Trafalgar Road Improvements Environmental Assessment (EA)

Georgetown, Ontario

Natural Heritage Characterization Report

Prepared for:

Halton Region

MMM Group Limited
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3214006

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1.0 INTRODUCTION

1.1 Study and Site Overview

Halton Region, herein referred to as the 'Region', is currently undertaking a Municipal Class Environment Assessment (EA), Schedule C, to identify a preferred alternative that would address the need for anticipated road improvements to meet capacity needs of the Region until 2031. Road improvements being considered include:

- Widen Trafalgar Road from two to four lanes, from Steeles Ave to Highway 7 (13 km);
- Possible improvements at various intersections within the study area; and
- Improvements to the vertical and horizontal alignments where necessary, including structural improvements.

In support of this EA, MMM Group was retained by the Region to conduct the Natural Heritage assessment component of the study. As part of this assessment background review and field studies were completed to characterize existing natural heritage features and functions. This included documenting and delineating existing vegetation communities and species, breeding bird surveys, breeding amphibian surveys, fish habitat characterization, identification and evaluation of potential wildlife habitat, and documentation of all incidental wildlife observations.

Field surveys were carried out in the spring, summer, and fall of 2014. The study area is presented in Figure 1 and is focused on the area within the Trafalgar Road Right-of-Way (ROW), including 120m on either side of the ROW limit, as well as the area identified for the proposed road realignment to the west of the existing road (also included 120m on either side of alignment limit). Aquatic surveys focused on 50 m upstream and downstream of the road crossing. A larger area (approximately 1 km) was also investigated for the presence of occurrence records of sensitive species that are not limited in spatial range.

Numerous overlapping natural heritage features and designated policy areas are present within the Trafalgar Road study area. These include; Black Creek (a coldwater permanent watercourse with resident brook trout population), portions of the Hungry Hollow Environmentally Sensitive Area (ESA), Waterfalls Woods ESA, Stewarttown Woods ESA, Hornby Swamp Wetland Complex (locally significant wetland), regional woodlands, unevaluated wetlands, several small watercourses, Halton Region Official Plan (2006) Greenland System Areas (A and B), Greenbelt Plan Natural Heritage System - Protected Countryside, Niagara Escarpment Plan Area – Rural Area, Regional Official Plan (2009)- Natural Heritage System, Halton Hills Official Plan (2006) – Greenlands System (A and B), Significant Wildlife Habitat (SWH), and habitat of Species at Risk (SAR) and Species of Conservation Concern (SCC). Natural heritage features are generally concentrated in the northern portion of the study area where large areas of woodlands and wetlands occur. Surrounding adjacent lands are predominately active agricultural within the larger rural landscape including rural residential. The Hamlets of Hornby, Ashgrove and Stewarttown

are located within the study area. The Town of Georgetown is also located in the northeastern portion of the study area.

This report addresses the following:

- Summarizes the existing natural heritage features, functions and applicable policies within the study area;
- Evaluates the significance and sensitivity of identified features and species;
- Identifies constraints and opportunities associated with the proposed road improvements;
- Assesses impacts associated with the selected preliminary preferred alternative; and
- Provides recommendations to mitigate the predicted impacts and monitor the effectiveness of proposed mitigation measures.

1.2 Project Background

A municipal Class EA was initiated by the Region in 2003 for Trafalgar Road from Side Road 10 to Highway 7 to address existing, future, and long term transportation needs in the corridor. As there were several other transportation and planning studies occurring concurrently, the study was discontinued until the other studies had been completed.

As a result of discontinuing the 2003 EA, the Region initiated the Trafalgar Road Short Term Intersection and Operations Review Study to address short term needs in 2010. From this study, short term improvements were implemented that included: traffic operations, traffic safety, and speed management. In addition, some geometry improvements were made to No. 2 Side Road and No. 10 Side Road.

The Road to Change – Halton Region Transportation Master Plan 2031 (Dillon 2011) was completed in 2011. That Plan identified the need to widen Trafalgar Road from Steeles Ave to Highway 7 to meet projected traffic capacity. As a result, the current road improvement EA was initiated to evaluate alternatives for the proposed road widening options.

2.0 PLANNING AND POLICY OVERVIEW

Relevant planning studies, legislation and policy pertinent to this assessment are summarized briefly in the following sections. The general relevance of these policies to the study area is also noted. More detailed analysis of policy implications is provided in subsequent sections of this report.

2.1 Provincial Policy Statement (2014)

The Ontario Provincial Policy Statement (PPS) was issued under Section 3 of the Ontario Planning Act. Section 3 of the Planning Act requires that decisions affecting planning matters "shall be consistent with" policy statements issued under the Act (OMMAH 1990). The current PPS came into effect March 1, 2005, and applies to all applications submitted on or after this date. The PPS was then updated in 2014 (OMMAH 2014). The PPS provides policy direction on land use planning and development matters that are of provincial interest which protect the natural environment as well as public health and safety. The natural heritage provisions of the PPS (Section 2.1.) provide protection for the following features:

1. Significant Habitats of Endangered and Threatened Species
2. Provincially Significant Wetlands (PSW)
3. Significant woodlands
4. Significant valleylands
5. Significant wildlife habitat
6. Significant Areas of Natural and Scientific Interest
7. Fish Habitat

Development and site alteration is not permitted within features 1 and 2, although may be permitted within the remaining features (3 through 7), and adjacent to all features if the ecological function has been evaluated and it has been demonstrated that there will be no negative impacts on the natural features or on their ecological functions. The definition of development within the PPS excludes activities that create or maintain infrastructure authorized under an Environmental Assessment (EA) process.

The PPS is applicable to a number of the natural heritage features within the study area, as discussed further in this report. This includes the presence of fish habitat, and the potential presence of Significant Habitat of Endangered and Threatened Species, Significant Wildlife Habitat, and provincially Significant Woodlands. No significant valleylands, PSWs, or areas of natural and scientific interest identified within the study area.

2.2 Endangered Species Act (2007)

Species designated as Threatened or Endangered by the Committee on the Status of Species at Risk in Ontario (COSSARO), otherwise known as Species at Risk in Ontario (SARO), and their habitats (e.g. areas essential for breeding, rearing, feeding, hibernation and migration) are automatically afforded legal protection under the Endangered Species Act (ESA) (Government of Ontario 2007). The ESA (Subsection 9(1)) states that:

"No person shall,

(a) kill, harm, harass, capture or take a living member of a species that is listed on the Species at Risk in Ontario List as an extirpated, endangered or threatened species;

(b) possess, transport, collect, buy, sell, lease, trade or offer to buy, sell, lease or trade,

(i) a living or dead member of a species that is listed on the Species at Risk in Ontario List as an extirpated, endangered or threatened species,

(ii) any part of a living or dead member of a species referred to in subclause (i),

(iii) anything derived from a living or dead member of a species referred to in subclause (i); or

(c) sell, lease, trade or offer to sell, lease or trade anything that the person represents to be a thing described in subclause (b) (i), (ii) or (iii).

Clause 10(1)(a) of the ESA states that:

"No person shall damage or destroy the habitat of a species that is listed on the Species at Risk in Ontario list as an endangered or threatened species"

The ESA also calls for the development of species-specific Recovery Strategies and Habitat Regulations. Unlike the general habitat of a species, regulated habitat may include areas that are currently unoccupied by the species. These areas are commonly referred to as "recovery habitat."

In order to balance social and economic considerations with protection and recovery goals, the ESA also enables the OMNR to issue permits or enter into agreements with proponents in order to authorize activities that would otherwise be prohibited by subsections 9(1) or 10(1) of the Act provided the legal requirements of the Act are met.

The ESA is of particular relevance to this project as several species afforded protection under the Act are known to occur within the vicinity of the study area.

2.3 Fisheries Act (1985)

The Canadian Fisheries Act provides provisions for the protection of fish and fish habitat. Amendments to the Fisheries Act were made on June 29th 2012, and came into effect on November 25th, 2013. These amendments have resulted in a revised prohibition that combines the previous Section 32 (killing of fish by means other than fishing) and Section 35 (harmful alteration, disruption or destruction of fish habitat). The revised Act now focuses on managing 'serious harm to fish' that are part of or support commercial, recreational or Aboriginal fisheries with the goal of ensuring their productivity and ongoing sustainability.

These amendments have re-focused the Act by focusing protection on real and significant threats to these fish and the habitat that supports them, while providing exemptions for routine projects that have low risk of causing serious harm to fish and fish habitat. The Fisheries Protection Policy Statement (2013) was prepared to explain the revised fisheries protection provisions and outlines how DFO will implement these provisions.

Section 35 (1) of the Fisheries Act now states:

> *"No person shall carry on any work, undertaking or activity that results in serious harm to fish that are part of a commercial, recreational or Aboriginal fishery, or to fish that support such a fishery."*

The Act interprets 'serious harm to fish' as "*the death of fish or any permanent alteration to, or destruction of, fish habitat*".

Proponents that plan to undertake activities in or near water have potential to negatively affect fisheries, and as such, are responsible for avoiding, mitigating, and offsetting 'serious harm to fish'.

Avoidance is achieved by undertaking measures which completely prevent serious harm to fish. These measures include project design considerations, location of activity, and timing of works.

Mitigation is implemented by following best practices such as those described in the 'measures to avoid harm' to fish and fish habitat'.

Any residual impacts are then required to be addressed by offsetting. An offsetting measure is one that counterbalances serious harm to fish resulting from a project, where serious harm remains after all feasible mitigation measures have been applied. It is our understanding that offsetting measures are the equivalent to what was previously described as 'compensation'.

Proponents should be aware of the new self-assessment process, as it is the responsibility of the proponent to determine whether their projects require review by the Department of Fisheries and Oceans (DFO) to determine whether or not potential authorization under the *Act* is required. The self-assessment process addresses a set of routine projects for which standard mitigation measures are generally applicable. Through the self-assessment process, details of the proposed undertaking are reviewed against available exemption criteria. If criteria are met, the project can proceed without review by the DFO. However, the proponent is still required to avoid and mitigate serious harm to fish.

As direct fish habitat is associated with the project, the *Fisheries Act* is a key piece of legislation relevant to the proposed undertaking. The requirement for review by the DFO and potential for authorization under the *Fisheries Act* will be determined at the detailed design phase of the project when the details of the undertaking are known. All relevant measures to avoid harm will be developed within the EA based on the preliminary design of the bridge project. These measures will then be refined and finalized during the detailed design phase.

2.4 Migratory Birds Convention Act (1994)

The Migratory Birds Convention Act, MBCA (1994) and Migratory Birds Regulations, MBR (2014) protect most species of migratory birds and their nests and eggs anywhere they are found in Canada, including surrounding ocean waters, regardless of ownership. General prohibitions under the MBCA and MBR

protect migratory birds, their nests and eggs and prohibit the deposit of harmful substances in waters / areas frequented by them.

The MBR includes an additional prohibition against incidental take, defined by Environmental Canada as:

> *"The inadvertent harming, killing, disturbance or destruction of migratory birds, nests and eggs."*

Environment Canada implements policies and guidelines to protect migratory birds, their eggs and their nests. There is guidance on the Environment Canada website to minimize the risk of incidental take effects to migratory birds, to achieve compliance with the law and to maintain sustainable populations of migratory birds.

Compliance with the MBCA and MBR is best achieved through a due diligence approach, which identifies potential risk, based on a site specific analysis in consideration of the Avoidance Guidelines and Best Management Practices information on the Environment Canada website.

Implications of the MBCA have potential to occur during the construction phase of the project when the developable portion of the ROW is cleared and grubbed of vegetation, potentially removing nests of migratory birds.

2.5 Greenbelt Plan (2005)

The northern portions of the study area fall within the Greenbelt Plan Natural Heritage System, known as 'Protected Countryside', and as such is subject to the Greenbelt Plan. The objective of the Greenbelt Plan is to provide long-term protection to agricultural lands and ecological features and functions occurring on the landscape designated under the Plan. The Plan includes lands within and builds upon the protections provided by the Niagara Escarpment Plan (NEP), and the Oak Ridges Moraine Conservation Plan (ORMCP).

Protected Countryside lands are intended to build upon lands identified under the NEP, and the ORMCP by extending beyond the limits of these plans; enhancing, connecting and further protecting the agricultural and environmental functions of the lands identified under these plans. There are three types of Protected Countryside: Agricultural System, Natural System and Settlement Areas. The objective of the plan associated with protected countryside is that the areas designated as such will continue to accommodate a range of commercial, industrial, and institutional uses, as well as support a range of recreational and tourism uses such as parks, trails, golf courses etc.

The applicable policies under the Greenbelt Plan (i.e., Section 4.2 Infrastructure) include the following:

> *All existing, expanded or new infrastructure subject to and approved under …the Environmental Assessment Act…is permitted within the Protected Countryside, subject to the policies of this section and provided it meets one of the following two objectives:*

1. *It supports agriculture, recreation and tourism, rural settlement areas, resource use or the rural economic activity that exists and is permitted within the Greenbelt; or*
2. *It serves the significant growth and economic development expected in southern Ontario beyond the Greenbelt by providing for the appropriate infrastructure connections among urban growth centres and between these centres and Ontario's borders.*

The location and construction of infrastructure and expansions, extensions, operations and maintenance of infrastructure in the Protected Countryside, are subject to the following:

a. *Planning, design and construction practices shall minimize, wherever possible, the amount of the Greenbelt, and particularly the Natural Heritage System, traversed and/or occupied by such infrastructure;*

b. *Planning, design and construction practices shall minimize, wherever possible, the negative impacts and disturbance of the existing landscape, including, but not limited to, impacts caused by light intrusion, noise and road salt.*

Where practicable, existing capacity and coordination with different infrastructure services is optimized so that the rural and existing character of the Protected Countryside and the overall urban structure for southern Ontario established by Greenbelt and any provincial growth management initiatives are supported and reinforced;

New or expanding infrastructure shall avoid key natural heritage features or key hydrologic features unless need has been demonstrated and it has been established that there is no reasonable alternative; and

Where infrastructure does cross the Natural Heritage System or intrude into or result in the loss of a key natural heritage feature or key hydrologic feature , including related landform features , planning, design and construction practices shall minimize negative impacts and disturbance on the features or their related functions, and where reasonable, maintain or improve connectivity .

Mapping of the limits of Greenbelt Plan Natural Heritage System Protected Countryside within the study area is provided in Appendix A.

2.6 Niagara Escarpment Area Plan (2005)

The Niagara Escarpment Plan provides a framework of objectives and policies to strike a balance between development, preservation and the enjoyment of the Niagara Escarpment. The Plan provides policies for the maintenance of the Niagara Escarpment and land in its vicinity substantially as a continuous natural environment, and to ensure only such development occurs as is compatible with that natural environment.

Within the study area, a small portion of the northern extent of the study area located along Side Road 20 falls under the Niagara Escarpment Plan area, specifically the land is designated as Niagara Escarpment - Rural Area.

Escarpment Rural Areas are considered: *an essential component of the Escarpment corridor, including portions of the Escarpment and lands in its vicinity. They provide a buffer to the more ecologically sensitive areas of the Escarpment* (NEC 2005).

Permitted uses of these areas applicable to this study include; existing uses, and transportation and utility facilities with only linear facilities being permitted in prime agricultural areas.

2.7 Halton Region Official Plan (2006): In-Force

The Halton Region Official Plan (2006), the current in-force Official Plan, outlines areas designated as Greenlands which encompass natural heritage features present within the planning area. The goal of the Greenlands System as outlined in the Plan is: *"to maintain as a permanent landform an interconnected system of natural areas and open space that will preserve areas of significant ecological value while providing, where appropriate, some opportunities for recreation"*

The Greenlands System is comprised of natural heritage features with designations that include; Greenlands A, Greenlands B, and Environmentally Sensitive Areas (ESA's). Greenlands A includes; regulatory flood plain areas, PSW, and significant habitat of provincially Endangered or Threatened species. Greenlands B includes; portions of ESA's that are outside of Greenlands A, regionally significant wetlands, significant woodlands, and Halton Region forests. ESA's within the planning area are land and water areas within the Greenlands System that contain natural features or ecological functions of such significance that they warrant protection.

Within the study area, Greenlands A, Greenlands B, and ESA's are all present according to Map 1- The Regional Structure (Halton Region 2006). Designations for each natural heritage feature within the study area are provided in Appendix H.

Natural Heritage policies of the Plan indicate that alteration of the physical and/or biological features within the Greenlands System should be restricted. In addition, for any development, including public works, that is to occur within or adjacent to the Greenlands System the proponent is required to complete an Environmental Impact Assessment (EIA) to demonstrate that the development/alteration will not result in a negative impact to the ecological function of the feature.

2.8 Regional Official Plan (ROP) Halton Region (2009): Under Appeal

The Regional Official Plan (2009) is the most current Official Plan for the region, although it is currently under appeal. The Plan identifies a Regional Natural Heritage System. The Plan's goal for the Regional Natural Heritage System is to: "*increase the certainty that the biological diversity and ecological functions within Halton will be preserved and enhanced for future generations."*

Within the study area, the Regional Natural Heritage System is shown on Figure 1 in Appendix A. Most natural features within the study area are included within this system.

Natural Heritage policies of the Plan indicate that transportation uses are permitted within the Regional Natural Heritage System. As with the 2006 Official Plan, if development or site alteration is to occur within or adjacent to the Natural Heritage System the proponent is required to complete an EIA to demonstrate that the development/alteration will not result in a negative impact to the ecological function of the feature.

2.9 Town of Halton Hills Official Plan (2008 Consolidation)

The Town of Halton Hills Official Plan (2008) conforms with the 2006 Halton Region Plan. The Plan identifies a Greenlands System. The goal of the Greenlands System is: "*to protect, enhance, and where possible restore significant natural heritage features and related ecological functions in the Town for present or future generations."*

Like the Halton Region Official Plan (2006), the Greenlands System is comprised of natural heritage features with designations that include; Greenlands A and Greenlands B. The definitions of these designations are also consistent with those in the 2006 Regional Plan and include: Greenlands A - regulatory flood plain areas, PSW, and significant habitat of provincially Endangered or Threatened species. Greenlands B includes regionally significant wetlands, significant woodlands, and Halton Region forests.

Natural Heritage policies of the Plan prohibit development within significant wetlands and significant habitat of endangered and threatened species as well as restriction of activities within remaining natural heritage features unless demonstrated through the completion of an Environmental Impact Study (EIS) that there will be no negative impact on the feature or its ecological function.

2.10 Vision Georgetown (In-Progress)

Vision Georgetown is a planning study within Halton Region that is currently underway. The two main components of the Vision Georgetown planning project include:

- A land use planning study (known as a secondary plan); and,
- A subwatershed study which deals with all aspects of the natural environment.

The limits of the Vision Georgetown study within the Trafalgar EA study area shown on Figure 1 in Appendix A.

Completion of these studies will fulfill Phases I and II of the Environmental Assessment process required when planning for transportation and services.

This new community will play a key role in accommodating the Town's projected population growth to the year 2031. The study area is 1,000 acres and is anticipated to be home to approximately 20,000 people.

2.11 Conservation Authority Regulation of Development, Interference with Wetlands and Alterations to Watercourses and Shorelines

The *Regulation of Development, Interface with Wetlands and Alterations to Shorelines and Watercourses* (Ontario Regulation 160/06 and 162/06, respectively), are regulations issued under the Conservation Authorities Act, R.S.O. 1990. Through this regulation, the Credit Valley Conservation Authority (CVC) and Conservation Halton (CH) have the responsibility to regulate activities in natural and hazardous areas (e.g., areas in and near rivers, streams, floodplains, wetlands, slopes and the Lake Huron shoreline). As the study area is located within both CVC and CH regulated lands, more specifically, wetlands and watercourses, a permit will be required from the CVC and CH under their respective regulations to proceed with site alteration within these areas.

3.0 STUDY APPROACH

MMM was retained to complete the Natural Heritage component of a Class EA for proposed improvements to Trafalgar Road located in the Region of Halton (see Appendix A for study area).

Ecological surveys were carried out at the preliminary design/ EA level and focused on identifying Natural Heritage constraints with the understanding that site specific field surveys would be undertaken at the detailed design phase of the project. Existing background information for the study area was incorporated where appropriate.

For the purposes of the assessment, 'Natural Heritage Features' have been identified within the Study Area to allow for reference to specific locations within the Study Area. Locations of these features are shown on mapping provided in Appendix A.

MMM Group undertook a review of all available relevant background materials (discussed in Section 3.1) and conducted a scoped field program (discussed in Section 3.2) to assess existing natural heritage conditions within the study area.

3.1 Background Review

All relevant background material for the study area and adjacent areas (i.e. within 120 m, according to Official Plan and PPS definitions of adjacent lands) were collected and reviewed. Information collected through the background review was used to inform and supplement the field program and ensure compliance with applicable policies, regulations, and guidelines. A review of applicable policy and guidelines was also undertaken to ensure study compliance and to provide focus to the field investigations. A summary of applicable regulations and polices is provided in Section 2.0.

As part of the background data collection, requests for data/information were submitted to Halton Region, Conservation Halton, Credit Valley Conservation, and Aurora District Ministry of Natural Resources and Forestry (MNRF) in April 2014.

An abundance of existing natural heritage information was found to be available for the study area. This included information and data collected by conservation authorities, MNRF, Halton Region, as well as from previous environmental studies. Resources identified as part of the review are summarized in Appendix B.

The following *key* sources of information were reviewed to supplement and provide context for field investigations:

- Trafalgar Road EA Study- 10 Side Road to Highway 7, Region of Halton (Various Reports 2004-2006);
- Silver Creek Subwatershed Study Phase 1 Characterization Report (CVC 2002);
- Black Creek Subwatershed Background Report Study (CVC 2009);
- Halton Region Environmentally Sensitive Areas Consolidation Report (Halton 2005);
- Trafalgar Road Animal Road Collision Data. (Halton Region 2014);
- Sixteen Mile Creek Monitoring Study (Dunn and Jamieson Undated);
- MNRF Natural Heritage Information Centre (NHIC) Land Information Ontario mapping (2014);
- MNRF Species at Risk website - regional Species at Risk list (2014);
- MNRF Land Information Ontario (LIO) (2014);
- Regional Official Plan (ROP) Consolidation 2013 (Halton Region 2013);
- Halton Region Official Plan (Halton Region 2009);
- Department of Fisheries and Oceans (DFO) Distribution of Species at Fish and Mussel Species at Risk Mapping, Credit Valley Conservation and Conservation Halton Authority Jurisdictions (2014); and
- Digital air photos.

Background and other data sources are also listed in the 'References' section of this report.

3.2 Field Surveys

Field investigations were completed to assess terrestrial, aquatic, wetland and wildlife resources within the Trafalgar Road EA study area in 2014. These surveys were carried out to confirm and enhance information available from existing documentation. Field surveys were focused along the Trafalgar Road ROW and on those properties where permission-to-enter (PTE) was obtained. Properties with PTE are mapped in Appendix A. Where PTE was not granted, surveys were completed from the closest available vantage point (e.g. roadside).

Field surveys and methodology are summarized in Table 1 and are discussed further in this section. Representative site photographs were taken during field visits and some are provided in Appendix C.

Existing conditions are summarized in Section 4.0. A summary/assessment of each Natural Heritage Feature within the study area is provided in Appendix H.

Additional targeted field surveys will be undertaken in the spring and summer of 2015 when the preferred road improvement alternative is known. These surveys will target areas where the preferred alternative footprint overlaps natural features to collect additional detailed information on habitat to inform the completion of the impact analysis.

Table 1. Summary of Field Surveys

SURVEY	METHODOLOGY	SURVEY DATES	MMM STAFF
Vegetation Assessment	A two-season botanical inventory was undertaken within the study area. This was deemed appropriate to survey for any plant Species at Risk that may occur in the area and to capture the majority of flora that occurs on the site. Classification, mapping and evaluation of vegetation communities within the study area using a modified version of the Ecological Land Classification (ELC) for Southern Ontario (Lee et al. 1998). Assessment focused on within the ROW and within 120m as well as those properties in which PTE was obtained.	June 23 2014 June 24 2014 July 10 2014 September 18 2014 September 19 2014	N. Charlton
Fish Habitat Assessment	Survey focused on the aquatic features within the ROW and approximately 50 m up and downstream of the road crossing as well as features located within the realignment portion of the study area (where accessible). Included documenting substrates, habitat characteristics, cover, geomorphic details, channel dimensions, riparian habitat, specialized habitats, evidence of groundwater inputs, fish observations.	June 23 2014 September 15 2014	R. LeCraw
Fish Community Survey	Adequate fish community records were presumed to be available; therefore no fish sampling was undertaken.	Not Applicable	Not Applicable
Breeding Birds Survey	An avifaunal inventory, breeding and habitat assessment was undertaken on five visits in 2014. The surveys were conducted by qualified, experienced staff, and the level of breeding bird evidence observed was recorded following standard criteria established by the Ontario Breeding Bird Atlas (OBBA).	June 6 2014 June 9 2014 June 17 2014 June 23 2014 June 25 2014	J. Holdsworth

SURVEY	METHODOLOGY	SURVEY DATES	MMM STAFF
Breeding Amphibian Surveys	Amphibian calling (breeding) activity was assessed using the Marsh Monitoring Program (MMP) amphibian calling survey protocol (Bird Studies Canada 2003, revised 2009). Surveys were conducted by qualified experienced staff under appropriate conditions (i.e., dusk/evening survey with suitable air temperatures, high humidity or light rain, and low/no wind).	April 242014 May 15 2014 June 12 2014 June 18 2014	N. Charlton R. LeCraw
General Wildlife Surveys	Supplemental observations of herpetofauna, mammals, and insects were recorded during all field visits. All observations made during the field surveys were recorded, including sightings of species, as well as evidence of use (e.g. browse, tracks / trails, scat, burrows, and vocalizations). Wildlife habitat potential was also evaluated during field surveys	June 6 2014 June 9 2014 June 17 2014 June 23 2014 June 25 2014 September 16 2014	J. Holdsworth

3.2.1 Vegetation Survey Approach

A two-season vegetation assessment and botanical inventory was undertaken on June 23, June 24, July 10, September 18 and September 19, 2014 within the study area (Right-of-Way and adjacent 120 m on either side, and select properties where PTE was granted – See PTE mapping in Appendix A).

For those properties in which access was not granted, vegetation communities were characterized by; existing available characterization information from previous studies, air photo interpretation, or by roadside survey (closest available vantage point).

The scope of vegetation fieldwork and analyses included the following:

- Classification, mapping and evaluation of vegetation communities within the study area using the Ecological Land Classification (ELC) for Southern Ontario (Lee et al. 1998), provided on Figure 3 (plates 1-12) in Appendix A;
- Vegetation communities are described in Section 4.5.1;
- Vegetation community significance was evaluated using Natural Heritage Resources of Ontario: Vegetation Communities of Southern Ontario (Bakowsky 1996) and vegetation community significance listed on the NHIC website at the time of report preparation. A vascular plant species list was prepared based on the botanical inventory work (Appendix D) and is discussed in Section4.5.2; and
- Plant species status was was evaluated using the rankings within *The Vascular Plants of Halton Region (Halton Natural Areas Inventory 2006)* for regional significance; the *Rare Vascular Plants of Ontario, Fourth Edition* (Oldham and Brinker 2009) for provincial significance; the current *Species At Risk in Ontario List* (OMNRF, May 2014) for Ontario species at risk; and, the Species At Risk Act (Schedules 1 and 3), for species at risk in Canada.

Vegetation characteristics are described generally in Appendix H for each feature within the study area where information was available.

3.2.2 Fish and Fish Habitat Survey Approach

Field investigations of aquatic features within the study area were conducted on June 23 and September 15, 2014 by MMM Group ecologists. All watercourse and drainage feature crossings of Trafalgar Road within the study area were assessed and habitat mapped approximately 50 m upstream and 50 m downstream of Trafalgar Road where access was permitted (see Appendix F for habitat mapping). Within the remainder of the study area, all mapped watercourse features visible on aerial photography were assessed generally for habitat characteristics and quality from roadsides. On the September 15th site visit, watercourses associated with Feature #23, #25, and #27 were assessed in more detail given that at that time PTE for associated properties had been granted. Watercourse assessments included noting of the following habitat parameters (where applicable):

- Flow condition, clarity, general gradient and velocities;
- Channel dimensions and general character;
- Morphology (e.g., riffles, pools);
- Cover opportunities (i.e., woody debris, undercut banks, boulders, aquatic vegetation);
- Substrate type;
- Bank height, character and stability/evidence of erosion;
- Riparian vegetation;
- Any observations of fish presence and/or barriers to fish movement;
- Potential specialized and important habitat areas including potential spawning habitat, good nursery cover, holding habitat (deeper refuge pools);
- Evidence of groundwater discharge or indicators; and
- Disturbances, habitat limitations and potential habitat enhancement opportunities.

Fish community surveys were not undertaken, as existing fish community data were available from numerous previous reports in the study area. The available background information was deemed sufficient to categorize these watercourses without requiring additional fish community surveys. Results are discussed in Section 4.7. A fish species list is provided in Appendix F. Fisheries information by feature is provided in Appendix H.

3.2.3 Wildlife Survey Approach

Wildlife surveys were undertaken on several occasions in 2014. Surveys included; avifauna, breeding amphibians, wildlife habitat assessment for SAR and SWH, as well as collection of general wildlife and

habitat information. Survey dates in 2014 included; April 24, May 15, June 6, 9, 12, 17, 18, 23, 25, and September 16 2014. The surveys were carried out within the ROW and on adjacent private properties within 120 m of the ROW, where PTE was obtained (see PTE mapping in Appendix A).

Additional detail on these surveys is provided in sections following.

3.2.3.1 Avifauna

Avian surveys were conducted to gather breeding bird data and to evaluate the study area for avian habitat potential. Breeding bird surveys were undertaken on June 6, 9, 17, 23, and 25 2014 and were conducted by qualified, experienced staff. The surveys included recording all visual and audible observations as well as the level of breeding bird evidence following standard criteria established by the Ontario Breeding Bird Atlas (OBBA). Bird species observed during surveys are listed in Appendix E and discussed in Sections 4.6.1, 4.8, and 4.9.

3.2.3.2 Breeding Amphibians

Amphibian calling (breeding) activity was surveyed using the Marsh Monitoring Program (MMP) amphibian calling survey protocol (Bird Studies Canada 2003, revised 2009). Surveys were conducted by qualified experienced staff under appropriate conditions (i.e., dusk/evening survey with suitable air temperatures, high humidity or light rain, and low/no wind). Surveys were completed three times during the spring, at least ten days apart. Suitability of timing for amphibian calling was confirmed by referencing other local sites with known amphibian populations and/or liaison with other researchers. Following guidelines of the MMP, night time air temperatures were greater than: 5°C for the first survey; 10°C for the second survey; and 17°C for the third survey. Each calling station was surveyed for three minutes and surveys were started one half hour after sunset and were completed before midnight.

Using the MMP, amphibian calling activity was rated using three levels: Level 1 (individual calls can be counted with no overlap), Level 2 (some calls can be counted or estimated, some overlap) or Level 3 (calls continuous and overlapping, individuals not distinguishable).

Three rounds of amphibian calling surveys were completed at 18 stations within or adjacent to the study area on the following dates in 2014: April 24, May 15, and June 12 and 18.

Refer to wildlife Figure 4 (plates 1-4) provided in Appendix A for amphibian survey station locations. Only stations within or directly adjacent to the study area are shown on mapping.

3.2.3.3 Wildlife Habitat Assessment and General Observations

An assessment of existing habitats was undertaken to consider potential use for SAR and SCC known to occur within the vicinity of the study area as well as other wildlife. This included searches for cavity/snag trees and open building structures that may provide suitable roosting/maternity habitat for SAR bats. Existing habitats were also screened for potential as Significant Wildlife Habitat (SWH) as defined in Ecoregion 6E SWH Criterion Schedule (MNRF 2015), including key wildlife movement corridors. Existing structures such as bridges and culverts were also surveyed to document any bird nesting or other wildlife use (e.g. using culverts as a movement corridor).

Supplemental observations of herpetofauna, mammals, and insects were recorded during all field visits. These observations were recorded, including sightings of species, as well as evidence of use (e.g. browse, tracks / trails, scat, burrows, and vocalizations). Other wildlife observations are listed in Appendix E. Findings for each natural heritage feature within the study area are provided in Appendix H.

3.3 Technical Review

A review of supporting technical information will be completed as details become available. This includes review of road alignment alternatives, preferred alignment preliminary designs and grading plans, and water crossing structures. Ecology staff will review and provide input into design plans and layouts to minimize impacts to the form and function of the existing natural heritage features. This information will also be reviewed as part of the impact analysis.

3.4 Agency Liaison

Key agencies engaged for this study include; Halton Region, CVC, CH, and MNRF-Aurora District. These agencies were first engaged through a Notice of Project Commencement sent out on April 3 2014. Agencies were then sent background information request letters in April of 2014. These letters requested that any available natural heritage background information for the study area be provided. CVC responded via email on June 2 2014 providing available natural heritage information. MNRF also responded via email on June 27 2014 indicating key SAR and SCC known to occur within the area.

An initial meeting was held with CVC and CH regarding natural heritage on September 30 3014. At this meeting, a summary of existing natural heritage conditions was provided for the study area, highlighting key natural features and constraints. Mapping was also presented showing natural features within the study area. Materials were provided to agencies for review and input to ensure all existing background information was captured for the study area. Following this meeting on October 29 2014, CVC provided a checklist of details they would like to see provided as part of the study.

Subsequent meetings with CVC and CH occurred on March 4 2015 to present and discuss the proposed road alternatives and again on April 14 2015 to review key natural heritage features in the field. Upon the completion of the alternatives assessment, a meeting with CVC, CH, and MNRF staff was held on April 28th 2015 to present the findings of the assessment which resulted identification of the preferred alignment. At this meeting, MNRF provided mapping of existing SAR and SCC records for within the study area.

4.0 EXISTING CONDITIONS

4.1 Physiography and Soils

The Niagara Escarpment, located approximately 6 km northwest of the study area, is the most significant physiographic feature within the region. Within the study area, two physiographic regions are present, the Peel Plain in the south and South Slope in the north. The Peel Plain represents areas that were once covered by a pre-glacial lake (Glacial Lake Peel), whereby shallow water deposits (silt and clay) overlie deeper glacial till units, and bedrock. This region consists of flat to undulating terrain, whereby this plain has a very gentle slope to the southeast, towards Lake Ontario. As per Chapman and Putnam (1984), much of the Peel Plain is underlain by poorly drained clay soils, however select regions have sandy sub-soils. The South Slope differs from the Peel Plain in that the glaciolacustrine deposits are absent and glacial till is typically the surficial geological unit. Again, this area consists of undulating terrain (drumlinized to bevelled till plains), with a very gentle slope towards Lake Ontario - however the plain is characterized by flutings (subtle elongated ridges and valleys) and localized drumlins.

Additional detail, including bedrock geology, is provided in the report titled *Initial Hydrogeological Assessment Trafalgar Road Environmental Assessment* (MMM 2016).

4.2 Surface Drainage and Watershed Characteristics

The study area lies within two watershed systems; Credit River (Credit Valley Conservation) and 16 Mile Creek (Halton Region Conservation). Within the Credit River watershed portion of the study area, Black Creek is the dominant watercourse feature. Within the 16 Mile Creek watershed (Middle Branch), the Hornby Tributary is the dominant watercourse feature. Both of these features, Feature #12 and #3 respectively, are classified as permanent watercourses.

Black Creek Subwatershed

The Black Creek subwatershed is approximately 79 km^2 in area and is a major tributary of Silver Creek intercepting it in the west end of Georgetown. Silver Creek is a tributary to the Credit River (CVC 2009). The headwaters of Black Creek originate at Fairly Lake in the Town of Acton. The majority of the watercourse flows through undulating terrain and crosses over the Niagara Escarpment between Acton and Georgetown. Groundwater supports baseflow of the creek and maintains cool/coldwater thermal characteristics. Black Creek contains sensitive coldwater salmonids, specifically, Brown Trout (*Salmo trutta*), Brook Trout (*Salvelinus fontinalis*), Rainbow Trout (*Oncorhynchus mykiss*), and Atlantic Salmon (*Salmo salar* - through stocking efforts by MNRF). Black Creek is currently managed as a mixed coldwater/coolwater system under the Credit River Fisheries Management Plan (MNRF & CVC 2002). Land use within the subwatershed is predominantly agriculture, with some naturalized areas (woodlands and wetlands), rural residential and urban (Acton and Georgetown).

In addition to Black Creek, within the study area there are 3 tributaries of Black Creek present, two of which cross Trafalgar Road.

16 Mile Creek Subwatershed (Middle and Middle East Branches):

The Sixteen Mile Creek watershed is located at the western end of Lake Ontario. It drains approximately 372 km² of land within nine distinct sub-watersheds (Dunn and Jamieson Undated). The main branches of the creek originate from wetlands and forested swamps associated with the Niagara Escarpment. The tributaries within the study area generally support warmwater baitfish species. The Middle Branch of 16 Mile Creek is known to occupy Redside Dace (*Clinostomus elongates*) a species listed as Endangered provincially, and therefore afforded protection under the Endangered Species Act (2007). Land use within the subwatershed is predominantly agriculture, with some naturalized areas (woodlands and wetlands), rural residential, becoming predominantly urban south of the study area as it flows through several Greater Toronto Area (GTA) communities.

The main associated watercourse within the study area is the Hornby Tributary. There are an additional 9 tributaries present within the study area associated with either the middle or east branches of 16 Mile Creek, 7 of which cross Trafalgar Road.

4.3 Hydrogeology

For detail on hydrogeological characteristics within the study area please see the report titled *Initial Hydrogeological Assessment Trafalgar Road Environmental Assessment* (MMM 2016).

4.4 Environmentally Designated Areas

Several overlapping natural heritage features and designated policy areas are present within the study area. These include;

- *Hungry Hollow ESA;*
- *Waterfalls Woods ESA;*
- *Stewarttown Woods ESA;*
- *Hornby Swamp Wetland Complex* (locally significant wetland);
- Region of Halton Official Plan (2006) *Greenlands System*;
- Regional Official Plan – Halton Region (2009) *Regional Natural Heritage System*;
- Town of Halton Hills Official Plan (2008)- *Greenlands System;*
- Greenbelt Plan *Natural Heritage System* (2005)- *Protected Countryside*

- Niagara Escarpment Plan Area (2005) – *Rural Area;* and
- *Floodplain regulation areas governed by the Regulation of Development, Interface with Wetlands and Alterations to Shorelines and Watercourses* (Ontario Regulation 160/06 and 162/06, respectively)

4.5 Vegetation

Land use within the study area is primarily agricultural with residential development concentrated at the northeastern end (Georgetown). Natural communities are fragmented and interspersed throughout the agricultural/rural landscape. Larger areas of natural vegetation in the form of woodlands and wetlands are concentrated within the northern portion of the study area with the presence of the Hungry Hollow ESA/PSW, Waterfalls ESA, and Stewarttown Woods ESA.

Vegetation communities are mapped on Figure 3 (plates 1-12) provided in Appendix A and described below in Section 4.5.1. More detailed information is available for communities where field or roadside confirmation was possible (as indicated on Figure 3 [plates 1-12] in Appendix A) - this is reflected in community descriptions below. Vegetation communities are also identified by Feature # in Appendix H.

Plant lists for each community type are provided for communities where a reasonable level of observation of community strata was possible from the roadside/community edge or where property access was permitted. In some cases, communities were observed from a large distance away or had high edge density which reduced visibility, in which only the primary canopy and edge species could be observed. As such, no plant list for these communities has been included. Vascular plant lists are provided in Appendix D.

4.5.1 Vegetation Communities

Cultural Communities

Dry – Moist Old Field Meadow (CUM1-1)

These old-field communities consist of a dense layer of herbaceous ground vegetation, with the most abundant species typically consisting of Tall Goldenrod (*Solidago altissima*), New-England Aster (*Symphyotrichum novae-angliae*), Wild Carrot (*Daucus carota*), Panicled Aster (*Symphyotrichum lanceolatum*), White Heath Aster (*Symphyotrichum ericoides*), Awnless Brome (*Bromus inermis ssp inermis*), Common Dandelion (*Taraxacum officinale*), Garden Bird's-foot-trefoil (*Lotus corniculatus*), Orchard Grass (*Dactylis glomerata*), tall sweet clovers (*Melilotus spp*), and Canada Thistle (*Cirsium arvense*).

CUS1 Mineral Cultural Savannah

This cultural savannah consists of an open stand of mature Sugar Maple (*Acer saccharum var saccharum*), Red Oak (*Quercus rubra*), and Black Cherry (*Prunus serotina*), with a dense ground layer dominated by Tall Goldenrod, Riverbank Grape (*Vitis riparia*), and grasses. Shrubs occur in dense

patches and consist mainly of Common Buckthorn (*Rhamnus cathartica*) and Staghorn Sumac (*Rhus typhina*).

CUT1 Mineral Cultural Thicket Ecosite

Small patches of cultural thicket are present and consist of a mix of common shrubs and young trees; Staghorn Sumac, Common Buckthorn, Manitoba Maple (*Acer negundo*), American Elm (*Ulmus americana*) are the most frequently observed. Ground layers consist of old-field species as described above.

CUW1 Mineral Cultural Woodland Ecosite

Cultural woodland habitats consist of areas with tree cover in the 35-60% range, and have largely been inferred through air photo interpretation for this study. One occurrence at the roadside consists of a mix of planted Silver Maple (*Acer saccharinum*), Sugar Maple, White Pine (*Pinus strobus*), and spruce (*Picea sp*). No plant list is provided.

CUP2 Mixed Plantation

This small plantation consists of mid-age Norway Maple (*Acer platanoides*) and White Pine, with a very sparse ground layer consisting mainly of Herb-robert (*Geranium robertianum*), Garlic Mustard (*Alliaria petiolata*), and low-growing Choke Cherry (*Prunus virginiana var virginiana*) seedlings.

CUP3 Coniferous Plantation

Communities where field or roadside confirmation was possible indicate some variability in age and composition. A large plantation complexed with deciduous forest (near Steeles Ave) consists primarily of mid-age White Spruce (*Picea glauca*), White Pine, and Scotch Pine (*Pinus sylvestris*) (deciduous forest component described under *Forest Communities*). Another, associated with residential properties, consists of Norway Spruce (*Picea abies*), Scotch Pine, and White Spruce. A young plantation on the north side of Sideroad 15 is dominated by a spruce species with cultural meadow ground vegetation, and less frequent Black Locust (*Robinia pseudo-acacia*), Staghorn Sumac, and Scotch Pine associates.

Forest Communities

FOD Deciduous Forest

These communities were interpreted via air photos only and no additional information is available. No plant list is provided.

FOD3-1 Dry – Fresh Poplar Deciduous Forest

This is a small forest patch on a valley slope, dominated by mature Trembling Aspen (*Populus tremuloides*) with younger Bitternut Hickory (*Carya cordiformis*) and Black Cherry associates. Black Walnut (*Juglans nigra*), Staghorn Sumac and Common Buckthorn are present in a moderately dense understory. Riverbank Grape is abundant in the ground layer and understory. Woody debris is abundant.

FOD5 Dry – Fresh Sugar Maple Deciduous Forest Ecosite

These communities are dominated by Sugar Maple with various associates. A typical assemblage consists of Sugar Maple with ash species (*Fraxinus sp*), American Beech (*Fagus grandifolia*), White Pine, Red Oak (*Quercus rubra*), Paper Birch (*Betula papyrifera*), Trembling Aspen, and Bitternut Hickory as the most abundant associates. Patchy understories consist mainly of Alternate-leaf Dogwood (*Cornus alternifolia*), Wild Red Raspberry (*Rubus idaeus ssp strigosus*) and Choke Cherry.

FOD5-1 Dry – Fresh Sugar Maple Deciduous Forest

This mid-age to mature forest is dominated by Sugar Maple with American Basswood (*Tilia americana*), Eastern Hemlock (*Tsuga canadensis*), American Beech, White Ash (*Fraxinus americana*), and Trembling Aspen. White Ash regeneration, Purple-flowering Raspberry (Rubus odoratus), and Common Buckthorn comprise the sparse understory. The ground layer is also sparse, consisting mainly of May Apple (*Podophyllum peltatum*), Large-flower Trillium (*Trillium grandiflorum*), and Running Strawberry-bush (*Euonymus obovata*). A culvert and dry stream bed is present where species such as Dame's Rocket (*Hesperis matronalis*), Purple-stemmed Aster (*Symphyotrichum puniceum*), Climbing Nightshade (*Solanum dulcamara*), and Fowl Manna Grass (*Glyceria striata*) were observed.

FOD5-3 Dry – Fresh Sugar Maple – Oak Deciduous Forest

These small forest patches are dominated by mid-age to mature Sugar Maple and Red Oak. The patch associated with Feature 42 includes occasional to rare White Ash, Black Cherry, and American Basswood associates. Dense subcanopy and understory layers are dominated by Staghorn Sumac and Common Buckthorn, with Choke Cherry and Spreading Dogbane (*Apocynum androsaemifolium*). Common Buckthorn seedlings, Thicket Creeper (*Parthenocissus vitacea*) and Riverbank Grape are the most abundant ground layer species. Feature 22 includes canopy associates of American Basswood, Bitternut Hickory, Red Maple (*Acer rubrum*), and Eastern Hemlock, with Common Buckthorn and Choke Cherry in the understory. Ground vegetation is less weedy than Feature 38 and consists mainly of Broad-leaved Goldenrod (*Solidago flexicaulis*), May Apple, Running Strawberry-bush, Enchanter's Nightshade (*Circaea lutetiana ssp canadensis*), and non-native species including Periwinkle (*Vinca minor*) and Herb-robert. Both communities are subject to anthropogenic disturbance in the form of clearing and/or dumping.

FOD5-8 Dry – Fresh Sugar Maple – White Ash Deciduous Forest

A common forest type within the study area, consists of Sugar Maple dominated canopy with White Ash as the primary associate, with varying amounts of White Pine, Black Cherry, Eastern Hop-hornbeam, Paper Birch, and American Beech.

FOD6-5 Fresh – Moist Sugar Maple – Hardwood Deciduous Forest

This mid-age to mature forest exists in a complex with Green Ash swamp (described below). Sugar Maple dominates, with American Basswood, Bitternut Hickory, Shagbark Hickory (*Cary ovata*), White Ash, White Pine, Black Cherry, and White Oak (*Quercus alba*). Eastern Hop-hornbeam (*Ostrya virginiana*) occurs with these species in the subcanopy. The understory is sparse and consists mainly of

Choke Cherry and Eastern Hop-hornbeam. The most abundant species in the ground layer are Running Strawberry-bush, Garlic Mustard, Broad-leaved Goldenrod, and Enchanter's Nightshade.

FOD7 Fresh – Moist Lowland Deciduous Forest Ecosite

These lowland forest communities occupy valley slopes and bottomlands and consist primarily of Black Walnut, Manitoba Maple, and ash species. Where visible, understory shrubs include Staghorn Sumac and Alternate-leaf Dogwood.

FOD9 Fresh – Moist Oak – Maple – Hickory Deciduous Forest Ecosite

This forest type occurs alone or in complex with coniferous plantation. Canopies consist of variable mixtures containing Shagbark Hickory, Bur Oak, Freeman's Maple (*Acer x freemanii*), Sugar Maple, Red Oak, and American Basswood. Where it occurs with plantation, ground vegetation includes moist openings with Elecampane (*Inula helenium*), Orange Jewelweed (*Impatiens capensis*), Kansas Milkweed (*Asclepias syriaca*), White Avens (*Geum canadense*), and grasses and sedges (*Carex species*).

FOM Mixed Forest

Interpreted via air photos only and no additional information is available. No plant list is provided.

FOM2 Dry – Fresh White Pine – Maple – Oak Mixed Forest Ecosite

This mixed forest occupies a valley slope and consists of White Pine with deciduous species such as American Elm, Black Cherry, American Beech, and American Basswood, with Eastern White Cedar in the subcanopy. No plant list is provided.

FOM4 Dry – Fresh White Cedar Mixed Forest Ecosite

A young, dense mixed forest consisting of Eastern White Cedar, Norway Maple, American Elm, and Black Walnut. No plant list is provided.

Swamp Communities

SWD Deciduous Swamp

These communities were interpreted via air photos only and no additional information is available, with the exception of two small communities, one within Feature 24 adjacent to Sideroad 15, the second in association with Feature 39. The first is a small swamp situated on the lowland riparian habitat adjacent to a watercourse, and consists of Black Locust with American Elm, Black Walnut, Willow species (*Salix sp*), and Green Ash, with Reed Canary Grass (*Phalaris arundinacea*) and Ostrich Fern (*Matteuccia struthiopteris*) dominant in the ground layer. The second is a regenerating swamp with a mix of deciduous canopy species, including Trembling Aspen, Shagbark Hickory, Freeman's Maple, forming a ring around a herbaceous layer dominated by Reed Canary Grass and pooled water.

SWD1-2 Bur Oak Mineral Deciduous Swamp

These swamp communities are dominated by Bur Oak, with smaller patches containing Manitoba Maple, and larger communities with main associates consisting of Green Ash, American Elm, and Shagbark

Hickory. Where visible, Common Buckthorn appears dominant in the understory. Ground vegetation observed includes White Avens, Thicket Creeper, Orange Jewelweed, sedge species, Fowl Manna Grass, and Spinulose Wood Fern (*Dryopteris carthusiana*).

SWD2-1 Black Ash Mineral Deciduous Swamp

A young swamp with marshy ground vegetation. The canopy is dominated by young Black Ash (*Fraxinus nigra*), with occasional to rare occurrences of a willow species, Eastern Cottonwood (*Populus deltoides*), and Eastern White Cedar. Shrubs are infrequent but consist of Speckled Alder (*Alnus incana ssp rugosa*), Dwarf Raspberry (*Rubus pubescens*), and Wild Black Currant (*Ribes americanum*). The ground layer varies – in more open areas with lower tree cover, Narrow-leaved Cattail (*Typha angustifolia*) dominates with Reed Canary Grass and Orange Jewelweed as main associates, whereas in areas of denser tree cover, Orange Jewelweed, Purple-stemmed Aster, Sensitive Fern (*Onoclea sensibilis*), and Rice Cutgrass (*Leersia oryzoides*) are the most abundant species.

SWD2-2 Green Ash Mineral Deciduous Swamp

This community occurs in a complex with FOD6-5 described above. The canopy is dominated by Freeman's Maple, with Red Maple, Green Ash, Bur Oak, and Shagbark Hickory as associates. Sedges and ferns dominate the ground layer, including Hop Sedge (*Carex lupulina*), Blunt Broom Sedge (*Carex tribuloides*), Tuckerman Sedge (*Carex tuckermanii*), Fringed Sedge (*Carex crinita*), Lady Fern (*Athyrium filix-femina ssp angustum*), Sensitive Fern, Ostrich fern. Other frequently observed species include Fowl Manna Grass, Orange Jewelweed, Panicled Aster, and Devil's Beggar's Ticks (*Bidens frondosa*). Extensive seasonal pooling is evident – at the time of the field survey, pooled areas were moist and consisted of bare ground or contained the species listed above.

SWD3-3 Swamp Maple Mineral Deciduous Swamp

This mid-age swamp is dominated by Freeman's Maple with occasional Eastern Hemlock, and rare occurrences of Green Ash, Red Maple, and Paper Birch. American Elm is abundant in the subcanopy. Ground vegetation is dominated by Orange Jewelweed, with Panicled Aster, Devil's Beggar's Ticks, Hairy Willow Herb (*Epilobium ciliatum ssp ciliatum*), Wild Lily-of-the-valley (*Maianthemum canadense*), Sensitive Fern, Climbing Nightshade, Spinulose Woodfern, and Wild Sarsaparilla (*Aralia nudicaulis*). This community likely dries earlier in the season than the SWD2-2 described above. Along its interface with the FOD5-8, several distinct pools (dry) were observed.

SWD3-4 Manitoba Maple Mineral Deciduous Swamp

This small riparian swamp consists of a canopy of Manitoba Maple and a dense shrub layer of willow, Nannyberry (*Viburnum lentago*), and Choke Cherry. Reed Canary Grass dominates the ground layer with Spotted Joe-pye Weed, Orange Jewelweed, Swallow-wort species (*Cynanchum sp*), and Canada Anemone (*Anemone canadensis*).

SWD4 Mineral Deciduous Swamp Ecosite

The canopies of these riparian swamps are composed of mid-age Manitoba Maple and Willow species. Ground vegetation was not visible from the roadside. No plant list is provided.

SWC Coniferous Swamp

This community was interpreted via air photos only and no additional information is available. No plant list is provided.

SWM1-1 White Cedar – Hardwood Mineral Mixed Swamp

This swamp is situated on a lowland riparian area and consists of mid-age Eastern White Cedar with Black Walnut, Green Ash, American Elm, and willow species. Ground vegetation is dominated by Reed Canary Grass with Spotted Joe-pye Weed (*Eupatorium maculatum*) also observed.

SWT Thicket Swamp

This community was interpreted via air photos only and no additional information is available. The community appears to be dominated by shrubby vegetation with a marshy ground cover. No plant list is provided.

Marsh Communities

MAMM1-12* Common Reed Graminoid Mineral Meadow Marsh

This community is dominated by European Reed Grass (*Phragmites australis ssp australis*), with scattered Common Buckthorn and young Black Walnut and Manitoba Maple throughout. Air photos indicate a pond is present within the interior though this could not be confirmed from the roadside.

MAM2-2 Reed-canary Grass Mineral Meadow Marsh

These communities are most often present in association with drainage channels and tributaries throughout the study area, but also occur on bottomlands in isolation or in association with wooded features. They are typically dominated by Reed Canary Grass with various associates occurring in low frequencies, such as Orange Jewelweed, asters, and cattail.

MAS2-1 Cattail Mineral Shallow Marsh

These shallow marshes are dominated by Cattail (most often Narrow-leaved Cattail) and occur along/within tributaries, drainage channels, and bottomlands. Hydrophytic shrubs and trees may occur sporadically, and other herbaceous associates include Reed Canary Grass, Fowl Manna Grass, and sedges.

Open Water Communities

OA Open Water

These open water communities were interpreted via air photos only and no additional information is available. No plant list is provided.

Of the above noted community types, one is considered rare in the province: Bur Oak Mineral Deciduous Swamp (S3). This swamp type has been delineated within Natural Heritage Features #3, #4 and #5 (Shown on Vegetation Figure 3 (plates 1-12) provided in Appendix A). Confirmation of dominant species and character should occur during future field surveys to be carried out in spring/summer of 2015.

4.5.2 Floristic Inventory

A total of 196 species were recorded within the study area during field surveys (a Vascular Plant List is provided in Appendix D), 21 of which could not be identified to species due to an absence of identifying characteristics. Of the identified species, 31 (17%) are non-native.

Of the native species for which information is available:

- Coefficient of Conservatism (CC)[1] values range from 0 to 8 with the majority being 0 to 6.
- The majority of species observed have S-ranks[2] of S5 (Secure in the province) while one species has a rank of S4 (Apparently secure). One species has an S-rank of 'S3?': Butternut (*Juglans cinerea*), also a SAR, and is discussed further below.

One provincially Endangered species, Butternut, was observed within the study area. This species was observed within 2 communities in the study area – once at the edge of the FOD7 associated with Natural Heritage Feature #25, and within the FOD5 of Feature #17 (locations shown on Figure 3 [plates 1-12] provided in Appendix A). It is likely that more than one individual is present within each of these communities, although this could not be confirmed due to lack of property access. Additionally, one dead specimen was observed within the SWD1-2 associated with Natural Heritage Feature #3. No other provincially or federally listed plant species were observed.

One vascular plant species considered rare in Halton Region was observed during field surveys: Hackberry (*Celtis occidentalis*). The observation was a planted specimen associated with SWM facilities near Natural Heritage Feature #19.

[1] Value of 0 to 10 based on plants degree of fidelity to a range of synecological parameters: (0-3) Taxa found in a variety of plant communities; (4-6) Taxa typically associated with a specific plant community but tolerate moderate disturbance; (7-8) Taxa associated with a plant community in an advanced successional stage that has undergone minor disturbance; (9-10) Taxa with a high fidelity to a narrow range of synecological parameters (Oldham et al., 1995).

[2] Refer to plant list legend in Appendix D for an explanation of S-Ranks.

4.6 Wildlife

4.6.1 Birds

Breeding bird surveys were conducted on; June 6, 9, 17, 23, and 25 2014. Through completion of these surveys as well as documentation of any birds observed during other surveys, a total of 85 bird species were observed within the study area (refer to Appendix E for a full list of species). A summary of results, including level of breeding evidence, is highlighted below:

- Of the 85 species observed, 81 are considered to be breeding within the study area (i.e. 'possible', 'probable' or 'confirmed' OBBA breeding evidence);
- Four (4) SAR species listed as Threatened provincially and afforded protection under the ESA (2007) were observed within the study area. These were: Barn Swallow (*Hirundo rustica*), Bobolink (*Dolichonyx oryzivorus*), Chimney Swift (*Chaetura pelagica*) and Eastern Meadowlark (*Sturnella magna*). See Section 4.8.2 for discussion.
- Three (3) species of Conservation Concern (SCC) were observed within the study area and included; Wood Thrush (*Hylocichla mustelina*) [federally listed as Threatened]; Eastern Wood Pewee *(Contopus virens*) [federally listed as Special Concern]; and Hooded Warbler (*Setophaga citrina*) [provincially S-Rank 3B]. See Section 4.8.2 for discussion.
- Several Regionally Significant bird species were observed within the study area:
    - Regionally Rare – a total of 3 regionally rare bird species within Halton Region were observed within the study area, this included the Common Raven (*Corvus corax*), Hooded Warbler (*Setophaga citrina*), and Orchard Oriole (*Icterus spurius*); and
    - Regionally Un-Common: a total of 19 regionally un-common bird species within Halton Region were observed within the study area.

Bird species observed are predominantly common, generalist, urban-adapted and agricultural species, with forest-associated species recorded in appropriate habitats. The avifauna observed and exhibiting breeding evidence in the study area are expected for the site conditions present. All of the SAR and SCC bird species recorded would be considered common and expected for Halton Region, given the habitats present. A full list of bird observations is provided in Appendix E, as is the Feature # in which the species was observed.

4.6.2 Amphibians and Reptiles

Seven calling amphibians were recorded during calling surveys undertaken by MMM staff in 2014, all of which except one are common and expected species for the area. These species included; Green Frog (*Lithobates clamitans*), Northern Leopard Frog (*Lithobates pipiens*), American Toad (*Anaxyrus*

americanus), Gray Treefrog (*Hyla versicolor*), Spring Peeper (*Pseudacris crucifer*), Chorus Frog (*Pseudacris*), and Wood Frog (*Rana sylvatica*).

These species were observed likely breeding in Features 23 (likely farm pond adjacent to the feature), 25, 28, 29, 38, and 45 within the study area. An additional dug farm pond had confirmed breeding noted, this pond is located south of Sideroad 20 and north of Feature 15.

Spring Peepers were also noted calling during the April 14 2015 agency site visit in the wetland/woodland Feature 20. Standing water was also observed within the wetland areas. It is inferred that this feature provides breeding amphibian habitat for a variety of species.

One species, Western Chorus Frog (*Pseudacris triseriata*, Great Lakes / St. Lawrence - Canadian Shield population), a federally Threatened species, was recorded at chorus (L3) call levels at calling station 9 on May 15, 2014. This calling station is located well outside of the study area within Natural Heritage Feature 17, which is part of the Niagara Escarpment Plan Area. Species recorded at each station are provided in Appendix E.

A total of 4 reptile species were observed within the study area during the 2014 surveys. This included two species with provincial Special Concern status; the Snapping Turtle (*Chelydra serpentina*) observed in Feature #24 (Stewarttown Woods ESA) as a roadkill specimen; and the Milksnake (*Lampropeltis triangulum*) observed in Feature #24 with an additional anecdotal observation noted in Feature #22. The remaining two species included the Midland Painted Turtle (*Chrysemys picta marginata*) observed in Feature #2 and the Eastern Gartersnake (*Thamnophis sirtalis sirtalis*) observed in Feature #17 (Waterfall Woods ESA).

4.6.3 Mammals

Mammal observations, including sightings and evidence of use (e.g. browse, tracks / trails, scat and burrows) were recorded during all field surveys.

In total, 12 common and expected mammal species, including Eastern Chipmunk (*Tamias striatus*), Grey Squirrel (*Sciurus carolinensis*), Raccoon (*Procyon lotor*), and White-tailed Deer (*Odocoileus virginianus*) were observed in the study area. A complete list of species is found in Appendix E. All are expected in this rural and urbanizing setting.

No federally (SARA/COSEWIC) or provincially (SARO) designated SAR, or provincially rare species (i.e. S1 to S3 ranked by NHIC) were recorded within the study area.

This area likely supports a range of common mammals that were not observed during the field surveys but are often found in similar habitats throughout the province. These species may include but are not limited to a number of small mammals that often go undetected (e.g. shrews, voles, mice, bats).

Three species of bat including; Little Brown (*Myotis lucifugus*), Northern Long-eared Bat (*Myotis septentrionalis*), and Eastern Small-Footed bat (*Myotis leibii*) have potential to occur within the study area. These species are listed as Endangered provincially and as such are afforded protection under the ESA (2007). As targeted bat surveys were not part of the approved study scope, presence/absence of these species and their habitat is unknown.

4.6.4 Lepidoptera and Odonates

Seventeen Odonate (damselfly and dragonfly) species and 26 Lepidoptera (butterfly and moth) species were recorded in the course of the field surveys within the study area. Of these species one SCC were recorded within the study area which included; Monarch (*Danaus plexippus*) [listed as Special Concern Provincially]. Nine of these species are considered regionally Rare in Halton Region, 4 are considered uncommon in Halton Region, and 5 are considered Locally Significant. A complete list of species is found in Appendix E.

Of the remaining species recorded, all would be considered common and expected for Halton Region. The greatest diversity of Odonates and Lepidoptera species was observed in Feature #24 (Stewarttown Woods ESA).

4.6.5 Wildlife Movement Corridors

Field investigations did not indicate any areas of obvious high-use large / medium-sized mammal movement corridors or road crossing points. Examination of Halton Region Police Service (HRPS) collision data involving vehicular traffic and medium/large sized mammals indicated that seven reported collisions had occurred between Steeles Avenue and 10 Side Road (approx. 4.5km) over a 5-yr period. It should be noted that documentation of the collision locations is not sufficiently detailed to suggest defined crossing points.

Within the broad study area, large and medium sized mammals such as White-tailed Deer and Coyote will likely follow the contours and / or interior of wooded features as they approach roadways. Areas where woodland patches of sufficient size are bisected by the roadway creates a potential crossing point. Examples of this within the study area include – Features 2, 24/11, and 15/19. Outside of these locations, mammals can be expected to follow wooded corridors such as hedgerows, riparian corridors or vegetated drains. In some cases, both large and small mammals may use the underside of bridges and culverts as movement opportunities, avoiding any vehicular interaction in the process. Amphibian movement is also anticipated to be similar in that they will move across Trafalgar Road at locations where natural features are bisected - this also includes Features 2, 24/11, and 15/19.

Within the road realignment study area, it is anticipated that wildlife movement is occurring along the length of Black Creek within Feature 24 as well as between Features 17, 18, and 15.

4.7 Watercourses and Fish Habitat

Field investigations of aquatic features within the study area were conducted on June 23 and September 15, 2014 by MMM Group ecologists. Aquatic habitat characterization surveys were carried out on all watercourses within the study area with exception of those where PTE was not granted. These features included Features #33 and #36 within the Trafalgar Road study corridor, as well as Feature #44 located in the road realignment study area.

A summary of findings from the watercourse assessments carried out within the study area is provided in Tables 2 and 3. Table 2 includes those features that cross Trafalgar Road. Table 3 includes those features within the road realignment portion of the study area. A discussion of associated watersheds and subwatersheds (Black Creek and 16 Mile Creek) as well as watercourses present within the study has been previously provided in Section 4.2.

In total, there are 12 watercourses present within the study area. Of these 12, nine cross Trafalgar Road. Two are permanent watercourses directly supporting fish: Hornby Tributary of Middle Sixteen Mile Creek, and Black Creek in the Credit River watershed. Both of these watercourses contain high quality fish habitat in the vicinity of Trafalgar Road.

Of the remaining watercourses present, only one watercourse (Feature #7) had no potential for fish habitat with no surface connection to a fish bearing watercourse. The remaining six watercourses were considered contributing fish habitat, with no potential to directly support fish communities, although they do provide flow to a fish-bearing watercourse. These details are summarized in Tables 2 and 3.

Table 2. Existing Conditions in Aquatic Features Crossing Trafalgar Road

Feature #	Watercourse	Flow Regime	Channel Characteristics	Bank/Riparian Characteristics	Fish Habitat (None, Direct, Contributing) and Fish Community
1	Tributary to Middle Sixteen Mile Creek (part of Hornby Tributary)	Intermittent. Dry ATOS[3] with patches of standing water in culvert and at outlet. Low gradient.	Two branches of the tributary join immediately upstream (North of Trafalgar Road) and a single defined channel conveys drainage from Trafalgar Road to the Hornby Tributary approx. 450 m downstream. Upstream, the bankfull width ranges from 0.6 to 1.0 m with a bankfull depth of 0.45 to 0.60 m. Downstream, the bankfull width is approx. 1.2 m with a bankfull depth of 0.55 m. The channel substrate is mostly a mix of sand and cobble, with some gravel and boulders downstream.	The channel flows through agricultural fields. Banks are steep and stable. Both up and downstream the channel flows through hay fields with grasses overhanging the channel throughout the study reach, and some localized overhanging shrubs. Downstream, a horse pasture borders the watercourse on the south side.	• Contributing fish habitat • Drains to fish bearing watercourse approx. 450 m downstream. • MNRF identifies the reach as coldwater (MNRF 2014) although species records downstream indicate warmwater baitfish community.
3	Hornby Tributary to Middle Sixteen Mile Creek	Permanent. Moderate flow ATOS. Low gradient.	Medium -sized creek and major tributary to Middle Sixteen Mile Creek. The channel is mostly straight through the study reach with a natural pool/riffle sequence. Bankfull width upstream is 6.0 to 7.3 m with a bankfull depth of approx. 0.6 m in pools and 0.3 m in riffles. Downstream, the bankfull width is 4.0 to 4.7 m with a bankfull depth of approx. 0.5 m in pools and 0.35 m in riffles. Substrates are generally coarse; a mixture of sand, gravel, and cobbles with some silt in pools. Instream cover is provided by overhanging bank vegetation including trees and roots, cobble and boulders and some undercut banks downstream.	The channel flows through deciduous forest (Feature #2) with a residential/commercial property with manicured lawn in the southwest quadrant. Banks are approx. 1.0 m high throughout, mostly natural with some rip rap stabilization downstream. The stream is approx. 70% shaded by canopy with some overhanging trees and roots providing stream cover.	• Direct fish habitat • CH identifies the reach as warmwater baitfish. Fish community sampling in 2011 captured mostly baitfish/panfish species with one coldwater salmonid (Rainbow Trout) (CH 2011). MNRF identifies the reach as a coldwater fishery (MNRF 2014). • Full species list in Appendix F. • Contributing to regulated Redside Dace habitat in Middle Sixteen Mile Creek ~2 km downstream.
7	Tributary to Hornby Tributary	Ephemeral. Dry ATOS. Roadside ditch drainage upstream, and no channel downstream	Minor drainage feature consisting of a dry ditch with defined channel upstream (west) of Trafalgar Road. The upstream channel has a bankfull width of approx. 0.7 m, and a bankfull depth of 0.3 m with sand and silt substrate. There was some gravel substrate at the inlet to the culvert. Downstream, the channel appears to have been blocked or filled in at the outlet of the culvert. There is no surface water connection to another drainage feature in the vicinity. Flow would drain out over the agricultural field during periods of high flows.	Upstream of Trafalgar Road, the channel is a roadside ditch with an agricultural field to the west and a 1 m high embankment to Trafalgar Road on the east. The ditch is overgrown with grasses. There is no overhead canopy, although grasses overhang the channel. Downstream, the outlet of the culvert ends at a mowed grass embankment bordering Trafalgar Road and an agricultural field.	• Not fish habitat. • No surface connection to fish bearing watercourse.
8	Tributary to Middle East Sixteen Mile Creek	Intermittent. No defined channel. Standing water ATOS.	Drainage feature draining roadside ditch on upstream (west) of Trafalgar Road and draining into agricultural drain perpendicular to Trafalgar Road on downstream (east side) contributing to headwaters of East Sixteen Mile Creek. The upstream ditch drainage channel has a bankfull width of approx. 1 m, and had a depth of 0.28 m ATOS. The banks are undefined as the channel is overgrown with grasses, sedges and cattails. Downstream, there is no defined channel but an overgrown outlet pool approx. 3 m wide, narrowing to a wetted width of approx. 0.3 m ATOS flowing into the agricultural drain overgrown with reeds and cattails. The substrates are generally silt and organic muck.	Upstream, the roadside drainage is bordered by an agricultural field to the west and Trafalgar Road to the east. There is no overhead canopy, with grasses and other vegetation overhanging the channel. Downstream, the drain flows through open agricultural fields with no overhead canopy cover. The riparian area of the drain is a wetland area of reeds and cattails approx. 3 to 4 m wide that shades the drainage feature.	• Contributing fish habitat. • No fish habitat is present at the Trafalgar Road crossing, but flow drains to East Sixteen Mile Creek, a fish bearing watercourse. • MNRF identifies the reach as coolwater (MNRF 2014) although species records downstream indicate warmwater baitfish community.

[3] ATOS –At time of survey (June 23 2014 or September 15 2014 for features #23, 25, and 27)

Feature #	Watercourse	Flow Regime	Channel Characteristics	Bank/Riparian Characteristics	Fish Habitat (None, Direct, Contributing) and Fish Community
9	Tributary to Middle East Sixteen Mile Creek	Intermittent. Dry with some standing water downstream ATOS. At the downstream outlet, there is a dry pool with evident scouring indicating intermittent high flows.	Drainage feature through agricultural fields upstream with short roadside ditch segment on east side of Trafalgar Road, draining to defined, but dry, channel along roadside on downstream side with some standing water, eventually connecting to headwaters of East Sixteen Mile Creek. Upstream, the channel is undefined, marshy and overgrown with grasses and it diffuses into a marshy drainage channel in the agricultural field. The downstream roadside channel has a bankfull width of approx. 2.5 m with banks 1 m high. Substrates are mostly silt and sand with some rip rap rubble at culvert outlet. A pool of standing water approx. 0.2 m deep had tadpoles and macroinvertebrates observed. The culvert is perched approx. 0.2 m at the outlet.	Upstream, the channel flows through open agricultural fields with no overhead canopy and bordered by marshy riparian vegetation including grasses and sedges. Downstream, the roadside channel is bordered by steep banks approx. 2 m high with Trafalgar Road to the west and agricultural fields to the east. There is no overhead canopy, but the riparian grasses on the banks overhang the channel.	• Contributing fish habitat • Intermittent flow likely prevents fish use, flow drains to East Sixteen Mile Creek, a fish bearing watercourse. • MNRF identifies the reach as coolwater (MNRF 2014) although species records downstream indicate warmwater baitfish community.
10	Tributary to Middle East Sixteen Mile Creek	Intermittent. No defined channel upstream. Channel downstream dry ATOS.	A dry grassy channel drains from the agricultural field on the east side of Trafalgar Road, parallel to the road for approx. 10 m then crosses the road to drain downstream through an agricultural swale. The channel upstream was dry ATOS but defined with a bankfull width of approx. 2.2 m and bankfull depth of approx. 0.3 m. The channel was overgrown with grasses upstream. Downstream, a defined channel through the grassy embankment to the agricultural swale was dry ATOS. Bankfull width is approx. 1.5 m and bankfull depth 0.45 m. Substrates were a mix of gravel, sand, and rubble (old rip rap) indicating regular flow through the channel. Beyond the Trafalgar Road ROW the channel becomes an agricultural swale.	The drainage channel flows through open agricultural fields up and downstream. Some wetland riparian vegetation is visible beyond the property line fence on the upstream side of Trafalgar Road. There is no overhead canopy cover, although grasses overhang the channel within the Trafalgar Road ROW.	• Contributing fish habitat. • Intermittent flow and lack of fish habitat, flow drains to East Sixteen Mile Creek, a fish bearing watercourse. • MNRF identifies the reach as coolwater (MNRF 2014) although species records downstream indicate warmwater baitfish community.
12	Black Creek. Tributary to Credit River West Branch	Permanent. Moderate flow ATOS. Contributing flow, likely groundwater fed. Low to moderate gradient.	A moderately sized watercourse with a relatively straight channel through the study area crossing Trafalgar Road, turning to the north and entering the golf course approximately 50 m east of Trafalgar Road. The physical conditions of the creek are fairly uniform throughout the 100 m study reach, and mostly riffle morphology. The bankfull width upstream of Trafalgar Road is 8.4 to 9.3 m with a uniform bankfull depth of 0.4 m. Downstream of the road bankfull width is 11.1 m at the bridge, and narrows to approx. 5.9 m further downstream. Bankfull depth is approx. 0.6 m in downstream riffles and 1.2 m in a large pool 50 m downstream of Trafalgar Road. Morphology throughout the reach is 90% riffles with mostly cobble substrate with some gravel and sand. A large pool approx. 50 m downstream of Trafalgar Road was 0.9 m deep ATOS with a mix of sand, gravel, cobble, and boulder substrate. A small pool cut into the bank 5 m downstream of Trafalgar Road was fed by a trickle of flow over bedrock, was approx. 0.6 m deep and provided ideal nursery habitat for fish.	This reach of Black Creek flows through mostly rural residential (at the Trafalgar Road crossing). The banks are mostly natural and stable with a buffer of riparian vegetation including grasses, shrubs, willow, and maple trees. Approximately 10% of the stream area is shaded by riparian trees including some low overhanging branches for cover. The south bank east of Trafalgar road shows significant erosion and a partially collapsed log retaining wall on the outside bank of the upstream bend in the creek. In this southeast quadrant, beyond the riparian zone is a larger block of mixed forest associated with Feature #12 (Hungry Hollow ESA). In all other areas of the study reach, beyond the riparian zone is manicured lawns/gardens of residential and commercial properties.	• Direct fish habitat. • This reach is classified as a coldwater stream with resident Brook Trout populations (MNRF 2014, CVC 2009). Full list of fish species at this site in Appendix F. Contributing habitat to identified Redside Dace habitat at confluence with The Credit River West Branch approx. 2 km downstream (CVC 2009).ATOS adult fish (approx. 200 – 300 mm TL) were observed in the large pool downstream and YOY[4] salmonids in the nursery pool just downstream of Trafalgar Road.
14	Tributary to Black Creek.	Intermittent. Low flow ATOS. Iron precipitates observed upstream of culvert indicating groundwater (CVC, pers comm. 2014) Connected to feature #25, 400-450 m downstream.	Channel originates west of Trafalgar Road, in a marshy area with dense Phragmites and cattails, and flows east, under Trafalgar Road, becoming a defined channel through a residential property where a debris dam has created a large pool. Upstream the channel is marshy and undefined, with a bankfull width of approx. 1.3 m and depth of 0.2 m. Downstream, within the Trafalgar Road ROW, the channel is stabilized and lined with rip rap, and has a bankfull width of approx. 1.5 m and a bankfull depth of approx. 0.4 m. Substrates beyond the ROW appear to become more fine including sand and silt. The culvert outlet is perched approx. 0.15 m, combined with the undefined channel upstream would act as a barrier to fish passage.	Upstream this channel flows through wet meadow and dense reeds east of Trafalgar Road. There is no overhead tree canopy but the channel is shaded by reeds. Downstream in the Trafalgar Road ROW, the channel flows through dense grasses and reeds, then into a residential property with manicured lawn to the north and mixed forest on the south. Canopy cover appears to increase beyond the residential property. Banks downstream become steeper and more unstable than the undefined banks upstream.	• Contributing fish habitat. • Lack of fish habitat upstream may exclude fish use. This watercourse continues to feature #25 with very low flows and is piped for approx. 170 m upstream of confirmed fish use on the golf course. • MNRF identifies the reach as coldwater (MNRF 2014)

[4] YOY- Young of the Year

Feature #	Watercourse	Flow Regime	Channel Characteristics	Bank/Riparian Characteristics	Fish Habitat (None, Direct, Contributing) and Fish Community
15/19	Tributary to Black Creek.	Intermittent. Trickle flow/standing water ATOS. Iron staining may indicate groundwater source to watercourse. No watercourse on mapping, but flows into mapped tributary of Black Creek.	Roughly defined channel present draining from Feature #15, perpendicular to Trafalgar Road and fed by roadside ditch drainage, crossing Trafalgar through PVC culvert with concrete collar, and through feature #19. Upstream the channel was dry with a bankfull width of approx. 1 m. Downstream was a trickle of flow with standing water ATOS with a bankfull width of approx. 2.0 m. Rip rap/boulder rock protection present in ditch drainage on west side of Trafalgar draining to channel, and at outlet of culvert on east side of Trafalgar present a potential barrier to fish (CVC, pers comm. 2014). The channel appears to become more defined downstream as it flows through private property.	Both up and downstream of Trafalgar Road, the watercourse flows through a ravine of deciduous forest. Within the Trafalgar Road ROW there is no overhead canopy, but the stream is shaded by meadow vegetation and shrubs. Up and downstream, the watercourse is shaded by approx. 100% canopy cover.	• Contributing fish habitat. • Low or no flows exclude direct fish use, at least seasonally. Watercourse drains to fish bearing tributary of Black Creek. • MNRF identifies the reach as coolwater (MNRF 2014)
16	Tributary to Black Creek.	Intermittent. No flow ATOS, but standing water in culvert. Substrates wet indicating recent flows.	Defined channel both up and downstream of Trafalgar Road. The channel is open for approx. 10 m upstream of Trafalgar before entering another culvert (large CSP) under 20th Side Road. Upstream up this culvert, flow appear to come from north of the rail line, under the tracks via a culvert, under 20th Sideroad where it continues as overland flow (no defined bed and bank) through a rural residential property meeting with the culvert. Based on the hydrology, it appears that he channel may be picking up some minor groundwater inputs from within the large CSP under 20th Sideroad as there is no evidence of flow upstream but some small flow downstream. Downstream, the channel is defined and straight, following the base of the embankment for the railway. Both upstream and downstream the bankfull width is approx. 1.8 m with a bankfull depth of approx. 0.45 m. Substrates at the culvert inlet are a mix of gravel and cobble. Downstream, substrates are mostly sand and gravel with some cobble. There do not appear to be any barriers to fish passage within the study reach and the channel would be suitable fish habitat under sufficient flows.	The channel is surrounded by steep banks due to embankments of the railway to the north and subdivisions to the south. Valley sides are 10 to 15 m high on both sides of the channel with thick grasses and meadow vegetation in the upstream segment and on the north side of the channel downstream of Trafalgar Road. On the south side downstream, the embankment is mostly thicket vegetation with canopy cover increasing. Upstream there is no overhead canopy but the channel is shaded by overhanging grasses. Downstream, the channel is approx. 80% shaded by overhead shrub and tree canopy.	• Contributing fish habitat. • Low or no flows exclude direct fish use, at least seasonally. Watercourse drains to fish bearing tributary of Black Creek. • MNRF identifies the reach as coolwater (MNRF 2014)

Table 3. Characteristics of Aquatic Features in the Road Realignment Study Area

Feature #	Watercourse	General Characteristics	Fish Habitat
12 (within #24)	Black Creek	Meandering reach of Black Creek crossing 15th Side Road twice, upstream of the Trafalgar Road crossing. The channel flows through a mix of land uses at this crossing including forest, agriculture, and residential. Channel characteristics are similar to those surveyed at the Trafalgar Road crossing (Feature #12). Bankfull width is approx. 6 m with a bankfull depth of approx. 0.6 m with mostly riffle morphology. Substrates include more sand and gravel than at Trafalgar Road providing spawning habitat for salmonids. Overhanging trees provide good cover habitat for fish.	• Direct fish habitat. • This reach is identified as coldwater, supporting resident Brook Trout populations and spawning redds have been observed at this location (CVC 2009). • Juvenile Atlantic Salmon have been caught at this location as part of the reintroduction program (Whitford 2006) • Fish were observed by MMM staff throughout the reach at the time of survey.
43	Tributary to Black creek	Channel originates north of 17th Side Road as tile drainage, and joins groundwater fed drainage from the west at 17th Side Road, flows south through a culvert and becomes a defined channel south of the road flowing through Feature #23. Upstream, the channel is artificial, lined with rip rap and has a steep gradient from the road (Feature #43). Iron floc is present at the inlet to the culvert at 17th Side Road indicating groundwater inputs. South of the road, the channel is defined with a bankfull width of approx. 1.2 m and depth of approx. 0.05 m ATOS. Substrates were coarse downstream, mostly cobble, rubble, and boulders. Significant iron floc was present throughout the visible downstream channel, and water temperature was cold.	• Unknown. • Watercourse is not mapped on available layers. If direct connection to Black Creek downstream and no significant barriers, could support direct fish use. • MNRF identifies the reach as coldwater (MNRF 2014)
25	Tributary to Black Creek	Groundwater fed tributary crossing Maple Avenue, east of Trafalgar Road and flowing through the North Halton golf course before outletting to Black Creek. A second branch of the tributary crosses Maple Avenue from a pond 300 m to the east and joins just south of Maple Avenue. Upstream the west channel has very low flows through a forested ravine, with several groundwater indicators including iron staining and oily sheen. The west watercourse is piped for approx. 170 m and outlets on the golf course where it flows through a large pond with a dam and waterfall barrier. Below the barrier the stream is defined with gravel substrates and uniform bankfull width of approx. 1.5 m. There is at least one large area of groundwater seepage apparent, providing suitable Brook Trout spawning habitat.	• Direct fish habitat • Watercourse is connected to Black Creek and fish were observed by MMM staff at the field survey throughout the reach of the tributary below the waterfall barrier. • Brook Trout have been captured at a station upstream of the barrier and north of Maple Avenue on the east branch (CVC 2009), indicating Brook Trout Use throughout this tributary. • MNRF identifies the reach as coldwater (MNRF 2014)

Feature #	Watercourse	General Characteristics	Fish Habitat
44	Tributary to East Sixteen Mile Creek	Agricultural drainage channel originating at a marshy area and woodland patch approx. 900 m west of Trafalgar Road and draining to Feature #9 at Trafalgar Road. Drainage is a muddy channel with a bankfull width of approx. 3 m, overgrown with grasses and ponding in places. Drainage becomes a marshy corridor with trickle flow and small pools that support insect larvae and frogs as it reaches Trafalgar Road.	• Contributing fish habitat • No suitable fish habitat, but flow drains to East Sixteen Mile Creek, a fish bearing watercourse. • MNRF identifies the reach as warmwater (MNRF 2014)
31	Drainage to Middle Sixteen Mile Creek	Agricultural drainage channel originating around 10th Side Road and flowing south. Channelized drainage feature with wetland vegetation indicating permanent moisture, but no defined channel.	• Contributing fish habitat. • No fish habitat but flows to fish bearing watercourse downstream. • MNRF identifies the reach as warmwater (MNRF 2014)

4.8 Species at Risk and Species of Conservation Concern

Species at Risk (SAR) are defined as species listed as Threatened or Endangered provincially by the Committee on the Status of Species at Risk in Ontario (COSSARO) and subsequently are afforded protection under the *Endangered Species Act* (ESA). Species designated as Special Concern provincially, assigned a conservation status (S-Rank) of S1 to S3 or SH, or designated as Special Concern, Threatened, or Endangered by the Committee for the Status of Endangered Wildlife in Canada (COSEWIC) or under the federal *Species at Risk Act*, are considered Species of Conservation Concern (SCC). Confirmed habitat for SCC is considered Significant Wildlife Habitat (SWH) under the Provincial Policy Statement (PPS) and therefore is discussed further within the context of SWH (Section 4.9).

Recent direction from MNRF to assess the potential presence of SAR has been to undertake a screening exercise to identify which SAR have potential to be present within a given study area based on known occurrences of the species within the area and habitat present. The screening exercise involved developing a list of SAR and SCC known to occur within the vicinity of study area or region from review of various sources including: species indicated by MNRF through correspondence, NHIC data extracted from online tool, MNR Species at Risk website regional species list, and DFO SAR mapping. Once the list of species was developed, each species known preferred habitat was then cross-referenced against habitats identified within the study area or adjacent lands. Background lists and other SAR information is provided in Appendix G along with a summary table of the screening assessment.

Those species identified through the completion of the screening as having potential suitable habitat within the study area and that have reasonable potential to be present are discussed further in Sections 4.8.1 and 4.8.2.

4.8.1 Aquatic SAR and SCC Habitat Potential

Based on an analysis of the preferred habitat for all the SAR and SCC identified in the screening assessment table provided in Appendix G, no aquatic SAR are known to occur within the study area. Only one aquatic SAR was confirmed as being present in downstream reaches of Black Creek and Tributaries of the Middle 16 Mile Creek outside of the study area - Redside Dace. These features would be considered contributing habitat to the species.

Redside Dace is listed as Endangered provincially by SARO and is also listed as Special Concern-Schedule 1 federally under SARA. As such, this species is afforded protection under the *ESA*.

It is of note that Atlantic Salmon are present within Black Creek. This species is listed as Extinct in Ontario and is currently being reintroduced into the Credit River through an ongoing fish stocking programs. Success of the species within the systems has been documented.

4.8.2 Terrestrial SAR Habitat Potential

4.8.2.1 Vegetation

Findings of the SAR and SCC screening indicated that suitable habitat is present within the study area for several vegetation species. These species are summarized in Tables 4 and 5 along with their provincial and federal status.

Table 4. Summary of SAR Vegetation Species with Reasonable Potential to be Present within the Study Area

Species	S-Rank	COSEWIC	SARO	SARA	Summary of Observations and Presence of Suitable Habitat
Butternut (*Juglans cineria*)	S3?	END	END	END-Schedule 1	Species was observed within Feature Units 17 and 25. Records provided from MNRF indicate presence in Feature #17 and 24. Suitable habitat present throughout study area in all natural communities or at their edges and in Hedgerows (HRs). Likely to be present within FOD communities, and moderate potential to occur within SWD and floodplain areas.
American Columbo (*Frasera caroliniensis*)	S2	END	END	END-Schedule 1	Not observed. Suitable habitat throughout study area in open deciduous woods in Feature Units 38, 35, 34, 32, 30, 28, 11, 24, 23, 22, 25, 15, 19, 18, 17, and 42. Presence of species in suitable habitats could not be assessed as PTE was not granted.

S-Rank (provincial) (MNR NHIC 2014)
S3- Vulnerable
COSEWIC – Committee on the Status of Endangered Wildlife in Canada (COSEWIC 2014)
SARO – Species at Risk in Ontario (MNR 2014)
SARA – Species at Risk Act (SARA 2014)
END- Endangered
SC- Special Concern
NAR- Not at Risk

Table 5. Summary of SCC Vegetation Species with Reasonable Potential to be Present within the Study Area

Species	S-Rank	COSEWIC	SARO	SARA	Summary of Observations and Presence of Suitable Habitat
Broad Beech Fern (*Phegopteris hexagonoptera*)	S3	SC	SC	SC-Schedule 3	Not observed. Suitable habitat present within FOD communities throughout study area (located within Feature Units 38, 35, 34, 32, 30, 28, 11, 24, 23, 22, 25, 15, 19, 18, 17, and 42. Presence of species in suitable habitats could not be assessed as PTE was not granted.
Northern Hawthorn (*Crataegus pruinosa var. dissona*)	S3	NAR	NAR	NAR	Not observed. Potential to occur throughout study area, particularly in HRs where Hawthorns are abundant. Moderate potential to occur. Presence of species in suitable habitats could not be assessed as PTE was not granted.

S-Rank (provincial) (MNR NHIC 2014)
S2- Imperiled
S3- Vulnerable
COSEWIC – Committee on the Status of Endangered Wildlife in Canada (COSEWIC 2014)
SARO – Species at Risk in Ontario (MNR 2014)
SARA – Species at Risk Act (SARA 2014)
END- Endangered
SC- Special Concern
NAR- Not at Risk

Of the species identified in Tables 4 and 5, one species, Butternut, was observed within the study area. This species was observed within two communities in the study area – at the edge of the FOD7 associated with Feature #25 (Stewarttown Woods ESA), and within the FOD5 of Feature #17 (Waterfall Woods ESA). More specimens have potential to be located within the study area. More detailed tree surveys should be undertaken at the detailed design phase in locations where tree removal is proposed. The remaining species were not observed in areas surveyed, although suitable habitats for the species are present within the study area and with limited PTE access, absence of the species cannot be confirmed.

4.8.2.2 Wildlife

Findings of the SAR and SCC screening indicated that several wildlife species have been documented or have reasonable potential to be preset with the study area. These species are summarized in Tables 6 and 7 along with their provincial and federal status.

Table 6. Summary of SAR Wildlife Species with Reasonable Potential to be Present within the Study Area

Species	S-Rank	COSEWIC	SARO	SARA	Summary of Observations and Presence of Suitable Habitat
Birds					
Barn Swallow (*Hirundo rustica*)	S4B, SZN	THR	THR	No Status	Observed in Feature #24 (Stewarttown Woods) with confirmed breeding evidence and in agricultural fields throughout the study area. Suitable breeding habitat is present within the study area, in the form of culverts, barns, out buildings and other suitable structures.
Bobolink (*Dolichonyx oryzivorus*)	S4B	THR	THR	No Status	Observed in agricultural lands within the study area. Records provided from MNRF indicate presence in Feature #24. Suitable breeding habitat is present adjacent to the Trafalgar Road corridor, in the form of hayfields, pasture, cultural meadow and old field habitat. Suitable breeding habitat is also located immediately adjacent to Feature 26.
Chimney Swift (*Chaetura pelagica*)	S5B,SZN	THR	THR	THR-Schedule 1	Observed in Feature #24 with possible breeding evidence. Potentially suitable habitat is present throughout the study area wherever wooded areas occur, or in the form of suitable chimneys as part of roadside / study area structures. Both woodland nesting (in hollow trees, snags or cavities) and anthropogenic nesting (chimneys, enclosed vertical surfaces) are extremely hard to detect without specific surveys.
Eastern Meadowlark (*Sturnella magna*)	S4B	THR	THR	No Status	Observed in agricultural lands adjacent to Feature #3 within the study area. Suitable breeding habitat is present within the study area, in the form of hayfields, pasture, cultural meadow and old field habitat. Suitable breeding habitat also located immediately adjacent to Unit 26.
Mammals					
Eastern Small-footed Myotis (*Myotis leibii*)	S2S3	NA	END	No Status	Not observed. Bats have potential to occur within the study area. As targeted bat surveys were not part of the approved study scope,
Little Brown Myotis (*Myotis lucifuga*)	S4	END	END	No Status	

Species	S-Rank	COSEWIC	SARO	SARA	Summary of Observations and Presence of Suitable Habitat
Northern Myotis (*Myotis septentrionalis*)	S3	END	END	No Status	presence/absence of these species and their habitat is unknown. No bat work was undertaken, but potential for cavity trees are present in woodland features- 15, 17, 19, 22, 24, 26, 28, 32

S-Rank (provincial) (MNR NHIC 2014)
S3- Vulnerable
S4- Apparently Secure
S4B- Apparently Secure (Breeding)
S5B-
SZN- Non-breeding migrants/vagrants
COSEWIC – Committee on the Status of Endangered Wildlife in Canada (COSEWIC 2014)
SARO – Species at Risk in Ontario (MNR 2014)
SARA – Species at Risk Act (SARA 2014)
END- Endangered
SC- Special Concern

Table 7. Summary of SCC Wildlife Species with Reasonable Potential to be Present within the Study Area

Species	S-Rank	COSEWIC	SARO	SARA	Summary of Observations and Presence of Suitable Habitat
Birds					
Eastern Wood Peewee (*Contopus virens*)	S4B	SC	No Status	No Status	Observed within the study area in Features 2, 17, 19, 24, and 32 with evidence of possible breeding. Suitable breeding habitat is present throughout the study area where moderate to large- sized deciduous and mixed woodland is present. Areas of most suitable habitat include Features 2, 3, 6, 12, 15, 17, 19, 22, 24, 25, 26, 28, 32, 35, and 39.
Hooded Warbler (*Setophaga citrina*)	S3B	No Status	No Status	No Status	Observed in Feature 17 with possible breeding evidence. Note that is observation occurred within Feature #17 but outside of the study area.
Wood Thrush (*Hylocichla mustelina)*	S4B	THR	SC	No Status	Observed in Feature #17 with possible breeding evidence. Suitable breeding habitat is present throughout the study area where moderate to large-sized deciduous and mixed woodland is present. Suitable habitat include Features 2,3,12,15,17,19,22,24,25,26,28, and 32.
Reptiles					
Eastern Milksnake (*Lampropeltis triangulum*)	S3	SC	SC	SC- Schedule 1	Not observed. This species was not observed within the study area, although no targeted snake surveys were undertaken. Anecdotal observations from locals indicated they have seen the snake in features #22 and #24.

Species	S-Rank	COSEWIC	SARO	SARA	Summary of Observations and Presence of Suitable Habitat
Snapping Turtle (*Chelydra s. serpentina*)	S3	SC	SC	SC-Schedule 1	Observed as a road kill hatchling specimen found along 6th Line, adjacent to Feature #24. Records provided from MNRF also indicate presence in Feature # 24. Suitable habitat is present wherever permanent or even seasonal water bodies are present. In the case of the study area, this could include any creek, river, pond or drain, depending on water levels, and rainfall amounts. Areas of best habitat, including conditions suitable for nesting and overwintering are Features 2, 3, 12, 24, with some potential in Features 19 and 33.
Mammals					
Tri-coloured Bat (*Perimyotis subflavus*)	S3?	END	No Status	No Status	Bats have potential to occur within the study area. As targeted bat surveys were not part of the approved study scope, presence/absence of these species and their habitat is unknown. No bat work was undertaken, but potential for cavity trees are present in woodland features- 15, 17, 19, 22, 24, 26, 28, 32.
Insects					
Harpoon Clubtail (*Gomphus descriptus*)	S3	No Status	No Status	No Status	Observed in Feature #24, but outside of the study area. Suitable habitat for the species is present along the length of Black Creek (Feature #24).
Swamp Darner (*Epiaeschna heros)*	S2,S3	No Status	No Status	No Status	Observed in Feature #24, but outside of the study area. Suitable habitat for the species is present along the length of Black Creek (Feature #24) and Feature #17.
Monarch (*Danaus plexippus*)	S4	SC	SC	SC-Schedule 3	Observed in features 16, 26, and 41. Suitable habitat is present wherever nectar sources or the host plant (milkweed) are present, which was observed throughout the study area.

Of the species listed in Tables 6 and 7, suitable nesting habitat for three species was identified within the study area. This includes the potential for Barn Swallow to nest in culvert structures at water crossings, as well as presence of suitable nesting habitat of Bobolink and Eastern Meadowlark in an agricultural field (hay crop) located south of the railway line at HWY 7 as well as within an old field/meadow located north of Sideroad 17, west of Trafalgar Road.

No key hibernation or roosting habitats were identified within the areas of the identified road alternatives.

4.9 Significant Wildlife Habitat

A general assessment of the potential for Significant Wildlife Habitat (SWH) within the study area was completed using the definitions provided below in consideration of available provincial guidance documents: *Significant Wildlife Habitat Technical Guide* (SWHTG) (OMNR 2000) and Ecoregion 6E Criterion Schedule (MNRF 2012)

In the SWHTG, SWH is broadly identified under four categories, with evaluation criteria presented under each category. These categories are discussed further below.

Seasonal Concentration Areas: Seasonal Concentration Areas are relatively small areas where wildlife gather at certain times of the year. Examples include winter deer yards, waterfowl stopover areas, snake and bat hibernacula, and raptor roosts.

Rare Vegetation Communities and Specialized Habitats for Wildlife: This category of SWH includes two separate components. Rare vegetation communities are provincially rare vegetation communities or communities that are rare within the planning area. Provincially rare vegetation communities are ranked by the MNRF. Examples include alvars and some rock barren habitats. Specialized habitats for wildlife are microhabitats that may be critical to some wildlife species. Examples include habitat for area sensitive species, forests providing a high diversity of habitats, turtle nesting habitat, and seeps and springs.

Habitat of Species of Conservation Concern: Species designated as Special Concern provincially, assigned a conservation status (S-Rank) of S1 to S3 or SH, or designated as Special Concern, Threatened, or Endangered by the Committee for the Status of Endangered Wildlife in Canada (COSEWIC) or under the federal Species at Risk Act, are considered SCC.

Wildlife Movement Corridors: Animal movement corridors are elongated areas of natural vegetation that link habitats. Examples include riparian zones and shorelines, hydro corridors, and fencerows.

Based on our review of background information and results of site-specific field surveys, the assessment of SWH within the study area is discussed as ‘candidate’ and ‘confirmed’. Those categories that are identified as candidate, require additional targeted surveys to be undertaken to confirm. Consideration for carrying out additional surveys to confirm presence of SWH may be undertaken at the detailed design phase when project footprints are known. Confirmed SWH, identifies those categories in which available information has confirmed that SWH category criteria are met. A summary of the findings of this exercise are as follows:

Candidate SWH:

- Critical habitat areas that provide for seasonal concentrations of animals:
    - **Waterfowl Stopover and Staging Areas -** CUM1 communities are present within Features #1, 5, 14, 16, 26, and 24. CUT1 community is also present just south of Feature #10. Large tracts of agricultural lands are also present within the study area. It is unknown if these areas flood in the spring, enabling them to act as waterfowl stopover and staging areas;
    - **Bat Maternity Colonies-** Potential suitable habitat is present in the following woodland features that are greater than 10 ha in size: Features 2, 24, 23, 17, and 11;
    - **Turtle Wintering Areas** – Potential suitable habitat present in Features 3, 12, and 24. Feature 24 highly likely, with a road-killed hatchling Snapping Turtle indicating suitable breeding habitat, overwintering likely to also occur within the feature;
    - **Reptile Hibernaculum –** Potential suitable habitat likely to occur within study area. Most likely locations include man-made structures (e.g. old building foundations, rock piles, etc.). In natural areas, the greater potential occurs within Features 3, 11, 5, 24, and 17; and
    - **Colonially - Nesting Bird Breeding Habitat (Tree/Shrubs) -** Potential suitable habitat for nesting herons may be present in larger woodlands within the study area, such as Features 2, 5, 11, and 24.
- Rare vegetation communities or specialized habitats for wildlife:
    - **Rare Vegetation Community** - One rare vegetation community type is present within the study area; Bur Oak Mineral Deciduous Swamp (S3). This swamp type has been delineated within Features 3, 4 and 5;
    - **Waterfowl Nesting Area** – Potential suitable habitat within the study area located adjacent to Features 13, 5, 29, 26, 20, and 24 in upland habitats.
    - **Woodland Raptor Nesting Habitat** – Potential suitable habitat present within the study area in Features 2, 17, and 24. Cooper's hawk was recorded from Feature 24 and 40, very likely to be found nesting within study area.
    - **Turtle Nesting Areas** – High potential for turtle nesting area located in Feature 24 with observation of a road-killed hatchling Common Snapping Turtle adjacent to the feature.
    - **Amphibian Breeding Habitat (Woodland) –** Potential suitable habitat present within the study area including Features 23 (likely in adjacent pond), 19, 25, 28, 29, and 38.

- Habitats for Species of Conservation Concern:
    - See Section 4.8 for a list of all SCC that have potential to occur within the study area as suitable habitat present within the study area and there is a reasonable likelihood the species may occur.
- Wildlife Movement Corridors:
    - **Amphibian Movement Corridor** – Potential for amphibian movement corridors, although no data or observations confirmed within the study area. Amphibian movement is anticipated at locations where natural features are bisected - examples include Features 2, 24/11, and 15/19. Within the road realignment study area, it is anticipated that wildlife movement is concentrated along the length of Black Creek within Feature 24 as well as between Features 17, 18, and 15.
    - **Deer Movement Corridor** – Potential for deer movement corridors, although no data or observations confirmed within study area. Areas where woodland patches of sufficient size are bisected by the roadway create a potential crossing corridor. Examples of this within the study area include – Features 2, 24/11, and 15/19. Within the road realignment study area, it is anticipated that wildlife movement is concentrated along the length of Black Creek within Feature 24 as well as between Features 17, 18, and 15

Confirmed SWH:

- Rare vegetation communities or specialized habitats for wildlife:
    - **Seeps and Springs -** Confirmed to be present within Features 11 and 24 through existing documentation and/or field observations.
- Habitats for Species of Conservation Concern:
    - Confirmed habitat for several SCC including:
    - Eastern Wood Pewee- Observed within the study area in Features 2, 15, 17, 24, and 32 with evidence of possible breeding in suitable breeding habitat;
    - Wood Thrush – Observed in Feature #17 with possible breeding evidence in suitable breeding habitat;
    - Snapping Turtle – Observed as a road kill hatchling specimen found along 6th Line, adjacent to Feature #24. Feature likely supports breeding and nesting of the species;
    - Harpoon Clubtail- Observed in Feature #24. Suitable habitat for the species is present along the length of Black Creek in Feature #24;
    - Swamp Darner- Observed in Feature #24. Suitable habitat for the species is present along the length of Black Creek (Feature #24); and

- Monarch Butterfly- Observed throughout the study area (migrant individuals). Suitable habitat is present wherever nectar sources or the host plant (milkweed) are present, which was observed throughout the study area.

Therefore, based on our assessment of the existing natural heritage features, Features 2, 11, 15, 17, 24, and 32 meet the criteria for SWH although this would require confirmation by MNRF.

5.0 ASSESSMENTOF SIGNIFICANCE AND SENSITIVITY

The analysis of significance and sensitivity is used to identify any 'constraints' or limitations to the proposed activity as it relates to the presence of natural features and habitats.

For the purposes of this report, sensitivity rankings of low, moderate, and high have been attributed to the identified natural heritage features present within the study area. These rankings are defined below:

High Sensitivity: are those that are sensitive to disturbance based on the rarity or significance of the feature or its functions, and/or are addressed by policies, legislation, or planning-related studies which prohibits site alteration to occur within or adjacent to them.

Moderate Sensitivity: some sensitivity to disturbance, significant features or functions may be present, may have policies/legislation or planning related designations that prohibit or restrict site alteration.

Low Sensitivity: limited sensitivity to disturbance, no significant features or functions present, limited applicable policies, typically already have existing disturbance from human activity.

Results of this analysis are intended to provide input to the preliminary design in order to avoid and reduce impacts to natural features and functions. A summary of this analysis is provided in Appendix H. Those features identified as being highly sensitive are highlighted in Section 6.0 as constraints to the project.

6.0 SUMMARY OF OPPORTUNITIES AND CONSTRAINTS

In general, natural features provide some constraint to the undertaking. These include designated natural features such as woodlands, wetlands, SAR and SCC habitat, floodplains and watercourses. Encroachment within these areas should be avoided or limited as much as possible, where feasible.

The primary areas of constraint within the Trafalgar Road study area associated with natural heritage features and functions include the following five Natural Heritage Features (see Appendix H for detailed analysis):

- **Black Creek (Feature #12)** - Black Creek is a permanent coldwater watercourse and a major tributary of Silver Creek intercepting it in the west end of Georgetown. Silver Creek is a tributary to the Credit River. The following are key aspects of Black Creek that contribute to its identification as highly sensitive and a constraint to the undertaking:
    - Supports resident salmonids (Brown Trout, Rainbow Trout, and Atlantic Salmon). Spawning has been recorded just upstream of the Trafalgar Road ROW. Rearing habitat was observed in close proximity to the Trafalgar Road crossing;
    - Atlantic Salmon is an extinct species that is currently being reintroduced into the Credit River through stocking programs;
    - Groundwater supports baseflow of the creek and maintains cool/coldwater thermal characteristics;
    - Black Creek is contributing habitat to identified Redside Dace habitat at confluence with the Credit River West Branch approx. 2 km downstream;
    - Black Creek is in parts surrounded by the Hungry Hollow ESA (Feature #11) and the Stewarttown Woods ESA (Feature #24); and
    - Candidate SWH as a Turtle Overwintering Area.
- **Hungry Hollow ESA (Feature #11)** – The Hungry Hollow Ravine is a deep valley feature with several tributaries of the Credit River, including Black Creek. The feature woodland is extensive and diverse and is comprised of mature Sugar Maple forests and mixed forests and a lush herbaceous layer. The following are key aspects of the feature that contribute to its identification as highly sensitive and a constraint to the undertaking:
    - Presence of rare vegetation community – fens.
    - The wooded areas of the ESA are of very high quality. There are excellent examples of mature Sugar Maple forests and mixed forests. The high quality woodlands and floodplain, combined with scenic views of the surrounding landscape, give this area a high aesthetic value;
    - Groundwater contributions present with evidence of seeps; and
    - SAR and several Species of Conservation Concern are known to occur within the feature. An abundance of regionally rare species are also present within this feature.

- **Stewarttown Woods ESA (Feature #24)** – Extensive and diverse woodland and riverine habitat. The following are key aspects of the feature that contribute to its identification as highly sensitive and a constraint to the undertaking:
    - Black Creek (Feature #12 and #24) flows through this ESA;
    - The ESA contains significant groundwater discharge areas that are significant in maintaining surface water quality and quantity within Black Creek. This is evident through records and observations of groundwater seeps;
    - Contains high quality assemblages of native plant and/or animal species. Confirmed presence of several Species of Conservation Concern. Several regionally rare species are also present within this feature; and
    - Candidate SWH for Bat Maternity Colonies, Turtle Wintering Areas, Reptile Hibernaculum, Colonially - Nesting Bird Breeding Habitat, Woodland Raptor Nesting Habitat and Wildlife Movement Corridor.
- **Waterfall Woods ESA (Feature #17)** – Is a largely deciduous forest with swamp habitats. Provides functional habitat linkage to adjacent natural systems. SAR and regional species known to occur within the feature. Portions of the Niagara Escarpment are present within this feature, which is designated as a UNESCO biosphere reserve, although outside of the study area. The following are key aspects of the feature that contribute to its identification as highly sensitive and a constraint to the undertaking:
    - Provides functional habitat linkage to adjacent natural systems;
    - SAR, Species of Conservation Concern, and regional species known to occur within the feature;
    - Butternut (provincially Endangered) possibly present within 25 m of road. Additional specimens may be present; and
    - Candidate SWH for Bat Maternity Colonies, Reptile Hibernaculum, Woodland Raptor Nesting Habitat. Confirmed SWH with SCC species observed in suitable breeding habitat - Wood Thrush and Eastern Wood Pewee.
- **Woodland, Wetland and Watercourse (Feature #25)** – This feature is a woodland/wetland (swamp) that has a sensitive coldwater watercourse flowing through it. The following are key aspects of the feature that contribute to its identification as highly sensitive and a constraint to the undertaking:

- Butternut (provincially Endangered) possibly present within 25 m of road. Additional specimens may be present;
- Sensitive coldwater tributary of Black Creek that contains resident Brook Trout population.
- Groundwater contributions present with evidence of seeps; and
- Candidate SWH for Amphibian Breeding Habitat.

In addition to the above noted highly sensitive feature, moderately sensitive features should also be avoided where feasible. These predominantly include woodland features within the study area. Two main features to be considered are indicated below.

- Coulson Tract Woods (Feature #2); and
- Woodland Features 15/19

Opportunities' are identified as areas where development or site alteration is better focused because such areas have been previously disturbed, impacted, or contain no significant natural features or functions. In addition, opportunities can be identified as those associated with the potential for rehabilitation or enhancement. Within the study area, these include the already disturbed Trafalgar Road ROW as well as those areas adjacent that are anthropogenic in nature (e.g. agricultural fields, etc.). It should be noted that some agricultural lands may be habitat for provincially Threatened species including Eastern Meadowlark and Bobolink, depending on site conditions at the time of survey. As part of this study, two locations within the vicinity of the proposed road alternatives have been identified as currently suitable Bobolink and Eastern Meadowlark habitat - these locations include an agricultural field (hay crop) located south of the railway line at HWY 7 as well as within an old field/meadow located north of Sideroad 17, west of Trafalgar Road. Continued use of agricultural lands by these species within the preferred alignment footprint should be re-assessed at detailed design.

7.0 EVALUATION OF ALTERNATIVES

Within the EA process, a total of five road improvement design alternatives (1A, 1B, 1C, 2 and 3) were identified for the segment of Trafalgar Road between HWY 7 and 15 Sideroad. MMM Group ecologists evaluated each of the identified alternatives in relation to the natural features and functions present.

The following provides a summary of each alternative:

Alternative 1A: This alternative considers the roadway improvements along the existing Trafalgar Road corridor north of 15 Side Road through Stewarttown. Underpass grade separations at the CN Rail and Metrolinx line crossings on Trafalgar Road are proposed. With this alternative, Trafalgar Road would cross the CN Rail line to the east of the existing at-grade crossing.

Alternative 1B: This alternative considers the roadway improvements along the existing Trafalgar Road corridor north of 15 Side Road through Stewarttown. Underpass grade separations at the CN Rail and Metrolinx line crossings on Trafalgar Road are proposed. Under this alignment Trafalgar Road would cross the CN Rail line to the west of the existing at-grade crossing.

Alternative 1C: This alternative considers the roadway improvements along the existing Trafalgar Road corridor north of 15 Side Road through Stewarttown. Underpass grade separations at the CN Rail and Metrolinx line crossings on Trafalgar Road are proposed. This alignment crosses the CN Rail line further to the east of the existing at-grade crossing than Alternative 1A via an underpass to accommodate a "service road" concept south of the 17 Side Road intersection.

Alternative 2: This alternative would bypass Stewarttown to the west (about mid-concession) starting south of 15 Side Road and would continue northerly along the westerly property line of the Trafalgar Road Sports Complex. Both the CN and Metrolinx railway crossings along the existing Trafalgar Road would remain at-grade - the CN and Metrolinx railway crossings under the new alignment would be grade-separated as underpasses.

Alternative 3: This is the most westerly of the three alternatives. This alternative would bypass Stewarttown starting at south of 15 Side Road. Both the CN and Metrolinx railway crossings along the existing Trafalgar Road alignment would remain at-grade; the CN and Metrolinx railway crossings would be grade-separated as underpasses

No alternatives were identified from 15 Sideroad south to Steeles Ave as options for improvements within that segment of road are limited to widening within the existing ROW.

Details on each of the proposed alternatives considered for evaluation under the EA as well as evaluation findings are found within the main body of the Environmental Screening Report (ESR).

Based on the natural heritage assessment alone, Alternative 1B was the most preferred, although it is important to note that differences among the alternatives were not substantial. The combined analysis of the study team in the EA takes into account other criteria including other natural environment components, cultural, socio-economic, cost and transportation. The evaluation of alternatives resulted in Alternative 1A as the preferred road improvement alternative.

An assessment of potential impacts of the preferred design alternative, along with recommended mitigation measures, are discussed in Section 8.0.

8.0 IMPACT ANALYSIS AND MITIGATION

8.1 Summary of Potential Impacts and Recommended Mitigation Measures

The analysis of potential impacts arising from the planned improvements to Trafalgar Road was undertaken by assessing the details of the preferred road Alternative 1A in relation to the known natural heritage features, functions, and species present within the study area.

Potential impacts are discussed in two categories:

- Direct Impacts – associated with the direct removal of natural features/habitats, caused by the actual "footprint" of the undertaking (e.g., clearing and grading, direct alteration of surface water features); and
- Indirect Impacts – associated with; 1) site alteration (e.g., alterations to surface water and groundwater quality/quantity, flow patterns); and 2) temporary disruption of features/habitats or displacement of species from active construction activities (e.g., impact to water quantity/quality, temporary physical disturbance, erosion, etc.).

The analysis of potential impacts, recommended mitigation measures and the overall residual effect after mitigation has been applied is provided in Table 8.

As the impact assessment was based on preliminary conceptual design details, potential impacts and recommended mitigation measures should be revisited at the detailed design phase of the project when detailed design is developed.

Table 8. Summary of Potential Impacts and Recommended Mitigation Measures

ACTIVITY / IMPACT	DETAILS OF POTENTIAL IMPACTS	RECOMMENDED MITIGATION MEASURES	NET EFFECT
POTENTIAL DIRECT IMPACTS			
Vegetation/Habitat Removal	Minor vegetation removals required to accommodate proposed road widening and intersection improvements. **Individual Street/Urban Tree Removal** Individual tree removal is required to accommodate the widened roadway. No provincially or regionally significant species are anticipated to be impacted – this should be confirmed during detailed design. **Vegetation/Habitat Removals – Non-Natural Vegetated Areas** Minor removals of vegetation are required within the existing ROW. Vegetation affected is predominantly common, disturbance tolerant species and altered community types such as CUM1-1. Limited impact on wildlife and wildlife habitat anticipated. • BOBO and EAME Habitat. Agricultural fields (hay crop) located north and south of the Metrolinx railway are crossed by the new alignment, resulting in the removal of ~ 0.65 ha of potential habitat. • A small area of CUM1-1 (~0.14 ha) requires removal on the south side of the Metrolinx railway (west of Trafalgar Road). Low sensitivity feature. • Feature # 21 (cultural meadow). A small narrow strip (~10m width) along the existing ROW (~650 m^2 of CUM1-1 and ~280 m^2 of MAMM 1-12), 0.09 ha, would be removed. Feature is highly altered as it is being removed to accommodate development. Low sensitivity, no known sensitive wildlife habitats are anticipated to be affected. **Vegetation/Habitat Removals – Naturally Vegetated Areas** • Feature #15 (woodland) FOD5-1. A small narrow strip (ranging from ~6m to 15 m in width) along the existing ROW (about 0.15 ha) would be removed. Feature has moderate sensitivity, although likely low sensitivity in the area of encroachment (northeast exposure). Several SCC have been recorded within this feature. No known sensitive wildlife habitats are anticipated to be affected. Wildlife will continue to move between this feature and Feature #19 which have been identified as a candidate wildlife corridor. • Feature #19 (woodland) FOD5-8. A very small narrow strip (~6m width) along the existing ROW (~ 0.04 ha) would be removed. Feature has moderate sensitivity, although likely low sensitivity in the area of encroachment. Several SCC have been recorded within this feature. No known sensitive wildlife habitats are anticipated to be affected. Wildlife will continue to move between this feature and Feature #15 which have been identified as a candidate wildlife corridor. • Feature #25 (watercourse/small woodlot) This alternative would not encroach within the feature, but is located adjacent to this feature, in close proximity. Feature is moderate sensitivity. There is potential for indirect effects to the vegetation within feature from salt spray. Potential for indirect effects to wildlife within the feature are anticipated to be negligible as the feature is already impacted (e.g. noise, light from the existing Trafalgar Road).	• Woodland trees and wetland areas are to be retained and protected, if feasible. Re-establish vegetation in the newly cleared/graded areas that are not to be paved as soon as possible after disturbance. Native species are recommended for planting. • Tree and vegetation protection is recommended for all trees and vegetation being retained. Tree protection should be outlined in a Tree Protection Plan (TPP) prepared at Detailed Design. Vegetation protection should be outlined on specification drawings in detailed design. Protection should be implemented to ensure encroachment within the adjacent natural features is restricted to the identified construction footprint. Vegetation clearing and road improvement construction activities **should be minimized or avoided during the general nesting period for Zone C2**[5] to avoid direct impacts to wildlife anticipated to use these areas. This timing window also covers off the breeding period of amphibians. • Additional recommended mitigation measures to address indirect impacts that may occur during the construction phase are discussed under 'in-direct impacts'. • Any trees identified for removal as part of the detailed design should be surveyed for potential suitable bat habitat (i.e. cavity) prior to removal. • Additional targeted BOBO and EAME surveys would be required prior to the completion of Detailed Design. Compensation of the removed area in terms of habitat removal may be required depending on the findings of those surveys.	Removal of disturbed vegetation within the existing ROW. Adjacent natural features form and function will be maintained. Wildlife in ROW will be displaced to adjacent available habitats.

[5] http://www.ec.gc.ca/paom-itmb/default.asp?lang=En&n=4F39A78F-1

ACTIVITY / IMPACT	DETAILS OF POTENTIAL IMPACTS	RECOMMENDED MITIGATION MEASURES	NET EFFECT
	• Feature #13 (wetland/woodland). A strip (~38m width) along the existing ROW (~0.68ha) in total), includes FOD5 (~0.18 ha) and SWD2-1 (~0.50 ha) would be removed. Feature has moderate sensitivity, although likely low sensitivity in the area of encroachment. No known sensitive wildlife habitats are anticipated to be affected. Several SCC have been recorded within this feature. • A small area of MAS 2-1 (cattail marsh) along the existing ROW (west of Trafalgar Road and Feature #13) will require removal of ~0.29 ha • Feature #11 (Hungry Hollow ESA). A small narrow strip (~11 m width) along existing ROW (~ 0.12 ha) is affected. Feature is high sensitivity, although likely low sensitivity in the area of encroachment as it is immediately adjacent to Trafalgar Road with rural residential development in the immediate vicinity. A retaining wall is currently present at this location which will require replacement with the road widening. No known sensitive wildlife habitats are anticipated to be affected. This Feature is located within the Black Creek valley, which is a candidate wildlife movement corridor. • Feature #2 (Coulson Tract Woods) – The proposed limits of grading do not appear to encroach within the woodland feature, although some vegetation removal might be required at isolated locations (i.e. individual trees – to be confirmed at detailed design). Overall, there will be limited removal of vegetation/habitat within the existing ROW and removals within existing adjacent natural communities/features. Minor encroachment into natural features is not anticipated to affect the form or function of the wetland and woodland features. The majority of each feature area is retained outside the alignment. Minor vegetation removals are not anticipated to affect significant flora or fauna species if recommended mitigation is implemented, although would require confirmation during detailed design. Wildlife using the ROW will be displaced to adjacent natural habitats. Potential disturbance during construction is discussed under 'Wildlife Disturbance'.	See above	See above
Wildlife Passage	Candidate wildlife movement corridors have been identified at three locations within the study area; • Black Creek Corridor (Feature 12) – the existing box culvert will be removed and replaced with a large bridge span structure, significantly improving potential for wildlife (including large mammals) to move across Trafalgar Road within the Black Creek river valley. • Within woodland Feature 15 – a small CSP structure will be replaced with a larger box culvert (1.2 x 0.9 x 45 m) for an OR of 0.02. The structure replacement is an improvement upon existing conditions and maintains any existing function, - passage by tolerant amphibian and mammal species. • Within the Coulson Woods (Feature 2) - this crossing currently includes two box culverts (2.7 x 2.2 x 36.4 m) for an Openness Ratio (OR) of 0.16 for each cell. This currently provides adequate opportunity for movement by a variety of tolerant wildlife species. The proposed improvements will result in an extension of the two cells to 53.7 m, with some reduction in structure openness. OR of 0.11 will continue to support passage of tolerant wildlife species. The addition of the new box culvert cell at 3 x 2.4 x 53.7 m will provide an OR of 0.13. Overall, the three cells together are anticipated to provide a collectively larger and more inviting location for passage and modifications are not anticipated to impact the function of the crossing.	• The modified structures will continue to maintain wildlife passage and, in the case of the new black Creek bridge structure, will significantly enhance potential for movement. It is recommended that new structures be designed using most current wildlife passage design principles available at the time of detailed design. • It is recommended that the structure at Feature 15 be designed to minimize the final length of the culvert, at detailed design, in order to maximize suitability for continued wildlife passage. Final culvert dimensions (both length and height) should be reviewed at detailed design.	• Wildlife passage function will be maintained. In the case of the new bridge structure over Black Creek, wildlife passage opportunities will be significantly enhanced.

ACTIVITY / IMPACT	DETAILS OF POTENTIAL IMPACTS	RECOMMENDED MITIGATION MEASURES	NET EFFECT
Fish Habitat Alteration and Serious Harm to Fish	The alternative has the potential to impact 11 aquatic features crossing Trafalgar Road. Impacts to aquatic features by the proposed works at watercourse crossings are limited to minor additional enclosure of features and minor removals of riparian vegetation associated with proposed culvert replacements with longer culverts, and extensions to two existing culverts. There are 8 intermittent watercourses with proposed culvert replacements, one intermittent and one permanent watercourse with proposed extensions to the existing culverts, and one permanent watercourse (Black Creek) with a proposed bridge replacement. All intermittent watercourses with proposed culvert replacements are indirect fish habitat only, and have low sensitivity. The one permanent watercourse with a proposed extension to the existing culvert is moderately sensitive supporting a coolwater fish community and contributing to Redside Dace habitat downstream. Black Creek, with the proposed bridge replacement, is highly sensitive coldwater salmonid habitat. Black Creek, and all intermittent watercourses north of Black Creek (Features #14, 16, and 19) have evidence of groundwater inputs. Longer culvert lengths may impact watercourses by reducing allochthonous and solar inputs to contributing fish habitat and potentially interfering with groundwater input to the watercourses. All of the culvert replacements will result in larger openings than the existing structures. The proposed alignment also shifts a segment of road to be adjacent to a moderately sensitive groundwater-fed watercourse (Feature #25), with potential impacts to the bank. **Details of potential impacts to each aquatic feature follow:** • Feature #1 (Intermittent watercourse). Enclosure of an additional 7.9 m of watercourse, resulting in reduced solar and allochthonous inputs. • Feature #3 (Permanent watercourse). Enclosure of an additional 17.3 m of watercourse, resulting in reduced solar and allochthonous inputs. The addition of a 3rd concrete culvert cell will ensure maintenance of natural flows and stream morphology in fish habitat up and downstream, but will also result in removal of riparian vegetation. • Feature #7 (No fish habitat). No predicted impacts to fish habitat. • Feature #8 (Intermittent watercourse). Enclosure of approximately an additional 20 m of watercourse resulting in reduced solar and allochthonous inputs. The larger culvert opening and inset of the culvert by 0.3 m into the substrate will ensure maintenance of natural flows contributing to fish habitat downstream and no new barriers to potential fish passage. • Feature #9 (Intermittent watercourse). Enclosure of approximately an additional 23 m of watercourse resulting in reduced solar and allochthonous inputs. The larger culvert opening and inset of the culvert by 0.3 m into the substrate will ensure maintenance of natural flows contributing to fish habitat downstream and no new barriers to potential fish passage. • Feature #10 (Intermittent watercourse). Enclosure of approximately an additional 22 m of watercourse resulting in reduced solar and allochthonous inputs. The larger culvert opening and inset of the culvert by 0.3 m into the substrate will ensure maintenance of natural flows contributing to fish habitat downstream and no new barriers to potential fish passage.	• Adhere to standard coldwater timing window for in-water work of **Oct 1 to May 31** to protect the coldwater fishery in Black Creek, including works on contributing flows in tributaries. **No in-water work is to occur within this timeframe**. • Ensure that DFO 'Measures to Avoid Harm to Fish and Fish Habitat' are implemented. • Eliminate potential for direct impacts to fish habitat by restricting access of works to limit of grading. This can be achieved through clearly demarcating the limit of works through use of ESC structures such as silt fencing. Implement standard best management practices when carrying out construction activities near water. • All culvert extensions should ideally be replacements with open-bottom structures to minimize impacts to groundwater inputs, especially on Features 19 and 14 where groundwater evidence was observed. • Areas of groundwater input, such as the northeast bank of Black Creek, should be maintained with appropriate design and fill materials in the design of the bridge replacement. • Culverts should be embedded into the existing invert of the watercourses by 10% to maintain natural flows and prevent barriers to potential seasonal movement of fish. • Consider employing wingwalls to minimize required length extension of culverts and additional enclosure of watercourses.	Overall, potential impacts to sensitive fish habitat and groundwater input channels in Black Creek can be mitigated with appropriate design (i.e. clear-span bridge). Following design mitigation on all culvert extensions and replacements, impacts of these route alternatives would be limited to minor losses of riparian vegetation, allochthonous input and solar inputs to channel sections enclosed or covered by structure extensions. With proper design, groundwater inputs to watercourses can be retained – this will be a priority during detailed design.

ACTIVITY / IMPACT	DETAILS OF POTENTIAL IMPACTS	RECOMMENDED MITIGATION MEASURES	NET EFFECT
	• Feature #12 – Black Creek (Permanent watercourse). The proposed bridge replacement will be up to 30 m wider than the existing bridge, shading an additional length of the watercourse, removing riparian vegetation and potentially reducing allochthonous and solar inputs. However, the bridge replacement will increase the span from the existing 8.8 m span, to a 30 m clear span, which will increase the natural bank area allowing more natural flows and morphology in the fish habitat under the bridge and upstream and downstream, as well as increase the potential allochthonous and solar inputs from the sides of the bridge. The bridge widening would potentially impact two specific sensitive features of the watercourse: Widened bridge abutments could interfere with a groundwater seepage channel ~8 m west of the bridge on the north bank; and sensitive fish habitat in the form of a nursery pool with YOY salmonids observed ~6 m east of the bridge on the south bank. This would need to be assessed at detailed design. • Feature #14 (Intermittent watercourse). Enclosure of approximately an additional 19 m of watercourse resulting in reduced solar and allochthonous inputs. The larger culvert opening and inset of the culvert by 0.3 m into the substrate will ensure maintenance of natural flows contributing to fish habitat downstream and no new barriers to potential fish passage. The proposed closed cell box culvert may interfere with groundwater inputs feeding the watercourse that were observed immediately upstream of the existing culvert. • Feature #16 (Intermittent watercourse). The proposed alignment will require replacing both culverts under Trafalgar Road and 20th Side Road. This will result in enclosure of approximately an additional 30 m of the watercourse resulting in reduced solar and allochthonous inputs. The larger culvert openings and inset of the culverts by 0.3 m into the substrate will ensure maintenance of natural flows contributing to fish habitat downstream and no new barriers to potential fish passage. The proposed closed cell box culvert may interfere with groundwater inputs suspected to be feeding the watercourse in the vicinity of the existing culverts. • Feature #19 (Intermittent watercourse). Enclosure of approximately an additional 13 m of watercourse resulting in reduced solar and allochthonous inputs. The larger culvert opening and inset of the culvert by 0.3 m into the substrate will ensure maintenance of natural flows contributing to fish habitat downstream and no new barriers to potential fish passage. The proposed closed cell box culvert may interfere with groundwater inputs feeding the watercourse that were observed immediately downstream of the existing culvert. Feature #25 (intermittent watercourse) – The proposed alignment would not encroach within the feature, but is located closely adjacent to this feature. Grading requirements may interfere with the bank slopes on the west side of the watercourse and associated ravine. Potential for indirect effects to aquatic habitat from road salt application and stormwater runoff. This Feature is moderately sensitive due to noted groundwater seepages and indirect fish habitat with Brook Trout known to occur downstream in close vicinity.	See above	See above
Alteration of Existing Surface Water Drainage Patterns	No alterations of drainage patterns are anticipated. All existing water crossing structures and drainage features and functions will be retained. The increased opening size of all proposed culvert replacements will ensure maintenance of natural flows contributing to watercourses downstream.	• Mitigated through design considerations. All existing drainage features and functions will be maintained.	Existing surface water drainage patterns are to be maintained through design.

POTENTIAL INDIRECT IMPACTS			
ACTIVITY / IMPACT	**DETAILS OF POTENTIAL IMPACTS**	**RECOMMENDED MITIGATION MEASURES**	**NET EFFECT**
Wildlife Disturbance During Construction	Increased disturbance caused by excessive noise, dust, vibrations, and proximity of human presence during construction may cause certain wildlife taxa to abandon or avoid the area. Additionally, these disturbances may disrupt or discourage breeding birds from nesting within the vicinity. However, these impacts are anticipated to be minimal and localized given the existing degree of anthropogenic disturbance, tolerance of species expected to use these habitats and small areas of proposed grading / works.	• Ensure that timing constraints are applied to avoid vegetation clearing (including grubbing) during the breeding bird season for tree nesting (approximately **April 1 to August 31**). It should be noted that occasionally bird species will precede or exceed the approximate breeding bird season window. • **Wildlife exclusion fencing** should be installed temporarily to keep wildlife out of the construction zone, particularly in areas adjacent to natural habitat features e.g. fencing to prevent movement of amphibians and reptiles into the construction zone in areas adjacent to wetlands. • In the event that an animal encountered during construction does not move from the construction zone and construction activities are such that continuing construction in the area would result in harm to the animal, all activities will stop and the Contract Administrator will be notified. In the event that a SAR or possible SAR is found in the construction area, all construction that could potentially harm the animal will cease immediately and the Contract Administrator will be notified. The Contract Administrator will then contact the MNRF SAR Biologist for direction, as these animals are protected under the ESA (2007).	None anticipated with proper implementation of the recommended mitigation measures.

Surface Water Quality Impairment	Potential indirect impacts to surface water quality are associated with all surface water drainage features, including fish habitat.
	
	Sedimentation of a watercourse or wetland from construction activities (e.g., sediment laden runoff, dewatering discharge) can negatively impact surface water quality with increased turbidity and Total Suspended Solids (TSS) levels. Dewatering is required at three locations within the study area; 1) at the Black Creek Crossing; 2) Metrolinx Grade Separation and: 3) at the CN Rail Grade Separation. Dewatering may also be required at additional locations where groundwater levels are near surface and excavation is required (e.g. works adjacent to wetland areas). Dewatering requirements will be identified at detailed design.
	
	Contaminant spills will result in the degradation of water quality. The degree and type of impact is dependent on the type and volume of contaminant released and how promptly and effectively the Spill Response Plan is initiated. Ultimately, a release of contaminant or 'spill' into a water body is considered a release of a 'deleterious substance'.
	
	Alterations of surface water quality have potential to impact aquatic organisms. Under prolonged conditions where water quality remains at levels unacceptable for aquatic life, death of aquatic organisms may result.
		• Implement an Erosion and Sediment Control (ESC) Plan to minimize risk of potential impacts from sedimentation. See 'Erosion and Sedimentation'
		• Isolate in-water work areas, preventing sediment laden water or spills from entering the watercourse.
		• Ensure that DFO 'Measures to Avoid Harm to Fish and Fish Habitat' are implemented. Applicable measures include[6]:
		  ○ Ensure that machinery arrives on site in a clean condition and is maintained free of fluid leaks.
		  ○ Whenever possible, operate machinery on land above the high water mark, on ice, or from a floating barge in a manner that minimizes disturbance to the banks and bed of the waterbody.
		  ○ Limit machinery fording of the watercourse to a one-time event (i.e., over and back), and only if no alternative crossing method is available. If repeated crossings of the watercourse are required, construct a temporary crossing structure.
		  ○ Use temporary crossing structures or other practices to cross streams or waterbodies with steep and highly erodible (e.g., dominated by organic materials and silts) banks and beds. For fording equipment without a temporary crossing structure, use stream bank and bed protection methods (e.g., swamp mats, pads) if minor rutting is likely to occur during fording.
		  ○ Wash, refuel and service machinery and store fuel and other materials for the machinery in such a way as to prevent any deleterious substances from entering the water.
		  ○ Plan activities near water to ensure that materials such as paint, primers, blasting abrasives, rust solvents, degreasers, grout, or other chemicals do not enter the watercourse.
		  ○ Develop a response plan that is to be implemented immediately in the event of a sediment release or spill of a deleterious substance and keep an emergency spill kit on site.
		  ○ Ensure that building material used in a watercourse has been handled and treated in a manner to prevent the release or leaching of substances into the water that may be deleterious to fish.
		  ○ Manage water flowing onto the site, as well as water being pumped/diverted from the site such that sediment is filtered out prior to the water entering a waterbody.
		• A Permit to Take Water (PTTW) from the Ministry of Environment and Climate Change (MOEE) may be required. A mitigation and monitoring plan will be required to address any potential impacts from dewatering.
			None anticipated with proper implementation of the recommended mitigation measures.

[6] Note that these measures should be applied anywhere where surface water has potential to be impacted (i.e. wetlands).

ACTIVITY / IMPACT	DETAILS OF POTENTIAL IMPACTS	RECOMMENDED MITIGATION MEASURES	NET EFFECT
Disruption to Fish and Fish Habitat	Potential indirect effects on fish and fish habitat include temporary impacts during construction: • Temporary disturbance to bed and banks of watercourses by workers or equipment during construction • Temporary disruption of fish passage during works • Direct harm to fish caught within the work area of in-water works. • Release of sediment into the watercourse from construction areas • Potential spills of deleterious materials from machinery during construction • Temporary disturbance to riparian vegetation during construction • Temporary interruption of stream flow from localized dewatering which is required at three locations within the study area; 1) at the Black Creek Crossing; 2) at the Metrolinx Grade Separation; and 3) at the CN Rail Grade Separation. Temporary interruption may also be required at additional locations where groundwater levels are near surface and excavation is required (e.g. works adjacent to wetland areas). Indirect effects may also occur during future operation / maintenance of the road way: • Increased input of salt to watercourses during winter maintenance	• Ensure DFO 'Measures to Avoid Harm to Fish and Fish Habitat' are implemented. These include but are not limited to: ○ Time work in water to respect timing windows to protect fish, including their eggs, juveniles, spawning adults and/or the organisms upon which they feed. ○ Minimize duration of in-water work. ○ Conduct instream work during periods of low flow, or at low tide, to further reduce the risk to fish and their habitat or to allow work in water to be isolated from flows. ○ Schedule work to avoid wet, windy and rainy periods that may increase erosion and sedimentation ○ Design and plan activities and works in waterbody such that loss or disturbance to aquatic habitat is minimized and sensitive spawning habitats are avoided. ○ Undertake all instream activities in isolation of open or flowing water to maintain the natural flow of water downstream and avoid introducing sediment into the watercourse. ○ Ensure that all in-water activities, or associated in-water structures, do not interfere with fish passage, constrict the channel width, or reduce flows. ○ Retain a qualified environmental professional to ensure applicable permits for relocating fish are obtained and to capture any fish trapped within an isolated/enclosed area at the work site and safely relocate them to an appropriate location in the same waters. Fish may need to be relocated again, should flooding occur on the site. ○ Screen any water intakes or outlet pipes to prevent entrainment or impingement of fish. ○ Plan activities near water such that materials such as paint, primers, blasting abrasives, rust solvents, degreasers, grout, or other chemicals do not enter the watercourse. ○ Develop a response plan that is to be implemented immediately in the event of a sediment release or spill of a deleterious substance and keep an emergency spill kit on site. ○ Ensure that building material used in a watercourse has been handled and treated in a manner to prevent the release or leaching of substances into the water that may be deleterious to fish ○ Develop and implement an Erosion and Sediment Control Plan for the site that minimizes risk of sedimentation of the waterbody during all phases of the project. Erosion and sediment control measures should be maintained until all disturbed ground has been permanently stabilized, suspended sediment has resettled to the bed of the waterbody or settling basin and runoff water is clear. ○ Clearing of riparian vegetation should be kept to a minimum: use existing trails, roads or cut lines wherever possible to avoid disturbance to the riparian vegetation and prevent soil compaction. When practicable, prune or top the vegetation instead of grubbing/uprooting. ○ Minimize the removal of natural woody debris, rocks, sand or other materials from the banks, the shoreline or the bed of the waterbody below the ordinary high water mark. If material is removed from the waterbody, set it aside and return it to the original location once construction activities are completed. ○ Immediately stabilize shoreline or banks disturbed by any activity associated with the project to prevent erosion and/or sedimentation, preferably through re-vegetation with native species suitable for the site. ○ Restore bed and banks of the waterbody to their original contour and gradient - if the original gradient cannot be restored due to instability, a stable gradient that does not obstruct fish passage should be restored.	The potential for indirect negative effects on fish and fish habitat through construction activities occurring in close proximity will be mitigated through recommended best management practices. Potential increase of salt input to watercourses may persist with future road maintenance, however, watercourses are already subject to salt inputs with winter maintenance of the existing roadway. "Smart Use" of road salt should be the application principle at play.

ACTIVITY / IMPACT	DETAILS OF POTENTIAL IMPACTS	RECOMMENDED MITIGATION MEASURES	NET EFFECT
	See above	○ If replacement rock reinforcement/armouring is required to stabilize eroding or exposed areas, then ensure that appropriately-sized, clean rock is used; and that rock is installed at a similar slope to maintain a uniform bank/shoreline and natural stream/shoreline alignment. ○ Remove all construction materials from site upon project completion. ○ Ensure that machinery arrives on site in a clean condition and is maintained free of fluid leaks, invasive species and noxious weeds. ○ Whenever possible, operate machinery on land above the high water mark, on ice, or from a floating barge in a manner that minimizes disturbance to the banks and bed of the waterbody. ○ Limit machinery fording of the watercourse to a one-time event (i.e., over and back), and only if no alternative crossing method is available. If repeated crossings of the watercourse are required, construct a temporary crossing structure. ○ Use temporary crossing structures or other practices to cross streams or waterbodies with steep and highly erodible (e.g., dominated by organic materials and silts) banks and beds. For fording equipment without a temporary crossing structure, use stream bank and bed protection methods (e.g., swamp mats, pads) if minor rutting is likely to occur during fording. ○ Wash, refuel and service machinery and store fuel and other materials for the machinery in such a way as to prevent any deleterious substances from entering the water. • A mitigation and monitoring plan will be required to address any potential impacts from dewatering.	See above
Vegetation Disturbance	Vegetation clearing and other construction activities have the potential to inadvertently destroy, damage and degrade adjacent vegetation through: use of construction equipment outside of the work zone; sedimentation; soil compaction; and spills. Temporary drawdown of shallow groundwater levels from localized dewatering which is required at three locations within the study area; at the Black Creek Crossing, Metrolinx Grade Separation, at the CN Rail Grade Separation, and maybe be required at additional locations where groundwater levels are near surface and excavation is required (e.g. works adjacent to wetland areas). This has potential to impact water levels in wetland areas supporting wetland vegetation if the drawdown is prolonged and recovery is slow. Any decreases in water levels are anticipated to be temporary and minor in nature, resulting in no permanent impacts to adjacent wetland vegetation.	• Install ESC silt fencing prior to any site grading to delineate the work zone and prevent direct damage to adjacent retained vegetation (i.e., mechanical damage, soil compaction). Leave fencing in place until construction is complete. • Implement tree protection measures outlined in the Tree Protection Plan (TPP) (to be prepared at detailed design). • A mitigation and monitoring plan will be required to address any potential impacts from dewatering.	None anticipated with proper implementation of the recommended mitigation measures.
Soil Compaction	Soil compaction also has potential to occur as a result of heavy machinery and the stockpiling of heavy materials and stripped soils. Soil compaction can greatly reduce the permeability of soils and affect their ability to retain water during rain/snow melt events. This may result in an increase in surface water run-off which will ultimately increase the erosion potential and the amount of sediment being transported into adjacent features. Soil compaction can prohibit roots from establishing in soil, preventing vegetation growth.	• Control vehicle access routes and areas and limit equipment access • Locate staging areas away from natural features (e.g., 30m)	None anticipated with proper implementation of the recommended mitigation measures.
Construction Materials/Debris	Construction materials or vegetative debris from clearing stockpiled near a natural feature have potential to enter the feature if not properly contained. Debris entering a water body has potential to: destroy or disturb fish habitat; disrupt flow patterns increasing risk for flooding or erosion and sedimentation; and impair water quality. The degree of impact on the water body is dependent on the type and amount of material entering the watercourse. Debris entering wetlands or woodlands has potential to: smoother and/or damage vegetation and impact water quality.	• Stabilize construction debris (e.g., tarps) away from natural features • Dispose of refuse and other material appropriately off-site • Locate staging areas away from natural features (e.g., 30m)	None anticipated with proper implementation of the recommended mitigation measures.

ACTIVITY / IMPACT	DETAILS OF POTENTIAL IMPACTS	RECOMMENDED MITIGATION MEASURES	NET EFFECT
Erosion and sedimentation	Vegetation clearing, grading, use of heavy machinery, and soil stockpiling all have the potential to increase erosion and sedimentation. Sediment-laden runoff has the potential to enter into adjacent natural features. Impacts include impaired surface water quality and the potential for vegetation dieback. Discharges to watercourses from temporary dewatering have potential to cause streambed and/or bank erosion and downstream sedimentation if not managed properly. Dewatering is required at three locations within the study area; 1) at the Black Creek Crossing; 2) at the Metrolinx Grade Separation; and 3) at the CN Rail Grade Separation. Dewatering may also be required at additional locations where groundwater levels are near surface and excavation is required (e.g. works adjacent to wetland areas). Dewatering requirements will be identified at detailed design. A PTTW from MOECC may be required. A mitigation and monitoring plan will be required to address any potential impacts from dewatering.	• Ensure that DFO 'Measures to Avoid Harm to Fish and Fish Habitat' are implemented. Applicable measures include: ○ "Develop and implement an Erosion and Sediment Control Plan for the site that minimizes risk of sedimentation during all phases of the project. Erosion and sediment control measures should be maintained until all disturbed ground has been permanently stabilized, suspended sediment has resettled to the bed of the waterbody or settling basin and runoff water is clear." ○ "Clearing of riparian vegetation should be kept to a minimum: use existing trails, roads or cut lines wherever possible to avoid disturbance to the riparian vegetation and prevent soil compaction. When practicable, prune or top the vegetation instead of grubbing/uprooting." ○ "Minimize the removal of natural woody debris, rocks, sand or other materials from the banks, the shoreline or the bed of the waterbody below the ordinary high water mark. If material is removed from the waterbody, set it aside and return it to the original location once construction activities are completed." ○ "Immediately stabilize shoreline or banks disturbed by any activity associated with the project to prevent erosion and/or sedimentation, preferably through re-vegetation with native species suitable for the site." ○ "Restore bed and banks of the waterbody to their original contour and gradient; if the original gradient cannot be restored due to instability, a stable gradient that does not obstruct fish passage should be restored." ○ "If replacement rock reinforcement/armoring is required to stabilize eroding or exposed areas, then ensure that appropriately-sized, clean rock is used; and that rock is installed at a similar slope to maintain a uniform bank/shoreline and natural stream/shoreline alignment." ○ "Schedule work to avoid wet, windy and rainy periods that may increase erosion and sedimentation." ○ "Remove all construction materials from site upon project completion." ○ "Minimize duration of in-water work." ○ "Conduct in-stream work during periods of low flow, or at low tide, to further reduce the risk to fish and their habitat or to allow work in water to be isolated from flows." • Eliminate potential from erosion and sedimentation by restricting access of works to limit of grading. Achieved through clearly demarcating the limit of works through use of ESC structures such as silt fencing. • A mitigation and monitoring plan will be required to address any potential impacts from dewatering.	None anticipated with proper implementation of the recommended mitigation measures.

9.0 OPPORTUNITIES FOR ENHANCEMENT

Stream habitat enhancement opportunities exist at water crossing locations within the study area through selection of open bottom culvert structures. At those locations where there is currently a CSP structure, if replaced with an open bottom culvert, the new channel can be constructed using natural channel design principles resulting in a net gain of fish habitat and improvement of overall function of habitat within the vicinity of the crossing. Opportunities for natural channel design and enhancement of aquatic habitat are also present within those reaches of watercourses that require realignment.

Replacement of the existing CSP structures with open bottom box culvert structures and placement of natural substrates will also enhance the potential function for amphibian and small mammal passage. Wildlife passage opportunities will be greatly enhanced with the new Black Creek bridge structure. Implementing measures to minimize the length of required culvert extensions and enhance “openness” of culverts are detailed design opportunities.

10.0 CONCLUSION AND SUMMARY OF RECOMMENDATION

With the proper implementation of the recommended mitigation measures identified in Table 8 of this report, residual impacts to the identified natural heritage features are anticipated to be minor and manageable, and functions of such features will persist. The following are key outcomes and considerations for the study:

- Black Creek crossing structure replacement from a closed box structure to a large span bridge structure will provide benefit to aquatic habitat and wildlife passage.
- Proposed crossing structure replacements will result in improved function for wildlife passage at key locations, particularly if most current wildlife passage principles are incorporated in the detailed design of each culvert.
- Some small areas of wetland will require removal (just north of the Black Creek crossing), although it is not anticipated to impact the function of the wetland.
- Trafalgar Road is an already heavily used functioning road, with associated existing affects from traffic noise, light, and salt management. The proposed improvements to Trafalgar Road will introduce incremental changes in these factors that are already at play in this urban and urbanizing environment.

- Alignment 1A avoids construction of a new alignment to the west that had potential to result in greater environmental impact as it crossed several sensitive natural heritage features. The selection of this alignment as preferred resulted in an early opportunity for environmental mitigation that will be accompanied by associated detailed design measures to further reduce effects to the extent possible.

Potential impacts and measures will be further revisited at Detailed Design when grading and construction requirements are further refined.

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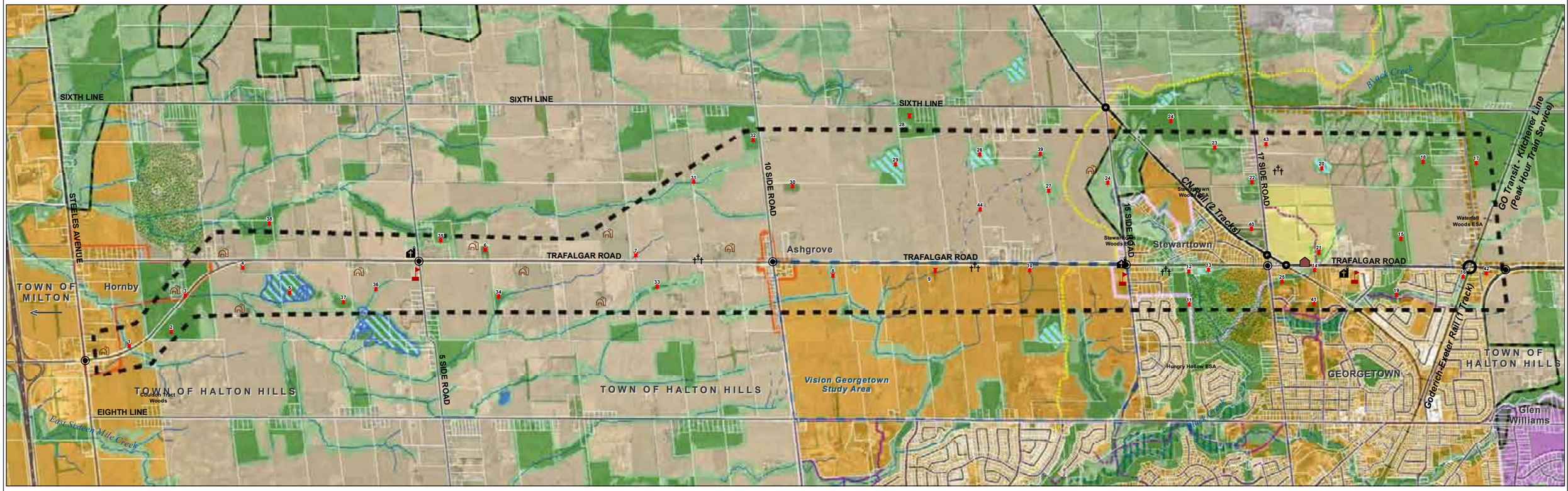
APPENDIX A – Study Area Figures



Legend

- Natural Heritage Features
- Farm
- Educational Institution
- Historical Building
- Church
- Cemetery
- Signalized Intersection
- Rail Line
- Roads / Highways
- Existing Cycling Facilities
- Proposed Cycling Facilities
- Intermittent Watercourse (MNRF NRVIS)
- Permanent Watercourse (MNRF NRVIS)
- Study Area
- Property Line
- Municipal Boundary
- CH / CVC Boundary
- Pit Quarry
- Golf Course
- Vision Georgetown Study
- Greenbelt Limits
- Niagara Escarpment Boundary
- Rural Cluster
- Hamlet Boundary
- Wetlands Identified
- Regional Wetlands
- Provincial Wetlands
- Recreation
- Wooded Area
- Water Body

Land Use

- Agricultural Rural Area
- Hamlet
- Mineral Resource Extraction Area
- Natural Heritage System (ROP 2009)
- Urban Area
- Future Development Area

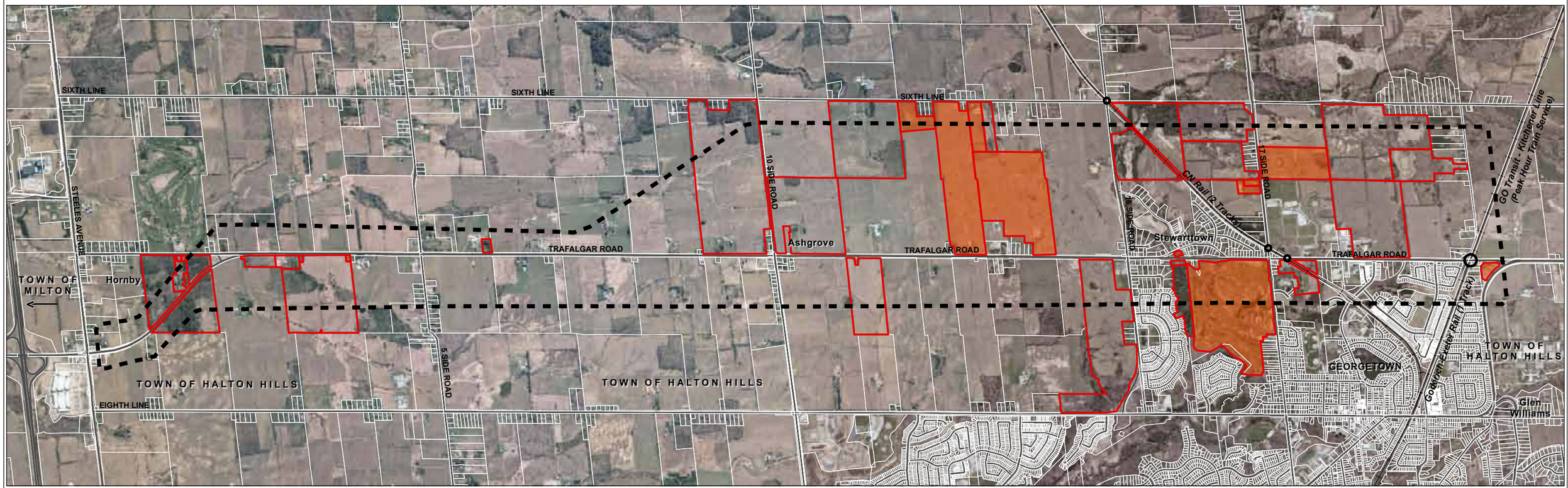
N

0 0.25 0.5 1 Kilometer

Trafalgar Road EA
Steeles Avenue to Highway 7
Natural Heritage Features

Figure 1

MMM GROUP



Legend

- Roads / Highways
- Rail Line
- Property Line
- Study Area
- Permission To Enter to be Requested
- Permission to Enter Granted

0 0.25 0.5 1 Kilometer

Trafalgar Road EA Steeles Avenue to Highway 7 **Permission to Enter**	Figure 2	MMM GROUP

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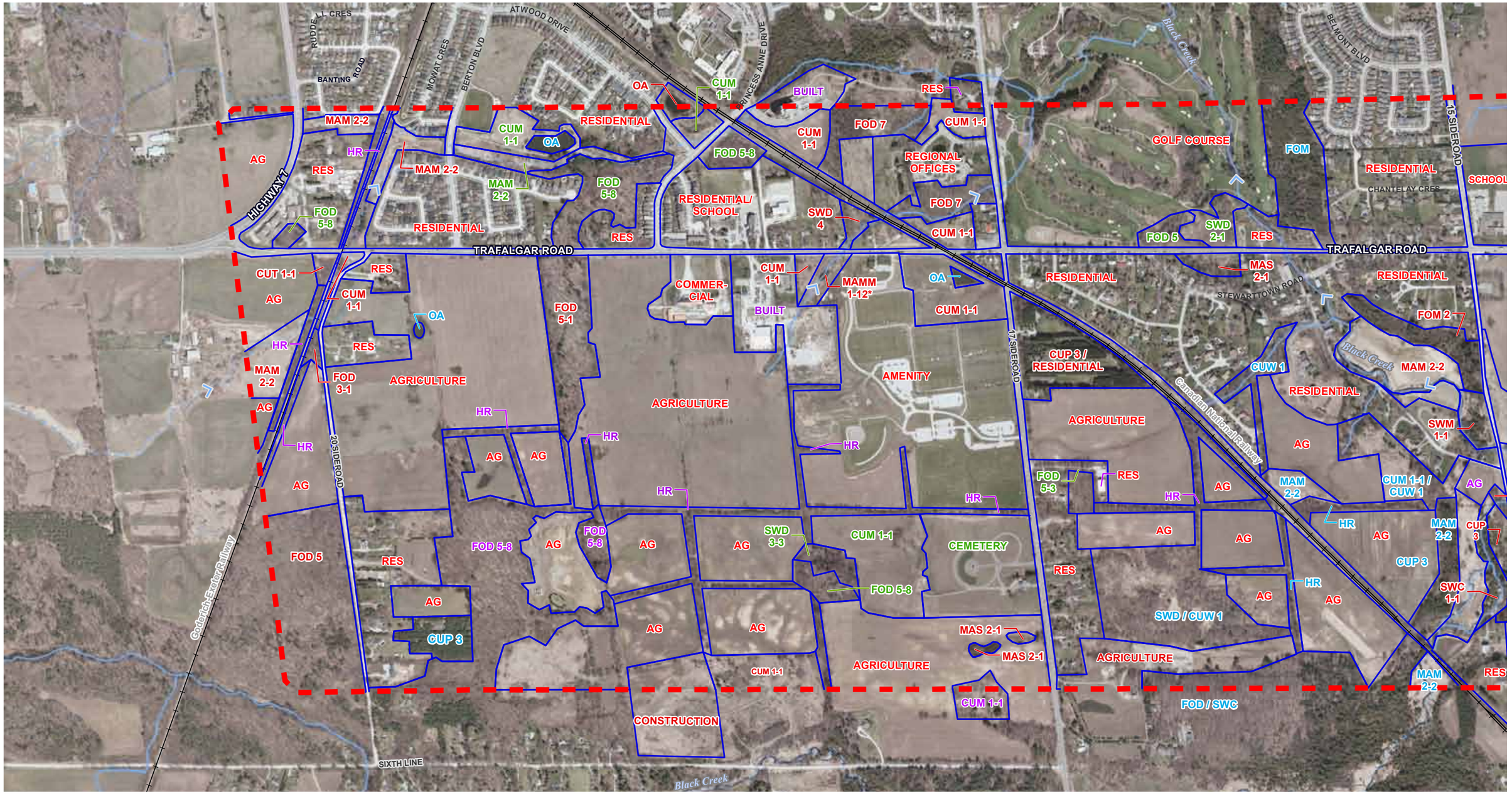


Vegetation Community

Cultural Communities
CUM1-1 – Dry – Moist Old Field Meadow
CUS1 – Mineral Cultural Savannah
CUT1 – Mineral Cultural Thicket Ecosite
CUW1 – Mineral Cultural Woodland Ecosite
CUP2 – Mixed Plantation
CUP3 – Coniferous Plantation

Swamp Communities
SWD – Deciduous Swamp
SWD1-2 – Bur Oak Mineral Deciduous Swamp
SWD2-1 – Black Ash Mineral Deciduous Swamp
SWD2-2 – Green Ash Mineral Deciduous Swamp
SWD3-3 – Swamp Maple Mineral Deciduous Swamp
SWD4 – Mineral Deciduous Swamp Ecosite
SWC – Coniferous Swamp
SWM1-1 – White Cedar – Hardwood Mineral Mixed Swamp
SWT – Thicket Swamp

Forest Communities
FOD – Deciduous Forest
FOD3-1 – Dry - Fresh Poplar Deciduous Forest
FOD5 – Dry - Fresh Sugar Maple Deciduous Forest Ecosite
FOD5-1 – Dry - Fresh Sugar Maple Deciduous Forest
FOD5-3 – Dry - Fresh Sugar Maple - Oak Deciduous Forest
FOD5-8 – Dry - Fresh Sugar Maple - White Ash Deciduous Forest
FOD6-5 – Fresh - Moist Sugar Maple - Hardwood Deciduous Forest
FOD7 – Fresh - Moist Lowland Deciduous Forest Ecosite
FOD9 – Fresh - Moist Oak - Maple - Hickory Deciduous Forest Ecosite
FOM – Mixed Forest
FOM2 – Dry - Fresh White Pine - Maple - Oak Mixed Forest Ecosite
FOM4 – Dry - Fresh White Cedar Mixed Forest Ecosite

Marsh Communities
MAMM1-12* – Common Reed Graminoid Mineral Meadow Marsh
MAM2-2 – Reed-canary Grass Mineral Meadow Marsh
MAS2-1 – Cattail Mineral Shallow Marsh

Open Water Communities
OA – Open Water

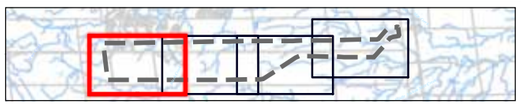
Other
Res / Residential
AG / Agriculture

Watercourses
Permanent
Intermittent
Study Boundary
Railway
Flow Direction

Purple – Desktop/Background Information Available
Blue – Air Photo Interpretation
Green – Field Survey
Red – Roadside/Edge Survey
* – ELC type from *Lee 2008*

MMM GROUP

TRAFALGAR ROAD EA
Vegetation Communities - Ecological Land Classification



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Date: January 2015
Project No: 3214006
Figure No: 3 – 1

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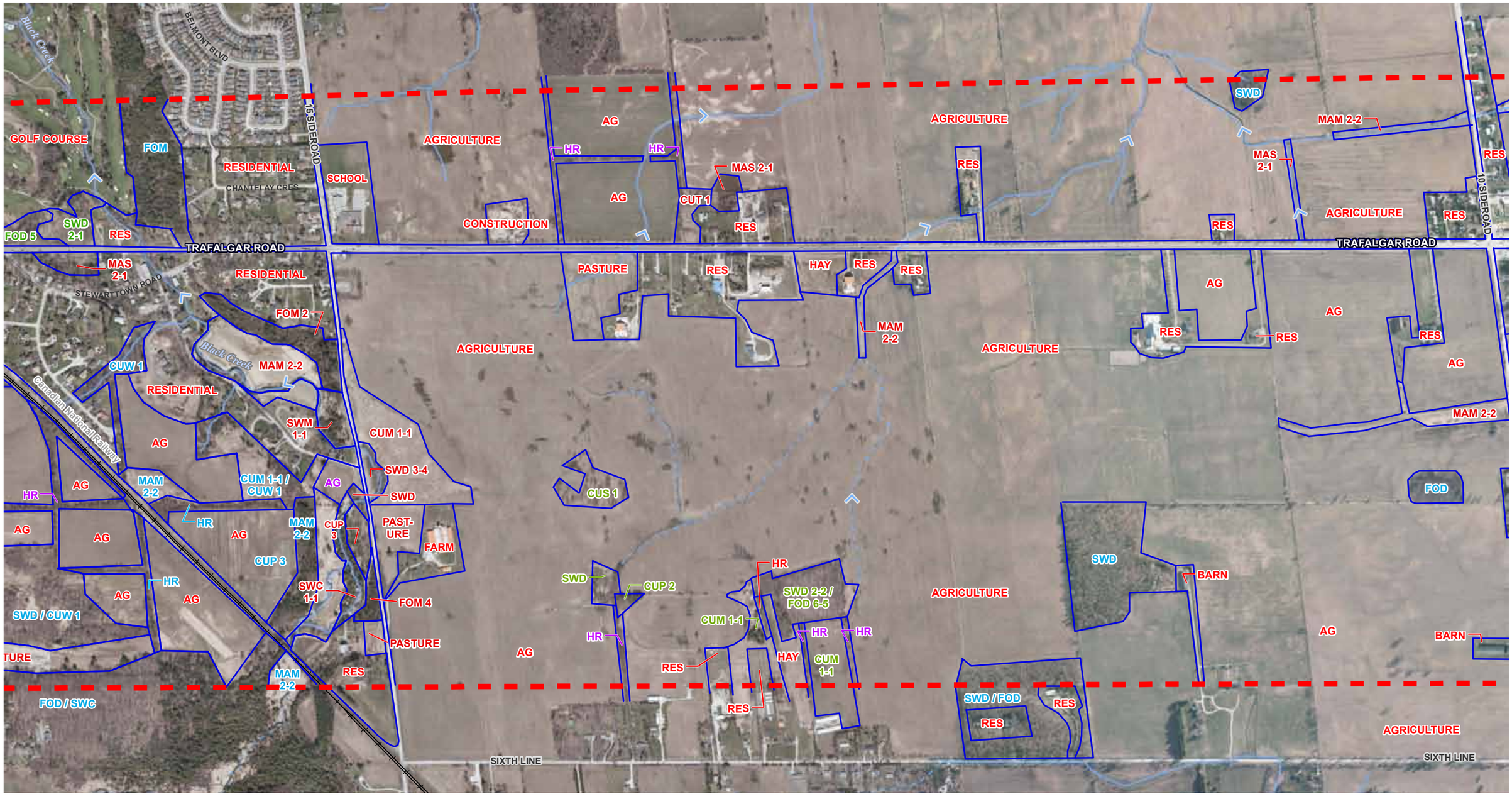

Vegetation Community ——

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MAM2-2 – Reed-canary Grass Mineral Meadow Marsh
MAS2-1 – Cattail Mineral Shallow Marsh

Open Water Communities
OA – Open Water

Other
Res / Residential
AG / Agriculture

Watercourses
Permanent — Intermittent - - - Railway +—+—+ Flow Direction
Study Boundary

Purple – Desktop/Background Information Available
Blue – Air Photo Interpretation
Green – Field Survey
Red – Roadside/Edge Survey
* – ELC type from *Lee 2008*

MMM GROUP

TRAFALGAR ROAD EA
Vegetation Communities - Ecological Land Classification

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Date: January 2015
Project No: 3214006
Figure No: 3 – 2

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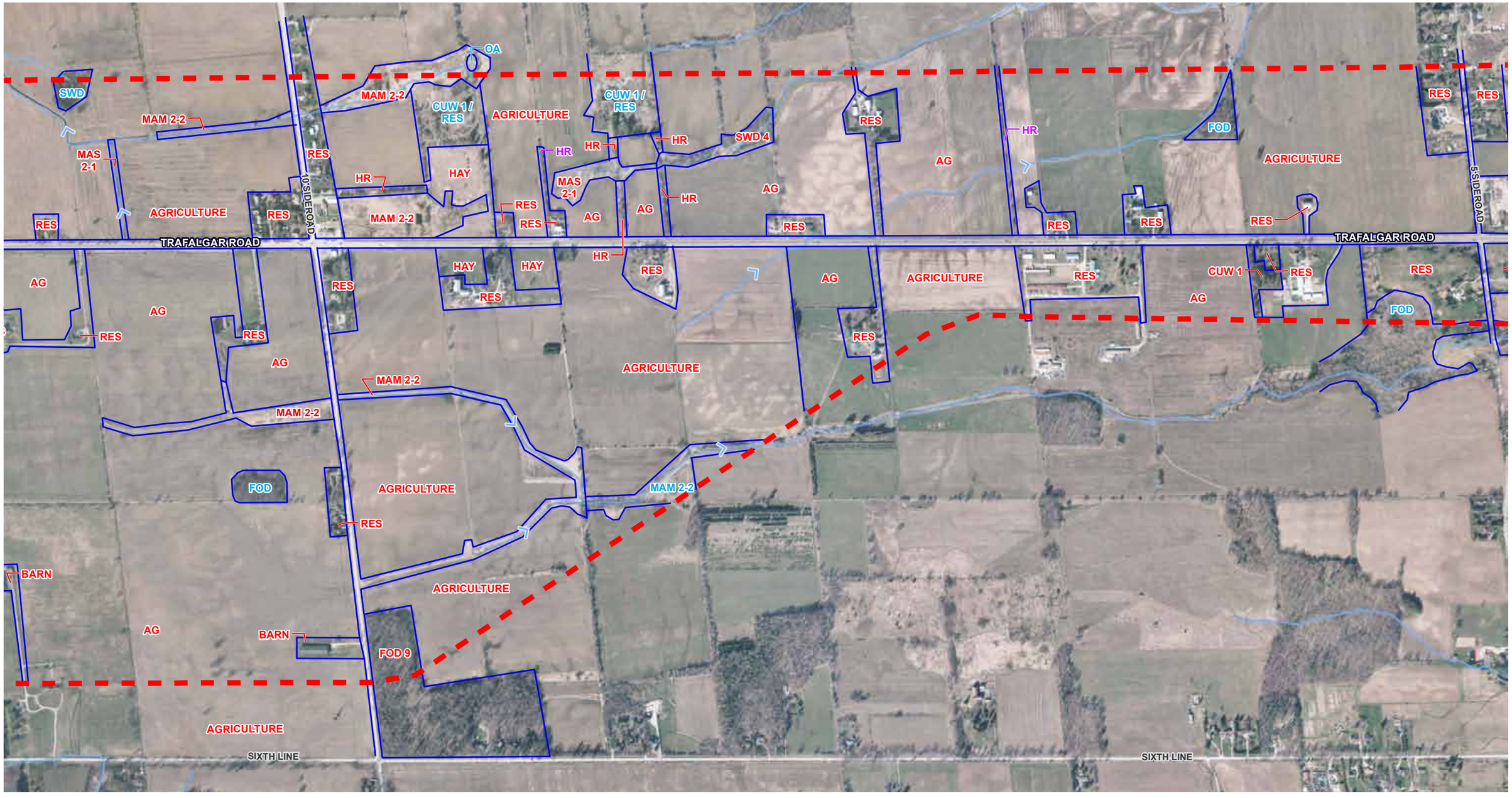

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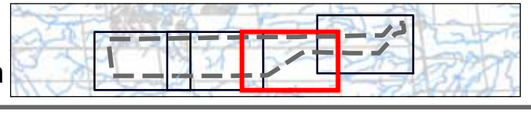

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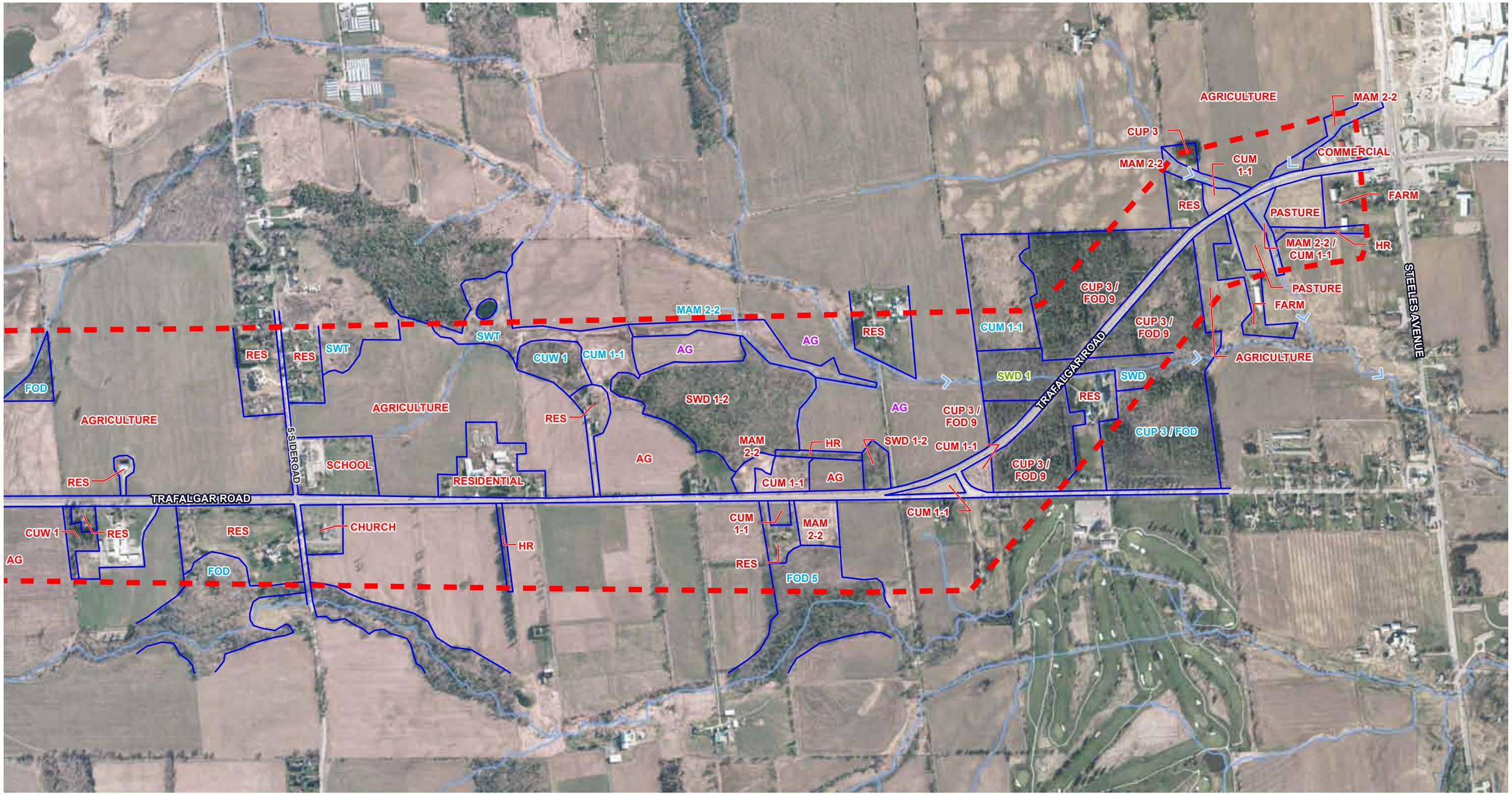
Date: January 2015
Project No: 3214006
Figure No: 3 – 3



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AG / Agriculture

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Permanent — Intermittent - - - Study Boundary — Railway +—+ Flow Direction

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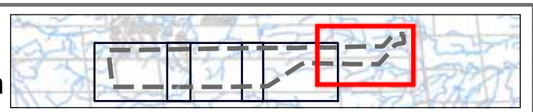
MMM GROUP

TRAFALGAR ROAD EA
Vegetation Communities - Ecological Land Classification



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Date: January 2015
Project No: 3214006
Figure No: 3 – 4

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HIGHWAY 7
BANTING ROAD
MOWAT CRES
BERTON BLVD
ATWOOD DRIVE
PRINCESS ANNE DR
TRAFALGAR ROAD
20 SIDEROAD
17 SIDEROAD
15 SIDEROAD
BELMONT BLVD
CHANTELAY CRES
STEWART TOWN ROAD
SIXTH LINE
Black Creek
Goderich-Exeter Railway
Canadian National Railway

Hungry Hollow ESA
Waterfall Woods ESA
Stewarttown Woods ESA

7
8
10
11
12
6a
6b

Legend

Study Boundary

Natural Heritage Features

- Wooded Area
- Natural Heritage System (ROP 2009)
- Permanent Watercourse
- Intermittent Watercourse
- Flow Direction
- 6a Amphibian Calling Station

Wetlands

- Provincially Significant
- Other Evaluated
- Unevaluated
- Candidate Wildlife Movement Corridors
- Railway

Natural Heritage Features Sensitivities

1 Low 2 Moderate 3 High

MMM GROUP

TRAFALGAR ROAD EA
Wildlife Habitat

0 100 200 300
Meters
1:10,000

N

Date: January 2015
Project No: 3214006
Figure No: 4 – 1

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BELMONT BLVD
Black Creek
11
Hungry Hollow ESA
15 SIDEROAD
CHANTELAY CRES
12
13
6a
6b
TRAFALGAR ROAD
10
9
8
TRAFALGAR ROAD
STEWARTTOWN ROAD
10 SIDEROAD
44
27
30
Canadian National Railway
39
26
29
23
15 SIDEROAD
24
Stewarttown Woods ESA
Black Creek
28
SIXTH LINE
13
14
15
16
SIXTH LINE

Legend

- Study Boundary

Natural Heritage Features

- Wooded Area
- Natural Heritage System (ROP 2009)
- Permanent Watercourse
- Intermittent Watercourse
- Flow Direction
- 6a Amphibian Calling Station

Wetlands

- Provincially Significant
- Other Evaluated
- Unevaluated
- Candidate Wildlife Movement Corridors
- Railway

Natural Heritage Features Sensitivities

1 Low 2 Moderate 3 High

MMM GROUP

TRAFALGAR ROAD EA
Wildlife Habitat

0 100 200 300
Meters
1:10,000

N

Date: January 2015
Project No: 3214006
Figure No: 4 – 2

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TRAFALGAR ROAD

TRAFALGAR ROAD

10 SIDEROAD

5 SIDEROAD

SIXTH LINE

8 7 6 33 34 35 30 31 32

3 4 5

Legend

- Study Boundary

Natural Heritage Features

- Wooded Area
- Natural Heritage System (ROP 2009)
- Permanent Watercourse
- Intermittent Watercourse
- Flow Direction
- 6a Amphibian Calling Station

Wetlands

- Provincially Significant
- Other Evaluated
- Unevaluated
- Candidate Wildlife Movement Corridors
- Railway

Natural Heritage Features Sensitivities

1 Low 2 Moderate 3 High

MMM GROUP

TRAFALGAR ROAD EA
Wildlife Habitat

0 100 200 300
Meters
1:10,000

N

Date: January 2015
Project No: 3214006
Figure No: 4 – 3

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Coulson Tract Woods

Hornby Swamp Wetland Complex (Locally Significant Wetland)

STEELES AVENUE

TRAFALGAR ROAD

5 SIDEROAD

1 2 2a 2b 3 4 5 6 34 35 36 37 38

Legend

- Study Boundary

Natural Heritage Features

- Wooded Area
- Natural Heritage System (ROP 2009)
- Permanent Watercourse
- Intermittent Watercourse
- Flow Direction
- 6a Amphibian Calling Station

Wetlands

- Provincially Significant
- Other Evaluated
- Unevaluated
- Candidate Wildlife Movement Corridors
- Railway

Natural Heritage Features Sensitivities

1 Low 2 Moderate 3 High

MMM GROUP

TRAFALGAR ROAD EA
Wildlife Habitat

0 100 200 300
Meters
1:10,000

N

Date: January 2015
Project No: 3214006
Figure No: 4 – 4

APPENDIX B – Summary of Background Data Resources

Reference Number	Data Source	Citation	Data/Info Type	Status	Useful Data Found? (Y-yes, N-no)
1	Halton Region	NA – information was provided via email	GIS layers • ROPA 38 • Air photos • Geology • CH and CVC Reg/Floodline mapping • MNR ANSI • MNR wetlands (PSW incl) • MNR water layer • NEC layers • Greenbelt layers • Land Parcels • Municipal heritage mapping layer (likely cultural)	Received	Yes – Mapping layers applied to maps
2	Town of Milton, AMEC Source: Internet search	NA – reference not used in study	16 Mile Creek areas 2 and 7 Subwatershed Update Study (March 2013)	Received	N – Reference area was outside of study area
3	Town of Halton Hills; Dillon Consulting Source: Internet search	Town of Halton Hills & Dillon Consulting. March 2000. 401 Corridor Integrated Planning Project -Scoped Subwatershed Plan. (Town of Halton Hills & Dillon Consulting, 2000).	401 Corridor Integrated Planning Project Scoped Subwatershed Plan (March 2000)	Received	Y – Information was available on 3 features within the study area

Reference Number	Data Source	Citation	Data/Info Type	Status	Useful Data Found? (Y-yes, N-no)
4	Region of Peel, Halton Region, Town of Caledon, Town of Halton Hills, City of Brampton Source: Internet search	NA – reference not used in study	Halton Peel Boundary Area Transportation Study Amended Final Report (May 2010)	Received	N – No natural environment Info available in that report.
5	Halton Region, Aecom Source: Internet search	NA – reference not used in study	Regional Municipality of Halton New North Oakville Transportation Corridor and Crossing of Sixteen Mile Creek Class EA Study Environmental Study Report (March 2010)	Received	N – Study was completed outside of study area
6	Credit Valley Conservation Source: Internet search	Credit Valley Conservation. August 2002. Silver Creek Subwatershed Study – Subwatershed II – Phase I Characterization Report. (CVC, August 2002).	Silver Creek Subwatershed Study Phase 1 Characterization Report (August 2002)	Received	Y – Information available on vegetation communities
7	Regional Municipality of Halton, AECOM Source: internet search	Regional Municipality of Halton & AECOM. October 2011. Sustainable Halton Water & Wastewater Master Plan. (Regional Municipality of Halton & AECOM, Oct 2011).	Sustainable Halton Water & Wastewater Master Plan (Oct 2011)	Received	Y – Some general information available.

Reference Number	Data Source	Citation	Data/Info Type	Status	Useful Data Found? (Y-yes, N-no)
8	Halton Region Source: Internet search	Halton Region. April 2005. Environmentally Sensitive Areas Consolidation Report. (Halton Region, April 2005).	Halton Region ESA Consolidation report (April 2005)	Received	Y – Information available on ESAs.
9	Conservation Ontario Source: Internet search	Website http://www.conservation-ontario.on.ca/what-we-do/watershed-stewardship/aquatic-species-at-risk	DFO fish/mussel mapping for Halton and CVC	Received	Y– Confirmed no SAR aquatic spp. within study area
10	Credit Valley Conservation Source: Internet search	Credit Valley Conservation. February 2009. Black Creek Subwatershed Study – Subwatershed 10 – Background Report. (CVC, Feb 2009).	Black Creek Subwatershed Background Report Study and Appendix B (fisheries) (Feb 2009)	Received	Y – Abundance of information available.
11	Credit Valley Conservation Source: Internet search	NA – reference not used in study	Natural Areas Inventory Report for Maple Avenue Ravine	Received	N – Not in study area
12	Halton Region Source: Internet search	Halton Region. Trafalgar Road Animal Road Collision Data. (Halton Region, 2014).	Animal road collision data for Trafalgar road	Received	Y – Utilized in wildlife movement corridor analysis
13	Credit Valley Conservation	Credit Valley Conservation. Trafalgar Road EA – Fish Collection Data.	Fish collection data records	Received	Y – Fisheries information

Reference Number	Data Source	Citation	Data/Info Type	Status	Useful Data Found? (Y-yes, N-no)
14	Credit Valley Conservation	Credit Valley Conservation. Trafalgar Road EA (Integrated Watershed Monitoring Program – Fish Data).	Trafalgar Road EA (Integrated Watershed Monitoring Program – Fish Data)	Received	Y – Fisheries information available.
15	Credit Valley Conservation	Credit Valley Conservation. Trafalgar Road Wildlife and Plant Data.	Wildlife and Plant data for Trafalgar Road	Received	Y – Plant and wildlife data available.
16	Jacques Whitford, NCE Limited	Whitford, J.. December 2005. Trafalgar Road Schedule C Municipal Class EA – 10 Side Road to Highway 7 – Aquatic Environment Report. (Whitford, Dec 2005).	Trafalgar Road Schedule C Municipal Class EA, 10 Sideroad to Highway 7, Town of Halton Hills, Region of Halton, ON Aquatic Environment Report (Dec 2005)	Received	Y – Aquatic habitat and fisheries information available.
17	Jacques Whitford, NCE Limited	Whitford, J.. March 2004. Trafalgar Road – 10 Side Road to Highway 7 – Aquatic Environment Report. (Whitford, Mar 2004).	Trafalgar Road, 10 Sideroad to Highway 7, Region of Halton, ON Aquatic Environment Report (March 2004)	Received	Y -Aquatic habitat and fisheries information available.
18	Jacques Whitford, NCE Limited	Whitford, J.. August 2004. Trafalgar Road EA Study – 10 Side Road to Highway 7 – Summary of Existing Conditions and Constraints Terrestrial Update (Whitford, Aug 2004).	Trafalgar Road EA Study, 10 Sideroad to Highway 7, Town of Halton Hills, Region of Halton, ON Summary of Existing Conditions and Constraints Terrestrial Update (Aug 2004)	Received	Y – Wildlife and vegetation information available.

Reference Number	Data Source	Citation	Data/Info Type	Status	Useful Data Found? (Y-yes, N-no)
19	Jacques Whitford, NCE Limited	Whitford, J. January 2006. Trafalgar Road Schedule C Municipal Class EA – 10 Side Road to Highway 7 – Terrestrial Environment Report. (Whitford, Jan 2006).	Trafalgar Road Schedule C Municipal Class EA, 10 Sideroad to Highway 7, Town of Halton Hills, Region of Halton, ON Terrestrial Environment Report (Jan 2006)	Received	Y – Wildlife and vegetation information available.
20	Jacques Whitford, NCE Limited	Whitford, J. March 2004. Trafalgar Road – 10 Side Road to Highway 7 – Terrestrial Environment Report. (Whitford, Mar 2004).	Trafalgar Road, 10 Sideroad to Highway 7, Region of Halton, ON Terrestrial Environment Report (March 2004)	Received	Y - Wildlife and vegetation information available.
21	MNRF Aurora District office	MNRF Aurora. June 2014. SAR Screening Information for Trafalgar Road EA – Steeles to Highway 7. Personal Communication with D. Aulenback. (Aulenback, June 2014).	SAR Screening Information (email)	Received	Y – Indicates SAR known to occur within the study area.
22	Halton Region	Halton Region	Policy and Planning mapping layers	Received	Y – Applied to mapping
23	Conservation Halton (Andrea Dunn, Brian Jamieson)	Dunn, A., B. Jamieson. Sixteen Mile Creek Monitoring Project -Draft (Dunn and Jamieson).	Sixteen Mile Creek Monitoring Study (Dunn and Jamieson Undated)	Received	Y – Abundance of information available.
24	Regional Municipality of Halton, Dillon Consulting Limited	NA – reference not used in study	Cedarvale Well Field Expansion Class EA Study, Project File Report (Dec 2009)	Received	N – Not located within study area

Reference Number	Data Source	Citation	Data/Info Type	Status	Useful Data Found? (Y-yes, N-no)
25	Halton Region, AECOM	Halton Region & AECOM. June 2010. Lyndsay Court Well Field Expansion in the Community of Georgetown – Municipal Class EA. PIC Panels. (Halton Region & AECOM, June 2010).	Lyndsay Court Well Field Expansion in the Community of Georgetown, Municipal Class EA, PIC Panels (June 2010)	Received PIC panels, associated reports not yet received.	Y – Limited information available.
26	Town of Halton Hills, North-South Environmental	North-South Environmental Inc. Hungry Hollow Ravine Management Plan. (North-South 2004)	Hungry Hollow Ravine Management Plan (Mar 2004)	Received	Y – Limited general information on the Hungry Hallow Ravine
27	MNRF SAR Website	OMNRF (Ontario Ministry of Natural Resources and Forestry). 2014. Species at Risk in Ontario (SARO) List. Available at: http://www.mnr.gov.on.ca/en/Business/Species/2ColumnSubPage/276722.html	Species at Risk regional species list (MNRF 2014)	Received	Y- Species at Risk information for the study area.
28	MNRF Biodiversity Explorer Website	OMNRF (Ontario Ministry of Natural Resources and Forestry). 2014. Biodiversity Explorer (MNRF 2014)	Species at Risk and Species of Conservation Concern information (occurrence data) and natural heritage feature occurrences. (MNRF 2014)	Received	Y- Species at Risk, Species of Conservation Concern, and natural heritage feature information for the study area.

Reference Number	Data Source	Citation	Data/Info Type	Status	Useful Data Found? (Y-yes, N-no)
29	Halton Region	Regional Municipality of Halton. Regional Official Plan (ROP) Consolidation 2013 (Halton 2013)	Regional Official Plan - natural heritage designations	Received	Y- Provides regional natural heritage designations and policies.
30	Halton Region	Regional Municipality of Halton. Halton Region Official Plan (Halton 2009)	Regional Official Plan - natural heritage designations	Received	Y- Provides regional natural heritage designations and policies.
31	MMAH	Ministry of Municipal Affairs and Housing. 2005. *Greenbelt Plan*. Government of Ontario.(MMAH 2005)	Greenbelt Plan- Land use designations.	Received	Y- Provides regional natural heritage designations and policies.
32	MNRF	Ministry of Natural Resources and Forestry. 2014. Land Information Ontario. Accessed at: https://www.javacoeapp.lrc.gov.on.ca/geonetwork/srv/en/main.home	Watercourses and watercourse thermal regimes.	Received	Y- Provides thermal regimes for watercourses.
33	Gartner Lee Limited	Gartner Lee Limited. 2002. Profile of the Halton Forests. (Gartner Lee 2002)	General vegetation, wildlife and aquatic information	Received	Y- Provides name of woodland, other information is outdated.

Reference Number	Data Source	Citation	Data/Info Type	Status	Useful Data Found? (Y-yes, N-no)
34	MNRF	Ministry of Natural Resources and Forestry and Credit Valley Conservation. 2002. Credit River Fisheries Management Plan. (OMNRF and CVC 2002).	Fisheries information and management objectives.	Received	Y- Fisheries information

APPENDIX C – Representative Site Photographs

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Feature 1: Watercourse- Tributary of Middle 16 Mile Creek (Part of Hornby Tributary). May 23, 2014.

Feature 2: Coulson Tract Woods. May 23, 2014.

Feature 3: Watercourse Crossing – Tributary of Middle 16 Mile Creek . May 23, 2014.

Figure 4: Small Woodland Patch. May 23, 2014.

Feature 5: Hornby Swamp Wetland Complex (non-PSW). May 23, 2014.

Feature 6: Small Woodland Feature. May 23, 2014.

Feature 7: Watercourse Crossing– Ephemeral drainage feature, tiled upstream. Sep 15, 2014.

Feature 8: Watercourse Crossing – channelized drain. May 23, 2014.

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Feature 9: Watercourse Crossing – ephemeral drainage feature. May 23, 2014.

Feature 10: Watercourse Crossing - ephemeral drainage feature. May 23, 2014.

Feature 11: Hungry Hollow Environmental Sensitive Area (ESA). May 23, 2014.

Feature 12: Black Creek – permanent watercourse with sensitive resident coldwater salmonid population. May 23, 2014.

Feature 13: Small wetland, NE of Black Creek. May 23, 2014.

Feature 14: Watercourse crossing (intermittent) and small wetland. May 23, 2014.

Feature 15: Woodland. May 23, 2014.

Feature 16: Watercourse Crossing – Tributary of Black Creek . May 23, 2014.

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Date: March 2016

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Feature 17: Waterfall Woods ESA - Woodland. May 23, 2014.

Feature 18: Woodland. May 23, 2014.

Feature 19: Woodland and intermittent watercourse. Sep 15, 2014. Picture of evidence of groundwater seepages in watercourse.

Feature 23: Woodland and Watercourse. May 23, 2014.

Feature 25: Woodland, Wetland and Watercourse. June 23, 2014.

Feature 43: Watercourse—drainage feature. Sep 15, 2014.

Feature 44: Watercourse. Sep 15, 2014.

Feature 1: Cliff Swallow Nest on Culvert Structure. June 6, 2014.

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Feature 24: Roadkill Snapping Turtle Hatchling. June 17, 2014.

Feature 24: Swamp Darner. Representative photo. Species observed on June 17, 2014.

Feature 22: Woodland. Sep 16, 2014.

Feature 41: Woodland. Sep 16, 2014.

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REPRESENTATIVE PHOTOGRAPHS

Date: March 2016

Project No: 3214006

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APPENDIX D – Vascular Plant List

Table D.1 – Vascular Plant List

Common Name (Nature Serve Explorer - June 2013)	Accepted Name (Nature Serve Explorer - June 2013)	Authority	Family	cc[1]	cw[1]	Srank[3]	COSEWIC[4]	MNR[5]	SARA Status[6]	Schedule[6]	Halton Natural Areas Inventory (2005)	CUM1-1	CUS1	CUT1	CUW1	CUP2	CUP3	FOD3-1	FOD5	FOD5-1	FOD5-3	FOD5-8	FOD6-5	FOD7	FOD9	SWD	SWD1-2	SWD2-1	SWD2-2	SWD3-3	SWD3-4	SWM1-1	MAMM1-12*	MAM2-2	MAS2-1
Grass Species	Grass sp												x				x					x													
Box Elder	Acer negundo	L.	ACERACEAE	0	-2	S5						x		x								x		x	x		x				x		x		
Norway Maple	Acer platanoides	L.	ACERACEAE	*	5	SNA										x								x											
Red Maple	Acer rubrum	L.	ACERACEAE	4	0	S5															x								x	x				
Sugar Maple	Acer saccharum var. saccharum		ACERACEAE	4	3	S5							x						x	x	x	x	x		x									
Freeman's Maple	Acer X freemanii	E. Murr.	ACERACEAE			SNR																			x	x			x	x				x
Red-root Amaranth	Amaranthus retroflexus	L.	AMARANTHACEAE	*	2	SNA						x																						
Staghorn Sumac	Rhus typhina	L.	ANACARDIACEAE	1	5	S5						x	x	x			x	x	x		x													x
Northern Poison Oak	Toxicodendron rydbergii	(Small ex Rydb.) Greene	ANACARDIACEAE	0	0	S5																			x				x					
Queen Anne's Lace	Daucus carota	L.	APIACEAE	*	5	SNA						x																						
Wild Parsnip	Pastinaca sativa	L.	APIACEAE	*	5	SNA						x		x																				
Spreading Dogbane	Apocynum androsaemifolium ssp androsaemifolium		APOCYNACEAE	3	5	S5															x				x									
Lesser Periwinkle	Vinca minor	L.	APOCYNACEAE	*	5	SNA															x													
Jack-in-the-pulpit	Arisaema triphyllum ssp triphyllum		ARACEAE	5	-2	S5													x				x						x	x				
Wild Sarsaparilla	Aralia nudicaulis	L.	ARALIACEAE	4	3	S5																								x				
Kansas Milkweed	Asclepias syriaca	L.	ASCLEPIADACEAE	0	5	S5						x		x			x								x									
Swallow-wort Species	Cynanchum sp		ASCLEPIADACEAE																											x				
Common Yarrow	Achillea millefolium ssp millefolium	L.	ASTERACEAE	*	3	SNA						x																						
White Snakeroot	Ageratina altissima var. altissima		ASTERACEAE	5	3	S5													x															
Annual Ragweed	Ambrosia artemisiifolia	L.	ASTERACEAE	0	3	S5						x																						
Lesser Burdock	Arctium minus	Bernh.	ASTERACEAE	*	5	SNA						x	x																					
Devil's Beggar's Ticks	Bidens frondosa	L.	ASTERACEAE	3	-3	S5																x		x		x			x	x				
Chicory	Cichorium intybus	L.	ASTERACEAE	*	5	SNA						x																						
Creeping Thistle	Cirsium arvense	(L.) Scop.	ASTERACEAE	*	3	SNA						x	x									x												
Bull Thistle	Cirsium vulgare	(Savi) Ten.	ASTERACEAE	*	4	SNA						x																						
Daisy Fleabane	Erigeron strigosus	Muhl. ex Willd.	ASTERACEAE	0	1	S5						x																						
Spotted Joe-pye Weed	Eupatorium maculatum var. maculatum		ASTERACEAE	3	-5	SNR																										x	x	
Large-leaf Wood-aster	Eurybia macrophylla	(L.) Cass.	ASTERACEAE	5	5	S5																			x									

Common Name (Nature Serve Explorer - June 2013)	Accepted Name (Nature Serve Explorer - June 2013)	Authority	Family	cc[1]	cw[1]	Srank[3]	COSEWIC[4]	MNR[5]	SARA Status[6]	Schedule[6]	Halton Natural Areas Inventory (2005)	CUM1-1	CUS1	CUT1	CUW1	CUP2	CUP3	FOD3-1	FOD5	FOD5-1	FOD5-3	FOD5-8	FOD6-5	FOD7	FOD9	SWD	SWD1-2	SWD2-1	SWD2-2	SWD3-3	SWD3-4	SWM1-1	MAMM1-12*	MAM2-2	MAS2-1
Flat-top Fragrant Goldenrod	Euthamia graminifolia	(L.) Nutt.	ASTERACEAE	2	-2	S5						x																							
Sunflower Species	Helianthus sp		ASTERACEAE																x																
Jerusalem Artichoke	Helianthus tuberosus	L.	ASTERACEAE	*	0	SU							x																						
Rough Hawkweed	Hieracium sp		ASTERACEAE														x																		
Elecampane Flower	Inula helenium	L.	ASTERACEAE	*	5	SNA						x										x			x								x		
Oxeye Daisy	Leucanthemum vulgare	Lam.	ASTERACEAE	*	5	SNA																			x										
Tall Rattlesnake-root	Prenanthes altissima	L.	ASTERACEAE	5	3	S5																							x						
Tall Goldenrod	Solidago altissima	L.	ASTERACEAE	1	3	S5						x	x								x			x											
Broad-leaved Goldenrod	Solidago flexicaulis	L.	ASTERACEAE	6	3	S5													x		x	x	x		x										
Wrinkleleaf Goldenrod	Solidago rugosa ssp rugosa		ASTERACEAE	4	-1	S5																						x							
Goldenrod Species	Solidago sp		ASTERACEAE									x		x					x			x					x				x		x		
Field Sowthistle	Sonchus arvensis ssp arvensis		ASTERACEAE	*		SNA																			x										
White Heath Aster	Symphyotrichum ericoides var. ericoides		ASTERACEAE			S5						x																							
Panicled Aster	Symphyotrichum lanceolatum ssp. lanceolatum	(Willd.) Nesom	ASTERACEAE			S5						x	x											x		x		x	x	x					
Calico Aster	Symphyotrichum lateriflorum var. lateriflorum	(L.) Á. Löve & D. Löve	ASTERACEAE	3	-2	SNR																							x						
New England Aster	Symphyotrichum novae-angliae	(L.) Nesom	ASTERACEAE	2	-3	S5						x	x						x		x														
White Heath Aster	Symphyotrichum pilosum var. pilosum		ASTERACEAE	4	2	S5					U	x																							
Heart-leaved Aster	Symphyotrichum cordifolium	(L.) Nesom	ASTERACEAE	5	5	S5													x																
Purple-stemmed Aster	Symphyotrichum puniceum var. puniceum	(L.) A.& D. Löve	ASTERACEAE	6	-5	S5														x					x			x							
Aster Species	Symphyotricum sp		ASTERACEAE																			x				x								x	
Common Dandelion	Taraxacum officinale	G.H. Weber ex Wiggers	ASTERACEAE	*	3	SNA						x										x													
Colt's Foot	Tussilago farfara	L.	ASTERACEAE	*	3	SNA																		x											
Orange Jewelweed	Impatiens capensis	Meerb.	BALSAMINACEAE	4	-3	S5													x	x		x		x	x	x	x	x		x	x			x	
Blue Cohosh	Caulophyllum thalictroides	(L.) Michx.	BERBERIDACEAE			S5																x													
May Apple	Podophyllum peltatum	L.	BERBERIDACEAE	5	3	S5														x	x				x										
Speckled Alder	Alnus incana ssp rugosa	(Du Roi) Clausen	BETULACEAE	6	-5	S5					U																	x							
Yellow Birch	Betula alleghaniensis	Britt.	BETULACEAE	6	0	S5																								x					
Paper Birch	Betula papyrifera	Marsh.	BETULACEAE	2	2	S5													x			x													x

Common Name (Nature Serve Explorer - June 2013)	Accepted Name (Nature Serve Explorer - June 2013)	Authority	Family	cc[1]	cw[1]	Srank[3]	COSEWIC[4]	MNR[5]	SARA Status[6]	Schedule[6]	Halton Natural Areas Inventory (2005)	CUM1-1	CUS1	CUT1	CUW1	CUP2	CUP3	FOD3-1	FOD5	FOD5-1	FOD5-3	FOD5-8	FOD6-5	FOD7	FOD9	SWD	SWD1-2	SWD2-1	SWD2-2	SWD3-3	SWD3-4	SWM1-1	MAMM1-12*	MAM2-2	MAS2-1
American Hornbeam	Carpinus caroliniana ssp. virginiana	(Marsh.) Furlow	BETULACEAE	6	0	S5													x										x						
Eastern Hop-hornbeam	Ostrya virginiana	(P. Mill.) K. Koch	BETULACEAE	4	4	S5															x	x	x		x										
European Gromwell	Lithospermum officinale	L.	BORAGINACEAE	*	5	SNA																x													
True Forget-me-not	Myosotis scorpioides	L.	BORAGINACEAE	*	-5	SNA																					x								
Garlic Mustard	Alliaria petiolata	(Bieb.) Cavara & Grande	BRASSICACEAE	*	0	SNA						x				x	x					x	x		x										
Dame's Rocket	Hesperis matronalis	L.	BRASSICACEAE	*	5	SNA														x		x													
Tartarian Honeysuckle	Lonicera tatarica	L.	CAPRIFOLIACEAE	*	3	SNA						x									x														
Common Elderberry	Sambucus nigra ssp. canadensis	(L.) R. Bolli	CAPRIFOLIACEAE	5	-2	S5																									x				
Red Elderberry	Sambucus racemosa var. racemosa		CAPRIFOLIACEAE	5	2	SNR																								x					
Coffee Tinker's-weed	Triosteum aurantiacum	Bickn.	CAPRIFOLIACEAE	7	5	S5													x																
Nannyberry	Viburnum lentago	L.	CAPRIFOLIACEAE	4	-1	S5																									x				
Viburnum Species	Viburnum sp		CAPRIFOLIACEAE									x																							
Running Strawberry-bush	Euonymus obovatus	Nutt.	CELASTRACEAE	6	5	S5														x	x	x	x												
Goosefoot Species	Chenopodium sp		CHENOPODIACEAE									x																							
St. John's-wort	Hypericum perforatum	L.	CLUSIACEAE	*	5	SNA						x							x																
Alternate-leaf Dogwood	Cornus alternifolia	L. f.	CORNACEAE	6	5	S5												x	x			x		x											
Gray Dogwood	Cornus racemosa	Lam.	CORNACEAE	2	-2	S5																							x						
Red-osier Dogwood	Cornus sericea	L.	CORNACEAE	2	-3	S5																				x									
Wild Mock-cucumber	Echinocystis lobata	(Michx.) Torr. & Gray	CUCURBITACEAE	3	-2	S5																		x						x					
Eastern Red Cedar	Juniperus virginiana	L.	CUPRESSACEAE	4	3	S5					U	x																					x		
Northern White Cedar	Thuja occidentalis	L.	CUPRESSACEAE	4	-3	S5																						x			x				
Fringed Sedge	Carex crinita	Lam.	CYPERACEAE	6	-4	S5					U																		x						
Graceful Sedge	Carex gracillima	Schwein.	CYPERACEAE	4	3	S5																							x						
Greater Bladder Sedge	Carex intumescens	Rudge	CYPERACEAE	6	-4	S5																							x						
Hop Sedge	Carex lupulina	Muhl. ex Willd.	CYPERACEAE	6	-5	S5																							x						
Sedge Species	Carex sp		CYPERACEAE									x									x					x	x		x						x
Stalk-grain Sedge	Carex stipata	Muhl. ex Willd.	CYPERACEAE	3	-5	S5																											x		
Blunt Broom Sedge	Carex tribuloides	Wahlenb.	CYPERACEAE	5	-4	S4S5					U																		x						
Tuckerman Sedge	Carex tuckermanii	Dewey	CYPERACEAE	7	-5	S4					U																		x						
Fox Sedge	Carex vulpinoidea	Michx.	CYPERACEAE	3	-5	S5																							x						

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Soft-stemmed Bulrush	Schoenoplectus tabernaemontani	(K. C. Gmelin) Palla	CYPERACEAE	5	-5	S5																					x							
Woolgrass Bulrush	Scirpus atrovirens	Willd.	CYPERACEAE	3	-5	S5						x																						
Cottongrass Bulrush	Scirpus cyperinus	(L.) Kunth	CYPERACEAE	4	-5	S5																				x								
Bulrush Species	Scirpus sp		CYPERACEAE																													x		
Fuller's Teasel	Dipsacus fullonum	L.	DIPSACACEAE	*	5	SNA						x																						
Lady-fern	Athyrium filix-femina ssp. angustum	(Willd.) Clausen	DRYOPTERIDACEAE	4	0	S5																						x						
Bulblet Fern	Cystopteris bulbifera	(L.) Bernh.	DRYOPTERIDACEAE	5	-2	S5																					x							
Spinulose Wood Fern	Dryopteris carthusiana	(Vill.) H.P. Fuchs	DRYOPTERIDACEAE	5	-2	S5																					x			x				
Ostrich Fern	Matteuccia struthiopteris	(L.) Todaro	DRYOPTERIDACEAE	5	-3	S5																				x			x					
Sensitive Fern	Onoclea sensibilis	L.	DRYOPTERIDACEAE	4	-3	S5																				x		x	x	x				
Field Horsetail	Equisetum arvense	L.	EQUISETACEAE	0	0	S5														x														
Garden Bird's-foot-trefoil	Lotus corniculatus	L.	FABACEAE	*		SNA						x																						
Black Medic	Medicago lupulina	L.	FABACEAE	*	1	SNA						x																						
White Sweet Clover	Melilotus alba	(L.) Lam.	FABACEAE	*	3	SNA						x																						
Tall Yellow Sweetclover	Melilotus officinalis	Thuill.	FABACEAE	*	5	SNA						x																						
Black Locust	Robinia pseudoacacia	L.	FABACEAE	*	4	SNA								x			x		x							x								
Red Clover	Trifolium pratense	L.	FABACEAE	*	2	SNA						x																						
Tufted Vetch	Vicia cracca	L.	FABACEAE	*	5	SNA						x		x								x												
American Beech	Fagus grandifolia	Ehrh.	FAGACEAE	6	3	S4													x	x	x	x	x											
White Oak	Quercus alba	L.	FAGACEAE	6	3	S5																	x											
Bur Oak	Quercus macrocarpa	Michx.	FAGACEAE	5	1	S5								x											x		x		x					
Northern Red Oak	Quercus rubra	L.	FAGACEAE	6	3	S5							x						x		x	x			x									
Herb-robert	Geranium robertianum	L.	GERANIACEAE	*	5	SNA										x					x		x		x		x							
Wild Black Currant	Ribes americanum	P. Mill.	GROSSULARIACEAE	4	-3	S5																					x							
Virginia Waterleaf	Hydrophyllum virginianum	L.	HYDROPHYLLACEAE	6	-2	S5																x							x					
Bitternut Hickory	Carya cordiformis	(Wangenh.) K. Koch	JUGLANDACEAE	6	0	S5												x	x		x	x	x		x									
Shagbark Hickory	Carya ovata	(Miller) K. Koch	JUGLANDACEAE	6	3	S5																			x	x	x		x					
Butternut	Juglans cinerea	L.	JUGLANDACEAE	6	2	S3?	END	END	END	1									x					x										
Black Walnut	Juglans nigra	L.	JUGLANDACEAE	5	3	S4								x				x	x			x		x	x	x	x					x	x		x
Rush Species	Juncus sp		JUNCACEAE									x																							

Common Name (Nature Serve Explorer - June 2013)	Accepted Name (Nature Serve Explorer - June 2013)	Authority	Family	cc[1]	cw[1]	Srank[3]	COSEWIC[4]	MNR[5]	SARA Status[6]	Schedule[6]	Halton Natural Areas Inventory (2005)	CUM1-1	CUS1	CUT1	CUW1	CUP2	CUP3	FOD3-1	FOD5	FOD5-1	FOD5-3	FOD5-8	FOD6-5	FOD7	FOD9	SWD	SWD1-2	SWD2-1	SWD2-2	SWD3-3	SWD3-4	SWM1-1	MAMM1-12*	MAM2-2	MAS2-1
Torrey's Rush	Juncus torreyi	Coville	JUNCACEAE	3	-3	S5					U																	x							
Common Motherwort	Leonurus cardiaca ssp. cardiaca		LAMIACEAE	*	5	SNA						x																							
Common Heal-all	Prunella vulgaris ssp. vulgaris	L.	LAMIACEAE	*	0	SNA											x								x									
Asparagus	Asparagus officinalis	L.	LILIACEAE	*	3	SNA											x																		
Wild-lily-of-the-valley	Maianthemum canadense	Desf.	LILIACEAE	5	0	S5																								x					
False Solomon's Seal	Maianthemum racemosum ssp. racemosum		LILIACEAE	4	3	S5																	x		x										
Solomon's Seal Species	Polygonatum sp		LILIACEAE																											x					
Large-flower Trillium	Trillium grandiflorum	(Michx.) Salisb.	LILIACEAE	5	5	S5														x									x						
Purple Loosestrife	Lythrum salicaria	L.	LYTHRACEAE	*	-5	SNA																						x							
White Ash	Fraxinus americana	L.	OLEACEAE	4	3	S5													x	x	x	x	x	x											
Black Ash	Fraxinus nigra	Marshall	OLEACEAE	7	-4	S5																						x							
Green Ash	Fraxinus pennsylvanica	Marshall	OLEACEAE	3	-3	S5																			x		x		x	x		x		x	
Ash Species	Fraxinus sp		OLEACEAE											x												x									
European Privet	Ligustrum vulgare	L.	OLEACEAE	*	1	SNA																x													
Enchanter's Nightshade	Circaea lutetiana ssp canadensis	(L.) Aschers. & Magnus	ONAGRACEAE	3	3	S5											x		x		x	x	x	x	x		x								
Hairy Willow-herb	Epilobium ciliatum ssp ciliatum		ONAGRACEAE			S5																			x				x	x				
Small-flower Willow-herb	Epilobium parviflorum	Schreb.	ONAGRACEAE	*	3	SNA																						x							
Eastern Helleborine	Epipactis helleborine	(L.) Crantz	ORCHIDACEAE	*	5	SNA																x			x				x						
Upright Yellow Wood Sorrel	Oxalis stricta	L.	OXALIDACEAE	0	3	S5																			x				x						
Bloodroot	Sanguinaria canadensis	L.	PAPAVERACEAE	5	4	S5																	x												
Balsam Fir	Abies balsamea	(L.) Miller	PINACEAE	5	-3	S5											x																		
Norway Spruce	Picea abies	(L.) Karsten	PINACEAE	*	5	SNA											x																		
White Spruce	Picea glauca	(Moench) Voss	PINACEAE	6	3	S5					U	x					x																		
Spruce Species	Picea sp		PINACEAE														x																		
Eastern White Pine	Pinus strobus	L.	PINACEAE	4	3	S5										x	x		x		x	x	x		x										
Scotch Pine	Pinus sylvestris	L.	PINACEAE	*	5	SNA											x																		
Eastern Hemlock	Tsuga canadensis	(L.) Carriere	PINACEAE	7	3	S5													x	x	x	x								x					
English Plantain	Plantago lanceolata	L.	PLANTAGINACEAE	*	0	SNA						x																							

Common Name (Nature Serve Explorer - June 2013)	Accepted Name (Nature Serve Explorer - June 2013)	Authority	Family	cc[1]	cw[1]	Srank[3]	COSEWIC[4]	MNR[5]	SARA Status[6]	Schedule[6]	Halton Natural Areas Inventory (2005)	CUM1-1	CUS1	CUT1	CUW1	CUP2	CUP3	FOD3-1	FOD5	FOD5-1	FOD5-3	FOD5-8	FOD6-5	FOD7	FOD9	SWD	SWD1-2	SWD2-1	SWD2-2	SWD3-3	SWD3-4	SWM1-1	MAMM1-12*	MAM2-2	MAS2-1
Giant Bentgrass	Agrostis gigantea	Roth	POACEAE	*	0	SNA						x																						
Awnless Brome	Bromus inermis ssp inermis	L.	POACEAE	*	5	SNA						x	x	x			x		x					x										
Orchard Grass	Dactylis glomerata	L.	POACEAE	*	3	SNA						x													x									
Creeping Wild Rye	Elymus repens	(L.) Gould	POACEAE	*	3	SNA						x																						
Virginia Wild-rye	Elymus virginicus var. virginicus	L.	POACEAE			S5																					x							
Manna Grass Species	Glyceria sp		POACEAE																															x
Fowl Manna Grass	Glyceria striata	(Lam.) A.S. Hitchc.	POACEAE	3	-5	S5														x						x	x	x	x				
Rice Cutgrass	Leersia oryzoides	(L.) Sw.	POACEAE	3	-5	S5																					x							
Kentucky Fescue	Lolium arundinaceum	(Schreb.) S.J. Darbyshire	POACEAE	*	2	SNA						x																						
Reed Canary Grass	Phalaris arundinacea	L.	POACEAE	0	-4	S5						x		x								x		x		x		x			x	x		x	
Meadow Timothy	Phleum pratense	L.	POACEAE	*	3	SNA						x																						
European Reed Grass	Phragmites australis ssp. australis		POACEAE			SNR																											x		
Bluegrass Species	Poa sp		POACEAE									x																						
Foxtail Species	Setaria sp		POACEAE									x																						
Curly Dock	Rumex crispus	L.	POLYGONACEAE	*	-1	SNA						x													x									
Scarlet Pimpernel	Anagallis arvensis	L.	PRIMULACEAE	*	4	SNA						x																						
White Baneberry	Actaea pachypoda	Elliott	RANUNCULACEAE	6	5	S5																	x											
Canada Anemone	Anemone canadensis	L.	RANUNCULACEAE	3	-3	S5																									x			
Tall Buttercup	Ranunculus acris	L.	RANUNCULACEAE	*	-2	SNA												x				x			x									
Hooked Crowfoot	Ranunculus recurvatus	Poir.	RANUNCULACEAE	4	-3	S5																					x							
Tall Meadowrue	Thalictrum pubescens	Pursh	RANUNCULACEAE	5	-2	S5																						x						
Buckthorn	Rhamnus cathartica	L.	RHAMNACEAE	*	3	SNA						x	x	x			x	x	x		x	x	x		x		x	x					x	
Virginia Strawberry	Fragaria virginiana ssp virginiana		ROSACEAE	2	1	SU											x					x			x									
Yellow Avens	Geum aleppicum	Jacq.	ROSACEAE	2	-1	S5																x												
White Avens	Geum canadense	Jacq.	ROSACEAE	3	0	S5																x			x		x							
Avens Species	Geum sp		ROSACEAE														x		x										x					
Apple Species	Malus sp		ROSACEAE									x																					x		
Wild Black Cherry	Prunus serotina	Ehrh.	ROSACEAE	3	3	S5							x					x			x	x	x											
Choke Cherry	Prunus virginiana var. virginiana		ROSACEAE	2	1	S5										x			x		x	x	x		x						x			
Allegheny Blackberry	Rubus allegheniensis	Porter	ROSACEAE	2	2	S5																x												

Common Name (Nature Serve Explorer - June 2013)	Accepted Name (Nature Serve Explorer - June 2013)	Authority	Family	cc[1]	cw[1]	Srank[3]	COSEWIC[4]	MNR[5]	SARA Status[6]	Schedule[6]	Halton Natural Areas Inventory (2005)	CUM1-1	CUS1	CUT1	CUW1	CUP2	CUP3	FOD3-1	FOD5	FOD5-1	FOD5-3	FOD5-8	FOD6-5	FOD7	FOD9	SWD	SWD1-2	SWD2-1	SWD2-2	SWD3-3	SWD3-4	SWM1-1	MAMM1-12*	MAM2-2	MAS2-1
Wild Red Raspberry	Rubus idaeus ssp. strigosus	(Michx.) Focke	ROSACEAE			S5						x							x			x												
Purple-flowering Raspberry	Rubus odoratus	L.	ROSACEAE	3	5	S5														x														
Dwarf Raspberry	Rubus pubescens	Raf.	ROSACEAE	4	-4	S5																						x						
Catchweed Bedstraw	Galium aparine	L.	RUBIACEAE	4	3	S5																					x							
Marsh Bedstraw	Galium palustre	L.	RUBIACEAE	5	-5	S5														x														
White Poplar	Populus alba	L.	SALICACEAE	*	5	SNA											x																	
Balsam Poplar	Populus balsamifera ssp balsamifera		SALICACEAE	4	-3	S5																x												x
Eastern Cottonwood	Populus deltoides ssp. deltoides	Bartram ex Marshall	SALICACEAE			SU																						x						
Quaking Aspen	Populus tremuloides	Michx.	SALICACEAE	2	0	S5						x						x	x	x					x	x								
Willow Species	Salix sp		SALICACEAE											x												x		x			x	x		x	x
Butter-and-eggs	Linaria vulgaris	Miller	SCROPHULARIACEAE	*	5	SNA						x																						
Gypsy-weed	Veronica officinalis	L.	SCROPHULARIACEAE	*	5	SNA															x													
Hispid Greenbrier	Smilax tamnoides	L.	SMILACACEAE	6	0	S4																	x											
Climbing Nightshade	Solanum dulcamara	L.	SOLANACEAE	*	0	SNA														x								x	x	x				
American Basswood	Tilia americana	L.	TILIACEAE	4	3	S5													x	x	x	x	x		x		x	x				x		
Narrow-leaved Cattail	Typha angustifolia	L.	TYPHACEAE	3	-5	SNA																						x					x	x	x
Broad-leaf Cattail	Typha latifolia	L.	TYPHACEAE	3	-5	S5																												x	
Common Hackberry	Celtis occidentalis	L.	ULMACEAE	8	1	S4					R	x																						
American Elm	Ulmus americana	L.	ULMACEAE	3	-2	S5								x					x			x			x	x	x		x	x		x		x	
Violet Species	Viola sp		VIOLACEAE																									x						
Thicket Creeper	Parthenocissus vitacea	(Knerr) A.S. Hitchc.	VITACEAE	3	3	S5						x	x					x	x		x	x			x		x							
Riverbank Grape	Vitis riparia	Michx.	VITACEAE	0	-2	S5						x	x	x			x	x	x		x	x		x	x		x							

Legend

Accepted Name and Authority

Accepted Name and Authority were updated primarily using NatureServe Explorer (Updated June 2013), in combination with the Integrated Taxonomic Information System (ITIS), United States Department of Agriculture (USDA) Plants Database, and the New York Flora Atlas.

NatureServe Explorer: http://www.natureserve.org/explorer/index.htm

ITIS: http://www.itis.gov/

USDA Plants: http://plants.usda.gov/java/

New York Flora Atlas: http://newyork.plantatlas.usf.edu/Default.aspx

[1]Coefficient of Conservatism and Coefficient of Wetness

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

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

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

[2]G-Rank (Global)

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

(Global Status from MNR Biodiversity Explorer September 2012)

Global (G) Conservation Status Ranks

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

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

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

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

G5 Very common—demonstrably secure under present conditions.

Variant Ranks

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

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

GNR – Unranked – Global rank not yet assessed

GNA – Not Applicable – A conservation status rank is not applicable because the species is not a suitable target for conservation activities.

Rank Qualifiers

? - Inexact Numeric Rank—Denotes inexact numeric rank; this should not be used with any of the Variant Global Conservation Status Ranks or GX or GH.

Q - Questionable taxonomy that may reduce conservation priority—Distinctiveness of this entity as a taxon or ecosystem type at the current level is questionable; resolution of this uncertainty may result in change from a species to a subspecies or hybrid, or inclusion of this taxon or type in another taxon or type, with the resulting taxon having a lower-priority (numerically higher) conservation status rank. The “Q” modifier is only used at a global level and not at a national or subnational level.

C - Captive or Cultivated Only—Taxon or ecosystem at present is presumed or possibly extinct or eliminated in the wild across their entire native range but is extant in cultivation, in captivity, as a naturalized population (or populations) outside their native range, or as a reintroduced population or ecosystem restoration, not yet established. The “C” modifier is only used at a global level and not at a national or subnational level. Possible ranks are GXC or GHC. This is equivalent to “Extinct” in the Wild (EW) in IUCN’s Red List terminology (IUCN 2001).

[3]S-Ranks (Provincial)

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

(Provincial Status from MNR Biodiversity Explorer September 2012)

S1 - Critically Imperiled—Critically imperiled in the nation or state/province because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the state/province.

S2 - Imperiled—Imperiled in the nation or state/province because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the nation or state/province.

S3 - Vulnerable—Vulnerable in the nation or state/province due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.

S4 - Apparently Secure—Uncommon but not rare; some cause for long-term concern due to declines or other factors.

S5 - Secure—Common, widespread, and abundant in the nation or state/province.

S#S# Range Rank —A numeric range rank (e.g., S2S3) is used to indicate any range of uncertainty about the status of the species or community. Ranges cannot skip more than one rank (e.g., SU is used rather than S1S4).

SX - Presumed Extirpated - Species or community is believed to be extirpated from the nation or state/province. Not located despite intensive searches of historical sites and other appropriate habitat, and virtually no likelihood that it will be rediscovered.

SH - Possibly Extirpated (Historical) - Species or community occurred historically in the nation or state/province, and there is some possibility that it may be rediscovered. Its presence may not have been verified in the past 20-40 years. A species or community could become NH or SH without such a 20-40 year delay if the only known occurrences in a nation or state/province were destroyed or if it had been extensively and unsuccessfully looked for. The NH or SH rank is reserved for species or communities for which some effort has been made to relocate occurrences, rather than simply using this status for all elements not known from verified extant occurrences.

SE – Species is considered exotic in Ontario

SNR - Unranked – Nation of state/province conservation status not yet assessed.

SU - Unrankable – Currently unrankable due to lack of information or due to substantially conflicting information about status or trends.

SNA - Not Applicable – A conservation status rank is not applicable because the species is not a suitable target for conservation activities.[1]

[4]COSEWIC (Committee on the Status of Endangered Wildlife in Canada)

(federal status from COSEWIC September 2014)

EXT - Extinct - A species that no longer exists.

EXP - Extirpated - A species no longer existing in the wild in Canada, but occurring elsewhere.

END - Endangered - A species facing imminent extirpation or extinction.

THR - Threatened - A species likely to become endangered if limiting factors are not reversed.

SC - Special Concern (formerly vulnerable) - A species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats.

NAR - Not At Risk - A species that has been evaluated and found to be not at risk of extinction given the current circumstances.

DD - Data Deficient (formerly Indeterminate) - Available information is insufficient to resolve a species' eligibility for assessment or to permit an assessment of the species' risk of extinction.

Implied COSEWIC Status Notations (Status Due to Taxonomic Relationships)[2]

[1] Added on June 4, 2013 from http://nhic.mnr.gov.on.ca/glossary/srank.cfm

[2] Added on June 5, 2013 from http://www.natureserve.org/explorer/statusca.htm

value (Flagged Value) – The taxon itself is not named in the Canadian Species at Risk list, however, it does have status as a result of its taxonomic relationship to a named entity. For example, if a species has a COSEWIC status of "threatened", then by default, all of its recognized subspecies that occur in Canada also have a threatened status. The subspecies in this example would have the value "$T_{(2)}$" under COSEWIC. Likewise, if all of a species' infraspecific taxa occurring in Canada have the same COSEWIC status, then that status appears in the entry for the "full" species as well. In this case, if the species name is not mentioned in the Canadian Species at Risk list, the status appears with a flag $_{(2)}$ in NatureServe Explorer.
value, value: (Combination values with flags) – The taxon itself is not named in the Canadian Species at Risk list, however, all of its infraspecific taxa occurring in Canada do have status but two or more of the taxa do not have the same status. In this case, a combination of statuses shown with a flag $_{(7)}$ indicates the statuses that apply to infraspecific taxa or populations within this taxon.
PS (partial status) – Indicates "partial status" – in only a portion of the species' range in Canada. Typically indicated for a "full' species where at least one but not all of a species' infraspecific taxa or populations has COSEWIC status.
PS:*value* (partial status) – Indicates "partial status" – status in only a portion of the species' range. The value of that status appears because the entity with status (usually a population defined by geopolitical boundaries within Canada) does not have an individual entry in NatureServe Explorer. Information about the entity with status can be found in reports for the associated species.

[5]MNR (Ministry of Natural Resources)
(*provincial status from MNR September, 2014)*
The provincial review process is implemented by the MNR's Committee on the Status of Species at Risk in Ontario (COSSARO).

EXT - Extinct—A species that no longer exists anywhere.
EXP - Extirpated—A species that no longer exists in the wild in Ontario but still occurs elsewhere.
END - Endangered - A species facing imminent extinction or extirpation in Ontario which is a candidate for regulation under Ontario's Endangered Species Act (ESA).
THR - Threatened—A species that is at risk of becoming endangered in Ontario if limiting factors are not reversed.
SC - Special Concern (formerly Vulnerable) —A species with characteristics that make it sensitive to human activities or natural events.
NAR - Not at Risk—A species that has been evaluated and found to be not at risk.
DD - Data Deficient (formerly Indeterminate) —A species for which there is insufficient information for a provincial status recommendation.

[6] SARA (Species at Risk Act) Status and Schedule
The Act establishes Schedule 1, as the official list of species at risk. It classifies those species as being either Extirpated, Endangered, Threatened, or a Special Concern. Once listed, the measures to protect and recover a listed species are implemented.
EXT Extinct - A species that no longer exists.
EXP Extirpated **-** A species that no longer exists in the wild in Canada, but exists elsewhere in the wild.
END Endangered - A species that is facing imminent extirpation or extinction.
THR Threatened - A species that is likely to become endangered if nothing is done to reverse the factors leading to its extirpation or extinction.
SC Special Concern - A species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats.

Schedule 1: is the official list of species that are classified as extirpated, endangered, threatened, and of special concern.
Schedule 2: species listed in Schedule 2 are species that had been designated as endangered or threatened, and have yet to be re-assessed by COSEWIC using revised criteria. Once these species have been re-assessed, they may be considered for inclusion in Schedule 1.
Schedule 3: species listed in Schedule 3 are species that had been designated as special concern, and have yet to be re-assessed by COSEWIC using revised criteria. Once these species have been re-assessed, they may be considered for inclusion in Schedule 1.

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

Government of Canada. Species at Risk Public Registry. Website: [http://www.sararegistry.gc.ca/default_e.cfm September 27, 2012]

Glossary: http://www.sararegistry.gc.ca/about/glossary/default_e.cfm#e
Species Index A-Z: http://www.sararegistry.gc.ca/sar/index/default_e.cfm
Species Listing by Schedule: http://www.sararegistry.gc.ca/sar/listing/default_e.cfm

[7] Regional Status –

Halton Region

Halton Natural Areas Inventory. 2006. The Vascular Plants of Halton Region, Ontario. Volume 2: Species Checklists.
Codes are adapted as follows:
R – Rare
U – Uncommon
F – Requires further review
EX – Extirpated

APPENDIX E – Wildlife Species List and Amphibian Breeding Data

Table E.1 – Wildlife Species List

Common Name	*Scientific Name*	SRANK[2]	COSEWIC[3]	MNR[4]	SARA Status[5]	Schedule[5]	CVC (2010) [6]	Halton Region (1993) [7]	Highest Breeding Evidence	1	2	3 (see #2)	4	5 no data	6	7	8	9	10	11 no data	12	13	14	15	16	17	18 no data	19	20 no data	21 no data	22	23 no data	24	25	26	27	28	29 no data	30 no data	31	32	33 no data	34 no data	35	36	37	38	39	40	41	42	Ag. Lands
Birds																																																			
Mallard	*Anas platyrhynchos*	S5					4		Possible												2/H										2/H																							
Wood Duck	*Aix sponsa*	S5					2		Possible																						1/H																							
Canada Goose	*Branta canadensis*	S5					4	I	Possible																						2/H																							
Wild Turkey	*Meleagris gallopavo*	S5					3	U/I	Confirmed		7/FY														2/H																													X
Green Heron	*Butorides virescens*	S4B					2	U	Possible												1/H																																	
Great Blue Heron	*Ardea herodias*	S4					3		Possible																4/H																													
Turkey Vulture	*Cathartes aura*	S5B					3		Possible																						4/H																							X
Cooper's Hawk	*Accipiter cooperii*	S4	NAR	NAR			2	U	Possible																						1/H																					1/X			
Red-tailed Hawk	*Buteo jamaicensis*	S5	NAR	NAR			4		Confirmed																2/H						2/P												3/FY										X
Killdeer	*Charadrius vociferus*	S5B, S5N					3		Probable							1/H	1/H	2/P																								2/A											X
American Woodcock	*Scolopax minor*	S4B					3		Possible		1/H																																										
Spotted Sandpiper	*Actitis macularius*	S5					3		Possible																						1/H																							
Ring-billed Gull	*Larus delawarensis*	S5B, SZN					2		Observed																																2/X												X
Rock Pigeon	*Columba livia*	SNA					5	I	Possible	4/H															2/H																												
Mourning Dove	*Zenaida macroura*	S5					4		Possible		2/H		1/H		1/S		1/H				1/H				1/H										2/X		1/H		6/X									1/X			1/X	
Black-billed Cuckoo	*Coccyzus erythropthalmus*	S4B, SZN					2	U	Possible																1/S						1/S																					
Great Horned Owl	*Bubo virginianus*	S4					3		Possible		1/H																																										
Chimney Swift	*Chaetura pelagica*	S4B,S4N	THR	THR	THR	1	1	U	Possible																						2/H																							
Ruby-throated Hummingbird	*Archilochus colubris*	S5B					3		Possible															1/H																													
Belted Kingfisher	*Megaceryle alcyon*	S4B					3		Possible												1/H				1/H						1/H																							
Hairy Woodpecker	*Picoides villosus*	S5					3		Possible		1/H														1/H																1/X												
Downy Woodpecker	*Picoides pubescens*	S5					4		Confirmed		2/P		1/H									1/H		1/H		2/P		1/H			2/X		2/H	2/H	1/X		2/FY				2/H									1/X		
Pileated Woodpecker	*Dryocopus pileatus*	S5					2	U	Probable																2/P						2/A																					
Red-bellied Woodpecker	*Melanerpes carolinus*	S4					2	U	Possible		1/H														1/H						1/X		1/H				1/H															
Northern Flicker	*Colaptes auratus*	S4B					3		Confirmed															2/H		3/FY		1/H			1/X		5/FY	1/H									1/H										
Eastern	*Tyrannus tyrannus*	S4B					3		Probable				2/P						1/H												2/A									1/H												

Common Name	*Scientific Name*	SRANK[2]	COSEWIC[3]	MNR[4]	SARA Status[5]	Schedule[5]	CVC (2010) [6]	Halton Region (1993) [7]	Highest Breeding Evidence	1	2	3 (see #2)	4	5 no data	6	7	8	9	10	11 no data	12	13	14	15	16	17	18 no data	19	20 no data	21 no data	22	23 no data	24	25	26	27	28	29 no data	30 no data	31	32	33 no data	34 no data	35	36	37	38	39	40	41	42	Ag. Lands
Kingbird																																																			
Great Crested Flycatcher	*Myiarchus crinitus*	S4B					3		Probable		2/S													1/S		2/P		1/S				2/H								2/S			1/H									
Eastern Phoebe	*Sayornis phoebe*	S5B					3		Confirmed		2/N										1/S					2/P						4/FY																				
Eastern Wood-pewee	*Contopus virens*	S4B	SC				3		Possible		2/S															2/S		1/S				1/S								2/S												
Willow Flycatcher	*Empidonax traillii*	S5B,SZN					3	U	Possible																							2/S																				
Alder Flycatcher	*Empidonax alnorum*	S5B					3		Possible																							1/S																				
Least Flycatcher	*Empidonax minimus*	S4B					3	U	Possible																							1/S																				
Red-eyed Vireo	*Vireo olivaceus*	S5B					4		Confirmed		6/S				1/S						1/S	1/S		2/A	1/S	5/FY		3/S				3/S	2/S			2/S			5/S			1/S									
Warbling Vireo	*Vireo gilvus*	S5B					4		Possible		1/S										2/S	1/S										1/S																				
Blue Jay	*Cyanocitta cristata*	S5							Confirmed		3/H											2/H		2/H		4/FY		2/H			3/X		4/X						2/H			2/H				2/X	1/X	3/X		
Common Raven	*Corvus corax*	S5						R	Observed																					1/X																				
American Crow	*Corvus brachyrhynchos*	S5B					4		Confirmed		2/H		2/P													6/H															3/FY	2/H						6/X			X
Horned Lark	*Eremophila alpestris*	S5B,SZN					3	U	Possible																															2/H										X
Purple Martin	*Progne subis*	S4B					2	U	Probable												2/P																														
Cliff Swallow	*Petrochelidon pyrrhonota*	S4B					3		Probable	2/N															2/H																											X
Barn Swallow	*Hirundo rustica*	S4B	THR	THR	No Status	No schedule			Confirmed																							7/FY																				X
Tree Swallow	*Tachycineta bicolor*	S4B					3		Possible										2/H			2/H			2/H																										X
Northern Rough-winged Swallow	*Stelgidopteryx serripennis*	S4B					3	U	Possble																							3/H																				
Black-capped Chickadee	*Poecile atricapillus*	S5					4		Confirmed		5/FY		1/H		2/H						2/H	3/H		2/H		4/FY		2/H			2/X		6/FY	2/H	4/X		2/H			6/FY							3/X	4/X	3/X		
White-breasted Nuthatch	*Sitta carolinensis*	S5					3		Probable		2/T													1/H		2/H		1/H			1/X		1/H	1/H					2/P			1/H								
Red-breasted Nuthatch	*Sitta canadensis*	S5					3	U	Possible		1/H																																					2/X				
Brown Creeper	*Certhia americana*	S5B					2	U	Probable		2/T																																									
House Wren	*Troglodytes aedon*	S5B					4		Probable		2/H		1/H		1/S							1/H		1/H		2/A						1/S	1/S			1/S			1/S			1/S								
Wood Thrush	*Hylocichla mustelina*	S4B	THR				2		Possible																	1/S																									
Veery	*Catharus fuscescens*	S4B					3		Possible																	1/S																									
American Robin	*Turdus migratorius*	S5B					4		Confirmed	3/FY	3/FY		2/FY		2/S		2/S		2/S		1/H	2/H	2/H	3/FY	1/S	6/FY		1/S			2/X		7/FY	4/FY	13/X		4/FY			5/FY			2/H				2/X	5/X	1/X	X
Eastern Bluebird	*Sialia sialis*	S5B	NAR	NAR			3	U	Possble																															1/S										
Northern Mockingbird	*Mimus polyglottos*	S4					3	U	Possble							1/S																																			

Common Name	*Scientific Name*	SRANK[2]	COSEWIC[3]	MNR[4]	SARA Status[5]	Schedule[5]	CVC (2010) [6]	Halton Region (1993) [7]	Highest Breeding Evidence	1	2	3 (see #2)	4	5 no data	6	7	8	9	10	11 no data	12	13	14	15	16	17	18 no data	19	20 no data	21 no data	22	23 no data	24	25	26	27	28	29 no data	30 no data	31	32	33 no data	34 no data	35	36	37	38	39	40	41	42	Ag. Lands
Gray Catbird	*Dumetella carolinensis*	S4B					3		Confirmed		5/FY		1/S									1/S	1/S	1/H	1/H	3/FY		1/S				2/S	1/S	1/X		1/H				3/S			1/S							2/X		
Brown Thrasher	*Toxostoma rufum*	S4B					2		Possible															1/S																												X
European Starling	*Sturnus vulgaris*	SNA					5	I	Confirmed	5/FY			3/H		2/H		4/FY		3/H				2/H		3/H					3/X					6/FY			9/FY	7/FY			33/ FY								3/X	X
Cedar Waxwing	*Bombycilla cedrorum*	S5B					4		Confirmed		5/FY										3/H		2/H																2/H							2/X					
Yellow Warbler	*Setophaga petechia*	S5B					4		Confirmed		3/T										1/S	3/S	1/S	1/H								5/FY							3/A			2/S									
Pine Warbler	*Setophaga pinus*	S5B					3	U	Probable		1/T															1/S						1/T							1/S											
Ovenbird	*Seiurus aurocapilla*	S4B					3		Probable		2/T															2/S																								
Northern Waterthrush	*Parkesia noveboracensis*	S5B					3	U	Possible																	1/S																								
Mourning Warbler	*Geothlypis philadelphia*	S4B					3	U	Possible		2/S															1/S						1/S																	
Common Yellowthroat	*Geothlypis trichas*	S5B					4		Probable		3/A											2/S	2/S		1/S	1/S						2/A							1/S			1/S									
Hooded Warbler	*Setophaga citrina*	S3B	NAR	NAR			1	R	Possible																	1/S																								
American Redstart	*Setophaga ruticilla*	S5B					3		Probable		1/T															2/A																								
Scarlet Tanager	*Piranga olivacea*	S4B					3		Possible																							1/S																	
Vesper Sparrow	*Pooecetes gramineus*	S4B					2	U	Possible									1/S																1/X																	X
Savannah Sparrow	*Passerculus sandwichensis*	S4B					4		Confirmed	1/S						2/CF	1/S		1/S						1/S								3/X																	X
Chipping Sparrow	*Spizella passerina*	S5B					4		Probable		2/P														1/S	1/H		1/H					1/S			1/S				1/H			1/H					3/X			X
Field Sparrow	*Spizella pusilla*	S4B					3		Possible				1/S																		2/P																	X
Song Sparrow	*Melospiza melodia*	S5B					4		Confirmed	2/S	11/ FY		2/S		1/S	1/H					1/S	3/S	2/S	2/S	2/S	5/FY		2/S			1/X		9/FY	3/S	9/X	3/X	1/S				2/S			2/CF				2/X	1/X	6/X	1/X	X
Swamp Sparrow	*Melospiza georgiana*	S5B					4		Probable													2/A																	1/S											
Northern Cardinal	*Cardinalis cardinalis*	S5					2		Confirmed		4/FY				1/S						2/H	2/P		1/S		4/FY		4/FY			1/X		4/S	1/H	2/X		3/FY			6/FY			1/H				2/X	1/X	5/X	2/X	
Rose-breasted Grosbeak	*Pheucticus ludovicianus*	S4B					3		Confirmed		3/T											1/S		1/S		4/FY		1/S					1/H	1/S			1/S			3/H								1/X		
Indigo Bunting	*Passerina cyanea*	S4B					3		Probable		1/S											1/S		1/S	1/A	2/S		1/S					2/S	1/S			1/S			2/P			1/S							
Bobolink	*Dolichonyx oryzivorus*	S4B	THR	THR	No Status	No schedule	2		Observed																																									X
Brown-headed Cowbird	*Molothrus ater*	S4B					4		Confirmed		2/CF							1/H								3/FY										2/H																X
Red-winged Blackbird	*Agelaius phoeniceus*	S4					4		Confirmed		8/FY		2/H		2/H		4/H	3/A	2/H		2/H	8/FY	5/H	2/A		4/FY					4/X		8/FY	2/X	10/X	5/X			4/FY	6/FY			5/FY					12/X	2/X	X
Eastern Meadowlark	*Sturnella magna*	S4B	THR	THR	No status		3		Observed																																									X
Orchard Oriole	*Icterus spurius*	S4B					3	R	Possible																							1/S																			

Common Name	*Scientific Name*	SRANK[2]	COSEWIC[3]	MNR[4]	SARA Status[5]	Schedule[5]	CVC (2010) [6]	Halton Region (1993) [7]	Highest Breeding Evidence	1	2	3 (see #2)	4	5 no data	6	7	8	9	10	11 no data	12	13	14	15	16	17	18 no data	19	20 no data	21 no data	22	23 no data	24	25	26	27	28	29 no data	30 no data	31	32	33 no data	34 no data	35	36	37	38	39	40	41	42	Ag. Lands
Baltimore Oriole	*Icterus galbula*	S4B					3		Confirmed		2/P		1/S		1/S						1/H	2/H	1/S	1/S		2/FY		1/S					4/FY				1/S			3/H			2/S									
Common Grackle	*Quiscalus quiscula*	S5B					4		Confirmed		11/ FY					3/H	2/H	3/H				5/FY	2/H	2/H		11/ FY							3/H	5/FY			2/S			11/ FY			9/FY							1/X	X
House Finch	*Carpodacus mexicanus*	SNA					5	I	Possible													2/S										2/S													1/X				
American Goldfinch	*Spinus tristis*	S5B					4		Probable		7/H								2/H				2/P	2/H		2/P						2/H			2/X							4/H								
House Sparrow	*Passer domesticus*	SNA					5	I	Probable							4/P			4/P																	2/H															X
Amphibians & Reptiles																																																			
Snapping Turtle	*Chelydra serpentina*	S3	SC	SC	SC	1	1	C																								1																			
Midland Painted Turtle	*Chrysemys picta marginata*	S5					3	C			1																																								
Milksnake	*Lampropeltis triangulum*	S3	SC	SC	SC	1	1	C																						1[1]		1[1]																			
Eastern Gartersnake	*Thamnophis sirtalis sirtalis*	S5					4	A																	1																										
American Toad	*Anaxyrus americanus*	S5					3	A			1																																								
Gray Treefrog	*Hyla versicolor*	S5					3	A																	2																										
Green Frog	*Lithobates clamitans*	S5					3	A			2																					2											14								
Northern Leopard Frog	*Lithobates pipiens*	S5	NAR	NAR			3	A													1	2																														
Mammals																																																			
Eastern Cottontail	*Sylvilagus floridanus*	S5					4	C														1								1																					
Eastern Chipmunk	*Tamias striatus*	S5					3	C			2														2					1																					
Woodchuck	*Marmota monax*	S5					3	C													1																														
Grey Squirrel	*Sciurus carolinensis*	S5					4				5												2		10		1		2		2																				
Red Squirrel	*Tamiasciurus hudsonicus*	S5					3	C														1										1																			
Beaver	*Castor canadensis*	S5					3	C																								1																			
Deer Mouse	*Peromyscus maniculatus*	S5					3	C																								1																			
Meadow Vole	*Microtus pennsylvanicus*	S5					3	C			1																																								
Coyote	*Canis latrans*	S5					3	C																	1							1																			
Raccoon	*Procyon lotor*	S5					4	C			1														1																										

[1] Anecdotal record only, provided by local landowner. Species was not observed in the field.

Common Name	*Scientific Name*	SRANK[2]	COSEWIC[3]	MNR[4]	SARA Status[5]	Schedule[5]	CVC (2010) [6]	Halton Region (1993) [7]	Highest Breeding Evidence	1	2	3 (see #2)	4	5 no data	6	7	8	9	10	11 no data	12	13	14	15	16	17	18 no data	19	20 no data	21 no data	22	23 no data	24	25	26	27	28	29 no data	30 no data	31	32	33 no data	34 no data	35	36	37	38	39	40	41	42	Ag. Lands
Mink	*Mustela vison*	S5					2	C																															1												
White-tailed Deer	*Odocoileus virginianus*	S5					3	C			3											1			1																											
Dragonflies & Damselflies																																																		
Common Green Darner	*Anax junius*	S5					X															2			3																										
Ebony Jewelwing	*Calopteryx maculata*	S5					X														6				6							20																			
Twin-spotted Spiketail	*Cordulegaster maculata*	S4					X	R																	1							1																			
Stream Cruiser	*Didymops transversa*	S4					X																									1																			
Familiar Bluet	*Enallagma civile*	S5					X															10																													
Stream Bluet	*Enallagma exsulans*	S5					X	R													3											5																			
Swamp Darner	*Epiaeschna heros*	S2S3					X	R																								1																			
Common Baskettail	*Epitheca cynosura*	S5					X	U														2			1							3																			
Harpoon Clubtail	*Gomphus descriptus*	S3					X																									1																			
Lancet Clubtail	*Gomphus exilis*	S5					X	U																								1																			
Eastern Forktail	*Ischnura verticalis*	S5					X																									2																			
Emerald Spreadwing	*Lestes dryas*	S5					X																									2																			
Dot-tailed Whiteface	*Leucorrhinia intacta*	S5					X																									2																			
Twelve-spotted Skimmer	*Libellula pulchella*	S5					X				1														2																											
Common Whitetail	*Plathemis lydia*	S5					X																									3																			
White-faced Meadowhawk	*Sympetrum obtrusum*	S5					X																									5																			
Black Saddlebags	*Tramea lacerata*	S4					X																		2																											
Butterflies & Moths																																																			
Northern Cloudywing	*Thorybes pylades*	S5					X	C																								2																			
Least Skipper	*Ancyloxypha numitor*	S5					X	C														1																													
European Skipper	*Thymelicus lineola*	SNA					X	C													2																														
Hobomok Skipper	*Poanes hobomok*	S5					X	LS / R														2										4																			
Black Swallowtail	*Papilio polyxenes*	S5					X	R			1								1																																
Eastern Tiger Swallowtail	*Papilio glaucus*	S5					X														1				1							1																			
Cabbage White	*Pieris rapae*	SNA					X			5	2		2		1																2								1												

Common Name	*Scientific Name*	SRANK[2]	COSEWIC[3]	MNR[4]	SARA Status[5]	Schedule[5]	CVC (2010) [6]	Halton Region (1993) [7]	Highest Breeding Evidence	1	2	3 (see #2)	4	5 no data	6	7	8	9	10	11 no data	12	13	14	15	16	17	18 no data	19	20 no data	21 no data	22	23 no data	24	25	26	27	28	29 no data	30 no data	31	32	33 no data	34 no data	35	36	37	38	39	40	41	42	Ag. Lands
Clouded Sulphur	*Colias philodice*	S5					X			15								2														7			2																
Orange Sulphur	*Colias eurytheme*	S5					X																									1																		
Eastern Tailed Blue	*Everes comyntas*	S5					X																											2																	
Summer Azure	*Celastrina neglecta*	S5					X				1															2						2																			
Silvery Blue	*Glaucopsyche lygdamus*	S5					X	C																								1																		
Great Spangled Fritillary	*Speyeria cybele*	S5					X	R																								1																		
Pearl Crescent	*Phyciodes tharos*	S4					X	LS / U																								2																		
Question Mark	*Polygonia interrogationis*	S5					X	C																								1																		
Eastern Comma	*Polygonia comma*	S5					X	LS / U																1																											
Mourning Cloak	*Nymphalis antiopa*	S5					X	LS / R																		1																										
Painted Lady	*Vanessa cardui*	S5					X	LS / R																								1		1																		
Red Admiral	*Vanessa atalanta*	S5					X	C																									1																		
Common Buckeye	*Junonia coenia*	SNA					X																		1																										
Red-spotted Purple	*Limenitis arthemis astyanax*	S5					X	R			1																																	1								
Northern Pearly-Eye	*Enodia anthedon*	S5					X																																				1								
Little Wood-Satyr	*Megisto cymela*	S5					X	C																		8		2				4																		
Common Ringlet	*Coenonympha tullia*	S5					X	C															3		2							2																		
Common Wood-Nymph	*Cercyonis pegala*	S5					X	C			5															2																										
Monarch	*Danaus plexippus*	S2N,S4B	SC	SC	SC	1	X																		1									1																		1		

* Numbers in columns indicate the number of specimans observed. When a / is shown to the right of a number with a letter. The letter cooresponds to breeding bird eveidence.

Breeding Bird Evidence Level

X- Observation

Possible = H- Species observed in its breeding season in suitable nesting habitat, S- Singing male/breeding calls in suitable nesting habitat in breeding season

Probable = T-Territory, A-Anxiety Behaviour, P-Pair, N-Nest building

Confirmed = F- Fledged young, CF- carrying food

[1]G-Rank (global)

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

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

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

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

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

G5 Very common - demonstrably secure under present conditions.

[2]S-Ranks (provincial)

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

S1 Critically Imperiled - Critically imperiled in the nation or state/province because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the state/province.

S2 Imperiled - Imperiled in the nation or state/province because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the nation or state/province.

S3 Vulnerable - Vulnerable in the nation or state/province due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.

S4 Apparently Secure - Uncommon but not rare; some cause for long-term concern due to declines or other factors.

S5 Secure - Common, widespread, and abundant in the nation or state/province.

S#S# Range Rank - A numeric range rank (e.g., S2S3) is used to indicate any range of uncertainty about the status of the species or community. Ranges cannot skip more than one rank (e.g., SU is used rather than S1S4).

SAN Non-breeding accidental.

SE Exotic - not believed to be a native component of Ontario's fauna.

SZN Non-breeding migrants/vagrants.

SZB Breeding migrants/vagrants.

[3]COSEWIC (Committee on the Status of Endangered Wildlife in Canada)

(federal status from COSEWIC April 2014)

EXT Extinct - A species that no longer exists.

EXP Extirpated - A species no longer existing in the wild in Canada, but occurring elsewhere.

END Endangered - A species facing imminent extirpation or extinction.

THR Threatened - A species likely to become endangered if limiting factors are not reversed.

SC Special Concern (formerly vulnerable) - A species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats.

NAR Not At Risk - A species that has been evaluated and found to be not at risk of extinction given the current circumstances.

DD Data Deficient (formerly Indeterminate) - Available information is insufficient to resolve a species' eligibility for assessment or to permit an assessment of the species' risk of extinction.

[4]OMNRF (Ontario Ministry of Natural Resources and Forestry)

EXT Extinct - A species that no longer exists anywhere in the world.

EXP Extirpated - A species that lives somewhere in the world, lived at one time in the wild in Ontario, but no longer lives in the wild in Ontario.

END Endangered - A species that is facing imminent extinction or extirpation.

THR Threatened - A species that is likely to become endangered if steps are not taken to address factors threatening to lead to its extinction or extirpation.

SC Special Concern – A species that may become threatened or endangered because of a combination of biological characteristics and identified threats.

[5]SARA (Species at Risk Act) Status and Schedule

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

EXT Extinct - A wildlife species that no longer exists.

EXP Extirpated - A wildlife species that no longer exists in the wild in Canada, but exists elsewhere in the wild.

END Endangered - A wildlife species that is facing imminent extirpation or extinction.

THR Threatened - A wildlife species that is likely to become endangered if nothing is done to reverse the factors leading to its extirpation or extinction.

SC Special Concern - A wildlife species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats.

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

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

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

The Act establishes Schedule 1 as the official list of wildlife species at risk. However, please note that while Schedule 1 lists species that are extirpated, endangered, threatened and of special concern, the prohibitions do not apply to species of special concern.

Species that were designated at risk by COSEWIC prior to October 1999 (Schedule 2 & 3) must be reassessed using revised criteria before they can be considered for addition to Schedule 1 of SARA. After they have been assessed, the Governor in Council may on the recommendation of the Minister, decide on whether or not they should be added to the List of Wildlife Species at Risk.

Government of Canada. Species at Risk Public Registry. Website: http://www.sararegistry.gc.ca/default_e.cfm November 3, 2010[]

Glossary: http://www.sararegistry.gc.ca/about/glossary/default_e.cfm#e

Species Index A-Z: http://www.sararegistry.gc.ca/sar/index/default_e.cfm

Species Listing by Schedule: http://www.sararegistry.gc.ca/sar/listing/default_e.cfm

[6]Credit Valley Conservation (2010)

Credit Valley Conservation Species of Conservation Concern Project (June 2010). These rankings are part of a draft watershed list current as of June 2010. This list is a dynamic document and subject to periodic review.

TIER	TITLE	CRITERIA
1	Species of Conservation Concern	Federal/provincial legislation, COSEWIC and COSSARO designations, NHIC S1-S3? ranks, local rarity (anticipated)*
2	Species of Interest	Local lists, CVC data, professional judgment
3	Species of Urban Interest	Mississauga NAS Ranks, CVC data, professional judgment
4	Secure Species	CVC data, professional judgment
5	Non-Native & Non-Native Hybrid Species	Not native to Ontario and/or the Credit River watershed but found planted or naturalized.

* An anticipated outcome is for locally rare species to be updated to Tier 1 status and for CVC to develop policy to protect these species.

Tier 1—Species of Conservation Concern

Tier 1 species, Species of Conservation Concern, are either currently protected under Canada's Species At Risk Act (SARA) or Ontario's Endangered Species Act (ESA), have been designated a species at risk by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) or by the Committee on the Status of Species at Risk on Ontario (COSSARO), or have been assigned at Subnational Rank (S-rank) of S1-S3? by the Natural Heritage Information Centre (NHIC). Tier 1 species are generally characterized by low abundance, low population density, specialized habitat requirements, and/or a narrow tolerance for survival.

Tier 2 – Species of Interest

Tier 2 species are those that have not been identified as Species of Conservation Concern but may be at risk from extirpation from the Credit River Watershed. These species appear to be exhibiting population declines, are naturally rare, are known or suspected to be sensitive to habitat loss and the effects of urbanization, or are species for which data is lacking. CVC aims to track these species to ensure that through policy and stewardship they receive the protection they require to prevent extirpation.

Tier 3—Species of Urban Interest

Species that have been designated Tier 3 are being tracked in urban areas. Urban areas are considered to be those within 2 km of built up cities or towns, including Mississauga, Brampton, Georgetown, Acton, Erin and Orangeville. Generally these species are secure in rural areas but have shown declines in or sensitivities to areas that are anthropogenically influenced or disturbed. CVC is interested in tracking these species to guide management decisions and address species declines in urban areas.

Tier 4—Secure Species

Tier 4 species are currently considered to be secure in the Credit River watershed. CVC continues to record these species and their relative abundance; however their locations and exact numbers are not recorded.

Tier 5 – Non-Native Hybrid Species

Tier 5 species are those that are not native either to Ontario or to the Credit River watershed. Not all Tier 5 species are considered invasive and harmful; CVC has prioritized invasive species for management and developed a list of the Top 16 invasive species within the watershed. Data collected on these Top 16 invasive species will help guide management decisions to protect native floral and faunal biodiversity and reduce the ecological and economic impacts of invasive species.

X=Present

[7]Halton Region

From : Halton Natural Areas Inventory (Dwyer 2006)

A = Abundant >125 Stations

C = Common 36-125 Stations

U = Uncommon 15-35 Stations

R= Rare < 15 Stations

E = Extirpated no longer present in Halton Region

I = Introduced an introduced species not native to Ontario

Uncertain = Uncertain if species is present in Halton Region

LS = Locally Significant

M = Migration

Table E.2 – Amphibian Calling Data

Amphibian Calling Stations*

Species	AC1			AC2a			AC2b			AC3			AC4			AC5		
	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd
Green Frog (*Lithobates clamitans)*																		
Northern Leopard Frog (*Lithobates pipiens)*																L1 (1)	L1 (1)	
American Toad (*Anaxyrus americanus)*												L1 (1)					L2 (2-3)	
Gray Treefrog (*Hyla versicolor)*												L1 (1)						
Spring Peeper (*Pseudacris crucifer)*							L2 (3-5)	L2 (10-15)								L1 (1)	L1 (2)	
Chorus Frog (*Pseudacris triseriata)*																		
Wood Frog (Lithobates sylvaticus)																L2 (2)		
Species Richness							**1**	**1**				**2**				**3**	**3**	

Species	AC6a			AC6b			AC7			AC8			AC9			AC10		
	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd
Green Frog (*Lithobates clamitans)*																		L2 (2)
Northern Leopard Frog (*Lithobates pipiens)*																		
American Toad (*Anaxyrus americanus)*											L1 (1)	L2 (4-6)		L2 (2-3)				
Gray Treefrog (*Hyla versicolor)*												L2 (4-6)			L1 (2)			L2 (4-6)
Spring Peeper (*Pseudacris crucifer)*				L3	L3	L1 (2)	L2 (1-2)	L3			L1 (1)		L2 (6-10)	L2 (8-10)		L3	L3	
Chorus Frog (*Pseudacris triseriata)*														L3				
Wood Frog (Lithobates sylvaticus)													L2 (5-6)					
Species Richness				**1**	**1**	**1**	**1**	**1**			**2**	**2**	**2**	**3**	**1**	**1**	**1**	**2**

Species	AC11			AC12			AC13			AC14			AC15			AC16		
	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd
Green Frog (*Lithobates clamitans)*						L1 (2)												L1 (1)
Northern Leopard Frog (*Lithobates pipiens)*	L1 (1)																	
American Toad (*Anaxyrus americanus)*	L2 (2-4)		L1 (2)		L1 (2)			L2 (3-4)	L2 (1-2)	L1 (1)	L2 (3-4)		L2 (3-4)	L2 (3-4)			L2 (2-3)	
Gray Treefrog (*Hyla versicolor)*		L2 (4-6)	L2 (5-7)					L2 (4-5)	L2 (1-2)		L2 (4-5)							L1 (1)
Spring Peeper (*Pseudacris crucifer)*	L3	L3	L1 (2)	L1 (1)	L2 (5-6)		L3	L3		L3	L3		L3	L2 (4-5)			L2 (4-5)	
Chorus Frog (*Pseudacris triseriata)*																		
Wood Frog (Lithobates sylvaticus)	L2 (3-5)						L3											
Species Richness	**4**	**2**	**3**	**1**	**2**	**1**	**2**	**3**	**2**	**2**	**3**		**2**	**2**			**2**	**2**

Call Level Codes

Level 1 (L1) – individual calls can be counted, no overlap

Level 2 (L2) – some calls can be counted, some overlap

Level 3(L3) – calls continuous and overlapping, individuals not distinguishable

Notations indicate call level followed by an estimate of the number of individuals calling

* Station locations are provided on Figure 4

APPENDIX F – Fish Species List

Table F.1. Fish Community

Common Name	Scientific Name	Thermal Regime	Tolerance	Habitat Preference[1]	ESA/COSSARO Status[2]	SARA Status/ Schedule[3]	Hornby Tributary (#3)	Black Creek (#12)	Black Creek (#24)	Tributary to Black Creek (#25)
Brook Trout	*Salvelinus fontinalis*	coldwater	intolerant	cold, clear, well-oxygenated streams, rivers, ponds and lakes with maximum water temperature less than 22°C; preferred water temperature range 13-17°C	-	-		✓[6]	✓[8]	✓[9]
Brown Trout	*Salmo trutta*	coldwater	intolerant	cool creeks and rivers with moderate flow, gravelly substrates and riffle-pool habitat, and lake shallows; preferred water temperature range 15-18°C	-	-		✓[6]		
Rainbow Trout	*Oncorhynchus mykiss*	coldwater	intolerant	mid-waters of lakes; creeks and rivers with moderate flow, gravelly bottoms and riffle-pool habitat; preferred water temperature range 12-18°C	-	-	✓[5]	✓[6]		
Atlantic Salmon	*Salmo salar*	coldwater	intolerant	cool mid-waters of lakes; rocky runs and pools of small to large coldwater rivers; preferred water temperature range 12-16°C	Extinct[4]	-			✓[8]	
Pumpkinseed	*Lepomis gibbosus*	warmwater	intermediate	warm, shallows of lakes and ponds, quiet, pools of creeks and small rivers, with aquatic vegetation and organic debris; preferred water temperature range 22-30°C	-	-	✓[5]	✓[7]		
White Sucker	*Catostomus commersonii*	coolwater	tolerant	pools and riffles of creeks and rivers, warm shallow lakes and embayments of larger lakes usually at depths of 6-9 m; preferred water temperature range 17-23°C	-	-	✓[5]	✓[6]		
Northern Hog Sucker	*Hypentelium nigricans*	warmwater	intermediate	riffles, runs and pools of clear creeks and small rivers with gravel, cobble substrates; rare in lakes; preferred water temperature range 25-29°C	-	-		✓[7]	✓[8]	
Mottled Sculpin	*Cottus bairdii*	coldwater	intermediate	cobble and gravel riffles of cool creeks, small rivers and rocky shores of lakes (<16 m deep); preferred water temperature range 13-18°C	-	-		✓[6]	✓[8]	
Rainbow Darter	*Etheostoma caeruleum*	coolwater	intolerant	fast-flowing gravel and cobble riffles of clear creeks and small to medium rivers; preferred water temperature 19.8°C	-	-	✓[5]			
Fantail Darter	*Etheostoma flabellare*	coolwater	intolerant	shallow, rocky riffles of creeks and small to medium rivers with deep pools and slow to moderate currents; preferred water temperature 22.4°C	-	-	✓[5]	✓[6]		
Johnny Darter	*Etheostoma nigrum*	coolwater	tolerant	sandy, silty, gravelly, sometimes rocky, pools of creeks and small to medium rivers, and sandy shores of lakes; preferred water temperature 22.8°C; reported to a depth of 42 m in the Great Lakes	-	-	✓[5]			
Creek Chub	*Semotilus atromaculatus*	coolwater	intermediate	pools of clear creeks and small rivers; rare in lakes and large rivers; preferred water temperature 20.8°C	-	-	✓[5]	✓[7]		
Brook Stickleback	*Culaea inconstans*	coolwater	intermediate	small, boggy headwater streams, shallow lake margins, ponds, and clear pools and backwaters of creeks and small rivers; usually associated with aquatic vegetation; occasionally brackish water; preferred water temperature 21.3°C	-	-	✓[5]			

Common Name	Scientific Name	Thermal Regime	Tolerance	Habitat Preference[1]	ESA/COSSARO Status[2]	SARA Status/ Schedule[3]	Hornby Tributary (#3)	Black Creek (#12)	Black Creek (#24)	Tributary to Black Creek (#25)
Western Blacknose Dace	*Rhinichthys obtusus*	coolwater	intermediate	riffles and runs of cool, small- to medium-sized streams with moderate to steep gradient and gravel substrate; rarely lakes; preferred water temperature range 19-25°C	-	-	✓[5]	✓[6]		
Nothern Redbelly Dace	*Chrosomus eos*	coolwater	intermediate	lakes, bogs, ponds and pools of creeks with organic substrates and aquatic vegetation; usually stained water; preferred water temperature 25.3°C	-	-		✓[7]		
Longnose Dace	*Rhinichthys cataractae*	coolwater	intermediate	cobble, boulder or gravel riffles of clean, cool, swiftly-flowing creeks and small to medium rivers, and rocky shores of lakes; preferred water temperature range 13-21°C	-	-		✓[6]	✓[8]	
Common Shiner	*Luxilus cornutus*	coolwater	intermediate	pools near riffles in clear, cool creeks and small to medium rivers, and near shore in clear-water lakes; preferred water temperature 21.9°C	-	-		✓[6]		
Bluntnose Minnow	*Pimephales notatus*	warmwater	intermediate	sand and gravel bottomed shallows of clear lakes, creeks, rivers and ponds; preferred water temperature 26.3°C	-	-	✓[5]	✓[6]		
Fathead Minnow	*Pimephales promelas*	warmwater	tolerant	still waters of ponds, lakes, creeks and small rivers with muddy substrate; preferred water temperature range 23-29°C	-	-		✓[7]		
Brassy Minnow	*Hybognathus hankinsoni*	coolwater	intermediate	pools of sluggish, clear creeks and small rivers with soft substrates, boggy lakes and shallow bays; often stained waters; usually associated with aquatic vegetation	-	-		✓[7]		

[1] Eakins, R. J. 2014. Ontario Freshwater Fishes Life History Database. Version 4.45. On-line database. (http://www.ontariofishes.ca), accessed November 2014

[2] ESA- Endangered Species Act
COSSARO – Committee on Status of Species at Risk in Ontario

[3] SARA – Species at Risk Act
"-" = No Status

[4] Lake Ontario population extinct. Occurrences are due to stocking reintroduction program.

[5] Conservation Halton. 2011. Grindstone Creek, Sixteen Mile Creek and Supplemental Monitoring. Long Term Monitoring Report.

[6] Whitford, J., March 2004. Trafalgar Road – 10 Side Road to Highway 7 – Aquatic Environment Report. (Whitford, Mar 2004).

[7] Credit Valley Conservation. 1982-1992. Trafalgar Road EA – Fish Collection Data.

[8] Whitford, J. Aquatic Environmental Report. Trafalgar Road, 10 Sideroad to Highway 7. January 2006

[9] Credit Valley Conservation. 2009. Black Creek Subwatershed Study – Background Report

APPENDIX G – SAR and SCC Screening Table

Table G.1 – Species at Risk and Species of Conservation Concern Screening

SPECIES	PREFERRED HABITAT	SRANK[1]	COSEWIC[2]	SARO[3]	SARA STATUS[4]	SARA SCHEDULE[5]	SOURCE OF RECORD	PRESENCE OF POTENIALLY SUITABLE HABITAT AND REASONABLE LIKLIHOOD OF SPECIES PRESENCE WITHIN STUDY AREA?	SURVEYS UNDERTAKEN	OBSERVED DURING FIELD SURVEYS
Vascular Plants, Lichens, Mosses										
American Chestnut (*Castanea dentata*)	The American Chestnut prefers dryer upland deciduous forests with sandy, acidic to neutral soils. In Ontario, it is only found in the Carolinian Zone between Lake Erie and Lake Huron. The species grows alongside Red Oak, Black Cherry, Sugar Maple, American Beech and other deciduous tree species [5.]	S2	END	END	END	1	MNRF regional list (2014-online)	Suitable habitat present within FOD communities or remnant treed upland areas throughout study area (located within Feature Units 38, 35, 34, 32, 30, 28, 11, 24, 23, 22, 25, 15, 19, 18, 17, and 42, including areas for which PTE was not granted and site conditions were assessed through air photo interpretation. Moderate quality habitat present in PTE areas (i.e., associate species present). Unlikely to occur due to rarity.	Visual search within suitable habitat where access allowed.	Not observed within PTE / visible ROW areas
American Columbo (*Frasera caroliniensis*)	American Columbo grows primarily in open deciduous forests, and to a lesser extent along open forest edges and dense shrub thickets in Ontario. It is most commonly found in dry upland woods, but in parts of its range it has been found in grasslands, moist woods and swampy habitats [5.]	S2	END	END	END	1	MNRF regional list (2014-online)	Most suitable habitat throughout study area in open deciduous woods in Feature Units 38, 35, 34, 32, 30, 28, 11, 24, 23, 22, 25, 15, 19, 18, 17, and 42, including areas for which PTE was not granted and site conditions were assessed through air photo interpretation.	Visual search within suitable habitat where access allowed.	Not observed within PTE / visible ROW areas
American Hart's-tongue Fern (Asplenium scolopendrium)	Restricted to calcareous rocky woods[21]	SC	SC	SC	SC	1	MNRF regional list (2014-online), NHIC Search (2014)	No suitable habitat present within areas for which PTE was granted. Suitable habitat is potentially present within other FOD communities that were not accessed that may be present in Feature Units 38, 35, 34, 32,30, 28, 23, 41, 18, 17. Best potential of these would be larger, less disturbed features north of 15 Sideroad where (if) calcareous rock outcrops are present. Unlikely to occur.	Visual search within suitable habitat where access allowed.	Not observed within PTE / visible ROW areas
Broad Beech Fern (*Phegopteris hexagonoptera*)	The Broad Beech Fern prefers to grow in rich soils in deciduous forests, often in areas dominated by maple and beech trees. It requires moist soil and usually grows in full shade.	S3	SC	SC	SC	3	MNRF regional list (2014-online)	Suitable habitat present within FOD communities throughout study area (located within Feature Units 38, 35, 34, 32, 30, 28, 11, 24, 23, 22, 25, 15, 19, 18, 17, and 42, including areas for which PTE was not granted and site conditions were assessed through air photo interpretation. Moderate quality habitat present (i.e. associate species present). Moderate potential to occur.	Visual search within suitable habitat where access allowed.	Not observed within PTE / visible ROW areas

SPECIES	PREFERRED HABITAT	SRANK[1]	COSEWIC[2]	SARO[3]	SARA STATUS[4]	SARA SCHEDULE[5]	SOURCE OF RECORD	PRESENCE OF POTENIALLY SUITABLE HABITAT AND REASONABLE LIKLIHOOD OF SPECIES PRESENCE WITHIN STUDY AREA?	SURVEYS UNDERTAKEN	OBSERVED DURING FIELD SURVEYS
Butternut (*Juglans cinerea*)	In Ontario, Butternut usually grows alone or in small groups in deciduous forests. It prefers moist, well-drained soil and is often found along streams. It is also found on well-drained gravel sites and rarely on dry rocky soil. This species does not do well in the shade, and often grows in sunny openings and near forest edges [5.]	S3?	END	END	END	1	NHIC Search (2014), MNRF Correspondence (2014)	Suitable habitat present throughout study area in all natural communities or at their edges and in Hedgerows (HRs). Likely to be present within FOD communities, and moderate potential to occur within SWD and floodplain areas. Records provided from MNRF indicate presence in Feature #17 and 24.	Visual search within suitable habitat where access allowed.	Yes, within Feature Units 17 and 25.
Dense Blazing Star *(Liatris spicata)*	Occurs in remnant prairie and oak savanna habitat and occasionally along rail lines and roadsides[21]	S3	THR	THR	THR	1	MNRF regional list (2014-online)	No suitable habitat within study area (to be confirmed through detailed site visits).	Visual search within suitable habitat where access allowed.	Not observed within PTE / visible ROW areas
Eastern Flowering Dogwood (*Cornus florida*)	Eastern Flowering Dogwood grows under taller trees in mid-age to mature deciduous or mixed forests. It most commonly grows on floodplains, slopes, bluffs and in ravines, and is also sometimes found along roadsides and fencerows.	S2	END	END	END	1	MNRF regional list (2014-online)	Suitable habitat present within FOD communities or remnant treed upland areas throughout study area (located within Feature Units 38, 35, 34, 32, 30, 28, 11, 24, 23, 22, 25, 15, 19, 18, 17, and 42), including areas for which PTE was not granted and site conditions were assessed through air photo interpretation. Unlikely to occur.	Visual search within suitable habitat where access allowed.	Not observed within PTE / visible ROW areas
Hoary Mountain mint (*Pycnanthemum incanum*)	In Ontario, Hoary Mountain-mint mostly occurs in dry, oak woodland habitat, on steep, warmer-than-normal slopes. The species does best in open areas with ample sunlight, in habitats that depend on disturbance such as fire to maintain these conditions.	S1	END	END	END	1	MNRF regional list (2014-online)	Suitable habitat present within FOD communities or remnant treed upland areas throughout study area (located within Feature Units 38, 35, 34, 32, 30, 28, 11, 24, 23, 22, 25, 15, 19, 18, 17, and 42), including areas for which PTE was not granted and site conditions were assessed through air photo interpretation. Habitat quality is generally poor in PTE areas (oak-dominated forest generally not present). Unlikely to occur.	Visual search within suitable habitat where access allowed.	Not observed within PTE / visible ROW areas
Northern Hawthorn (*Crataegus pruinosa var. dissona*)	Hawthorn species occur in disturbed sites and seral communities such as pastures, forest edges, open second growth forests, and thickets along streams[22]	S3	N/A	N/A	N/A	N/A	NHIC Search (2014)	Potential to occur throughout study area, particularly in HRs where Hawthorns are abundant. Moderate potential to occur.	Visual search within suitable habitat where access allowed.	Not observed within PTE / visible ROW areas

SPECIES	PREFERRED HABITAT	SRANK[1]	COSEWIC[2]	SARO[3]	SARA STATUS[4]	SARA SCHEDULE[5]	SOURCE OF RECORD	PRESENCE OF POTENIALLY SUITABLE HABITAT AND REASONABLE LIKLIHOOD OF SPECIES PRESENCE WITHIN STUDY AREA?	SURVEYS UNDERTAKEN	OBSERVED DURING FIELD SURVEYS
Red Mulberry (*Morus rubra*)	In Ontario, Red Mulberry grows in moist, forested habitats and on both sandy and limestone-based loamy soils. It is often found in areas where the forest canopy is quite open and allows lots of sunlight to reach the forest floor, but it will tolerate some shade.	S2	END	END	END	1	MNRF regional list (2014-online)	Suitable habitat present within FOD communities or remnant treed upland areas throughout study area (located within Feature Units 38, 35, 34, 32, 30, 28, 11, 24, 23, 22, 25, 15, 19, 18, 17, and 42), including areas for which PTE was not granted and site conditions were assessed through air photo interpretation. Habitat quality is generally poor in PTE areas (canopies likely provide too much shade). Unlikely to occur.	Visual search within suitable where access allowed.	Not observed within PTE / visible ROW areas
Rugulose Grape Fern (*Sceptridium rugulosum*)	Woodlands, woodland edges, and grassy open areas[21]	S2	N/A	N/A	N/A	N/A	NHIC Search (2014)	No known suitable habitat within study area and unlikely to occur. Presence/absence should be confirmed through appropriate site visits at detailed design stage.	Visual search of woodland edges and open areas where access allowed.	Not observed within PTE / visible ROW areas
Birds										
Acadian Flycatcher (*Empidonax virescens*)	Prefers mature deciduous forests, including beech-maple, oak-hickory and western mesophytic, although it also nests in conifers in appropriate habitats. Usually associated with water and found in bottomland forests along streams and often in deep, shady ravines. In northern part of range, occurs in wooded ravines, river bottoms, and tamarack swamps. Also reported in 35- to 50-yr-old pine plantations in Wisconsin. In Michigan sites were dominated by American beech, sugar maple, and hemlock. In New York, appears to favor shady hemlock ravines. In Ontario, the Acadian Flycatcher primarily lives in the warmer climate of southern Ontario's Carolinian forests. It needs large, undisturbed forests, often more than 40 hectares in size. It is typically found in mature, shady forests with ravines, or in forested swamps with lots of maple and beech trees. In southern Ontario, often breeds in black ash swamps [5; 13.]	S2S 3B	END	END	END	1	MNRF regional list (2014-online)	Yes, suitable habitat present in Unit 17 and 32 Unlikely to occur based on observed conditions	Breeding bird surveys	No
Barn Swallow (*Hirundo rustica*)	Ability to adapt to nesting in a variety of artificial structures (barns, bridges, etc.) and able to exploit foraging opportunities in open, human-modified, rural landscapes such as cliffs, caves, rock niche [3 -] Breeding habitat usually contains open areas (fields, meadows) for foraging, nest site that includes a vertical or horizontal substrate (often enclosed) underneath some type of roof or ceiling, and a body of water that provides mud for nest-building [13.]	S4B SZN	THR	THR	NA	NA	MNRF regional list (2014-Online), MNRF correspondence (2014)	Yes, suitable breeding habitat present along much of the Trafalgar Road corridor, in the form of culverts, barns, out buildings and other suitable structures.	Breeding bird surveys	Yes, this species iwas observed in Feature #24. Suitable habitat is present throughout the study area.

SPECIES	PREFERRED HABITAT	SRANK[1]	COSEWIC[2]	SARO[3]	SARA STATUS[4]	SARA SCHEDULE[5]	SOURCE OF RECORD	PRESENCE OF POTENIALLY SUITABLE HABITAT AND REASONABLE LIKLIHOOD OF SPECIES PRESENCE WITHIN STUDY AREA?	SURVEYS UNDERTAKEN	OBSERVED DURING FIELD SURVEYS
Bobolink (*Dolichonyx oryzivorus*)	Habitat mainly consists of hayfields, pastures, and meadows which are dominated a mixture of grasses and broad-leaved forbs (e.g., red clover, dandelion, timothy). also occurs in wet prairie, graminoid peatlands, abandoned fields, no-till cropland, small-grain fields, and reed beds. Bobolinks do not nest in annual row crops like corn and soybean; however, in at le some parts of southwestern Ontario (e.g., Norfolk, Chatham-Kent, Essex, Durham Bobolinks will nest in some large (i.e., >50 ha) fields of winter wheat and rye. Bobolinks are positively associated with high grass-to-forb ratios (i.e., grass cover usually dominant). They also prefer a moderate grass-litter depth (generally 2-5 cr They avoid fields having a thick litter layer and areas with bare ground. Density is significantly higher in areas with low alfalfa cover and total legume cover but with high grass-to-legume ratios e.g.hayfields ≥ 8 yr old). Nest tends to be sited in wet habitats, transitional between drier soils and areas providing poor drainage. Nest is always on ground, often at base of large forbs such as meadow rue, golden alexander, clover, etc. Bobolinks will occupy fields having scattered shrubs or fen posts that are used as perches but avoid fields where the cover of woody shrubs a saplings >25%. They also respond negatively to the presence of nearby forest edges. Bobolink is sensitive to habitat patch size, preferring larger grasslands (i.e., genera >10 ha). Although relatively small grasslands (e.g., 5-10 ha) in fragmented landscapes can provide suitable breeding habitat for Bobolink, these sites represe poor habitat if surrounded by forest. Bobolinks have a lower tolerance to the presence of patches of bare ground (e.g., 0.3%) than Eastern Meadowlarks (e.g., 0.5-8.5%) [13; 3.]	S4B	THR	THR	No Status	No Schedule	MNRF regional list (2014-online), MNRF correspondence (2014)	Yes, suitable breeding habitat is present adjacent to the Trafalgar Road corridor, in the form of hayfields, pasture, cultural meadow and old field habitat. Records provided from MNRF indicate presence in Feature #24. Suitable breeding habitat also located immediately adjacent to Unit 26	Breeding bird surveys	Yes, this species occurs frequently in the hayfields and pastures.
Cerulean Warbler (*Dendroica cerulea*)	Routinely identified with predominantly forested landscapes, mature forest, large and tall trees of broad-leaved, deciduous species with an open understory; in wet bottomlands, or upland situations. This species will occupy second-growth as well as mature forest. Usually considered an area-sensitive species. In Ontario, found breeding in tracts as small as 10 ha. Gaps in the canopy, or openings, are important for this species. Important habitat elements range wide for this species appear to include large tracts of forest with big deciduous trees in mature to older-growth forest with horizontal heterogeneity of, or openings in, the canopy. White oaks and bitternut hickories appear to be preferred in much of their range for nesting, foraging, and as song posts, while red oaks and red maples are typically avoided for most uses. The pattern of vertical distribution of foliage in the canopy is also important [13.]	S3B	END	THR	SC	1	MNRF regional list (2014-online)	Some suitable habitat present in Unit 17 and Unit 24. Species is unlikely to occur based on observed conditions	Breeding bird surveys	No

SPECIES	PREFERRED HABITAT	SRANK[1]	COSEWIC[2]	SARO[3]	SARA STATUS[4]	SARA SCHEDULE[5]	SOURCE OF RECORD	PRESENCE OF POTENIALLY SUITABLE HABITAT AND REASONABLE LIKLIHOOD OF SPECIES PRESENCE WITHIN STUDY AREA?	SURVEYS UNDERTAKEN	OBSERVED DURING FIELD SURVEYS
Canada Warbler (*Wilsonia canadensis)*	A variety of moist forest habitats with a well-developed understory. It prefers mixed forest with dense shrubs but will also inhabit shrub marshes, red maple swamps, cedar or aspen woods, spruce-tamarack bogs, spruce-birch forests, brushy ravines and slopes, and alder or willow riparian areas. Within these habitats it will build its nest on or near the ground in dense ferns, in cavities or banks, on fallen logs or roots of fallen trees, under shrubs, and next to rocks, hummocks, or stumps [3; 13; 10]	S5B, SZN	THR	SC	THR	1	MNRF regional list (2014)	Yes, some suitable habitat present in Unit 3, 17 and 24. Low likelihood to occur	Breeding bird surveys	No
Chimney Swift (*Chaetura pelagica)*	Appears more concentrated in urban areas where there are large concentrations of chimneys for nest sites and communal roosts. Most sightings occur in cities, towns, or small villages or open habitats near human settlement. However, in some relatively unpopulated areas, this species may still nest in hollow trees, tree cavities, or caves. Forages in a variety of habitats, even over forests, but most common over open country; above ponds and lakes, where insects concentrate; and residential areas [13.]	S5B SZN	THR	THR	THR	1	MNRF regional list (2013),	Potentially suitable habitat is present throughout the study site wherever wooded areas occur, or in the form of suitable chimneys as part of roadside / study area structures. Both woodland nesting [in hollow trees, snags or cavities] and anthropogenic nesting [chimneys, enclosed vertical surfaces] extremely hard to detect without specific surveys.	Breeding bird surveys	Yes, Unit 24, with possible breeding evidence
Eastern Meadowlark (*Sturnella magna*)	The Eastern Meadowlark is most common in pastures, followed by hayfields, native grasslands, and savannahs. It also nests in a wide variety of other grassland habitats, including weedy meadows, young orchards, golf courses, restored grasslands on surface mines, grassy roadside verges, young oak plantations, grain fields, herbaceous fencerows, and grassy airfields. Like the Bobolink, it rarely nests in row crops such as corn and soybean, except perhaps when grassed waterways are present. At the field scale, the Eastern Meadowlark's response to vegetation structure varies among studies. Optimal nesting habitat generally contains moderately tall (25 to 50 cm) grass with abundant litter cover, a high proportion of grass cover (>80% is optimal; <20% is inadequate), moderate forb density, low proportions of shrub and woody vegetation cover (<5%; >35% is too dense), and low percent cover of bare ground. Litter cover, plant diversity and vegetation patchiness increase, whereas total plant cover, legume cover, and vegetation height decrease. Grass-dominated hayfields are preferred over Alfalfa fields. The Eastern Meadowlark is not especially area-sensitive; nevertheless, large tracts of grasslands are generally preferred over smaller ones. The minimum size required is about five hectares. Eastern Meadowlarks have a higher tolerance to the presence of patches of bare ground (e.g., 0.5-8.5%) than Bobolinks (e.g., 0.3%) [13.]	S4B	THR	THR	No Status	No Schedule	MNRF regional list (2014-Online), MNR Correspondence (2014)	Yes, suitable breeding habitat is present adjacent to the Trafalgar Road corridor, in the form of hayfields, pasture, cultural meadow and old field habitat. Suitable breeding habitat also located immediately adjacent to Unit 26	Breeding bird surveys	Yes, 2 birds recorded in a hayfield south of Unit 3.

SPECIES	PREFERRED HABITAT	SRANK[1]	COSEWIC[2]	SARO[3]	SARA STATUS[4]	SARA SCHEDULE[5]	SOURCE OF RECORD	PRESENCE OF POTENIALLY SUITABLE HABITAT AND REASONABLE LIKLIHOOD OF SPECIES PRESENCE WITHIN STUDY AREA?	SURVEYS UNDERTAKEN	OBSERVED DURING FIELD SURVEYS
Eastern Wood Pewee (*Contopus virens)*	Inhabits a wide variety of wooded upland and lowland habitats including deciduous, coniferous, or mixed forests. Occurs most frequently in forests with some degree of openness, whether it be the result of forest structure, natural disturbance, or human alteration. Intermediate-aged forests with a relatively sparse midstory are preferred. Territories in such forests can be equally abundant under both an open or closed canopy. However, under some circumstances may be absent from closed-canopied forests. Tends to inhabit edges of younger forests having a relatively dense midstory. Also occurs in anthropogenic habitats providing an open forested aspect such as parks and suburban neighborhoods [10.]	S4B	SC	SC	No Status	No Schedule		Yes, suitable breeding habitat is present throughout the study area where moderate to large sized deciduous and mixed woodland is present. Areas of most suitable habitat include Units 2,3,6,12,15,17,19,22,24,25,26,28,32,35, 39	Breeding bird surveys	Yes, confirmed in Units 2, 17, 19, 24, and 32
Henslow's Sparrow (*Ammodramus henslowii*)	Henslow's sparrows occupy open fields. The vegetation of these areas includes tall grasses that are interspersed with tall herbaceous plants, or shrubby species. The sparrow avoids areas that have been grazed or burned. It prefers undisturbed areas with dense living grasses and a dense thatch of dead grasses. The species may occupy hayfields, but if the hay is cut early, the nests are destroyed and the resulting losses are severe. Only areas that remain undisturbed for several years appear to be more successfully colonized.4 Historically, populations along the Atlantic Coast were found to inhabit coastal marshes, swamps, dry fields, salt marshes, low wet meadows, and upland, weedy hayfields or pastures. Habitat also usually dominated by grasses and has scattered forbs for singing perches. Generally avoids grassland habitat adjacent to treelines [13].	SHB	END	END	END	1	MNRF regional list (2014-online)	Marginally suitable habitat present in the form of hayfields [along the Trafalgar Road corridor] and cultural meadow / old field adjacent to Unit 26. Very unlikely to occur	Breeding bird surveys	No
Hooded Warbler (*Setophaga citrina*)		S3B	No Status	No Status	No Status	No Schedule	MMM Group observation (2014)	Observed in Feature 17 with possible breeding evidence	Breeding Bird Surveys	Yes, confirmed in Unit 17 with possible breeding evidence.
Least Bittern (*Ixobrychus exilis*)	Area-sensitive. Bog/fen, HERBACEOUS WETLAND, Riparian, SCRUB-SHRUB WETLAND. Tall emergent vegetation in marshes, primarily freshwater, less commonly in coastal brackish marshes and mangrove swamps. Prefers marshes with scattered bushes or other woody growth. In the northeastern U.S., breeds mainly in wetlands along lakes, rivers, and estuaries on the coastal plain. Occurrences have been associated particularly with cattail, vegetated edges along deep, open waters, and nutrient-rich microhabitats. Nests typically 0.15-0.75 m above water near open water, in water typically 10-50 cm deep. Nesting usually occurs among dense, tall growths of emergent vegetation (particularly cattail, sedge, bulrush, or common reed interspersed with some woody vegetation and open, fresh water). Occurrences have been associated particularly with cattail, vegetated edges along deep waters, and approx. equal amounts of open water and veg ('hemi-marsh' conditions). Spend nearly all the diurnal period in dense, grass-like vegetation. Not associated with open, sparse, or short vegetative cover or muddy openings. Forages in shallow water or along banks. Heavy growths of cattail, bulrush, wild rice, burreed, water smartweed, and reeds are favored feeding sites [13; 10]. Intolerant of loss of habitat and human disturbance[2.]	S4B	THR	THR	THR	1	MNRF regional list (2014-online)	Suitable habitat not present. Species is unlikely to occur.	Breeding bird surveys	No

SPECIES	PREFERRED HABITAT	SRANK[1]	COSEWIC[2]	SARO[3]	SARA STATUS[4]	SARA SCHEDULE[5]	SOURCE OF RECORD	PRESENCE OF POTENIALLY SUITABLE HABITAT AND REASONABLE LIKLIHOOD OF SPECIES PRESENCE WITHIN STUDY AREA?	SURVEYS UNDERTAKEN	OBSERVED DURING FIELD SURVEYS
Louisiana Waterthrush (*Seiurus motacilla*)	Most frequently breeds along medium to high-gradient, first to third-order, clear, perennial streams flowing through closed-canopy, hilly, deciduous or mixed-evergreen forest. Territory density and occupancy are reduced along streams with degraded benthic macroinvertebrate communities. Establishes territories early in spring when streams are flowing, but in drought-impacted regions, by the time nestlings fledge stream may become intermittent or only pools of stagnant water may remain. Where range overlaps with Northern Waterthrush, tends to select sites with faster-flowing water, but territorial overlap between the 2 species is not uncommon and often extensive. Also breeds in cypress swamps and bottomland forest along mud-bottomed streams, but in lower densities than in upland forest [13]. Nests on ground [2].	S3B SZN	SC	SC	SC	1	MNRF regional list (2014-online)	Suitable habitat present in Units 3, 12 and 24 Low likelihood of occurrence.	Breeding bird surveys	No
Peregrine Falcon (*Falco peregrinus*)	Most commonly occupied habitats contain cliffs, for nesting, with open gulfs of air (rather than in confined areas) and generally open landscapes for foraging. May breed to 3,600 m. In some regions; threatened by chemical contamination; reintroduction efforts have been attempted in numerous locations throughout Ontario [2]. Peregrine Falcons usually nest on tall, steep cliff ledges adjacent to large waterbodies, but some birds adapt to urban environments and raise their young on ledges of tall buildings, even in densely populated downtown areas.5 Traditionally nest on cliffs ranging from about 8 to 400 m high; cliffs 50–200 m preferred [13].	S3B	SC	THR	No Status	No Schedule	MNRF regional list (2014-online)	Suitable habitat not present	Breeding bird surveys	No
Prothonotary Warbler (*Protonotaria citrea*)	Large, mature and semi-mature deciduous forest, swamp forest and riparian floodplain. Pools or slow moving water are characteristic. This species nests in natural cavities and those made by other species, located at low heights. Key (and nearly universal) features are presence of water near wooded area with suitable cavity nest sites. Nest usually placed over or near large bodies of standing or slow-moving water. Exhibits area sensitivity, avoiding forests <100 ha in area and avoiding waterways with wooded borders <30 m wide (Petit 1999).	S1S 2B,S ZN	END	END	END	1	MNRF regional list (2014-online)	Suitable habitat not present	Breeding bird surveys	No
Red-headed Woodpecker (*Melanerpes erythrocephalus*)	Feeds on insects and stores nuts or acorns for winter; requires cavity trees with at least 40 cm dbh; requires about 4 ha for a territory. Commonly found in deciduous woodlands, especially with beech or oak, lowland and upland habitats, river bottoms, open woods, groves of dead and dying trees, orchards, parks, open agricultural country, savannah-like grasslands with scattered trees, and forest edge and along roadsides. Found in open, upland meadow or short-grass areas, such as pastures around farms or residential zones such as golf courses, isolated woodlots, and forest islands. In those areas, at least a few snags or large dead limbs are necessary. Attracted to American beaver (Castor canadensis) ponds, open wooded swamps where dead trees and stumps are plentiful, fringes of bottomland forest with numerous snags near or over water, and margins of reclaimed strip mines and reservoirs [13].	S4B	THR	SC	THR	1	MMM species knowledge	Yes – this species can be found in a wide variety of wooded, semi-wooded and open areas. Red-headed Woodpecker should be considered possible throughout the study area. Low likelihood of occurrence	Breeding bird surveys	No

SPECIES	PREFERRED HABITAT	SRANK[1]	COSEWIC[2]	SARO[3]	SARA STATUS[4]	SARA SCHEDULE[5]	SOURCE OF RECORD	PRESENCE OF POTENIALLY SUITABLE HABITAT AND REASONABLE LIKLIHOOD OF SPECIES PRESENCE WITHIN STUDY AREA?	SURVEYS UNDERTAKEN	OBSERVED DURING FIELD SURVEYS
Wood Thrush (*Hylocichla mustelina)*	Interior and edges of deciduous and mixed forests, especially upland mesic ones with a dense tree canopy and a fairly well-developed deciduous understory. Bottomlands and other rich hardwood forests are prime habitats. Also frequents pine forests with a deciduous understory. Key elements of oft-used sites: trees >16 m in height, high variety of deciduous tree species, moderate subcanopy and shrub density, shade, fairly open forest floor, moist soil, and decaying leaf litter. More likely to occur in larger-area forests but may nest in 1ha fragments and semi-wooded residential areas and parks.	S4B	THR	SC	NA	NA	MMM observation	Yes, suitable breeding habitat is present throughout the study area where moderate to large sized deciduous and mixed woodland is present. Suitable habitat include Units 2,3,12,15,17,19,22,24,25,26,28,32	Breeding bird surveys	Yes, confirmed in Unit 17 with possible breeding evidence
Mammals										
Eastern Small-footed Myotis (*Myotis leibii*)	Habitat is mostly hilly or mountainous areas, in or near deciduous or evergreen forest, sometimes in mostly open farmland. In Pennsylvania, found this species mostly in thick hemlock forests in the foothills of mountains that rise to 2,000 feet (600 meters). Warm-season roosts include buildings, towers, hollow trees, spaces beneath the loose bark of trees, cliff crevices, caves, mines and beneath large flat rocks; in the southern U.S., bridges (e.g., in expansion joints) may also be used for roosting by this species (and several others). Hibernation occurs in solution and fissure caves and mine tunnels (including coal, iron, copper, and talc mines). Situations near the entrance where the air is relatively cold and dry seem to be preferred, though sometimes deeper locations are used. Roost sites often are deep in crevices, or under rocks on the cave floor. These bats are usually found singly or occasionally in small clusters, but many may be packed in a crevice; often they hang among other species. 52% of Pennsylvania hibernacula were small caves of less than 150 m (500 feet) in length. Like many other bat species, this one typically forages over ponds and streams [10.]	S2S3	NA	END	NA	NA	MNRF regional list (2014-online)	Suitable habitat [for maternal colonies and roosting] is present throughout the study area in the form of barns, outbuildings, hollow trees, crags, crevices, loose bark, bridges and any other openings and crannies. As a result, this species should be considered wherever any of the above exist .	No targeted surveys undertaken, general wildlife observations made	No – targeted and specialized surveys required to detect.
Little Brown Myotis (*Myotis lucifuga*)	Has adapted to using human-made structures for resting and maternity sites; also uses caves and hollow trees. Foraging habitat requirements are generalized; usually forages in woodlands near water. In winter, a relatively constant temperature of about 1-5 C and 80-100% relative humidity is required within the hibernacula (uses caves, tunnels, abandoned mines, and similar sites). Maternity colonies commonly are in warm sites in buildings and other structures; also infrequently in hollow trees. Narrow microclimate is suitable for raising young, and availability of suitable maternity sites may limit abundance and distribution [10.]	S4	END	END	No Status	No Schedule	MNRF regional list (2014-Online)	Suitable habitat [for maternal colonies and roosting] is present throughout the study area in the form of barns, outbuildings, hollow trees, crags, crevices, loose bark, bridges and any other openings and crannies. As a result, this species should be considered wherever any of the above exist	No targeted surveys undertaken, general wildlife observations made	No - targeted and specialized surveys required to detect.

SPECIES	PREFERRED HABITAT	SRANK[1]	COSEWIC[2]	SARO[3]	SARA STATUS[4]	SARA SCHEDULE[5]	SOURCE OF RECORD	PRESENCE OF POTENIALLY SUITABLE HABITAT AND REASONABLE LIKLIHOOD OF SPECIES PRESENCE WITHIN STUDY AREA?	SURVEYS UNDERTAKEN	OBSERVED DURING FIELD SURVEYS
Northern Myotis (*Myotis septentrionalis*)	Generally associated with forested communities. Hibernates in caves, mines, and tunnels from late fall through early spring. Hibernators frequently roost in crevices, drill holes, and similar sites, but roosting in the open is not uncommon. The principal requirements of a suitable hibernation site are winter-long, low temperatures above freezing, high humidity, and lack of disturbances, both natural (floods) and anthropogenic (visitation). Caves, mines, and quarry tunnels are used as night roosts. Daytime roosting observations typically are of individuals in crevices or hollows or under loose bark on trees and in a variety of small spaces associated with buildings and other structures. Nursery colonies include barns, cabins, with the majority likely occurring under the loose bark of trees. Small, highly fragmented, or young forests that provide limited areas of subcanopy foraging habitat may not be suitable. Young forests may also lack appropriate nursery sites. A lack of suitable hibernacula may prevent occupancy of areas that otherwise have adequate habitat [10].	S3	END	END	No Status	No Schedule	MNRF regional list (2014-Online)	Suitable habitat [for maternal colonies and roosting] is present throughout the study area in the form of barns, outbuildings, hollow trees, crags, crevices, loose bark, bridges and any other openings and crannies. As a result, this species should be considered wherever any of the above exist	No targeted surveys undertaken, general wildlife observations made	No - targeted and specialized surveys required to detect.
Woodland Vole (*Microtus pinetorum*)	Lives in a wide variety of habitats, but appears to be closely associated with mature deciduous forests along Lake Erie where there is a thick layer of loose sandy soil and deep humus suitable for burrowing. In Ontario, preferred habitat is most common within the Carolinian Forest. Spends most of time underground in shallow burrow systems. Young are born in nests built beneath logs, below surface litter, or underground (Dobbyn 1994; NatureServe 2013).	S3?	SC	SC	SC	1	MNRF regional list (2014-online)	Possible in many woodland or semi-wooded situations. Impossible to detect / predict without intensive, targeted surveys for this species.	No targeted surveys undertaken, general wildlife observations made	No
Amphibians and Reptiles										
Blanding's Turtle (*Emydoidea blandingii*)	Inhabits marshes, ponds, swamps, lake shallows, backwater sloughs, flooded graminoid-dominated meadows, beaver regulated wetlands, shallow slow-moving rivers, man-made channels, protected coves and inlets of large lakes, oxbows, and pools adjacent to rivers. Waterbodies are characterized as eutrophic with soft organic substrates, shallow water, and abundant aquatic vegetation. Nesting occurs in open sunny locations and eggs are deposited in a variety of loose substrates including sand, organic soil, cobblestone, and gravel. Nest sites include sand beaches, soil-filled crevices on rocky outcrops, lawns, gardens, plowed fields, muskrat and beaver lodges, and gravel roads or gravel road edges. Females may travel >1km to reach suitable nesting habitat. This species will hibernate in substrate at the bottom of permanent wetlands. This species will bask on aquatic emergent structures such as muskrat lodges, hummocks, logs, floating mats of vegetation, or amongst emergent grasses or sedges next to the water [3; 9; 10.]	S3	THR	THR	THR	1	MNRF regional list (2014-online)	Marginally suitable habitat present in Unit 12 and 24. Unlikely to occur.	No targeted surveys undertaken, general wildlife observations made	No

SPECIES	PREFERRED HABITAT	SRANK[1]	COSEWIC[2]	SARO[3]	SARA STATUS[4]	SARA SCHEDULE[5]	SOURCE OF RECORD	PRESENCE OF POTENIALLY SUITABLE HABITAT AND REASONABLE LIKLIHOOD OF SPECIES PRESENCE WITHIN STUDY AREA?	SURVEYS UNDERTAKEN	OBSERVED DURING FIELD SURVEYS
Eastern Ribbonsnake (*Thamnophis sauritus*)	"The Eastern Ribbonsnake is semi-aquatic and frequents the edges of ponds, marshes, streams, bogs, wet meadows, seasonally flooded prairies, lake shorelines, or can be found in swamps and moist forests. Rarely found in upland areas. Usually this snake is in or near vegetative cover (often shrubs or clumps of sedges or grasses) in sun-exposed sites along the edge of standing or flowing water. Wetland and shoreline habitats are generally near forests. This species basks along shorelines in vegetation or on logs or low shrubs. They hibernate underground in small mammal burrows, ant mounds, or crevices in rock outcroppings [3; 10; 12.]"	S3	SC	SC	SC	3	MNRF regional list (2014-online)	Suitable habitat present in Units 2,3,12,13,17,24. Low likelihood of occurrence	No targeted surveys undertaken, general wildlife observations made	No
Jefferson Salamander (*Ambystoma jeffersonianum*)	Occurs near or within deciduous or mixed upland forests containing suitable breeding ponds. These sites include limestone sinkhole ponds, kettle ponds, and other natural basins. Populations often breed in upland ponds along ridges and at the tops of stream drainages, but they also utilize ponds in woodlots and floodplains. Breeding ponds are devoid of predatory fish, contain submerged twigs, branches, or vegetation, are often ephemeral, and are filled by spring runoff, groundwater, or springs. Abandoned, fishless farm ponds with rank growths of cattails and other vegetation are good sites to find breeding populations. In Ontario, this species is closely associated with Carolinian forests. Microhabitats used include small mammal burrows, rock fissures, tree stumps, leaf litter, logs, and woody debris on the forest floor. They winter underground below the frost line in vertical fissures or burrows.[10]	S2	END	END	THR	1	MNRF regional list (2014-online), NHIC search 2014, MNRF correspondence (2014)	Suitable habitat [in the form of mature, mixed forest with vernal pools for breeding] is present in Unit 17. To date, this is the only site detected with suitable conditions although more extensive fieldwork would be required throughout the remaining study area to determine suitability. Species is not likely to occur within the study area.	No targeted surveys undertaken, general wildlife observations made	No
Eastern Milksnake (*Lampropeltis triangulum*)	Habitats vary greatly among different geographic regions: semiarid to wet, lowland valleys to mountains, grasslands and shrublands to forests and forest edges, primary forest to secondary forest, sand dunes to rocky areas, and wilderness to semi agricultural and suburban. Habitats include: Bare rock/talus/scree, Cliff, Cropland/hedgerow, Desert, Coniferous, Hardwood, or Mixed Forest or Woodland, Grassland/herbaceous, Old field, Sand/dune, Savannah, Shrubland/chaparral, Suburban/orchard. It can live in almost any habitat that provides shelter and a source of food. Milksnakes are usually found under cover objects including planks, debris, stumps, decaying logs, rocks and rock piles, stones, bark, rubbish, tar paper, iron sheets, and damp trash. This species hibernates underground in mammal burrows, old building foundations, old wells and cisterns, stone walls, gravel and dirt banks, hollow logs, rotting stumps, or rock crevices. Eggs are laid in rotting stumps or logs, small mammal burrows, piles of manure, leaf mounds, sawdust piles, compost, sand, under boards, logs, or in loose soil. [3; 10; 12.]	S3	SC	SC	SC	1	MNRF regional list (2014-online), NHIC search 2014, MNRF correspondence (2014)	Yes, as a habitat generalist, this species may occur throughout the study area. Special attention should be paid where barns, old buildings, foundations, bridge footings, brush and rock piles occur. Likely widespread within the study area. Anecdotal observations from units 22 and 24	No targeted surveys undertaken, general wildlife observations made	No. Anecdotal observations from local landowners.

SPECIES	PREFERRED HABITAT	SRANK[1]	COSEWIC[2]	SARO[3]	SARA STATUS[4]	SARA SCHEDULE[5]	SOURCE OF RECORD	PRESENCE OF POTENIALLY SUITABLE HABITAT AND REASONABLE LIKLIHOOD OF SPECIES PRESENCE WITHIN STUDY AREA?	SURVEYS UNDERTAKEN	OBSERVED DURING FIELD SURVEYS
Eastern Musk Turtle (*Sternotherus odoratus*)	Inhabits of variety of permanent waterbodies that maintain a slow current, shallow water (<2m), and abundant floating and submerged vegetation. Includes ponds, lakes, marshes, sloughs, streams, and rivers. In Great Lakes region they are most commonly associated with clear lakes or ponds with marl, sand, or gravel bottoms. They occasionally climb out on rocks, branches, or logs to bask but most often they bask partially submerged in shallow water. Nesting occurs in sand or soil on bare ground or beneath logs, clumps of vegetation, decaying vegetable matter, leaf mold, soil-filled crevices on rock outcroppings, shoreline debris, or in the tops of rotting stumps or muskrat lodges. This species hibernates under mud or logs at the water bottom, or in undercut banks, or muskrat lodges [3; 9; 10.]	S3	SC	THR	THR	1	MNRF regional list (2014-online)	Marginally suitable habitat present in Unit 24. Very unlikely to occur.	No targeted surveys undertaken, general wildlife observations made	No
Northern Map Turtle (*Graptemys geographica*)	Inhabits rivers, lakes, streams, and creeks with slow to moderate flows. Watercourse substrate is highly variable and includes soft mud, clay, sand, gravel, marl, bedrock, organic muck, cobble, and rock. They require well-oxygenated waters that support mollusc prey (bivalves, snails, crayfish, and benthic invertebrates) and shallow water areas for foraging. The habitat must maintain abundant basking sites such as rocky shoals and islands, emergent logs or rocks, and exposed banks. Later in the season, aquatic mats of floating vegetation may be used for basking. This species will nest in sand or soft soil along sandbars or sandbanks, laneways, gardens, or even atop rock outcrops with thin strips of soil. Deep, highly-oxygenated pools are required for hibernation. This species prefers areas of natural shoreline and can be found in shallow waters with emergent vegetation [9; 3]	S3	SC	SC	SC	1	MNRF regional list (2014-online)	Marginally suitable habitat present in Unit 24. Very unlikely to occur.	No targeted surveys undertaken, general wildlife observations made	No
Snapping Turtle (*Chelydra serpentina)*	Snapping turtles occupy all types of freshwater habitats (streams, bogs, rivers, lakes, reservoirs, ponds, marshes, swamps), especially those with slow-moving waters, soft mud bottoms, and abundant aquatic vegetation or submerged brush and logs. Preferred nesting areas are open and sunny with moist well-drained sand or soil. Females generally nest on sand and gravel embankments, but muskrat houses, abandoned beaver lodges, road shoulders, fissures in rocky shorelines, sawdust heaps, freshly dug soil, gardens, lawns, and forest clearings will also be utilized. Turtles hibernate in small streams, along lakeshores, or in wetlands either buried in substrate or wedged beneath or adjacent to submerged logs or woody debris [3; 9; 10].	S3	SC	SC	SC	1	MNRF regional list (2014-online), NHIC Search 2014, MNRF Correspondence (2014)	Suitable habitat is present wherever permanent or even seasonal water bodies are present. In the case of the study area, this could include any creek, river, pond or drain, depending on water levels, rainfall amounts etc. Records provided from MNRF indicate presence in Feature # 24. Areas of best habitat, including conditions suitable for nesting and overwintering are Units 2,3,12,24, probably 19, probably 33	No targeted surveys undertaken, general wildlife observations made	Yes, road killed hatchling found along 6th Line, Unit 24

SPECIES	PREFERRED HABITAT	SRANK[1]	COSEWIC[2]	SARO[3]	SARA STATUS[4]	SARA SCHEDULE[5]	SOURCE OF RECORD	PRESENCE OF POTENIALLY SUITABLE HABITAT AND REASONABLE LIKLIHOOD OF SPECIES PRESENCE WITHIN STUDY AREA?	SURVEYS UNDERTAKEN	OBSERVED DURING FIELD SURVEYS
Spiny Softshell (*Apalone s. spinifera*)	Inhabits rivers and the larger streams, inland lakes, reservoirs, protected bays, and river mouth areas of the Great Lakes themselves. They prefer rivers with soft sand, or mud bottoms, but will also use rivers with sand-gravel substrates. They generally avoid streams with sharp-edged rocks. Open habitats with little aquatic vegetation are favoured. They can tolerate a swift current. These turtles require gravelly or sandy areas close to the water for nesting and deep water for hibernating. Females may travel in excess of 30km to reach nesting areas. Basking habitat includes exposed banks, emergent boulders or logs in the water, shallow water sandy or muddy backbays, and shallow water gravel or sand bars. Heavily vegetated shallow backwaters with soft substrates are important nursery habitat. Softshells are typically associated with river bend areas [3; 9; 12.]	S3	THR	THR	THR	1	MNRF regional list (online)	Marginally suitable habitat present in Unit 24. Very unlikely to occur.	No targeted surveys undertaken, general wildlife observations made	No
Common Five-lined Skink (*Plestiodon fasciatus*)	Habitats include wooded areas of many kinds, especially those that are humid, well-drained, supply abundant cover (rocks, logs, stumps, woody debris leaf litter, brush piles, sawdust piles, standing snags and tree cavities, tin and wood piles, boardwalks, stone and wood fences, and slabs of loose or fallen bark), and have a patchy canopy; also seasonally flooded lowlands in some areas. They are more abundant in eco-tone areas (woodland edges or openings, cleared areas, partial burns, etc.). Five-lined skinks in the Great Lakes–St. Lawrence population are typically found in forest openings, specifically large rock outcrops. Along the Lake Erie shoreline, where the Carolinian population lives, skinks inhabit open forests, small meadows, beaches and vegetated sand dunes. Five-lined skinks hibernate in groups under rocks or tree stumps and in rotting wood. Eggs are laid in or under rotting logs, stumps, boards, humus, or rocks. In Ontario, preferred nest sites were large, moderately decayed logs with high substrate moisture. [3; 9; 10; 12.]	S3	END	END	END	1	MNRF regional list (online)	Suitable habitat not present	No targeted surveys undertaken, general wildlife observations made	No
Fish										
Lake Sturgeon (*Acipenser fulvescens*)	Lives almost exclusively in freshwater lakes and rivers with soft bottoms of mud, sand or gravel. They are usually found at depths of 5m to 20m. They spawn in relatively shallow, fast flowing water (usually below waterfalls, rapids or dams) with gravel boulders at the bottom. However, they will spawn in deeper water where habitat is available. They are also known to spawn on open shoals in large rivers with strong currents [5.]	S2, S3	THR	THR	NA	NA	MNRF regional list (2014-Online)	Suitable habitat not present. Does not occur.	Fish habitat surveys. No fish community surveys	No
Redside Dace (*Clinostomus elongatus)*	Pools and slow-moving sections of relatively small (<10 m width), clear, cool, streams with sand or gravel bottoms , riffle/pool habitat and overhanging vegetation; preferred water temperature range 14-23°C. [23]	S2	END	END	SC	3	MNRF regional list (2014-online), NHIC search 2014, MNR Correspondence (2014)	Suitable habitat present in Black Creek. Unlikely to occur.	Fish habitat surveys. No fish community surveys	No. Records present for reaches of Black Creek and 16 Mile Creek Tributaries (outside of Study Area)

SPECIES	PREFERRED HABITAT	SRANK[1]	COSEWIC[2]	SARO[3]	SARA STATUS[4]	SARA SCHEDULE[5]	SOURCE OF RECORD	PRESENCE OF POTENIALLY SUITABLE HABITAT AND REASONABLE LIKLIHOOD OF SPECIES PRESENCE WITHIN STUDY AREA?	SURVEYS UNDERTAKEN	OBSERVED DURING FIELD SURVEYS
Silver Shiner (*Notropis photogenis*)	Deep runs, riffles and pools with variable (clay to boulder) substrates in relatively clear, medium to large streams (>20 m) with swift currents. [23]	S2, S3	THR	THR	SC	3	MNRF regional list (2014-online)	Suitable habitat present in Black Creek. Unlikely to occur.	Fish habitat surveys. No fish community surveys	No
Insects										
Clamp-tipped Emerald (*Somatochlora tenebrosa*)	Shaded woodland streams with backwater pools, riffles and / or small rapids [pers. obs.]	S3	NA	NA	NA	NA	NHIC search (2014)	Yes, along the length of Black Creek – Unit 24	No targeted surveys undertaken, incidental observations noted.	No
Harpoon Clubtail (*Gomphus descriptus*)	A variety of clear woodland streams and rivers with good flow, riffles or small rapids. Usually rocky with gravelly / cobble substrate. [pers. obs.]	S3	NA	NA	NA	NA	MMM observation (2014)	Yes, along the length of Black Creek – Unit 24	No targeted surveys undertaken, incidental observations noted.	Yes, male photographed in Unit 24, although outside of the study area.
Swamp Darner (*Epiaeschna heros)*	Rich woodlands or swampy woods with pools or standing water [pers. obs.]	S2/ S3	NA	NA	NA	NA	MMM observation (2014)	Yes, Unit 17, 24	No targeted surveys undertaken, incidental observations noted.	Yes, Unit 24, although outside of the study area.
Monarch (*Danaus plexippus*)	Monarchs in Canada exist primarily wherever milkweed (Asclepius) and wildflowers (such as Goldenrod, asters, and Purple Loosestrife) exist. This includes abandoned farmland, along roadsides, and other open spaces where these plants grow. Monarch wintering habitats include Eucalyptus trees along the Californian coast, and the Oyamel Fir forest in central Mexico [4]. Throughout their life cycle, Monarchs use three different types of habitat. Only the caterpillars feed on milkweed plants and are confined to meadows and open areas where milkweed grows. Adult butterflies can be found in more diverse habitats where they feed on nectar from a variety of wildflowers [5.]	S4	SC	SC	SC	3	MMM observation (2014)	Suitable habitat is present wherever nectar sources or the host plant [milkweed] are present which occur throughout the study area in cultural meadow and old field habitat. This species should be considered possible throughout the study area.	No targeted surveys undertaken, incidental observations noted.	Yes, feature 16, 26, and 41.
Rusty-patched Bumble Bee (*Bombus affinis*)	"B. affinis is a habitat generalist. Nesting Habitat: Based on records from the U.S. and Canada, over 90% of B. affinis nests have been found underground, usually in old rodent burrows, occasionally, found above ground, in one incidence inside an abandoned armchair. Nests of this species are likely similar to other bumble bee species but are extremely difficult to locate in the wild. Foraging Habitat: This species has been found foraging in a wide variety of habitats such as mixed farmland, sand dunes, marshes, urban and wooded areas. As the species is active from April to October a lengthy period of abundant flowering plants is required. Hibernating Habitat: There are no data on overwintering habitat for B. affinis but mated queens likely burrow underground, or in rotting logs as do queens of other Bombus species [3.]	S1	END	END	END	1	MNRF regional list (2014-online), NHIC search (2014)	As a habitat generalist, this species may occur wherever nectar sources occur – including throughout the Trafalgar Road corridor / ROW and in cultural meadow and old field. Due to provincial rarity, very unlikely to occur.	No targeted surveys undertaken, incidental observations noted.	No

LEGEND

Preferred Habitat References:

[1] N/A as used in the Critical Habitat Definition column indicates that **no** Recovery Strategy or Action Plan exists for the species; therefore no Critical Habitat definition is available yet.

[2] Ministry of Natural Resources. 2000. Significant Wildlife Habitat Technical Guide. Fish and Wildlife Branch, Wildlife Section. Science Development and Transfer Branch, South central Science Section. 151pp. + appendices.

[3] Government of Canada 2014. COSEWIC Species Assessment and Status Reports. Accessed June 2014 at http://www.sararegistry.gc.ca/search/advSearchResults_e.cfm?stype=doc&docID=18

[4] Government of Canada. 2014. Species at Risk Public Registry, Accessed June 2014 at http://www.sararegistry.gc.ca/default_e.cfm.

[5] Ministry of Natural Resources and Forestry. 2014. Species at Risk Website, Accessed June 2014 at http://www.MNRF.gov.on.ca/en/Business/Species/index.html

[6] Royal Ontario Museum. Explore Ontario's Biodiversity. Accessed June 2014 at http://www.rom.on.ca/ontario/

[7] Petranka, J. W. 1998. Salamanders of the United States and Canada. Smithsonian Institution Press: Washington and London, 587pp.

[8] MacCulloch, R.D. 2002. The ROM Field Guide to Amphibians and Reptiles of Ontario. Royal Ontario Museum. Toronto.

[9] Harding, J. 1997. Amphibians and Reptiles of the Great Lakes Region. The University of Michigan Press, Ann Arbor, Michigan, USA, 378 pp.

[10] NatureServe. 2013. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Accessed June 2014 at http://www.natureserve.org/explorer

[11] Dobbyn, J.S. 1994. Atlas of the Mammals of Ontario. Federation of Ontario Naturalists, Toronto, Ontario.

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[14] Schmidly, D. J. 1991. The Bats of Texas. Texas A&M University Press. 188 pp.

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[16] Wesley, PA. 2006. Local and Regional Scale Habitat Selection by Wood Turtles (Glyptemys Insculpta) in Ontario. M.Sc. University of Guelph. 106p.

[17] Cadman, M., D. Sutherland, G. Beck, D. Lepage and A. 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 Forestry and Ontario Nature, Toronto, xxii + 706 pp.

[18] The Butterflies and Moths of North America. 2014. Accessed June 2014 at http://www.butterfliesandmoths.org/

[19] Forest Gene Conservation Association (FGCA). 2011. About Butternut. Accessed June 2014 at [http://fgca.net/conservation/sar/butternut_about.aspx].

[20] Ministry of Natural Resources and Forestry. 2014. Make a Map: Natural Heritage Areas. Accessed June 2014 at http://www.giscoeapp.lrc.gov.on.ca/web/MNRF/NHLUPS/NaturalHeritage/Viewer/Viewer.html?utm_source=MNRFCentral&utm_medium=Twitter&utm_term=natural%2Bheritage&utm_content=natural%2Bheritage%2Bbiodiversity&utm_campaign=Biodiversity

[21] Oldham, M.J., and S.R. Brinker. 2009. Rare Vascular Plants of Ontario, Fourth Edition. Natural Heritage Information Centre, Ontario Ministry of Natural Resources. Peterborough, Ontario.

[22] Gleason, H. A. and A. Cronquist. 1991. Manual of the Vascular Plants of Northeastern United States and Adjacent Canada. 2nd ed. New York Botanical Garden, NY. 910 p.

[23] Eakins, R. J. 2014. Ontario Freshwater Fishes Life History Database. Version 4.43. On-line database. (http://www.ontariofishes.ca), accessed May 2014 (Eakins 2014)

Status Sources:

[1]**S-Ranks (provincial)**

Provincial (or Subnational) ranks are used by the Natural Heritage Information Centre (NHIC) to set protection priorities for rare species and natural communities. These ranks are not legal designations. Provincial ranks are assigned in a manner similar to that described for global ranks, but consider only those factors within the political boundaries of Ontario.
(Provincial Status from MNRF NHIC 2014)

S1 Critically Imperiled - Critically imperiled in the nation or state/province because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the state/province.
S2 Imperiled - Imperiled in the nation or state/province because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the nation or state/province.
S3 Vulnerable - Vulnerable in the nation or state/province due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.
S4 Apparently Secure - Uncommon but not rare; some cause for long-term concern due to declines or other factors.
S5 Secure - Common, widespread, and abundant in the nation or state/province.
S#S# Range Rank - A numeric range rank (e.g., S2S3) is used to indicate any range of uncertainty about the status of the species or community. Ranges cannot skip more than one rank (e.g., SU is used rather than S1S4).
SAN Non-breeding accidental.
SE Exotic - not believed to be a native component of Ontario's fauna.
SZN Non-breeding migrants/vagrants.
SZB Breeding migrants/vagrants.

[2]**COSEWIC (Committee on the Status of Endangered Wildlife in Canada)**
(federal status from COSEWIC)

EXT Extinct - A species that no longer exists.
EXP Extirpated - A species no longer existing in the wild in Canada, but occurring elsewhere.
END Endangered - A species facing imminent extirpation or extinction.
THR Threatened - A species likely to become endangered if limiting factors are not reversed.

SC Special Concern (formerly vulnerable) - A species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats.
NAR Not At Risk - A species that has been evaluated and found to be not at risk of extinction given the current circumstances.
DD Data Deficient (formerly Indeterminate) - Available information is insufficient to resolve a species' eligibility for assessment or to permit an assessment of the species' risk of extinction.

[3]**SARO (Species at Risk Ontario)** (provincial status from MNRF May 2014)
The provincial review process is implemented by the MNRF's Committee on the Status of Species at Risk in Ontario (COSSARO).

EXT Extinct - A species that no longer exists anywhere.
EXP Extirpated - A species that no longer exists in the wild in Ontario but still occurs elsewhere.
END Endangered - A species facing imminent extinction or extirpation in Ontario which is a candidate for regulation under Ontario's Endangered Species Act (ESA) (END-R designations are no longer relevant as species are covered under new ESA April 2009)
THR Threatened - A species that is at risk of becoming endangered in Ontario if limiting factors are not reversed.
SC Special Concern (formerly Vulnerable) - A species with characteristics that make it sensitive to human activities or natural events.
NAR Not at Risk - A species that has been evaluated and found to be not at risk.
DD Data Deficient (formerly Indeterminate) - A species for which there is insufficient information for a provincial status recommendation.

[4]**SARA (Species at Risk Act) Status and Schedule**
The Act establishes Schedule 1, as the official list of wildlife species at risk. It classifies those species as being either Extirpated, Endangered, Threatened, or a Special Concern. Once listed, the measures to protect and recover a listed wildlife species are implemented.
EXT Extinct - A wildlife species that no longer exists.
EXP Extirpated - A wildlife species that no longer exists in the wild in Canada, but exists elsewhere in the wild.
END Endangered - A wildlife species that is facing imminent extirpation or extinction.
THR Threatened - A wildlife species that is likely to become endangered if nothing is done to reverse the factors leading to its extirpation or extinction.
SC Special Concern - A wildlife species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats.

[5]**SARA Schedules**
Schedule 1: is the official list of species that are classified as extirpated, endangered, threatened, and of special concern.
Schedule 2: species listed in Schedule 2 are species that had been designated as endangered or threatened, and have yet to be re-assessed by COSEWIC using revised criteria. Once these species have been re-assessed, they may be considered for inclusion in Schedule 1.
Schedule 3: species listed in Schedule 3 are species that had been designated as special concern, and have yet to be re-assessed by COSEWIC using revised criteria. Once these species have been re-assessed, they may be considered for inclusion in Schedule 1.

The Act establishes Schedule 1 as the official list of wildlife species at risk. However, please note that while Schedule 1 lists species that are extirpated, endangered, threatened and of special concern, the prohibitions do not apply to species of special concern.

Species that were designated at risk by COSEWIC prior to October 1999 (Schedule 2 & 3) must be reassessed using revised criteria before they can be considered for addition to Schedule 1 of SARA. After they have been assessed, the Governor in Council may on the recommendation of the Minister, decide on whether or not they should be added to the List of Wildlife Species at Risk.

Government of Canada. Species at Risk Public Registry. Website: [http://www.sararegistry.gc.ca/default_e.cfm May 24, 2011]
Glossary: http://www.sararegistry.gc.ca/about/glossary/default_e.cfm#e
Species Index A-Z: http://www.sararegistry.gc.ca/sar/index/default_e.cfm
Species Listing by Schedule: http://www.sararegistry.gc.ca/sar/listing/default_e.cfm

Source Record References:

Department of Fisheries and Oceans, Aquatic Species at Risk Mapping. Accessed August 2014 at http://www.conservation-ontario.on.ca/projects/DFO.html (2014 DFO SAR Mapping)

Ministry of Natural Resources and Forestry Species at Risk Website, Accessed August 2014 at http://www.MNRF.gov.on.ca/en/Business/Species/index.html (MNRF SAR Website 2014)

Ministry of Natural Resources and Forestry. Natural Heritage Information Centre. 2014. (NHIC Search August 2014)

APPENDIX H – Significance and Sensitivity Analysis

Table 1: Summary of Significance and Sensitivity Analysis- Trafalgar Road EA Study Area by Natural Heritage Feature

Feature #	Feature Type/ Name	Study Area Location		Description	Significance /Sensitivity	Policy and Regulatory Considerations	Project Considerations
		Trafalgar Road Corridor	Road Realignment Area				
1	Watercourse- Tributary of Middle 16 Mile Creek (part of Hornby Tributary)	✓		**Vegetation:** Reed Canary Grass Mineral Meadow Marsh (MAM2-2) along the watercourse, adjacent cultural meadow (CUM1-1) and pasture, and a small spruce coniferous plantation (CUP3) at the north eastern edge of the study area. **Wildlife:** Culvert is potentially suitable for Barn Swallow (provincially Threatened) although no nests observed at time of survey. Culvert is oversized (several meters high), and accomodates wildlife passage. Racoon and muskrat prints were noted within the culvert. **Aquatic:** Contributing fish habitat. Drains to fish bearing watercourse approximatly 450 m downstream. Defined channel with bankfull width <1 m. Channel has sand/gravel/cobble substrate. MNRF identifies the reach as coldwater (MNRF 2014) although species records downstream indicate warmwater baitfish community. Connected to regulated Redside Dace creek (~2km downstream). Flowing on April 14 2015.	Low	• Federal Fisheries Act (1985) • CH Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourse162/06 • Regional Official Plan- Halton Region (2009) – watercourse corridor designated as part of the Regional Natural Heritage System. • Endangered Species Act (2007) • Provincial Policy Statement (2014)	• The project should avoid/limit works affecting fish and fish habitat • If in-water work is required, adhere to the in-water work timing windows for warmwater baitfish species (March 15 to July 15). • Any works proposed within regulated areas will require approval and permitting from the CH under Regulation 162/06 • Consider Fisheries Act exemption criteria as well as 'measures to avoid harm' as part of preliminary design • Any proposed works that have potential to 'seriously harm' fish and/or fish habitat require approval under the Fisheries Act by DFO. Determination for DFO project review occurs at the detailed design phase of the project. • Ensure that timing constraints are applied to avoid vegetation clearing (including grubbing) during the breeding bird season (approximately May 1st to August 8th).
2	Woodland (Coulson Tract)	✓		**Vegetation:** Consists of a complex of pine plantation and deciduous forest (CUP3 / FOD9) with some moist cultural meadow openings. Transitions to northwest to Bur Oak Swamp (SWD1-2) associated with Feature 3. **Wildlife:** Candidate Significant Wildlife Habitat (SWH) for Bat Maternity Colony habitat, Colonially –Nesting Bird Breeding Habitat (Trees/Shrubs), Woodland Raptor Nesting Habitat. East side confirmed to support SCC - Eastern Wood Pewee (provincially Special Concern) and is suitable for Wood Thrush (provincially Special Concern). North end, west side has habitat suitable for SCC- Canada Warbler (provincially Special Concern). Deer present in this woodland based on collison data. Potential wildlife movement corridor for large and small mammals.	Moderate	• Halton Regional Offical Plan (2006)- designated as Greenlands B and candidate Signifcant Woodlands. • Regional Official Plan- Halton Region (2009) – designated as part of the Regional Natural Heritage System. • Town of Halton Hills Official Plan (2008) - identified as Greenlands B and Candidate Significant Woodland. • Provincial Policy Statement (2014)	• Limit encroachment into the feature. • Ensure that timing constraints are applied to avoid vegetation clearing (including grubbing) during the breeding bird season (approximately May 1st to August 8th. • Candidate wildlife movement corridor. If culvert replacement is required, sizing should consider passage of wildlife.

Feature #	Feature Type/ Name	Study Area Location		Description	Significance /Sensitivity	Policy and Regulatory Considerations	Project Considerations
		Trafalgar Road Corridor	Road Realignment Area				
3	Watercourse Crossing – Tributary of Middle 16 Mile Creek (Hornby Tributary)	✓		**Aquatic:** Permanent watercourse with bankfull width 4 - 7 m . Direct fsh habitat. Channel mostly shaded with cobble/gravel/sand substrate. Pool-Riffle sequences with baitfish observed in pools and spawning potential in gravel areas/riffles. Connected to regulated Redside Dace creek (~2km downstream). CH identifies the reach as warmwater baitfish. Fish community sampling in 2011 captured mostly baitfish/panfish species with one coldwater salmonid (Rainbow Trout) (CH 2011). MNRF identifies the reach as a coldwater fishery (MNRF 2014). **Vegetation:** mid-age Bur Oak swamp (SWD1-2) surrounds watercourse (Feature #2). A rare vegetation type, Bur Oak Mineral Deciduous Swamp (S3), is also present adjacent to this feature. **Wildlife:** Candidate SWH for Turtle Wintering Areas and reptile hibernaculum. Culvert potentially suitable for Barn Swallow (provincially Threatened) although none observed during field surveys. Watercourse habitat suitable for SCC (Louisiana Waterthrush [provincially Special Concern), Snapping Turtle [provincially Special Concern])- although species not observed. Culvert is oversized (several meters high), and accomodates wildlife passage. Sediment accumulation incluvert provides a dry space for wildlife to move through.	Moderate	• Federal Fisheries Act (1985) • CH Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourse162/06 • Regional Official Plan- Halton Region (2009) – watercourse corridor designated as part of the Regional Natural Heritage System • Halton Regional Official Plan (2006) – designated as Greenlands A • Town of Halton Hills Official Plan (2008) - identified as Greenlands A. • Endangered Species Act (2007) • Provincial Policy Statement (2014)	• The project should avoid/limit works affecting fish and fish habitat • If in-water work is required, adhere to the in-water work timing windows for warmwater baitfish species (March 15 to July 15). • Any works proposed within regulated areas will require approval and permitting from the CH under Regulation 162/06 • Consider Fisheries Act exemption criteria as well as 'measures to avoid harm' as part of preliminary design • Any proposed works that have potential to 'seriously harm' fish and/or fish habitat require approval under the Fisheries Act by DFO. Determination for DFO project review occurs at the detailed design phase of the project. • Ensure that timing constraints are applied to avoid vegetation clearing (including grubbing) during the breeding bird season (approximately May 1st to August 8th).
4	Small Woodland Patch	✓		**Vegetation:** Species indicative of deciduous swamp (Bur Oak, Willow, Manitoba Maple, Green Ash). ELC community type SWD1-2. One rare vegetaion community, Bur Oak Mineral Deciduous Swamp (S3) is present within the feature. **Wildlife:** Small, isolated feature and poor quality habitat with very low to no SAR potential apart from low probability of Milksnake (provincially Special Concern). Potential use by deer based on collision data.	Moderate	• Provincial Policy Statement (2014)	• Limit encroachment into the feature. The presence of the rare vegetation community should be confirmed at detailed design. If confirmed, the community should be retained and buffered where feasible. • Ensure that timing constraints are applied to avoid vegetation clearing (including grubbing) during the breeding bird season (approximately May 1st to August 8th.

Feature #	Feature Type/ Name	Study Area Location		Description	Significance /Sensitivity	Policy and Regulatory Considerations	Project Considerations
		Trafalgar Road Corridor	Road Realignment Area				
5	Hornby Swamp Wetland Complex (non-PSW)	✓		**Vegetation:** Feature appears to consist of deciduous swamp (SWD1-2) with a small open natural area adjacent to the road consisting of cultural meadow (CUM1-1) and Reed Canary Grass Meadow Marsh (MAM2-2). Identified as a Regional Wetland. Desktop information indicates it is dominated by Eastern White Cedar. Species composition should be confirmed through detailed field surveys. A rare vegetation type, Bur Oak Mineral Deciduous Swamp (S3), is also present adjacent to this feature. **Wildlife:** no field surveys undertaken (no PTE). A variety of herpetofaunal species are anticipated to be present. Candidate SWH for Reptile Hibernacilum and Colonially – Nesting Bird Breeding Habitat (Tre/Shrubs).	Moderate	• Regional Official Plan- Halton Region (2009) – watercourse corridor designated as part of the Regional Natural Heritage System • Halton Regional Offical Plan (2006)- designated as Greenlands B and candidate Significant Woodlands. • Town of Halton Hills Official Plan (2008) - identified as Greenlands B and Candidate Significant Woodland and Locally Significant Wetlands. • CH Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourse162/06 • Provincial Policy Statement (2014)	• Proposed road improvements should avoid encroachment upon the boundaries of the wetland. • The presence of the rare vegetation community should be confirmed at detailed design. If confirmed, the community should be retained and buffered where feasible. • The project should maintain a naturalized buffer from wetland boundaries, where feasible. • Any works proposed within regulated areas will require approval and permitting from the CH under Regulation 162/06. • Ensure that timing constraints are applied to avoid vegetation clearing (including grubbing) during the breeding bird season (approximately May 1st to August 8th).
38	Woodland	✓		**Vegetation:** Likely deciduous forest (FOD). Woodland may be dominated by Sugar Maple with transition to southwest into mixed forest. Open area in front of woodland is a Reed Canary Grass dominated meadow marsh with scattered willow shrubs (MAM2-2). **Wildlife:** no field surveys (no PTE), no desktop information available. Candidate SWH for Amphibian Breeding Habitat (woodland)	Moderate	• Regional Official Plan- Halton Region (2009) – watercourse corridor designated as part of the Regional Natural Heritage System • Halton Regional Official Plan (2006) - designated as Greenlands A (associated with the 16 Mile Creek Tributary corridor) and candidate Significant Woodlands. • Town of Halton Hills Official Plan (2008) - identified as Candidate Significant Woodland. • Provincial Policy Statement (2014)	• Limit encroachment into the feature. • Ensure that timing constraints are applied to avoid vegetation clearing (including grubbing) during the breeding bird season (approximately May 1st to August 8th.

Feature #	Feature Type/ Name	Study Area Location		Description	Significance /Sensitivity	Policy and Regulatory Considerations	Project Considerations
		Trafalgar Road Corridor	Road Realignment Area				
37	Woodland	✓		**Vegetation:** no field surveys (no PTE), no desktop information available. Air photo interpretation indicates Cultural Woodland (CUW1). **Wildlife:** no field surveys (no PTE). Deer are present based on collision data.	Moderate	• Regional Official Plan- Halton Region (2009) – watercourse corridor designated as part of the Regional Natural Heritage System • Halton Region Official Plan (2006) – identified as candidate Significant Woodlands. • Town of Halton Hills Official Plan (2008) - identified as Candidate Significant Woodland.	• Limit encroachment into the feature. • Ensure that timing constraints are applied to avoid vegetation clearing (including grubbing) during the breeding bird season (approximately May 1st to August 8th.
36	Watercourse	✓		**Aquatic:** no field surveys (no PTE). CH identifies the reach as warmwater baitfish. Fish community sampling downstream indicates mostly baitfish/panfish (CH 2011). MNRF identifies the reach as a coldwater fishery (MNRF 2014). **Vegetation:** no field surveys (no PTE), no desktop information available. Based on air photos, the feature is a small swale feature through agricultural fields.	Low	• Federal Fisheries Act (1985) • CH Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourse162/06 • Regional Official Plan- Halton Region (2009) – watercourse corridor designated as part of the Regional Natural Heritage System. • Halton Regional Offical Plan (2006)- designated as Greenlands A. • Provincial Policy Statement (2014)	• The project should avoid/limit works affecting fish and fish habitat • If in-water work is required, adhere to the in-water work timing windows for warmwater baitfish species (March 15 to July 15). • Any works proposed within regulated areas will require approval and permitting from the CH under Regulation 162/06 • Consider Fisheries Act exemption criteria as well as 'measures to avoid harm' as part of preliminary design • Any proposed works that have potential to 'seriously harm' fish and/or fish habitat requires approval under the Fisheries Act by DFO. Determination for DFO project review occurs at the detailed design phase of the project. • Ensure that timing constraints are applied to avoid vegetation clearing (including grubbing) during the breeding bird season (approximately May 1st to August 8th).
35	Woodland	✓		**Vegetation:** Air photo interpretation indicates community is deciduous forest (FOD) with a stream corridor and potential for swamp habitat associated with the narrow bottomland. **Wildlife:** Watercourse likely suitable for Snapping Turtle (provincial Special Concern), marginal for Eastern Ribbonsnake (both provincially Special Concern). Woodland suitable for Eastern Wood Pewee and Wood Thrush (both provincially Special Concern). Open meadow adjacent to SR 5 suitable for Monarch (provincially Special Concern) – Milkweed present. Deer are present based on collision data.	Moderate	• Regional Official Plan- Halton Region (2009) – watercourse corridor designated as part of the Regional Natural Heritage System. • Halton Regional Official Plan (2006) –designated as Greenlands B (associated with the 16 Mile Creek Tributary corridor) and candidate Significant Woodlands. • Town of Halton Hills Official Plan (2008) – identified as candidate Significant Woodlands	• Limit encroachment into the feature. • Ensure that timing constraints are applied to avoid vegetation clearing (including grubbing) during the breeding bird season (approximately May 1st to August 8th.

Feature #	Feature Type/ Name	Study Area Location		Description	Significance /Sensitivity	Policy and Regulatory Considerations	Project Considerations
		Trafalgar Road Corridor	Road Realignment Area				
6	Small Woodland Patch	✓		**Vegetation:** very small woodland area around a residence containing planted Silver Maple, Sugar Maple, White Pine and spruce (CUW1). **Wildlife:** Largely anthropogenic feature with low SAR potential – Eastern Wood Pewee (provincialy Special Concern) unlikely but possible. Deer possibly present based on collison data.	Low	• None	• Limit encroachment into the feature for aesthetic reasons. • Ensure that timing constraints are applied to avoid vegetation clearing (including grubbing) during the breeding bird season (approximately May 1st to August 8th.
34	Small Woodland	✓		**Vegetation:** no field surveys (no PTE), no desktop information available. Air photo interpretation indicates community is deciduous forest (FOD). **Wildlife:** no field surveys (no PTE). Deer are potentially present based on collision data.	Moderate	• Regional Official Plan- Halton Region (2009) –designated as part of the Regional Natural Heritage System • Halton Regional Official Plan (2006) – identified as candidate Significant Woodlands. • Town of Halton Hills Official Plan (2008) – identified as candidate Significant Woodlands	• Limit encroachment into the feature. • Ensure that timing constraints are applied to avoid vegetation clearing (including grubbing) during the breeding bird season (approximately May 1st to August 8th.
7	Watercourse Crossing– Ephemeral drainage feature, tiled upstream	✓		**Aquatic:** Shallow ephemeral drainage feature becoming more defined with some sand/gravel substrates near culvert. Some standing water, no flow. At downstream end, drainage channel has been blocked/filled in, not conveying drainage except in flooded conditions. Not fish habitat, no surface connection to fish bearing watercourse. **Vegetation:** agriculture – row crop **Wildlife:** No SAR potential.	Low	• CH Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourse162/06	• Any works proposed within regulated areas will require approval and permitting from the CH under Regulation 162/06 • Ensure that timing constraints are applied to avoid vegetation clearing (including grubbing) during the breeding bird season (approximately May 1st to August 8th).

Feature #	Feature Type/ Name	Study Area Location		Description	Significance /Sensitivity	Policy and Regulatory Considerations	Project Considerations
		Trafalgar Road Corridor	Road Realignment Area				
33	Watercourse, with wooded riparian corridor (wetland)	✓		**Aquatic:** no field surveys (no PTE). CH identifies the reach as warmwater baitfish. Fish community sampling downstream indicates mostly baitfish/panfish (CH 2011). MNRF identifies the reach as a coldwater fishery (MNRF 2014). **Vegetation:** Consists mainly of Cattail marsh (MAS2-1) and a small area of Willow – Manitoba Maple deciduous swamp SWD4) associated with the stream channel. **Wildlife:** no field surveys (no PTE), no desktop information available.	Moderate	• Federal Fisheries Act (1985) • CH Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourse162/06 • Regional Official Plan- Halton Region (2009) –designated as part of the Regional Natural Heritage System • Provincial Policy Statement (2014)	• The project should avoid/limit works affecting fish and fish habitat • If in-water work is required, adhere to the in-water work timing windows for warmwater baitfish species (March 15 to July 15). • Any works proposed within regulated areas will require approval and permitting from the CH under Regulation 162/06 • Consider Fisheries Act exemption criteria as well as 'measures to avoid harm' as part of preliminary design • Any proposed works that have potential to 'seriously harm' fish and/or fish habitat requires approval under the Fisheries Act by DFO. Determination for DFO project review occurs at the detailed design phase of the project. • Ensure that timing constraints are applied to avoid vegetation clearing (including grubbing) during the breeding bird season (approximately May 1st to August 8th). • Proposed road improvements should avoid encroachment upon the boundaries of the wetland. • The project should maintain a naturalized buffer from wetland boundaries, where feasible.
8	Watercourse – channelized drain	✓		**Aquatic:** Shallow intermittent drainage feature. Some standing water, no flow. Channelized drain on downstream sections.. Contributing fish habitat. No fish habitat is present at the Trafalgar Road crossing, but flow drains to East Sixteen Mile Creek, a fish bearing watercourse. MNRF identifies the reach as coolwater (MNRF 2014) although species records downstream indicate warmwater baitfish community. **Vegetation:** In-stream vegetation dominated by Narrow-leaved Cattail (MAS2-1) or Reed Canary Grass (MAM2-2). A small deciduous swamp occurs near Study Area boundary (SWD). **Wildlife:** No SAR potential	Low	• Federal Fisheries Act (1985) • CH Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourse162/06 • Regional Official Plan- Halton Region (2009) –designated as part of the Regional Natural Heritage System • Provincial Policy Statement (2014)	• The project should avoid/limit works affecting fish and fish habitat • If in-water work is required, adhere to the in-water work timing windows for warmwater baitfish species (March 15 to July 15). • Any works proposed within regulated areas will require approval and permitting from the CH under Regulation 162/06 • Consider Fisheries Act exemption criteria as well as 'measures to avoid harm' as part of preliminary design • Any proposed works that have potential to 'seriously harm' fish and/or fish habitat requires approval under the Fisheries Act by DFO. Determination for DFO project review occurs at the detailed design phase of the project. • Ensure that timing constraints are applied to avoid vegetation clearing (including grubbing) during the breeding bird season (approximately May 1st to August 8th).

Feature #	Feature Type/ Name	Study Area Location		Description	Significance /Sensitivity	Policy and Regulatory Considerations	Project Considerations
		Trafalgar Road Corridor	Road Realignment Area				
9	Watercourse – ephemeral drainage feature	✓		**Aquatic:** Shallow ephemeral drainage feature with some standing water, no flow. Scouring of banks just downstream of culvert and dry 'pool' area ~0.75 m wide indicates high flows at certain times. Contributing fish habitat. Intermittent flow likely prevents fish use, flow drains to East Sixteen Mile Creek, a fish bearing watercourse. MNRF identifies the reach as coolwater (MNRF 2014) although species records downstream indicate warmwater baitfish community. **Vegetation:** vegetation associated with the stream channel is low diversity Reed Canary Grass Mineral Meadow Marsh (MAM2-2). **Wildlife:** No SAR potential. Culvert unsuitable for nesting birds.	Low	• Federal Fisheries Act (1985) • CH Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourse162/06 • Provincial Policy Statement (2014)	• The project should avoid/limit works affecting fish and fish habitat • If in-water work is required, adhere to the in-water work timing windows for warmwater baitfish species (March 15 to July 15). • Any works proposed within regulated areas will require approval and permitting from the CH under Regulation 162/06 • Consider Fisheries Act exemption criteria as well as 'measures to avoid harm' as part of preliminary design • Any proposed works that have potential to 'seriously harm' fish and/or fish habitat requires approval under the Fisheries Act by DFO. Determination for DFO project review occurs at the detailed design phase of the project. • Ensure that timing constraints are applied to avoid vegetation clearing (including grubbing) during the breeding bird season (approximately May 1st to August 8th).
10	Watercourse - ephemeral drainage feature	✓		**Aquatic:** Shallow ephemeral drainage feature with some standing water, no flow. Some riprap/cobble downstream of culvert, but mostly channelized ditch through cornfield, no cover, earth substrate, no flow. Contributing fish habitat. Ephemeral flow and lack of fish habitat, flow drains to East Sixteen Mile Creek, a fish bearing watercourse. MNRF identifies the reach as coolwater (MNRF 2014) although species records downstream indicate warmwater baitfish community. Flowing on April 14 2015. **Vegetation**: primarily agricultural land use (cultivated field on east side of road, pasture on west) with some very small patches of wetland vegetation associated with low-lying areas of the pasture. Pasture includes some common meadow species such as New-England Aster. **Wildlife:** No SAR potential.	Low	• Federal Fisheries Act (1985) • CH Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourse162/06 • Provincial Policy Statement (2014)	• The project should avoid/limit works affecting fish and fish habitat • If in-water work is required, adhere to the in-water work timing windows for warmwater baitfish species (March 15 to July 15). • Any works proposed within regulated areas will require approval and permitting from the CH under Regulation 162/06 • Consider Fisheries Act exemption criteria as well as 'measures to avoid harm' as part of preliminary design • Any proposed works that have potential to 'seriously harm' fish and/or fish habitat requires approval under the Fisheries Act by DFO. Determination for DFO project review occurs at the detailed design phase of the project. • Ensure that timing constraints are applied to avoid vegetation clearing (including grubbing) during the breeding bird season (approximately May 1st to August 8th).

Feature #	Feature Type/ Name	Study Area Location		Description	Significance /Sensitivity	Policy and Regulatory Considerations	Project Considerations
		Trafalgar Road Corridor	Road Realignment Area				
11	Hungry Hollow Environmental Sensitive Area (ESA)	✓		The Hungry Hollow Ravine is a deep valley feature with several tributaries of the Credit River, including Black Creek. The feature woodland is extensive and diverse and is comprised of cedar and lush herbaceous layer. Fens, which are considered rare vegetation communities, are present within the ESA. The wooded areas of the ESA are of very high quality. There are excellent examples of mature Sugar Maple forests and mixed forests. The high quality woodlands and floodplain, combined with scenic views of the surrounding landscape, give this area a high aesthetic value. Wetlands within the ESA are designated as PSW, but are located well away from the ROW (outside of study area). **Vegetation:** Community Types within Study Area are FOD5 and FOM. Provincially Significant Wetland Complex. Plant communities in the ESA include Cattail Marsh, Shrub Rich Wet Meadow, Southern White Cedar Swamp, Silver Maple Swamp, Rich Sugar Maple-Mixed Hardwood Forest, Eastern Hemlock-Mixed Hardwood Forest, Hawthorn Thicket, Late Successional Old Field. Rare spp in ESA include Finely-pilose Evening-primrose. Numerous regionally rare vegetation species. A fen community exists within this ESA. Fens are considered to be rare plant communities whenever they occur south of the Canadian Shield. **Wildlife:** no field surveys undertaken (no PTE). SAR and several SCC are known to occur within the feature. An abundance of regionally rare species are also present within this feature. Candidate SWH is present as Bat Maternity Colonies, Reptile Hibernaculum, Colonially - Nesting Bird Breeding Habitat (Tree/Shrubs), and Wildlife Movement Corridor (between Units 11 and 24). Confirmed SWH with presence of Seeps and Springs within the feature.	High	• Regional Official Plan- Halton Region (2009) –designated as part of the Regional Natural Heritage System. • Halton Regional Official Plan (2006) –designated as Greenlands A (Black Creek corridor) and Greenlands B (remaining ESA lands) and candidate Significant Woodlands. • Town of Halton Hills Official Plan (2008) – identified as candidate Significant Woodlands • Endangered Species Act (2007) • CVC Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourse160/06 • Provincial Policy Statement (2014)	• Proposed road improvements should avoid encroachment upon the boundaries of the ESA. • The project should maintain a naturalized buffer from natural feature, where feasible • Any works proposed within regulated areas will require approval and permitting from the CVC under Regulation 160/06. • All aspects of the Endangered Species Act (2007) should be complied with in regard to the presence of Species at Risk. • Ensure that timing constraints are applied to avoid vegetation clearing (including grubbing) during the breeding bird season (approximately May 1st to August 8th). • Maintain corridor function by limiting encroachment within the corridor.

Feature #	Feature Type/ Name	Study Area Location		Description	Significance /Sensitivity	Policy and Regulatory Considerations	Project Considerations
		Trafalgar Road Corridor	Road Realignment Area				
12	Black Creek – permanent watercourse with sensitive resident coldwater salmonid population	✓	✓	Black Creek is a permanent sensitive coldwater watercourse. Salmonids (Brown Trout, Rainbow Trout, and Atlantic Salmon) present with known spawning in the area. Atlantic Salmon is an extinct species that is currently being reintroduced into the Credit River through stocking programs **Aquatic:** Sensitive cool/coldwater fish community with the presence of Salmonids (Brown Trout, Brown Trout, Rainbow Trout, Atlantic Salmon). Stewarttown dam (major dam) is present just (~0.5 km) upstream from crossing feature. Substrate mostly cobble – not likely sufficient gravel for salmonid spawning near bridge. Bankfull width average 9 m. Uniform riffle upstream, riffle with large pool (~1 m deep) downstream. Deep, clear nursery pool with YOY (potentially salmonid) at bank immediately downstream of Trafalgar Rd. Large fish observed in deep downstream pool. Direct fish habitat. This reach is classified as a coldwater stream with resident Brook Trout populations (MNRF 2014, CVC 2009). Contributing habitat to identified Redside Dace habitat at confluence with The Credit River West Branch approx. 2 km downstream (CVC 2009).ATOS adult fish (approx. 200 – 300 mm TL) were observed in the large pool downstream and YOY[1] salmonids in the nursery pool just downstream of Trafalgar Road. **Vegetation:** Surrounded in part by the Hungry Hallow ESA (see Feature 11 for vegetation communities). **Wildlife:** Potential Candidate SWH as Turtke Wintering Areas. Bridge supports no nesting birds but is suitable for Barn Swallow (provincially Threatened). Watercourse / edge habitat suitable for Louisiana Waterthrush (provincially Special Concern) and upstream habitat likely suitable for Eastern Wood Pewee (provincially Special Concern) and Wood Thrush (provincially Special Concern). Watercourse may be suitable for Rapid's Clubtail (provincially Endangered) and other provincially rare (S-Rank) odonates.	High	• Federal Fisheries Act (1985) • CVC Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourse160/06 • Regional Official Plan- Halton Region (2009) –designated as part of the Regional Natural Heritage System. • Halton Regional Official Plan (2006) –designated as Greenlands A (Black Creek corridor) • Provincial Policy Statement (2014)	• The project should avoid/limit works affecting fish and fish habitat • If in-water work is required (not anticipated), adhere to the in-water work timing windows for coldwater salmonid species (Sept 15th to July 15th). This timing window will also mitigate potential impacts to any turtles that may be overwintering in the watercourse. • Any works proposed within regulated areas will require approval and permitting from the CVC under Regulation 160/06 • Consider Fisheries Act exemption criteria as well as 'measures to avoid harm' as part of preliminary design • Any proposed works that have potential to 'seriously harm' fish and/or fish habitat requires approval under the Fisheries Act by DFO. Determination for DFO project review occurs at the detailed design phase of the project. • Maintain corridor function by limiting encroachment within the corridor. • Ensure that timing constraints are applied to avoid vegetation clearing (including grubbing) during the breeding bird season (approximately May 1st to August 8th).

[1] YOY- Young of the Year

Feature #	Feature Type/ Name	Study Area Location		Description	Significance /Sensitivity	Policy and Regulatory Considerations	Project Considerations
		Trafalgar Road Corridor	Road Realignment Area				
13	Small wetland/ woodland, NW of Hungry Hollow ESA	✓		**Vegetation:** Forested slope contains Black Walnut, White Elm, Sugar Maple, and White Ash (FOD5). Swamp (SWD2-1) contains open patches of marshy ground cover largely dominated by Narrow-leaved Cattail, Reed Canary Grass, and Spotted Touch-me-not. Health of ash trees is poor, however, White Elm is also abundant and occasional willow trees are scattered throughout. **Wildlife:** Wetland may be suitable for Snapping Turtle (provincially listed as Special Concern) and Milksnake also listed as Special Concern. Roadside surveys did not detect open wetland habitat. It is anticipated to provide habitat for a variety of herpetofaunal species.	Moderate	• CVC Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourse160/06 • Regional Official Plan- Halton Region (2009) –designated as part of the Regional Natural Heritage System. • Halton Regional Official Plan (2006) –designated as Greenlands A and candidate Significant Woodlands. • Town of Halton Hills Official Plan (2008) – identified as candidate Significant Woodlands	• Proposed road improvements should avoid/limit encroachment upon the boundaries of the wetland. • The project should maintain a naturalized buffer from natural feature, where feasible • Any works proposed within regulated areas will require approval and permitting from the CVC under Regulation 160/06. • Ensure that timing constraints are applied to avoid vegetation clearing (including grubbing) during the breeding bird season (approximately May 1st to August 8th).

Feature #	Feature Type/ Name	Study Area Location		Description	Significance /Sensitivity	Policy and Regulatory Considerations	Project Considerations
		Trafalgar Road Corridor	Road Realignment Area				
25	Woodland, Wetland (Swamp), and Watercourse	✓		**Vegetation:** Consists primarily of Black Walnut, American Ash and Black Locust, with Freeman's Maple also observed. A butternut (provincially Endangered) was observed at the eastern edge of the community and additional butternuts are suspected in the interior. Community Type is FOD7. **Wildlife:** Small, isolated and fairly low quality woodland, with low SAR potential. Habitat marginally suitable for Eastern Wood Pewee and Wood Thrush (both provincially Special Concern). Potential Candidate SWH for Amphibian Breeding Habitat (woodlands). **Aquatic:** Intermittent coldwater creek in steep wooded valley. Iron floc indicators of groundwater seepage. Wetted channel <1 m, bankfull width ~2.5-3 m. No fish observed. Rocky substrates with stabilized banks and a concrete dam barrier present downstream. Significant groundwater inputs (visible seeps and Watercress). Watercourse is connected to Black Creek and fish were observed by MMM staff at the field survey throughout the reach of the tributary below the waterfall barrier (within the golf course). MNRF identifies the reach as coldwater (MNRF 2014).	Moderate	• CVC Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourse160/06 • Regional Official Plan- Halton Region (2009) –designated as part of the Regional Natural Heritage System. • Halton Regional Official Plan (2006) – identified candidate Significant Woodlands. • Town of Halton Hills Official Plan (2008) – identified as candidate Significant Woodlands • Endangered Species Act (2007)	• Proposed road improvements should avoid/limit encroachment upon the boundaries of the feature. • The project should maintain a naturalized buffer from natural feature, where feasible • Any works proposed within regulated areas will require approval and permitting from the CVC under Regulation 160/06. • The project should avoid/limit works affecting fish and fish habitat • If in-water work is required (not anticipated), adhere to the in-water work for Brook Trout (Oct 1st to May 31st) • Consider Fisheries Act exemption criteria as well as 'measures to avoid harm' as part of preliminary design • Any proposed works that have potential to 'seriously harm' fish and/or fish habitat requires approval under the Fisheries Act by DFO. Determination for DFO project review occurs at the detailed design phase of the project. • All aspects of the ESA (2007) should be complied with in regard to the presence of Butternut. The trees should be assessed in terms of health/vigor by a qualified Butternut Health Assessor following MNR protocols, to determine any future mitigation requirements, if proposed for removal. • Ensure that timing constraints are applied to avoid vegetation clearing (including grubbing) during the breeding bird season (approximately May 1st to August 8th).
41	Woodland	✓		**Vegetation:** Consists of a mix of young to mid-age deciduous forest (FOD7) with areas of regeneration within cultural meadow habitat; situated on rolling topography; may include small portions of swamp habitat in bottomland stream areas. **Wildlife:** no field surveys (no PTE), no desktop information available.	Moderate	• Halton Regional Official Plan (2006) – identified candidate Significant Woodlands. • Town of Halton Hills Official Plan (2008) – identified as candidate Significant Woodlands	• Limit encroachment into the feature. • Ensure that timing constraints are applied to avoid vegetation clearing (including grubbing) during the breeding bird season (approximately May 1st to August 8th.

Feature #	Feature Type/ Name	Study Area Location		Description	Significance /Sensitivity	Policy and Regulatory Considerations	Project Considerations
		Trafalgar Road Corridor	Road Realignment Area				
14	Watercourse crossing (intermittent) and small wetland	✓		**Aquatic:** Intermittent watercourse. No defined channel upstream – small trickle through dense Phragmites. Defined channel downstream flows onto private residential property (no PTE). Stone bank stabilization and riprap instream. Culvert outlet slightly perched, low flow seasonal barrier. Contributing fish habitat. Low quality habitat. This watercourse continues to Feature #25 with very low flows and is piped for approx. 170 m upstream of confirmed fish use on the golf course. MNRF identifies the reach as coldwater (MNRF 2014). Fish collection records indicate the watercourse supports a warmwater fish community. CVC observed iron staining (groundwater indicator) upstream of culvert. **Vegetation:** Vegetation adjacent to the road consists of a European Reed-dominated marsh (MAMM1-12*) and cultural meadow (CUM1-1). Aerial photography indicates there is an open pond in the interior. On the east side of the crossing vegetation consists of a small deciduous swamp with a Willow species and Black Walnut (SWD4). **Wildlife:** Wetland may be suitable for Snapping Turtle and Milksnake (both provincially Special Concern). No other SAR potential.	Low	• Federal Fisheries Act (1985) • CVC Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourse160/06 • Regional Official Plan- Halton Region (2009) –designated as part of the Regional Natural Heritage System. • Provincial Policy Statement (2014)	• Proposed road improvements should avoid/limit encroachment upon the boundaries of the feature. • The project should maintain a naturalized buffer from wetland, where feasible • Any works proposed within regulated areas will require approval and permitting from the CVC under Regulation 160/06. • The project should avoid/limit works affecting fish and fish habitat • Consider Fisheries Act exemption criteria as well as 'measures to avoid harm' as part of preliminary design • Any proposed works that have potential to 'seriously harm' fish and/or fish habitat requires approval under the Fisheries Act by DFO. Determination for DFO project review occurs at the detailed design phase of the project. • Ensure that timing constraints are applied to avoid vegetation clearing (including grubbing) during the breeding bird season (approximately May 1st to August 8th).
21	Cultural Meadow	✓		**Vegetation:** Recent air photo interpretation and roadside surveys indicate majority of the small woodland that was previously located in this area has been removed for development. Background data indicates community type is Cultural. Mineral cultural thicket with less than 25% tree cover and more than 25% shrub cover with anthropogenic influence due to domestic species such as apple and pear. No field surveys (no PTE). **Wildlife:** no field surveys (no PTE), no desktop information available.	Low	• Regional Official Plan- Halton Region (2009) –designated as part of the Regional Natural Heritage System. • Halton Regional Official Plan (2006) – identified candidate Significant Woodlands. • Town of Halton Hills Official Plan (2008) – identified as candidate Significant Woodlands • OMMAH Greenbelt Plan Natural Heritage System (2005)- Protected Countryside	• Limit encroachment into the feature. • Ensure that timing constraints are applied to avoid vegetation clearing (including grubbing) during the breeding bird season (approximately May 1st to August 8th.

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		Trafalgar Road Corridor	Road Realignment Area				
19	Woodland and intermittent watercourse	✓		**Vegetation:** A forested ravine community consisting primarily of a mix of Sugar Maple, Ash species, and Black Cherry. Near the road, Ash, White Birch, and Sugar Maple are most abundant. A culvert drains to bottomland in the center of the community where Reed Canary Grass dominates. Seepage areas with an abundance of Spotted Touch-me-not occur in the interior. Transitions to southeast into SWM areas dominated by marsh vegetation. ELC community types are FOD5-8 and MAM2-2. One vascular plant species considered rare in Halton Region was observed during field surveys: Hackberry (*Celtis occidentalis*). The observation was a planted specimen associated with SWM facilities near Natural Heritage Feature #19. **Wildlife:** Moderate size / quality deciduous woodland. Potential for Wildlife Movement Corridor (between 19 and 15). Candidate SWH for Amphibian Breeding Habitat (woodland). Confirmed SWH with presence of SCC Eastern Wood Pewee in suitable breeding habitat. Suitable for Wood Thrush (provincially Special Concern). Moderate potential for Milksnake (provincially Special Concern). Some suitable cavity trees for SAR bat species. **Aquatic:** Intermittent channel present draining from Feature 15, crossing Trafalgar road through PVC culvert with concrete collar, and through feature 19. Standing water, no flow. Rip rap/boulder rock protection present. Both up and downstream flow through deciduous forest woodlots with ~100% canopy cover. Downstream, substrates were sand, cobble, and boulder with a bankfull width ~1.5-2.0 m. Some iron staining was observed in a pool on the downstream side, indicating possible groundwater seepages.CVC notes large boulders and concrete channel at downstream culvert. Contributing fish habitat, low or no flows exclude direct fish use, at least seasonally. Watercourse drains to fish bearing tributary of Black Creek. MNRF identifies the reach as coolwater (MNRF 2014). Flowing on April 14 2015. *Features 15 and 19 (located on other side of Trafalgar Road) are essentially one unit	Moderate	• Regional Official Plan- Halton Region (2009) –designated as part of the Regional Natural Heritage System. • Halton Regional Official Plan (2006) –designated as Greenlands A and candidate Significant Woodlands. • Town of Halton Hills Official Plan (2008) – identified as candidate Significant Woodlands • Federal Fisheries Act (1985) • CVC Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourse160/06 • Provincial Policy Statement (2014)	• Proposed road improvements should avoid/limit encroachment upon the boundaries of the feature. • The project should avoid/limit works affecting fish and fish habitat • If in-water work is required (not anticipated), adhere to the in-water work for Brook Trout (Oct 1st to May 31st) • Consider Fisheries Act exemption criteria as well as 'measures to avoid harm' as part of preliminary design • Any proposed works that have potential to 'seriously harm' fish and/or fish habitat requires approval under the Fisheries Act by DFO. Determination for DFO project review occurs at the detailed design phase of the project. • Ensure that timing constraints are applied to avoid vegetation clearing (including grubbing) during the breeding bird season (approximately May 1st to August 8th). • Maintain corridor function by limiting encroachment within the corridor. Should the existing culvert structure be required to be replaced, consideration should be made to sizing the culvert to accommodate wildlife passage.

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		Trafalgar Road Corridor	Road Realignment Area				
15	Woodland	✓	✓	**Vegetation:** Deciduous forest consisting of Sugar Maple with Basswood, American Beech, Trembling Aspen, and American Ash associates (FOD5-1). **Wildlife:** Moderate size / quality deciduous woodland. Suitable for Eastern Wood Pewee (provincially Special Concern) and Wood Thrush (provincially Special Concern). Moderate potential for Milksnake (provincially Special Concern). Potential Candidate SWH for Wildlife Movement Corridor (between 15 and 19). *Features 15 and 19 (located on other side of Trafalgar Road) are essentially one unit	Moderate	• Regional Official Plan- Halton Region (2009) –designated as part of the Regional Natural Heritage System. • Halton Regional Official Plan (2006) – identified candidate Significant Woodlands. • Town of Halton Hills Official Plan (2008) – identified as candidate Significant Woodlands • OMMAH Greenbelt Plan Natural Heritage System (2005)- Protected Countryside • Provincial Policy Statement (2014)	• Proposed road improvements should avoid/limit encroachment upon the boundaries of the feature. • Ensure that timing constraints are applied to avoid vegetation clearing (including grubbing) during the breeding bird season (approximately May 1st to August 8th). • Maintain corridor function by limiting encroachment within the corridor.
16	Watercourse Crossing – Tributary of Black Creek (ephemeral)	✓		**Aquatic:** Ephemeral watercourse with steep sides, especially downstream (~15 m high). Standing water in culvert, wet substrates/no flow, defined channel ~1.8 m bankfull width with sand/gravel/cobble substrate. Indication of frequent high flows. No barriers to fish observed other than no flow. Contributing fish habitat. Low or no flows exclude direct fish use, at least seasonally. Watercourse drains to fish bearing tributary of Black Creek. MNRF identifies the reach as coolwater (MNRF 2014). Feature originates in agricultural fields to the north, flows through a culvert underneath the rail ine to a grassed lawn area. Flows do not appear to be significant as there is only evidence of small pooling at the outlet of the channel. Overland flows from this would continue over the lawn to a large CSP, there is no evidence of scouring, bed or banks. Grass is growing in all areas. The culvert goes under the driveway and outlets to the west of Trafalgar where flows are present. It is possible that openings/cracks in the culvert are allowing for shallow groundwater to enter the culvert. A small channel is present for a few meters before flowing into another culvert and crossing Trafalgar Road. **Vegetation:** Cultural meadow (CUM1-1) habitat adjacent to road/rail, with small pockets of Staghorn Sumac thicket and a hedgerow consisting of White Elm, willow, and Pine. **Wildlife:** No SAR potential apart from low probability of Milksnake (provincially Special Concern). Monarch (provincially Special Concern) recorded as a fly-by along RR – suitable habitat	Low	• CVC Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourse160/06 • Regional Official Plan- Halton Region (2009) –designated as part of the Regional Natural Heritage System. • Federal Fisheries Act (1985) • Provincial Policy Statement (2014)	• Any works proposed within regulated areas will require approval and permitting from the CVC under Regulation 160/06. • The project should avoid/limit works affecting fish and fish habitat • Consider Fisheries Act exemption criteria as well as ‘measures to avoid harm’ as part of preliminary design • Any proposed works that have potential to ‘seriously harm’ fish and/or fish habitat requires approval under the Fisheries Act by DFO. Determination for DFO project review occurs at the detailed design phase of the project. • Ensure that timing constraints are applied to avoid vegetation clearing (including grubbing) during the breeding bird season (approximately May 1st to August 8th).

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		Trafalgar Road Corridor	Road Realignment Area				
42	Treed Area near Lindsay Court Well	✓		**Vegetation:** Red Oak dominated mid-age forest with White Pine and Sugar Maple associates (FOD5-8). **Wildlife:** SAR potential likely very low. Low potential for Eastern Wood Pewee (provincially Special Concern)	Low	• None	• Retain trees where feasible.
31	Watercourse-Channelized drainage feature		✓	**Aquatic:** Ephemeral channalized drain feature. Standing water at ends of culvert, but no flow. Eventually drains into Middle 16 Mile creek. Contributing fish habitat. Flows to fish bearing watercourse downstream. MNRF identifies the reach as warmwater (MNRF 2014) **Vegetation:** Relatively narrow bands of low diversity Reed Canary Grass Meadow Marsh (MAM2-2) habitat associated with the channel. Cattail and willow shrubs occur infrequently. **Wildlife:** No SAR potential apart from low probability of Milksnake (provincially Special Concern).	Low	• CH Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourse162/06 • Regional Official Plan- Halton Region (2009) –designated as part of the Regional Natural Heritage System. • Federal Fisheries Act (1985) • Provincial Policy Statement (2014)	• Any works proposed within regulated areas will require approval and permitting from the CH under Regulation 162/06. • The project should avoid/limit works affecting fish and fish habitat • Consider Fisheries Act exemption criteria as well as ‘measures to avoid harm’ as part of preliminary design • Any proposed works that have potential to ‘seriously harm’ fish and/or fish habitat requires approval under the Fisheries Act by DFO. Determination for DFO project review occurs at the detailed design phase of the project. • Ensure that timing constraints are applied to avoid vegetation clearing (including grubbing) during the breeding bird season (approximately May 1st to August 8th).

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		Trafalgar Road Corridor	Road Realignment Area				
32	Woodland		✓	**Vegetation:** Appears to consist of a complex of mid-age deciduous swamp and deciduous forest, with the portion within the Study Area consisting of FOD9. Bur Oak, Shagbark Hickory, and White Pine observed frequently. Air photo interpretation indicates areas of vernal pooling are present. **Wildlife:** Fairly large, diverse woodlot with some oak / hickory. Eastern Wood Pewee confirmed in two locations, habitat for Wood Thrush suitable (both provincially Special Concern). Habitat for Acadian Flycatcher (provincially Endangered) marginal. Confirmed SWH with presence of Eastern Wood Pewee in suitable breeding habitat.	Moderate	• Regional Official Plan- Halton Region (2009) –designated as part of the Regional Natural Heritage System. • Halton Regional Official Plan (2006) – identified candidate Significant Woodlands. • Town of Halton Hills Official Plan (2008) – identified as candidate Significant Woodlands • Provincial Policy Statement (2014)	• Proposed road improvements should avoid/limit encroachment upon the boundaries of the feature. • Ensure that timing constraints are applied to avoid vegetation clearing (including grubbing) during the breeding bird season (approximately May 1st to August 8th).
30	Woodland		✓	**Vegetation:** no field surveys (no PTE), no desktop information available. Air photo interpretation indicates community type is likely deciduous forest (FOD). **Wildlife:** no field surveys (no PTE), no desktop information available.	Moderate	• None	• Proposed road improvements should avoid/limit encroachment upon the boundaries of the feature. • Ensure that timing constraints are applied to avoid vegetation clearing (including grubbing) during the breeding bird season (approximately May 1st to August 8th).

Feature #	Feature Type/ Name	Study Area Location		Description	Significance /Sensitivity	Policy and Regulatory Considerations	Project Considerations
		Trafalgar Road Corridor	Road Realignment Area				
29	Wetland (swamp)		✓	**Vegetation:** Background data indicates Dry-fresh sugar maple-white ash deciduous forest type (J. Whitford Existing Conditions Terrestrial Report. August 2004). No field surveys were undertaken by MMM (no PTE), however, a wetland is identified within the community in MNRF wetland mapping, and air photointerpretation indicates presence of large areas f surface pooling. The feature is therefore asssumed to be a swamp based on available information for the purposes of this study. **Wildlife:** no field surveys (no PTE), it is antisipated that a variety of herpetofauna are present. Potential for Candidate SWH for Colonially - Nesting Bird Breeding Habitat (Tree/Shrubs)	Moderate	• Regional Official Plan- Halton Region (2009) –designated as part of the Regional Natural Heritage System. • Halton Regional Official Plan (2006) – identified candidate Significant Woodlands. • Town of Halton Hills Official Plan (2008) – identified as candidate Significant Woodlands • CH Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourse162/06 • Provincial Policy Statement (2014)	• Proposed road improvements should avoid/limit encroachment upon the boundaries of the feature. • Any works proposed within regulated areas will require approval and permitting from the CH under Regulation 162/06 • Ensure that timing constraints are applied to avoid vegetation clearing (including grubbing) during the breeding bird season (approximately May 1st to August 8th).
28	Woodland		✓	**Vegetation:** Tree species at edge indicate swamp habitat (e.g. Freeman's Maple), however, is expected to be anthropogenically influenced due to multiple residences within. Likely a complex of deciduous forest and smaller areas of deciduous swamp (FOD, SWD), particularly along the rear edge of the community. Air photo interpretation indicates the potential presence of vernal pooling within portions of the community. **Wildlife:** Fairly small, isolated moderate quality woodland, with low SAR potential. Habitat marginally suitable for Eastern Wood Pewee and Wood Thrush (both provincially Special Concern). Some suitable cavity trees for SAR bat species. Potential Candidate SWH for Amphibian Breeding Habitat (Woodland).	Moderate	• Regional Official Plan- Halton Region (2009) –designated as part of the Regional Natural Heritage System. • Halton Regional Official Plan (2006) – identified candidate Significant Woodlands. • Town of Halton Hills Official Plan (2008) – identified as candidate Significant Woodlands • Provincial Policy Statement (2014)	• Proposed road improvements should avoid/limit encroachment upon the boundaries of the feature. • Ensure that timing constraints are applied to avoid vegetation clearing (including grubbing) during the breeding bird season (approximately May 1st to August 8th).

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		Trafalgar Road Corridor	Road Realignment Area				
44	Watercourse – channelized ephemeral drainage feature		✓	**Aquatic:** Ephemeral drainage channel through agricultural field originating from marshy area with pools of standing water at woodland feature 26 and draining through field to crossing feature 9 at Trafalgar Road. Drainage has poorly defined banks, is overgrown with grasses, cattail and meadow veg. Contributing fish habitat. Drains to East Sixteen Mile Creek, a fish bearing watercourse. MNRF identifies the reach as warmwater (MNRF 2014). **Vegetation:** agriculture – row crop **Wildlife:** no field surveys, no desktop information available.	Low	• CH Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourse162/06 • Federal Fisheries Act (1985) • Provincial Policy Statement (2014)	• Any works proposed within regulated areas will require approval and permitting from the CH under Regulation 162/06. • The project should avoid/limit works affecting fish and fish habitat • Consider Fisheries Act exemption criteria as well as 'measures to avoid harm' as part of preliminary design • Any proposed works that have potential to 'seriously harm' fish and/or fish habitat requires approval under the Fisheries Act by DFO. Determination for DFO project review occurs at the detailed design phase of the project. • Ensure that timing constraints are applied to avoid vegetation clearing (including grubbing) during the breeding bird season (approximately May 1st to August 8th).
26	Wetland (swamp)		✓	**Vegetation:** Feature consists of a complex of Green Ash swamp (SWD2-2) and Sugar Maple forest (FOD6-5). Cultural Meadow (CUM1-1) occurs adjacent. **Wildlife:** Old field (cultural meadow) immediately west of woodlot. Suitable for Eastern Meadowlark, marginally suitable for Bobolink (provincially Threatened). Monarch (provincially Special Concern) confirmed and Milkweed present for breeding. Woodlot has moderate understory and some evidence of vernal pools, amphibian breeding likely. Some cavity trees suitable for SAR bat species present. Habitat suitable for Eastern Wood Pewee and Wood Thrush (both provincially Special Concern).	Moderate	• Regional Official Plan- Halton Region (2009) –designated as part of the Regional Natural Heritage System. • Halton Regional Official Plan (2006) – identified candidate Significant Woodlands. • Town of Halton Hills Official Plan (2008) – identified as candidate Significant Woodlands • CH Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourse162/06 • Provincial Policy Statement (2014)	• Proposed road improvements should avoid/limit encroachment upon the boundaries of the feature. • Any works proposed within regulated areas will require approval and permitting from the CH under Regulation 162/06 • Ensure that timing constraints are applied to avoid vegetation clearing (including grubbing) during the breeding bird season (approximately May 1st to August 8th).

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		Trafalgar Road Corridor	Road Realignment Area				
39	Treed Area		✓	**Vegetation:** a hedgerow terminating in a small White Pine – Norway Maple plantation (CUP2) and a Reed Canary Grass meadow marsh inclusion (MAM2-2) with a rim of treed deciduous swamp habitat (SWD). **Wildlife:** Marginally suitable for Eastern Wood Pewee. Suitable for Milksnake. Both are provincially Special Concern.	Low	• Regional Official Plan- Halton Region (2009) –designated as part of the Regional Natural Heritage System	• Proposed road improvements should avoid/limit encroachment upon the boundaries of the feature. • Ensure that timing constraints are applied to avoid vegetation clearing (including grubbing) during the breeding bird season (approximately May 1st to August 8th).
27	Treed Area		✓	**Vegetation:** Cultural savannah (CUS1) with cultural meadow ground vegetation – canopy consists of scattered mature Sugar Maple, Red Oak and Black Cherry. **Wildlife:** Monarch butterfly and American Painted Lady butterflies observed (provincially Special Concern).	Low	• Regional Official Plan- Halton Region (2009) –designated as part of the Regional Natural Heritage System. • Halton Regional Official Plan (2006) – identified candidate Significant Woodlands. • Town of Halton Hills Official Plan (2008) – identified as candidate Significant Woodlands • Provincial Policy Statement (2014)	• Proposed road improvements should avoid/limit encroachment upon the boundaries of the feature. • Ensure that timing constraints are applied to avoid vegetation clearing (including grubbing) during the breeding bird season (approximately May 1st to August 8th).

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		Trafalgar Road Corridor	Road Realignment Area				
24	Stewarttown Woods ESA - Woodland, Wetland, and Black Creek		✓	The Stewarttown Woods ESA is an extensive and diverse woodland and riverine habitat. Black Creek (Feature #12) flows through this ESA. The ESA contains significant groundwater discharge areas that are significant in maintaining surface water quality and quantity within Black Creek. Contains high quality assemblages of native plant and/or animal species. Confirmed presence of several Species of Conservation Concern. Several regionally rare species are also present within this feature. **Aquatic:** Black Creek, permanent watercourse with sensitive coldwater Salmonid population. Spawning is known to occur within the area. Cobble/gravel substrates, good flow with mix of riffles/flats. Water temp 15°C, and some sand/gravel beds at crossing – potential salmonid spawning sites. Direct fish habitat. This reach is identified as coldwater, supporting resident Brook Trout populations and spawning redds have been observed at this location (CVC 2009). Fish were observed by MMM staff throughout the reach at the time of survey. **Vegetation:** communities consist of mixed forested slopes, bottomland coniferous and deciduous swamps and meadow-marsh, as well as cultural meadow habitat and coniferous plantation. ELC community types are FOM2, MAM2-2, SWM1-1, CUM1-1, SWD3-4, SWD, SWC1-1, FOM4, CUP3, FOD, SWC. Part of the Greenbelt. **Wildlife:** Extensive, diverse woodland / riparian / riverine habitat with high SAR potential. Snapping Turtle (road killed hatchling) and Milksnake (road kill reported by resident) both provincially Special Concern, confirmed. SAR including Chimney Swift (provincially Threatened) and Barn Swallow (provincially Threatened) confirmed as foraging visitants. Eastern Ribbonsnake (provincially Special Concern) possible. Eastern Wood Pewee (provincially Special Concern), confirmed. Nesting Barn Swallow not detected under bridge but habitat suitable. Habitat may be suitable for several additional SAR. Record of Wood Thrush (provincially Special Concern). Harpoon Clubtail (S Rank S3) and Swamp Darner (S-Rank S2/S3) confirmed. Some suitable cavity trees for SAR bat species. Potential for Candidate SWH for Bat Maternity Colonies, Turtle Wintering Areas, Reptile Hibernaculum, Colonially - Nesting Bird Breeding Habitat, Woodland Raptor Nesting Habitat and Wildlife Movement Corridor. Confirmed SWH with the presence of several SCC in suitable breeding habitat including the Swamp Darner, Harpoon Clubtail, Snapping Turtle, and Eastern Wood Pewee. Seeps and Springs are also confirmed to be present in the feature.	High	• Regional Official Plan- Halton Region (2009) –designated as part of the Regional Natural Heritage System. • Halton Regional Official Plan (2006) – designated as Greenlands A and B and identified candidate Significant Woodlands. • Town of Halton Hills Official Plan (2008) – identified as candidate Significant Woodlands • OMMAH Greenbelt Plan Natural Heritage System (2005)- Protected Countryside • CVC Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourse160/06 • Endangered Species Act (2007 • Provincial Policy Statement (2014)	• Proposed road improvements should avoid encroachment upon the boundaries of the ESA. • The project should maintain a naturalized buffer from natural feature, where feasible • All aspects of the Endangered Species Act (2007) should be complied with in regard to the presence of Species at Risk. • Ensure that timing constraints are applied to avoid vegetation clearing (including grubbing) during the breeding bird season (approximately May 1st to August 8th). • The project should avoid/limit works affecting fish and fish habitat • If in-water work is required (not anticipated), adhere to the in-water work timing windows for coldwater salmonid species (Sept 15th to July 15th). This timing window will also mitigate potential impacts to any turtles that may be overwintering in the watercourse. • Any works proposed within regulated areas will require approval and permitting from the CVC under Regulation 160/06 • Consider Fisheries Act exemption criteria as well as ‘measures to avoid harm’ as part of preliminary design • Any proposed works that have potential to ‘seriously harm’ fish and/or fish habitat requires approval under the Fisheries Act by DFO. Determination for DFO project review occurs at the detailed design phase of the project. • Maintain corridor function by limiting encroachment within the corridor. Should any water crossing structures require replacement, consideration should be made to sizing to accommodate wildlife movement.

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		Trafalgar Road Corridor	Road Realignment Area				
23	Woodland and Watercourse		✓	**Vegetation:** Community Type is Swamp/Cultural (SWD / CUW1) No field surveys (no PTE). **Wildlife:** No field surveys (no PTE). Potential Candidate SWH for Bat Maternity Colonies and Amphibian Breeding Habitat (Woodland). **Aquatic:** Drainage channel (same as Feature 43). Defined channel has moderate gradient and cobble substrate with a bankfull width of ~1.2 m. Channel has abundant iron floc and temperature was 14°C indicating groundwater-fed coldwater stream. Flows through mixed forest canopy between residential properties. Watercourse is not mapped on available layers. If direct connection to Black Creek downstream and no significant barriers, could support direct fish use. MNRF identifies the reach as coldwater (MNRF 2014)	Moderate	• Regional Official Plan- Halton Region (2009) –designated as part of the Regional Natural Heritage System. • Halton Regional Official Plan (2006) – identified candidate Significant Woodlands. • Town of Halton Hills Official Plan (2008) – identified as candidate Significant Woodlands • OMMAH Greenbelt Plan Natural Heritage System (2005)- Protected Countryside • CVC Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourse160/06 • Provincial Policy Statement (2014)	• Proposed road improvements should avoid encroachment upon the boundaries of the natural feature. • Any works proposed within regulated areas will require approval and permitting from the CVC under Regulation 160/06. • Ensure that timing constraints are applied to avoid vegetation clearing (including grubbing) during the breeding bird season (approximately May 1st to August 8th). • The project should avoid/limit works affecting fish and fish habitat • If in-water work is required (not anticipated), adhere to the in-water work timing windows for coldwater salmonid species (Sept 15th to July 15th).. • Consider Fisheries Act exemption criteria as well as 'measures to avoid harm' as part of preliminary design • Any proposed works that have potential to 'seriously harm' fish and/or fish habitat requires approval under the Fisheries Act by DFO. Determination for DFO project review occurs at the detailed design phase of the project.
22	Woodland		✓	**Vegetation:** Mid-age deciduous woodland surrounding residences, likely subject to a fair amount of anthropogenic disturbance. Canopy composition includes American Basswood, Red Oak, Sugar Maple, Hickory, and Ash. Community Type is FOD5-3 and is part of the Greenbelt. **Wildlife:** High potential for Wood Thrush and Eastern Wood Pewee (both provincially Special Concern). Eastern Milksnake confirmed – landowner record from approx. 7 years ago. Some suitable cavity trees for SAR bat species	Moderate	• Regional Official Plan- Halton Region (2009) –designated as part of the Regional Natural Heritage System. • Halton Regional Official Plan (2006) – identified candidate Significant Woodlands. • Town of Halton Hills Official Plan (2008) – identified as candidate Significant Woodlands • OMMAH Greenbelt Plan Natural Heritage System (2005)- Protected Countryside • Provincial Policy Statement (2014)	• Proposed road improvements should avoid encroachment upon the boundaries of the natural feature. • Ensure that timing constraints are applied to avoid vegetation clearing (including grubbing) during the breeding bird season (approximately May 1st to August 8th).

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		Trafalgar Road Corridor	Road Realignment Area				
40	Plantation		✓	**Vegetation:** Conifer plantation (CUP3) and residential properties – species composition difficult to see from road but Scotch Pine, Norway Spruce and White Spruce observed.. **Wildlife:** Appears mostly anthropogenic from roadside – a mix of houses and lawns with apparent conifer plantation. SAR potential likely very low. Will survey in Sept.	Low	• Regional Official Plan- Halton Region (2009) –designated as part of the Regional Natural Heritage System. • Halton Regional Official Plan (2006) – identified candidate Significant Woodlands. • Town of Halton Hills Official Plan (2008) – identified as candidate Significant Woodlands • OMMAH Greenbelt Plan Natural Heritage System (2005)- Protected Countryside • Provincial Policy Statement (2014)	• Proposed road improvements should avoid encroachment upon the boundaries of the natural feature. • Ensure that timing constraints are applied to avoid vegetation clearing (including grubbing) during the breeding bird season (approximately May 1st to August 8th).
43	Watercourse - ephemeral drainage feature		✓	**Aquatic:** Ephemeral drainage feature with dense grasses/meadow vegetation west of a mowed lawn/cemetery. Some standing water, very low flow through overgrown channel with grasses and Cattail. Channel drains south across the road and eventually into Feature 23 (same watercourse). Likely provides indirect fish habitat. **Vegetation:** Cultural meadow dominated banks with Reed Canary Grass and Cattail in channel; adjacent farm field contains small depressional Cattail and Reed Canary Grass marshes. **Wildlife:** no field surveys, no desktop information available.	Low	• Regional Official Plan- Halton Region (2009) –designated as part of the Regional Natural Heritage System. • CVC Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourse160/06 • Federal Fisheries Act (1985) • Provincial Policy Statement (2014)	• Any works proposed within regulated areas will require approval and permitting from the CVC under Regulation 160/06. • The project should avoid/limit works affecting fish and fish habitat • Consider Fisheries Act exemption criteria as well as ‘measures to avoid harm’ as part of preliminary design • Any proposed works that have potential to ‘seriously harm’ fish and/or fish habitat requires approval under the Fisheries Act by DFO. Determination for DFO project review occurs at the detailed design phase of the project. • Ensure that timing constraints are applied to avoid vegetation clearing (including grubbing) during the breeding bird season (approximately May 1st to August 8th).

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		Trafalgar Road Corridor	Road Realignment Area				
45	Wetland		✓	**Vegetation:** Feature is comprised of MAS 2-1 Cattail Mineral Shallow Marsh. Small depressional area in agricultural field. **Wildlife:** Amphibian breeding was confirmed within this feature. Several species were heard calling including Northern Leopard frog, American toad, gray tree frog, spring peeper, wood frog. Anticipated to provide limited habitat for other wildlife species.	Low	• None	• Proposed road improvements should avoid/limit encroachment upon the boundaries of the feature. • Ensure that timing constraints are applied to avoid vegetation clearing (including grubbing) during the breeding amphibian and bird season (approximately April 1st to August 8th).
20	Wetland/ Woodland		✓	**Vegetation:** Feature consists of two contiguous community types, Sugar Maple dominated Forest and Freeman's Maple dominated swamp (FOD5-8 and SWD3-3). The FOD5-8 consists of Sugar Maple dominated canopy with White Ash as the primary associate, with varying amounts of White Pine, Black Cherry, Eastern Hop-hornbeam, Paper Birch, and American Beech. The mid-age swamp (SWD3-3) is dominated by Freeman's Maple with occasional Eastern Hemlock, and rare occurrences of Green Ash, Red Maple, and Paper Birch. American Elm is abundant in the subcanopy. Ground vegetation is dominated by Orange Jewelweed, with Panicled Aster, Devil's Beggar's Ticks, Hairy Willow Herb (Epilobium ciliatum ssp ciliatum), Wild Lily-of-the-valley (Maianthemum canadense), Sensitive Fern, Climbing Nightshade, Spinulose Woodfern, and Wild Sarsaparilla (Aralia nudicaulis). Along its interface with the FOD5-8, several distinct pools (dry) were observed. **Wildlife:** A variety of amphibian species are likely to breed within seasonal pools within the feature, although no targeted surveys were undertaken as access was not available during the breeding amphibian calling season. On April 14 2015 spring peepers were heard calling, standing water was also present throughout the wetland areas. Habitat very likely to provide SWH.	Moderate	• Regional Official Plan- Halton Region (2009) –designated as part of the Regional Natural Heritage System. • Halton Regional Official Plan (2006) – identified candidate Significant Woodlands. • Town of Halton Hills Official Plan (2008) – identified as candidate Significant Woodlands • OMMAH Greenbelt Plan Natural Heritage System (2005)- Protected Countryside • CVC Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourse160/06	• Proposed road improvements should avoid encroachment upon the boundaries of the natural feature. • The project should maintain a naturalized buffer from natural feature, where feasible • Any works proposed within regulated areas will require approval and permitting from the CVC under Regulation 160/06. • Ensure that timing constraints are applied to avoid vegetation clearing (including grubbing) during the breeding bird season (approximately May 1st to August 8th).

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		Trafalgar Road Corridor	Road Realignment Area				
18	Woodland		✓	**Vegetation:** Community Type is Forest (FOD5-8)/Coniferous Plantation (CUP3). Part of the Greenbelt. Dry-Fresh Sugar Maple-White Ash Deciduous Forest Type (FOD5-8). No field surveys (no PTE). **Wildlife:** no field surveys (no PTE), no desktop information available.	Moderate	• Regional Official Plan- Halton Region (2009) –designated as part of the Regional Natural Heritage System. • Halton Regional Official Plan (2006) – identified candidate Significant Woodlands. • Town of Halton Hills Official Plan (2008) – identified as candidate Significant Woodlands • OMMAH Greenbelt Plan Natural Heritage System (2005)- Protected Countryside	• Proposed road improvements should avoid encroachment upon the boundaries of the natural feature. • Ensure that timing constraints are applied to avoid vegetation clearing (including grubbing) during the breeding bird season (approximately May 1st to August 8th).
17	Waterfall Woods ESA - Woodland		✓	The Waterfall Woods ESA is a largely deciduous forest with swamp habitats. Provides functional habitat linkage to adjacent natural systems. SAR and regional species known to occur within the feature. Portions of the Niagara Escarpment are present within this feature, which is designation as UNESCO biosphere reserve, although outside of the study area. **Vegetation:** Vegetation community type overall Dry-Fresh Sugar Maple Deciduous Forest (FOD5). Appears to be largely deciduous forest adjacent to the road with a fairly mixed composition consisting of Ash, Trembling Aspen, White Pine, Red Oak, Sugar Maple, White Elm, American Basswood. Transitions westwards into Sugar Maple dominated forest with occasional White Pine and other associates. Woodland contains potential butternut trees within 25m of road, but species could not be verified due to lack of property access. Part of Waterfall Woods ESA. **Wildlife:** Wood Thrush (provincially Special Concern) and Eastern Wood Pewee (provincially Special Concern) confirmed, regionally rare species – Hooded Warbler – confirmed. Suitable habitat for Acadian Flycatcher (provincially Endangered) and Cerulean Warbler (provincially Endangered). Some suitable cavity trees for SAR bat species. Potential candidate SWH for Bat Maternity Colonies, Reptile Hibernaculum, Woodland Raptor Nesting Habitat. Confirmed SWH with SCC species observed in suitable breeding habitat, Wood Thrush and Eastern Wood Pewee.	High	• Regional Official Plan- Halton Region (2009) –designated as part of the Regional Natural Heritage System. • Halton Regional Official Plan (2006) – identified candidate Significant Woodlands. • Town of Halton Hills Official Plan (2008) – identified as candidate Significant Woodlands • OMMAH Greenbelt Plan Natural Heritage System (2005)- Protected Countryside • Niagara Escarpment Plan Area – Rural Area (2005) • Provincial Policy Statement (2014)	• Proposed road improvements should avoid encroachment upon the boundaries of the ESA. • The project should maintain a naturalized buffer from natural feature, where feasible • All aspects of the ESA (2007) should be complied with in regard to the presence of Butternut. The trees should be assessed in terms of health/vigor by a qualified Butternut Health Assessor following MNR protocols, to determine any future mitigation requirements, if proposed for removal. . • Ensure that timing constraints are applied to avoid vegetation clearing (including grubbing) during the breeding bird season (approximately May 1st to August 8th).

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Ag Lands		✓	✓	**Vegetation:** agriculture fields (crop and pasture). **Wildife:** SAR (Bobolink [provincially Threatened] and Eastern Meadowlark [provincially Threatened]) in an agricultural field (hay crop) located south of the railway line at HWY 7 as well as within an old field/meadow located north of Sideroad 17, west of Trafalgar Road. Barn structures present within the study area supports breeding Barn Swallow (provincially Threatened). Eastern Milksnake [SC] should be considered possible throughout entire study area.	Low (moderate in SAR habitat areas)	• Endangered Species Act (2007)	• All aspects of the ESA (2007) should be complied with regard to the presence of possible Meadowlark, Bobolink, and Barn Swallow nesting in future. Habitat for these species should be assessed again at detailed design. • Ensure that timing constraints are applied to avoid vegetation clearing (including grubbing) during the breeding bird season (approximately May 1st to August 8th).