



wood.

Appendix I

Terrestrial Report



**CLASS EA STUDY
AND
PRELIMINARY DESIGN
LAKESHORE ROAD WEST IMPROVEMENTS
FROM MISSISSAGA STREET TO DORVAL DRIVE
TOWN OF OAKVILLE, ONTARIO**

**TERRESTRIAL HABITAT
EXISTING CONDITIONS REPORT**

**Submitted to:
Corporation of the Town of Oakville
1225 Trafalgar Road
Oakville, ON L6H 0H3**

**Submitted by:
Amec Foster Wheeler Environment & Infrastructure
a Division of Amec Foster Wheeler Americas Limited
160 Traders Blvd., Suite 110
Mississauga, Ontario
L4Z 3K7**

September 2017

TPB166147

EXECUTIVE SUMMARY

The Town of Oakville has initiated a Municipal Class Environmental Assessment (Class EA) for improvements to Lakeshore Road West from Mississaga Street to Dorval Drive. The improvements are required to meet the needs of the town to the year 2031. The town is considering a wide range of options to satisfy active and vehicular transportation demand within the Lakeshore Road West corridor and within the study area.

Lakeshore Road West is a minor east-west arterial road under the jurisdiction of the Town of Oakville, which supports a considerable volume of traffic, and pedestrian and cycling activity. This Terrestrial Habitat Existing Conditions Report will facilitate the preparation of an Environmental Study Report for the project and aid in the completion of the Municipal Class EA process.

This report provides a summary of terrestrial existing conditions from both secondary source information and field investigations conducted on May 24 and June 19, 2017. Through a secondary source review of Land Information Ontario (LIO) data, several natural heritage features are located in the vicinity of the project area. These areas, along with details of Ecological Land Classification survey findings, are discussed herein.

Correspondence with MNR reports that 14 Species at Risk (SAR) have been recorded in the vicinity of the study area, 11 of which are terrestrial or semi-terrestrial. Several wildlife SAR and species of conservation concern were observed during field investigations, including: Barn Swallow, Chimney Swift, Eastern Wood-Pewee, Peregrine Falcon, Canada Warbler and Red-necked Grebe. These species are typically tolerant of disturbance and have learned to adapt in an urbanized environment. Generally habitat for SAR and species of conservation concern is limited and highly fragmented within the Project study area. As such, only minor impacts to wildlife and supporting habitat are anticipated to result from the proposed Project works.



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1.0 INTRODUCTION

Amec Foster Wheeler Environment & Infrastructure, a Division of Amec Foster Wheeler Americas Limited (Amec Foster Wheeler), has been retained by the Town of Oakville to undertake the required Schedule 'C' Municipal Class EA for the proposed roadway and intersection improvements of Lakeshore Road West. This Terrestrial Habitat Existing Conditions Report will facilitate the preparation of an Environmental Study Report (ESR) for the project and aid in the completion of the Municipal Class EA Process.

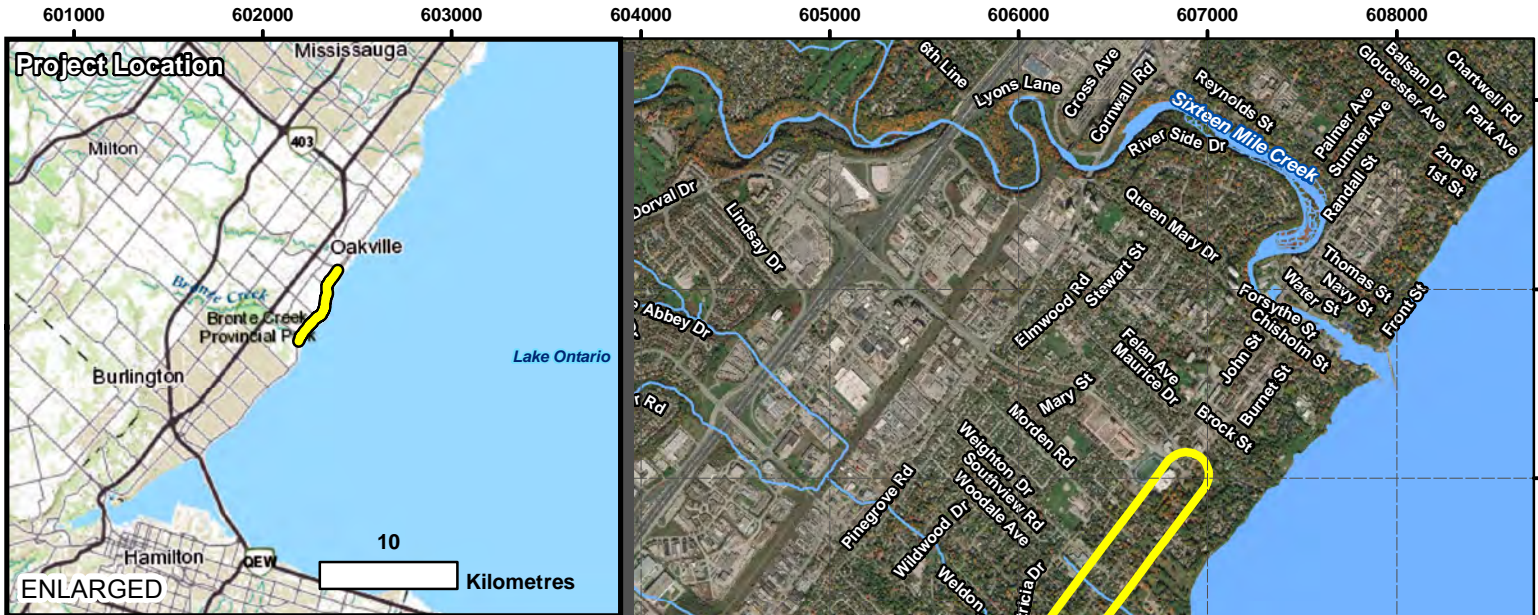
1.1 Background

To meet existing and future needs, the Town of Oakville is proposing roadway and intersection improvements to Lakeshore Road West. Potential improvements to the section of Lakeshore Road West under study may include; intersection improvements, potential bridge structure improvements or full replacement, provision of pedestrian and cycle facilities, urban design streetscape improvements, including provision of transit-related infrastructure.

1.2 Study Area

The study area for the site includes the road right-of-way (ROW) along the entire length of the approximately 6.2 km section between Lakeshore Road West from Mississaga Street to Dorval Drive, as well as the surrounding environment within 120 m of the ROW. The 120 m study area was defined for the Project to ensure all natural heritage features (such as significant woodlands and significant wildlife habitat) as defined by Halton Regions Official Plan (ROPA 38, 2017) are effectively documented through this terrestrial existing conditions report.

The Bronte Creek and Oakville West Urban Creek watersheds are present within the Project study area. These watersheds are under the regulatory jurisdiction of Halton Region, Conservation Halton (CH), and the Aurora District Ministry of Natural Resources and Forestry (MNR). The Project study areas is illustrated in Figure 1-1.



\\MIS-F-S1\Projects\2016\Projects_Other\TPB166147_Oakville_Lakeshore Rd W11_GIS\MXD\Project_Location_1.mxd

LEGEND

- Approximate Study Area**
- Watercourse**
- Wetland**
- Waterbody**

NOTES:
 - Background imagery from Google Earth
 - Topographic features extracted from LIO, MNRF.



**TOWN OF OAKVILLE
 LAKESHORE ROAD WEST IMPROVEMENTS**

Project Location

Datum & Projection:
 NAD 1983 UTM Zone 17N

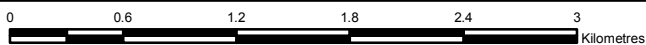


PROJECT N^o: TPB166147

FIGURE: 1-1

SCALE: 1:40,000

DATE: August 2017



2.0 METHODOLOGY

As part of the overall work program, Amec Foster Wheeler undertook a biophysical inventory of the Project study area. The purpose of the inventory was to characterize and evaluate the existing biophysical environment to provide baseline data to support the design and approval process for the Project. Secondary source information and data from field investigations were used to map vegetation communities and determine existing conditions of terrestrial habitat, compile inventories of plant and wildlife species, and to document Species at Risk (SAR) presence, as well as the probability of SAR occurrence based on habitat suitability/availability.

2.1 Secondary Source Review and Agency Consultation

Secondary sources and databases were reviewed to ascertain plant and wildlife species present in the Project study area. Information provided by external agencies, publicly-available topographic data, and correspondence with external agencies allowed for the assessment of Areas of Natural or Scientific Interest (ANSI), Environmentally Sensitive Areas, Provincially Significant Wetlands (PSW), other natural heritage features, and SAR located within or adjacent to the Project study area. Sources reviewed include:

- Conservation Halton (CH) publications and online data (CH website; CH 2017);
- Correspondence with CH and MNRF (Aurora district) (Appendix A);
- Environment Canada's Species at Risk Public Registry database (ECCC 2017a);
- The MNRF Species at Risk in Ontario List (MNRF 2017a);
- MNRF's Natural Heritage Information Centre (NHIC) (MNRF 2017b);
- Ontario Reptiles and Amphibian Atlas (ORAA) (Ontario Nature 2017);
- Atlas of the Mammals of Ontario (AMO) (Dobbyn 1994);
- Bat species profiles and range maps provided by Bat Conservation International, Inc. (BCI 2013);
- The Ontario Butterfly Atlas (OBA) (Toronto Entomological Association 2017) 10 x 10 km survey squares 17PJ00 and 17PJ01;
- Second Atlas (2001-2005) of Breeding Birds of Ontario (ABBO) 10 x 10 km survey squares 17PJ00, 17PJ01 within Region 10 (Cadman et al. 2007); and
- Topographic data extracted from Land Information Ontario (LIO).

The MNRF NHIC database utilizes a 1 km x 1 km system. The Project study area overlaps with 17 NHIC atlas squares, including 17PJ0304, 17PJ0305, 17PJ0404, 17PJ0405, 17PJ0406, 17PJ0505, 17PJ0506, 17PJ0507, 17PJ0508, 17PJ0509, 17PJ0606, 17PJ0607, 17PJ0608, 17PJ0609, 17PJ0610, 17PJ0709, and 17PJ0710.

The ABBO, ORAA, and OBA utilize a 10 km x 10 km system whereby species documented within a specific square can be used to generate a list of species potentially present within a given area.

The lists of mammals that may be found in the study area were similarly generated, however, these resources are not available in a database and as such, the potential presence of these species within the 10 km x 10 km squares was extrapolated based on inventory mapping provided within each atlas.

2.1.1 Species at Risk and Provincially Rare Species

In Ontario, SAR are listed for both plant and animal species whose individuals or populations are considered Extirpated, Endangered, Threatened, or Special Concern, as determined by the provincial Committee on the Status of Species at Risk in Ontario (COSSARO) and the federal Committee on the Status of Endangered Wildlife in Canada (COSEWIC). SAR and their critical habitat are regulated by the provincial *Endangered Species Act, 2007* (ESA) and the federal *Species at Risk Act, 2003* (SARA).

In Ontario, if a species is listed under the ESA as Extirpated, Endangered or Threatened, Section 9 of the *Act* prohibits killing, harming, harassing, capturing, taking, possessing, collecting, buying, selling, leasing, trading or offering to buy, sell, lease or trade a member of the species. Some of these prohibitions also apply to body parts of a member of the species and to things derived from a member of the species. Similarly, if a species is listed under the ESA as Endangered or Threatened, Section 10 of the *Act* prohibits damaging or destroying the habitat of the species. Species listed as Special Concern are not afforded protection under Section 9 and 10 of the ESA.

Provincially rare species are those with a provincial rank of S1, S2 or S3 and considered provincially vulnerable to provincially imperiled. Provincially rare species are tracked by the NHIC and are not protected under ESA. These species are acknowledged in this report as they are considered rare within the province of Ontario and should be taken into consideration for planning purposes.

The potential for SAR and rare species to occur with the Project study area was determined based on a review of background information and agency consultation. The background information included a review of the NHIC online database of significant floral and faunal species near the Project study area. The background information noted above (i.e., wildlife atlases) were also used to develop a complete list of SAR and rare species occurrences that may overlap the Project study area.

2.2 Field Investigations

Field investigations were performed within the Project ROW limits, and in a corridor extending 120 m beyond the ROW. As access was not granted for properties outside of the ROW at the time of field investigations, natural heritage features and wildlife habitat within the 120 m area around the ROW were undertaken through the application of alternative methods of observation (i.e., visual assessment from within the ROW and aerial/satellite imagery interpretation). Natural heritage features examined included vegetation communities, plant species occurrence, breeding bird occurrences, and areas of candidate significant wildlife habitat. No formal surveys were

conducted for mammals, reptiles, or amphibians; however, additional wildlife searches were undertaken concurrently with other field investigations and included direct sightings and evidence of occurrence.

The field investigations were undertaken by a qualified Amec Foster Wheeler biologist on May 24 and June 19, 2017. A description of field survey methodologies are provided in the subsections below. Breeding bird survey locations are illustrated in maps 1 to 9, appended to the document in Appendix B.

2.2.1 Vegetation Communities and Plant Inventories

Detailed vegetation community determination and mapping within the Project study area were conducted according to the Ecological Land Classifications (ELC) system for southern Ontario. The First Approximation of ELC (Lee et al. 1998) was applied for the determination of ecosite type; however, the 2008 catalogue of ecosite types was applied where ecosites could not be determined through the application of the First Approximation. The occurrence of ELC communities were cross-referenced with provincially significant vegetation communities as identified in the Significant Wildlife Habitat Technical Guide (SWHTG; MNR 2000) to determine whether these communities exist with the Project study area.

Botanical inventories were conducted from within the ROW and included documenting all visible species in ELC communities within the Project study area. Plant species occurrences were cross-referenced with NHIC database to determine existence of rare species within the Project study area. Common and scientific names of plant species are based on the current nomenclature as listed in the NHIC database. Only common names are provided within the body of the report; all scientific names are provided within Appendices C and D.

2.2.2 Breeding Bird Surveys

Sixteen (16) point count stations were surveyed on May 24 and June 19, 2017 by a qualified biologist skilled in the identification of birds by sight and sound. Surveys were conducted for ten minutes at each station (instead of the five minute listening period outlined in the ABBO) and all birds heard or observed were recorded at intervals of 0-50 m, 50-100 m, >100 m and flyovers (birds seen flying overhead). In addition, birds were recorded at intervals of 0-3 minutes, 3-5 minutes and 5-10 minutes. Surveys were initiated no earlier than 30 minutes prior to sunrise and extended to five hours after sunrise. Species were identified through their unique vocalisations and visual observations. Each bird was recorded once and mapped on the field data sheets to ensure no duplication of individual birds. All bird surveys were undertaken in good weather with warm temperatures, no precipitation, and little or no wind.

2.2.3 Wildlife Habitat

Based on the SWHTG, the MNR defines significant wildlife habitat (SWH) as ecologically important in terms of features, functions, representation or amount and contributing to the quality

and diversity of an identifiable geographic area or Natural Heritage System (MNR 2000). SWH is divided into four main categories:

- Seasonal Concentration Areas of Animals;
- Rare Vegetation Communities and Specialized Habitat for Wildlife;
- Habitat for Species of Conservation Concern (excluding Endangered or Threatened species); and
- Animal Movement Corridors.

To determine the existence of SWH within the Natural Heritage System, the MNRF has developed SWH Criterion Schedules for identifying ecosites and/or natural features suitable for wildlife to carry out critical life processes (listed within the four main categories described above). The Project study area falls within ecoregion 7E (Lake Erie-Lake Ontario Ecoregion); accordingly, the SWH Criterion Schedules for Ecoregion 7E were applied to document the occurrence of candidate SWH within the Project study area.

3.0 RESULTS

3.1 Secondary Source Review and Agency Consultation

3.1.1 Physiography and Soils

The project is located within the Iroquois Plain physiographic region which extends across the southern portions of the Greater Toronto and Hamilton Area (GTHA). The soils within and adjacent to the study area are comprised of permeable sandy soils, which were deposited 12,500 years ago along the shores of glacial Lake Iroquois (TRCA, 2017).

3.1.2 Vegetation Communities

The Project study area is within Ecoregion 7E and is contained within the Deciduous Forest Region, Niagara Forest Section. Forest communities are typically dominated by broadleaved tree species common to both the Great Lakes-St. Lawrence Ecoregion (6E) and Deciduous Forest Region, such as Sugar Maple, American Beech, Basswood, Red Oak, Black Walnut, and White Ash, and contains remnants of Carolinian forests with species such as Black Gum, various oaks and hickories, Common Hackberry, Sassafras, and Tulip Tree (Rowe 1972).

Natural vegetation cover within Ecoregion 7E is primary agriculture; however, land use within the Project study area is predominantly anthropogenic, characterized by commercial, industrial, and residential land uses. The majority of natural/semi natural vegetated areas are generally associated with watercourses throughout the study areas and have experienced intense anthropogenic disturbances for many decades. Invasive species presence is often abundant and outcompeting the native flora.

Three woodlands are found within the project study area, including a 2.1 hectare (ha) deciduous forest located in the vicinity of Town of Oakville sewage and water treatment plant, a 2.1 ha deciduous forest in the valley lands of Fourteen Mile Creek, and a 1.5 ha deciduous forest (FOD7) located in the valley lands of McCraney Creek.

3.1.3 Wildlife

Inventories of wildlife (Appendix C) were compiled from available literature and resources (listed in Section 2.1). Based on a review of background information, 107 species of birds, 41 species of mammals, 14 species of amphibians, and 12 species of reptiles are reported to occur with the natural heritage squares encompassing the Project study area.

3.1.3.1 Birds

Within the vicinity of the Project study area, 107 species of birds were reported in the 2nd ABBO (BSC et al. 2006) (see Appendix C). It is important to note that the exact locations of species occurrences are not available from the atlas and are instead recorded from point count locations within the two 10 x 10 km squares encompassing the study area (17PJ00, 17PJ01). Consequently, it is not certain that these species or their habitats are present within the more

focused study area or surrounding area of Lakeshore Road. Ten bird species are SAR or rare species (see Section 3.1.4).

3.1.3.2 Mammals

In total, 41 species of mammals were found to potentially occur within the Project study area. This data was gathered from range maps in the AMO (Dobbyn 1994) and bat data has been supplemented by Bat Conservation International Inc. records (BCI 2013) (see Appendix C). Of the 41 species reported to be present in the vicinity of the project study area, four (4) are listed as SAR under the ESA (Section 3.1.4).

3.1.3.3 Reptiles and Amphibians

A review of the ORAA map indicated 12 species of reptiles and 14 species of amphibians have been observed within the natural heritage square which encompasses the Project study area (Ontario Nature 2017) (see Appendix C). Four reptile species are SAR or rare species (see Section 3.1.4). No amphibian SAR or rare species were documented in the Project study area. It is important to note that the exact locations of these species records are not available through the ORAA and are instead recorded from locations within the 10 x 10 km square encompassing the study area (17PJ00). Consequently, it is not certain that these species or their habitats are present within the more focused study area or surrounding the Lakeshore Road area.

3.1.4 Species at Risk and Provincially Rare Species

Secondary source review (Appendix C) and MNRF consultation (Appendix A) revealed the presence of two (2) plant species, twelve (12) bird species, four (4) mammal species, and four (4) herptile SAR / provincially rare species documented within the vicinity of the study area (MNRF Correspondence, MNRF 2017b, Cadman et al. 2007, BCI 2013, Dobbyn 1994, Ontario Nature 2017). It is important to note that the exact locations of these species are not available through the reviewed sources. As a result, it is unknown if these species are present within the study area with the exception of the species MNRF confirmed were recorded from the study area. These species documented through desktop resources include:

Endangered Species

Eastern Small-footed Myotis (*Myotis leibii*)

Little Brown Myotis (*Myotis lucifugus*)

Northern Long-eared Myotis (*Myotis septentrionalis*)

Tri-coloured Bat (*Perimyotis subflavus*)

Butternut (*Juglans cinerea*)

Jefferson/Blue-spotted Salamander (*Ambystoma jeffersonianum/ laterale*)

Threatened Species

Bank Swallow (*Riparia riparia*)

Barn Swallow (*Hirundo rustica*)

Bobolink (*Dolichonyx oryzivorus*)
Eastern Meadowlark (*Sturnella magna*)
Chimney Swift (*Chaetura pelagica*)
Eastern Whip-poor-will (*Caprimulgus vociferus*)
Kentucky Coffee-tree (*Gymnocladus dioicus*)
Eastern Hog-nosed Snake (*Heterodon platirhinus*)

Special Concern Species

Eastern Wood-Pewee (*Contopus virens*)
Peregrine Falcon (*Falco peregrinus*)
Snapping Turtle (*Chelydra serpentina*)
Northern Map Turtle (*Graptemys geographica*)
Eastern Ribbonsnake (*Thamnophis sauritus*)
Canada Warbler (*Cardellina canadensis*)
Red-headed Woodpecker (*Melanerpes erythrocephalus*)
Common Nighthawk (*Chordeiles minor*)
Wood Thrush (*Hylocichla mustelina*)

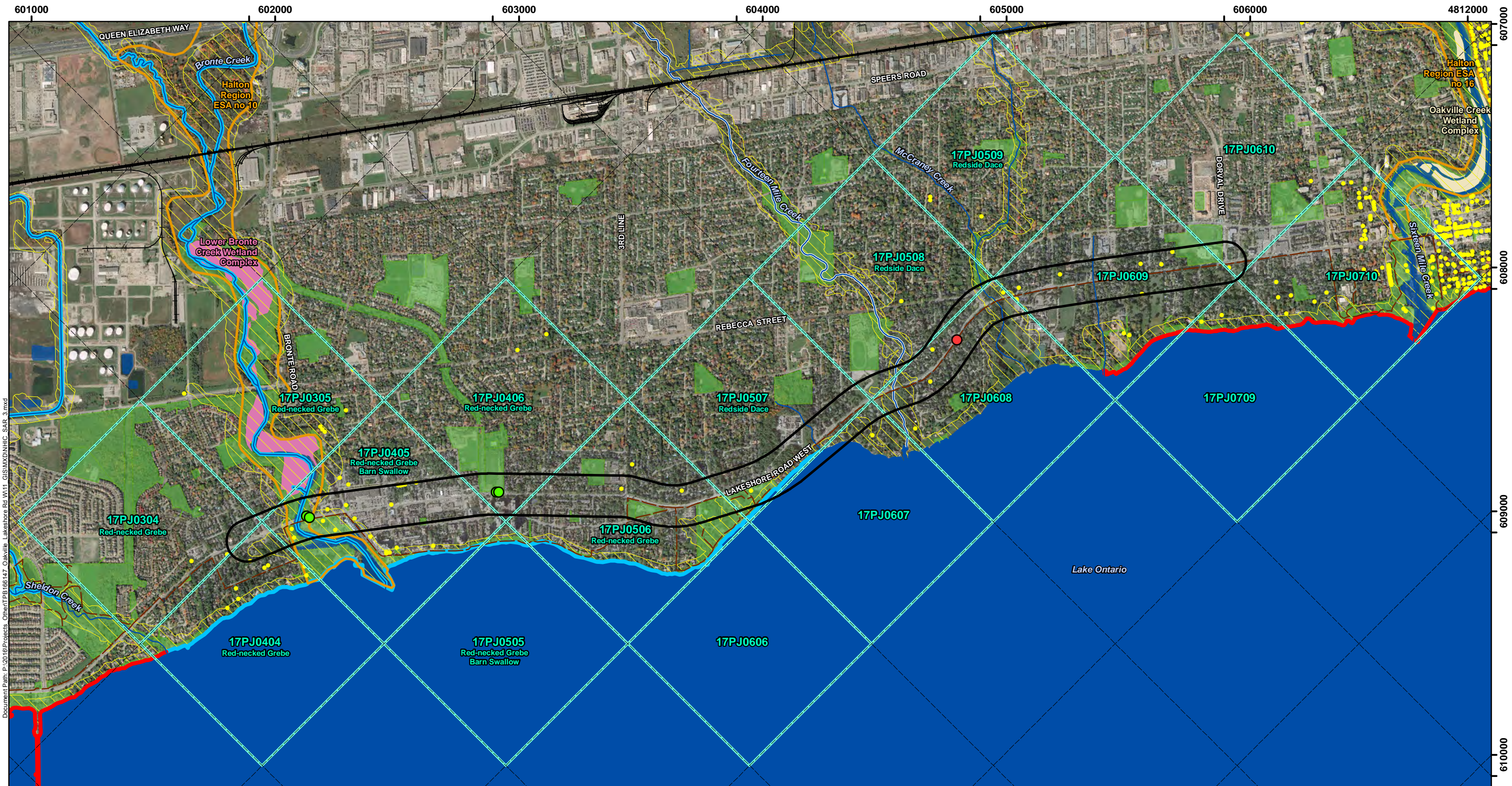
The MNRF also reported the potential presence of Red-necked Grebe, a provincially rare species (S3B/S4N) in the vicinity of the Project study area. NHIC searches within the 16 natural heritage squares (1km x 1km) which encompass the study area do not indicate any additional SAR within the area beyond what was reported by the MNRF. In section 3.2.2 the likely, confirmed, or observed presence of the SAR listed above, is discussed.

3.1.5 Significant Natural Areas

A review of MNRF's NHIC database and correspondence from MNRF indicates that there are a number of natural heritage features recorded in the vicinity of the project study area (Figure 1-1):

- Occupied American Eel and Silver Shiner habitat: Bronte Creek;
- Occupied Redside Dace habitat: Fourteen Mile Creek;
- Lower Bronte Creek Wetland Complex:
 - Located approximately 170 m north of the Bronte Creek Bridge on Lakeshore Road (not shown in Figure 3-1); and
- Riverview Park, Bronte Athletic Park, Coronation Park lands.

Correspondence with MNRF and Conservation Halton is currently ongoing to ensure guidelines are met to provide necessary protection of these areas. During the Detailed Design phase, a comprehensive assessment of potential impacts should be undertaken and site-specific mitigation measures developed.



Document Path: P:\2016\Projects\Other\TPB166147_Oakville_Lakeshore Rd W111_GIS\MXD\NHIC_SAR_3.mxd

LEGEND 		NOTES: - Background extracted from Bing. - Potential Butternut Hybrid. - Planted Trees	
2015 DFO Species at Risk (American Eel, Lake Sturgeon, Redside Dace, and Silver Shinner)			
2016 DFO Species at Risk (Deepwater Sculpin, Eastern Pondmussel, Grass Pickerel, Mapleleaf, Northern Brook Lamprey, River Redhorse, Shortnose Cisco, Spotted Gar, and Upper Great Laked Kiyi)		LAKESHORE ROAD WEST IMPROVEMENTS CLASS ENVIRONMENTAL	
2015 DFO Occupied Redside		Natural Heritage and Species at Risk	
Locally Significant Wetland		PROJECT N ^o : TPB166147 FIGURE: 3-1	
Provincially Significant Wetland		SCALE: 1:21,000 DATE: July 2017	
Butternut¹ kentucky coffee tree²		Datum & Projection: NAD 1983 UTM Zone 17N	
Parks Watercourse Railway Waterbody			

3.2 Field Investigations

3.2.1 Vegetation Communities

The majority of the land within the Project study area includes residential areas, commercial areas, and cultural vegetation habitats. Many of the vegetation communities within the Project study area have been created by human disturbance and are classified as cultural. Natural/semi-natural habitats are mainly associated the watercourses throughout the Project study area.

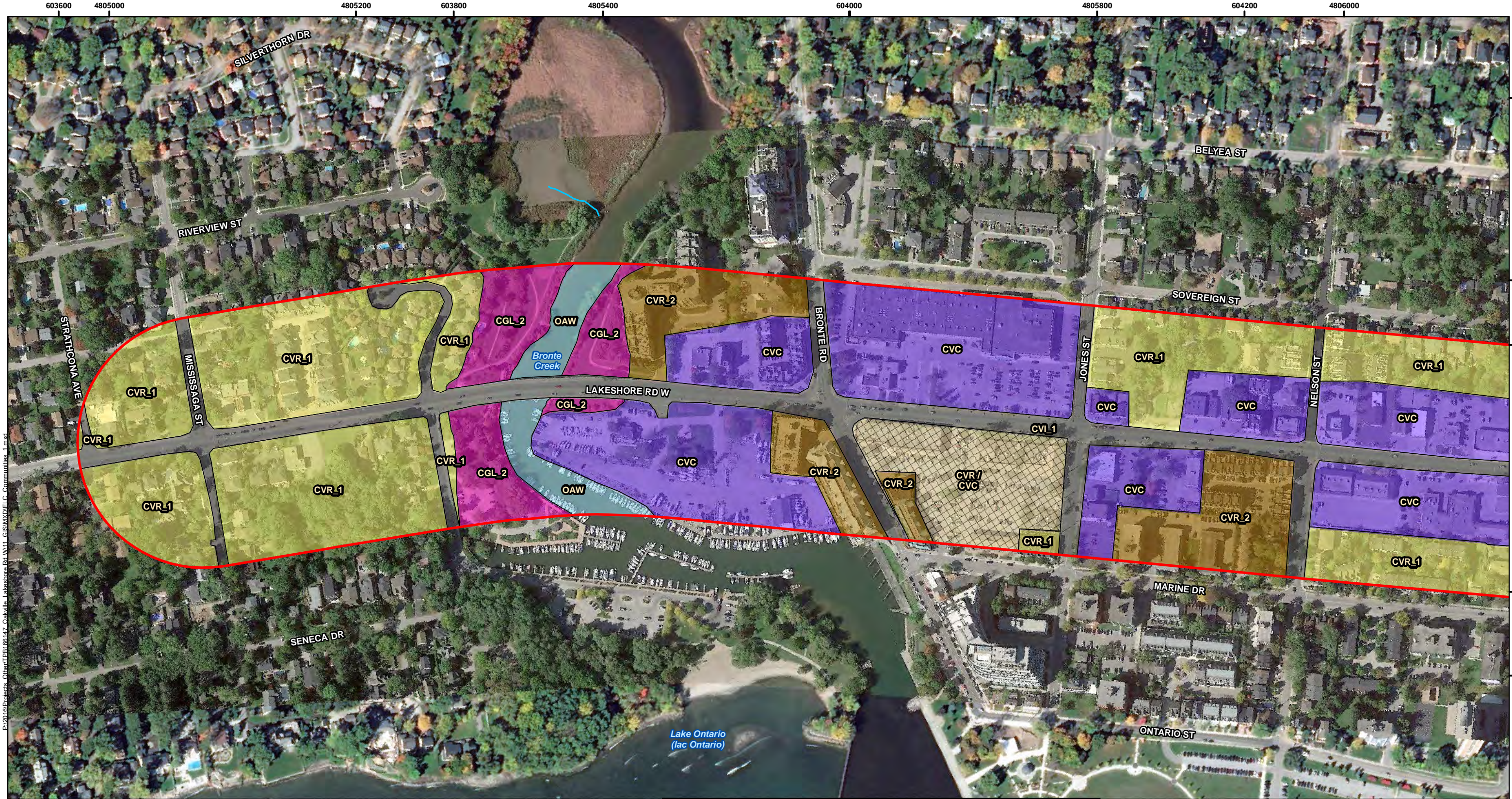
A summary table of the vegetation communities and land use within the study area is presented in Table 3-1, and distribution of land use and ELC units are illustrated in Figure 3-2 (Maps 1-6). Access was not granted for surveys outside of the ROW at the time of field investigations so communities could not be investigated thoroughly. ELC designations were undertaken at a high level based on observations from the ROW and aerial/satellite imagery interpretation. A compiled plant species list has been provided in Appendix D.

A total of 13 ELC community types / land uses were identified within the terrestrial study area. Of the 152 hectares (ha) that make-up the study area, 93.1% was made up of community types / land uses considered anthropogenic or cultural in origin (e.g., constructed). The natural / semi-natural habitats are known to contain numerous non-native species due to their proximity to cultural habitats.

Table 3-1: ELC Vegetation Communities and Land Uses

ELC Type	Community Description
Vegetated / Natural Communities	
<p>FOD5-2 Dry - Fresh Sugar Maple - Beech Deciduous Forest Type Total Area: 2.1 ha (1.4%)</p>	<p>This mature deciduous forest is dominated by Sugar Maple and American Beech in the canopy with a lesser component of Red Oak and Black Cherry. The sparse sub-canopy is also Sugar Maple and American Beech, while there are some invasive Honeysuckles and Choke Cherry in the understory as well as the tree species. The ground layer is dominated by Garlic Mustard but with a significant component of native wildflowers such as Yellow-trout Lily and White Trillium as well as seedling Sugar Maples. The edges have numerous invasive and weedy species, but the small forest interior is relatively undisturbed.</p>
<p>FOD7 Fresh - Moist Lowland Deciduous Forest Ecosite Total Area: 1.5 ha (1.0%)</p>	<p>This lowland forest along the creek is dominated by Norway Maple with some Black Walnut and willow. Norway Maple are also abundant at the lower levels, along with Manitoba Maple in the sub-canopy, Multiflora Rose and invasive honeysuckles in the understory and Garlic Mustard in the ground layer. There are very few native species in this community, and it is highly disturbed with numerous trails and signs of flooding.</p>
<p>FOD7-4 Fresh - Moist Black Walnut Lowland Deciduous Forest Type Total Area: 2.1 ha (1.4%)</p>	<p>The canopy in this lowland forest along the creek is dominated by Black Walnut with some willow and Red Oak. The sub-canopy and understory have significant components of Manitoba Maple, European Buckthorn and invasive honeysuckles as well as young Black Walnut. Goldenrods and Poison Ivy are abundant in the ground layer, and Riverbank Grape and Virginia Creeper vines are abundant at all levels. At the time of survey, all the trees had been completely defoliated. Likely this was due to the infestation of Fall Cankerworm (<i>Alsophila pometaria</i>) at the time.</p>

ELC Type	Community Description
CUW1 Mineral Cultural Woodland Ecosite Total Area: 0.9 ha (0.6%)	This cultural woodland is very diverse and disturbed. There are some large White Pine, Black Cherry and Black Walnut as well as planted young conifers. Some areas are densely covered in Manitoba Maple, Choke Cherry and Riverbank Grape while others are more open with many grasses and goldenrods.
OAW Open Water Total Area: 3.9 ha (2.5%)	The open water consists of several watercourses that cross Lakeshore Road.
Constructed Areas	
CGL_2 Parkland Total Area: 10.8 ha (7.1%)	Several city parks in the study area are dominated by lawn, but have small disturbed areas of cultural woodland, thicket and meadow.
CVC Commercial and Industrial Total Area: 10.7 ha (7.0%)	The area around downtown Bronte is particularly developed with numerous commercial buildings.
CVI_1 Transportation Total Area: 14.6 ha (9.6%)	The entire study area contains a dense network of city streets.
CVI_3 Sewage and Water Treatment Total Area: 0.9 ha (0.6%)	The Oakville Southwest Wastewater Treatment Plant is partially located within the study area.
CVR / CVC Residential / Commercial and Industrial Total Area: 1.7 ha (1.1%)	The area around downtown Bronte is particularly developed with numerous commercial and residential buildings.
CVR_1 Low Density Residential Total Area: 89.4 ha (58.8%)	Most of the study area is dominated by detached homes and the associated lawns, gardens and driveways.
CVR_2 High Density Residential Total Area: 6.4 ha (4.2%)	Around downtown Bronte there are several high-rise residential buildings.
CVS_1 Education Total Area: 7.0 ha (4.6%)	There are several schools within the study area.



LEGEND

Approximate Study Area

— Watercourse

Ecological Land Classification

- CGL_2, Parkland
- CVI_1, Transportation
- CVR / CVC, Residential / Commercial and Industrial
- CVC, Commercial and Industrial
- CVR_1, Low Density Residential
- CVR_2, High Density Residential
- OAW, Open Water



NOTES:
 - Aerial Imagery extracted from Google Earth, date is 2016.

Datum & Projection:
 NAD 1983 UTM Zone 17N

**TOWN OF OAKVILLE
 LAKESHORE ROAD WEST IMPROVEMENTS**

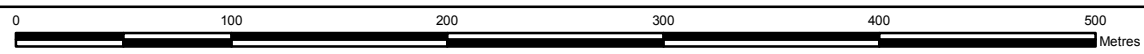
Ecological Land Classification

PROJECT N ^o : TPB166147	FIGURE: 3-2, Map1
SCALE: 1:3,500	DATE: June 2017

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603600 4805000 4805200 603800 4805400 604000 4805800 604200 4806000

604400 4806000 604600 604800 605000





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LEGEND

Approximate Study Area

Ecological Land Classification

- CGL_2, Parkland
- CVI_1, Transportation
- CVC, Commercial and Industrial
- CVR_1, Low Density Residential
- CVR_2, High Density Residential

0 100 200 300 400 500 Metres



NOTES:
- Aerial Imagery extracted from Google Earth, date is 2016.

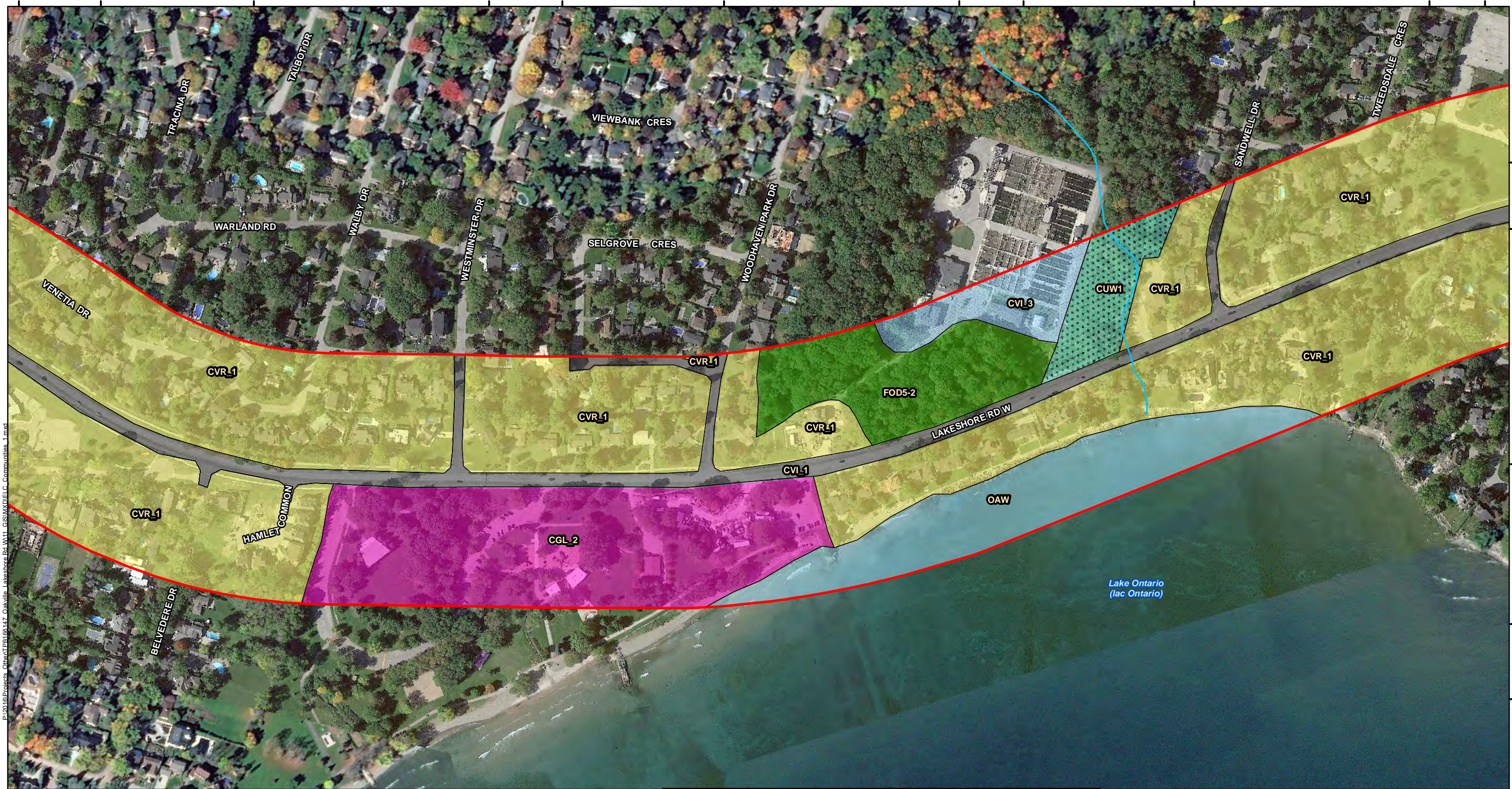
Datum & Projection:
NAD 1983 UTM Zone 17N

**TOWN OF OAKVILLE
LAKESHORE ROAD WEST IMPROVEMENTS**

Ecological Land Classification

PROJECT N°: TPB166147	FIGURE: 3-2, Map 2
SCALE: 1:3,500	DATE: June 2017

4806800 605200 4807000 4807200 605400 4807400 4807600 605600 4807800 4808000 605800



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LEGEND

- Approximate Study Area
- Watercourse

Ecological Land Classification

- CGL_2, Parkland
- CUW1, Mineral Cultural Woodland Ecosite
- CVI_1, Transportation
- CVI_3, Sewage and Water Treatment
- CVR_1, Low Density Residential
- FOD5-2, Dry - Fresh Sugar Maple - Beech Deciduous Forest Type
- OAW, Open Water

0 100 200 300 400 500 Metres



NOTES:
- Aerial Imagery extracted from Google Earth, date is 2016.

Datum & Projection:
NAD 1983 UTM Zone 17N

**TOWN OF OAKVILLE
LAKESHORE ROAD WEST IMPROVEMENTS**

Ecological Land Classification

PROJECT N°: TPB166147	FIGURE: 3-2, Map 3
SCALE: 1:3,500	DATE: June 2017



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LEGEND

Approximate Study Area

— Watercourse

Ecological Land Classification

- CVI_1, Transportation
- CVR_1, Low Density Residential
- CVS_1, Education
- FOD7, Fresh - Moist Lowland Deciduous Forest Ecosite
- FOD7-4, Fresh - Moist Black Walnut Lowland Deciduous Forest Type

0 100 200 300 400 500 Metres



NOTES:
- Aerial Imagery extracted from Google Earth, date is 2016.

Datum & Projection:
NAD 1983 UTM Zone 17N

**TOWN OF OAKVILLE
LAKESHORE ROAD WEST IMPROVEMENTS**

Ecological Land Classification

PROJECT N°: TPB166147	FIGURE: 3-2, Map 4
SCALE: 1:3,500	DATE: June 2017



LEGEND

Approximate Study Area

Watercourse

Ecological Land Classification

- CGL_2, Parkland
- CVI_1, Transportation
- CVR_1, Low Density Residential
- CVS_1, Education

0 100 200 300 400 500 Metres



NOTES:
 - Aerial Imagery extracted from Google Earth, date is 2016.

Datum & Projection:
 NAD 1983 UTM Zone 17N

TOWN OF OAKVILLE
LAKESHORE ROAD WEST IMPROVEMENTS

Ecological Land Classification

PROJECT N^o: TPB166147 **FIGURE: 3-2, Map 5**

SCALE: 1:3,500 DATE: June 2017

3.2.2 Wildlife

3.2.2.1 Birds

Fifty-seven (57) species were identified within the Project study area during the Amec Foster Wheeler breeding bird point count survey, of which 51 were not documented through the secondary source review (Appendix C). All species recorded during the Amec Foster Wheeler field investigations are considered common, except for six SAR/rare species, including Barn Swallow, Chimney Swift, Eastern Wood-Pewee, Peregrine Falcon, Canada Warbler, and Red-necked Grebe (see Section 3.2.4). The results of the breeding bird survey data are provided in Appendix E.

The most commonly recorded birds included Common Grackle, House Sparrow, European Starling, American Robin, and Chimney Swift, which represented 41% of all birds recorded. These species are typical of urban settings and anthropogenically influenced natural areas.

Watercourse culverts and bridges were inspected and no Barn Swallow nests were observed inside culverts which are common locations for nesting. Cliff Swallows were observed ingressing and egressing from the Bronte Creek Bridge during aquatic site investigations; however, no nests were observed on the structure. Correspondence with the Town of Oakville confirmed Cliff Swallow nests are present beneath the Bronte Creek Bridge (Town of Oakville pers. comm., 2017). While this species is not listed as 'at risk' provincially or federally, it is protected under the *Migratory Bird Convention Act, 1997* (MBCA). In order to minimize the potential for incidental take of nesting migratory birds, any proposed bridge rehabilitation works planned for the Bronte Creek Bridge should be undertaken outside of the active breeding season. Further details on construction timing windows are provided in Section 5.0.

Several of the species observed during the surveys are likely migrants that were commuting through the area, these species include Canada Warbler, Blackburnian Warbler, Blackpoll Warbler, Black-throated Green Warbler, Magnolia Warbler, Tennessee Warbler, and Northern Parula. Ring-billed Gull and Double-crested Cormorant were also observed during the field investigations, but are unlikely to nest within the area and are more likely commuting from breeding colonies in Hamilton Harbour and/or Leslie Street Spit in Toronto.

3.2.2.2 Mammals

In total, 41 species of mammals were documented as potentially occurring within the natural heritage blocks which encompass the Project study area (see Section 3.1.3.2). Of the 41 species, only one was observed during field surveys, an Eastern Gray Squirrel (*Sciurus carolinensis*) and urban tolerant species, was observed during site investigations. Field investigations were only conducted from the ROW and evidence of other species utilizing more natural areas beyond the ROW could not be observed. The majority of other potentially occurring species are small such as mice, voles and shrews, or nocturnal such as flying squirrels and bats. These species are difficult to detect using standard, non-invasive methods.

3.2.2.3 Reptiles and Amphibians

A review of the ORAA map indicated 12 species of reptiles and 14 species of amphibians which have been observed within the natural heritage block encompassing the study area (see Section 3.1.3.3). No reptile or amphibian species were observed during Amec Foster Wheeler field investigations. A scarcity of fallen woody debris, wetlands, and ponds within the Project study area indicate that there is limited potential habitat for feeding and nesting of reptiles and amphibians. As evidence of species utilizing more natural areas within the Project study area could not be observed from the ROW, the findings do not suggest that reptiles or amphibians are absent within the Project study area, but instead suggests these species are likely limited or isolated to marginal habitats in the area.

3.2.2.4 Invertebrates

An atlas for species in the *Insecta* class has not been published and therefore, it is difficult to reference how many species of butterflies, moths, and dragonflies inhabit the project study area. During field investigations, five invertebrates were observed within the Project study area including Cabbage White, Orange Sulphur, Clouded Sulphur, Hobomok Skipper, and Monarch Butterfly (see Section 3.2.4.5). These species may be utilizing the limited habitat in ditches or small plots of undeveloped land within the Project study area for feeding and/or egg laying.

3.2.3 Species at Risk (Endangered and Threatened)

Species identified through secondary source review and from field investigations were synthesized in Table 3-2 for the purpose of identifying potential/confirmed occurrence of endangered and threatened SAR within the Project study area. Special concern and provincially rare species are discussed in the context of significant wildlife habitat (Section 3.2.4.2). The probabilities provided in Table 3-2 are based on an assessment of each species' habitat preferences/needs in conjunction with existing conditions observed during 2017 field investigations and background information. Additional SAR may come into the area or species already occurring in the area may be up-listed at any time. For this reason, ongoing communication with the MNRF is strongly recommended to ensure compliance with the ESA. The probabilities of occurrence are defined as 'High', 'Moderate', 'Low', and 'None' and are based on the following definitions:

- **High:** Those species recorded in the vicinity of the project (typically within 10 km and recorded in the past 20 years) and whose preferred habitat is abundant within the Project study area. Species with high probability of occurrence would be expected to breed within or frequently use the habitats available within the Project study area and would be known to have a high relative abundance within the region (i.e., compared to other regions in Ontario).
- **Moderate:** Those species in the vicinity of the project, but have limited suitable habitat within the Project study area. Species with moderate probabilities of occurrence may not occur within the Project study area frequently, but may intermittently use it for foraging, migration or movement to other parts of their home-range.

- **Low:** Those species recorded in the vicinity of the Project study area, but whose preferred habitat does not occur or is extremely limited within the study area. These species may intermittently move through the study area, but are unlikely to become permanent residents.
- **None:** Those species whose preferred habitat is completely absent from the Project study and may only migrate intermittently through the Project study area.

Table 3-2: Records of Endangered and Threatened Species at Risk within the Vicinity of the Study Area and Probability of Occurrence

Species Name, Status (SARA, ESA, S-Rank) ^{1,2,3} and Data Source ⁴	Preferred Habitat	Potential SAR Habitat/Occurrence on Project site
SAR Birds		
Bank Swallow <i>(Riparia riparia)</i> SARA: No Status ⁵ ESA: Threatened S-Rank: S4B Source: ABBO (2001-2005)	Bank swallows nest in burrows in natural and human-made settings where there are vertical faces in silt and sand deposits. Many nests are on banks of rivers and lakes, but they are also found in active sand and gravel pits or former ones where the banks remain suitable (COSEWIC 2013a).	Low – No vertical faces suitable for Bank Swallow nesting are present within the Project study area.
Barn Swallow <i>(Hirundo rustica)</i> SARA: No Status ⁵ ESA: Threatened S-Rank: S4B Source: ABBO (2001-2005)	Often found feeding in a range of open habitats including fields, marshes, meadows, and ponds. They primarily use man-made structures such as building, bridges, and culverts for nesting (COSEWIC, 2011a).	Moderate – Human-made structures suitable for nesting are present, but no evidence of nesting was observed during the site surveys.
Bobolink <i>(Dolichonyx oryzivorus)</i> SARA: No Status ⁵ ESA: Threatened S-Rank: S4B Source: ABBO (2001-2005), NHIC (2003)	Bobolink nest primarily in forage crops, hayfields and associated pastures. Bobolink also occur in wet prairie, graminoid peatlands and abandoned fields dominated by tall grasses, no-till cropland, small-grain fields, reed beds and irrigated fields in arid regions. The species does not generally occupy fields of row crops such as corn, soybean and wheat, pastures in valleys which high shrub density or intensively grazed pastures (COSEWIC 2010a).	Low – There are few areas of marginally suitable habitat available within the study area. Areas of potential habitat are limited to small plots of undeveloped land located adjacent to the road ROW and to residential/commercial areas. Bobolink tend to avoid edge habitat and it is unlikely that these areas would provide suitable nesting habitat for the species.
Chimney Swift <i>(Chaetura pelagica)</i> SARA: Threatened ESA: Threatened S-Rank: S4B, S4N Source: ABBO (2001-2005)	Mainly associated with areas where the birds can find chimneys to use as nesting and resting sites; however, it is likely that a small portion of the population continues to use hollow trees. (COSEWIC 2007a).	Moderate – Chimney Swift were observed on site during Amec Foster Wheeler surveys. Nesting areas are limited within the project area, but some suitable chimneys are evident which may provide habitat for nesting.

Species Name, Status (SARA, ESA, S-Rank) ^{1,2,3} , and Data Source ⁴	Preferred Habitat	Potential SAR Habitat/Occurrence on Project site
Eastern Meadowlark <i>(Sturnella magna)</i> SARA: No Status ⁵ ESA: Threatened S-Rank: S4B Source: ABBO (2001-2005), NHC (2003)	Prefers grassland habitats, including native prairies and savannahs, as well as non-native pastures, hayfields, weedy meadows, herbaceous fencerows and airfields. Moderately area-sensitive preferring larger tracts of grasslands over smaller fragments; the minimum area required is estimated at 5 ha (COSEWIC 2011b).	Low - There are few areas of marginally suitable habitat available within the study area. Areas of potential habitat are limited to small plots of undeveloped land located adjacent to the road ROW and to residential/commercial areas. Bobolink tend to avoid edge habitat and it is unlikely that these areas would provide suitable nesting habitat for the species.
Eastern Whip-poor-will <i>(Antrostomus vociferous)</i> SARA: Threatened ESA: Threatened S-Rank: S4B Source: ABBO (2001-2005)	An obligate forest breeding bird dependent on open, dry deciduous or mixed forests with little or no underbrush forest. Shade, proximity to open areas for foraging, and fairly sparse ground cover are key elements of habitat chosen. Open habitats such as open wetlands with perches, regenerating forest edges and shrubby pastures for used for foraging (COSEWIC 2009).	Low – Suitable breeding habitat is not present on Site. Potential migrant through the area.
SAR Herpetiles		
Eastern hog-nosed snake <i>(Heteron platirhinos)</i> SARA: Threatened ESA: Threatened S-Rank: S3? Source: ORA 2017	This species inhabits fields, forests, shrubland, beaches and old dune habitats. This species is generally found in habitats with sandy, well-drained soils, into which this snake burrows. It is commonly encountered on beaches due to its affinity for open, sandy areas (Ontario Nature, 2017).	Low –The beaches of Lake Ontario as well as small undeveloped plots between residential and commercial areas provide limited habitat for this species.
Jefferson/Blue-Spotted Salamander Complex <i>(Ambystoma jeffersonianum/laterale)</i> SARA: Endangered ESA: Endangered S-Rank: S3? Source: Ontario Nature (2013)	Given Jefferson/Blue-spotted Salamander expresses Jefferson Salamander dominant alleles, this species is protected under SARA and the ESA. Throughout their range, Jefferson Salamanders are found within deciduous or mixed upland forests containing, or adjacent to, suitable breeding ponds. Breeding ponds are normally ephemeral, or vernal woodland pools that dry in late summer. Terrestrial habitat is mature woodlands (COSEWIC 2010b).	Low – Jefferson/Blue-spotted Salamander have been recorded in Petro-Canada Park, located to the north of the project area in the vicinity of the Rebecca Street Bridge at Bronte Creek. There is some likelihood that Jefferson Salamander dominant individuals could be present. Suitable habitat may be present on site, as vernal pools may be evident outside of areas that were studied. Suitable upland habitat is present.
SAR Mammals		
Eastern Small-footed Myotis <i>(Myotis leibii)</i> SARA: Not at Risk ESA: Endangered S-Rank: S2S3 Source: AMO (1994)	While some are found in caves/mines of eastern North America, they generally roost on the ground under rocks and in crevices, as well as hollow trees, in buildings and under tree bark (MNR, 2017c). Caves and mines are wintering habitat. Similar habitat requirements as other Myotis species.	Moderate – Potential maternal roost habitat is present in limited areas of woodland habitat on site.

Species Name, Status (SARA, ESA, S-Rank) ^{1,2,3} , and Data Source ⁴	Preferred Habitat	Potential SAR Habitat/Occurrence on Project site
<p>Little Brown Myotis (<i>Myotis lucifugus</i>)</p> <p>SARA: Endangered ESA: Endangered S-Rank: S4 Source: AMO (1994)</p>	<p>Roosts in tree cavity, including small spaces or crevices found in loose bark, hollow trees, rock faces and human structures such as attics, walls and bat boxes. Hibernates in caves and abandoned mines during the winter months. Typically forages over water (COSEWIC 2013b).</p>	<p>Moderate – Potential maternal roost habitat is present in limited areas of woodland habitat on site. Lake Ontario would provide an abundant foraging opportunity for this species.</p>
<p>Northern Myotis (<i>Myotis septentrionalis</i>)</p> <p>SARA: Endangered ESA: Endangered S-Rank: S3 Source: AMO (1994)</p>	<p>Roosts in tree cavity, including small spaces or crevices found in loose bark, hollow trees, rock faces and human structures such as attics, walls and bat boxes. Hibernates in caves and abandoned mines during the winter months. Typically forages over water (COSEWIC 2013b).</p>	<p>Moderate – Potential maternal roost habitat is present in limited areas of woodland habitat on site. Lake Ontario would provide an abundant foraging opportunity for this species.</p>
<p>Tri-colored Bat (<i>Perimyotis subflavus</i>)</p> <p>SARA: Endangered ESA: Endangered S-Rank: S3? Source: AMO (1994)</p>	<p>Within treed habitats, Tri-colored Bat primarily roosts in tree foliage (mainly within oak leaves). Leaf roosts are shaped like umbrellas with a "roof" and a hollow core where bats rest. Studies have shown that oak leaves are a preferred roost site. Maple leaves are also selected, although less commonly. It is thought that Tri-colored Bat may prefer roost trees in more open woodlands, as opposed to deep woods. Roosts in tree cavity are used less frequently than Myotis species (BCI 2017; COSEWIC 2013b).</p>	<p>Moderate – Potential maternal roost habitat is present in limited areas of woodland habitat on site. Lake Ontario would provide an abundant foraging opportunity for this species.</p>
SAR Plants		
<p>Butternut (<i>Juglans cinerea</i>)</p> <p>SARA: Endangered ESA: Endangered S-Rank: S3? Source: Stantec 2013; Amec Foster Wheeler 2017</p>	<p>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 (COSEWIC, 2003).</p>	<p>Moderate – Butternut Walnut or a Butternut/Walnut hybrid was found on site through field investigations. It is possible that additional individuals, which were not visible from the ROW, are present within the study area. Further investigations should be completed during the detail design phase of the Project to confirm the presence of the species.</p>
<p>Kentucky Coffee-tree (<i>Gymnocladus dioicus</i>)</p> <p>SARA: Threatened ESA: Threatened S-Rank: S3? Source: Town of Oakville, 2017</p>	<p>A Carolinian species which inhabits open areas of floodplains and edges of wetlands. Grows in areas with warm climates and a long growing season (SARA 2000).</p>	<p>High – This is a Carolinian species which is not likely to be found naturally growing within this area. While individuals were found growing in the Project study area, these individuals have likely been planted.</p>

¹ Species At Risk Act, 2002 (SARA).

² Endangered Species Act, 2007 (ESA).

³ S1 - Extremely rare throughout its range in the province; S2 - Rare throughout its range in the province; S3 - Uncommon or vulnerable species; S4 - Apparently Secure Species; S5 - Secure Species; SX - Extirpated; B - Breeding; N - Non-breeding; ? - Uncertainty

3.2.3.1 Birds

Of the avian SAR / provincially rare species potentially present within the vicinity of the study area (see Section 3.1.3.2), two species were reported during the Amec Foster Wheeler field investigations – Barn Swallow and Chimney Swift. All other SAR birds documented through the secondary source review have a low probability of occurrence due to a lack of suitable habitat in the Project study area. The critical habitat and rationale for Barn Swallow and Chimney Swift are discussed below.

Barn Swallow

Before European settlement in Ontario, Barn Swallows nested mostly in caves, holes, crevices and ledges in cliff faces (COSEWIC 2011a). Although Barn Swallows continue to nest in traditional natural habitats, they are now most closely associated with human structures in rural areas. Such nesting sites include a variety of artificial structures that provide either a horizontal nesting surface (e.g., a ledge) or a vertical face, often with some sort of overhang that provides shelter (COSEWIC 2011a). Nests are most commonly located in and around open barns, garages, sheds, boat houses, bridges and road culverts, and are situated on such surfaces as beams and posts, light fixtures, and ledges over windows and doors (COSEWIC 2011a). Because Barn Swallow nests are constructed of mud pellets, Barn Swallows require nest sites that have a source of nearby mud, which makes bridges and large culverts ideal sites for nesting (COSEWIC 2011a). Barn Swallows typically select foraging sites close to open habitats such as farmlands of various descriptions, wetlands, road rights-of-way and large forest clearings (COSEWIC 2011a). Barn Swallow are listed as Threatened provincially and are therefore protected under the ESA. Barn Swallows are listed federally as Threatened by COSEWIC but are not designated under SARA.

The Breeding Bird Atlas indicated records of Barn Swallow in the vicinity of the Study Area and Barn Swallow were observed on site through investigations. The Project study area provides suitable open foraging habitat for the Barn Swallow, with cleared ROW, as well as bridges and culverts suitable for nesting. As such, there is potential for Barn Swallows to be utilising the site to carry out life processes.

Chimney Swift

As the Chimney Swift spends most of the day foraging for insects on the wing, associating this species with a single type of habitat is difficult, but its presence in any given area is largely dependent upon the availability of suitable nesting sites and the abundance of insects (COSEWIC 2007a). Before the arrival of European settlers, the Chimney Swift was associated with old growth forests where they nested and roosted in large hollow trees (greater than 50 cm diameter at breast height; COSEWIC 2007a). As the availability of hollow trees declined with settlement and logging activities, the swifts adapted to nest in chimneys. As a result, the aptly named Chimney Swift is now primarily associated with urban and rural areas where chimney structures are available for nesting and roosting (COSEWIC 2007a). In addition to chimneys, Chimney Swifts have been documented to nest and roost in air shafts, silos, wells, barns and abandoned buildings

(COSEWIC 2007a). Nesting sites are difficult to locate due to the secretive behaviour of the swifts as they approach the nest, though roosts are easier to identify due to the larger number of birds involved (COSEWIC 2007a). Swifts are often commonly associated with bodies of water due to the higher abundance of insects, especially wetlands (COSEWIC 2007a). Studies indicate that most roosting sites are located within 1 km of a body of water (COSEWIC 2007a). Chimney Swift are listed provincially as Threatened and are therefore protected under the ESA. Chimney Swift are also designated federally as Threatened under SARA.

During biological inventories, a total of 27 Chimney Swifts were observed within the Study Area (station 2, 3, 4 and 14; Appendix B). Old growth forests were absent from the Study Area, as were large hollow trees and only a limited number of chimneys were evident that could provide nesting and/or roosting habitat for the species. The Town of Oakville stated that numerous Chimney Swift nesting areas are evident, including one nest at the Walton Memorial United Church, located slightly east of Bronte Creek (Town of Oakville pers. comm. 2017). These area have been noted, however, the proposed activities will not impact this building or impact this species.

3.2.3.2 Mammals

Through a review of the mammal atlases available online, the Bat Conservation International (BCI, 2013) database and available range maps, it was determined that four bat SAR have a low to moderate potential to exist within the project area, including Eastern Small-footed Myotis, Little Brown Myotis, Northern Myotis, and Tri-coloured Bat. Habitat suitable for bat maternity roosting may be present within the Project study area. Further details regarding the suitability of the habitat on site for bats is included below.

Little Brown Myotis

Little Brown Myotis are cavity roosting bat species that hibernate in Ontario. The Little Brown Myotis was listed as Endangered in February 2012 by Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and was subsequently listed as Endangered in October 2012 by Committee on the Status of Species at Risk in Ontario (COSSARO) thereby receiving protection as a SAR under the Endangered Species Act. Little Brown Myotis feed over open bodies of water, the margins of waterbodies and forests, in clearings and along open forest roads (COSEWIC, 2013b).

Northern Myotis

Northern Myotis are cavity roosting bat species that hibernate in Ontario. Similar to Little Brown Myotis, Northern Myotis was listed as Endangered in February 2012 by COSEWIC. This species was listed as Endangered in October 2012 by COSSARO thereby receiving protection as a SAR under the Endangered Species Act. Northern Myotis is a generalist in terms of foraging habitat and show no preference for over water versus over land sites, edge versus non-edge sides, areas with versus without canopy enclosures, or urban versus rural environments (COSEWIC, 2013b). Potential maternal roost habitat is present in limited areas of woodland habitat on site. Lake Ontario would provide an abundant foraging opportunity for this species.

Eastern Small-footed Myotis

While some are found in caves/mines of eastern North America, they generally roost on the ground under rocks and in crevices, as well as hollow trees, in buildings and under tree bark (MNR, 2011). Caves and mines are wintering habitat. Similar habitat requirements as other Myotis species. Potential maternal roost habitat is present in limited areas of woodland habitat on site.

Little Brown Myotis

Roosts in tree cavity, including small spaces or crevices found in loose bark, hollow trees, rock faces and human structures such as attics, walls and bat boxes. Hibernates in caves and abandoned mines during the winter months. Typically forages over water (COSEWIC, 2013b). Potential maternal roost habitat is present in limited areas of woodland habitat on site. Lake Ontario would provide an abundant foraging opportunity for this species.

Tri-coloured Bat

Within treed habitats, Tri-colored Bat primarily roosts in tree foliage (mainly within oak leaves). Leaf roosts are shaped like umbrellas with a "roof" and a hollow core where bats rest. Studies have shown that oak leaves are a preferred roost site. Maple leaves are also selected, although less commonly. It is thought that Tri-colored Bat may prefer roost trees in more open woodlands, as opposed to deep woods. Roosts in tree cavity are used less frequently than Myotis species (BCI 2017; COSEWIC, 2013b). Potential maternal roost habitat is present in limited areas of woodland habitat on site. Lake Ontario would provide an abundant foraging opportunity for this species.

3.2.3.3 Reptiles and Amphibians

Review of ORAA species list for the natural heritage square encompassing the study area indicated the potential presence of Jefferson Salamander/Blue-spotted Salamander hybrids in the vicinity of the project area. These species all have a low probability of occurrence due to a notable lack of suitable habitat in the Project study area.

3.2.3.4 Plants

MNRF correspondence indicated the potential for Butternut (*Juglans cinerea*) in the vicinity of the project site. The Town of Oakville online forestry database further indicated the potential presence of Butternut and Kentucky Coffee-tree (*Gymnocladus dioicus*) within the study area near the Lakeshore Road ROW. Amec Foster Wheeler field investigations concluded that four Kentucky Coffee-tree and potentially one Butternut or Walnut/Hybrid species are located within the Project study area (see Figure 3-1 for location details). During the detail design phase, further studies will be completed to determine the potential impacts of works to these species within the ROW. MNRF and Conservation Halton will be contacted for further guidance on protection measures and permitting requirements.

Butternut

This species is typically found growing in riparian habitats, but is also found on rich, moist, well-drained loams, and well-drained gravels, especially those of limestone origin. Within its Canadian range, butternut is widespread, primarily found as a minor component of hardwood stands, but also occurring as extensive pure stands on flood plains (COSEWIC, 2003).

Through vegetation surveys conducted within the study area, one potentially Butternut or Butternut/Walnut hybrid species was observed in the vicinity of the ROW. Further studies and potential genetic testing may be required during the future detail design phase of the project, to determine the status of the tree and MNRF will be solicited for information related to permitting requirements should the tree be impacted or removed through the proposed works. No other Butternut trees were observed in the vicinity of the road ROW.

The majority of improvements proposed for the Lakeshore Road West corridor will take place within the existing ROW. Furthermore, there is limited potential for this species to be naturally growing within the woodland habitats found on site, as the soil composition and tree stand composition are not in keeping with the preferred habitat of this species. During detailed design, once property requirements are determined, the potential for harm or removal of Butternut trees will be further assessed.

Kentucky Coffee-tree

This is a Carolinian species which grows in parts of southern Ontario exhibiting warmer climates and a long growing season. The Kentucky Coffee-tree inhabits open areas of floodplains and the edges of wetlands and is shade-intolerant (SARA, 2000).

Several Kentucky Coffee-tree individuals were observed during vegetation field studies. These species were found within the Lakeshore Road ROW and have likely been planted by the Town of Oakville. Given that these trees are not cultivated from wild stock, they do not receive habitat or species protection, as underlined in subsection 12 (1) of the ESA. The MNRF should be solicited during the detail design phase to ascertain whether genetic testing of the individuals on site is required to determine cultivar status and permitting requirements that may be needed.

3.2.3.5 Invertebrates

Monarch Butterfly (provincially listed as a species of special concern) was observed in the project area during site surveys. This species may be utilizing the limited habitat in ditches or small plots of undeveloped land within the study area for feeding and or egg laying. It is likely that this species was passing through the area on route to other more suitable habitat (see Section 3.2.4.5).

3.2.3.6 Fishes

Through correspondence, MNRF indicated that Bronte Creek provides occupied habitat for American Eel and Silver Shiner and that Fourteen Mile Creek provides occupied habitat for

Redside Dace. Further communications with the Aurora District MNR and Conservation Halton are underway to determine appropriate measures and permitting requirements required to protect these features. Further information pertaining to aquatic SAR can be found within Amec Foster Wheeler's (2017) *Aquatic Habitat Existing Conditions Report*.

3.2.4 Significant Natural Heritage Features

3.2.4.1 Significant Woodlands

The Halton Region official plan indicates that significant woodlands are those woodlands reach 2 ha in size or greater. Accordingly, two significant woodlands are found within the project area: a Dry-Fresh Sugar Maple – Beech Deciduous Forest (FOD5-2) is approximately 2.1 hectares (ha) in size and is located in the vicinity of Town of Oakville sewage and water treatment plant; and a 2.1 ha Fresh-Moist Black Walnut Lowland Deciduous Forest Type (FOD4-7) in the valley lands of Fourteen Mile Creek.

3.2.4.2 Significant Wildlife Habitat

3.2.4.3 Seasonal Concentration Areas

Seasonal concentration areas are those habitats where large numbers of a single species or many species congregate at one (or several) times a year. The SWH Criterion Schedules for Ecoregion 7E outlines 14 wildlife habitats meeting the criteria for seasonal concentration areas of Animals. Based on habitats and ecosites documented during field investigations, three candidate SWH are present within the Project study area, including bat maternity colonies, turtle wintering areas, and landbird migratory stopover areas.

The locations and site characteristics of bat maternal colony habitats are poorly known (OMNR, 2009). In Ontario, bats use two strategies for roosting during the day. Most species roost in small spaces or crevices found in loose bark, hollow trees, rock faces and human structures such as attics, walls and bat boxes and colony numbers may range from a few to hundreds of individuals (OMNR, 2011a). During the summer, females often roost in large maternity colonies while males tend to roost in small groups or individually (OMNR, 2011b). Other bat species roost in foliage in small groups or individually very high up in the tree canopy and as such are often difficult to detect. The presence of forest communities in the Project study area (FOD7, FOD5-2, and FOD7-4 ecosites) suggests these habitat may be present; however, given the woodland assessments were conducted from the ROW (no access was permitted), the present of potential bat maternal colonial habitat could not be ascertained.

Turtle over-wintering sites are permanent water bodies, large wetlands, and bogs or fens with adequate dissolved oxygen (OMNR, 2000). These areas may support congregations of turtles if over-wintering habitats are limited (OMNR, 2000). Two areas of open water (OAW ecosite) are present within the Project study area; one associated with Bronte Creek at the west end of the Project study area and the other a section of Lake Ontario overlapping the 120 m area surrounding the Project study area. The shorelines of Lake Ontario within the Project study area do not support

turtle overwintering habitat; however, several turtle species (Midland Painted Turtle, Snapping Turtle, and Northern Map Turtle) may overwinter in the slow moving waters of Bronte Creek.

Landbird migratory stopover areas can occur in any forest or treed swamp community (MNRF, 2000). The SWH Criterion Schedule for Ecoregion 7E defines significant landbird migratory stopover areas as forested habitats greater than 5 hectares (or 2 ha if woodlands are rare in the area) that occur within 5 km of Lake Ontario. Several woodland features meet the size criteria for landbird stopover areas within the Project study area. Although migratory bird surveys were not conducted as part of field investigations, the presence of multiple migratory birds that breed in the mixed hardwood and boreal forests in northern Ontario (i.e., Canada Warbler, Blackburnian Warbler, Blackpoll Warbler, Black-throated Green Warbler, Magnolia Warbler, Tennessee Warbler, and Northern Parula) suggests the areas may support landbird migratory bird habitat.

3.2.4.4 Rare Vegetation Communities and Specialized Habitat

Rare vegetation communities are those habitats rare in the province and/or the ecoregion. Based on the site investigations, none of the rare vegetation communities in Ecoregion 7E are present within the Project study area.

Specialized habitat for wildlife are those microhabitats that are critical to a species or several species. The SWH Criterion Schedules for Ecoregion 7E outlines eight wildlife habitats meeting the criteria for specialized habitat for wildlife. Based on habitats and ecosites documented during field investigations, two candidate SWH are present within the Project study area, including amphibian woodland breeding habitat and turtle nesting areas.

Amphibian woodland breeding habitat may occur in any forested ecosite supporting permanent and/or vernal woodland ponds. Woodlands with permanent ponds or those containing water in most years until mid-July are more likely to be used as breeding habitat. The presence of forest communities in the Project study area (FOD7, FOD5-2, and FOD7-4 ecosites) suggests this habitat may be present; however, given the woodland assessments were conducted from the ROW, the presence of potential amphibian woodland breeding habitat could not be ascertained. During detailed design, once Project details (i.e. footprint) have been determined, further field studies will be completed to confirm the presence/absence of amphibian woodland breeding habitat on site.

Turtle nesting areas must provide sand and/or gravel where turtles can dig their nests in, and are often south to south-west facing to maximize exposure to sunlight for egg incubation (OMNR, 2000). Sand and gravel beaches adjacent to shallow areas of marshes, lakes, and rivers are most frequently used (OMNR, 2000). If the turtle travels from the aquatic environment in search of a suitable nesting area, optimally, safe movement corridors will be present between the nesting and aquatic habitat (OMNR, 2000). Due to the presence of candidate turtle over-wintering sites in Bronte Creek, candidate turtle nesting areas may occur along the shorelines areas where suitable substrates for laying eggs are present. As stated above, during detailed design, further studies will be completed to assess the presence/absence of this habitat on site.

3.2.4.5 Habitat for Species of Conservation Concern

Habitat for species of conservation concern includes wildlife habitats that are fairly rare in southern Ontario and habitats for those species that are not afforded protection under the provincial ESA (e.g., special concern species, low S-ranking species). The SWH Criterion Schedules for Ecoregion 7E outlines five wildlife habitats meeting the criteria for habitat for species of conservation concern.

Twelve (12) species of conservation concern were recorded during the site investigations, identified through secondary sources, and/or were documented as potentially occurring through consultations with the MNRF, including:

- Canada Warbler
- Common Nighthawk
- Eastern Wood-Pewee
- Hooded Warbler
- Wood Thrush
- Red-Necked Grebe
- Red-headed Woodpecker
- Peregrine Falcon
- Snapping Turtle
- Northern Map Turtle
- Eastern Ribbonsnake
- Monarch Butterfly

Canada Warbler

The Canada Warbler is found in a variety of upland and wetland forest types, but it is most abundant in wet, mixed deciduous-coniferous forests with a well-developed shrub layer (COSEWIC 2008a). Nests are typically located on or near the ground on mossy logs or roots, along stream banks or on hummocks. Canada Warblers are also less commonly found in riparian shrub forests on slopes and ravines, old-growth forests with canopy openings and a high density of shrubs and in stands regenerating after disturbances (COSEWIC 2008a). The Canada Warbler is listed under the ESA as Special Concern.

Canada Warbler was not observed during the breeding bird surveys. Upland forest types are limited and fragmented. Wetland forest types are absent from the Project study area. As such, there is low potential for Canada Warbler to be utilizing elements of the study area to carry out its life history phases.

Common Nighthawk

The Common Nighthawk breeds in open habitats, such as sand dunes, beaches, recently logged areas, recently burned-over areas, forest clearings, short-grass prairies, pastures, open forests, peatbogs, marshes, lakeshores, gravel roads, river banks, rocky outcrops, rock barrens, quarries, and urban parks. The species is also present in mixed and coniferous forests, as well as in pine stands. Since the end of the 1870s, it has also used flat gravel-covered roofs in urban areas for nesting (COSEWIC 2007b).

While some areas of open-habitat exist on site in undeveloped areas, these areas are small, highly fragmented and are in close vicinity to edge habitat. As such, it is unlikely that this species is utilizing the site and impacts to this species are not anticipated.

Eastern Wood-Pewee

In Ontario, Eastern Wood-Pewee largely inhabits deciduous or mixed forests. This species is not area sensitive and will inhabit both small woodlots and large undisturbed forests. Nests are positioned near forest edges, clearings or water. This species is not known to be sensitive to fragmentation, though no studies have compared reproductive success to habitat size. This species is listed provincially under the ESA as Special Concern (COSEWIC 2012a).

Eastern Wood-Pewee were identified within the study area during field investigations. Findings from the vegetation surveys found some limited forested habitat area on site that may be suitable for breeding and nesting by this species (i.e., FOD5-2, FOD7, FOD7-4, and CUW1). As the Eastern Wood-Pewee is not area sensitive, the small fragmented forested areas may provide suitable habitat for this species.

Hooded Warbler

The Hooded Warbler typically nests in shrubs associated with small canopy-gaps within large tracts (>100 ha) of mature deciduous or mixed forests (COSEWIC 2012b). Given that large tracts of forested habitat are required to support this species, there is little/no likelihood that the study area would provide suitable habitat for this species. Forested habitat available on site is limited to small areas within residential/commercial lands and is highly fragmented. This species may migrate through the area on route to more suitable breeding grounds.

Red-headed Woodpecker

Preferred habitat of this woodpecker includes open woodlands, riparian habitat and in particular, oak savannah. Oak and American Beech are preferred foraging trees. The presence of this species largely depends on the presence of suitable foraging trees as well as an abundance of cavity trees which are used as nesting sites (SARA, 2007). The Red-headed Woodpecker is listed under the ESA as Special Concern.

During biological inventories, no Red-headed Woodpeckers were identified within the Study Area. Based on vegetation surveys, some open woodland areas are present (i.e., FOD5-2 and FOD7-4), which may provide foraging habitat for this species.

Peregrine Falcon

Peregrine Falcon nest on cliff ledges or crevices, but some will also use tall buildings and bridges near good foraging areas. Peregrine Falcons may use tall buildings for nesting and the rearing of young (COSEWIC, 2007c).

During the field surveys, one Peregrine Falcon was observed within the study area at breeding bird point count station #3 (Appendix B). Tall residential and commercial buildings are evident within the study area and may provide suitable nesting habitat for this species. This species is listed under the ESA as Special Concern.

Wood Thrush

Wood Thrush breed in mature or second growth deciduous and mixed wood forests (COSEWIC 2012d). They prefer forests with dense understory and large continuous areas of forest however they are not reliant on this. Habitat fragmentation due to human development and over grazing by White-tailed Deer are the main threats to this species (COSEWIC 2012d). Wood Thrush is listed under the ESA as Special Concern. During biological inventories, no Wood Thrush were identified within the Study Area. The forested areas on site have provide limited habitat for this species due to its sensitivity to human activity.

Red-necked Grebe

During the summer, Red-necked Grebes typically nest on large freshwater lakes, sloughs, and reservoirs. They prefer areas with stable water levels. Red-Necked Grebe typically nest in shallow waters and/or marsh habitat and require emergent vegetation to anchor their floating nests. During winter they are found predominantly on salt water, most commonly in protected bays, marshes, and coasts. However in winter they can also be found miles offshore (Bird Web, 2017).

Within the study area, this species is well documented as breeding annually in the outer Harbour near Bronte Creek. Nesting platforms have been installed to host the species, and 1-2 breeding pairs are observed with young are each year (Town of Oakville pers. comm., 2017). While this species is observed breeding in the greater vicinity of the study area, the proposed works are not anticipated to have impacts on this species.

Snapping Turtle

Snapping Turtles prefer slow-moving waters with a soft mud bottom and dense aquatic vegetation. Established populations are most often located in ponds, sloughs, shallow bays or river edges and slow streams and wetlands (COSEWIC, 2008). Individuals can persist in developed areas (e.g. golf course ponds, irrigation canals). Snapping Turtles can occur in highly polluted waterways, but environmental contamination is known to limit reproductive success (COSEWIC, 2008b). Snapping Turtle is listed under the ESA as special concern.

Bronte Marsh, located upstream of the Bronte Creek bridge and north of the study area, is known to contain juvenile and adult snapping turtles (Town of Oakville pers. comm., 2017). Given there is limited habitat present within the immediate area adjacent to the bridge, the potential for this

species to be utilizing the study to carry out life processes is low. Exclusionary fencing may be implemented to prevent entry of turtles into the active construction area if activity is noted. Further details pertaining to exclusionary fencing can be found in Section 5.0. No wetland areas are evident within the study area and the only area exhibiting a slow-moving flow and soft mud substrate is Bronte Creek, located on the westerly end of the site. The other watercourses on site (i.e. Fourteen Mile Creek, McCraney Creek and various small ephemeral drainage features) are not suitable in providing habitat to this species, as they exhibit shallow, more rapid flows and generally rockier bottom substrates.

Northern Map Turtle

Similar to the Snapping Turtle, the Northern Map Turtle prefers shallow, soft-bottomed aquatic habitats with exposed object for basking near shorelines. In the winter, this species typically hibernates on the bottom of deep, slow-moving sections of rivers or lakes (COSEWIC, 2012c). Northern Map Turtle is listed under the ESA as special concern.

No wetland areas are evident within the study area and the only area exhibiting a suitable flows and substrate for this species is Bronte Creek, located on the westerly end of the site. The other watercourses on site (i.e. Fourteen Mile Creek, McCraney Creek and various small ephemeral drainage features) are not suitable in providing habitat to this species, as they exhibit shallow, more rapid flows and generally rockier bottom substrates. As such, the potential for this species to be utilizing the site to carry out life processes is low.

Eastern Ribbonsnake

The Eastern Ribbonsnake is semi-aquatic. This species is most frequently found along wetland edges and prefers quiet areas with shallow water and low surrounding cover. Exposed areas for basking are also required. Female typically nest in upland areas (Ontario Nature 2017). This species is listed as special concern under the ESA.

There are no wetland areas evident within the Project study area and as such, the probability that this species is utilizing the site to carry out its life history phases is low. Impacts to this species resulting from the proposed project works are not anticipated.

Monarch Butterfly

Monarch is very widely distributed across North America and found in a wide variety of habitats. Populations fluctuate dramatically, but have been generally declining likely due to habitat destruction on the hibernation grounds in Mexico, as well as pesticide use and other factors on the vast breeding grounds. Monarchs require Milkweeds (*Asclepias*) to lay their eggs, and will use a variety of other flowers for adult food (COSEWIC, 2010b). This species is listed as special concern under the ESA.

This species may be utilizing the limited habitat in ditches or small plots of undeveloped land within the study area for feeding and or egg laying. It is likely that this species was passing through the area on route to other more suitable habitat.

3.2.4.6 Animal Movement Corridors

Animal movement corridors are habitats that link two or more wildlife habitats that are critical to the maintenance of a population of a particular species or group of species (particularly in highly fragmented landscapes; OMNR, 2000). These corridor habitats serve a key ecological function to enable wildlife to move between areas of significant wildlife habitat or core natural areas with a minimum of mortality (OMNR, 2000; OMNR, 2015). Animal movement corridors are elongated, naturally vegetated parts of the landscape used by animals to move from one habitat to another (OMNR, 2000). These corridors may include valleylands, dense vegetated riparian buffer areas, and hedgerows, and are potentially used by a variety of wildlife species including migratory and breeding birds, reptiles, and amphibians. The SWH Criterion Schedules for Ecoregion 7E outlines three wildlife habitats meeting the criteria for animal movement corridor habitat.

Based on a review of ecosites and wildlife present, only the amphibian movement corridor habitat is considered potentially present in the Project study area. These areas are associated with the woodland communities surrounding Fourteen Mile Creek and McCraney Creek due to the presence of candidate amphibian breeding habitats in these woodland features.

The Project study area is likely a part of a major migratory pathway and several other SAR, including Bald Eagle, Bank Swallow, Bobolink, Cerulean Warbler, Common Nighthawk, Eastern Meadowlark, Eastern Whip-poor-will, Golden-winged Warbler, Grasshopper Sparrow, Hooded Warbler, Louisiana Waterthrush, Olive-sided Flycatcher, Red-headed Woodpecker, Short-eared Owl, and Wood Thrush would be likely to move through this area on route to spring/summer habitat.

3.3 Summary of Existing Conditions

The study area is characterized by large amounts of cultural land use and fragmentation. Approximately 93.1% of the study area includes these anthropogenic and cultural habitats and land uses in the form of residential, industrial and commercial lands and cultural vegetation communities. The majority of existing naturalized areas are associated with the watercourses throughout the Project study area. Many non-native species were found within these naturalized areas. Wildlife found to occur in the vicinity of the Project area from the secondary source review, as well as those observed on site during field investigations were found to be those that are tolerant of urbanized environments (i.e. Raccoon, Skunk) and includes several SAR which were observed or have a high likelihood of occurring in the area.

Only those features immediately adjacent to Mississauga Road have potential to be directly impacted by project works. The Lower Bronte Creek Wetland Complex is located approximately 170 m north of the Bronte Creek Bridge on Lakeshore Road West (not shown in Figure 3-1) and is not anticipated to be impacted by the project works. Several urbanized parks (Riverview Park,

Bronte Athletic Park and Coronation Park), as well as fragmented areas of woodland/forest near the watercourses on site are also present within the Project study area. These parklands and fragments of forest/cultural woodland near the watercourses and are a relatively significant feature in context of the project area landscape, given that the area is characterized by a high degree of disturbance and development. Although the high disturbance and habitat fragmentation suggests limited functionality of these lands, several candidate SWH has been identified in the Project study area, including:

- Bat maternity colonies;
- Turtle wintering areas;
- Landbird migratory stopover areas;
- Amphibian woodland breeding habitat;
- Turtle nesting areas;
- Special concern and rare wildlife species habitats; and
- Amphibian movement corridor habitat.

Confirmation of habitat use within these SWH should be conducted at the detailed design stage of the Project to support the effects assessment and the development of environmental protection measures consistent with the municipal, regional, and provincial regulations.

4.0 PRELIMINARY IMPACT ASSESSMENT

The proposed improvements of the Project are expected to have minimal long term impact on the natural environment due to the current existing ROW and traffic in the area; however, there is potential for direct and indirect effects on the terrestrial environment during construction activities. These impacts may be associated with disturbance to significant natural features (i.e., woodlands, wetland, and wildlife habitat) and flora and fauna populations. The potential impacts specific to the candidate and known natural heritage features present within the Project study area may include:

- Loss of natural and cultural vegetation along exiting ROW and potential ROW expansion areas;
- Loss of pervious surfaces leading to increased runoff;
- Disturbance, damage, or harm to wildlife species protected under the MBCA, the FWCA, and/or the ESA;
- Potential Project encroachment on woodland features resulting in potential impacts to woodland dwelling species and land bird stopover areas;
- Loss and disturbance to bat maternity colonies through destruction and/or noise disturbance in forested habitats/treed areas within and adjacent to the ROW;
- Increased human presence near bat maternal roost sites may cause females to drop young for their protection or abandon young altogether if stressed;
- Potential encroachment of the road ROW into areas of the Project study area that may support turtle nesting;
- Potential increased noise and light disturbance to wildlife adjacent to the ROW;
- Potential increased dust generation and deposition on vegetation resulting in effects on photosynthesis, respiration, and transpiration;
- Potential increase in invasive species colonization within disturbed areas;
- Increased road mortality on birds, turtles, and amphibian associated with construction vehicles, increased road width, and increased traffic flows;
- Potential loss of amphibian breeding habitat adjacent to the ROW. Impacts may also include increased sedimentation; and
- Potential for direct loss of habitat for species of conservation concern. The footprint of the road along with associated shoulders, banks, and ditches will result in loss of habitat. Indirect loss of habitat may occur through changes in hydrology, introduction of non-native plant species, introduction of sediments and other contaminants, and salt spray and runoff.

The potential Project impacts discussed above should be further evaluated during the detailed design stage for the Project. The intent of this preliminary effects assessment is to only provide considerations for further effects evaluation based on significant natural features present within the Project study area, environmental consideration relative to road widening projects, and regulatory considerations for wildlife protected under various federal and provincial legislation.

5.0 PRELIMINARY ENVIRONMENTAL MITIGATION MEASURES

The following sections have been prepared to provide preliminary mitigation measures relative to potential direct and indirect effects identified in Section 4.0. Recommended design consideration and general mitigation measures are as follows:

- All materials and equipment shall be operated and stored in such a manner that prevents any deleterious substance from entering the water and drainage ditches.
- Apply sediment and erosion control measures (e.g., silt fence, silt curtain, sedimentation basins) consistent with Ontario Provincial Standards and Specifications (OPSS). In the vicinity of Bronte Creek and Fourteen Mile Creek, erosion and sediment control measures specific to the protection of Redside Dace/Silver Shiner shall be installed and maintained in order to protect these sensitive aquatic SAR species. The control measures shall be implemented prior to work and be maintained during construction and until disturbed areas have been effectively stabilized (further details pertaining to aquatic SAR protection and mitigation measures can be found within Amec Foster Wheeler's (2017) *Aquatic Habitat Existing Conditions Report*).
- Minimizing dust production to the extent practical by implementing dust suppression methods and thereby minimizing the zone of influence. Primary dust suppression methods can include road watering in cases where watering will not promote entry of chemicals in to nearby wetlands or waterways.
- Prevent introduction of new invasive species by washing down equipment prior to transporting to site and limiting travel of equipment and vehicles to and from the Project study area.
- All disturbed areas of the work site shall be stabilized and re-vegetated promptly, and/or treated with appropriate erosion protection materials.
- Disturbance and removal of existing trees and vegetation should be minimized where possible and confined to the footprint of the Project.
- In the event forest/woodland habitat requires removal for road widening, removal of habitat must occur outside critical periods for the bat species, which encompasses the summer active period of April 1 to September 30 or at least the maternity period of approximately June 1 to July 31.
- Comply with the *Migratory Bird Convention Act, 1997* (MBCA) regulations and guidelines for vegetation clearing recommended by Environment Canada. In order to minimize the potential for incidental take of nesting migratory birds, vegetation clearing and any proposed work activities in migratory bird habitat should be undertaken outside of the active breeding season. Clearing is to be avoided from April 1 to August 30 for this project location, although these timing constraints should not be perceived as absolutes. This period represents the core breeding period, although some species may nest in March and September. Ultimately, the objective from a compliance perspective is to not circumvent the MBCA. As such, due diligence measures should be implemented and

documented for any nest searching efforts, including record control, to ensure compliance with the MBCA.

- Road widening should be designed so that they are not barriers to herpetiles moving between significant habitats. Suitable ecopassages may be required to allow movement.
- Sufficient culverts should be installed under the road to ensure that lateral drainage is not impeded. Where possible, roadside ditches should never be designed so that they remove water from the wetland and cause localized drying;
- Where bird nests may be found on crossing structures (i.e. Cliff Swallow at Bronte Creek Bridge); should works be required to proceed within the breeding bird timing window, appropriate exclusion measures may be required to prevent nesting within the structure during the construction activities. These exclusion measures may include netting to prevent ingress to the crossing. These barriers should be installed prior to April 1 and shall remain in place until August 30, or until the completion of rehabilitation works.
- Vertical facings suitable for nesting by bird species (i.e., soil piles, excavation areas) should be covered using tarps, or plastic sheets, or any other means of preventing nesting within the construction zone. Such barriers should be installed prior to April 1 and shall remain in place until August 30, or until the completion of rehabilitation works. Alternatively, vertical facings should be maintained daily at a 45° angle to deter nesting.
- Where feasible, works will be conducted during daylight hours, unless otherwise necessary, to avoid potential effects of artificial night lighting on crepuscular and nocturnal species.
- Minimize footprint of the Project within habitats on site to the extent possible to limit impacts to sensitive habitats utilized for nesting, roosting, migratory stopover etc.
- Exclusion fencing shall be utilized in areas where there is potential for turtles to enter the active construction area. This fencing should be installed prior to the onset of the nesting period, prior to May 15 and should remain in place until July 15, or until the completion of the rehabilitation works.
- Minimize sources of unnecessary noise or encroachment of worker activities into nearby habitats in order to limit the extent of the project zone of influence when possible.
- All heavy equipment and tools used on-site shall be maintained in good working condition.
- Construction personnel shall avoid idling of vehicles when not necessary for construction activities.
- Equipment and vehicles shall be turned off when not in use unless required for construction activities and/or effective operation.
- The MNRF should be consulted to gain further direction relative to any technical and process requirements under ESA, and to obtain guidance on any additional mitigation measures that may be required during construction and operation phases of the Project.

6.0 CONCLUSIONS AND RECCOMENDATIONS

The Lakeshore Road West study area is predominantly anthropogenic, characterized by commercial, industrial, and residential land uses. The majority of natural/semi natural vegetated areas are generally associated with watercourses throughout the study areas and have experienced intense anthropogenic disturbances for many decades. Invasive species presence is often abundant and outcompeting the native flora. One Butternut individual or Butternut/Walnut hybrid and several Kentucky Coffee-tree were observed through field investigations. No rare vegetation communities were recorded within the study area.

Several habitat features such a critical wildlife habitats, rare vegetation communities, or habitat for species of conservation concern were observed within the study area. Due to the presence of the Lakeshore Road West ROW, as well as other roads, commercial, industrial and residential areas on-site, habitat connectivity is relatively low surrounding the study area and Project works are unlikely to increase the current habitat fragmentation level more than its current state.

The secondary source review indicated the potential presence of 107 species of birds, 41 species of mammals, 14 species of amphibians, and 12 species of reptiles in the vicinity of the Project study area. Several wildlife SAR and species of conservation concern were indicated, several of which were observed during field investigations (i.e. Barn Swallow, Chimney Swift, Eastern Wood-Pewee, Peregrine Falcon and Canada Warbler). These species are typically tolerant of disturbance and have learned to adapt in an urbanized environment. Generally habitat for SAR and species of conservation concern is limited and highly fragmented within the Project study area. As such, only minor impacts to wildlife and supporting habitat are anticipated to result from the proposed Project works.

As there is some potential for critical wildlife habitat to exist on site or other significant natural areas, as well as SAR and species of conservation concern, roadway improvement efforts for the terrestrial environment should focus on maintaining a small footprint; containing emissions, dust, and other deleterious substances; and proactively reducing the risks of wildlife roadway mortality.

7.0 CLOSURE

This existing condition report has been prepared based on a review of secondary source information, agency consultations, and field investigations and is based on the proposed Project footprint at the time of the report. This existing condition report is intended to support detailed design and should be used for focusing future field investigations relative to significant natural heritage features within the footprint of the Project. This report does not exclude any process requirements relative to the ESA and/or further consultations with the MNRF to ensure compliance with the ESA. This report is intended to guide further consultations with the MNRF relative to SAR and to support further SAR surveys, if required.

Yours truly,

Amec Foster Wheeler Environment & Infrastructure
a Division of Amec Foster Wheeler Americas Limited

Prepared by:



Brittany Ferguson, B.Sc.
Environmental Biologist

Reviewed by:



Jeff Balsdon, M.Sc.
Senior Terrestrial Ecologist

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APPENDIX A
CORRESPONDENCE

Ferguson, Brittany

Sent: February-13-17 12:11 PM
To: Hellinga, Erin
Cc: Rideout, Daryl T
Subject: RE: MNRF Information Request - Lakeshore Road West
Attachments: 14MileCreekFishDots.pdf; Bronte_Creek_unknown_DFO.pdf; BronteCreekFishDots.pdf; AMS11661_LakeshoreRdW.pdf

Hello Erin,

Please accept the attached response to your screening request.

Bronte Creek is an occupied reach of stream for American Eel and Silver Shiner. The construction timing window would be July 1 to September 15.

14 Mile Creek is an occupied reach of stream for Redside Dace. The construction timing window would be July 1 to September 15.

I have also included fish dot maps for your study area. Unfortunately we only have 1 of the files in digital format (which I have attached to this email), all the others (the red dots) are in hard copy. You can make an appointment with Karen Golby to come in and photocopy and/or scan these records.

Regards,

AURORA McALLISTER | MANAGEMENT BIOLOGIST | ONTARIO MINISTRY of NATURAL RESOURCES and FORESTRY |
AURORA DISTRICT OFFICE
50 Bloomington Road, Aurora, Ontario, L4G 0L8 | Email: aurora.mcallister@ontario.ca

From: ESA Aurora (MNRF)
Sent: 31-Jan-17 10:47 AM
To: 'Hellinga, Erin'
Cc: Rideout, Daryl T
Subject: RE: MNRF Information Request - Lakeshore Road West

Hi Erin,

Yes. Normally screenings take 4-6 weeks, sometimes longer during the busiest times of year. I will be in touch soon.

Aurora

AURORA McALLISTER | MANAGEMENT BIOLOGIST | ONTARIO MINISTRY of NATURAL RESOURCES and FORESTRY |
AURORA DISTRICT OFFICE
50 Bloomington Road, Aurora, Ontario, L4G 0L8 | Email: aurora.mcallister@ontario.ca

From: Hellinga, Erin [<mailto:Erin.Hellinga@amecfw.com>]
Sent: 31-Jan-17 10:45 AM
To: ESA Aurora (MNRF)

Cc: Rideout, Daryl T

Subject: FW: MNRF Information Request - Lakeshore Road West

To Whom It May Concern,

Amec Foster Wheeler would like to request if the MNRF is able to provide information with respect to the request below for the section of Lakeshore Road West extending from Mississauga Street to Dorval Drive (indicated in the attached map).

Thank you for your time and assistance.

Kind Regards,

Erin M. Hellinga, B.Sc.

Environmental Biologist, Environment & Infrastructure, Amec Foster Wheeler
900 Maple Grove Road, Unit 10, Cambridge, ON N3H 4R7, Canada
T +1 (519) 650-7132 M +1 (647) 919-7607
erin.hellinga@amecfw.com amecfw.com



From: Hellinga, Erin

Sent: January-07-17 3:26 PM

To: 'ESA Aurora (MNRF)' <ESA.Aurora@ontario.ca>

Cc: Rideout, Daryl T <Daryl.Rideout@amecfw.com>

Subject: MNRF Information Request - Lakeshore Road West

To Whom It May Concern,

This information request has been submitted to assist the Town of Oakville with the completion of Class EA requirements for the anticipated roadway improvements in the section of Lakeshore Road West extending from Mississauga Street (604019.7, 4804859.6) to Dorval Drive (606885.5, 4810013.6), Oakville (see attached map). Proposed project works include, but are not limited to, potential bridge structure improvements as well as provision of pedestrian and cycle facilities and future transit services.

At this time Amec Foster Wheeler would like to request the following information:

- Locations of Natural Heritage Features in the vicinity of the project;
- Species at Risk records in the vicinity of the project; and
- Fisheries data focusing of fish dot information, stream sensitivities, thermal regimes, and timing windows for watercourses along the length of the project.

Background data collection using the Ministry of Natural Resources and Forestry Natural Heritage Information Centre suggests that in the vicinity of the Lakeshore Road West crossing of Fourteen Mile Creek (ID 17PJ0508; Lakeshore Road West crossing at 606045.4, 4808137.4) there are recent records (from 2000) of Redside Dace and currently the Fourteen Mile Creek may contain Occupied or Recovery reaches for Redside Dace. Additionally, the area buffering Bronte Creek (ID 17PJ0405; Lakeshore Road West crossing at 604142.5, 4805149.2) is identified as an Environmentally Sensitive Area with Provincially Significant Wetlands (part of the Lower Bronte Creek Wetland Complex) north of Lakeshore Road West and historic records of Lake Sturgeon, Snapping Turtle and Northern Map Turtle (from 1962, 1993 and 1989, respectively).

To supplement these findings and information directly from the Ministry of Natural Resources and Forestry, information request have been sent to Conservation Halton and Fisheries and Oceans Canada.

Please find attached the completed Aurora District MNRF Information Request Form and project-specific figures for your reference. Should you require further information related to this project or if you have any questions please do not hesitate to contact me.

Kind Regards,

Erin M. Hellinga, B.Sc.

Environmental Biologist, Amec Foster Wheeler Environment & Infrastructure
900 Maple Grove Road, Unit 10, Cambridge, ON, N3H 4R7, Canada
T +1 (519) 650-7132 C +1 (647) 919-7607
erin.hellinga@amecfw.com amecfw.com



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Brittany Ferguson, B.Sc.

Environmental Biologist
Amec Foster Wheeler
Environment & Infrastructure

160 Traders Blvd, Suite 110
Mississauga, Ontario, Canada L4Z 3K7

D +1 (905) 568 2929 x 4122
E brittany.ferguson@amecfw.com
amecfw.com

Ferguson, Brittany

From: FPP.CA / PPP.CA (DFO/MPO) <fisheriesprotection@dfo-mpo.gc.ca>
Sent: January-11-17 5:06 PM
To: Hellinga, Erin
Subject: DFO Information Request - Lakeshore Road West

Hi Erin,

According to our maps, the following Species at Risk are in the vicinity of your project area, from Bronte Rd to Dorval Dr:

American Eel (Under Consideration)
Deepwater Sculpin (Special Concern)
Upper Great Lakes Kiyi (Special Concern)
Silver Shiner (Under Consideration)

If you require additional information, we ask that you complete the following request for review form (<http://www.dfo-mpo.gc.ca/pnw-ppe/reviews-revues/index-eng.html>).

Thank you,

Ashley Bedford

Fisheries Protection Program Biologist | Biologiste, Programme de Protection des Pêches
Fisheries and Oceans Canada | Pêches et Océans Canada
867 Lakeshore Road | 867 Chemin Lakeshore
Burlington, ON, L7S 1A1
Tel | Tél: 905-336-4588; Fax | Téléc: 905-336-6285

Ashley.Bedford@dfo-mpo.gc.ca

Web site | site Web: www.dfo-mpo.gc.ca/pnw-ppe/index-eng.html Government of Canada | Gouvernement du Canada

Fisheries and Oceans Canada has changed the way new project proposals (referrals), reports of potential Fisheries Act violations (occurrences) and information requests are managed in Central and Arctic Region (Alberta, Saskatchewan, Manitoba, Ontario, Nunavut and the Northwest Territories). Please be advised that general information regarding the management of impacts to fish and fish habitat and self-assessment tools (e.g. Measures to Avoid Harm) that enable you to determine Fisheries Act requirements are available at DFO's "Projects Near Water" website at www.dfo-mpo.gc.ca/pnw-ppe/index-eng.html. For all occurrence reports, or project proposals where you have determined, following self-assessment, that you cannot avoid impacts to fish and fish habitat, please submit to fisheriesprotection@dfo-mpo.gc.ca. For general inquiries call 1 855 852-8320.

From: Hellinga, Erin [<mailto:Erin.Hellinga@amecfw.com>]
Sent: January-07-17 3:26 PM
To: Info / Info (DFO/MPO)
Cc: Rideout, Daryl T
Subject: DFO Information Request - Lakeshore Road West

To Whom It May Concern,

This information request has been submitted to assist the Town of Oakville with the completion of Class EA requirements for the anticipated roadway improvements in the section of Lakeshore Road West extending from Mississauga Street (604019.7, 4804859.6) to Dorval Drive (606885.5, 4810013.6), Oakville (see attached NHIC map). Proposed project works include, but are not limited to, potential bridge structure improvements as well as provision of pedestrian and cycle facilities and future transit services.

Background data collection using the Fisheries and Oceans Canada mapping (map 16 of 33, DFO map attached) suggests that watercourses along the length of the project outlet into a portion of Lake Ontario in which Special Concern Species at Risk may be found.

At this time Amec Foster Wheeler would like to request further information relating to fisheries data and Species at Risk records in the vicinity of the project. Please note that a similar information request has also been submitted to the Ministry of Natural Resources and Forestry and Conservation Halton.

Kind Regards,

Erin M. Hellinga, B.Sc.

Environmental Biologist, Amec Foster Wheeler Environment & Infrastructure
900 Maple Grove Road, Unit 10, Cambridge, ON, N3H 4R7, Canada
T +1 (519) 650-7132 C +1 (647) 919-7607
erin.hellinga@amecfw.com amecfw.com



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APPENDIX B
BREEDING BIRD SURVEY POINT COUNT STATIONS

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4805050

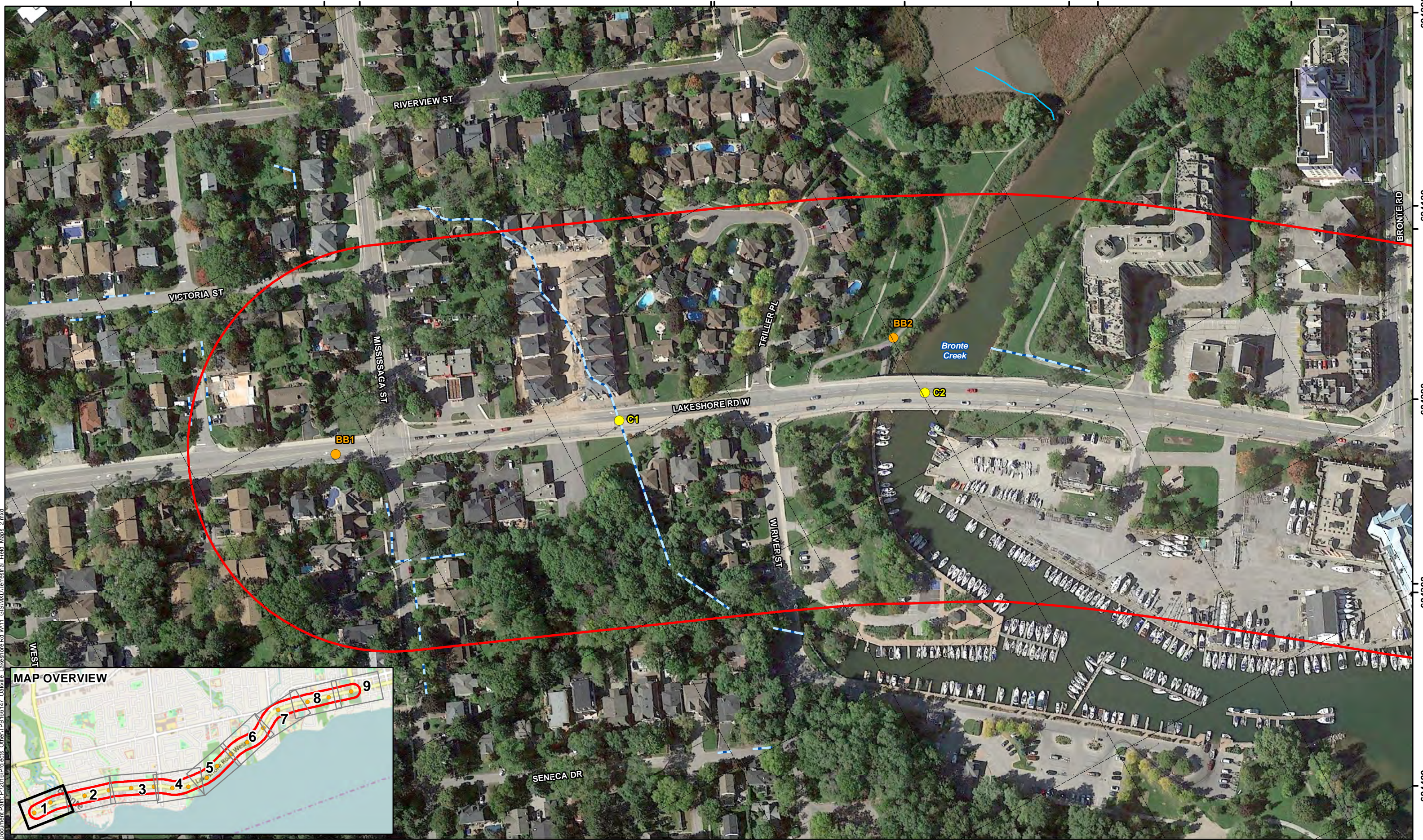
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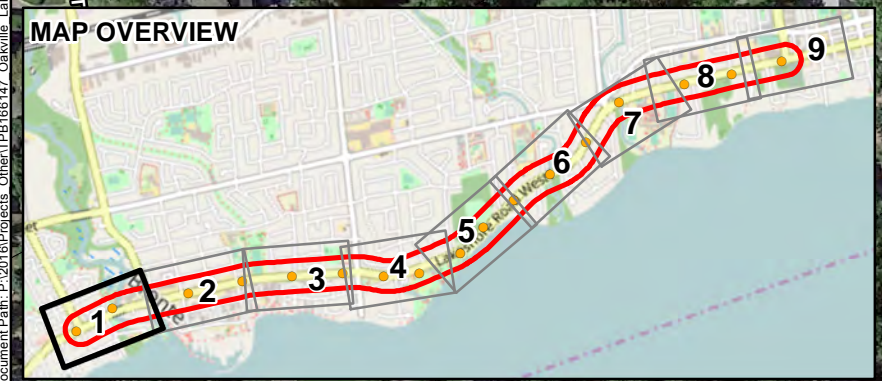


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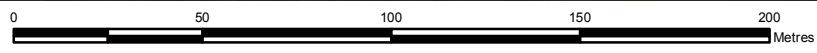
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LEGEND

- ▭ Approximate Study Area
- Watercourse
- Breeding Bird Survey Locations
- - - Drainage Line (City of Oakville)
- Watercourse Crossings

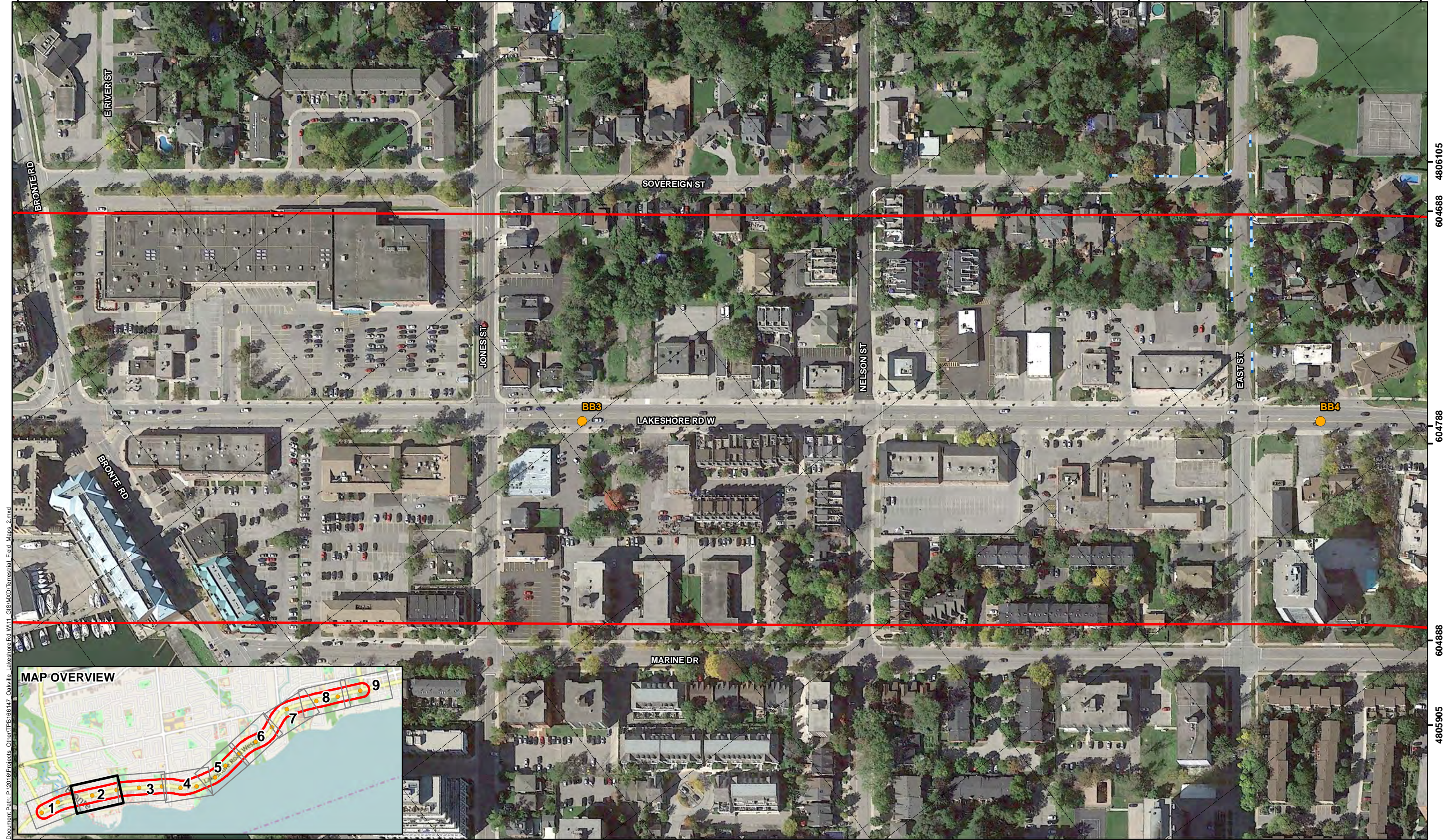


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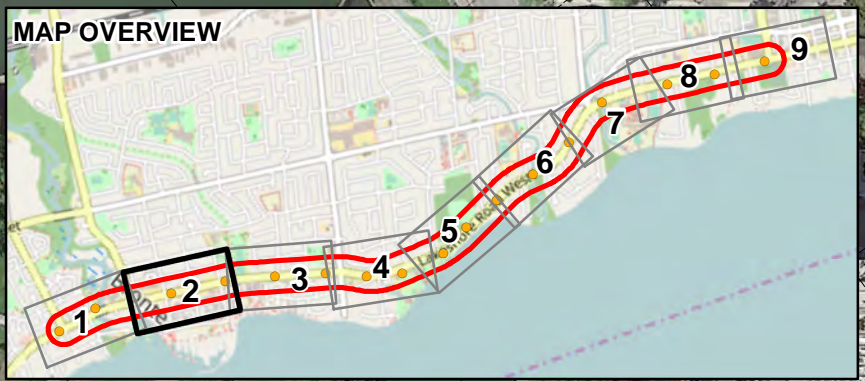


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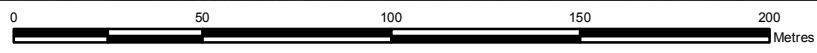


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LEGEND

- Approximate Study Area
- Watercourse
- Breeding Bird Survey Locations
- - - Drainage Line (City of Oakville)
- Watercourse Crossings



SCALE: 1:2,000
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 NAD 1983 UTM Zone 17N



Appendix B
Terrestrial Field Maps
Map 2

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4806206

604683

4806306

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4806406

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4806506

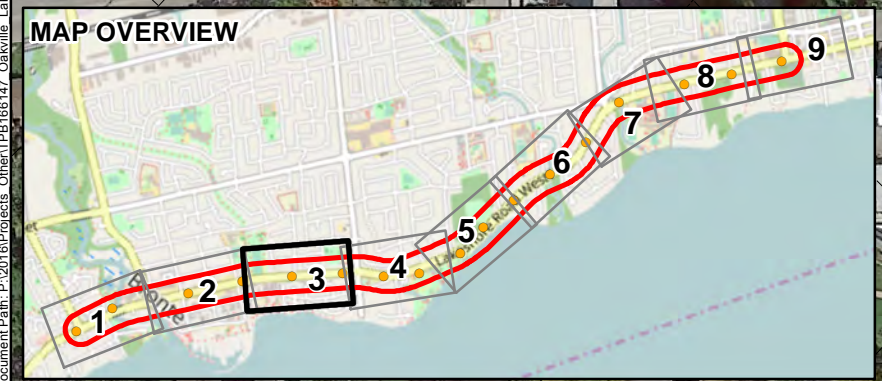
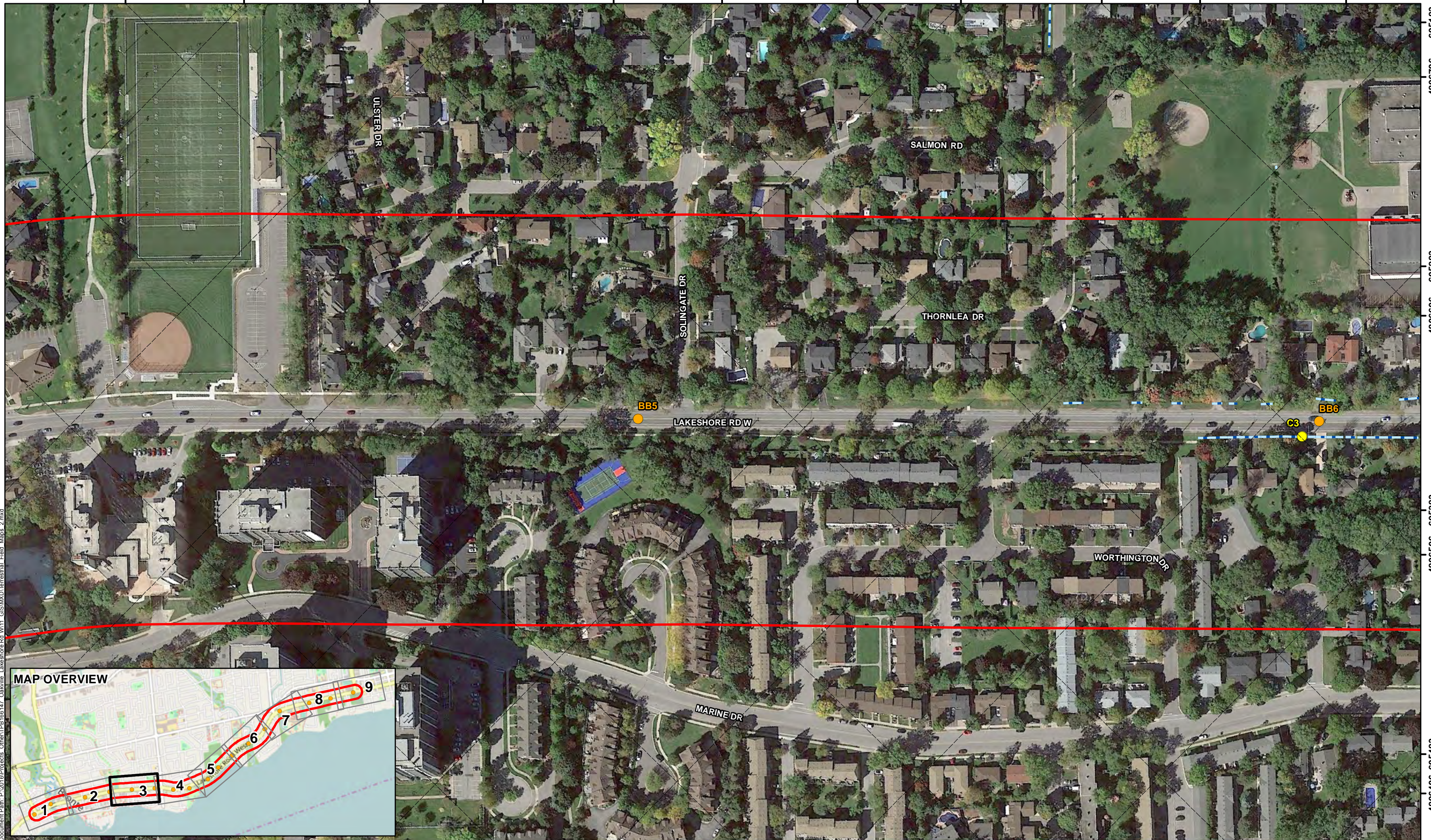
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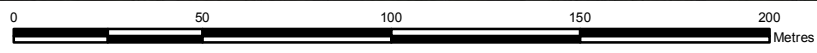
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LEGEND

- Approximate Study Area
- Watercourse
- Breeding Bird Survey Locations
- - - Drainage Line (City of Oakville)
- Watercourse Crossings

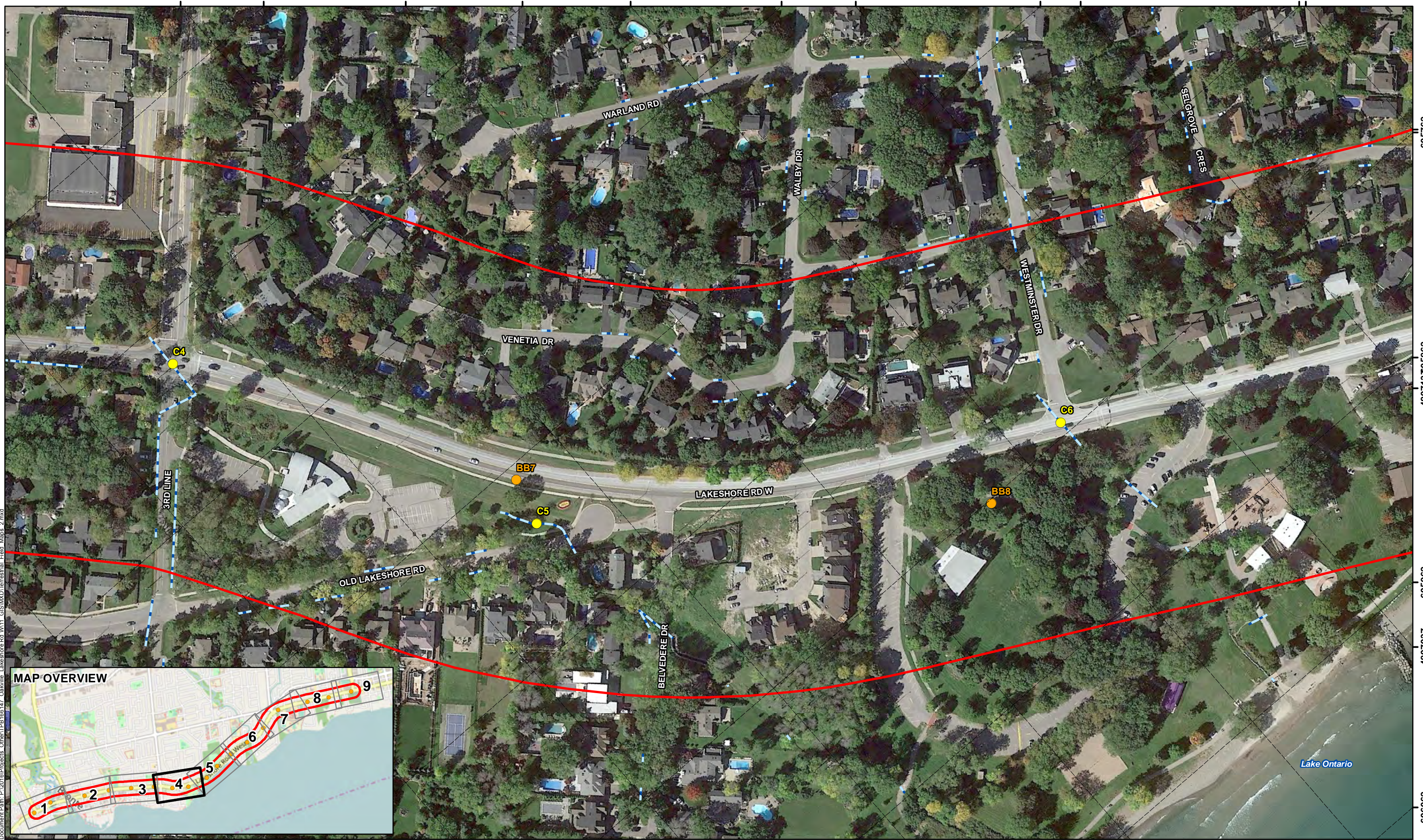


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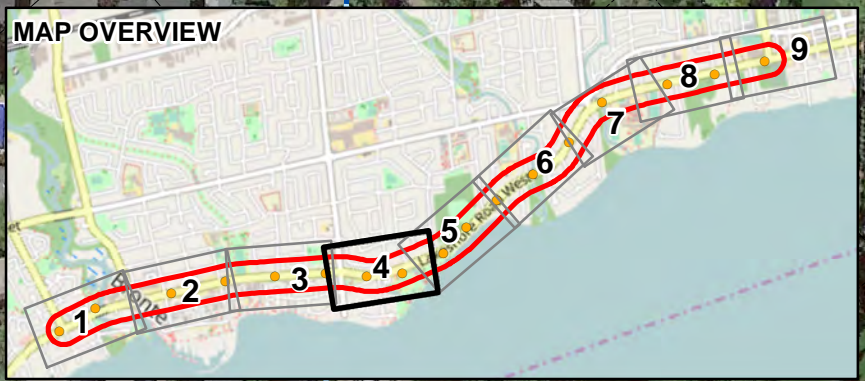
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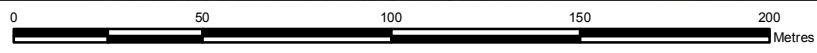


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- LEGEND**
- Approximate Study Area
 - Watercourse
 - Breeding Bird Survey Locations
 - - - Drainage Line (City of Oakville)
 - Watercourse Crossings

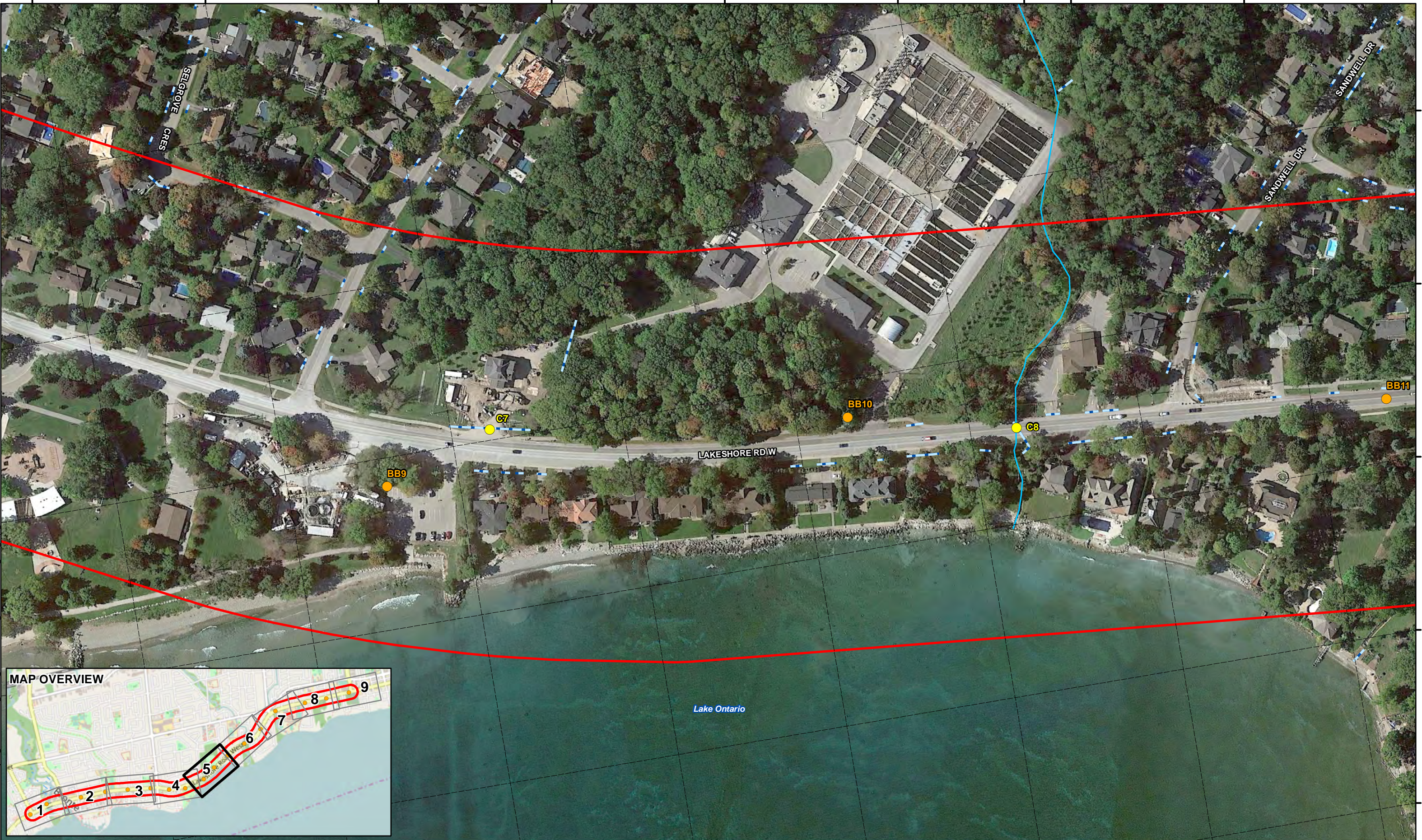


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Appendix B
Terrestrial Field Maps
Map 4

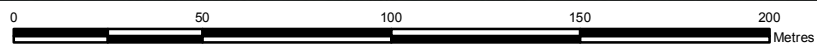
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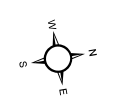
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- LEGEND**
- Approximate Study Area
 - Watercourse
 - Breeding Bird Survey Locations
 - - - Drainage Line (City of Oakville)
 - Watercourse Crossings



SCALE: 1:2,000
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 NAD 1983 UTM Zone 17N



Appendix B
Terrestrial Field Maps
Map 5

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4807835

4807935

4808035

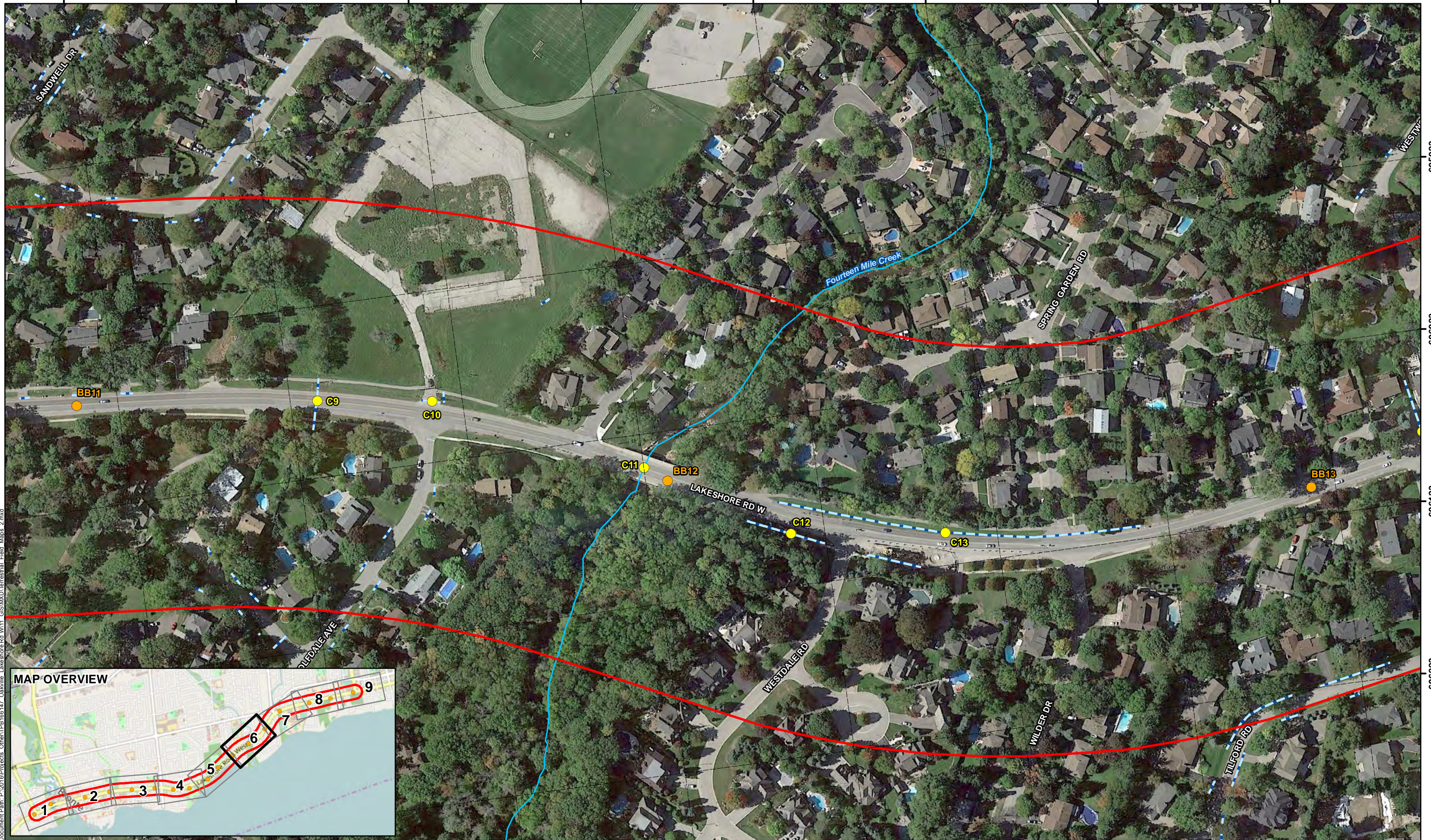
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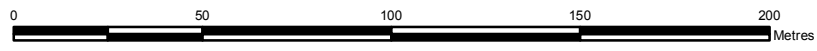
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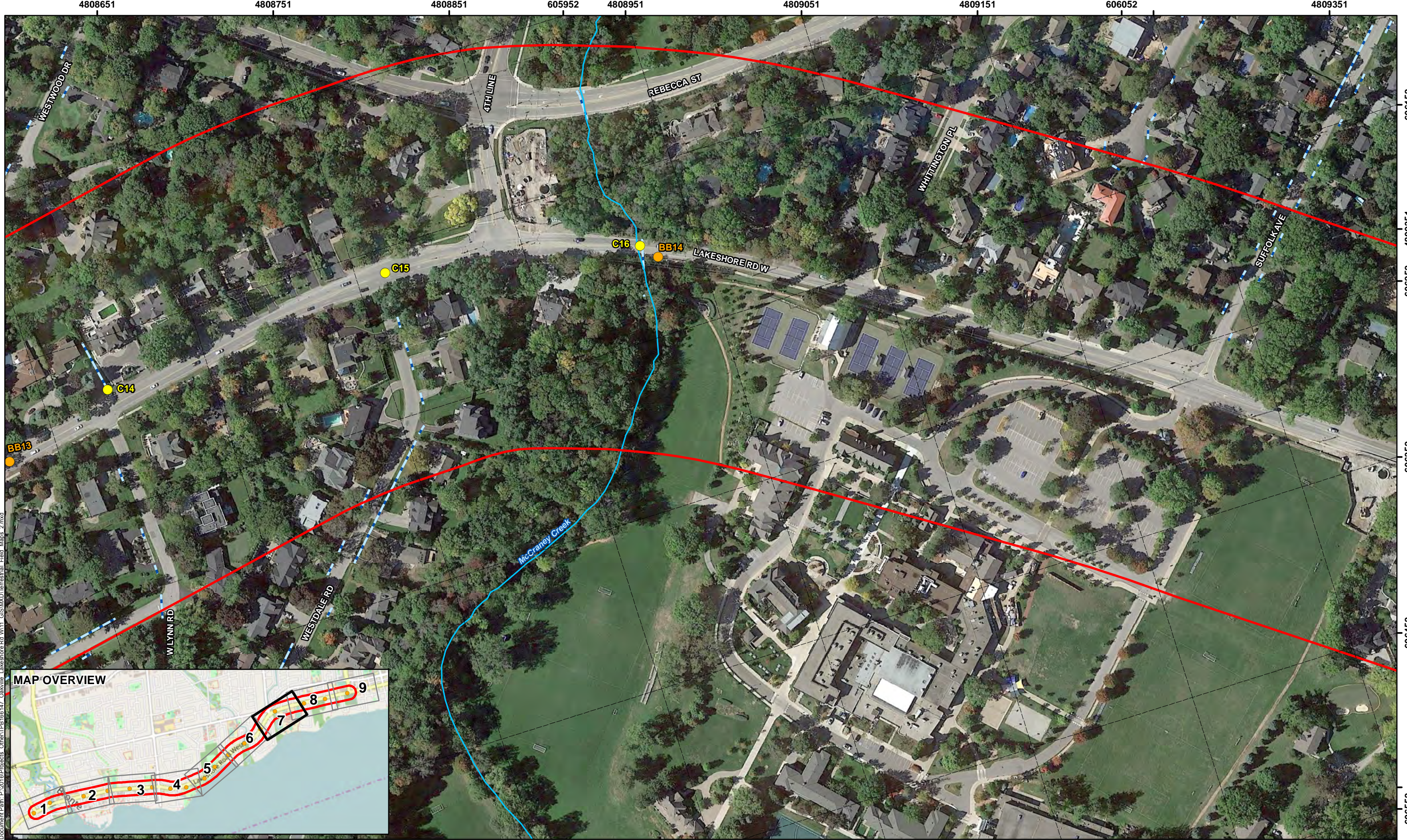
- LEGEND**
- Approximate Study Area
 - Watercourse
 - Breeding Bird Survey Locations
 - - - Drainage Line (City of Oakville)
 - Watercourse Crossings



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 NAD 1983 UTM Zone 17N



Appendix B
Terrestrial Field Maps
Map 6



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4808751

4808851

605952

4808951

4809051

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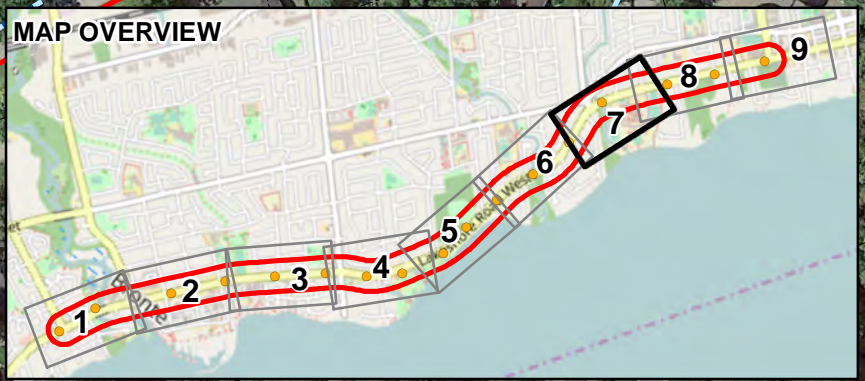
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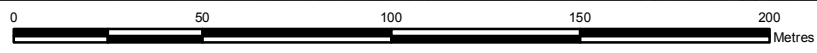
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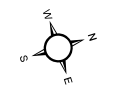


LEGEND

- ▭ Approximate Study Area
- Watercourse
- Breeding Bird Survey Locations
- - - Drainage Line (City of Oakville)
- Watercourse Crossings

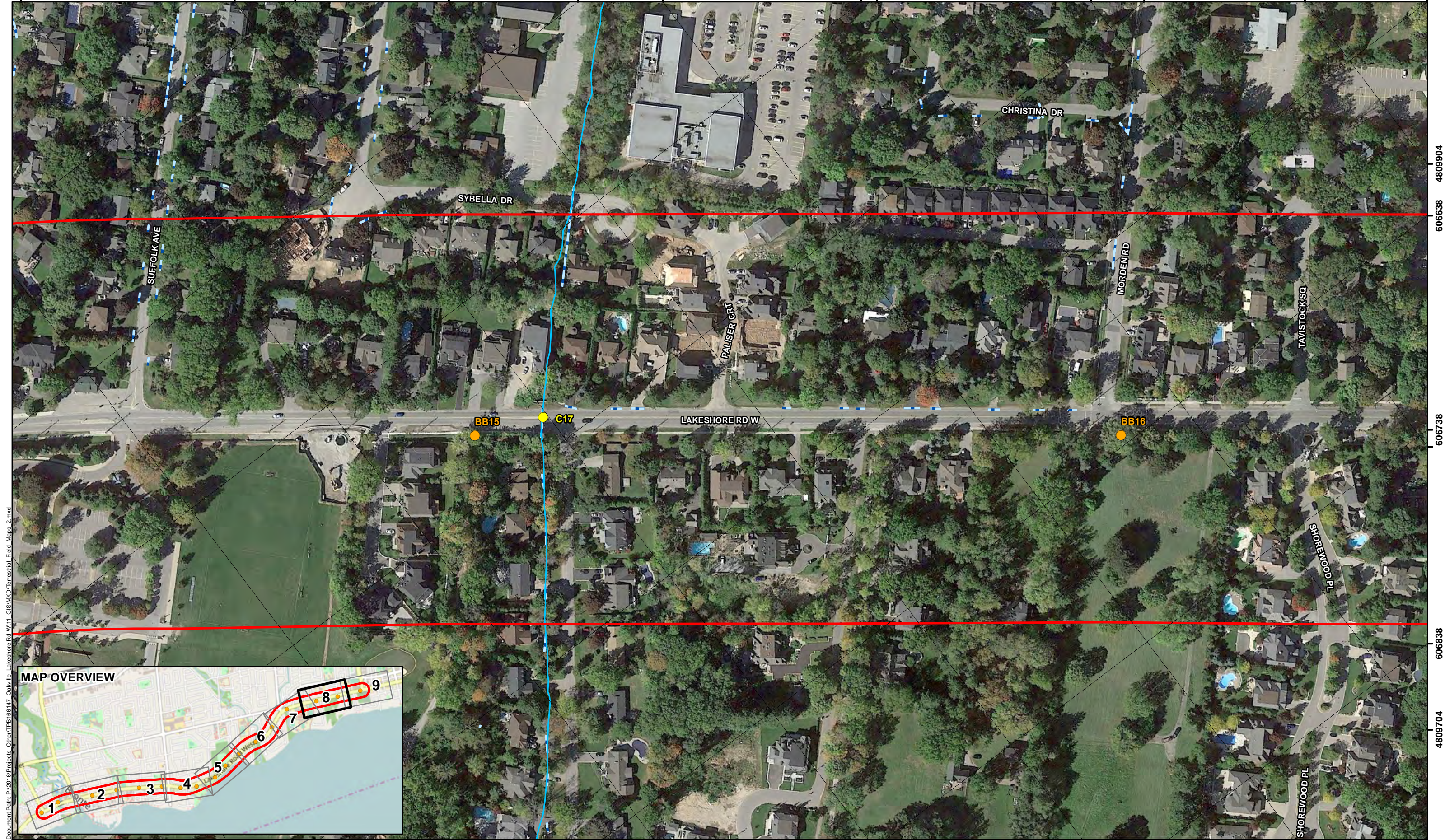


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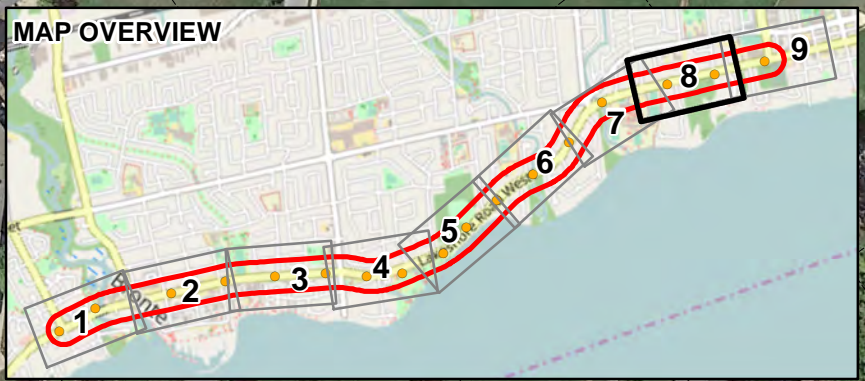


Appendix B
Terrestrial Field Maps
Map 7

4809304 4809404 606138 4809504 606238 4809604 606338 4809804 606438 4809904 606538

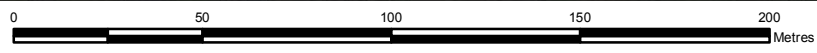


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LEGEND

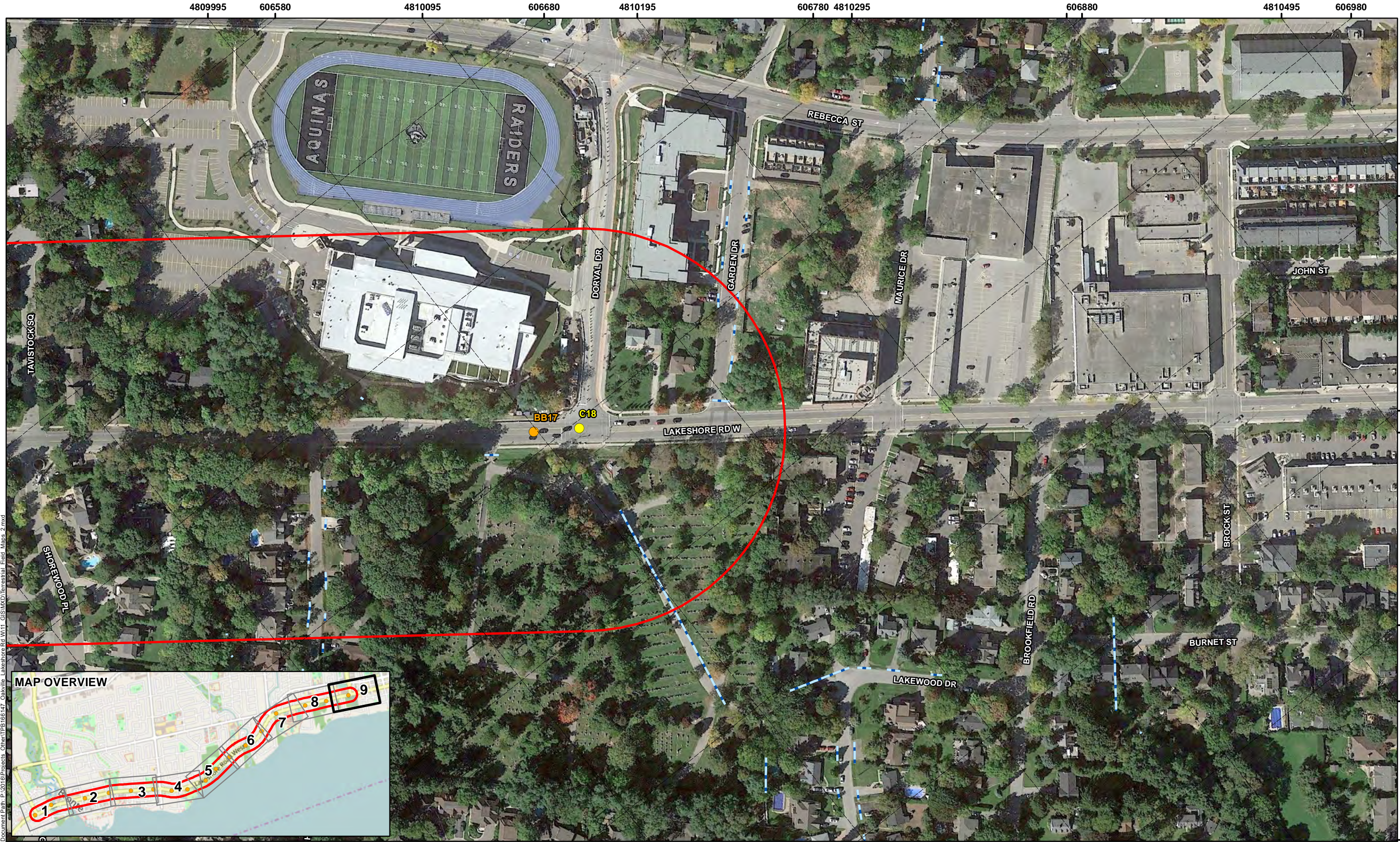
- Approximate Study Area
- Watercourse
- Breeding Bird Survey Locations
- - - Drainage Line (City of Oakville)
- Watercourse Crossings



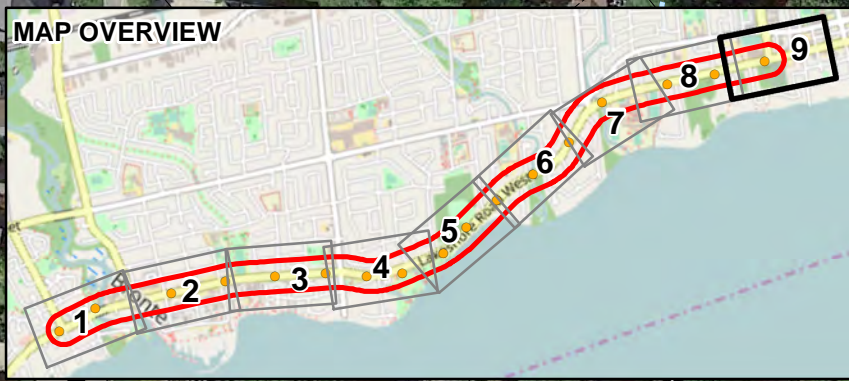
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 Datum & Projection:
 NAD 1983 UTM Zone 17N



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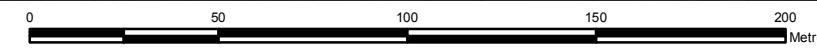


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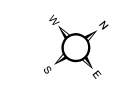


LEGEND

Approximate Study Area	Watercourse
Breeding Bird Survey Locations	Drainage Line (City of Oakville)
Watercourse Crossings	



SCALE: 1:2,000
 Datum & Projection:
 NAD 1983 UTM Zone 17N



4809995 606580 4810095 606680 4810195 606780 4810295 606880 4810495 606980

607080
607180
607280
4810295
607380

APPENDIX C
COMPILED WILDLIFE SPECIES LIST

COMPILED WILDLIFE SPECIES LIST

Species	Scientific Name	SRank	(SARA)*	(ESA)**
<u>Avian²</u>				
Alder Flycatcher	<i>Empidonax alnorum</i>	S5		
American Black Duck	<i>Anas rubripes</i>	S5		
American Crow	<i>Corvus brachyrhynchos</i>	S5		
American Goldfinch	<i>Spinus tristis</i>	S5		
American Kestrel	<i>Falco sparverius</i>	S4		
American Redstart	<i>Setophaga ruticilla</i>	S5		
American Robin	<i>Turdus migratorius</i>	S5		
American Woodcock	<i>Scolopax minor</i>	S5		
Baltimore Oriole	<i>Icterus galbula</i>	S4		
Bank Swallow	<i>Riparia riparia</i>	S4		THR
Barn Swallow	<i>Hirundo rustica</i>	S4		THR
Belted Kingfisher	<i>Megaceryle alcyon</i>	S4		
Black-billed Cuckoo	<i>Coccyzus erythrophthalmus</i>	S5		
Black-capped Chickadee	<i>Poecile atricapillus</i>	S5		
Black-throated Blue Warbler	<i>Setophaga caerulescens</i>	S5		
Black-throated Green Warbler***	<i>Dendroica virens</i>	S5		
Blackburnian Warbler***	<i>Dendroica fusca</i>	S5		
Blackpoll Warbler***	<i>Dendroica striata</i>	S4		
Blue Jay	<i>Cyanocitta cristata</i>	S5		
Blue-gray Gnatcatcher	<i>Polioptila caerulea</i>	S4		
Bobolink	<i>Dolichonyx oryzivorus</i>	S4		THR
Brown Creeper	<i>Certhia Americana</i>	S5		
Brown Thrasher	<i>Toxostoma rufum</i>	S4		
Brown-headed Cowbird	<i>Molothrus ater</i>	S4		
Canada Goose***	<i>Branta Canadensis</i>	S5		
Canada Warbler***	<i>Wilsonia canadensis</i>	S4	THR	SC
Carolina Wren	<i>Thryothorus ludovicianus</i>	S4		
Cedar Waxwing	<i>Bombycilla cedrorum</i>	S5		
Chestnut-sided Warbler	<i>Setophaga pensylvanica</i>	S5		
Chimney Swift	<i>Chaetura pelagica</i>	S4	THR	THR
Chipping Sparrow	<i>Spizella passerine</i>	S5		
Cliff Swallow	<i>Petrochelidon pyrrhonota</i>	S4		
Common Grackle	<i>Quiscalus quiscula</i>	S5		
Common Nighthawk	<i>Chordeiles minor</i>	S4	THR	SC
Common Yellowthroat	<i>Geothlypis trichas</i>	S5		
Cooper's Hawk	<i>Accipiter cooperii</i>	S4		
Double-crested Cormorant***	<i>Phalacrocorax auritus</i>	S4		
Downy Woodpecker	<i>Picoides pubescens</i>	S5		
Eastern Bluebird	<i>Sialia sialis</i>	S5		
Eastern Kingbird	<i>Tyrannus tyrannus</i>	S4		
Eastern Meadowlark	<i>Sturnella magna</i>	S4		THR
Eastern Phoebe	<i>Sayornis phoebe</i>	S5		
Eastern Screech-Owl	<i>Megascops asio</i>	S4		
Eastern Towhee	<i>Pipilo erythrophthalmus</i>	S4		
Eastern Wood-Pewee	<i>Contopus virens</i>	S4	SC	SC
European Starling	<i>Sturnus vulgaris</i>	SNA		
Field Sparrow	<i>Spizella pusilla</i>	S4		
Grasshopper Sparrow	<i>Ammodramus savannarum</i>	S4		
Gray Catbird	<i>Dumetella carolinensis</i>	S4		
Great Blue Heron	<i>Ardea Herodias</i>	S4		
Great Crested Flycatcher	<i>Myiarchus crinitus</i>	S4		
Great Horned Owl	<i>Bubo virginianus</i>	S4		

Species	Scientific Name	SRank	(SARA)*	(ESA)**
Green Heron	<i>Butorides virescens</i>	S4		
Hairy Woodpecker	<i>Picoides villosus</i>	S5		
Hooded Warbler	<i>Setophaga citrina</i>	S4	THR	
Horned Lark	<i>Eremophila alpestris</i>	S5		
House Finch	<i>Haemorhous mexicanus</i>	SNA		
House Sparrow	<i>Passer domesticus</i>	SNA		
House Wren	<i>Troglodytes aedon</i>	S5		
Indigo Bunting	<i>Passerina cyanea</i>	S4		
Killdeer	<i>Charadrius vociferus</i>	S5		
Least Flycatcher	<i>Empidonax minimus</i>	S4		
Magnolia Warbler***	<i>Dendroica magnolia</i>	S5		
Mallard	<i>Anas platyrhynchos</i>	S5		
Mourning Dove	<i>Zenaida macroura</i>	S5		
Mourning Warbler	<i>Geothlypis philadelphia</i>	S4		
Mute Swan	<i>Cygnus olor</i>	SE		
Northern Cardinal	<i>Cardinalis cardinalis</i>	S5		
Northern Flicker	<i>Colaptes auratus</i>	S4		
Northern Mockingbird	<i>Mimus polyglottos</i>	S4		
Northern Parula***	<i>Parula Americana</i>	S4		
Northern Rough-winged Swallow	<i>Stelgidopteryx serripennis</i>	S4		
Orchard Oriole	<i>Icterus spurius</i>	S4		
Ovenbird	<i>Seiurus aurocapilla</i>	S4		
Peregrine Falcon***	<i>Falco peregrinus anatum</i>	S2S3B	SC	SC
Pileated Woodpecker	<i>Dryocopus pileatus</i>	S5		
Pine Warbler	<i>Setophaga pinus</i>	S5		
Purple Finch	<i>Haemorhous purpureus</i>	S4		
Purple Martin	<i>Progne subis</i>	S4		
Red-bellied Woodpecker	<i>Melanerpes carolinus</i>	S4		
Red-breasted Nuthatch	<i>Sitta Canadensis</i>	S5		
Red-eyed Vireo	<i>Vireo olivaceus</i>	S5		
Red-headed Woodpecker	<i>Melanerpes erythrocephalus</i>	S4	THR	SC
Red-necked Grebe	<i>Podiceps grisegena</i>	S3		
Red-tailed Hawk	<i>Buteo jamaicensis</i>	S5		
Red-winged Blackbird	<i>Agelaius phoeniceus</i>	S4		
Ring-billed Gull***	<i>Larus delawarensis</i>	S5		
Rock Pigeon	<i>Columba livia</i>	SNA		
Rose-breasted Grosbeak	<i>Pheucticus ludovicianus</i>	S4		
Ruby-throated Hummingbird	<i>Archilochus colubris</i>	S5		
Savannah Sparrow	<i>Passerculus sandwichensis</i>	S4		
Scarlet Tanager	<i>Piranga olivacea</i>	S4		
Sharp-shinned Hawk	<i>Accipiter striatus</i>	S5		
Song Sparrow	<i>Melospiza melodia</i>	S5		
Spotted Sandpiper	<i>Actitis macularius</i>	S5		
Tennessee Warbler***	<i>Vermivora peregrina</i>	S5		
Tree Swallow	<i>Tachycineta bicolor</i>	S4		
Tufted Titmouse	<i>Baeolophus bicolor</i>	S2S3		
Turkey Vulture	<i>Cathartes aura</i>	S4		
Veery	<i>Catharus fuscescens</i>	S4		
Vesper Sparrow	<i>Pooecetes gramineus</i>	S4		
Warbling Vireo	<i>Vireo gilvus</i>	S5		
Eastern Whip-poor-will	<i>Antrostomus vociferus</i>	S4	THR	THR
White-breasted Nuthatch	<i>Sitta carolinensis</i>	S5		
Willow Flycatcher	<i>Empidonax traillii</i>	S5		
Wood Duck	<i>Aix sponsa</i>	S5		
Wood Thrush	<i>Hylocichla mustelina</i>	S5		SC
Yellow Warbler	<i>Setophaga petechial</i>	S5		

Species	Scientific Name	SRank	(SARA)*	(ESA)**
Yellow-billed Cuckoo	<i>Coccyzus americanus</i>	S4		
<u>Mammals</u>³				
Big Brown Bat	<i>Eptesicus fuscus</i>	S4		
Silver-haired Bat	<i>Lasionycteris noctivagans</i>	S4		
Eastern Red Bat	<i>Lasiurus borealis</i>	S4		
Hoary Bat	<i>Lasiurus cinereus</i>	S4		
Eastern Small-footed Myotis ⁶	<i>Myotis leibii</i>	S2S3		END
Little Brown Myotis ⁶	<i>Myotis lucifugus</i>	S4	END	END
Northern Long-eared Myotis ⁶	<i>Myotis septentrionalis</i>	S3	END	END
Tri-colored Bat	<i>Perimyotis subflavus</i>	S3	END	END
Coyote	<i>Canis latrans</i>	S5		
Red Fox	<i>Vulpes vulpes</i>	S5		
Raccoon	<i>Procyon lotor</i>	S5		
Ermine	<i>Mustela ermine</i>	S5		
Long-tailed Weasel	<i>Mustela frenata</i>	S4		
Mink	<i>Mustela vison</i>	S4		
Striped Skunk	<i>Mephitis mephitis</i>	S5		
White-tailed Deer	<i>Odocoileus virginianus</i>	S5		
Virginia Opossum	<i>Didelphis virginiana</i>	S4		
Eastern Cottontail	<i>Sylvilagus floridanus</i>	S5		
Snowshoe Hare	<i>Lepus americanus</i>	S5		
European Hare	<i>Lepus europaeus</i>	SNA		
Eastern Chipmunk	<i>Tamias striatus</i>	S5		
Woodchuck	<i>Marmota monax</i>	S5		
Gray Squirrel	<i>Sciurus carolinensis</i>	S5		
Red Squirrel	<i>Tamiasciurus hudsonicus</i>	S5		
Northern Flying Squirrel	<i>Glaucomys sabrinus</i>	S5		
Southern Flying Squirrel	<i>Glaucomys Volans</i>	S4		
Beaver	<i>Castor Canadensis</i>	S5		
White-footed Mouse	<i>Peromyscus leucopus</i>	S5		
Deer Mouse	<i>Peromyscus maniculatus</i>	S5		
Meadow Vole	<i>Microtus pennsylvanicus</i>	S5		
Muskrat	<i>Ondatra zibethicus</i>	S5		
Southern Bog Lemming	<i>Synaptomys cooperi</i>	S4		
Norway Rat	<i>Rattus norvegicus</i>	SNA		
House Mouse	<i>Mus musculus</i>	SNA		
Meadow Jumping Mouse	<i>Zapus hudsonius</i>	S5		
Porcupine	<i>Erethizon dorsatum</i>	S5		
Common Shrew	<i>Sorex cinereus</i>	S5		
Smoky Shrew	<i>Sorex fumeus</i>	S5		
Northern Short-tailed Shrew	<i>Blarina brevicauda</i>	S5		
Hairy-tailed Mole	<i>Parascalops breweri</i>	S4		
Star-nosed Mole	<i>Condylura cristata</i>	S5		
<u>Reptiles</u>⁴				
Snapping Turtle ⁶	<i>Chelydra septentina</i>	S3	SC	SC
Midland Painted Turtle	<i>Chrysemys picta marginata</i>	S4		
Northern Map Turtle ⁶	<i>Graptemys geographica</i>	S3	SC	SC
Eastern Milksnake ⁶	<i>Lampropeltis triangulum</i>	S4	SC	
Dekay's Brown Snake	<i>Storeria dekayi</i>	S5		
Red-bellied Snake	<i>Storeria occipitomaculata</i>	S5		
Northern Water Snake	<i>Nerodia sipedon sipedon</i>	S5		
Northern Ring-necked Snake	<i>Diadophis punctatus</i>	S5		
Red-eared Slider	<i>Trachemys scripta</i>	SNA		
Eastern Hog-nosed Snake	<i>Heteron platirhinos</i>	S3	THR	THR
Eastern Ribbonsnake	<i>Thamnophis sauritus</i>	S3	SC	SC
Eastern Gartersnake	<i>Thamnophis sirtalis</i>	S5		

Species	Scientific Name	SRank	(SARA)*	(ESA)**
<u>Amphibians</u> ⁴				
American Toad	<i>Anaxyrus americanus</i>	S5		
Eastern Red-backed Salamander	<i>Plethodon cinereus</i>	S5		
Gray Treefrog	<i>Hyla versicolor</i>	S5		
Green Frog	<i>Lithobates clamitans</i>	S5		
Northern Leopard Frog	<i>Lithobates pipiens</i>	S5		
Wood Frog	<i>Lithobates sylvaticus</i>	S5		
Spring Peeper	<i>Pseudacris crucifer</i>	S5		
American Bullfrog	<i>Lithobates catesbianus</i>	S4		
American Toad	<i>Bufo americanis americanis</i>	S5		
Pickerel Frog	<i>Rana palustris</i>	S5		
Eastern Newt	<i>Notophthalmus viridescens</i>	S5		
Mudpuppy	<i>Necturus maculosus maculosus</i>	S5		
Spotted Salamander	<i>Ambystoma maculatum</i>	S5		
Jefferson Salamander/Blue-Spotted Salamander Complex	<i>Ambystoma jeffersonianum</i>	S3	END	END
<u>Invertebrates</u>				
Cabbage White	<i>Pieris rapae</i>	S5		
Orange Sulphur	<i>Colias eurytheme</i>	S5		
Clouded Sulphur	<i>Colias philodice</i>	S5		
Hobomok Skipper	<i>Poanes hobomok</i>	S5		
Monarch Butterfly	<i>Danaus plexippus</i>	S3	SC	SC
¹ Shaded species are those observed/reported during Amec Foster Wheeler site investigations ² Second (2001-2005) Atlas of the Breeding Birds of Ontario (Cadman et al. 2007) ³ Atlas of the Mammals of Ontario (Dobbyn 1994; Species reported in the vicinity during 1970 – 1993); Bat data supplemented by Bat Conservation International (BCI 2013). ⁴ Ontario Reptile & Amphibian Atlas (Ontario Nature 2013) ⁵ NHIC Historical record. Last observed date was prior to 1980. (MNR 2013b) ⁶ MNRF Correspondence * SARA = Species at Risk Act ** ESA = Endangered Species at Risk Act *** means species were observed but not found in the ABBO Provincial Rank: S2 Imperilled; S3 Vulnerable; S4 Apparently Secure; S5 Secure; SNA Not Applicable/Provincially non-native, not suitable target for conservation activities; S#B Breeding; S#N Non-breeding SARA/ESA Designation: END Endangered, THR Threatened, SC Special Concern				

APPENDIX D

COMPILED PLANT SPECIES LIST

COMPILED PLANT SPECIES LIST

Common Name	Scientific Name	Provincial S-Rank
Manitoba maple	<i>Acer negundo</i>	S5
Norway Maple	<i>Acer platanoides</i>	SNA
Silver Maple	<i>Acer saccharinum</i>	S5
Sugar Maple	<i>Acer saccharum</i>	S5
Freeman's Maple	<i>Acer x freemanii</i>	SHY4?
Baneberry species	<i>Actaea sp.</i>	
Horse Chestnut	<i>Aesculus hippocastanum</i>	SNA
Hooked Agrimony	<i>Agrimonia gryposepala</i>	
Garlic Mustard	<i>Alliaria petiolata</i>	SNA
Speckled Alder	<i>Alnus incana rugosa</i>	S5
Common Burdock	<i>Arctium minus</i>	SNA
Jack-in-the-pulpit	<i>Arisaema triphyllum</i>	S5
Sedge species	<i>Carex sp.</i>	
Northern Catalpa	<i>Catalpa speciosa</i>	SNA
Greater Celandine	<i>Chelidonium majus</i>	SNA
Broadleaf Enchanter's Nightshade	<i>Circaea canadensis</i>	S5
Thistle species	<i>Cirsium sp.</i>	
European Lily-of-the-valley	<i>Convallaria majalis</i>	SNA
Red Osier Dogwood	<i>Cornus stolonifera</i>	S5
Hawthorn species	<i>Crataegus sp.</i>	
Fuller's Teasel	<i>Dipsacus fullonum sylvestris</i>	SNA
Beechdrops	<i>Epifagus virginiana</i>	S5
Yellow Trout Lily	<i>Erythronium americanum</i>	S5
Leafy Spurge	<i>Euphorbia esula</i>	SNA
American Beech	<i>Fagus grandifolia</i>	S4
Green Ash	<i>Fraxinus pennsylvanica</i>	S5
Wild Geranium	<i>Geranium maculatum</i>	
Herb-robert	<i>Geranium robertianum</i>	S5
Kentucky Coffee-Tree	<i>Gymnocladus dioicus</i>	S3
Dame's-rocket	<i>Hesperis matronalis</i>	SNA
Spotted Jewelweed	<i>Impatiens capensis</i>	S5
Butternut	<i>Juglans cinerea</i>	S3?
Black Walnut	<i>Juglans nigra</i>	S4
Juniper species	<i>Juniperus sp.</i>	
Invasive Honeysuckle species	<i>Lonicera sp. (invasive)</i>	
Canada Mayflower	<i>Maianthemum canadensis</i>	S5
Starry False Solomon's Seal	<i>Maianthemum stellatum</i>	
Ostrich Fern	<i>Matteucia struthiopteris</i>	S5
Virginia Creeper species	<i>Parthenocissus sp.</i>	
Norway Spruce	<i>Picea abies</i>	SNA
White Pine	<i>Pinus strobus</i>	S5
Scots Pine	<i>Pinus sylvestris</i>	S5
Broadleaf Plantain	<i>Plantago major</i>	
Mayapple	<i>Podophyllum peltatum</i>	
Solomon's Seal species	<i>Polygonatum sp.</i>	
Black Cherry	<i>Prunus serotina</i>	S5
Choke Cherry	<i>Prunus virginiana</i>	S5
Red Oak	<i>Quercus rubra</i>	S5
Common Buckthorn	<i>Rhamnus cathartica</i>	SNA
Fragrant Sumac	<i>Rhus aromatica</i>	S5
Staghorn Sumac	<i>Rhus typhina</i>	S5
Black Locust	<i>Robinia pseudoacacia</i>	SNA
Multiflora Rose	<i>Rosa multiflora</i>	SNA
Purple Flowering Raspberry	<i>Rubus odoratum</i>	S5
Dock species	<i>Rumex sp.</i>	

Common Name	Scientific Name	Provincial S-Rank
Crack Willow	<i>Salix x fragilis</i>	SNA
Black Elderberry	<i>Sambucus canadensis</i>	SNA
Bloodroot	<i>Sanguinaria canadensis</i>	S5
Bittersweet Nightshade	<i>Solanum dulcamara</i>	
Late Goldenrod	<i>Solidago altissima</i>	S5
Zigzag Goldenrod	<i>Solidago flexicaulis</i>	S5
Common Lilac	<i>Syringa vulgaris</i>	SNA
Common Dandelion	<i>Taraxacum officianale</i>	SNA
European Yew	<i>Taxus baccata</i>	SNA
Eastern White Cedar	<i>Thuja occidentalis</i>	S5
American Basswood	<i>Tilia americana</i>	S5
Western Poison Ivy	<i>Toxicodendron rydbergii</i>	S5
White Trillium	<i>Trillium grandiflorum</i>	S5
American Elm	<i>Ulmus americana</i>	S5
European Highbush Cranberry	<i>Viburnum opulus opulus</i>	S5
Common Periwinkle	<i>Vinca minor</i>	SNA
Common Blue Violet	<i>Viola sororia</i>	S5
Riverbank Grape	<i>Vitis riparia</i>	S5

APPENDIX E

RESULTS OF BREEDING BIRD SURVEYS

Species Name	Number of Birds/Station	Breeding Bird Point Count Station Number																
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Red-winged Blackbird	19	0	6	0	0	0	1	0	2	2	1	2	1	0	2	1	0	1
Ring-billed Gull	19	0	0	1	2	1	1	2	1	1	1	4	0	0	0	1	0	4
Rock Pigeon	3	0	0	0	1	0	0	0	0	2	0	0	0	0	0	0	0	0
Song Sparrow	8	0	2	0	0	0	0	0	0	1	3	0	1	0	1	0	0	0
Tennessee Warbler	4	0	0	0	0	0	0	1	0	0	2	0	1	0	0	0	0	0
Tree Swallow	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Tufted Titmouse	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Warbling Vireo	6	0	1	0	0	0	1	1	0	1	1	0	0	0	0	0	0	1
White-breasted Nuthatch	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Yellow Warbler	2	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Total Number of Birds Observed:	389																	