / ☒NO **NRWS** = ☐YES / ☒NO

| Number of: | CLSW | BARS | EAPH | AMRO | ROPI | HOSP | NRWS |
|---|---|---|---|---|---|---|---|
| Birds (5 min observation): | | | | | | | |
| Apparently active nests: | | | | | | | |
| Old nests: | | | | | | | |
| Nest scars: | | | | | | | |
| Nest holes observed active: | | | | | | | |
| Nest Holes not observed active: | | | | | | | |

Within 50m of culvert

Other species observed nesting:

## HABITAT DATA

Water in culvert? ☒YES / ☐NO | Maximum width of water in culvert: Same as culvert (metres)

## COMMENTS:

PAGE 1 OF 1

Quality Control: This form is complete ☐ & legible ☐

Print Name & Initial: Brandon Holden BH (field notes author) | Print Name & Initial: (field notes QA/QC personnel)

Stantec

# Culvert-nesting Birds Datasheet

Project Number: 165001057 | Project Name: MTO Hwy 401 Cobourg

Date: 12-16 August 2017 | Field Personnel: B Holden, B Miller

| Weather Conditions: | TEMP (°C) | WIND | CLOUD | PPT (current) | PPT (last 24 hrs) |
|---|---|---|---|---|---|
| | | | | | |

Watercourse Name: Unnamed Tributary 0 | Start/End times (24 hr): / 

Location: See map | Orientation (0 to 179°): ~180

Feature ID: See map (indicate on map) | UTM Coordinates: See map (Zone / Easting / Northing)

## CULVERT DATA

Culvert runs under: Highway 401 (road, rail, other)

Construction: ☐Open-bottom arch ☐Enclosed arch ☐Cylindrical ☒Open-bottom box ☐Enclosed box ☐Other

Number of arches or boxes: 1

Material: Concrete (wood, metal, concrete, stone, or other)

Culvert Dimensions: 30 (Total Culvert LENGTH (m)) x 3 (Maximum Culvert HEIGHT (m)) x 3 (Maximum Culvert WIDTH (m))

### Culvert Suitability for Nesting

Suitable horizontal ledges? ☐YES / ☒NO | Suitable vertical surface? ☐YES / ☐NO

Other suitable surfaces? ☒YES / ☐NO | ☐Bolts / ☐Holes / ☐Other

Artificial nest platform/ledge? ☐YES / ☒NO | If yes, describe:

Visibility of potential nest sites: 100 (HORIZONTAL (%)) | 100 (VERTICAL (%)) | 100 (HOLES (%))

## BIRD DATA

Species Detected: **BARS** = ☐YES / ☒NO **CLSW** = ☐YES / ☒NO **NRWS** = ☐YES / ☒NO

Nests Observed: **BARS** = ☐YES / ☒NO **CLSW** = ☐YES / ☒NO **NRWS** = ☐YES / ☒NO

| Number of: | CLSW | BARS | EAPH | AMRO | ROPI | HOSP | NRWS |
|---|---|---|---|---|---|---|---|
| Birds (5 min observation): | | | | | | | |
| Apparently active nests: | | | | | | | |
| Old nests: | | | | | | | |
| Nest scars: | | | | | | | |
| Nest holes observed active: | | | | | | | |
| Nest Holes not observed active: | | | | | | | |

Within 50m of culvert

Other species observed nesting:

## HABITAT DATA

Water in culvert? ☒YES / ☐NO | Maximum width of water in culvert: Same as culvert (metres)

## COMMENTS:

PAGE 1 OF 1

Quality Control: This form is complete ☐ & legible ☐

Print Name & Initial: Brandon Holden BH (field notes author)

Print Name & Initial: (field notes QA/QC personnel)

Stantec

# Culvert-nesting Birds Datasheet

Project Number: 165001057 | Project Name: MTO Hwy 401 Cobourg

Date: 12-16 August 2017 | Field Personnel: B Holden, B Miller

| Weather Conditions: | TEMP (°C) | WIND | CLOUD | PPT (current) | PPT (last 24 hrs) |
|---|---|---|---|---|---|
| | | | | | |

Watercourse Name: Unnamed Tributary 0 4 | Start/End times (24 hr): / 

Location: See map | Orientation (0 to 179°): ~180

Feature ID: See map (indicate on map) | UTM Coordinates: See map — Zone / Easting / Northing

## CULVERT DATA

Culvert runs under: Highway 401 (road, rail, other)

Construction: ☐Open-bottom arch ☐Enclosed arch ☐Cylindrical ☒Open-bottom box ☐Enclosed box ☐Other

Number of arches or boxes: 1

Material: Concrete (wood, metal, concrete, stone, or other)

Culvert Dimensions: 30 (Total Culvert LENGTH (m)) x 3 (Maximum Culvert HEIGHT (m)) x 3 (Maximum Culvert WIDTH (m))

### Culvert Suitability for Nesting

Suitable horizontal ledges? ☐YES / ☒NO | Suitable vertical surface? ☐YES / ☐NO

Other suitable surfaces? ☒YES / ☐NO | ☐Bolts / ☐Holes / ☐Other

Artificial nest platform/ledge? ☐YES / ☒NO | If yes, describe:

Visibility of potential nest sites: 100 (HORIZONTAL (%)) | 100 (VERTICAL (%)) | 100 (HOLES (%))

## BIRD DATA

Species Detected: **BARS** = ☐YES / ☒NO **CLSW** = ☐YES / ☒NO **NRWS** = ☐YES / ☒NO

Nests Observed: **BARS** = ☐YES / ☒NO **CLSW** = ☐YES / ☒NO **NRWS** = ☐YES / ☒NO

| Number of: | CLSW | BARS | EAPH | AMRO | ROPI | HOSP | NRWS |
|---|---|---|---|---|---|---|---|
| Birds (5 min observation): | | | | | | | |
| Apparently active nests: | | | | | | | |
| Old nests: | | | | | | | |
| Nest scars: | | | | | | | |
| Nest holes observed active: | | | | | | | |
| Nest Holes not observed active: | | | | | | | |

Within 50m of culvert

Other species observed nesting:

## HABITAT DATA

Water in culvert? ☒YES / ☐NO | Maximum width of water in culvert: Same as culvert (metres)

## COMMENTS:



Quality Control: This form is complete ☐ & legible ☐

Print Name & Initial: Brandon Holden BH (field notes author) | Print Name & Initial: (field notes QA/QC personnel)

Stantec

# Culvert-nesting Birds Datasheet

Project Number: 165001057 | Project Name: MTO Hwy 401 Cobourg

Date: 12-16 August 2017 | Field Personnel: B Holden, B Miller

| Weather Conditions: | TEMP (°C) | WIND | CLOUD | PPT (current) | PPT (last 24 hrs) |
|---|---|---|---|---|---|
| | | | | | |

Watercourse Name: Unnamed Tributary 0 5 | Start/End times (24 hr): / 

Location: See map | Orientation (0 to 179°): ~180

Feature ID: See map (Indicate on map) | UTM Coordinates: See map (Zone / Easting / Northing)

## CULVERT DATA

Culvert runs under: Highway 401 (road, rail, other)

Construction: ☐Open-bottom arch ☐Enclosed arch ☐Cylindrical ☒Open-bottom box ☐Enclosed box ☐Other

Number of arches or boxes: 1

Material: Concrete (wood, metal, concrete, stone, or other)

Culvert Dimensions: 30 (Total Culvert LENGTH (m)) x 3 (Maximum Culvert HEIGHT (m)) x 3 (Maximum Culvert WIDTH (m))

### Culvert Suitability for Nesting

Suitable horizontal ledges? ☐YES / ☒NO | Suitable vertical surface? ☐YES / ☐NO

Other suitable surfaces? ☒YES / ☐NO | ☐Bolts / ☐Holes / ☐Other

Artificial nest platform/ledge? ☐YES / ☒NO | If yes, describe:

Visibility of potential nest sites: 100 (HORIZONTAL (%)) | 100 (VERTICAL (%)) | 100 (HOLES (%))

## BIRD DATA

Species Detected: **BARS** = ☐YES / ☒NO **CLSW** = ☐YES / ☒NO **NRWS** = ☐YES / ☒NO

Nests Observed: **BARS** = ☐YES / ☒NO **CLSW** = ☐YES / ☒NO **NRWS** = ☐YES / ☒NO

| Number of: | CLSW | BARS | EAPH | AMRO | ROPI | HOSP | NRWS |
|---|---|---|---|---|---|---|---|
| Birds (5 min observation): | | | | | | | |
| Apparently active nests: | | | | | | | |
| Old nests: | | | | | | | |
| Nest scars: | | | | | | | |
| Nest holes observed active: | | | | | | | |
| Nest Holes not observed active: | | | | | | | |

Within 50m of culvert

Other species observed nesting:

## HABITAT DATA

Water in culvert? ☒YES / ☐NO | Maximum width of water in culvert: Same as culvert (metres)

## COMMENTS:

PAGE 1 OF 1

Quality Control: This form is complete ☐ & legible ☐

Print Name & Initial: Brandon Holden BH (field notes author) | Print Name & Initial: (field notes QA/QC personnel)

Stantec

# Culvert-nesting Birds Datasheet

Project Number: 165001057 | Project Name: MTO Hwy 401 Cobourg

Date: 12-16 August 2017 | Field Personnel: B Holden, B Miller

| Weather Conditions: | TEMP (°C) | WIND | CLOUD | PPT (current) | PPT (last 24 hrs) |
|---|---|---|---|---|---|
| | | | | | |

Watercourse Name: Unnamed Tributary 0 6 | Start/End times (24 hr): / 

Location: See map | Orientation (0 to 179°): ~180

Feature ID: See map (Indicate on map) | UTM Coordinates: See map (Zone / Easting / Northing)

## CULVERT DATA

Culvert runs under: Highway 401 (road, rail, other)

Construction: ☐Open-bottom arch ☐Enclosed arch ☐Cylindrical ☒Open-bottom box ☐Enclosed box ☐Other

Number of arches or boxes: 1

Material: Concrete (wood, metal, concrete, stone, or other)

Culvert Dimensions: 30 (Total Culvert LENGTH (m)) x 3 (Maximum Culvert HEIGHT (m)) x 3 (Maximum Culvert WIDTH (m))

### Culvert Suitability for Nesting

Suitable horizontal ledges? ☐YES / ☒NO | Suitable vertical surface? ☐YES / ☐NO

Other suitable surfaces? ☒YES / ☐NO | ☐Bolts / ☐Holes / ☐Other

Artificial nest platform/ledge? ☐YES / ☒NO | If yes, describe:

Visibility of potential nest sites: 100 (HORIZONTAL (%)) | 100 (VERTICAL (%)) | 100 (HOLES (%))

## BIRD DATA

Species Detected: **BARS** = ☐YES / ☒NO **CLSW** = ☐YES / ☒NO **NRWS** = ☐YES / ☒NO

Nests Observed: **BARS** = ☐YES / ☒NO **CLSW** = ☐YES / ☒NO **NRWS** = ☐YES / ☒NO

| Number of: | CLSW | BARS | EAPH | AMRO | ROPI | HOSP | NRWS |
|---|---|---|---|---|---|---|---|
| Birds (5 min observation): | | | | | | | |
| Apparently active nests: | | | | | | | |
| Old nests: | | | | | | | |
| Nest scars: | | | | | | | |
| Nest holes observed active: | | | | | | | |
| Nest Holes not observed active: | | | | | | | |

Within 50m of culvert

Other species observed nesting:

## HABITAT DATA

Water in culvert? ☒YES / ☐NO | Maximum width of water in culvert: Same as culvert (metres)

## COMMENTS:

PAGE 1 OF 1

Quality Control: This form is complete ☐ & legible ☐

Print Name & Initial: Brandon Holden BH (field notes author)

Print Name & Initial: (field notes QA/QC personnel)

Stantec

# Culvert-nesting Birds Datasheet

Project Number: 165001057 | Project Name: MTO Hwy 401 Cobourg

Date: 12-16 August 2017 | Field Personnel: B Holden, B Miller

| Weather Conditions: | TEMP (°C) | WIND | CLOUD | PPT (current) | PPT (last 24 hrs) |
|---|---|---|---|---|---|
| | | | | | |

Watercourse Name: Unnamed Tributary 07 | Start/End times (24 hr): /

Location: See map | Orientation (0 to 179°): ~180

Feature ID: See map (Indicate on map) | UTM Coordinates: See map (Zone / Easting / Northing)

## CULVERT DATA

Culvert runs under: Highway 401 (road, rail, other)

Construction: ☐Open-bottom arch ☐Enclosed arch ☐Cylindrical ☒Open-bottom box ☐Enclosed box ☐Other

Number of arches or boxes: 1

Material: Concrete (wood, metal, concrete, stone, or other)

Culvert Dimensions: 30 (Total Culvert LENGTH (m)) x 3 (Maximum Culvert HEIGHT (m)) x 3 (Maximum Culvert WIDTH (m))

### Culvert Suitability for Nesting

Suitable horizontal ledges? ☐YES / ☒NO | Suitable vertical surface? ☐YES / ☐NO

Other suitable surfaces? ☒YES / ☐NO | ☐Bolts / ☐Holes / ☐Other

Artificial nest platform/ledge? ☐YES / ☒NO | If yes, describe:

Visibility of potential nest sites: 100 (HORIZONTAL (%)) | 100 (VERTICAL (%)) | 100 (HOLES (%))

## BIRD DATA

Species Detected: **BARS** = ☐YES / ☒NO **CLSW** = ☐YES / ☒NO **NRWS** = ☐YES / ☒NO

Nests Observed: **BARS** = ☐YES / ☒NO **CLSW** = ☐YES / ☒NO **NRWS** = ☐YES / ☒NO

| Number of: | CLSW | BARS | EAPH | AMRO | ROPI | HOSP | NRWS |
|---|---|---|---|---|---|---|---|
| Birds (5 min observation): | | | | | | | |
| Apparently active nests: | | | | | | | |
| Old nests: | | | | | | | |
| Nest scars: | | | | | | | |
| Nest holes observed active: | | | | | | | |
| Nest Holes not observed active: | | | | | | | |

Within 50m of culvert

Other species observed nesting:

## HABITAT DATA

Water in culvert? ☒YES / ☐NO | Maximum width of water in culvert: Same as culvert (metres)

## COMMENTS:

PAGE 1 OF 1

Quality Control: This form is complete ☐ & legible ☐

Print Name & Initial: Brandon Holden BH (field notes author)

Print Name & Initial: (field notes QA/QC personnel)

Stantec

# Culvert-nesting Birds Datasheet

Project Number: 165001057 | Project Name: MTO Hwy 401 Cobourg

Date: 12-16 August 2017 | Field Personnel: B Holden, B Miller

| Weather Conditions: | TEMP (°C) | WIND | CLOUD | PPT (current) | PPT (last 24 hrs) |
|---|---|---|---|---|---|
| | | | | | |

Watercourse Name: Unnamed Tributary 0 8 | Start/End times (24 hr): / 

Location: See map | Orientation (0 to 179°): ~180

Feature ID: See map (Indicate on map) | UTM Coordinates: See map (Zone / Easting / Northing)

## CULVERT DATA

Culvert runs under: Highway 401 (road, rail, other)

Construction: ☐Open-bottom arch ☐Enclosed arch ☐Cylindrical ☒Open-bottom box ☐Enclosed box ☐Other

Number of arches or boxes: 1

Material: Concrete (wood, metal, concrete, stone, or other)

Culvert Dimensions: 30 (Total Culvert LENGTH (m)) x 3 (Maximum Culvert HEIGHT (m)) x 3 (Maximum Culvert WIDTH (m))

### Culvert Suitability for Nesting

Suitable horizontal ledges? ☐YES / ☒NO | Suitable vertical surface? ☐YES / ☐NO

Other suitable surfaces? ☒YES / ☐NO | ☐Bolts / ☐Holes / ☐Other

Artificial nest platform/ledge? ☐YES / ☒NO | If yes, describe:

Visibility of potential nest sites: 100 (HORIZONTAL (%)) | 100 (VERTICAL (%)) | 100 (HOLES (%))

## BIRD DATA

Species Detected: **BARS** = ☐YES / ☒NO **CLSW** = ☐YES / ☒NO **NRWS** = ☐YES / ☒NO

Nests Observed: **BARS** = ☐YES / ☒NO **CLSW** = ☐YES / ☒NO **NRWS** = ☐YES / ☒NO

| Number of: | CLSW | BARS | EAPH | AMRO | ROPI | HOSP | NRWS |
|---|---|---|---|---|---|---|---|
| Birds (5 min observation): | | | | | | | |
| Apparently active nests: | | | | | | | |
| Old nests: | | | | | | | |
| Nest scars: | | | | | | | |
| Nest holes observed active: | | | | | | | |
| Nest Holes not observed active: | | | | | | | |

Within 50m of culvert

Other species observed nesting:

## HABITAT DATA

Water in culvert? ☒YES / ☐NO | Maximum width of water in culvert: Same as culvert (metres)

## COMMENTS:

PAGE 1 OF 1

Quality Control: This form is complete ☐ & legible ☐

Print Name & Initial: Brandon Holden BH (field notes author) | Print Name & Initial: (field notes QA/QC personnel)

Stantec

# Culvert-nesting Birds Datasheet

Project Number: 165001057 | Project Name: MTO Hwy 401 Cobourg

Date: 12-16 August 2017 | Field Personnel: B Holden, B Miller

| Weather Conditions: | TEMP (°C) | WIND | CLOUD | PPT (current) | PPT (last 24 hrs) |
|---|---|---|---|---|---|
| | | | | | |

Watercourse Name: Unnamed Tributary 0 9 | Start/End times (24 hr): / 

Location: See map | Orientation (0 to 179°): ~180

Feature ID: See map (Indicate on map) | UTM Coordinates: See map (Zone / Easting / Northing)

## CULVERT DATA

Culvert runs under: Highway 401 (road, rail, other)

Construction: ☐Open-bottom arch ☐Enclosed arch ☐Cylindrical ☒Open-bottom box ☐Enclosed box ☐Other

Number of arches or boxes: 1

Material: Concrete (wood, metal, concrete, stone, or other)

Culvert Dimensions: 30 (Total Culvert LENGTH (m)) x 3 (Maximum Culvert HEIGHT (m)) x 3 (Maximum Culvert WIDTH (m))

### Culvert Suitability for Nesting

Suitable horizontal ledges? ☐YES / ☒NO | Suitable vertical surface? ☐YES / ☐NO

Other suitable surfaces? ☒YES / ☐NO | ☐Bolts / ☐Holes / ☐Other

Artificial nest platform/ledge? ☐YES / ☒NO | If yes, describe:

Visibility of potential nest sites: 100 (HORIZONTAL (%)) | 100 (VERTICAL (%)) | 100 (HOLES (%))

## BIRD DATA

Species Detected: **BARS** = ☐YES / ☒NO **CLSW** = ☐YES / ☒NO **NRWS** = ☐YES / ☒NO

Nests Observed: **BARS** = ☐YES / ☒NO **CLSW** = ☐YES / ☒NO **NRWS** = ☐YES / ☒NO

| Number of: | CLSW | BARS | EAPH | AMRO | ROPI | HOSP | NRWS |
|---|---|---|---|---|---|---|---|
| Birds (5 min observation): | | | | | | | |
| Apparently active nests: | | | | | | | |
| Old nests: | | | | | | | |
| Nest scars: | | | | | | | |
| Nest holes observed active: | | | | | | | |
| Nest Holes not observed active: | | | | | | | |

Within 50m of culvert

Other species observed nesting:

## HABITAT DATA

Water in culvert? ☒YES / ☐NO | Maximum width of water in culvert: Same as culvert (metres)

## COMMENTS:

PAGE 1 OF 1

Print Name & Initial: Brandon Holden BH (field notes author)

Quality Control: This form is complete ☐ & legible ☐

Print Name & Initial: (field notes QA/QC personnel)

Stantec

# Culvert-nesting Birds Datasheet

Project Number: 165001057 | Project Name: MTO Hwy 401 Cobourg

Date: 12-16 August 2017 | Field Personnel: B Holden, B Miller

| Weather Conditions: | TEMP (°C) | WIND | CLOUD | PPT (current) | PPT (last 24 hrs) |
|---|---|---|---|---|---|
| | | | | | |

Watercourse Name: Unnamed Tributary 1 O | Start/End times (24 hr): / 

Location: See map | Orientation (0 to 179°): ~180

Feature ID: See map (Indicate on map) | UTM Coordinates: See map (Zone / Easting / Northing)

## CULVERT DATA

Culvert runs under: Highway 401 (road, rail, other)

Construction: ☐Open-bottom arch ☐Enclosed arch ☐Cylindrical ☒Open-bottom box ☐Enclosed box ☐Other

Number of arches or boxes: 1

Material: Concrete (wood, metal, concrete, stone, or other)

Culvert Dimensions: 30 (Total Culvert LENGTH (m)) x 3 (Maximum Culvert HEIGHT (m)) x 3 (Maximum Culvert WIDTH (m))

### Culvert Suitability for Nesting

Suitable horizontal ledges? ☐YES / ☒NO | Suitable vertical surface? ☐YES / ☐NO

Other suitable surfaces? ☒YES / ☐NO | ☐Bolts / ☐Holes / ☐Other

Artificial nest platform/ledge? ☐YES / ☒NO | If yes, describe:

Visibility of potential nest sites: 100 (HORIZONTAL (%)) | 100 (VERTICAL (%)) | 100 (HOLES (%))

## BIRD DATA

Species Detected: **BARS** = ☐YES / ☒NO **CLSW** = ☐YES / ☒NO **NRWS** = ☐YES / ☒NO

Nests Observed: **BARS** = ☐YES / ☒NO **CLSW** = ☐YES / ☒NO **NRWS** = ☐YES / ☒NO

| Number of: | CLSW | BARS | EAPH | AMRO | ROPI | HOSP | NRWS |
|---|---|---|---|---|---|---|---|
| Birds (5 min observation): | | | | | | | |
| Apparently active nests: | | | | | | | |
| Old nests: | | | | | | | |
| Nest scars: | | | | | | | |
| Nest holes observed active: | | | | | | | |
| Nest Holes not observed active: | | | | | | | |

Within 50m of culvert

Other species observed nesting:

## HABITAT DATA

Water in culvert? ☒YES / ☐NO | Maximum width of water in culvert: Same as culvert (metres)

## COMMENTS:

PAGE 1 OF 1

Quality Control: This form is complete ☐ & legible ☐

Print Name & Initial: Brandon Holden BH (field notes author)

Print Name & Initial: (field notes QA/QC personnel)

Stantec

# Culvert-nesting Birds Datasheet

Project Number: 165001057 | Project Name: MTO Hwy 401 Cobourg

Date: 12-16 August 2017 | Field Personnel: B Holden, B Miller

| Weather Conditions: | TEMP (°C) | WIND | CLOUD | PPT (current) | PPT (last 24 hrs) |
|---|---|---|---|---|---|
| | | | | | |

Watercourse Name: Unnamed Tributary 1 | Start/End times (24 hr): / 

Location: See map | Orientation (0 to 179°): ~180

Feature ID: See map (Indicate on map) | UTM Coordinates: See map (Zone / Easting / Northing)

## CULVERT DATA

Culvert runs under: Highway 401 (road, rail, other)

Construction: ☐Open-bottom arch ☐Enclosed arch ☐Cylindrical ☒Open-bottom box ☐Enclosed box ☐Other

Number of arches or boxes: 1

Material: Concrete (wood, metal, concrete, stone, or other)

Culvert Dimensions: 30 (Total Culvert LENGTH (m)) x 3 (Maximum Culvert HEIGHT (m)) x 3 (Maximum Culvert WIDTH (m))

### Culvert Suitability for Nesting

Suitable horizontal ledges? ☐YES / ☒NO | Suitable vertical surface? ☐YES / ☐NO

Other suitable surfaces? ☒YES / ☐NO | ☐Bolts / ☐Holes / ☐Other

Artificial nest platform/ledge? ☐YES / ☒NO | If yes, describe:

Visibility of potential nest sites: 100 (HORIZONTAL (%)) | 100 (VERTICAL (%)) | 100 (HOLES (%))

## BIRD DATA

Species Detected: **BARS** = ☐YES / ☒NO **CLSW** = ☐YES / ☒NO **NRWS** = ☐YES / ☒NO

Nests Observed: **BARS** = ☐YES / ☒NO **CLSW** = ☐YES / ☒NO **NRWS** = ☐YES / ☒NO

| Number of: | CLSW | BARS | EAPH | AMRO | ROPI | HOSP | NRWS |
|---|---|---|---|---|---|---|---|
| Birds (5 min observation): | | | | | | | |
| Apparently active nests: | | | | | | | |
| Old nests: | | | | | | | |
| Nest scars: | | | | | | | |
| Nest holes observed active: | | | | | | | |
| Nest Holes not observed active: | | | | | | | |

Within 50m of culvert

Other species observed nesting:

## HABITAT DATA

Water in culvert? ☒YES / ☐NO | Maximum width of water in culvert: Same as culvert (metres)

## COMMENTS:

PAGE 1 OF 1

Print Name & Initial: Brandon Holden BH (field notes author)

Quality Control: This form is complete ☐ & legible ☐

Print Name & Initial: (field notes QA/QC personnel)

Stantec

# Culvert-nesting Birds Datasheet

Project Number: 165001057 | Project Name: MTO Hwy 401 Cobourg

Date: 12-16 August 2017 | Field Personnel: B Holden, B Miller

| Weather Conditions: | TEMP (°C) | WIND | CLOUD | PPT (current) | PPT (last 24 hrs) |
|---|---|---|---|---|---|
| | | | | | |

Watercourse Name: Unnamed Tributary 1 ? | Start/End times (24 hr): / 

Location: See map | Orientation (0 to 179°): ~180

Feature ID: See map (indicate on map) | UTM Coordinates: See map (Zone / Easting / Northing)

## CULVERT DATA

Culvert runs under: Highway 401 (road, rail, other)

Construction: ☐Open-bottom arch ☐Enclosed arch ☐Cylindrical ☒Open-bottom box ☐Enclosed box ☐Other _____

Number of arches or boxes: 1

Material: Concrete (wood, metal, concrete, stone, or other)

Culvert Dimensions: 30 (Total Culvert LENGTH (m)) x 3 (Maximum Culvert HEIGHT (m)) x 3 (Maximum Culvert WIDTH (m))

### Culvert Suitability for Nesting

Suitable horizontal ledges? ☐YES / ☒NO | Suitable vertical surface? ☐YES / ☐NO

Other suitable surfaces? ☒YES / ☐NO | ☐Bolts / ☐Holes / ☐Other _____

Artificial nest platform/ledge? ☐YES / ☒NO | If yes, describe: _____

Visibility of potential nest sites: 100 (HORIZONTAL (%)) | 100 (VERTICAL (%)) | 100 (HOLES (%))

## BIRD DATA

Species Detected: **BARS** = ☐YES / ☒NO **CLSW** = ☐YES / ☒NO **NRWS** = ☐YES / ☒NO

Nests Observed: **BARS** = ☐YES / ☒NO **CLSW** = ☐YES / ☒NO **NRWS** = ☐YES / ☒NO

| Number of: | CLSW | BARS | EAPH | AMRO | ROPI | HOSP | NRWS |
|---|---|---|---|---|---|---|---|
| Birds (5 min observation): | | | | | | | |
| Apparently active nests: | | | | | | | |
| Old nests: | | | | | | | |
| Nest scars: | | | | | | | |
| Nest holes observed active: | | | | | | | |
| Nest Holes not observed active: | | | | | | | |

Within 50m of culvert

Other species observed nesting: _____

## HABITAT DATA

Water in culvert? ☒YES / ☐NO | Maximum width of water in culvert: Same as culvert (metres)

## COMMENTS:

PAGE 1 OF 1

Quality Control: This form is complete ☐ & legible ☐

Print Name & Initial: Brandon Holden BH (field notes author) | Print Name & Initial: _____ (field notes QA/QC personnel)

Stantec

# Culvert-nesting Birds Datasheet

Project Number: 165001057 | Project Name: MTO Hwy 401 Cobourg

Date: 12-16 August 2017 | Field Personnel: B Holden, B Miller

| Weather Conditions: | TEMP (°C) | WIND | CLOUD | PPT (current) | PPT (last 24 hrs) |
|---|---|---|---|---|---|
| | | | | | |

Watercourse Name: Unnamed Tributary 13 | Start/End times (24 hr): / 

Location: See map | Orientation (0 to 179°): ~180

Feature ID: See map (indicate on map) | UTM Coordinates: See map — Zone / Easting / Northing

## CULVERT DATA

Culvert runs under: Highway 401 (road, rail, other)

Construction: ☐Open-bottom arch ☐Enclosed arch ☐Cylindrical ☒Open-bottom box ☐Enclosed box ☐Other

Number of arches or boxes: 1

Material: Concrete (wood, metal, concrete, stone, or other)

Culvert Dimensions: 30 (Total Culvert LENGTH (m)) x 3 (Maximum Culvert HEIGHT (m)) x 3 (Maximum Culvert WIDTH (m))

### Culvert Suitability for Nesting

Suitable horizontal ledges? ☐YES / ☒NO | Suitable vertical surface? ☐YES / ☐NO

Other suitable surfaces? ☒YES / ☐NO | ☐Bolts / ☐Holes / ☐Other

Artificial nest platform/ledge? ☐YES / ☒NO | If yes, describe:

Visibility of potential nest sites: 100 HORIZONTAL (%) | 100 VERTICAL (%) | 100 HOLES (%)

## BIRD DATA

Species Detected: **BARS** = ☐YES / ☒NO **CLSW** = ☐YES / ☒NO **NRWS** = ☐YES / ☒NO

Nests Observed: **BARS** = ☐YES / ☒NO **CLSW** = ☐YES / ☒NO **NRWS** = ☐YES / ☒NO

| Number of: | CLSW | BARS | EAPH | AMRO | ROPI | HOSP | NRWS |
|---|---|---|---|---|---|---|---|
| Birds (5 min observation): | | | | | | | |
| Apparently active nests: | | | | | | | |
| Old nests: | | | | | | | |
| Nest scars: | | | | | | | |
| Nest holes observed active: | | | | | | | |
| Nest Holes not observed active: | | | | | | | |

Within 50m of culvert

Other species observed nesting:

## HABITAT DATA

Water in culvert? ☒YES / ☐NO | Maximum width of water in culvert: Same as culvert (metres)

## COMMENTS:



Quality Control: This form is complete ☐ & legible ☐

Print Name & Initial: Brandon Holden BH (field notes author)

Print Name & Initial: (field notes QA/QC personnel)

Stantec

# Bridge-nesting Birds
# Datasheet (short version)

Project Number: 165001061 | Project Name: MTO 401 Cobourg

Date: 12-16 August 2017 | Field Personnel: B Holden, B Miller

Weather Conditions: _____ (TEMP (°C)) _____ (WIND) _____ (CLOUD) _____ (PPT (current)) _____ (PPT (last 24 hrs))

River Name & Section: Road - Nagle | Start/End times (24 hr): _____ / _____

Location: Highway 401 | Orientation (0 to 179°): ~90

Feature ID: See map (Indicate on map) | UTM Coordinates: Zone _____ | See map (Easting) | _____ (Northing)

## BRIDGE DATA

Bridge Type: Road (road, rail, other) | Over: road (water, road, land)

Construction: ☒Beam ☐Truss ☐Arch ☐Suspension ☐Tied Arch ☐Cable-stayed

Bridge Length (m): 30 m (TOTAL)

Bridge Width (m): 15 m each m

Bridge Height (m): 10 m (MAXIMUM)

Both EBL and WBL bridges

**Bridge Suitability for Nesting**

Suitable horizontal ledges? ☐YES / ☒NO

Suitable vertical surface? ☐YES / ☒NO

Other suitable surfaces? ☐YES / ☒NO ☐Bolts / ☐Holes / ☐Other: _____

% Visibility of potential nest sites: 100 % (HORIZONTAL) | 100 (VERTICAL) | 100 % (HOLES)

## BIRD DATA

Species Detected: **BARS** = ☐YES / ☒NO **CLSW** = ☐YES / ☒NO **NRWS** = ☐YES / ☒NO

Nests Observed: **BARS** = ☐YES / ☒NO **CLSW** = ☐YES / ☒NO **NRWS** = ☐YES / ☒NO

| Number of: | CLSW | BARS | EAPH | AMRO | ROPI | HOSP | NRWS |
|---|---|---|---|---|---|---|---|
| Birds (5 min observation): | | | | | | | |
| Apparently active nests: | | | | | | | |
| Old nests: | | | | | | | |
| Nest scars: | | | | | | | |
| Nest holes observed active: | | | | | | | |
| Nest Holes not observed active: | | | | | | | |

Within 50m of bridge

Other species observed nesting: _____

## HABITAT DATA

River width: It's not a river

## COMMENTS:



Quality Control: This form is complete ☐ & legible ☐

Print Name & Initial: Brandon Holden BH (field notes author) | Print Name & Initial: _____ (field notes QA/QC personnel)

Stantec

# Bridge-nesting Birds
# Datasheet (short version)

Project Number: 165001061 | Project Name: MTO 401 Cobourg
Date: 12-16 August 2017 | Field Personnel: B Holden, B Miller

Weather Conditions: TEMP (°C) | WIND | CLOUD | PPT (current) | PPT (last 24 hrs)

River Name & Section: Road - | Start/End times (24 hr): /
Location: Highway 401 | Orientation (0 to 179°): ~90

Feature ID: See map (Indicate on map) | UTM Coordinates: Zone | See map Easting | Northing

## BRIDGE DATA

Bridge Type: Road (road, rail, other) | Over: road (water, road, land)

Construction: ☒Beam ☐Truss ☐Arch ☐Suspension ☐Tied Arch ☐Cable-stayed

Bridge Length (m): 30 m (TOTAL)

Bridge Width (m): 15 m each m

Bridge Height (m): 10 m (MAXIMUM)

Both EBL and WBL bridges

**Bridge Suitability for Nesting**

Suitable horizontal ledges? ☐YES / ☒NO

Suitable vertical surface? ☐YES / ☒NO

Other suitable surfaces? ☐YES / ☒NO ☐Bolts / ☐Holes / ☐Other:

% Visibility of potential nest sites: 100 % (HORIZONTAL) | 100 (VERTICAL) | 100 % (HOLES)

## BIRD DATA

Species Detected: **BARS** = ☐YES / ☒NO **CLSW** = ☐YES / ☒NO **NRWS** = ☐YES / ☒NO

Nests Observed: **BARS** = ☐YES / ☒NO **CLSW** = ☐YES / ☒NO **NRWS** = ☐YES / ☒NO

| Number of: | CLSW | BARS | EAPH | AMRO | ROPI | HOSP | NRWS |
|---|---|---|---|---|---|---|---|
| Birds (5 min observation): | | | | | | | |
| Apparently active nests: | | | | | | | |
| Old nests: | | | | | | | |
| Nest scars: | | | | | | | |
| Nest holes observed active: | | | | | | | |
| Nest Holes not observed active: | | | | | | | |

Within 50m of bridge

Other species observed nesting:

## HABITAT DATA

River width: It's not a river

## COMMENTS:



Quality Control: This form is complete ☐ & legible ☐

Print Name & Initial: Brandon Holden BH (field notes author)

Print Name & Initial: (field notes QA/QC personnel)

Stantec

# Bridge-nesting Birds
# Datasheet (short version)

Project Number: 165001061 Project Name: MTO 401 Cobourg

Date: 12-16 August 2017 Field Personnel: B Holden, B Miller

Weather Conditions: _____ (TEMP (°C)) _____ (WIND) _____ (CLOUD) _____ (PPT (current)) _____ (PPT (last 24 hrs))

River Name & Section: Road - Gully Start/End times (24 hr): / 

Location: Highway 401 Orientation (0 to 179°): ~90

Feature ID: See map (Indicate on map) UTM Coordinates: Zone See map Easting Northing

## BRIDGE DATA

Bridge Type: Road (road, rail, other) Over: road (water, road, land)

Construction: ☒Beam ☐Truss ☐Arch ☐Suspension ☐Tied Arch ☐Cable-stayed

Bridge Length (m): 30 m TOTAL

Bridge Width (m): 15 m each m

Bridge Height (m): 10 m MAXIMUM

Both EBL and WBL bridges

**Bridge Suitability for Nesting**

Suitable horizontal ledges? ☐YES / ☒NO

Suitable vertical surface? ☐YES / ☒NO

Other suitable surfaces? ☐YES / ☒NO ☐Bolts / ☐Holes / ☐Other: _____

% Visibility of potential nest sites: 100 % HORIZONTAL 100 VERTICAL 100 % HOLES

## BIRD DATA

Species Detected: **BARS** = ☐YES / ☒NO **CLSW** = ☐YES / ☒NO **NRWS** = ☐YES / ☒NO

Nests Observed: **BARS** = ☐YES / ☒NO **CLSW** = ☐YES / ☒NO **NRWS** = ☐YES / ☒NO

| Number of: | CLSW | BARS | EAPH | AMRO | ROPI | HOSP | NRWS |
|---|---|---|---|---|---|---|---|
| Birds (5 min observation): | | | | | | | |
| Apparently active nests: | | | | | | | |
| Old nests: | | | | | | | |
| Nest scars: | | | | | | | |
| Nest holes observed active: | | | | | | | |
| Nest Holes not observed active: | | | | | | | |

Within 50m of bridge

Other species observed nesting: _____

## HABITAT DATA

River width: It's not a river

## COMMENTS:

PAGE 1 OF 1

Quality Control: This form is complete ☐ & legible ☐

Print Name & Initial: Brandon Holden BH (field notes author)

Print Name & Initial: _____ (field notes QA/QC personnel)

Stantec

# Bridge-nesting Birds
# Datasheet (short version)

Project Number: 165001061 Project Name: MTO 401 Cobourg

Date: 12-16 August 2017 Field Personnel: B Holden, B Miller

Weather Conditions: _____ (TEMP (°C)) _____ (WIND) _____ (CLOUD) _____ (PPT (current)) _____ (PPT (last 24 hrs))

River Name & Section: Road - R23 Start/End times (24 hr): _____ / _____

Location: Highway 401 Orientation (0 to 179°): ~90

Feature ID: See map (Indicate on map) UTM Coordinates: Zone _____ See map (Easting) _____ (Northing)

## BRIDGE DATA

Bridge Type: Road (road, rail, other) Over: road (water, road, land)

Construction: ☒Beam ☐Truss ☐Arch ☐Suspension ☐Tied Arch ☐Cable-stayed

Bridge Length (m): 30 m (TOTAL)

Bridge Width (m): 15 m each m

Bridge Height (m): 10 m (MAXIMUM)

Both EBL and WBL bridges

**Bridge Suitability for Nesting**

Suitable horizontal ledges? ☐YES / ☒NO

Suitable vertical surface? ☐YES / ☒NO

Other suitable surfaces? ☐YES / ☒NO ☐Bolts / ☐Holes / ☐Other: _____

% Visibility of potential nest sites: 100 % (HORIZONTAL) 100 (VERTICAL) 100 % (HOLES)

## BIRD DATA

Species Detected: **BARS** = ☐YES / ☒NO **CLSW** = ☐YES / ☒NO **NRWS** = ☐YES / ☒NO

Nests Observed: **BARS** = ☐YES / ☒NO **CLSW** = ☐YES / ☒NO **NRWS** = ☐YES / ☒NO

| Number of: | CLSW | BARS | EAPH | AMRO | ROPI | HOSP | NRWS |
|---|---|---|---|---|---|---|---|
| Birds (5 min observation): | | | | | | | |
| Apparently active nests: | | | | | | | |
| Old nests: | | | | | | | |
| Nest scars: | | | | | | | |
| Nest holes observed active: | | | | | | | |
| Nest Holes not observed active: | | | | | | | |

Within 50m of bridge

Other species observed nesting: _____

## HABITAT DATA

River width: It's not a river

## COMMENTS:

PAGE 1 OF 1

Quality Control: This form is complete ☐ & legible ☐

Print Name & Initial: Brandon Holden BH (field notes author)

Print Name & Initial: _____ (field notes QA/QC personnel)

Stantec

# Bridge-nesting Birds
# Datasheet (short version)

Project Number: 165001061 | Project Name: MTO 401 Cobourg
Date: 12-16 August 2017 | Field Personnel: B Holden, B Miller

Weather Conditions: _____ (TEMP (°C)) _____ (WIND) _____ (CLOUD) _____ (PPT (current)) _____ (PPT (last 24 hrs))

River Name & Section: Road - Shelter Valley | Start/End times (24 hr): _____ / _____
Location: Highway 401 | Orientation (0 to 179°): ~90

Feature ID: See map (Indicate on map) | UTM Coordinates: Zone _____ Easting See map Northing _____

## BRIDGE DATA

Bridge Type: Road (road, rail, other) | Over: road (water, road, land)

Construction: ☒Beam ☐Truss ☐Arch ☐Suspension ☐Tied Arch ☐Cable-stayed

Bridge Length (m): 30 m (TOTAL)

Bridge Width (m): 15 m each m

Bridge Height (m): 10 m (MAXIMUM)

Both EBL and WBL bridges

**Bridge Suitability for Nesting**

Suitable horizontal ledges? ☐YES / ☒NO

Suitable vertical surface? ☐YES / ☒NO

Other suitable surfaces? ☐YES / ☒NO ☐Bolts / ☐Holes / ☐Other: _____

% Visibility of potential nest sites: 100 % (HORIZONTAL) | 100 (VERTICAL) | 100 % (HOLES)

## BIRD DATA

Species Detected: **BARS** = ☐YES / ☒NO **CLSW** = ☐YES / ☒NO **NRWS** = ☐YES / ☒NO

Nests Observed: **BARS** = ☐YES / ☒NO **CLSW** = ☐YES / ☒NO **NRWS** = ☐YES / ☒NO

| Number of: | CLSW | BARS | EAPH | AMRO | ROPI | HOSP | NRWS |
|---|---|---|---|---|---|---|---|
| Birds (5 min observation): | | | | | | | |
| Apparently active nests: | | | | | | | |
| Old nests: | | | | | | | |
| Nest scars: | | | | | | | |
| Nest holes observed active: | | | | | | | |
| Nest Holes not observed active: | | | | | | | |

Within 50m of bridge

Other species observed nesting: _____

## HABITAT DATA

River width: It's not a river

## COMMENTS:



Quality Control: This form is complete ☐ & legible ☐

Print Name & Initial: Brandon Holden BH (field notes author) | Print Name & Initial: _____ (field notes QA/QC personnel)

Stantec

# Bridge-nesting Birds
# Datasheet (short version)

Project Number: 165001061 | Project Name: MTO 401 Cobourg

Date: 12-16 August 2017 | Field Personnel: B Holden, B Miller

Weather Conditions: _____ (TEMP (°C)) _____ (WIND) _____ (CLOUD) _____ (PPT (current)) _____ (PPT (last 24 hrs))

River Name & Section: Road - Vernonville | Start/End times (24 hr): _____ / _____

Location: Highway 401 | Orientation (0 to 179°): ~90

Feature ID: See map (indicate on map) | UTM Coordinates: Zone _____ Easting See map Northing _____

## BRIDGE DATA

Bridge Type: Road (road, rail, other) | Over: road (water, road, land)

Construction: ☒Beam ☐Truss ☐Arch ☐Suspension ☐Tied Arch ☐Cable-stayed

Bridge Length (m): 30 m (TOTAL)

Bridge Width (m): 15 m each m

Bridge Height (m): 10 m (MAXIMUM)

Both EBL and WBL bridges

**Bridge Suitability for Nesting**

Suitable horizontal ledges? ☐YES / ☒NO

Suitable vertical surface? ☐YES / ☒NO

Other suitable surfaces? ☐YES / ☒NO ☐Bolts / ☐Holes / ☐Other: _____

% Visibility of potential nest sites: 100 % (HORIZONTAL) | 100 (VERTICAL) | 100 % (HOLES)

## BIRD DATA

Species Detected: **BARS** = ☐YES / ☒NO **CLSW** = ☐YES / ☒NO **NRWS** = ☐YES / ☒NO

Nests Observed: **BARS** = ☐YES / ☒NO **CLSW** = ☐YES / ☒NO **NRWS** = ☐YES / ☒NO

| Number of: | CLSW | BARS | EAPH | AMRO | ROPI | HOSP | NRWS |
|---|---|---|---|---|---|---|---|
| Birds (5 min observation): | | | | | | | |
| Apparently active nests: | | | | | | | |
| Old nests: | | | | | | | |
| Nest scars: | | | | | | | |
| Nest holes observed active: | | | | | | | |
| Nest Holes not observed active: | | | | | | | |

Within 50m of bridge

Other species observed nesting: _____

## HABITAT DATA

River width: It's not a river

## COMMENTS:

PAGE 1 OF 1

Quality Control: This form is complete ☐ & legible ☐

Print Name & Initial: Brandon Holden BH (field notes author)

Print Name & Initial: _____ (field notes QA/QC personnel)

Stantec

# Bridge-nesting Birds
# Datasheet (short version)

Project Number: 165001061 | Project Name: MTO 401 Cobourg

Date: 12-16 August 2017 | Field Personnel: B Holden, B Miller

Weather Conditions: _____ (TEMP (°C)) _____ (WIND) _____ (CLOUD) _____ (PPT (current)) _____ (PPT (last 24 hrs))

River Name & Section: Road - Veron | Start/End times (24 hr): _____ / _____

Location: Highway 401 | Orientation (0 to 179°): ~90

Feature ID: See map (indicate on map) | UTM Coordinates: Zone _____ Easting See map Northing _____

## BRIDGE DATA

Bridge Type: Road (road, rail, other) | Over: road (water, road, land)

Construction: ☒Beam ☐Truss ☐Arch ☐Suspension ☐Tied Arch ☐Cable-stayed

Bridge Length (m): 30 m (TOTAL)

Bridge Width (m): 15 m each m

Bridge Height (m): 10 m (MAXIMUM)

Both EBL and WBL bridges

**Bridge Suitability for Nesting**

Suitable horizontal ledges? ☐YES / ☒NO

Suitable vertical surface? ☐YES / ☒NO

Other suitable surfaces? ☐YES / ☒NO ☐Bolts / ☐Holes / ☐Other: _____

% Visibility of potential nest sites: 100 % (HORIZONTAL) | 100 (VERTICAL) | 100 % (HOLES)

## BIRD DATA

Species Detected: **BARS** = ☐YES / ☒NO **CLSW** = ☐YES / ☒NO **NRWS** = ☐YES / ☒NO

Nests Observed: **BARS** = ☐YES / ☒NO **CLSW** = ☐YES / ☒NO **NRWS** = ☐YES / ☒NO

| Number of: | CLSW | BARS | EAPH | AMRO | ROPI | HOSP | NRWS |
|---|---|---|---|---|---|---|---|
| Birds (5 min observation): | | | | | | | |
| Apparently active nests: | | | | | | | |
| Old nests: | | | | | | | |
| Nest scars: | | | | | | | |
| Nest holes observed active: | | | | | | | |
| Nest Holes not observed active: | | | | | | | |

Within 50m of bridge

Other species observed nesting: _____

## HABITAT DATA

River width: It's not a river

## COMMENTS:

PAGE 1 OF 1

Quality Control: This form is complete ☐ & legible ☐

Print Name & Initial: Brandon Holden BH (field notes author) | Print Name & Initial: _____ (field notes QA/QC personnel)

Stantec

# Bridge-nesting Birds
# Datasheet (short version)

Project Number: 165001061 | Project Name: MTO 401 Cobourg

Date: 12-16 August 2017 | Field Personnel: B Holden, B Miller

Weather Conditions: _____ (TEMP (°C)) _____ (WIND) _____ (CLOUD) _____ (PPT (current)) _____ (PPT (last 24 hrs))

River Name & Section: Road - R25 | Start/End times (24 hr): _____ / _____

Location: Highway 401 | Orientation (0 to 179°): ~90

Feature ID: See map (indicate on map) | UTM Coordinates: Zone _____ Easting See map Northing _____

## BRIDGE DATA

Bridge Type: Road (road, rail, other) | Over: road (water, road, land)

Construction: ☒Beam ☐Truss ☐Arch ☐Suspension ☐Tied Arch ☐Cable-stayed

Bridge Length (m): 30 m (TOTAL)

Bridge Width (m): 15 m each m

Bridge Height (m): 10 m (MAXIMUM)

Both EBL and WBL bridges

**Bridge Suitability for Nesting**

Suitable horizontal ledges? ☐YES / ☒NO

Suitable vertical surface? ☐YES / ☒NO

Other suitable surfaces? ☐YES / ☒NO ☐Bolts / ☐Holes / ☐Other: _____

% Visibility of potential nest sites: 100 % (HORIZONTAL) | 100 (VERTICAL) | 100 % (HOLES)

## BIRD DATA

Species Detected: **BARS** = ☐YES / ☒NO **CLSW** = ☐YES / ☒NO **NRWS** = ☐YES / ☒NO

Nests Observed: **BARS** = ☐YES / ☒NO **CLSW** = ☐YES / ☒NO **NRWS** = ☐YES / ☒NO

| Number of: | CLSW | BARS | EAPH | AMRO | ROPI | HOSP | NRWS |
|---|---|---|---|---|---|---|---|
| Birds (5 min observation): | | | | | | | |
| Apparently active nests: | | | | | | | |
| Old nests: | | | | | | | |
| Nest scars: | | | | | | | |
| Nest holes observed active: | | | | | | | |
| Nest Holes not observed active: | | | | | | | |

Within 50m of bridge

Other species observed nesting: _____

## HABITAT DATA

River width: It's not a river

## COMMENTS:

PAGE 1 OF 1

Quality Control: This form is complete ☐ & legible ☐

Print Name & Initial: Brandon Holden BH (field notes author)

Print Name & Initial: _____ (field notes QA/QC personnel)

Stantec

# Bridge-nesting Birds
# Datasheet (short version)

Project Number: 165001061 | Project Name: MTO 401 Cobourg

Date: 12-16 August 2017 | Field Personnel: B Holden, B Miller

Weather Conditions: _____ (TEMP (°C)) _____ (WIND) _____ (CLOUD) _____ (PPT (current)) _____ (PPT (last 24 hrs))

River Name & Section: Shelter Valley Creek | Start/End times (24 hr): _____ / _____

Location: Highway 401 | Orientation (0 to 179°): ~90

Feature ID: See map (Indicate on map) | UTM Coordinates: _____ (Zone) See map (Easting) _____ (Northing)

## BRIDGE DATA

Bridge Type: Curved (road, rail, other) | Over: creek (water, road, land)

Construction: ☐Beam ☐Truss ☒Arch ☐Suspension ☐Tied Arch ☐Cable-stayed

Bridge Length (m): 30 m (TOTAL)

Bridge Width (m): 30 m

Bridge Height (m): 10 m (MAXIMUM)

**Bridge Suitability for Nesting**

Suitable horizontal ledges? ☐YES / ☒NO

Suitable vertical surface? ☐YES / ☒NO

Other suitable surfaces? ☒YES / ☐NO ☐Bolts / ☐Holes / ☒Other: surface

% Visibility of potential nest sites: 100 % (HORIZONTAL) 100 (VERTICAL) 100 % (HOLES)

## BIRD DATA

Species Detected: **BARS** = ☐YES / ☒NO **CLSW** = ☐YES / ☒NO **NRWS** = ☐YES / ☒NO

Nests Observed: **BARS** = ☐YES / ☒NO **CLSW** = ☐YES / ☒NO **NRWS** = ☐YES / ☒NO

| Number of: | CLSW | BARS | EAPH | AMRO | ROPI | HOSP | NRWS |
|---|---|---|---|---|---|---|---|
| Birds (5 min observation): | | | | | | | |
| Apparently active nests: | | | | | | | |
| Old nests: | | | 2 | | | | |
| Nest scars: | | | | | | | |
| Nest holes observed active: | | | | | | | |
| Nest Holes not observed active: | | | | | | | |

Within 50m of bridge

Other species observed nesting: _____

## HABITAT DATA

River width: 8 m

## COMMENTS:

Lots of human activity in here

PAGE 1 OF 1

Quality Control: This form is complete ☐ & legible ☐

Print Name & Initial: Brandon Holden (field notes author) | Print Name & Initial: _____ (field notes QA/QC personnel)

Stantec Consulting Ltd.
70 Southgate Drive
Guelph, Ontario, Canada
N1G 4P5
Tel: (519) 836-6050
Fax: (519) 836-2493

# Wildlife Habitat and Incidental Wildlife Observation Form

Project Number____165001057_____ Project Name: ____Hwy 401 Cobourg_____

Date / Time: ____14_____Aug 2017_ Field Personnel: _____B Holden, B Miller_____

| Weather Conditions: | Temp: | Wind: | Cloud: | PPT: | PPT in last 24 hrs: |
|---|---|---|---|---|---|
| | 24-26 | 1-2 | 30-70 | ✓ | ✓ |

## Wildlife Habitat

*List specific microhabitats present (snags, logs, hibernacula, vernal pools etc.) and what community they were encountered in (use ELC code where applicable).*

- Several Gray Treefrog E. of Danforth, S of 401
- Bat trees in Rav?
- Seep; Spring egg locations.

## Incidental Species Observations

*List species and type of observation:*
*(**TK** = track, **SC** = scat, **VO** = vocalization, **OB** = observed, **DP** = distinctive parts, **FE** = feeding evidence, **CA** = carcass, **FY** = eggs, nest, **HO** = house/den, **SI** = other sign)*

| Birds | Mammals | Herps | Butterflies / ~~Dragonflies~~ | ~~Other~~ Odes |
|---|---|---|---|---|
| *i.e. AMRO/VO*<br>AMGO<br>RBGU<br>RTHA<br>TUVU<br>BARS<br>CODV<br>BLJA<br>AMRO<br>RWBL<br>COGR<br>CORA | Coyote<br>WT Deer<br>E. Chipmunk | Gray Treefrog | Black Swallowtail<br>Cabbage White<br>Monarch<br>Wild Indigo Duskywing<br>Question Mark<br>Dun Skipper<br>Viceroy<br><br>Sev. Asshna Darners | 12 spot Skimmer<br>Ebony Jewelwing<br>C.G. Darner<br>E. Forktail<br>WF Meadowhawk<br>C. Whitetail<br><br>Swarming |

Quality Control: This form is complete (__) & legible (__).

Signature: _____ (Field Personnel) Signature: _____ (Project Manager)

Stantec Consulting Ltd.
70 Southgate Drive
Guelph, Ontario, Canada
N1G 4P5
Tel: (519) 836-6050
Fax: (519) 836-2493

# Wildlife Habitat and Incidental Wildlife Observation Form

Project Number 165001057 | Project Name: Hwy 401 Cobourg

Date / Time: 1 Aug 2017 | Field Personnel: B Holden, B Miller

| Weather Conditions: | Temp: 18-24 | Wind: 1-2 | Cloud: 10-90 | PPT: | PPT in last 24 hrs: |
|---|---|---|---|---|---|

## Wildlife Habitat

*List specific microhabitats present (snags, logs, hibernacula, vernal pools etc.) and what community they were encountered in (use ELC code where applicable).*

Brown-belted Bumblebee

## Incidental Species Observations

*List species and type of observation:*
*(**TK** = track, **SC** = scat, **VO** = vocalization, **OB** = observed, **DP** = distinctive parts, **FE** = feeding evidence, **CA** = carcass, **FY** = eggs, nest, **HO** = house/den, **SI** = other sign)*

Clouded Sulphur

| Birds | Mammals | Herps | Butterflies / Dragonflies | Other |
|---|---|---|---|---|
| *i.e. AMRO/VO* | WT Deer | A. Toad | Tawny-edged Skipper | Video Skimmer |
| AMRO | Raccoon | | Crescent | Mid Meadowhawk |
| NOCA | | | Monarch | Large-tipped Darner |
| COYE | | | Cabbage White | Red-winged Meadowhawk |
| SOSP | | | Black Swallowtail | G. Pondhawk |
| RWBL | | | C. Wood Nymph | Slender Spreadwing |
| AMGO | | | Halloween Pennant | 12 spot skimmer |
| AMCR | | | Giant Swallowtail | C.G. Darner |
| REVI | | | E. Pygmy | Black Saddlebags |
| BCCH | | | G.S. Fritillary | |
| RTHA | | | Viceroy | |
| TUVU | | | Least Skipper | |
| | | | Eastern Tailed Blue | |

Quality Control: This form is complete (✓) & legible (✓).

Signature: _____ (Field Personnel)

Signature: _____ (Project Manager)



REV: May, 07 Form

Stantec Consulting Ltd.
70 Southgate Drive
Guelph, Ontario, Canada
N1G 4P5
Tel: (519) 836-6050
Fax: (519) 836-2493

# Wildlife Habitat and Incidental Wildlife Observation Form

Project Number ____165001057_____ Project Name: ____Hwy 401 Cobourg_____

Date / Time: ____16 Aug 2017_ Field Personnel: _____B Holden, B Miller_____

| Weather Conditions: | Temp: | Wind: | Cloud: | PPT: | PPT in last 24 hrs: |
|---|---|---|---|---|---|
| | 17 | 2-3 | | | Rain |

## Wildlife Habitat

*List specific microhabitats present (snags, logs, hibernacula, vernal pools etc.) and what community they were encountered in (use ELC code where applicable).*

## Incidental Species Observations

*List species and type of observation:*
*(**TK** = track, **SC** = scat, **VO** = vocalization, **OB** = observed, **DP** = distinctive parts, **FE** = feeding evidence, **CA** = carcass, **FY** = eggs, nest, **HO** = house/den, **SI** = other sign)*

| Birds | Mammals | Herps | Butterflies / Dragonflies | Other |
|---|---|---|---|---|
| *i.e. AMRO/VO*<br>COGR<br>AMGO<br>AMRO<br>TUVU<br>SOSP<br>RTHA<br>FISP<br>EAPH | Vole sp. | PATU- roadkill | Dun Skipper<br>Monarch<br>Wild Indigo Duskywing?<br>Clouded Sulphur<br>C. White<br>C. Ringlet<br>White Admiral<br>C. Wood Nymph | Common White tail<br>LF. Meadowhawk<br>Lance tipped Darner<br>Familiar Bluet<br>C.G. Darner<br>Ruby Meadowhawk<br>Band-winged Meadowhawk<br>Variegated<br>Common |

Quality Control: This form is complete (__) & legible (__).

Signature: _____ (Field Personnel) Signature: _____ (Project Mar

Page _____ of _____ REV: Ma

# APPENDIX D:
## Species Lists

# VASCULAR PLANT LIST - MTO Highway 401 Cobourg to Colborne, ON

Plant species observed by Brian Miller on August 14, 15, 16 and 17, 2017 in Highway 401 Right-of-Way and adjacent natural features

| Scientific Name | Common Name | Establishment Means | Coefficient of Conservatism | OWES Wetland Plant Species | Provincial Status (S-rank) |
|---|---|---|---|---|---|
| **PTERIDOPHYTES (FERNS & FERN ALLIES)** | | | | | |
| Equisetum arvense | field horsetail | native | 0 | T | S5 |
| Equisetum hyemale ssp. affine | common scouring-rush | native | 2 | T | S5 |
| Equisetum variegatum | variegated scouring-rush | native | 5 | I | S5 |
| Matteuccia struthiopteris | ostrich fern | native | 5 | T | S5 |
| Onoclea sensibilis | sensitive fern | native | 4 | I | S5 |
| Pteridium aquilinum | eastern bracken fern | native | 2 | | S5 |
| Thelypteris palustris var. pubescens | eastern marsh fern | native | 5 | I | S5 |
| **GYMNOSPERMS (CONIFERS)** | | | | | |
| Juniperus communis | ground juniper | native | 4 | | S5 |
| Juniperus virginiana | eastern red cedar | native | | | S5 |
| Larix laricina | tamarack | native | 7 | I | S5 |
| Picea abies | Norway spruce | introduced | | | SE3 |
| Picea glauca | white spruce | native | 6 | T | S5 |
| Picea pungens | blue spruce | introduced | | | SE1 |
| Pinus nigra | Austrian pine | introduced | | | SE3 |
| Pinus resinosa | red pine | native | 8 | | S5 |
| Pinus strobus | eastern white pine | native | 4 | T | S5 |
| Pinus sylvestris | Scotch pine | introduced | | | SE5 |
| Thuja occidentalis | eastern white cedar | native | 4 | T | S5 |
| Tsuga canadensis | eastern hemlock | native | 7 | T | S5 |
| **ANGIOSPERMS (DICOTS)** | | | | | |
| Acer ×freemanii | Freeman maple | native | 5 | I | S5 |
| Acer negundo | Manitoba maple | native | 0 | T | S5 |
| Acer saccharinum | silver maple | native | 5 | I | S5 |
| Acer saccharum | sugar maple | native | 4 | | S5 |
| Achillea millefolium | common yarrow | introduced | | | SE |
| Agalinis tenuifolia | slender agalinis | native | 7 | | S4S5 |
| Alnus incana ssp. rugosa | speckled alder | native | 6 | I | S5 |
| Ambrosia artemisiifolia | common ragweed | native | 0 | | S5 |
| Amphicarpaea bracteata | American hog peanut | native | 4 | T | S5 |
| Anemone acutiloba | sharp-lobed hepatica | native | 6 | | S5 |
| Anemone cylindrica | long-headed anemone | native | 7 | | S4 |
| Anemone virginiana | Virginia anemone | native | 4 | | S5 |

# VASCULAR PLANT LIST - MTO Highway 401 Cobourg to Colborne, ON

Plant species observed by Brian Miller on August 14, 15, 16 and 17, 2017 in Highway 401 Right-of-Way and adjacent natural features

| Scientific Name | Common Name | Establishment Means | Coefficient of Conservatism | OWES Wetland Plant Species | Provincial Status (S-rank) |
|---|---|---|---|---|---|
| Apocynum androsaemifolium | spreading dogbane | native | 3 | | S5 |
| Apocynum cannabinum | hemp dogbane | native | | | S5 |
| Asclepias syriaca | common milkweed | native | 0 | | S5 |
| Asclepias tuberosa | butterfly milkweed | native | 8 | | S4 |
| Betula papyrifera | paper birch | native | | T | S5 |
| Bidens cernua | nodding beggarticks | native | 2 | I | S5 |
| Bidens frondosa | devil's beggarticks | native | 3 | I | S5 |
| Carduus acanthoides | spiny plumeless thistle | introduced | | | SE5 |
| Carya cordiformis | bitternut hickory | native | 6 | | S5 |
| Centaurea sp. | knapweed species | introduced | | | |
| Centaurium pulchellum | branched centaury | introduced | | | SE3 |
| Cichorium intybus | wild chicory | introduced | | | SE5 |
| Cicuta maculata | spotted water-hemlock | native | 6 | I | S5 |
| Circaea canadensis | enchanter's nightshade | native | 3 | | S5 |
| Cirsium arvense | Canada thistle | introduced | | | SE5 |
| Cirsium vulgare | bull thistle | introduced | | | SE5 |
| Convolvulus arvensis | field bindweed | introduced | | | SE5 |
| Cornus alternifolia | alternate-leaved dogwood | native | 6 | | S5 |
| Cornus racemosa | grey dogwood | native | 2 | T | S5 |
| Cornus stolonifera | red-osier dogwood | native | 2 | I | S5 |
| Crataegus sp. | hawthorn species | | | | |
| Crataegus monogyna | English hawthorn | introduced | | | SE4 |
| Cynanchum rossicum | European swallowwort | introduced | | | SE5 |
| Daucus carota | wild carrot | introduced | | | SE5 |
| Desmodium canadense | Canada tick-trefoil | native | 5 | | S4 |
| Dianthus armeria | Deptford pink | introduced | | | SE5 |
| Echinocystis lobata | wild cucumber | native | 3 | T | S5 |
| Echium vulgare | common viper's bugloss | introduced | | | SE5 |
| Elaeagnus angustifolia | Russian olive | introduced | | | SE3 |
| Epilobium hirsutum | hairy willowherb | introduced | | I | SE5 |
| Epilobium parviflorum | small-flowered willowherb | introduced | | T | SE4 |
| Erigeron canadensis | Canada horseweed | native | 0 | | S5 |
| Erigeron strigosus | rough fleabane | native | 0 | | S5 |
| Eupatorium perfoliatum | common boneset | native | 2 | I | S5 |
| Euphorbia davidii | David's spurge | introduced | | | SE4 |
| Euphorbia esula | leafy spurge | introduced | | | SE1? |

# VASCULAR PLANT LIST - MTO Highway 401 Cobourg to Colborne, ON

Plant species observed by Brian Miller on August 14, 15, 16 and 17, 2017 in Highway 401 Right-of-Way and adjacent natural features

| Scientific Name | Common Name | Establishment Means | Coefficient of Conservatism | OWES Wetland Plant Species | Provincial Status (S-rank) |
|---|---|---|---|---|---|
| Euphorbia maculata | spotted spurge | introduced | | | SE5 |
| Euthamia graminifolia | grass-leaved goldenrod | native | 2 | | S5 |
| Eutrochium maculatum | spotted Joe Pye weed | native | 3 | I | S5 |
| Fagus grandifolia | American beech | native | 6 | | S4 |
| Fragaria vesca | woodland strawberry | native | 4 | | S5 |
| Fraxinus americana | white ash | native | 4 | | S4 |
| Fraxinus pennsylvanica | red ash | native | 3 | T | S4 |
| Hieracium spp. | hawkweed species | | | | |
| Hydrophyllum virginianum | Virginia waterleaf | native | 6 | | S5 |
| Hypericum perforatum | common St. John's-wort | introduced | | | SE5 |
| Impatiens capensis | spotted jewelweed | native | 4 | I | S5 |
| Inula helenium | elecampane | introduced | | T | SE5 |
| Lactuca serriola | prickly lettuce | introduced | | | SE5 |
| Laportea canadensis | Canada wood nettle | native | 6 | T | S5 |
| Leucanthemum vulgare | oxeye daisy | introduced | | | SE5 |
| Linaria vulgaris | butter-and-eggs | introduced | | | SE5 |
| Lonicera tatarica | Tartarian honeysuckle | introduced | | | SE5 |
| Lotus corniculatus | garden bird's-foot trefoil | introduced | | | SE5 |
| Lycopus americanus | American water-horehound | native | 4 | I | S5 |
| Lycopus uniflorus | northern water-horehound | native | 5 | I | S5 |
| Lysimachia arvensis | scarlet pimpernel | introduced | | | SE4 |
| Lythrum salicaria | purple loosestrife | introduced | | I | SE5 |
| Medicago lupulina | black medick | introduced | | | SE5 |
| Medicago sativa | alfalfa | introduced | | | SE5 |
| Melilotus albus | white sweet-clover | introduced | | | SE5 |
| Melilotus officinalis | yellow sweet-clover | introduced | | | SE5 |
| Mentha canadensis | Canada mint | native | 3 | I | S5 |
| Monarda fistulosa | wild bergamot | native | 6 | | SU |
| Oenothera cf. biennis | common evening primrose | native | 0 | | S5 |
| Ostrya virginiana | ironwood | native | 4 | | S5 |
| Oxybasis glauca | oak-leaved goosefoot | introduced | | | SE5 |
| Parthenocissus cf. vitacea | thicket creeper | native | 3 | | S5 |
| Pastinaca sativa | wild parsnip | introduced | | | SE5 |
| Penstemon digitalis | foxglove beardtongue | introduced | 6 | | S4S5 |
| Physalis heterophylla | clammy ground-cherry | native | 3 | | S4 |
| Plantago arenaria | sand plantain | introduced | | | SE4 |

# VASCULAR PLANT LIST - MTO Highway 401 Cobourg to Colborne, ON

Plant species observed by Brian Miller on August 14, 15, 16 and 17, 2017 in Highway 401 Right-of-Way and adjacent natural features

| Scientific Name | Common Name | Establishment Means | Coefficient of Conservatism | OWES Wetland Plant Species | Provincial Status (S-rank) |
|---|---|---|---|---|---|
| Plantago lanceolata | English plantain | introduced | | | SE5 |
| Podophyllum peltatum | May-apple | native | 5 | | S5 |
| Populus balsamifera | balsam poplar | native | 4 | T | S5 |
| Populus deltoides ssp. deltoides | eastern cottonwood | native | 4 | T | S5 |
| Populus grandidentata | large-toothed aspen | native | 5 | | S5 |
| Populus tremuloides | trembling aspen | native | | T | S5 |
| Potentilla recta | sulphur cinquefoil | introduced | | | SE5 |
| Prunella vulgaris ssp. vulgaris | common self-heal | introduced | | | SE3 |
| Prunus pensylvanica | pin cherry | native | 3 | | S5 |
| Prunus virginiana | chokecherry | native | 2 | | S5 |
| Quercus rubra | northern red oak | native | 6 | | S5 |
| Ratibida pinnata | grey-headed coneflower | native | 9 | | S3 |
| Rhamnus cathartica | European buckthorn | introduced | | T | SE5 |
| Rhus typhina | staghorn sumac | native | 1 | | S5 |
| Ribes cynosbati | eastern prickly gooseberry | native | 4 | | S5 |
| Robinia pseudoacacia | black locust | introduced | | | SE5 |
| Rosa cf. blanda | smooth rose | native | 3 | | S5 |
| Rubus idaeus ssp. strigosus | American red raspberry | native | 0 | | S5 |
| Rubus occidentalis | black raspberry | native | 2 | | S5 |
| Rubus odoratus | purple-flowering raspberry | native | 3 | | S5 |
| Rudbeckia hirta | black-eyed Susan | native | 0 | | S5 |
| Rumex crispus | curled dock | introduced | | T | SE5 |
| Salix cf. alba | white willow | introduced | | T | SE4 |
| Salix amygdaloides | peach-leaved willow | native | 6 | T | S5 |
| Salix bebbiana | Bebb's willow | native | 4 | I | S5 |
| Salix discolor | pussy willow | native | 3 | I | S5 |
| Salix eriocephala | cottony willow | native | 4 | T | S5 |
| Salix interior | sandbar willow | native | 3 | T | S5 |
| Salix petiolaris | meadow willow | native | 3 | I | S5 |
| Sambucus canadensis | common elderberry | native | 5 | T | S5 |
| Sanguinaria canadensis | bloodroot | native | 5 | | S5 |
| Saponaria officinalis | bouncing-bet | introduced | | | SE5 |
| Securigera varia | purple crown-vetch | introduced | | | SE5 |
| Silene antirrhina | sleepy catchfly | native | 3 | | S5 |
| Silene vulgaris | bladder campion | introduced | | | SE5 |
| Solanum dulcamara | bittersweet nightshade | introduced | | T | SE5 |

## VASCULAR PLANT LIST - MTO Highway 401 Cobourg to Colborne, ON

Plant species observed by Brian Miller on August 14, 15, 16 and 17, 2017 in Highway 401 Right-of-Way and adjacent natural features

| Scientific Name | Common Name | Establishment Means | Coefficient of Conservatism | OWES Wetland Plant Species | Provincial Status (S-rank) |
|---|---|---|---|---|---|
| Solidago canadensis | Canada goldenrod | native | 1 | | S5 |
| Solidago flexicaulis | zigzag goldenrod | native | 6 | | S5 |
| Solidago gigantea | giant goldenrod | native | 4 | T | S5 |
| Solidago nemoralis | grey-stemmed goldenrod | native | 2 | | S5 |
| Sonchus arvensis | field sow-thistle | introduced | | | SE5 |
| Spiraea alba | white meadowsweet | native | 3 | I | S5 |
| Symphyotrichum ericoides | white heath aster | native | | | S5 |
| Symphyotrichum lanceolatum | white panicled aster | native | 3 | I | S5 |
| Symphyotrichum lateriflorum | calico aster | native | 3 | T | S5 |
| Symphyotrichum novae-angliae | New England aster | native | 2 | | S5 |
| Symphyotrichum puniceum | purple-stemmed aster | native | 6 | I | S5 |
| Symphyotrichum urophyllum | arrow-leaved aster | native | 6 | | S4 |
| Syringa vulgaris | common lilac | introduced | | | SE5 |
| Tanacetum vulgare | common tansy | introduced | | | SE5 |
| Taraxacum officinale | common dandelion | introduced | | | SE5 |
| Thalictrum dioicum | early meadow-rue | native | 5 | | S5 |
| Tilia americana | basswood | native | 4 | | S5 |
| Toxicodendron radicans | western poison ivy | native | 5 | T | S5 |
| Tragopogon dubius | yellow goatsbeard | introduced | | | SE5 |
| Trifolium pratense | red clover | introduced | | | SE5 |
| Trifolium repens | white clover | introduced | | | SE5 |
| Tussilago farfara | coltsfoot | introduced | | T | SE5 |
| Ulmus americana | white elm | native | 3 | T | S5 |
| Ulmus pumila | Siberian elm | introduced | | | SE3 |
| Urtica dioica ssp. gracilis | slender stinging nettle | native | 2 | T | S5 |
| Verbena hastata | blue vervain | native | 4 | I | S5 |
| Verbena stricta | hoary vervain | native | 7 | | S4 |
| Veronica anagallis-aquatica | water speedwell | introduced | | I | SE5 |
| Viburnum lentago | nannyberry | native | 4 | T | S5 |
| Vicia cracca | tufted vetch | introduced | | | SE5 |
| Vitis riparia | riverbank grape | native | 0 | | S5 |
| **ANGIOSPERMS (MONOCOTS)** | | | | | |
| Agrostis gigantea | redtop | introduced | | T | SE5 |
| Agrostis stolonifera | creeping bentgrass | introduced | | T | SE5 |
| Arisaema triphyllum | Jack-in-the-pulpit | native | 5 | T | S5 |

## VASCULAR PLANT LIST - MTO Highway 401 Cobourg to Colborne, ON

Plant species observed by Brian Miller on August 14, 15, 16 and 17, 2017 in Highway 401 Right-of-Way and adjacent natural features

| Scientific Name | Common Name | Establishment Means | Coefficient of Conservatism | OWES Wetland Plant Species | Provincial Status (S-rank) |
|---|---|---|---|---|---|
| Asparagus officinalis | garden asparagus | introduced | | | SE5 |
| Bromus inermis | smooth brome | introduced | | | SE5 |
| Carex albursina | white bear sedge | native | 7 | | S5 |
| Carex bebbii | Bebb's sedge | native | 3 | I | S5 |
| Carex brevior | short-beaked sedge | native | 7 | | S4S5 |
| Carex cristatella | crested sedge | native | 3 | I | S5 |
| Carex flava | yellow sedge | native | 5 | I | S5 |
| Carex granularis | limestone meadow sedge | native | 3 | T | S5 |
| Carex hitchcockiana | Hitchcock's sedge | native | 6 | | S5 |
| Carex hystericina | porcupine sedge | native | 5 | I | S5 |
| Carex retrorsa | retrorse sedge | native | 5 | I | S5 |
| Carex rosea | rosy sedge | native | 5 | | S5 |
| Carex spp. | | | | | |
| Carex spicata | spiked sedge | introduced | | | SE5 |
| Carex vulpinoidea | fox sedge | native | 3 | I | S5 |
| Dactylis glomerata | orchard grass | introduced | | | SE5 |
| Echinochloa cf. muricata | rough barnyard grass | native | 4 | I | S5 |
| Elymus hystrix | bottlebrush grass | native | 5 | | S5 |
| Epipactis helleborine | broad-leaved helleborine | introduced | | | SE5 |
| Eragrostis sp. | lovegrass species | | | | |
| Glyceria striata | ridged mannagrass | native | 3 | I | S5 |
| Hordeum jubatum | foxtail barley | native | | | S5 |
| Juncus alpinoarticulatus | alpine rush | native | 5 | I | S5 |
| Juncus articulatus | jointed rush | native | 5 | I | S5 |
| Juncus bufonius | toad rush | native | 1 | T | S5 |
| Juncus compressus | compressed rush | introduced | | T | SE5 |
| Juncus dudleyi | Dudley's rush | native | 1 | T | S5 |
| Juncus torreyi | Torrey's rush | native | 3 | T | S5 |
| Lolium arundinaceum | tall fescue | introduced | | | SE5 |
| Maianthemum racemosum | large false Solomon's seal | native | 4 | | S5 |
| Maianthemum stellatum | starry false Solomon's seal | native | 6 | | S5 |
| Panicum capillare | common panicgrass | native | 0 | | S5 |
| Phalaris arundinacea | reed canarygrass | native | 0 | T | S5 |
| Phleum pratense | common timothy | introduced | | | SE5 |
| Phragmites australis ssp. australis | European reed | introduced | | T | SE5 |
| Poa compressa | Canada bluegrass | introduced | | | SE5 |

## VASCULAR PLANT LIST - MTO Highway 401 Cobourg to Colborne, ON

Plant species observed by Brian Miller on August 14, 15, 16 and 17, 2017 in Highway 401 Right-of-Way and adjacent natural features

| Scientific Name | Common Name | Establishment Means | Coefficient of Conservatism | OWES Wetland Plant Species | Provincial Status (S-rank) |
|---|---|---|---|---|---|
| Poa pratensis | Kentucky bluegrass | introduced | | | SE5 |
| Schoenoplectus tabernaemontani | soft-stemmed bulrush | native | 5 | I | S5 |
| Scirpus atrovirens | dark-green bulrush | native | 3 | T | S5 |
| Scirpus cyperinus | common woolly bulrush | native | 4 | I | S5 |
| Scirpus pendulus | hanging bulrush | native | 3 | I | S5 |
| Trillium grandiflorum | white trillium | native | 5 | | S5 |
| Typha angustifolia | narrow-leaved cattail | introduced | 3 | I | SE5 |

| FLORISTIC SUMMARY | TOTAL |
|---|---|
| Total Species | 212 |
| Native Species | 136 |
| Introduced (exotic) species | 76 |
| Species at Risk in Ontario (END, THR or SC) | 0 |
| Rare in Ontario (S1, S2 or S3) | 1 |
| Uncommon to common in Ontario (S4) | 12 |
| Common to very common in Ontario (S5) | 123 |
| Highly sensitive plant species with C value greater than 7 | 3 |
| Wetland Tolerant (T) Plant Species as identified in OWES Manual | 45 |
| Wetland Indicator (I) Plant Species as identified in OWES Manual | 41 |

| *Species Common Name* | *Species Scientific Name* | S-Rank | Provincial Satus (COSSARO) | National Status (COSEWIC) |
|---|---|---|---|---|
| | **ODONATA** | | | |
| Ebony Jewelwing | *Calopteryx maculata* | S5 | | |
| Slender Spreadwing | *Lestes rectangularis* | S5 | | |
| Familiar Bluet | *Enallagma civile* | S5 | | |
| Eastern Forktail | *Ischnura verticalis* | S5 | | |
| Lance-Tipped Darner | *Aeshna constricta* | S5 | | |
| Common Green Darner | *Anax junius* | S5 | | |
| Halloween Pennant | *Celithemis eponina* | S4 | | |
| Eastern Pondhawk | *Erythemis simplicicollis* | S5 | | |
| Widow Skimmer | *Libellula luctuosa* | S5 | | |
| Twelve-Spotted Skimmer | *Libellula pulchella* | S5 | | |
| Common Whitetail | *Plathemis lydia* | S5 | | |
| White-faced Meadowhawk | *Sympetrum obtrusum* | S5 | | |
| Ruby Meadowhawk | *Sympetrum rubicundulum* | S5 | | |
| Band-winged Meadowhawk | *Sympetrum semicinctum* | S4 | | |
| Black Saddlebags | *Tramea lacerata* | S4 | | |
| | **BUTTERFLIES** | | | |
| Wild Indigo Duskywing | *Erynnis baptisiae* | S4 | | |
| Least Skipper | *Ancyloxypha numitor* | S5 | | |
| Tawny-edged Skipper | *Polites themistocles* | S5 | | |
| Dun Skipper | *Euphyes vestris* | S5 | | |
| Black Swallowtail | *Papilio polyxenes* | S5 | | |
| Giant Swallowtail | *Papilio cresphontes* | S3 | | |
| Cabbage White | *Pieris rapae* | SNA | | |
| Clouded Sulphur | *Colias philodice* | S5 | | |
| Eastern Tailed Blue | *Everes comyntas* | S5 | | |
| Great Spangled Fritillary | *Speyeria cybele* | S5 | | |
| Tawny Crescent | *Phyciodes batesii* | S4 | | |
| Question Mark | *Polygonia interrogationis* | S5 | | |
| Viceroy | *Limenitis archippus* | S5 | | |
| Common Ringlet | *Coenonympha tullia* | S5 | | |
| Common Wood-Nymph | *Cercyonis pegala* | S5 | | |
| Monarch | *Danaus plexippus* | S4B, S2N | SC | SC |
| | **AMPHIBIANS** | | | |
| American Toad | *Anaxyrus americanus* | S5 | | |
| Tetraploid Gray Treefrog | *Hyla versicolor* | S5 | | |
| | **REPTILES** | | | |
| Midland Painted Turtle | *Chrysemys picta marginata* | S5 | | |
| | **BIRDS** | | | |
| Turkey Vulture | *Cathartes aura* | S5B | | |
| Red-tailed Hawk | *Buteo jamaicensis* | S5 | NAR | NAR |
| Eastern Phoebe | *Sayornis phoebe* | S5B | | |
| Red-eyed Vireo | *Vireo olivaceus* | S5B | | |
| Blue Jay | *Cyanocitta cristata* | S5 | | |
| American Crow | *Corvus brachyrhynchos* | S5B | | |
| Common Raven | *Corvus corax* | S5 | | |
| Barn Swallow | *Hirundo rustica* | S4B | THR | THR |
| Black-capped Chickadee | *Poecile atricapillus* | S5 | | |
| American Robin | *Turdus migratorius* | S5B | | |
| Cedar Waxwing | *Bombycilla cedrorum* | S5B | | |
| American Goldfinch | *Spinus tristis* | S5B | | |
| Field Sparrow | *Spizella pusilla* | S4B | | |
| Song Sparrow | *Melospiza melodia* | S5B | | |
| Red-winged Blackbird | *Agelaius phoeniceus* | S4 | | |
| Common Grackle | *Quiscalus quiscula* | S5B | | |
| Common Yellowthroat | *Geothlypis trichas* | S5B | | |
| Northern Cardinal | *Cardinalis cardinalis* | S5 | | |
| Rose-breasted Grosbeak | *Pheucticus ludovicianus* | S4B | | |

| ***Species Common Name*** | ***Species Scientific Name*** | **S-Rank** | **Provincial Satus (COSSARO)** | **National Status (COSEWIC)** |
|---|---|---|---|---|
| | **MAMMALS** | | | |
| Eastern Chipmunk | *Tamias striatus* | S5 | | |
| Coyote | *Canis latrans* | S5 | | |
| Raccoon | *Procyon lotor* | S5 | | |
| White-tailed Deer | *Odocoileus virginianus* | S5 | | |
| Vole Species | - | - | | |
| | | | | |
| COSSARO: Committee on the Status of Species at Risk in Ontario | | | | |
| COSEWIC: Committee on the Status of Endangered Wildlife in Canada | | | | |
| S3: Vulnerable—Vulnerable in the province, relatively few populations (often 80 or fewer) | | | | |
| S4: Apparently Secure—Uncommon but not rare | | | | |
| S5: Secure—Common, widespread, and abundant in the province | | | | |
| S#B- Breeding status rank | | | | |
| S#N- Non Breeding status rank | | | | |
| END: Endangered | | | | |
| THR: Threatened | | | | |
| SC: Special Concern | | | | |