Prepared for: GR (CAN) Investments Inc.

Thundering Waters Secondary Plan

Preliminary Natural Heritage Characterization Report (DRAFT)

Dougan & Associates
C. Portt and Associates

November 1st, 2015

DOUGAN & ASSOCIATES
ECOLOGICAL CONSULTING & DESIGN

77 Wyndham Street South • Guelph ON N1E 5R3
T 519.822.1609 • F 519.822.5389 • www.dougan.ca

TABLE OF CONTENTS

1. INTRODUCTION

1.1. TERMS OF REFERENCE SUMMARY AND OBJECTIVES

Dougan & Associates Ecological Consulting and Design (D&A) and C. Portt and Associates (CPA) were retained in early 2015 by GR (Can) Investments to provide natural heritage support for the Secondary Plan process that has been initiated for the lands colloquially known as Thundering Waters.

Throughout spring and summer 2015, D&A and CPA worked with the Secondary Plan team, the client, and the approvals agencies to develop a terms of reference (ToR) to outline the scope for the natural heritage studies required to support, and inform, the Secondary Plan process of important environmental features that will require protection and management.

The ToR for the natural heritage studies used the Niagara Region's Environmental Impact Study (EIS) guidelines as a framework for the proposed scope, as well as input from the Niagara Peninsula Conservation Authority (NPCA). The submitted (not yet approved) ToR is provided in Appendix A, and in summary includes the following study objectives for the natural heritage characterization report:

Fieldwork and reporting to identify the following terrestrial and aquatic natural heritage elements was required:

- Provincially Significant Wetland (PSW) areas
- Habitat of Endangered and Threatened Species
- Significant Woodlands
- Habitat of Species of Concern
- Location of NPCA regulated wetlands
- Critical Fish Habitat (Type 1)
- Critical Fish Habitat (Type 2 and 3)

The work plans to address these objectives are outlined in the ToR (Appendix A). Comments on the proposed ToR from NPCA highlighted that in addition to the proposed work plan, crepuscular bird habitat characterization should be considered (primarily to assess habitat suitability and occurrence of Eastern Whip-poor-will (*Antrostomus vociferus*) should be considered, as well as inventory for Bat Maternity Roost trees.

In this report, results from fieldwork conducted between March-September 2015 is summarized. The report concludes with proposed principles and recommendations that will help guide specific details of an environmental management plan for the Secondary Plan area.

1.2. STUDY AREA SUMMARY

The study area is located within the eastern-most extent of the Niagara Peninsula (Map 1). The study area is bounded by Oldfield Road to the north, Dorchester Road to the west, Chippawa Parkway to the south, and lands west of the existing development along Kister Road (Map 1).

In this area, the bedrock geology consists of sandstone, shale, dolostone, and siltstone of the Guelph Formation, which overlays Precambrian basement rock (Ontario Geological Survey, 2011). The study area is also within the Haldimand Clay Plain, and the surficial geology consist predominantly of fine-textured glaciolacustrine deposits of silt and clay with minor sand and gravel components (Chapman and Putnam 1983; Ontario Geological Survey, 2010). In the south-western corner of the study area the soils consist of man-made deposits of fill (Ontario Geological Survey, 2010), which are likely from the excavation of the adjacent Power Canal and/or the Conrail Drain that bisects the study area.

Topographic relief across the site is minimal and generally slopes in a south and south-east direction towards the Welland River and power canal. Fine-scale topographic variation across the site is due to a combination of small moraine ridges in undisturbed areas, and man-made deposits and drainage ditches. The small moraines, or sloughs, underlie most of the Niagara Falls Slough Forest Wetland Complex (NFSFWC), and are characterized by a network of shallow depressions and connecting channels which create complex drainage patterns. Slough topography such as that present on the property was likely formed at the margin of the retreating Laurentide Ice Sheet during the Late Wisconsinan glacial period (Menzies et al. 2001); land use practices during recent times, however have undoubtedly modified these systems. Along Dorchester Road and Chippawa Parkway most of the slough topography has been eliminated due to filling and piling.

2. METHODS

2.1. BACKGROUND REVIEW

2.1.1. MNRF DATA

A spatial query for records of natural heritage areas (e.g. Woodlands, Wetlands, Areas of Natural and Scientific Interest (ANSI)) and Species at Risk was conducted for the study area and the adjacent 1km grid squares using data provided by the Natural Heritage Information Centre (NHIC) and their online mapping tool (Figure NHIC 2015) on May 6th, 2015. Species at Risk records were also requested from local MNRF staff (Anne Yagi, Pers. Comm.), along with any specific information regarding their occurrence in the area.

2.1.2. NPCA DATA

The Niagara Peninsula Conservation Authority's online mapping tool was used to review existing mapping for ELC, Environmental Conservation Areas, Wetlands, and associated regulated area layers on April 9th, 2015. Additionally, meetings with the NPCA ecology staff identified potential species of conservation concern and wildlife habitat that would require consideration for field inventory, including: Whip-poor-will and Bat Maternity Roost habitat.

2.2. SITE VISITS

2.2.1. ECOLOGICAL LAND CLASSIFICATION

Vegetation communities were classified and mapped using the Ecological Land Classification System for Southern Ontario (Lee et al. 1998). Interpretation of aerial photo/satellite imagery, MNRF wetland boundaries, and a digital elevation model from LiDAR points were used to determine differences in land cover across the study area and establish potential ELC boundaries. Subsequent site visits were conducted to confirm/refine boundaries and classify the vegetation communities present. The Niagara Natural Area Inventory (NAI) (NPCA 2010) was also reviewed to determine which ELC communities were likely to occur within the study area.

D&A staff completed site visits to classify vegetation communities during the spring, summer, and fall 2015; specific dates and staff present are summarized in Table 1. During each site visit, staff walked transects through each pre-defined polygon to inventory the flora and determine the composition of the dominant canopy species. Soil texture and soil moisture regime were determined using Denholm and Schut (2009) by extracting soil cores within representative areas of each ELC vegetation type.

2.2.2. PLANT INVENTORY

Spring, summer, and fall vegetation inventories were conducted simultaneously with site visits for ELC and wetland boundary delineation, as outlined in Table 1. The habitat requirements for all Species at Risk (SAR) identified during the review of background material were noted and used in the field to

improve the potential for detecting these species. When SAR and/ or provincially rare species were observed, a GPS point and notes regarding the habitat were taken. Vascular plants species that could not be positively identified in the field were collected, pressed, and confirmed at a later date. The nomenclature reported for all vascular plants is consistent with the Natural Heritage Information Centre (NHIC 2014). Federal rankings for identified Species at Risk are from the Committee on the Status of Endangered Wildlife in Canada (COSEWIC, 2015), provincial rankings for Species at Risk are from the Natural Heritage Information Centre (NHIC 2014), and regional rankings are from Oldham (2010). The native status of identified plants is based on the NHIC (2014).

2.2.3. WETLAND BOUNDARY DELINEATION

As per the request of the Ontario Ministry of Natural Resources and Forestry (Anne Yagi, Pers. Comm.), the boundary of the Niagara Falls Slough Forest Wetland Complex PSW required delineation. D&A staff delineated the boundary using the Ontario Wetland Evaluation System (OWES) protocols; a Trimble GeoExplorer 6000 Series GeoXH high-accuracy GPS unit was used to georeference the boundary. This boundary was reviewed in the field with MNRF and NPCA staff. A summary of the dates and surveyors present for the wetland boundary delineation is provided in Table 1.

2.2.4. SALAMANDER INVENTORY

Dougan & Associates undertook a salamander trapping program within the study area. This program was employed to determine the extent of pond breeding salamander diversity and activity and to screen for the Endangered Jefferson Salamander (*Ambystoma jeffersonianum*) (Species-at-Risk; COSEWIC 2015; OMNR 2015).

The study involved the capture of pond-breeding salamanders in natural populations at select locations shown in Appendix B. Tissue samples (i.e. tail tips) were required from individual Ambystoma salamanders in order to perform DNA analysis to definitively determine which species or polyploids are present. Tissue samples were obtained in the field and specimens were released at the capture site.

Prior to fieldwork, Wildlife Animal Care Committee Research Protocol (WACCRP), Wildlife Scientific Collectors Authorization (WSCA) and Endangered Species Act (ESA) permits were required. Applications for these permits were submitted on March 27, 2015. OMNRF staff accompanied field staff during the first trapping round to observe protocols and ensure that WACCRP, WSCA and ESA standards were upheld. The following permits numbers were issued for the 2015 trapping program: WACCRP: 15-143, WSCA: 1079399, ESA: GU-B-004-15.

In order to ensure that all individuals are treated with the highest care, standard operating procedures were followed. In particular, the following sets of documents were reviewed prior to fieldwork and recommendations followed wherever applicable:

- Canadian Council on Animal Care Species-specific Recommendations on: Amphibians & Reptiles
- Canadian Council on Animal Care Guidelines on: The Care and Use of Wildlife
- USGS National Wildlife Health Center "Restraint & Handling of Live Amphibians"
- In addition, although toe-clipping was not performed, the USGS National Wildlife Health Centre "Toe-Clipping of Frogs and Toads" (also covers salamanders) was reviewed for general insights

The protocol for trapping in the 2015 season was undertaken to minimize the length of time that captured specimens spent in traps. This lessened the potential of salamanders becoming fatigued and/or oxygen deprived. Salamanders were handled for the shortest amount of time possible, but long enough to collect a tail tip sample. The smallest sample necessary to obtain a successful genetic analysis is taken, approximately 5 mm which can take up to about a minute of handling time.

The trapping survey period was selected to coincide with adult Ambystomid seasonal migrations to breeding ponds (Stebbins and Cohen, 1995; JSRT, 2009; COSEWIC, 2010). An initial site reconnaissance before trapping was started was conducted on April 1st, 2015 to confirm pond location; during the visit target ponds had ice cover between 75 and 100%. Trapping was undertaken one week later, following a warm spring rain. Survey dates and conditions are outlined in Table 2.

Based on site reconnaissance and screening of habitat suitability as well as correspondence with OMNRF (Pers. corres. with Guelph District OMNRF) and results from previous salamander trapping studies on site (unpublished 2009 OMNRF salamander trapping program within the study area), eight (08) ponds were selected for trapping in 2015 (Appendix B). Potentially suitable breeding ponds are present throughout the slough forest habitat on site, and although they vary in size (aerial photo interpretation of ponds suggested ponds range from approximately 26m^2 to 4032m^2), the larger ponds were generally similar in structure and vegetation characteristics. Larger pools were targeted to ensure that the trapping effort was focused on habitat with adequate depth and sufficient vegetation to support egg-laying sites, and thus would increase the chance that salamanders would be captured.

Five traps were deployed in each of the eight ponds surveyed (40 traps total) during the five evenings outlined in Table 2. Within the study ponds, specific trap locations were chosen in the field based on pond shape, depth and the presence of egg-laying sites (e.g. submerged vegetation, logs, shrubs), as these areas are thought to be more attractive to breeding adult salamanders.

Adult salamanders were collected using standard 6mm square, silver wire mesh minnow traps in suitable breeding ponds. On sample nights, the traps were set out before dark and checked early the following morning to minimize the amount of time salamanders spent in the traps. Each trap was flagged, numbered, georeferenced, and attached with rope to a fixed feature on land (i.e. tree, deadfall, rock). Traps were placed in the water with at least 85% of the trap submerged and ensure that the trap was lying horizontally on the pond bottom.

When salamanders were caught, specimens handled for analysis were limited to individuals belonging to the "Jefferson Salamander complex" (i.e. *Ambystoma laterale – A. jeffersonianum complex*); other amphibian species and wildlife (e.g. invertebrates and fish) were documented and released. When a specimen from the "Jefferson Salamander Complex" was captured, a small amount of tail tip was removed (~ 5 mm) using a sterile scalpel blade. The tail tip was then placed into a labelled tube of 70% ethanol. After each sample, the scalpel and cutting surface were sterilized using rubbing alcohol and an open flame; scalpel blades were also replaced frequently. After processing, specimens were held for several minutes in a container to monitor for any signs of adverse health effects. After this monitoring period, specimens were released at the point of capture.

On May 7, 2015 tail-tip samples collected during the trapping study were delivered to the lab of Dr. James Bogart, at the University of Guelph. These samples were processed in Dr. Bogart's lab to determine specimen polyploid identification. Results of this DNA analysis were delivered to Dougan & Associates on June 23, 2015.

2.2.5. NOCTURNAL AMPHIBIAN CALL SURVEYS

Nocturnal Amphibian Call Surveys were conducted in accordance with the Marsh Monitoring Program (MMP) (Bird Studies Canada 2009). Survey dates were selected to ensure weather conditions were well within the acceptable ranges described by the MMP (Table 3). During site reconnaissance visits throughout the first half of April, 2015, active amphibian breeding habitat and potentially suitable breeding habitat was detected in several parts of the study area. Informed by this site reconnaissance 10 stations were established around the perimeter of the study area on April 19th, 2015 (Table 3; Appendix B). Three additional stations were added on May 28th, 2015, for a total of 13 surveyed during May and June, 2015 (Table 3; Appendix B). Two of these additional locations, NACS 11 and NACS 12, were established along the Conrail Drain that bisects the study area (Appendix B). NACS 13 was established on the north eastern edge of the study area near salamander Trapping Pond 6 (Appendix B).

2.2.6. BREEDING BIRD SURVEYS

Two breeding bird surveys were conducted on May 28 and May 29 (first survey) and June 4 and June 5 (second survey), 2015, following the protocols outlined by the Ontario Breeding Bird Atlas (OBBA) (Cadman et al., 2007). The survey locations are shown in Appendix B. The OBBA protocol stipulates that the surveys be conducted between sunrise and 10:00 a.m., between May 24 and July 12, during appropriate weather conditions (i.e., light winds, no heavy rains, and good visibility). Given the size of the study area, a total of 32 Point Count Stations (PCS) were surveyed for 10 minutes each (Appendix B), with additional species noted in areas between and outside of the PCS locations.

2.2.7. AQUATIC SURVEYS

Field investigations were conducted by C. Portt and Associates staff, on April 11th, 12th, 21th, June 11th, and October 6th, 2015. The initial field investigations were conducted to characterize the aquatic habitats within the subject properties, and assess their importance under early spring conditions with regard to potential spawning habitat and accessibility for fish. In particular, wetland areas within the subject properties and along the edge of the Welland River were evaluated for their suitability and utilization as spawning areas for Northern Pike (Esox lucius), and watercourses were examined for riffle-spawning fishes such as White Sucker (Catostomus commersonii). Locations that were identified as having potential for spawning and/or more permanent habitats were examined again on April 21th, 2015. Additional observations of flow and general habitat were conducted on June 11 and October 6. Electrofishing was undertaken on June 11 and October 6, 2013, using a Halltech 2000 backpack electrofisher. After field identification and enumeration, all fish were released alive at the point of capture. A Garmin GPS 76CSx Global Positioning System (GPS) unit was used to record the locations of all observations and digital photographs, as well as electrofishing locations. Selected photographs of site conditions are provided in Appendix H. Common aquatic plants were identified at a basic level to be included, where appropriate, in habitat descriptions, but no attempt was made to characterize the full aquatic macrophyte community.

The Ministry of Natural Resources and Forestry (MNRF) and the Niagara Peninsula Conservation Authority (NPCA) were also contacted to obtain any relevant existing fish collection information.

3. RESULTS

3.1. BACKGROUND STUDIES

3.1.1. TERRESTRIAL

The spatial query for NHIC data revealed a total of sixty-three (63) records for species of conservation concern known to occur presently or historically within approximately 1km of the study. The records include forty-nine (49) species of vascular plants, four (4) birds, two (2) fish, four (4) invertebrates, including three (3) mollusks and one (1) odonate, three (3) reptiles, and one (1) restricted record. The provincial rankings (S Rank; NHIC, 2014) ranged from Presumed Extirpated (SX) to Apparently Secure (S4), though most records are for species that are considered Critically Imperiled (S1), Imperiled (S2), or Vulnerable (S3), or some combination of those rankings. According to COSEWIC (2015), twelve (12) species are Endangered (END), four (4) species are Special Concern (SC), seven (7) species are Threatened (THR), and one (1) species is Extirpated (EXP). Species at Risk in Ontario include twelve (12) Endangered (END), three (3) Special Concern (SC), eight (8) Threatened (THR), and one (1) extirpated species (MNRF; NHIC, 2014).

In addition to the NHIC Query, Guelph District MNRF staff provided the following list of species that may occur in the areas:

- Round-leaved Greenbrier (*Smilax rotundifolia*); Present in Warren Creek PSW- possibly in Niagara Falls Slough Wetland PSW (NFSW)
- Snapping Turtle (*Chelydra serpentina*); Highly likely using site
- Eastern Flowering Dogwood (*Cornus florida*); Not likely- upland species
- White Wood Aster (*Eurybia divaricate*); Not likely-upland species
- Swamp Rose-mallow (*Hibiscus moscheutos*); Yes. Present along Chippawa Channel (formerly Welland River)
- Butternut (*Juglans cinerea*); Possibly
- American Water-willow (*Justicia americana*); No. Present in Lyon's Creek and Dufferin Island Only
- Peregrine Falcon (*Falco peregrinus*); Nesting active in cliff and old OPG building at base of fall in Lower Niagara River
- Eastern Meadowlark (*Sturnella magna*); Good potential in open areas

A review of natural heritage mapping by the NHIC (2014) identified both woodlands and a Provincially Significant Wetland (PSW), the Niagara Falls Slough Forest Wetland Complex (NFSFWC), occurring within the study area (Figure 2). The NFSFWC consists of multiple wetland units both within and outside of the study area. Based on NHIC mapping, seven (7) wetland units occur within the study area, including two relatively large, contiguous units. Aside from the NFSFWC, additional woodlands are shown throughout the study area with the exception of several large areas within the southern half of the study area and along the rail corridor and large drainage feature that bisect the study area (Map 2).

3.1.2. AQUATICS

The MNRF (Anne Yagi) stated that it does not have any fish information for this site. Anne Yagi also suggested that the mouth of the Conrail Drain should be investigated with regard to fish access from the Power Canal, and that spawning Northern Pike (Esox lucius) may access the wetlands along the edge of the Welland River.

The NPCA (Lee-Ann Hamilton) indicated that it does not have any fish information for this site.

3.2. SITE INVESTIGATIONS

3.2.1. ECOLOGICAL LAND CLASSIFICATION

A total of 13 ELC dominant vegetation communities from Anthopogenic, Cultural, Forest, and Swamp ELC Ecosites were identified among 47 polygons during the site investigations conducted in 2015 (Table 5). Within the some of the ELC communities, an additional seven (7) vegetation types were identified as complexes and/or inclusions with the dominant vegetation types. A summary of the dominant ELC communities is provided in Table 5, and a list of all ELC vegetation types observed including their provincial rankings are provided in Table 6. Oak Mineral Deciduous Swamp (SWD1) accounts for the largest proportion of the study area at 95ha (42%) followed by Mineral Cultural Woodland (CUW1; 19%), Green Ash Mineral Deciduous Swamp (SWD4-1; 13%) (Table 5). The remaining vegetation communities each amount to less than 10% of the total study area.

Each of the dominant ELC Ecosites and Vegetation Types is summarized below. For species associated with the ELC polygons see Table 6.

3.2.1.1. ANTHROPOGENIC LANDS

Anthropogenic (ANTH): Polygon 41
Lands classified as ANTH include areas that have been cleared of natural vegetation and are in use for human activities such as parking lots, lawns, residential dwellings, commercial outlets, and industrial structures. Due to the removal of natural habitats, features, and functions from these areas, all lands categorized as ANTH are considered to be low quality.

Anthropogenic lands account for only 3.62ha (1.61%) of the study area, and are found only in the easternmost portion of the study area (Polygon 41; Figure 2). This area is a former industrial site with several buildings, aggregate storage areas, and a driveway from Progress Street. Vegetation within this polygon was sparse and primarily early successional with scattered shrubs and trees. Industrial waste was also present throughout, including piles of garbage and concrete bordering the adjacent vegetation communities.

3.2.1.2. CULTURAL PLANT COMMUNITIES

Dry-Moist Old Field Meadow (CUM1-1): Polygons 42, 43, 44

Cultural meadows represent a very early stage of natural succession. They contain a low abundance of woody species (<25% cover) and are dominated primarily by opportunistic forbs and grasses. Cultural meadows account for 19ha (8.5%) of the study area, and are present along and within the Conrail Drain that bisects the study area (Polygon 7), a large open area used informally for all-terrain vehicles along Dorchester Road (Polygon 25), and areas adjacent to the industrial facility (Polygons 42, 43, 44) at the eastern edge of the study area. Polygon 7 is a long, linear, drainage feature, polygon 25 is large open filled area, and polygons 42 – 44 are old-fields that may have a history of agricultural use based on historic imagery (Google Earth™, 2015).

Dominant species included exotic forbs (e.g. *Trifolium pretense*, *Vicia cracca*) and grasses (e.g. *Phragmites australis ssp australis*, *Schedonorus pratensis*), though some native species such as Hemp Dogbane (*Apocynum cannabinum*), Strict Blue-eyed-grass (*Sisyrinchium montanum var. montanum*), and Goldenrod (*Solidago altissima*, *S. juncea*) were present. Relative cover of trees and shrubs was less than 25%, and included scattered Eastern Cottonwood (*Populus deltoides ssp deltoides*), and patches of Common Buckthorn (*Rhamnus cathartica*), Heart-leaved Willow (*Salix eriocephala*), Gray Dogwood (*Cornus racemosa*), and Dotted Hawthorn (*Crataegus punctata*). Regionally rare species includes Wooly Sedge (*Carex pellita*), which was observed in a moist pocket within polygon 25.

Cultural Thicket (CUT1-1): Polygon 16

These communities are characteristic of lands that have been cleared in the past, left to regenerate, and succeed towards a naturally-vegetated community. Cultural thickets include areas in a somewhat later stage of succession than cultural meadow, where shrub cover is greater than 25% but tree cover remains below 25%. Cultural thicket communities are dominated by woody shrubs and often have an understory of forbs and grasses.

Overall, mineral cultural thicket accounts for approximately 15.7 ha (7%) of the land cover within the study area, and is only present as a dominant Ecosite within polygon 16. This area is dominated by Dotted Hawthorn with occasional Gray Dogwood, and scattered trees including American Elm (*Ulmus Americana*) and Eastern Cotton Wood. The herbaceous groundcover community is abundant with Smooth Aster (*Symphyotrichum laeve var. laeve*), Old Field Aster (*Symphyotrichum pilosum var. pilosum*), New England Aster (*Symphyotrichum novae-angliae*), and Wild Strawberry (*Fragaria virginiana*) in moist areas; drier areas contained Gray-stemmed Goldenrod (*Solidago nemoralis*), Early Goldenrod, Canada Pussytoes (*Antennaria howelii ssp. canadensis*), Oxeye Daisy (*Leucathemum vulgare*), and Common St. John's-wort (*Hypericum perforatum*). Notable species include Canada Pussytoes and Yellow Sedge (*Carex flava*), which are both rare within Niagara Region. The substrates within this feature are primarily derived from man-made fill, and consist of unstratified Clay Loam to a depth of 60cm with no mottling.

Gray Dogwood Cultural Thicket (CUT1-4): Polygons 9, 11, 28, 45

Gray Dogwood Cultural Thicket accounts for 8.3ha (3.7%) of the total study area among 4 polygons (Figure 2; polygons 9, 11, 28, 45). These features occur between the Conrail Drain and the rail line (polygon 9, 11), within the northwest corner of the study area (polygon 45), and in polygon 28 east of polygon 27 (Figure 2). Overall, the species composition within these features was similar to that of

polygon 16, but suggestive of slightly more moist soil conditions. Gray Dogwood was the most abundant shrub species rather than Dotted Hawthorn, and tree cover was slightly higher than polygon 16. The occurrence of taller tree species was infrequent and below 25%, and included Green Ash (*Fraxinus pennsylvanica*), Red Maple (*Acer rubrum*), Northern Pin Oak (*Quercus palustris*), Black Cherry (*Prunus serotina*), and American Elm. In moist areas shrubs species included White Meadowsweet (*Spirea alba*), Bebb's Willow, and Briar Rose (*Rosa rubiginosa var. rubiginosa*), while dominant ground cover species included various Aster species (*Symphyotrichum* spp), Blue Vervain (*Verbena hastata*), Begger's Ticks (*Bidens sp*), sedges (*Carex sp*), Common Boneset (*Eupatoreum perfoliatum*), Purple Loosestrife (*Lythrum salicaria*), Reed Canary Grass (*Phalaris arundinacea*), and Sensitive Fern (*Onoclea sensibilis*); drier areas had Canada Goldenrod (*Solidago canadensis*), Queen Anne's Lace, Common Plantain (*Plantago major*), and Black Knapweed (*Centaurea nigra*). The substrate within these communities were moist Clay Loam, though mottling was generally below 20cm.

Cultural Woodland (CUW1): Polygons 1, 15, 19, 22, 34, 35, 37

Cultural woodlands are treed areas characterized by canopy coverage between 35 – 60%. These communities often represent the stage of natural succession between cultural thicket and forest, but may also represent a disturbed or fragmented forest.

Cultural woodlands were prevalent throughout the study area, and accounted for 43ha (19%) of the total area among 7 polygons. These areas were complexed with Cultural Thicket (CUT1) due to the open canopy and dense shrub/understory layer of Hawthorn (e.g. *Crataegus punctata*, *Crataegus succulenta*), Gray Dogwood, Common Apple (*Malus pumila*), and Common Buckthorn in many areas. The relative cover of canopy species was below 60% in most areas, and generally consisted of Green Ash and Eastern Cottonwood, with lower abundance of American Elm, White Willow (*Salix alba*), and occasional Northern Pin Oak. Green Ash was the dominant understory species and was present as regenerating stems and as groundcover. Climbing Poison Ivy (*Toxicodendron radicans*) was abundant throughout. Herbaceous groundcover species included Broad-leaved Enchanter's Nightshade (*Circaea Canadensis*), Fowl Mannagrass (*Glyceria striata*), Field Horsetail (*Equisetum arvense*), Woodland Sedge (*Carex blanda*), Common Nipplewort (*Lapsana communis*), and Kidney-leaved Buttercup (*Ranunculus arbotivus*). The soil in these features was Clay or Silty Clay with mottling at or well below 20cm.

White Pine Coniferous Plantation (CUP3-2): Polygon 33

Coniferous plantations include vegetation communities where canopy cover is greater than 60% and the dominating canopy trees are conifers, typically planted in rows.

The small White Pine plantation (0.3 ha) was dominated by planted White Pine (*Pinus strobus*) with few other tree species aside from Green Ash. The understory and shrub layer were abundant with Climbing Poison Ivy, Thicket Creeper, and Choke Cherry, while Wild Red Raspberry (*Rubus idaeus ssp strigosus*), Avens species (*Geum* sp), Wild Strawberry, and Virginia Knotweed (*Persicaria virginiana*) were abundant in the ground layer.

3.2.1.3. TERRESTRIAL PLANT COMMUNITIES

Dry-Fresh Deciduous Forest Ecosite (FOD4): Polygons 36, 38, 40

This ELC Ecosite made up a relatively small portion of the study area at 1.7ha (0.76%), and was restricted to narrow features bordering the tributary at the east end of the study area (Figure 2). The canopy was dominated by Oak species (*Quercus rubra*, *Q. macrocarpa*, *Q. alba*), with less common Green and White Ash (*Fraxinus americana*), American Basswood (*Tilia americana*), Black Cherry, and Hickory (*Carya spp*). The understory and shrub layers were similar in composition, with the addition of Eastern Hop-Hornbeam (*Ostrya virigniana*), Hawthorns (*Crataegus spp*), Red Osier Dogwood (*Cornus stolonifera*), Climbing Poison Ivy, and Choke Cherry (*Prunus virginiana*). The groundcover was comprised of Northern Rough-leaved Goldenrod (*Solidago rugosa ssp. rugosa*), Graceful Sedge (*Carex gracillima*), Broad-leaved Enchanter's Nightshade, Asters, Avens, Large-leaved Aster (*Eurybia macrophylla*) and Hooked Agrimony (*Agrimonia grypocephala*). The soils were consistent with elsewhere in the study area, being composed of Silty Clay, though no mottling was observed above a depth of 60 cm.

3.2.1.4. WETLAND PLANT COMMUNITIES

Fresh-Moist Sugar Maple Deciduous Forest Ecosite (FOD6): Polygon 13
This small (1.8 ha) vegetation community (polygon 13) borders the north side of one of the large slough forest blocks (polygon 27), and is similar in composition to the upland areas within the slough forest complex (e.g. polygons 5 and 27), with species such as Sugar Maple (*Acer Saccharum*, American Beech (*Fagus grandifolia*), and Aspen (*Populus sp*).

Fresh-Moist Poplar Deciduous Forest (FOD8-1): Polygon 14
This small vegetation community (polygon 14; 0.9 ha) included a young Eastern Cottonwood canopy with American Elm, and an understory of Common Buckthorn, Gray Dogwood, and Highbush Cranberry (*Viburnum opulus ssp trilobum*). The groundcover was indicative of relatively moist soils, and included sedges (*Carex gracillima, C. leptonervia*), Rushes (*Juncus dudlei, Juncus tenuis*), Red-tinged Bulrush (*Scirpus microcarpus*), and Purple Loosestrife. Creeping Spike-rush (*Eleocharis palustris*), a rare species in Niagara Region, was also found within this polygon.

Oak Mineral Deciduous Swamp (SWD1): Polygons 5, 12, 27, 29, 31, 32)

Oak Mineral Deciduous Swamp occupied the largest proportion of the study area with a total of 95ha (42%) across six (6) polygons (Figure 2); polygons 5, 27, and 32 make up the core areas of the Niagara Falls Slough Forest Wetland Complex. This feature is characterized by a complex of Oak (*Quercus palustris, Q. macrocarpa, Q bicolor*) and Freeman Maple (*Acer x freemanii*) - dominant bottomland swamp (i.e. sloughs) with intervening Fresh-Moist Oak - Maple Deciduous Forest (FOD9-2) uplands composed of Red Oak, Sugar Maple, American Beech, American Basswood, Shagbark Hickory (*Carya ovata*), Bitternut Hickory (*Carya cordiformis*) Green Ash, American Elm, and White Oak. The subcanopy composition was similar, with the addition of Blue-beech (*Carpinus caroliniana*), Hawthorns, and a higher abundance of Maple, American Beech, and Green Ash than the canopy. The understory was abundant throughout with Spicebush (*Lindera benzoin*), Gray Dogwood, Chokecherry (*Prunus virginiana*), and Hawthorns. The groundcover vegetation was relatively diverse and included species such as Fowl Mannagrass, Sensitive Fern, various sedges, Climbing Poison Ivy, Wild Strawberry, Yellow Trout Lily, Wild Geranium (*Geranium maculatum*), White Trillium, Virginia Knotweed, Garlic Mustard

(*Alliaria petiolata*), Dewberry (*Rubus pubescences* and *R. hispidus*), Northeastern Lady Fern (*Athyrium felix-femina var. angustum*), and Spinulose Wood Fern (*Dryopteris carthusiana*).

In deeper slough vernal pools, several additional wetland vegetation types occur, including Buttonbush Mineral Thicket Swamp (SWT2-4) which is a provincially important vegetation community type, and Bulrush Mineral Shallow Marshes (MAS2-2). The Buttonbush Thicket Swamps are dominated by Buttonbush shrubs (*Cephalanthus occidentalis*), and include other abundant species such as Gray Dogwood and Silky Dogwood (*Cornus amomum*); surrounding canopy species include Northern Pin Oak, Black Willow (*Salix nigra*), and American Elm. Less common shrubs included Black Chokeberry (*Aronia melanocarpa*), Black Holly (*Ilex verticillata*), and Mountain Holly (*Ilex mucronata*). The groundcover was rich in graminoid species (e.g. *Eleocharis obtusa, C. lupulina, C. retrorsa, C. tenera, C. tribuloides, C. tuckermanii, Glyceria striata, G. septentrionalis, Juncus effusus, Scirpus pendulus*), as well as forbs such as Ditch Stonecrop (*Penthorum sedoides*), Spotted Water-Hemlock (*Cicuta maculata*), Hemlock Water-parsnip, and Northern Water-horehound (*Lycopus uniflorus*). The Bulrush Mineral Marshes were similar in species composition, though with much less canopy and shrub cover and had a larger percentage of open water with species such as Rufous Bulrush (*Scirpus pendulus*). Soils within this polygon consisted of Clay, Silty Clay, and Clay Loam with mottling at depths ranging from 12cm – 20cm.

Overall, the NFSFWC is an exceptional example of Carolinian slough forest, containing high diversity of native species and a variety of wetland habitats.

Pin Oak Mineral Deciduous Swamp (SWD1-3): Polygons 3, 4

This vegetation type was identified in two small slough polygons along the western edge of the study area, and included 1.7 ha (0.73%) of the total landcover of the study area. The species composition was largely similar to the sloughs within polygons 5 and 7 with a Pin Oak-dominant canopy, and contained similar marsh and thicket swamp inclusions but at a lower abundance.

Green Ash Mineral Deciduous Swamp (SWD2-2): Polygons 6, 8, 18, 26, 39

Green Ash Mineral Deciduous Swamp made up 28.8 ha (13%) of the study area across 5 polygons. These features are younger swamp forest than the NFSFWC, with some history of human disturbance such as drainage or filling. Much of the Green Ash-dominant canopy had died back, likely due to Emerald Ash Borer. Some areas of the canopy had a similar species composition to polygons 5 and 27, being Oak-dominant, but were generally younger and lacked the slough topography that defined those communities. Areas with less canopy contained Gray Dogwood Mineral Thicket Swamp (SWT2-9) inclusions, similar to polygons 9, 11, and 28, but with a slightly higher percentage of canopy cover. The subcanopy and understory layers were abundant with Green Ash, Freeman Maple, Pin Oak, and American Elm, as well as Smooth Arrowood (*Viburnum recognitum*), Downy Service Berry (*Amelanchier arborea*), Spîcebush, and Tatarian Honeysuckle (*Lonicera tatarica*). Abundant species in the groundcover included Broad-leaved Enchanter`s Nightshade, Fowl Mannagrass, Northern Rough-leaved Goldenrod, Sensitive Fern, Climbing Poison Ivey, Panicled Aster (*Symphyotrichum lanceolatum ssp. lanceolatum*), and Dark-green Bulrush (*Scirpus atrovirens*). The soils in these features consisted of Clay Loam with mottles from 15cm -25cm.

Willow Mineral Deciduous Swamp (SWD4-1): Polygons 2, 10, 17, 20, 21, 23, 24

Willow Mineral Deciduous Swamp (SWD4-1) made up approximately 5 ha (2.22%) of the study area and was found in seven (7) polygons. These features are dominated by White Willow and Eastern Cottonwood with Black Walnut (*Juglans nigra*) and American Elm, in both the canopy and subcanopy. The understory consists of Silky Dogwood (*Cornus amomum*) and Gray Dogwood, Highbush Cranberry, Hawthorns, Chokecherry and Bebb`s Willow. The groundcover composition includes Wild Strawberry in upland areas, and in wetter areas Field Horsetail, Panicled Aster, Coltsfoot (*Tussilago farfara*), Northern Water-horehound, and Pin Oak seedlings. The soils within polygons 17, 21, 23, and 24 are similar to those of the CUW1-1 and SWD2-2 polygons. However, unlike the rest of the study area, the soils underlying polygon 17 consist of fine sandy loam with to a depth of 75cm with the water table at a depth of 22cm. No mottles were evident within 20cm.

3.2.2. PLANT INVENTORY

A total of 306 vascular plants were observed during the field investigations, and 285 of these were identified to the species level (Table 6). Of the identified species, 217 (75.87%) are considered native within Ontario (NHIC 2014). A summary of the rankings for vascular plant species is provided in Table 6; no federal or provincial Species at Risk were observed. The Floristic Quality Index (FQI) for the study area was 20.29 including native and exotic species, and was 65.51 for native species only. The relatively high FQI for native species indicates a high richness of species with specific habitat requirements, and is driven primarily by species observed within the NFSFWC polygons. The mean wetness index for the study area was -0.31.

Notable plant species findings included: Schreber's Aster (*Eurybia schreberi*), an Imperiled (S2) species within Ontario; and Honey-Locust (*Gleditsia triacanthus),* an Imperiled to Vulnerable (S2S3) species within Ontario. Both are rare within Niagara Region. The identification of Schreber's Aster was confirmed by John Semple (Pers. Comm.) of the University of Waterloo; he is an expert in Asteraceae taxonomy and identification. This species was detected in the upland areas of the Oak Mineral Deciduous Swamp (polygon 27; Map 2). The two Honey-Locust observations (one subcanopy tree approximately 20cm dbh, and 1 seedling) are likely naturally established trees based on them having large thorns (thorns are lacking in the commonly planted cultivars) (Farrar, 1995). Furthermore, the two trees were observed growing within an Oak Mineral Deciduous Swamp (polygon 31; Figure 2), which is consistent with the rich bottomland deciduous forests that native cultivars of this species are typically associated with (Farrar, 1995).

Based on communication with MNRF and NPCA staff, Black Gum (*Nyssa sylvatica*) and Round-leaved Greenbrier are also present in some areas within the NFSFWC; though they were not observed by D&A staff, they do have potential to be present on the property. A further 51 species that were detected are considered Rare or Uncommon in Niagara Region (Table 6).

Overall, the study area contains a rich assemblage of rare to uncommon native species with an affinity for high-quality wetland habitats.

3.2.3. SALAMANDER TRAPPING

The 2015 trapping program was successfully implemented within the seasonal migration of Ambystoma to breeding ponds. During reconnaissance to the study area on April 1, 2015, all of the

target pond surfaces were variously frozen between approximately 75 and 95%. One week later, after a warm rain, the first trap session was undertaken (April 7 and 8, 2015) followed by four additional trap sessions over the following twelve days (Table 7). *Ambystoma sp.* (later determined to be *Ambystoma laterale* and various unisexual polyploids) were captured in all but one of the target ponds (Table 7). No other salamander species were captured during the 2015 trapping program.

The number of captured salamanders was generally related to pond size and vegetation cover. Pond 1 and Pond 8 (Appendix B) had the highest number of captured salamanders; both exhibit considerable cover from Buttonbush (*Cephalanthus occidentalis*) and other emergent shrubs, which serve as egg-laying sites for Blue-spotted salamanders (Talentino and Landre, 1991). These ponds were also relatively large and deep, providing more vernal pool habitat and ensuring that these habitat sites did not dry out too quickly for sufficient salamander development (JSRT, 2009). Pond 7 is a large pond, however it is not as deep as Pond 8 and has little cover for potential egg-laying sites. Pond 5 appeared to have sufficient emergent shrub cover for egg-laying sites, however it is directly adjacent to Oldfield Road; no salamanders were captured in this pond suggesting there may be road mortality, water quality issues, or other forms of encroachment, which reduce the suitability of Pond 5 as breeding habitat for Blue-spotted Salamanders. Despite having substantial vegetation cover, numerous canisters, fuel drums and other debris were dumped in Pond 4, which may have inhibited the suitability of this pond for breeding Blue-spotted Salamanders.

Incidental species captured during trapping included Spring Peeper (*Pseudacris crucifer*), Stickleback (*Gasterosteidae sp*), and Predaceous Diving Beetle (*Dytiscidae sp*).

Salamander tail-tip samples analyzed by Dr. Bogart (University of Guelph) identified the captured individuals as *Ambystoma laterale* (Blue-spotted Salamanders) and unisexuals (Blue-Spotted Genome dominant) present within the study area (Appendix E). The unisexuals were both female Ambystoma polyploids with a predominance of *A. laterale* chromosomes, which require the presence of male *Ambystoma laterale* to stimulate reproduction (JSRT, 2009). The specific unisexuals present were the triploid *Ambystoma* (2) *laterale – jeffersonianum* or 'LLJ' as well as the tetraploid *Ambystoma* (3) laterale – *jeffersonianum* or 'LLLJ'. No, endangered Jefferson Salamander (*Ambystoma jeffersonianum*) or Jefferson dominant polyploids were detected.

These results are consistent with the findings from previous salamander studies conducted at other areas on the site, including: OMNRF surveys conducted within the study area, which captured 37 salamanders within the *Ambysoma laterale* (LL) and *Ambystoma* (2) *laterale – jeffersonianum* (LLJ) genotypes (OMNRF, 2009), and results presented in a report by L. Campbell and Associates (2005). The 2015 findings indicate that all salamanders present are Blue-spotted (*A. laterale*) and Blue-spotted dominant polyploids and there is no evidence of Jefferson Salamander or Jefferson dominant polyploids within the study area (JSRT, 2009; COSEWIC, 2010).

3.2.4. NOCTURNAL AMPHIBIAN CALL SURVEYS

During the amphibian call survey, six anuran species were heard calling within the study area including Spring Peeper (*Pseudacris crucifer*), American Toad (*Anaxyrus americanus*), Western Chorus Frog (*Pseudacris triseriata*), Northern Leopard Frog (*Lithobates pipiens*), Gray Treefrog (*Hyla versicolor*), and Wood Frog (*Lithobates sylvaticus*). Survey locations are shown in Appendix B and survey results are summarized in the table below as well as in further detail in Appendix F.

Four species of anurans with moderate levels of calling activity were detected in the slough forest ponds along the north section of the property (NACS 1, 2, 13; Appendix B). Western Chorus Frog was most abundant; at least 11 individuals were detected in ponds close to Oldfield Road. Spring Peepers were heard calling throughout this area, but only a few individuals were recorded. American Toad was recorded deeper into the slough forest greater than 100m from the roadside survey stations. Only a couple of calling Gray Treefrogs were detected.

The west section of the property, north of the Conrail Drain (NACS 3, 4, 5; Appendix B) had a relatively low species richness (three species) of anurans and lower number of calling individuals. Spring Peepers were heard calling from southeast of NACS3 and east of NACS4; they were also heard calling just south and east of NACS5. Three Western Chorus Frogs were heard calling from within 100m east of NASC3 and NASC5. They were also heard calling from within 100m southeast of NASC 5. Gray Treefrogs were heard calling from all three stations at low abundances, one to three individuals.

Surveys along the south side of the Conrail Drain (NACS6 and 11; Appendix B) documented five (5) anuran species: Spring Peeper, American Toad, Western Chorus Frog, Northern Leopard Frog, and Gray Treefrog. Breeding habitat just southeast of NACS6 supported only small populations of Spring Peeper, Western Chorus Frog, Northern Leopard Frog, Gray Treefrog, and American. Two Western Chorus Frogs were heard calling from greater than 100m to the east. Only Gray Tree Frog was detected from the survey location in the central area of the property south of the Conrail Drain (NACS11). Other species such as Western Chorus Frog and Spring Peeper would likely have been detected if the location was included in the first round of surveys in April.

In central areas of the property south of the Conrail Drain (NACS12; Appendix B), only Gray Tree Frog was detected; in part because this location was included only after the first round of surveys. Despite being the only species detected, ponds in this area supported a high abundance of Gray Tree Frog. It is assumed that ponds in the slough forest east of NACS 12 also support other early breeding amphibians such as Spring Peeper and Western Chorus Frog.

Surveys within the south section of the property along Dorchester Road (NACS7, 8, 9, 10; Appendix B) documented five species: Spring Peeper, American Toad, Western Chorus Frog, Gray Treefrog, and Wood Frog. Spring Peepers were heard calling from NACS 7, 8, and 9; abundance ranged from a few individuals to a full chorus (north of NACS9). Many American toads were documented at NACS 8. Western Chorus Frog was very abundant just north of NACS9, but was recorded in low abundance across the other survey locations in this area of the property. Gray Treefrog were present along the southern border of the study area in low abundances. One Wood frog was heard calling north of NACS 9 at a distance greater than 100m.

3.2.5. BREEDING BIRD SURVEYS

A total of 67 species of birds was detected during the breeding bird surveys; 56 of these species were considered at least possibly breeding on the site. Nine (9) species were observed flying over the site only, and not considered breeding (code X – see Table 9), while two (2) species were categorized as migrants only: Blackpoll Warbler (*Setophaga striata)* and Wilson's Warbler (*Cardellina pusilla)*. Of the 56 species of breeding birds, three of them are considered introduced (non-native): Rock Pigeon (*Patagioena livia*), European Starling (*Sturnus vulgaris*), and House Sparrow (*Passer domesticus*).

Of the remaining 53 species, four (4) of them are designated as Species at Risk (SAR): Eastern Wood-Pewee (*Contopus virens*), Acadian Flycatcher (*Empidonax virescens*), Barn Swallow (*Hirundo rustica*), and Wood Thrush (*Hylocichla mustelina*). Acadian Flycatcher is designated as "Endangered" at both a federal level and a provincial level, while Barn Swallow is considered "Threatened" at both levels (COSEWIC 2014, COSEWIC 2015, OMNRF 2015). Eastern Wood-Pewee is categorized as "Special Concern" at both federal and provincial levels and Wood Thrush is ranked as "Threatened" federally and "Special Concern" provincially (COSEWIC 2014, COSEWIC 2015, OMNRF 2015). An additional SAR – Chimney Swift (Chaetura pelagica) – was observed foraging over the site only (code X) and is not considered to be a breeding bird. Chimney Swift is designated "Threatened" in Ontario (OMNRF 2015) and Canada (COSEWIC 2014, COSEWIC 2015). See the "Species at Risk" section for further details.

At a provincial level, 52 of the 53 native breeding species have been assigned an Srank of either S4 or S5 by the Natural Heritage Information Centre (NatureServe Explorer, 2015), indicating that their provincial populations are "apparently secure" or "secure", respectively (NHIC 2015). The one exception is Acadian Flycatcher, which is ranked as S2S3, indicating that its provincial populations are considered "vulnerable".

At a regional level, 12 species – Northern Flicker (*Colaptes auratus*), Eastern Wood-Pewee (C*ontopus virens*), Acadian Flycatcher (*Empidonax virescens*), Willow Flycatcher (*Empidonax traillii*), Wood Thrush (*Hylocichla mustelina*), Brown Thrasher (*Toxostoma rufum*), Blue-winged Warbler (*Vermivora cyanoptera*), Eastern Towhee (*Pipilo erythrophthalmus*), Field Sparrow (Spizella pusilla), Savannah Sparrow (*Passerculus sandwichensis*), Rose-breasted Grosbeak (*Pheucticus ludovicianus*), and Baltimore Oriole (*Icterus galbula*) – have been designated by Ontario Partners in Flight as priority landbird species in Bird Conservation Region (BCR) 13 (Lower Great Lakes - St. Lawrence Plain) (OPIF 2008); in Ontario, BCR 13 corresponds roughly with the area south of the Canadian Shield. The Ontario Landbird Conservation Plan, from which the list of priority landbird species was obtained, is a coalition of government agencies and organizations led by Environment Canada Ontario Region (EC) and the Ontario Ministry of Natural Resources and Forestry (OMNRF), in partnership with Bird Studies Canada (BSC).

At a local level, 36 of the 56 potentially native and non-native breeding species are considered common to very common within the Region of Niagara (Black and Roy 2010). The 20 exceptions are as follows:

- Uncommon – Wood Duck (*Aix sponsa*), Wild Turkey (*Meleagris gallopavo*), Sharp-shinned Hawk (Accipiter striatus), Cuckoo sp. (*Coccyzus sp*.), Great Horned Owl (*Bubo virginianus*), Red-bellied Woodpecker (*Melanerpes carolinus*), Hairy Woodpecker (*Picoides villosus*), Willow Flycatcher (*Empidonax traillii)*, White-breasted Nuthatch (*Sitta carolinensis*), Wood Thrush (*Hylocichla mustelina*), Brown Thrasher (*Toxostoma rufum*), Blue-winged Warbler (*Vermivora cyanoptera*), Eastern Towhee (*Pipilo erythrophthalmus*), Field Sparrow (*Spizella pusilla*), Swamp Sparrow (*Melospiza georgiana*), and Scarlet Tanager (*Piranga olivacea*);

- Uncommon to rare – Orchard Oriole (*Icterus spurius*);
- Rare – Tufted Titmouse (*Baeolophus bicolor*);
- Rare and local – Yellow-throated Vireo (*Vireo flavifrons*);
- Extremely rare – Acadian Flycatcher (*Empidonax virescens*).

The Ontario Ministry of Natural Resources (OMNR 2000) considers eight (8) of the species recorded as being area sensitive: Sharp-shinned Hawk, Hairy Woodpecker, Acadian Flycatcher, Yellow-throated Vireo, Tufted Titmouse, White-breasted Nuthatch, Savannah Sparrow, and Scarlet Tanager. This indicates that the species requires large areas of suitable habitat for its long-term survival and is therefore more sensitive to development.

For application of the Migratory Birds Convention Act (Government of Canada 1994a,b), 45 of the 56 species recorded as at least possibly breeding are protected by the Act. As such, it means that it is illegal to harm or kill these species, or to harm or destroy their nests and nesting habitat. The 11 species that are afforded no protection from the Act are Wild Turkey, Sharp-shinned Hawk, Rock Pigeon, Great Horned Owl, Blue Jay, American Crow, European Starling, Red-winged Blackbird, Common Grackle, Brown-headed Cowbird, and House Sparrow.

For application of the Endangered Species Act (ESA) (Government of Ontario, 2007) and the Species at Risk Act (SARA) (Government of Canada, 2002), five bird Species-at-Risk were detected on the site: Chimney Swift, Eastern Wood-Pewee, Acadian Flycatcher, Barn Swallow, and Wood Thrush. These five species are discussed below:

- Chimney Swift – Designated "Threatened" in Ontario and Canada; one bird was recorded foraging overhead at PCS 29; this species was not considered to be breeding on the site as no suitable nesting habitat (e.g. chimneys) is present within it. There are likely suitable chimneys for breeding in nearby areas, accounting for the presence of this foraging bird.
- Eastern Wood-Pewee – Designated "Special Concern" in Ontario and Canada; at least single birds were heard at 13 PCS's during the surveys; two of these stations had multiple birds singing and three additional birds were detected between stations.
- Acadian Flycatcher – Designated "Endangered" in Ontario and Canada; one bird was heard singing at PCS 28 on May 29; it was not subsequently observed so this bird would not be considered territorial.
- Barn Swallow – Designated "Threatened" in Ontario and Canada; one bird was seen foraging west of PCS 7 on May 28. There is no suitable breeding habitat (e.g. barns, bridges) and limited foraging habitat available on the site. There are suitable structures for breeding in the general vicinity so this species may occasionally be present foraging in any open habitats.
- Wood Thrush – Designated "Threatened" in Canada and "Special Concern" in Ontario; this species was recorded at 18 PCS's, with three of the PCS having multiple birds. Three additional birds were detected between or beyond the point count stations.

For full details on the breeding bird surveys for this site, please see Table 9.

3.2.6. INCIDENTAL SPECIES

Two additional bird species were detected during other field surveys that are likely breeding. American Woodcock (Scolopax minor) was heard calling near during nocturnal amphibian surveys on April 19, 2015; it was near nocturnal amphibian station 6. A Wilson's Snipe (*Gallinago delicata*) was observed near pond 6 during salamander surveys on April 10, 2015. Neither of these species are considered SAR; both are common and widespread in southern Ontario. American Woodcock is considered common locally, while Wilson's Snipe is considered uncommon (Black and Roy 2010).

An unidentified owl (possibly Barred Owl, *Strix varia*) was observed on April 10, 2015; this species has no breeding status in Niagara Region (Black and Roy 2010). No owl calls were heard during subsequent evening site visits for amphibian surveys (April 19th, May 28th, June 24th, 2015). Given the relatively early spring date, it could have represented a spring migrant.

An unidentified turtle (likely Snapping Turtle, *Chelydra serpentina*, based on size) was observed by George Coker in the large pond in polygon 24 (Map 2) on June 11th, 2015 while conducting aquatic surveys of the site.

Other species and/or signs of species (e.g. tracks) that were observed while conducting site visits included:

- Coyote (*Canis latrans*)
- White-tailed Deer (*Odocoileus virginianus*)
- Eastern Chipmunk (*Tamias striatus*)
- Grey Squirrel (*Sciurus carolinensis*)
- Raccoon (*Procyon lotor*)
- Eastern Gartersnake (*Thamnophis sirtalis sirtalis*)

3.2.7. AQUATICS

3.2.7.1. SHORELINE

While not part of the subject property, the flattest and lowest areas along the shore of the Welland River, between the river shoreline and Dorchester Road, were examined in detail for Northern Pike spawning areas on April 11th, 2015 (Appendix 2). While there were shallow wet locations in this area, the shoreline was not overtopped by the adjacent river to provide access for Northern Pike, nor was there any evidence that overtopping had occurred recently (Photographs 1 and 2). This area was examined briefly during all subsequent site visits, and on no occasion was the bank overtopped or was there evidence of recent overtopping. Therefore it appears that this area did not provide Northern Pike spawning habitat in 2015, though there may be some potential spawning locations in shallow nearshore areas with dense rooted aquatic macrophytes in the Welland River.

3.2.7.2. WATERCOURSES

There are three main watercourses that provide potential access routes for fish from the Welland River and the Power Canal into the interior of the subject property. Watercourse 1 is approximately 212 m long and begins at an old concrete culvert outfall, which is believed to convey flows from a network of legacy pipes that drain surface water, via inlets and broken sections, from the elevated south-central portion of the subject property. The outfall, at the base of an embankment, feeds a small marsh pocket about 30 m long and 13 m wide, which drains through a shallow, 4 to 5 m wide, mud-bottomed watercourse (Photograph 3) to the Welland River. This watercourse appears to be a dug drainage ditch. It has a gentle gradient and in early April it had approximately 10 cm of water depth, which had dwindled to a few centimetres by June 11th, 2015 and was dry when examined on October 6th, 2015. Near its downstream end at its culvert beneath Dorchester Road, it has emergent and submergent

aquatic macrophytes (Photographs 4 and 5). Due to the low flow velocity and abundant aquatic plants in its lower section near the Welland River, as well the low gradient connection to the marsh at its upstream end, it is thought that this watercourse represents the best potential Northern Pike spawning habitat within or immediately adjacent to the subject property. Therefore, it was targeted twice for spawning observations (April 11th and 21st, 2015), and electrofished twice (June 11th and October 6th, 2015) in search of young-of-the-year (YOY) Northern Pike (Table 10). No spawning Northern Pike, or YOY, were observed.

Watercourse 2 appears to originate within the Thundering Waters Golf Club grounds, northeast of the subject property. On all field investigations in 2015 there was flowing water in Watercourse 2: estimated at 15 L/s on April 12. When Watercourse 2 first enters the subject property it is a straight mud channel, approximately 140 m long, that has been historically channelized (Photograph 6). It then passes through a 70 m long culvert beneath the entrance of a derelict industrial site, but it is not perched at the downstream end and may not be a barrier to the upstream movement of fish. For 104 m downstream of the culvert the watercourse appears to be straightened with rip-rap along much of the banks. For the remaining 816 m to its confluence with the Welland River, Watercourse 2 appears to be a natural meandering channel set within a small valley feature. The upper 634 m of this section has a fairly uniform, shallow, clay/mud channel (Photograph 7). Coarse material mixed into the clay/mud substrate occurs where the watercourse passes the end of Don Murie Street, which may be the source of this material, and continues for approximately 100 m downstream (Photograph 8). Downstream to its confluence with the Welland River, the remaining 94 m of Watercourse 2 is dominated by soft clay mud.

Northern Pike, or any other fish, were not observed when Watercourse 2 was walked along its entire length in April 2015. There were no accessible wetlands along Watercourse 2, or any aquatic vegetation within the channel, that could be used for Northern Pike spawning. The general lack of instream cover within the largely featureless channel of Watercourse 2 likely contributes to the lack of fish observed. The clay/mud substrates through most of the watercourse would not provide spawning habitat for White Suckers or any of the other common fishes that spawn in flowing waters over coarse substrate. The only exception is the short section with coarse material near the downstream end of Watercourse 2, but no spawning fishes were observed here even though the water temperature was 12.2°C on April 21, which is within the range for White Sucker spawning (Scott and Crossman, 1973), and the White Sucker spawning run was well underway at locations in the Hamilton area. No fish were captured by electrofishing on June 21, even though a significant length of stream was fished. However, low numbers of six species, including YOY White Sucker, were captured in the same watercourse section on October 6, 2015 (Table 10). It is not known if the YOY suckers were spawned in this watercourse, or were spawned at some off-site location and have come to occupy this watercourse as a way of avoiding predatory fishes in the Welland River.

Watercourse 3, also known as the Conrail Drain, is a deep, straight, artificial channel, lined with rip-rap along its entire length (Photograph 9). There was some flow observed here during every field investigation in 2015, with, as expected, the highest flow in April and the lowest in October. Some sections of the watercourse had only interstitial flow through the rip-rap channel liner, which would severely inhibit the movement of large fish if they were to occur here. However, it is not expected that larger fish can move into this watercourse from its mouth at the Power Canal, because the steeper-sloped channel in this location, combined with failing and thick gabion rock baskets and the rooted vegetation through which all but the highest flows likely pass, will block upstream movement of large

fish (Photograph 10). It was not expected that a diverse fish community could exist under the observed condition of Watercourse 3, and electrofishing only captured Brook Stickleback (Table 10).

Watercourses 4 and 5 are short and have ephemeral flow, and do not appear to have a surface connection to the Power Canal.

Large areas of shallow surface water were observed within the subject property during April. These areas were inaccessible to fish, in particular Northern Pike which can utilize such habitats for spawning, and most were dry by June. One isolated pond was observed to remain permanently wet through 2015 and to support a community of aquatic plants, but no fish were found (Table 10).

In summary, watercourse feature that provide fish habitat are largely restricted to Watercourse 2 (WC3, Map 2). The fish captured during this investigation are considered common and not at risk in southern Ontario. Most of Watercourse 1 (WC1, Map 2) upstream of Dorchester Road provides seasonal, relatively unproductive, non-spawning habitat for fish. Watercourse 2 (WC2, Map 2) is a largely natural watercourse with permanent flow within a small valley feature. While habitat is generally simple and unproductive, it is presently unclear if it provides limited spawning habitat for off-site fishes; retention will likely be required. Watercourse 3 (WC 3, Map 3) is a constructed drainage ditch that provides no spawning habitat for off-site fishes, nor can it be accessed by large off-site fishes. It is relatively unproductive and only supports a sparse population of Brook Stickleback. Watercourses 4 and 5 (WC4 and WC5, Map 2) are not considered fish habitat at this time. The numerous shallow upland wet areas observed in April appeared to all be isolated from fish-occupied waters, and therefore are not expected to contribute to fish habitat on the subject property.

4. CHARACTERIZATION SUMMARY AND ENVIRONMENTAL MANAGEMENT STRATEGY RECOMMENDATIONS

The findings from the Natural Heritage Characterization Assessment will be used as input to an environmental management strategy for the Secondary Plan area. The strategy will consider the use of the mitigation hierarchy (i.e. avoidance, minimization, mitigation/rehabilitation, and compensation) in an adaptive approach, to define potential impacts that may result from the proposed land use, servicing, and transportation scenarios.

At this stage in the process, only a subset of avoidance areas have been identified. This includes natural features that have been designated as Provincially Significant Wetland (PSW) and Regional Environmental Protection Areas (EPA). In addition to the protected PSW/EPA areas, buffers will be recommended based on factors such as features' sensitivities, functional linkages to adjacent lands, and proposed land uses. Additional lands outside of the PSW may also be identified for protection where they complement the natural features that occur within the PSW, provide significant wildlife habitat, and/or provide important ecological linkage functions; on-going fieldwork, site analysis, and integration with other disciplines (e.g. system hydrology, transportation, land-use zoning) will provide insight into the management of impacts to natural heritage areas to ensure the long-term sustainability of the natural system.

The remaining steps of the mitigation hierarchy (minimize, rehabilitate/mitigate, and compensate) will be explored as the Secondary Plan process moves into the impact assessment and management phase. Early stages of the impact assessment phase will involve reviewing community masterplan concepts to identify potential impacts, establishing strategies for minimizing impacts, and determining the feasibility of enhancement, restoration, and compensation strategies to offset impacts to natural features that are currently outside of the identified protected areas.

The natural heritage elements and preliminary policy triggers that have been documented on the property and are present in Table 11, include the following:

- Provincially Significant Wetland Slough Forest
- Watercourse 2 and associated floodplain (WC2, Map 2)
- Endangered/Threatened Species at Risk and their associated habitat
- Old growth/Mature Forest Habitat
- Shrub/Early Successional Bird Habitat
- Bat Maternity Roost Habitat
- Mast Tree Habitat
- Amphibian Breeding Habitat (Woodland Type)
- Habitat for Provincially Rare and/or Species of Special Concern (Schreber's Aster, Honey Locust, Eastern Wood-Pewee, Wood Thrush, and Snapping Turtle)
- Reptile Hibernacula
- Deer Winter Congregation Areas
- Rare Vegetation Communities
- NPCA regulated wetlands
- ECA woodlands

Four core principles are proposed as a means to guide the process of developing an effective environmental management strategy to address the identified natural features and species within the Secondary Plan area:

i) Consolidate and complement the existing protected areas where important natural features are adjacent to and contiguous with the PSW/EPA boundaries (e.g. mature woodlands/trees and/or habitat for species of conservation concern).

ii) Promote opportunities/functional linkages of protected areas (known PSW/EPA areas, and those to be identified) using a combination of natural and anthropogenic corridors.

iii) Identify areas on-site that provide practical opportunities for enhancement and/or compensation for natural areas that will be impacted in the context of future urban uses.

iv) Outline appropriate inventory and monitoring methods to assess the environmental management strategy objectives and targets and establish adaptive measures.

To address the natural heritage features and species that are likely to trigger provincial and municipal policy, direction on the first three principles outlined in the foregoing is summarized in Table 11. Mitigation recommendations are provided, as well as key considerations in developing the environmental management strategy. Feedback and ultimately agreement from the various stakeholders and responsible authorities (e.g. MNRF, Region, City, and NPCA) on these recommendations will be critical to ensuring the environmental management strategy, land use plan, and supporting infrastructure are consistent with the overarching environmental policies that are relevant to the property.

5. REFERENCES

Black, J.E. and K.J. Roy (eds). 2010. Niagara Birds: a compendium of articles and species accounts of the birds of the Niagara Region in Ontario. 703 pages.

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

Chapman, L.J. and D.F. Putnam. 2007. Physiography of southern Ontario; Ontario Geological Survey, Miscellaneous Release--Data 228.

COSEWIC (Committee on the Status of Endangered Wildlife in Canada). 2010. Assessment and Status Report on the Jefferson Salamander (Ambystoma jeffersonianum) in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. 49 pp

COSEWIC (Committee on the Status of Endangered Wildlife in Canada). 2014. Canadian Wildlife Species at Risk. October 2014. Committee on the Status of Endangered Wildlife in Canada. Web site: http://www.cosewic.gc.ca/eng/sct0/rpt/rpt_csar_e.cfm [accessed 5 October 2015]

COSEWIC (Committee on the Status of Endangered Wildlife in Canada). 2015. Canadian Wildlife Species at Risk. October 2015. Committee on the Status of Endangered Wildlife in Canada. Web site: http://www.cosewic.gc.ca/eng/sct1/index_e.cfm

COSEWIC (Committee on the Status of Endangered Wildlife in Canada). 2015. COSEWIC Wildlife Species Assessments (detailed version), May 2015. Available at: http://www.cosewic.gc.ca/rpts/Detailed_species_assessments_e.pdf

Dougan & Associates (D&A). 2015. Mortality Incident Report – Ambystoma Trapping Surveys. Submitted to the OMNRF on April 16, 2015. 2 pp.

Farrar. J.L. 1995. Tree in Canada. Fitzhenry and Whiteside Ltd and Canadian Forest Service. 502 pp.

Government of Ontario. 2007. Endangered Species Act, Statutes of Ontario (2007, c. 6). Retrieved from the ServiceOntario e-Laws website: http://www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_07e06_e.htm

Government of Canada. 1994a. Migratory Birds Convention Act, Statutes of Canada (1994, c. 22). Retrieved from the Department of Justice Laws Website: http://laws-lois.justice.gc.ca/eng/acts/M-7.01/FullText.html

Government of Canada. 1994b. Migratory Birds Regulations, Consolidated Regulations of Canada (1994, c. 1035). Retrieved from the Department of Justice Laws Website: http://laws-lois.justice.gc.ca/eng/regulations/C.R.C.,_c._1035/FullText.html

Government of Canada. 2002. Species at Risk Act, Statutes of Canada (2002, c. 29). Retrieved from the Department of Justice Laws Website: http://laws-lois.justice.gc.ca/eng/acts/S-15.3/index.html

Lee, H., W.D. Bakowsky, J. Riley, J. Bowles, M. Puddister, P. Uhlig and S. McMurray. 1998. Ecological Land Classification for Southern Ontario: First Approximation and Its Application. Ontario Ministry of Natural Resources, Southcentral Science Section, Science Development and Transfer Branch. SCSS Field Guide FG-02.

Jefferson Salamander Recovery Team (JSRT). 2009. Draft Recovery Strategy for the Jefferson Salamander (Ambystoma jeffersonianum) in Ontario. Ontario Recovery Strategy Series. Prepared for the Ontario Ministry of Natural Resources, Peterborough, Ontario. vi + 27 pp.

L Campbell and Associates. 2005. Salamander Study, Preliminary Report. Draft Report 6 pp.

Menzies, J. 2001. The quaternary sedimentology and stratigraphy of small ice-proximal, subaqueous grounding-line moraines in the central Niagara Peninsula, Southern Ontario. Geographie physique et Quaternaire, 55: 75-86.

NatureServe Explorer. 2015. National and Subnational Conservation Status Definitions web page. Available at: http://explorer.natureserve.org/nsranks.htm

NHIC (Natural Heritage Information Centre). 2014. Ontario Vascular Plant Species List. April 2014. Ontario Ministry of Natural Resources. https://contrib.ontario.ca/environment-and-energy/get-natural-heritage-information
NHIC (Natural Heritage Information Centre). 2015. NHIC Species Lists. Available at: http://www.ontario.ca/page/get-natural-heritage-information

Niagara Peninsula Conservation Authority (NPCA). 2010. Natural Area Inventory, Volume 1. Niagara Peninsula Conservation Authority. Welland, ON.
Oldham M. J., Bakowsky W. D., Sutherland D. A. 1995. Floristic Quality Assessment System for Southern Ontario. Natural Heritage Information Center, OMNR (Ontario Ministry of Natural Resources). Peterborough, Ontario. 69 pp.

Oldham, M.J. 2010. Checklist of the Vascular Plants of Niagara Regional Municipality, Ontario. Ontario Natural Heritage Information Centre, Ministry of Natural Resources. Peterborough, Ontario. 223pp

OMMAH (Ontario Ministry of Municipal Affairs and Housing). 2005. Provincial Policy Statement. 37 pp. Available at: http://www.mah.gov.on.ca/Asset1421.aspx

OMNR (Ontario Ministry of Natural Resources). 2000. Significant Wildlife Habitat Technical Guide. 151 pp.

OMNRF (Ontario Ministry of Natural Resources and Forestry). 2009. Unpublished salamander trapping data from Dorchester Road property, provided by Graham Buck (OMNRF, Guelph District).

OMNRF (Ontario Ministry of Natural Resources and Forestry). 2015. Species at Risk in Ontario (SARO) List. Updated October 1, 2015. Available at: http://www.ontario.ca/environment-and-energy/species-risk-ontario-list

Ontario Geological Survey. 2010. Surficial geology of Southern Ontario; Ontario Geological Survey, Miscellaneous Release--Data 128-REV

Ontario Geological Survey. 2011. 1:250 000 scale bedrock geology of Ontario; Ontario Geological Survey, Miscellaneous Release---Data 126-Revision 1.

Ontario Nature. 2015. Reptile and Amphibian Atlas Program: accessed at: http://www.ontarionature.org/protect/species/herpetofaunal_atlas.php

OPIF (Ontario Partners in Flight). 2008. Ontario Landbird Conservation Plan: Lower Great Lakes/St. Lawrence Plain, North American Bird Conservation Region 13. Ontario Ministry of Natural Resources, Bird Studies Canada, Environment Canada. Draft version 2.0. Available at: http://www.bsc-eoc.org/PIF/PIFOBCR13Plan.pdf

Scott, W.B and E.J. Crossman. 1973. Freshwater fishes of Canada. Fisheries Research Board of Canada. Bulletin 183. Ottawa, Canada. 966 p.

Stebbins, R. and Cohen, N.W. 1995. A Natural History of Amphibians. Princeton University Press 316 pp.

Talentino, K. A., E. Landre. 1991. Comparative development of two species of sympatric Ambystoma salamanders. Journal of Freshwater Ecology, 6(4), 395-401.

6. TABLES

Table 1: ELC, Plant inventory, and PSW delineation site visit summary

Purpose	Date	Surveyors
Spring ELC and Plant Inventory	May 6th, 2015	Dylan White, Zack Harris
Spring ELC and Plant Inventory	May 8th, 2015	Dylan White, Kristen Beauchamp
Spring ELC and Plant Inventory	May 15th, 2015	Kristen Beauchamp, Zack Harris
Summer ELC and Plant Inventory	June 3rd, 2015	Steve Hill, Zack Harris
Summer ELC, Wetland Delineation, Summer Plant Inventory	August 17th, 2015	Dylan White, Zack Harris
Summer ELC and Wetland Delineation, Summer Plant Inventory	August 21, 2015	Dylan White, Zack Harris
Summer ELC and Wetland Delineation, Summer Plant Inventory	August 26th, 2015	Dylan White, Kristen Beauchamp
Summer ELC and Wetland Delineation, Summer Plant Inventory	August 27th, 2015	Dylan White, Kristen Beauchamp
Summer ELC and Wetland Delineation, Summer Plant Inventory	August 28th, 2015	Dylan White, Kristen Beauchamp
Fall ELC and Plant Inventory	September 28th, 2015	Dylan White, Zack Harris
Fall ELC and Plant Inventory	October 5th, 2015	Dylan White, Zack Harris

Table 2: Salamander trapping summary

Date	Survey	Time	Weather	Surveyors
April 1, 2015	Site Recon.	15:00-18:30	5ºC, clear	Dylan White
April 7, 2015	Trap Set 1	17:00-20:00	3ºC, overcast, light breeze	Dylan White
April 8, 2015	Trap Check 1	06:30-11:00	5ºC, overcast	Kristen Beauchamp, Dylan White, Helen Hemansen (OMNRF)
April 9, 2015	Trap Set 2	17:30-20:30	11ºC, rain, calm	Dylan White
April 10, 205	Trap Check 2	06:15-11:15	10ºC, partly cloudy, light breeze	Kristen Beauchamp, Karl Konze, Dylan White
April 12, 2015	Trap Set 3	18:00-20:00	9ºC, clear	Dylan White
April 13, 2015	Trap Check 3	05:45-8:45	8ºC, clear, sunny	Kristen Beauchamp, Dylan White
April 16, 2015	Trap Set 4	18:00-20:00	12ºC, partly cloudy, breeze	Dylan White
April 17, 2015	Trap Check 4	06:00-9:30	10ºC, partly cloudy	Kristen Beauchamp, Dylan White
April 19, 2015	Trap Set 5	18:00-20:00	12ºC, partly cloudy	Dylan White
April 20, 2015	Trap Check 5 and Trap removal	06:00-09:30	13ºC, partly cloudy	Kristen Beauchamp, Dylan White

Table 3: Nocturnal amphibian survey summary

Date (2015)	Surveyors	Station ID	Start Time (p.m.)	Noise Index (as per NAAMP)	Wind (Beaufort Scale)	Temperature (°C)	Precipitation
April 19	Dylan White	1	10:15	2	1-2	8-10	None
		2	10:25	2	1-2	8-10	None
		3	10:38	2	1-2	8-10	Light rain
		4	10:43	2	1-2	8-10	Light rain
		5	10:52	2	1-2	8-10	Light rain
		6	11:00	2	1-2	8-10	Light rain
		7	11:10	2	1-2	8-10	Light rain
		8	11:20	2	1-2	8-10	Light rain
		9	11:30	2	1-2	8-10	Light rain
		10	11:37	2	1-2	8-10	Light rain
May 28	Zack Harris Kristen Beauchamp	1	12:15	2-3	0	16.0	Humid
		2	12:05	2-3	0	14.0	Humid
		3	11:55	2-3	0	14.0	Humid
		4	11:45	2-3	0	14.0	Humid
		5	11:37	2-3	0	15.8	Humid
		6	10:28	2-3	1	15.0	Humid
		7	11:28	2-3	0	15.8	Humid
		8	11:20	2	1	15.0	Humid
		9	11:10	2	1	15.0	Humid
		10	11:00	2	1	15.0	Humid
		11	9:23	2	0	19.5	None
		12	9:59	2	0	19.5	None
		13	12:21	2	1	16.0	Humid
June 24	Zack Harris Kristen Beauchamp	1	12:04	3	0	17.8	Humid
		2	11:55	3	0	17.8	Humid
		3	11:46	3	0	17.8	Humid
		4	11:36	3	0	17.8	Humid
		5	11:28	3	0	17.8	Humid
		6	10:36	3	0	16.5	Humid
		7	11:18	3	0	16.5	Humid
		8	11:11	2-3	0	16.5	Humid
		9	11:00	2	0	16.5	Humid
		10	10:49	2-3	0	16.5	Humid
		11	9:48	2	0	16.5	Humid
		12	10:16	2	0	16.5	Humid
		13	12:12	2	0	17.5	Humid

Noise Index as per North American Amphibian Monitoring Program (NAAMP) Frog call survey instructions http://www.massnaamp.org/online_docs/NAAMP%20MA%20Datasheet%202012.pdf)

Code	Indicator
0	No appreciable effect (e.g. owl calling)
1	Slightly affecting sampling (e.g. distant traffic, dog barking, 1 car passing)
2	Moderately affecting sampling (e.g. nearby traffic, 2 – 5 cars passing)
3	Seriously affecting sampling (e.g. continuous traffic nearby, 6 – 10 cars passing)
4	Profoundly affecting sampling (e.g. continuous traffic passing, construction noise)

Beaufort Wind Scale as described according to the MMP (BSC, 2009)		
Code	**Wind Speed (kph)**	**Indicator**
0	0 – 2	Calm; smoke rises vertically
1	3 – 5	Light air movement; smoke drifts
2	6 – 11	Slight breeze; wind felt on face, leaves rustle
3	12 – 19	Gentle breeze; leaves and small twigs in constant motion
4	20 – 30	Moderate breeze; small branches are moved, raises dust & loose paper
5	31 – 39	Fresh breeze; small trees in leaf begin to sway; crested wavelets form
6	40 – 50	Strong breeze; large branches in motion.

Table 4: Breeding bird survey summary

Date	Observer	Time	Weather Conditions	Purpose
May 28, 2015	Karl Konze	05:23 – 08:59	Partly cloudy, light west-northwest winds, 16 – 20°C	Breeding bird survey #1 (PCS 1 – 16)
May 29, 2015	Karl Konze	05:19 – 09:28	Partly cloudy, light south winds, 15 – 20°C	Breeding bird survey #1 (PCS 17 – 32)
June 4, 2015	Karl Konze	05:15 – 09:03	Clear, calm, 11 – 19°C	Breeding bird survey #2 (PCS 1 – 16)
June 5, 2015	Karl Konze	05:20 – 09:32	Partly cloudy, calm, 17 – 21°C	Breeding bird survey #2 (PCS 17 – 32)

Table 1: Summary of ELC Ecosite and Vegetation Types observed within study area.

ELC Community Code (Dominant)	ELC Community Description	Number of Polygons	Total Area (ha)	Percent
ANTH	Anthropogenic	2	3.62	1.61
CUM1-1	Cultural Meadow	5	19.34	8.59
CUP3-2	White Pine Coniferous Plantation	1	0.33	0.15
CUT1	Mineral Cultural Thicket	1	15.68	6.96
CUT1-4	Gray Dogwood Cultural Thicket	4	8.27	3.68
CUW1	Mineral Cultural Woodland	7	43.23	19.21
FOD4	Dry – Fresh Deciduous Forest	4	1.70	0.76
FOD6	Fresh – Moist Sugar Maple Deciduous Forest	1	1.76	0.78
FOD8-1	Fresh – Moist Poplar Deciduous Forest	1	0.92	0.41
SWD1	Oak Mineral Deciduous Swamp	7	94.80	42.12
SWD1-3	Pin Oak Mineral Deciduous Swamp	3	1.65	0.73
SWD2-2	Green Ash Mineral Deciduous Swamp	5	28.77	12.78
SWD4-1	Willow Mineral Deciduous Swamp	6	5.00	2.22
		47	225.07	100.00

Table 6: Summary of plant species observed within ELC polygons. Grey highlighting identifies species that are uncommon or rare in Niagara; those with asterisk (*) represent those that are provincially rare (S2 or S2S3).

Scientific Name	Common Name	1	2	3	4	5	6	7	8	9	10	11	12	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	33
Acer negundo	Manitoba Maple	x													x																
Acer rubrum	Red Maple																	x									x	x				
Acer saccharinum	Silver Maple					x							x														x					
Acer saccharum	Sugar Maple				x	x							x														x					
Acer x freemanii	Hybrid Maple (Acer rubrum X Acer saccharinum)			x	x	x	x	x										x									x					
Achillea millefolium	Common Yarrow									x					x													x				
Agrimonia gryposepala	Hooked Agrimony	x			x	x	x	x	x			x	x			x											x			x	x	
Agrostis gigantea	Redtop															x																
Agrostis stolonifera	Creeping Bentgrass																										x					
Alisma triviale	Northern Water-plantain			x	x	x														x												
Alliaria petiolata	Garlic Mustard	x		x	x	x			x			x	x		x			x									x			x	x	
Allium tricoccum var. tricoccum	Wild Leek					x																										
Ambrosia trifida	Great Ragweed					x																										
Amelanchier arborea	Downy Serviceberry	x				x	x		x			x	x																			
Antennaria howellii ssp. canadensis	Canada Pussytoes															x																
Apocynum androsaemifolium	Spreading Dogbane																											x				
Apocynum cannabinum	Hemp Dogbane																								x							
Arisaema triphyllum	Jack-in-the-pulpit				x	x	x						x		x			x	x			x										
Aronia melanocarpa	Black Chokeberry																										x					
Asclepias incarnata	Swamp Milkweed			x	x	x											x			x							x					
Asclepias syriaca	Common Milkweed									x																		x				
Asparagus officinalis	Garden Asparagus									x																						
Athyrium filix-femina var. angustum	Northeastern Lady Fern					x																					x					
Atriplex prostrata	Creeping Saltbush																													x	x	
Berberis thunbergii	Japanese Barberry				x	x																					x					
Bidens cernua	Nodding Beggarticks																										x	x		x	x	
Bidens comosa	Three-parted Beggarticks					x																										
Bidens connata	Purple-stemmed Beggarticks			x	x																											
Bidens frondosa	Devil's Beggarticks																											x				
Boehmeria cylindrica	False Nettle			x	x										x												x					
Brassica nigra	Black Mustard								x						x																	
Caltha palustris	Yellow Marsh Marigold					x																										
Calystegia sepium	Hedge False Bindweed															x																
Cardamine concatenata	Cut-leaved Toothwort					x																										
Cardamine douglassii	Limestone Bittercress					x																										
Cardamine pensylvanica	Pennsylvania Bittercress																										x					

Scientific Name	Common Name	1	2	3	4	5	6	7	8	9	10	11	12	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	33
Carduus nutans ssp. nutans	Nodding Thistle																								x							
Carex arcta	Northern Clustered Sedge																		x													
Carex bebbii	Bebb's Sedge																	x													
Carex blanda	Woodland Sedge					x	x								x				x								x					
Carex canescens	Hoary Sedge																	x													
Carex comosa	Bristly Sedge																										x					
Carex crinita	Fringed Sedge			x	x	x																					x					
Carex flava	Yellow Sedge															x	x															
Carex garberi	Elk Sedge																x															
Carex gracillima	Graceful Sedge	x				x								x	x			x									x			x	x	
Carex grayi	Asa Gray Sedge																										x					
Carex hystericina	Porcupine Sedge																										x					
Carex intumescens	Bladder Sedge					x																					x					
Carex lacustris	Lake-bank Sedge																			x							x					
Carex leptonervia	Finely-nerved Sedge													x			x															
Carex lupulina	Hop Sedge		x			x												x									x					
Carex pallescens	Pale Sedge																										x					
Carex pellita	Woolly Sedge																								x							
Carex prasina	Drooping Sedge																	x														
Carex projecta	Necklace Sedge					x																					x					
Carex pseudocyperus	Cyperus-like Sedge																										x					
Carex radiata	Stellate Sedge				x				x																		x					
Carex retrorsa	Retrorse Sedge																										x					
Carex stipata	Awl-fruited Sedge	x															x	x														
Carex stricta	Tussock Sedge					x														x												
Carex tenera	Slender Sedge				x	x																					x					
Carex tribuloides	Blunt Broom Sedge																			x							x					
Carex tuckermanii	Tuckerman's Sedge			x	x																											
Carex vulpinoidea	Fox Sedge					x												x		x												
Carpinus caroliniana	Blue-beech				x	x							x														x					
Carya cordiformis	Bitternut Hickory			x	x														x								x					
Carya ovata	Shagbark Hickory				x	x	x						x					x	x			x					x					
Centaurea nigra	Black Knapweed																											x				
Cephalanthus occidentalis	Common Buttonbush			x	x	x																					x					
Cerastium fontanum	Common Mouse-ear Chickweed																										x					
Chelidonium majus	Greater Celadine																										x					
Chelone glabra	White Turtlehead					x																										
Cichorium intybus	Chicory							x																								

Scientific Name	Common Name	1	2	3	4	5	6	7	8	9	10	11	12	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	33
Cicuta maculata var. maculata	Spotted Water-hemlock					x	x								x					x						x					
Cinna latifolia	Drooping Woodreed				x	x												x								x					
Circaea canadensis	Broad-leaved Enchanter's Nightshade	x					x		x				x		x			x	x							x			x	x	
Cirsium vulgare	Bull Thistle					x												x													
Claytonia caroliniana	Carolina Spring Beauty												x																		
Claytonia virginica	Narrow-leaved Spring Beauty					x							x																		
Convallaria majalis	European Lily-of-the-valley					x																									
Convolvulus arvensis	Field Bindweed																								x						
Cornus amomum	Silky Dogwood	x	x	x	x													x									x				
Cornus racemosa	Gray Dogwood	x		x	x	x	x	x	x	x		x	x	x	x		x	x	x	x		x			x	x	x	x			
Cornus stolonifera	Red-osier Dogwood		x	x	x	x	x	x	x	x	x	x			x	x	x	x		x						x	x	x	x	x	
Crataegus monogyna	English Hawthorn																			x											
Crataegus punctata	Dotted Hawthorn	x					x		x						x	x	x		x						x		x			x	x	
Crataegus succulenta	Fleshy Hawthorn	x																	x													
Dactylis glomerata	Orchard Grass														x																	
Daucus carota	Wild Carrot							x		x					x	x									x			x				
Dryopteris carthusiana	Spinulose Wood Fern					x																										
Elaeagnus angustifolia	Russian Olive								x							x																
Eleocharis erythropoda	Red-stemmed Spike-rush																x															
Eleocharis obtusa	Blunt Spike-rush			x	x																						x					
Eleocharis ovata	Ovate Spike-rush														x												x					
Eleocharis palustris	Creeping Spike-rush													x																		
Elymus canadensis	Canada Wildrye																											x				
Elymus hystrix	Bottlebrush Grass					x																										
Elymus virginicus var. virginicus	Virginia Wildrye				x																						x					
Epifagus virginiana	Beechdrops					x																										
Epilobium ciliatum	Hairy Willowherb	x																														
Equisetum arvense	Field Horsetail					x			x	x					x	x	x	x	x			x										
Erigeron annuus	Annual Fleabane														x																	
Erigeron philadelphicus	Philadelphia Fleabane																		x													
Erythronium americanum	Yellow Trout-lily					x	x		x				x																			
Eupatorium perfoliatum	Common Boneset					x																					x	x		x	x	
Eurybia macrophylla	Large-leaved Aster				x	x																					x			x	x	
*Eurybia schreberi**	Schreber's Aster*																										x					
Euthamia graminifolia	Grass-leaved Goldenrod																x								x			x				
Eutrochium maculatum var. maculatum	Spotted Joe Pye Weed																	x		x		x										
Fagus grandifolia	American Beech				x	x												x									x					
Fragaria virginiana	Wild Strawberry	x		x	x	x	x	x	x	x		x	x		x	x	x	x				x			x		x			x	x	x

Scientific Name	Common Name	1	2	3	4	5	6	7	8	9	10	11	12	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	33
Frangula alnus	Glossy Buckthorn														x		x	x			x	x	x	x								
Fraxinus americana	White Ash					x																								x	x	
Fraxinus pennsylvanica	Green Ash	x		x	x	x	x	x	x	x		x	x		x		x	x	x	x	x	x	x	x		x	x	x		x	x	
Galium obtusum	Blunt-leaved Bedstraw																										x					
Galium palustre	Marsh Bedstraw			x	x	x														x												
Geranium maculatum	Spotted Geranium					x						x	x					x									x					
Geum fragarioides	Barren Strawberry					x																										
Geum laciniatum	Rough Avens				x																											
*Gleditsia triacanthos**	Honey-locust*																														x	
Glyceria septentrionalis	Eastern Mannagrass																										x					
Glyceria striata	Fowl Mannagrass	x		x	x	x												x	x	x	x		x	x			x			x	x	
Hamamelis virginiana	American Witch-hazel																										x					
Hemerocallis fulva	Orange Daylily														x																	
Hydrophyllum virginianum	Virginia Waterleaf												x																			
Hypericum perforatum	Common St. John's-wort	x				x									x	x																
Hypericum punctatum	Common St. John's-wort					x																										
Ilex mucronata	Mountain Holly																										x					
Ilex verticillata	Black Holly																										x					
Impatiens capensis	Spotted Jewelweed					x									x												x			x	x	
Iris versicolor	Harlequin Blue Flag			x	x	x									x																	
Juglans nigra	Black Walnut	x	x															x										x				
Juncus dudleyi	Dudley's Rush													x														x				
Juncus effusus	Soft Rush	x		x	x																						x					
Juncus tenuis	Path Rush													x																		
Juniperus virginiana	Eastern Red Cedar							x								x																
Lamium amplexicaule	Common Deadnettle																x															
Laportea canadensis	Wood Nettle																													x	x	
Lapsana communis	Common Nipplewort	x													x			x	x			x					x			x	x	x
Leersia oryzoides	Rice Cutgrass			x	x	x																										
Leersia virginica	Virginia Cutgrass																										x					
Leucanthemum vulgare	Oxeye Daisy														x	x										x						
Ligustrum vulgare	European Privet	x																x	x													
Linaria vulgaris	Butter-and-eggs														x																	
Lindera benzoin	Spicebush	x		x	x	x							x					x	x			x					x					
Lonicera tatarica	Tartarian Honeysuckle	x	x	x	x	x	x		x		x	x	x		x			x	x							x	x	x				
Lycopus americanus	American Water-horehound					x														x								x				
Lycopus uniflorus	Northern Water-horehound			x	x	x									x		x										x					
Lysimachia nummularia	Creeping Jennie					x									x													x		x	x	

Scientific Name	Common Name	1	2	3	4	5	6	7	8	9	10	11	12	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	33
Lythrum salicaria	Purple Loosestrife			x	x	x		x						x				x									x	x				
Maianthemum canadense	Wild Lily-of-the-valley					x																										
Maianthemum racemosum	False Solomon's-seal																										x					
Maianthemum stellatum	Star-flowered False Solomon's-seal					x																					x					
Malus coronaria	Sweet Crabapple																								x							
Malus pumila	Common Apple	x				x			x										x													
Medicago lupulina	Black Medic																										x					
Melilotus albus	White Sweet-clover																								x							
Melilotus officinalis	Yellow Sweet-clover															x																
Mentha arvensis	Field Mint																x	x														
Narcissus pseudonarcissus	Commom Daffodil											x																				
Onoclea sensibilis	Sensitive Fern			x	x	x	x						x		x			x	x		x		x	x			x	x				
Osmunda regalis	Royal Fern					x																										
Osmundastrum cinnamomeum	Cinnamon Fern					x																										
Ostrya virginiana	Eastern Hop-hornbeam																										x			x	x	
Oxalis montana	Common Wood-sorrell					x									x																	
Parthenocissus inserta	Thicket Creeper	x			x	x			x	x			x		x		x	x	x			x					x	x		x	x	x
Penstemon digitalis	Foxglove Beardtongue			x	x																								x			
Penthorum sedoides	Ditch-stonecrop			x	x											x						x						x				
Persicaria hydropiper	Marshpepper Smartweed			x	x																							x				
Persicaria sagittata	Arrow-leaved Smartweed					x																										
Persicaria virginiana	Virginia Smartweed	x		x	x	x	x						x		x			x									x			x	x	
Phalaris arundinacea	Reed Canary Grass		x	x	x	x																					x	x		x	x	
Phragmites australis ssp. americanus	American Reed							x																			x					
Phragmites australis ssp. australis	European Reed									x	x	x	x												x							
Pilea pumila	Canada Clearweed					x																										
Pilosella caespitosa	Meadow Hawkweed																										x					
Pinus sylvestris	Scotch Pine	x		x	x																											
Plantago lanceolata	English Plantain															x	x								x							
Plantago major	Common Plantain								x																		x	x				
Poa compressa	Canada Bluegrass														x																	
Poa nemoralis	Woods Bluegrass				x																											
Poa pratensis ssp. pratensis	Kentucky Bluegrass														x										x							
Podophyllum peltatum	May-apple					x							x						x													
Polygonum achoreum	Leathery Knotweed					x																										
Polygonum aviculare ssp. aviculare	Prostrate Knotweed																								x							
Polygonum virginianum	Virginia Knotweed																															x
Populus deltoides ssp. deltoides	Eastern Cottonwood	x	x			x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x					

Scientific Name	Common Name	1	2	3	4	5	6	7	8	9	10	11	12	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	33
Populus tremuloides	Trembling Aspen					x			x			x																			
Potentilla recta	Sulphur Cinquefoil	x																														
Potentilla simplex	Old-field Cinquefoil					x									x												x					
Prunella vulgaris ssp. vulgaris	Self-heal																											x				
Prunus americana	American Plum																		x													
Prunus avium	Sweet Cherry					x																					x					
Prunus pensylvanica	Pin Cherry				x																											
Prunus serotina	Wild Black Cherry	x				x	x						x														x	x		x	x	
Prunus virginiana	Choke Cherry	x		x	x	x	x	x	x	x		x	x		x	x	x	x	x			x					x			x	x	x
Quercus alba	White Oak					x																					x			x	x	
Quercus bicolor	Swamp White Oak			x	x										x			x									x		x	x	x	
Quercus macrocarpa	Bur Oak	x		x	x	x	x					x	x		x			x								x	x	x	x	x	x	
Quercus palustris	Pin Oak	x	x	x	x	x	x		x			x	x				x	x	x	x	x		x		x		x	x	x	x	x	
Quercus rubra	Northern Red Oak				x	x	x		x				x					x									x			x	x	
Ranunculus abortivus	Kidney-leaved Buttercup					x									x				x								x					
Ranunculus acris	Tall Buttercup														x																	
Rhamnus alnifolia	Alderleaf Buckthorn																			x												
Rhamnus cathartica	Common Buckthorn	x		x	x	x	x		x		x	x	x	x	x			x	x	x	x	x	x	x	x	x	x	x		x	x	
Ribes americanum	Wild Black Currant								x																							
Ribes cynosbati	Prickly Gooseberry					x																x										
Ribes glandulosum	Skunk Currant	x				x									x			x	x											x	x	
Ribes hirtellum	Smooth Gooseberry			x	x																											
Ribes lacustre	Bristly Black Currant		x			x																										
Ribes triste	Swamp Red Currant						x																									
Rosa multiflora	Multiflora Rose														x											x	x			x	x	
Rosa palustris	Swamp Rose																										x					
Rosa rubingosa var. rubingosa	Briar Rose					x																x						x				
Rubus allegheniensis	Alleghany Blackberry						x						x					x								x	x		x	x		
Rubus hispidus	Bristly Dewberry					x																				x						
Rubus idaeus ssp. strigosus	Wild Red Raspberry	x				x	x		x	x		x	x		x			x		x		x				x	x					x
Rubus occidentalis	Black Raspberry	x																												x	x	
Rubus pubescens	Dewberry				x	x																										
Rudbeckia hirta var. hirta	Black-eyed Susan								x																							
Salix alba	White Willow		x												x				x													
Salix amygdaloides	Peach-leaved Willow																										x					
Salix bebbiana	Bebb's Willow					x											x	x									x	x				
Salix discolor	Pussy Willow																x															
Salix eriocephala	Heart-leaved Willow																								x							

Scientific Name	Common Name	1	2	3	4	5	6	7	8	9	10	11	12	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	33
Salix interior	Sandbar Willow															x	x															
Salix nigra	Black Willow																										x					
Salix x fragilis	(Salix alba X Salix euxina)							x																								
Sambucus canadensis	Common Elderberry				x																											
Sambucus nigra	European Elder																										x					
Sanguinaria canadensis	Bloodroot																		x													
Schedonorus pratensis	Meadow Fescue														x										x							
Schoenoplectus tabernaemontani	Soft-stemmed Bulrush																			x												
Scirpus atrovirens	Dark-green Bulrush																	x														
Scirpus microcarpus	Red-tinge Bulrush													x																		
Scirpus pendulus	Rufous Bulrush		x	x	x	x																										
Scutellaria lateriflora	Mad Dog Skullcap					x																						x				
Securigera varia	Common Crown-vetch																								x							
Sisyrinchium montanum var. montanum	Strict Blue-eyed-grass															x									x							
Sium suave	Hemlock Water-parsnip			x	x															x							x					
Solanum dulcamara	Climbing Nightshade		x	x	x										x												x	x				
Solidago altissima ssp. altissima	Eastern Late Goldenrod														x			x							x		x					x
Solidago canadensis var. canadensis	Canada Goldenrod					x										x	x	x										x				
Solidago flexicaulis	Zigzag Goldenrod				x	x																										
Solidago juncea	Early Goldenrod														x	x									x							
Solidago nemoralis ssp. nemoralis	Gray-stemmed Goldenrod							x								x																
Solidago rugosa var. rugosa	Northern Rough-leaved Goldenrod	x		x	x	x												x				x				x	x			x	x	
Sphenopholis intermedia	Slender Wedge Grass																										x					
Spiraea alba	White Meadowsweet			x	x	x	x																				x	x				
Symphyotrichum ericoides var. ericoides	White Heath Aster							x						x		x												x				
Symphyotrichum laeve var. laeve	Smooth Aster															x																
Symphyotrichum lanceolatum ssp. lanceolatum	Panicled Aster	x	x	x	x	x		x						x	x		x	x		x		x				x	x	x		x	x	x
Symphyotrichum lateriflorum	Starved Aster	x	x			x																					x	x		x	x	x
Symphyotrichum novae-angliae	New England Aster					x			x					x	x	x		x									x	x				
Symphyotrichum pilosum var. pilosum	Old Field Aster							x						x		x																
Symphyotrichum urophyllum	Arrow-leaved Aster					x																										
Taraxacum officinale	Common Dandelion	x				x	x		x	x		x	x		x		x	x							x							
Thalictrum dioicum	Early Meadow-rue					x							x																			
Thelypteris palustris	Eastern Marsh Fern					x																										
Tilia americana	American Basswood					x							x					x									x			x	x	
Toxicodendron radicans	Climbing Poison Ivy	x	x		x	x		x	x			x	x		x		x	x	x	x		x					x	x		x	x	x
Trifolium pratense	Red Clover									x					x										x							
Trifolium repens	White Clover																											x				

Scientific Name	Common Name	1	2	3	4	5	6	7	8	9	10	11	12	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	33
Trillium grandiflorum	White Trillium					x																										
Tussilago farfara	Colt's-foot							x									x															
Typha angustifolia	Narrow-leaved Cattail					x																										
Typha latifolia	Broad-leaved Cattail			x	x																				x		x					
Ulmus americana	American Elm	x	x	x	x	x	x	x	x	x		x	x		x	x	x	x	x	x							x	x		x	x	
Ulmus rubra	Slippery Elm													x																		
Urtica dioica ssp. dioica	European Stinging Nettle			x	x																											
Uvularia grandiflora	Large-flowered Bellwort					x																										
Vaccinium corymbosum	Highbush Blueberry					x																										
Verbena hastata	Blue Vervain		x															x									x	x		x	x	
Verbena urticifolia	White Vervain	x																														
Veronica officinalis	Common Speedwell	x							x																		x					
Viburnum acerifolium	Maple-leaf Viburnum																										x					
Viburnum lentago	Nannyberry					x	x											x									x					
Viburnum opulus ssp. trilobum	Highbush Cranberry													x	x		x		x													
Viburnum recognitum	Smooth Arrowwood								x							x		x														
Vicia cracca	Tufted Vetch							x	x	x					x										x			x				
Vinca minor	Periwinkle								x						x																	
Viola affinis	Le Conte's Violet																	x														
Viola cucullata	Marsh Blue Violet			x	x	x																										
Vitis riparia	Riverbank Grape				x				x	x					x		x	x	x								x	x				
Arctium sp	Burdock Species																															x
Carya sp	Hickory Species														x															x	x	
Crataegus sp	Hawthorn Species			x	x	x				x		x	x					x				x				x		x				
Dryopteris sp	Wood Fern Species				x										x												x					
Epilobium sp	Willow-herb Species					x									x																	
Geum sp	Avens Species	x					x		x				x		x			x	x			x					x			x	x	x
Hieracium sp	Hawkweed Species															x																
Juncus sp	Rush Species					x									x																	
Lemna sp	Duckweed Species					x																					x					
Malus sp	Apple Species						x	x							x			x														
Myosotis sp	Forget-me-not Species			x	x																											
Oenothera sp	Evening-primrose Species															x																
Polygonum sp	Smartweed Species	x	x	x	x																											
Potamogeton sp	Pondweed Species					x																										
Potentilla sp	Cinquefoil Species						x																				x					
Prenanthes sp	Rattlesnake-root Species					x																										
Rosa sp	Rose Species	x		x	x		x	x	x			x						x														

Scientific Name	Common Name	1	2	3	4	5	6	7	8	9	10	11	12	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	33
Salix sp	Willow Species			x	x				x	x	x									x	x		x	x							
Scirpus sp	Bulrush Species																			x												
Trifolium sp	Clover Species							x								x																
Viola sp	Violet Species														x				x								x					

Table 7: *Ambystoma laterale* (and unisexual polyploids) capture numbers by date and pond (see Appendix 2).

Pond	Number of Ambystoma laterale captured by survey date					TOTAL
	April 8	April 10	April 13	April 17	April 20	
1	3	12	1	0	0	16
2	1	3	0	0	0	4
3	3	4	2	0	1	10
4	1	2	1	0	0	4
5	0	0	0	0	0	0
6	1	3	2	0	0	6
7	2	5	0	0	0	7
8	0	19	0	0	0	19
TOTAL	11	48	6	0	1	66

Table 8: Summary of anuran species found at each Nocturnal Amphibian Call Station.

Property Location	NACS Station	Spring Peeper *Pseudacris crucifer*	American Toad *Anaxyrus americanus*	Western Chorus Frog *Pseudacris triseriata*	Northern Leopard Frog *Lithobates pipiens*	Gray Treefrog *Hyla versicolor*	Wood Frog *Lithobates sylvaticus*
North Area (Oldfield Road)	1	Present	Present	Present		Present	
	2	Present	Present	Present		Present	
	13					Present	
East Area (Dorchester Road)	3	Present		Present		Present	
	4	Present				Present	
	5	Present		Present		Present	
Central Area (Near Conrail Drain)	6	Present	Present	Present	Present	Present	
	11	Present				Present	
Central Area (south of Conrail Drain)	12					Present	
South Area (north of Dorchester Road/Chippewa Parkway)	7	Present	Present	Present		Present	
	8	Present	Present	Present		Present	
	9	Present		Present		Present	Present
	10		Present	Present		Present	

Table 9: Breeding Bird Summary. Grey highlights indicate species that were observed, but not breeding on the property. Green highlights indicate species that are either provincially, regionally, or locally rare, and/or area sensitive.

Common Name	Scientific Name	Conservation Status					Covered by MBCA (1994)	Area Sensitivity (OMNR 2000)	Breeding Evidence (OBBA 2001)
		National	Provincial		Regional	Local			
		COSEWIC Designation (2014)	OMNRF Designation (OMNRF 2015)	Srank (2013 Update)	BCR 13 Priority Sp. (Lower Great Lakes / St. Lawrence Plain) (OPIF 2008)	Niagara Region (Black & Roy 2010)			
Canada Goose	*Branta canadensis*	---	---	S5	---	very common	Y	---	X
Wood Duck	*Aix sponsa*	---	---	S5	---	uncommon	Y	---	Possible
Mallard	*Anas platyrhynchos*	---	---	S5	---	common	Y	---	Possible
Wild Turkey	*Meleagris gallopavo*	---	---	S5	---	uncommon	N	---	Possible
Double-crested Cormorant	*Phalacrocorax auritus*	NAR	NAR	S5	---	very common	N	---	X
Great Blue Heron	*Ardea herodias*	---	---	S4	---	uncommon	Y	---	X
Great Egret	*Ardea alba*	---	---	S2	---	rare	Y	---	X
Black-crowned Night-Heron	*Nycticorax*	---	---	S3	---	uncommon	Y	---	X
Sharp-shinned Hawk	*Accipiter striatus*	NAR	NAR	S5	---	uncommon	N	AS	Possible
Killdeer	*Charadrius vociferus*	---	---	S5	---	common	Y	---	Probable
Spotted Sandpiper	*Actitis macularius*	---	---	S5	---	common	Y	---	Possible
Common Tern	*Sterna hirundo*	NAR	NAR	S4	---	uncommon	Y	---	X
Rock Pigeon	*Patagioena livia*	---	---	SNA	---	very common	N	---	Possible
Mourning Dove	*Zenaida macroura*	---	---	S5	---	very common	Y	---	Possible
Cuckoo species	*Coccyzus sp.*	---	---	S4-S5	---	uncommon	Y	---	Possible
Great Horned Owl	*Bubo virginianus*	---	---	S4	---	uncommon	N	---	Possible
Chimney Swift	*Chaetura pelagica*	THR	THR	S4	PLS	uncommon	Y	---	X
Red-bellied Woodpecker	*Melanerpes carolinus*	---	---	S4	---	uncommon	Y	---	Probable
Downy Woodpecker	*Picoides pubescens*	---	---	S5	---	common	Y	---	Probable
Hairy Woodpecker	*Picoides villosus*	---	---	S5	---	uncommon	Y	AS	Possible
Northern Flicker	*Colaptes auratus*	---	---	S4	PLS	common	Y	---	Probable
Eastern Wood-Pewee	*Contopus virens*	SC	SC	S4	PLS	common	Y	---	Probable
Acadian Flycatcher	*Empidonax virescens*	END	END	S2S3	PLS	extremely rare	Y	AS	Possible
Willow Flycatcher	*Empidonax traillii*	---	---	S5	PLS	uncommon	Y	---	Probable

Common Name	Scientific Name	Conservation Status					Covered by MBCA (1994)	Area Sensitivity (OMNR 2000)	Breeding Evidence (OBBA 2001)
		National	Provincial		Regional	Local			
		COSEWIC Designation (2014)	OMNRF Designation (OMNRF 2015)	Srank (2013 Update)	BCR 13 Priority Sp. (Lower Great Lakes / St. Lawrence Plain) (OPIF 2008)	Niagara Region (Black & Roy 2010)			
Eastern Phoebe	*Sayornis phoebe*	---	---	S5	---	common	Y	---	Possible
Great Crested Flycatcher	*Myiarchus crinitus*	---	---	S4	---	common	Y	---	Probable
Yellow-throated Vireo	*Vireo flavifrons*	---	---	S4	---	rare and local	Y	AS	Probable
Warbling Vireo	*Vireo gilvus*	---	---	S5	---	common	Y	---	Probable
Red-eyed Vireo	*Vireo olivaceus*	---	---	S5	---	common	Y	---	Probable
Blue Jay	*Cyanocitta cristata*	---	---	S5	---	very common	N	---	Probable
American Crow	*Corvus brachyrhynchos*	---	---	S5	---	common	N	---	Probable
Purple Martin	*Progne subis*	---	---	S4	---	very common	Y	---	X
Tree Swallow	*Tachycineta bicolor*	---	---	S4	---	very common	Y	---	Probable
Northern Rough-winged Swallow	*Stelgidopteryx serripennis*	---	---	S4	---	uncommon	Y	---	X
Barn Swallow	*Hirundo rustica*	THR	THR	S4	---	very common	Y	---	Possible
Black-capped Chickadee	*Poecile atricapillus*	---	---	S5	---	common	Y	---	Probable
Tufted Titmouse	*Baeolophus bicolor*	---	---	S4	---	rare	Y	AS	Probable
White-breasted Nuthatch	*Sitta carolinensis*	---	---	S5	---	uncommon	Y	AS	Probable
House Wren	*Troglodytes aedon*	---	---	S5	---	common	Y	---	Probable
Wood Thrush	*Hylocichla mustelina*	THR	SC	S4	PLS	uncommon	Y	---	Probable
American Robin	*Turdus migratorius*	---	---	S5	---	very common	Y	---	Probable
Gray Catbird	*Dumetella carolinensis*	---	---	S4	---	common	Y	---	Probable
Brown Thrasher	*Toxostoma rufum*	---	---	S4	PLS	uncommon	Y	---	Possible
European Starling	*Sturnus vulgaris*	---	---	SNA	---	very common	N	---	Probable
Cedar Waxwing	*Bombycilla cedrorum*	---	---	S5	---	common	Y	---	Probable
Blue-winged Warbler	*Vermivora cyanoptera*	---	---	S4	PLS	uncommon	Y	---	Probable
Common Yellowthroat	*Geothlypis trichas*	---	---	S5	---	common	Y	---	Probable
Yellow Warbler	*Setophaga petechia*	---	---	S5	---	common	Y	---	Probable
Blackpoll Warbler	*Setophaga striata*	---	---	S4	---	spring/fall transient	Y	---	Migrant

Common Name	Scientific Name	Conservation Status					Covered by MBCA (1994)	Area Sensitivity (OMNR 2000)	Breeding Evidence (OBBA 2001)
		National	Provincial		Regional	Local			
		COSEWIC Designation (2014)	OMNRF Designation (OMNRF 2015)	Srank (2013 Update)	BCR 13 Priority Sp. (Lower Great Lakes / St. Lawrence Plain) (OPIF 2008)	Niagara Region (Black & Roy 2010)			
Wilson's Warbler	*Cardellina pusilla*	---	---	S4	---	spring/fall transient	Y	---	Migrant
Eastern Towhee	*Pipilo erythrophthalmus*	---	---	S4	PLS	uncommon	Y	---	Probable
Chipping Sparrow	*Spizella passerina*	---	---	S5	---	common	Y	---	Probable
Field Sparrow	*Spizella pusilla*	---	---	S4	PLS	uncommon	Y	---	Probable
Savannah Sparrow	*Passerculus sandwichensis*	---	---	S4	PLS	very common	Y	AS	Possible
Song Sparrow	*Melospiza melodia*	---	---	S5	---	very common	Y	---	Probable
Swamp Sparrow	*Melospiza georgiana*	---	---	S5	---	uncommon	Y	---	Probable
Scarlet Tanager	*Piranga olivacea*	---	---	S4	---	uncommon	Y	AS	Probable
Northern Cardinal	*Cardinalis*	---	---	S5	---	common	Y	---	Probable
Rose-breasted Grosbeak	*Pheucticus ludovicianus*	---	---	S4	PLS	common	Y	---	Probable
Indigo Bunting	*Passerina cyanea*	---	---	S4	---	common	Y	---	Probable
Red-winged Blackbird	*Agelaius phoeniceus*	---	---	S4	---	very common	N	---	Probable
Common Grackle	*Quiscalus quiscula*	---	---	S5	---	very common	N	---	Probable
Brown-headed Cowbird	*Molothrus ater*	---	---	S4	---	very common	N	---	Probable
Orchard Oriole	*Icterus spurius*	---	---	S4	---	uncommon to rare	Y	---	Possible
Baltimore Oriole	*Icterus galbula*	---	---	S4	PLS	common	Y	---	Probable
American Goldfinch	*Spinus tristis*	---	---	S5	---	common	Y	---	Probable
House Sparrow	*Passer domesticus*	---	---	SNA	---	very common	N	---	Probable

LEGEND:
COSEWIC: END - Endangered; THR - Threatened; SC - Special Concern; NAR - assessed and deemed to be not at risk; --- = not assessed as population secure
OMNRF: END - Endangered; THR - Threatened; SC - Special Concern; NAR - assessed and deemed to be not at risk; --- = not assessed as population secure
Provincial Sranks: S2/S3 - vulnerable; S4 - apparently secure; S5 - secure; SNA - non-native exotic
OPIF: PLS - Priority Landbird Species
Area Sensitivity: AS = Area Sensitive species
OBBA: X - species observed flying over site only and not considered as potential breeder; M - migrant only

Table 10: Fish species captured during 2015 site investigation

	Watercourse 1				Watercourse 2		Watercourse 3 (Conrail Drain)		Pond
Date	June 11	Oct. 6	June 11	June 11	June 11	Oct. 6	June 11	June 11	June 11
Station	1-1	1-1	1-2	1-3	2-1	2-1	3-1	3-2	P1
Electroseconds Stream length sampled	241 s 22 m	na 22 m	196 s 25 m	115 s 36 m	703 s 155 m	1057 s 168 m	811 s 105 m	109 s 12 m	141 s na
Species									
White Sucker *Catostomus commersonii*	1j	20yoy	0	0	0	18yoy	0	0	0
Largemouth Bass *Micropterus salmoides*	0		0	0	0	7j	0	0	0
Central Mudminnow *Umbra limi*	2a	10a	0	0	0	1a	0	0	0
Yellow Perch *Perca flavescens*	1j		0	0	0	0	0	0	0
Brook Stickleback *Culaea inconstans*	0		0	0	0	0	5	0	0
Brown Bullhead *Ameiurus nebulosus*	3j		0	0	0	1j	0	0	0
Bluntnose Minnow *Pimephales notatus*	1a		0	0	0	1a	0	0	0
Emerald Shiner *Notropis atherinoides*	0		0	4	0	0	0	0	0
Golden Shiner *Notemigonus crysoleucas*	0		0	0	0	2a	0	0	0

Notes: j=juvenile; a=adult; yoy=young of the year

Table 11: Preliminary Environmental Management Strategy Recommendations

Natural Heritage Element and Preliminary Policy Trigger(s)	Mitigation Hierarchy Recommendations	Preliminary Environmental Management Strategy Considerations
Slough Forest/Vernal Pool Complex Floodplain Wetlands along east creek Policy Trigger: PPS: Provincially Significant Wetland) Municipal: EPA Associated polygons: 3, 4, 5, 20, 21, 23, 24, 27, 31, 32	Avoid: Required for residential and commercial development; preferable option for servicing and transportation. Minimize: Where servicing and transportation impacts are unavoidable, steps should be taken to minimize the spatial extent and duration of impact. Mitigate/Rehabilitate: Where servicing and transportation impacts are unavoidable, steps should be taken to mitigation/rehabilitate impacted features. Compensate: Not typically an option for PSW features, but compensation for residual impacts resulting from servicing and transportation should be considered.	PSW features have been identified and tentatively confirmed by the MNRF. There may be some room for small adjustments to the tentative boundary; where this is required, adjustments should be as minimal as possible. Buffers to the PSW boundary will range between 10 and 30 meters, and/or that required to ensure vernal pools and their function are not impacted by adjacent development; adjacent lands uses will also be considered during the prescription of buffer dimensions. Enhancement areas within PSW boundaries where features and/or functions have been disturbed in the past (e.g. recreate vernal pools where topography has been altered, clear/control patches of invasive species, identify areas of potential forest decline and establish an understory of native tree species, etc.) Establish linkages (both ecological and anthropogenic) among the PSW units to ensure core features are connected and permeable for small and medium sized wildlife.
Watercourses and Fish Habitat Policy Trigger: Fisheries Act: Fish habitat	Avoid: Impacts from development should be avoided where possible. Minimize: Where servicing and transportation impacts are unavoidable, steps should be taken to minimize the spatial extent and duration of impact.	Watercourses 1 and 2 are largely within the PSW boundaries on the property and will therefore be maintained. Where watercourse crossings are necessary, the location(s) that minimize potential impacts should be assessed based on existing habitat condition, associated floodplain, and associated vegetation communities in the adjacent valley land. Where impacts are unavoidable, mitigation and/or compensation strategies will be developed in consultation with the NPCA, and submitted to the Department of Fisheries and Oceans for permitting if fish or fish habitat are impacted.

PPS: Fish habitat, watercourse, valley land Conservation Authorities Act General Regulation Associated Features: WC1, WC2	Mitigate/Rehabilitate: Where servicing and transportation impacts are unavoidable, steps should be taken to mitigation/rehabilitate impacted features. Compensate: Where servicing and transportation impacts are unavoidable, steps should be taken to compensate for impacted habitat.	
Species at Risk/Species at Risk Habitat (Endangered and Threatened Species) Policy Trigger: PPS (Endangered Species Act) Municipal (Environmental Conservation Area)	Avoid: Impacts resulting from residential and commercial development should be avoided; preferable option for servicing and transportation. Minimize: Where impacts from development are unavoidable, the spatial extent and duration of impact should be minimized, particularly where it relates to occupied or potential habitat. Mitigate/Rehabilitate: Where servicing and transportation impacts are unavoidable, steps should be taken to mitigation/rehabilitate impacted features. Compensate: Not typically an option for species at risk habitat, but compensation for residual impacts resulting from servicing and transportation should be considered.	Provincially Endangered or Threatened Species at Risk detected during the 2015 surveys include: • Barn Swallow • Chimney Swift • Acadian Flycatcher Nesting habitat for Barn Swallow and Chimney Swift were not documented on the site. If nesting habitat for these species is found and will be impacted, a permit will be required. The occurrence of Acadian Flycatcher included an individual that was documented in one of the isolated Willow Deciduous Swamp features (polygon 20); the individual was not documented on subsequent site visits (either during follow-up breeding bird surveys or ELC characterization) and therefore the feature was note considered breeding habitat, and a management plan is not required for this species. Other species that have not been detected, but have a high potential to be present include: • White Wood Aster • Round-leaved Greenbrier

		If these species are documented on the subject property, the location will be georeferenced and a contingency plan will be developed in collaboration with the MNRF and NPCA. ESA permits will be required if there is potential impact to the species and/or its habitat.
Old growth/Mature Forest Policy Trigger: PPS (Significant Wildlife Habitat) Municipal (Environmental Conservation Area) Affected polygons: 5, 27, 32 and potentially localized areas within 6,12, 13, 29, and 30	Avoid: Where possible impacts from development should be avoided. Minimize: Where impacts are unavoidable, the spatial extent and duration of impact should be minimized. Mitigate/Rehabilitate: Where impacts are unavoidable, best management practices will be required to ensure the spatial extent of impact is contained, and efforts to restore to pre-disturbance condition are planned. Compensate: Not feasible for old growth/mature forests.	The bulk of old growth/mature forest will be protected within the PSW. Where other old-growth areas are present on the site they should be protected; this could include individual tree protection. Where development blocks are proposed on and/or adjacent to old-growth trees outside of the PSW, setbacks should be large enough to ensure the trees roots are not impacted. Buffers to old growth/mature forest areas will ensure appropriate spatial separate is provided to reduce impacts to trees. Compensation for old-growth forest is not feasible.
Shrub/Early Successional Bird Habitat Policy Trigger: PPS (Significant Wildlife Habitat) Municipal (Environmental Conservation Area)	Avoid: Where possible, impacts should be avoided. Minimize: Where impacts are unavoidable, the spatial extent and duration of impact should be minimized. Mitigate/Rehabilitate: Where impacts are unavoidable, the best management practices should be undertaken to ensure the spatial extent of impact is contained,	Shrub/Early successional bird habitat is present in areas that will be proposed for development. Therefore, the features and characteristics of this habitat type will be a priority for creation within PSW buffers, parkland blocks, and/or restoration planting along the Con-rail Drain. Specific aspects of the plan will be developed with NPCA later in the Secondary Plan process.

Affected polygons: 9, 11, 16, 28	and efforts to restore to pre-disturbance conditions are planned. Compensate: High potential for on-site restoration and incorporating into design of parks, greenspace, and other open space blocks.	
Bat Maternity Roost Habitat Policy Trigger: PPS (Significant Wildlife Habitat) Municipal (Environmental Conservation Area) Affected polygons: 5, 27, 32 and potentially localized areas within 6,12, 13, 29, and 30	Avoid: Impacts will likely need to be avoided where bat maternity roosts are document, particularly if the roosts are used by Bat SAR. Minimize: Impacts to bat maternity roost trees will be considered on a cases by case basis. Mitigate/Rehabilitate: Where indirect impacts are likely, disturbances can be minimized through individual tree setbacks. Compensate: Compensation for loss of bat maternity roost trees is not feasible, other options that result in the creation of bat roost habitat can be explored.	Surveys for Bat Maternity Roost habitat will be undertaken during early November 2015. Updates will be provided as an addendum to the preliminary characterization report. Individual trees that meet the criteria for bat maternity roosts will be identified and georeferenced.
Mast Tree Habitat Policy Trigger: PPS (Significant Wildlife Habitat) Municipal (Environmental	Avoid: Concentration areas of mast trees (e.g. Oaks and Hickories) should be protected. Minimize: Where impacts are unavoidable, the extent of tree removal should be minimized. Mitigate/Rehabilitate: Where indirect impacts are likely, disturbances can be	Surveys for Mast Tree habitat will be undertaken during early November 2015. Updates will be provided as an addendum to the preliminary characterization report. Areas with larger diameter trees will be identified

Conservation Area) Affected polygons: 5, 27, 32 and potentially localized areas within 6,12, 13, 29, and 30	minimized through appropriate setbacks to protect individual trees and their root systems. Compensate: Where mast trees are removed, an appropriate compensation plan should be developed based on the size/age of each tree.	
Amphibian Breeding Habitat (Woodland type) Policy Trigger: PPS (Significant Wildlife Habitat) Municipal (Environmental Conservation Area) Affected polygons: 3, 4, 5, 20, 21, 23, 24, 27, and 32; potential for some areas within polygons 11 and 12	Avoid: Impacts to amphibian breeding habitat are to be avoided within the PSW, and should be avoided where possible outside of the PSW. Minimize: Where unavoidable, the spatial extent and duration of impacts to amphibian breeding habitat should be minimized. Mitigate/Rehabilitate: Where impacts are unavoidable, best management practices should be undertaken to ensure the spatial extent of impact is contained, and efforts to restore to pre-disturbance conditions are planned. Compensate: Opportunities for vernal pool creation/enhancement can be explored, both as a method to address potential loss of ponds outside the PSW, and to enhance ponds within the PSW.	The majority of amphibian woodland breeding habitat will be protected in the PSW. Other small vernal ponds exist across the property outside of the PSW boundary. These areas have been documented as part of the characterization, and where impacts are unavoidable, opportunities for enhancement of existing habitat will be explored; as well, opportunities for habitat recreation on-site will be explored in collaboration with the NPCA.
Habitat for Provincially Rare Species	Avoid: Impacts to Schreber's Aster are to be avoided within the PSW, and should be	Currently, Schreber's Aster has only been documented in PSW areas and therefore will be protected. If it is found in other locations, the area will be georeferenced. Where the

and/or Species of Special Concern (Schreber's Aster) Policy Trigger: PPS (Significant Wildlife Habitat) Municipal (Environmental Conservation Area) Affected polygons: 27	avoided where possible outside of the PSW. Minimize: Where unavoidable, the spatial extent and duration of impacts the species habitat should be minimized. Mitigate/Rehabilitate: Where impacts are unavoidable, best management practices should be undertaken to ensure the spatial extent of impact is contained, and efforts to restore to pre-disturbance conditions are planned. Additionally, plants should be salvage and relocated to suitable habitat. Compensate: Where required, salvaged plants can be used for restoration and enhancement of degraded areas within the PSW, or within restoration areas identified elsewhere on site.	species occurs outside of protected areas, a salvage and relocation plan will be developed in collaboration with the NPCA.
Habitat for Provincially Rare Species and/or Species of Special Concern (Honey-locust) Policy Trigger: PPS (Significant Wildlife Habitat) Municipal (Environmental	Avoid: Impacts to Honey-locust are to be avoided within the PSW, and should be avoided where possible outside of the PSW. Minimize: Where unavoidable, the spatial extent and duration of impacts the species habitat should be minimized. Mitigate/Rehabilitate: Where impacts are unavoidable, best management practices should be undertaken to ensure the spatial extent of impact is contained, and efforts to restore to pre-disturbance conditions are planned. Additionally,	Currently, Honey-locust has only been documented in PSW areas and therefore will be protected. If it is found in other locations, the area will be georeferenced. Where the species occurs outside of protected areas, a tree preservation study will be completed to determine the feasibility of avoiding impacts. Where impacts are unavoidable, a compensation plan will be developed in collaboration with the NPCA.

Conservation Area) Affected polygons: 31	plants should be salvage and relocated to suitable habitat. Compensate: Where required, salvaged plants can be used for restoration and enhancement of degraded areas within the PSW, or within restoration areas identified elsewhere on site.	
Habitat for Provincially Rare Species and/or Species of Special Concern (Eastern Wood Pewee) Policy Trigger: PPS (Significant Wildlife Habitat) Municipal (Environmental Conservation Area) Affected polygons: 5, 6, 18, 19, 27	Avoid: Impacts to Eastern Wood-Pewee breeding habitat within the PSW are to be avoided, and should be avoided where possible outside of the PSW. Minimize: Where impacts to Eastern Wood-Pewee habitat are unavoidable, the spatial extent and duration of impact should be minimized. Mitigate/Rehabilitate: Where impacts are unavoidable, best management practices should be undertaken to ensure the spatial extent of impact is contained, and efforts to restore forest understory areas to pre-disturbance conditions are planned. Compensate: Compensation for Eastern Wood-Pewee habitat is not feasible in the short-term.	Large areas of Eastern Wood-Pewee habitat will be protected within the PSW areas. Other woodland areas that support this species could also be protected and/or prioritized for compensation/enhancement. Additionally, as this species will use smaller woodland elements, the feasibility of retaining groups of trees as woodland elements will be explored during the Secondary Plan process.
Habitat for Provincially Rare Species and/or Species of Special Concern (Wood Thrush)	Avoid: Impacts to Wood Thrush breeding habitat within the PSW are to be avoided, and should be avoided where possible outside of the PSW. Minimize: Where impacts to Eastern Wood-Pewee habitat are unavoidable, the	Large areas of Wood Thrush habitat will be protected within the PSW areas. Other woodland areas that support this species may also be protected and/or prioritized for compensation/enhancement. This species is unlikely to use small woodland patches, and/or wooded areas in proximity to developed land, therefore larger buffers around high quality habitat areas may be required for PSW and other areas that are retained.

Policy Trigger: PPS (Significant Wildlife Habitat) Municipal (Environmental Conservation Area) Affected polygons: 1, 4, 5, 6, 11, 12, 13, 19, 24, 27	spatial extent and duration of impact should be minimized. Mitigate/Rehabilitate: Where impacts are unavoidable, best management practices should be undertaken to ensure the spatial extent of impact is contained, and efforts to restore forest understory areas to pre-disturbance conditions are planned. Compensate: Compensation for Wood Thrush habitat is not feasible in the short-term.	
Habitat for Provincially Rare Species and/or Species of Special Concern (Snapping Turtle) Policy Trigger: PPS (Significant Wildlife Habitat) Municipal (Environmental Conservation Area) Affected polygons: 24 (potential)	Avoid: Impacts to Snapping Turtle breeding habitat within the PSW are to be avoided, and should be avoided where possible outside of the PSW. Minimize: Where impacts to Snapping Turtle breeding habitat are unavoidable, the spatial extent and duration of impact should be minimized. Mitigate/Rehabilitate: Where impacts are unavoidable, best management practices should be undertaken to ensure the spatial extent of impact is contained, and efforts to restore pre-disturbance conditions are planned. Additionally, linkage among wetland feature and the Welland Canal should be maintained and/or enhanced. Compensate: Where impacts are unavoidable and cannot be mitigated,	Snapping Turtle habitat may be present in larger ponds on the property. One sighting (assumed to be a Snapping Turtle) was observed in polygon 24 located near the Welland River. This feature is part of the PSW, and therefore will be retained. Additional consideration should be given to ensuring linkage to the Welland River, and to other ponds across the property.

	compensation for impacted Snapping Turtle habitat will be considered and opportunities identified.	
Reptile Hibernacula Policy Trigger: PPS (Significant Wildlife Habitat) Municipal (Environmental Conservation Area) Affected polygons: Potentially All	Avoid: The location of reptile hibernacula should be avoided if documented. Minimize: Given that reptile hibernacula are very difficult to detect, a contingency plan will be developed to minimize impacts to reptile hibernacula should they be found. Mitigate/Rehabilitate: Where indirect impacts to reptile hibernacula are unavoidable, best management practices should be undertaken to ensure the spatial extent of impact is contained, and efforts to restore pre-disturbance conditions are planned. As noted above, a contingency plan will be prepared in the event that reptile hibernacula is encountered. This will include spatial setbacks, and linkage to protected natural areas. Compensate: Where impacts are unavoidable, reptile hibernacula can be recreated on-site.	Reptile hibernacula were not observed during site visits, in part because they are very difficult to detect. If hibernacula are identified during subsequent site visits, the location will be documented and a contingency plan will be developed in collaboration with the NPCA.
Deer Winter Congregation Areas Policy Trigger: PPS (Significant Wildlife Habitat)	Avoid: Impacts to deer wintering habitat should be avoided within the PSW, and other woodland areas where possible. Minimize: Where impacts are unavoidable, the extent of impacted forest should be minimized, and avoid core areas within the identified habitat.	Deer winter congregation habitat will be largely protected within the PSW areas. Protection of these areas, associated buffers, and linkage protection/creation will ensure that core areas of this habitat are protected and connectivity is maintained.

Municipal (Environmental Conservation Area) Affected polygons: TBD	Mitigate/Rehabilitate: Where impacts are unavoidable, linkage among core areas of deer wintering habitat should be established. Compensate: On-site compensation for deer wintering habitat is not feasible.	
Rare Vegetation Communities Policy Trigger: PPS (Significant Wildlife Habitat) Municipal (Environmental Conservation Area) Affected polygons: 3, 4, 5, 6, 27, 32	Avoid: Impacts to rare vegetation community types should be avoided. Minimize: Where impacts cannot be avoided, the extent and duration of disturbance should be minimized. Mitigate/Rehabilitate: Where impacts are unavoidable, best management practices adjacent to rare vegetation community types should be undertaken. Additionally, if these areas have a high likelihood of being impacted, ensure representative species are salvaged and use for restoration and enhancement elsewhere. Compensate: Where impacts are unavoidable, some on-site compensation work may be feasible for rare vegetation communities. As above, a salvaging strategy should be developed for such cases.	Rare vegetation types include: Pin Oak Mineral Deciduous Swamp Type (SWD1-3): S2S3 Buttonbush Mineral Thicket Swamp Type (SWT2-4): S3 Gray Dogwood Mineral Thicket Swamp Type (SWT2-9): S3S4 The Pin Oak Mineral Deciduous Swamp Type is primarily associated with the PSW and will therefore be protected. There are other polygons outside of the PSW boundary that have elements of this vegetation type (e.g. polygon 12). Where this feature type will be impacted, a salvaging and relocation plan should be developed for provincially or regionally rare plant species associated with the feature. Relocation should target areas that will be protected, either within the PSW as enhancement and/or in other areas that are targeted for on-site compensation/restoration. The Buttonbush Mineral Thicket Swamp communities are associated with the PSW and will be therefore be protected. If other features are found during additional field investigations (e.g. within polygon 12), they will be identified. As above, where this feature type is impacted, a salvaging and relocation plan will be prepared for any provincially or regionally rare plant species and wildlife that are present. The Gray Dogwood Mineral Thicket Swamp communities are associated with non-PSW wetlands areas (example as inclusions in polygon 6). Where this type of habitat is impacted, the extent of loss can be documented; the extent of loss will be incorporated into the buffer planting plans and on-site enhancement/compensation plans, with attempts to balance impacts. Direction for the salvaging and relocation plan will be developed in collaboration with the NPCA.

Other Wetlands (e.g. Green Ash Swamp, Willow Swamp, Oak Swamp) Policy Trigger: Municipal (Environmental Conservation Area) Affected polygons: 2, 6, 8, 10, 12, 17, 18, 26, and 29)	Avoid: Where feasible, non-PSW wetland features should be considered for protection. Minimize: Where unavoidable, the spatial extent of impact to non-PSW wetlands should be minimized. Mitigate/Rehabilitate: Where non-PSW areas are protected, appropriate buffers should be implemented to ensure protection of their features and functions. Additionally, where retained, some enhancement/rehabilitation may be required. Compensate: Where impacts result in loss of these features, the potential for compensation through enhancement of on-site PSW features and recreation of similar habitats should be considered.	Areas of Green Ash, Willow, and Oak swamp exist outside of the PSW boundary. These areas are regulated by the Region of Niagara and the NPCA, therefore will require negotiations regarding removal. To address potential impacts associated with removal of these features, opportunities should be explored to enhance the PSW areas, identify potential on-site compensation areas, and identify linkage corridors among features that are retained. On-going collaboration with the NPCA will be required to identify how these features will be managed as part of the Secondary Plan.
Deciduous Forest and Woodlands outside of PSW boundaries Municipal (Environmental Conservation Area) Affected polygons: 14, 19,	Avoid: The highest quality deciduous forest and woodland areas should be protected. Minimize: Where impacts are unavoidable, steps should be taken to minimize the spatial extent and duration of impact of these features. Mitigate/Rehabilitate: Where forested and woodland areas are protected, appropriate buffers should be implemented to ensure protection of their features and functions. Additionally, where retained, some	Areas of deciduous woodland and cultural woodland exist outside of the PSW boundary. These areas are regulated by the Region of Niagara and the NPCA, therefore will require negotiations regarding removal. To address potential impacts associated with removal of these features, opportunities should be explored to enhance the PSW areas, identify potential on-site compensation areas, and identify linkage corridors among features that are retained. On-going collaboration with the NPCA will be required to identify how these features will be managed as part of the Secondary Plan.

<table>
<tr><td></td><td>enhancement/rehabilitation may be required.

Compensate: Where impacts result in loss of these features, the potential for compensation through enhancement of on-site PSW features and restoration of similar habitats should be considered.</td><td></td></tr>
<tr><td>Regionally Rare Plants.</td><td>Avoid: Where regionally rare plant species are present in the PSW, impacts will be avoided.

Minimize: Where regionally rare species are present outside of the PSW, impacts to these species should be minimized through maintaining habitat around locations where these species are abundant.

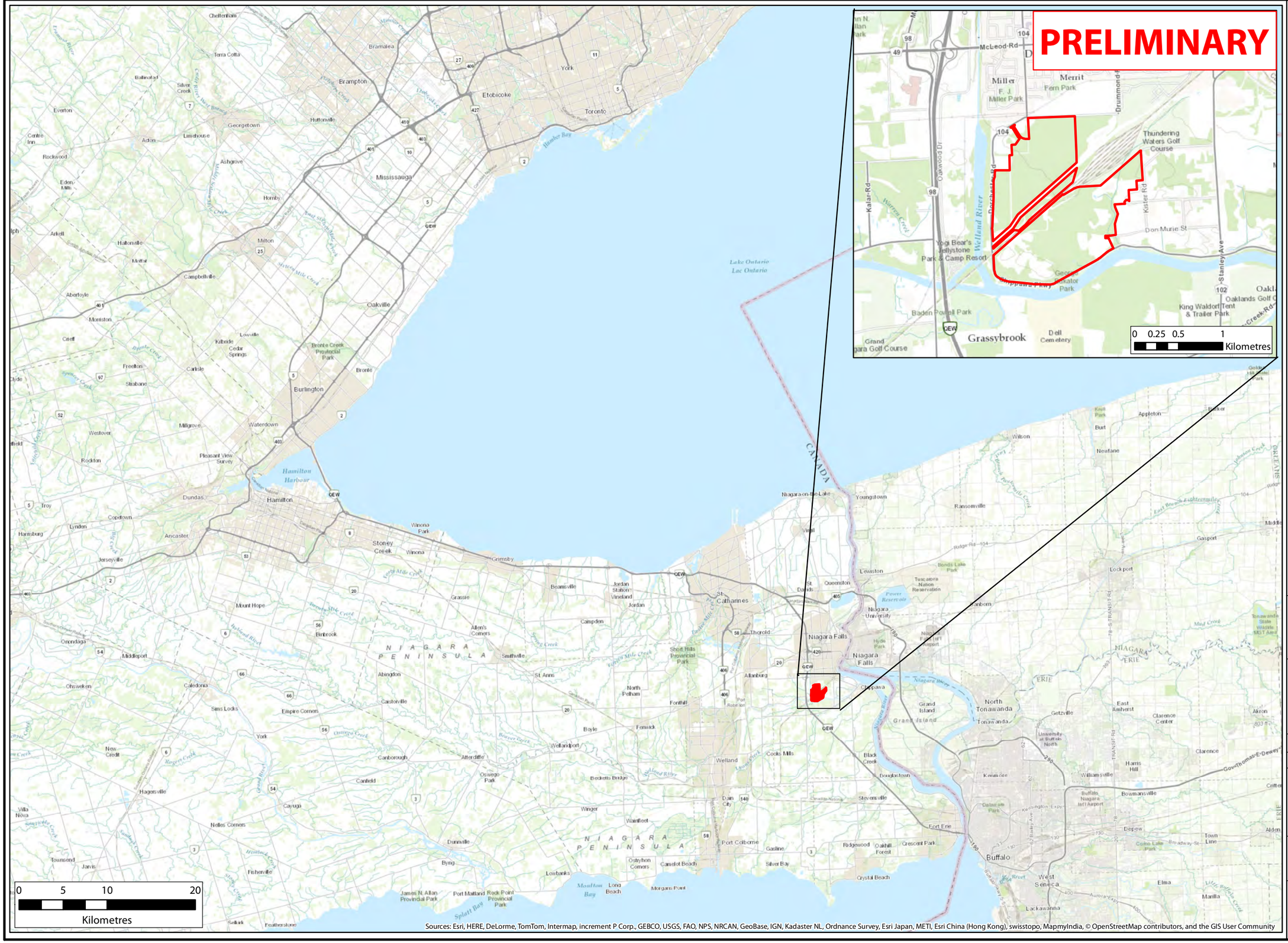
Mitigate/Rehabilitate: Where impacts are unavoidable, regionally rare species should be salvaged and replanted in appropriate habitat that will be protected on-site. In this regard, attention should be given to regionally rare species that occur outside of the PSW.

Compensate: Where impacts are unavoidable, and plant relocation is required, enhancement and habitat restoration maybe necessary to create the appropriate habitat conditions for the respective regionally rare plants.</td><td>The following table identifies regionally rare plant species that were documented on the subject property. Where species are found in features outside of the PSW areas, and/or other features that end up being protected, recommendations for salvaging and relocation can be developed.

<table>
<tr><th>Common Name</th><th>Scientific Name</th><th>Within PSW</th><th>Outside PSW</th></tr>
<tr><td>Pin Cherry</td><td>Prunus pensylvanica</td><td>x</td><td></td></tr>
<tr><td>Limestone Bittercress</td><td>Cardamine douglassii</td><td>x</td><td></td></tr>
<tr><td>Leathery Knotweed</td><td>Polygonum achoreum</td><td>x</td><td></td></tr>
<tr><td>Asa Gray Sedge</td><td>Carex grayi</td><td>x</td><td></td></tr>
<tr><td>Pale Sedge</td><td>Carex pallescens</td><td>x</td><td></td></tr>
<tr><td>Schreber's Aster</td><td>Eurybia schreberi</td><td>x</td><td></td></tr>
<tr><td>Blunt-leaved Bedstraw</td><td>Galium obtusum</td><td>x</td><td></td></tr>
<tr><td>Mountain Holly</td><td>Ilex mucronata</td><td>x</td><td></td></tr>
<tr><td>Honey-locust</td><td>Gleditsia triacanthos</td><td>x</td><td></td></tr>
<tr><td>Smooth Gooseberry</td><td>Ribes hirtellum</td><td>x</td><td></td></tr>
<tr><td>Drooping Woodreed</td><td>Cinna latifolia</td><td>x</td><td>x</td></tr>
<tr><td>Necklace Sedge</td><td>Carex projecta</td><td>x</td><td>x</td></tr>
<tr><td>Swamp Red Currant</td><td>Ribes triste</td><td></td><td>x</td></tr>
<tr><td>Carolina Spring Beauty</td><td>Claytonia caroliniana</td><td></td><td>x</td></tr>
<tr><td>Creeping Spike-rush</td><td>Eleocharis palustris</td><td></td><td>x</td></tr>
</table></td></tr>
</table>

		Red-tinge Bulrush	*Scirpus microcarpus*	x
		Finely-nerved Sedge	*Carex leptonervia*	x
		Yellow Sedge	*Carex flava*	x
		Canada Pussytoes	*Antennaria howellii ssp. canadensis*	x
		Elk Sedge	*Carex garberi*	x
		Drooping Sedge	*Carex prasina*	x
		Le Conte's Violet	*Viola affinis*	x
		American Plum	*Prunus americana*	x
		Alderleaf Buckthorn	*Rhamnus alnifolia*	x
		Woolly Sedge	*Carex pellita*	x
Regionally Rare Wildlife Species	Avoid: Where regionally rare wildlife species are present in the PSW, impacts will be avoided. Minimize: Where regionally rare species are present outside of the PSW, impacts to these species should be minimized through maintaining habitat around locations where these species are abundant. Mitigate/Rehabilitate: Appropriate buffers adjacent to protected areas where these species have been documented will help to reduce impacts. Where impacts are unavoidable, the spatial extent of impacts should be restored as soon as possible for temporary disturbances. Compensate: Compensation for Regionally Rare wildlife species habitat that were documented on site is not feasible.	Regionally rare bird species observed on the property included Acadian Flycatcher (Polygon 20), Yellow-throated Vireo (Polygon 11, 14, 15, 27), and Tufted Titmouse (Poly 5, 6, 11, 12, 27). Although Acadian Flycatcher was observed on the property, only an individual on one occasion was observed (Polygon 20). This suggests the species was not breeding on the property and management of this species and habitat is not required. Habitat for Yellow-throated Vireo and Tufted Titmouse will be protected within the PSW areas. Buffers to the PSW and other retained features may also provide appropriate habitat for these species. Some areas that provide habitat outside of the PSW areas may also be retained if features are determined to be old growth and/or have bat maternity roosts.	

7. MAPS



Legend

Property Boundary

Thundering Waters Secondary Plan
Preliminary Natural Heritage Characterization Report (DRAFT)

Study Area

DOUGAN & ASSOCIATES
ECOLOGICAL CONSULTING & DESIGN
77 Wyndham Street South • Guelph ON N1E 5R3
T 519.822.1609 • F 519.822.5389 • www.dougan.ca

PROJECT: DA15-014-02

CLIENT: GR (CAN) Investments Ltd.

N W E S
UTM Zone 17 NAD83

DATE: OCTOBER 2015

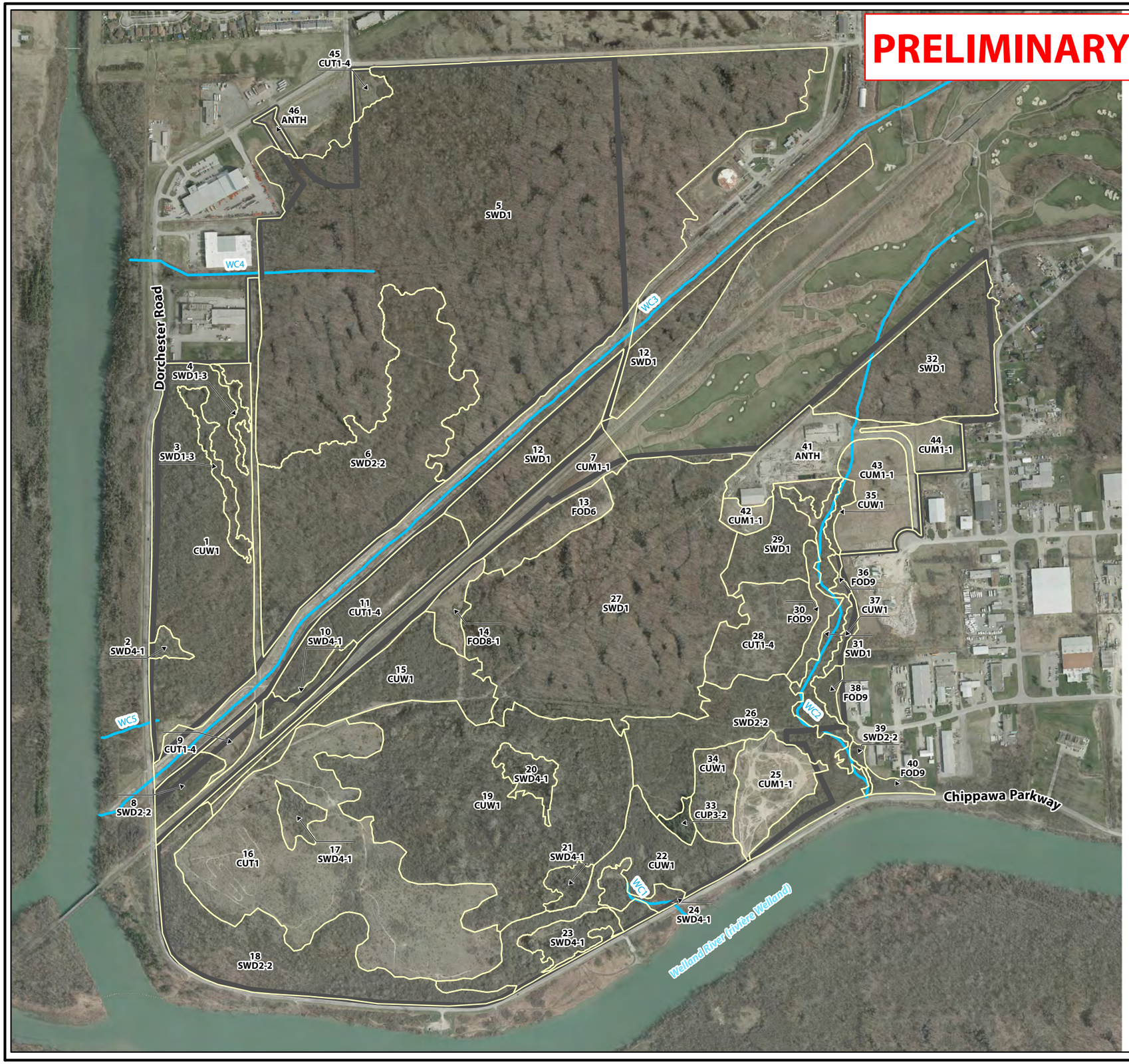
SCALE: 1:400,000

DRAWN BY: LC

CHECKED BY: SH

Map:

1



Vegetation Community Description

Anthropogenic

- ANTH - Anthropogenic

Cultural

- CUM1-1 - Dry - Moist Old Field Meadow
- CUP3-2 - White Pine Coniferous Plantation
- CUT1 - Mineral Cultural Thicket
- CUT1-4 - Gray Dogwood Cultural Thicket
- CUW1 - Mineral Cultural Woodland

Terrestrial

- FOD6 - Fresh – Moist Sugar Maple Deciduous Forest
- FOD8-1 - Fresh – Moist Poplar Deciduous Forest
- FOD9 - Fresh – Moist Oak – Maple – Hickory Deciduous Forest

Wetland

- SWD1 - Oak Mineral Deciduous Swamp
- SWD1-3 - Pin Oak Mineral Deciduous Swamp
- SWD2-2 - Green Ash Mineral Deciduous Swamp
- SWD4-1 - Willow Mineral Deciduous Swamp

0 105 210 420

Metres

2013 Imagery provided by the City of Niagara Falls.

Legend

- Property Boundary
- Water Courses (2015)
- Vegetation Community Boundary

Thundering Waters Secondary Plan
Preliminary Natural Heritage Characterization Report (DRAFT)
Vegetation Communities

DOUGAN & ASSOCIATES
ECOLOGICAL CONSULTING & DESIGN
77 Wyndham Street South • Guelph ON N1E 5R1
T 519.822.1609 • F 519.822.5389 • www.dougan.ca

PROJECT: DA15-014-03

CLIENT: GR (CAN) Investments Ltd.

N W E S
UTM Zone 17 NAD83

DATE: OCTOBER 2015
SCALE: 1:8,000
DRAWN BY: LC
CHECKED BY: SH

Map: 2

8. APPENDICES

APPENDIX A: TERMS OF REFERENCE (DRAFT)

Niagara Falls Paradise Development

"Draft" Terms of Reference for Environmental Impact Study

Niagara Falls, Ontario

Prepared for:

GR(CAN) Investment Co., LTD

Prepared by:
Amec Foster Wheeler Environment & Infrastructure
Dougan & Associates
C. Portt and Associates

July 2015

Project No. TP115026

THE PARADISE AT NIAGARA FALLS

"Draft" Terms of Reference Environmental Impact Assessment

Submitted to:

GR(CAN) Investment Co., LTD

Submitted by:

Amec Foster Wheeler Environment & Infrastructure

Dougan & Associates

C. Portt and Associates

July 2015

TP115026

TABLE OF CONTENTS

PAGE

LIST OF APPENDICES

1.0 PURPOSE/SCOPE OUTLINE

The Environmental Impact Study (EIS) is an important 'building block' for the Secondary Plan. It establishes a clear understanding of the environmental resources including the area features, their function and form. Fundamental components of the EIS include:

- Delineation of the provincially significant wetland boundary;
- Assessment of identified Regional Environmental Conservation Areas;
- Characterization of terrestrial and aquatic natural heritage features and their functions;
- Characterization of sensitivities and constraints related to natural heritage features and functions;
- Identification of ecological linkages;
- Recommendations of appropriate setbacks and buffers;
- Tree preservation;
- Mitigation measures; and
- Rehabilitation, enhancement, and management strategies.

Further details specific to the purpose of the EIS associated with the on-site fisheries and terrestrial systems is offered in the following:

Fish and Aquatic Habitat

The three main watercourses that traverse portions of the study are potentially accessible to fish from the Niagara River and Welland River. Therefore there is the potential for several fish species to use the watercourses on, and adjacent to, the site for spawning. These species include muskellunge (*Esox masquinongy*), northern pike (*Esox lucius*), grass pickerel (*Esox americanus*; a threatened species), and white sucker (*Catostomus commersonii*). There is also the matter of fishes that may permanently inhabit watercourses and waterbodies within the subject property. Based on discussions with the Ontario Ministry of Natural Resources and Forestry (MNRF) and the Niagara Peninsula Conservation Authority (NPCA), fish and fish habitat must be addressed as part of the Environmental Impact Study (EIS). Any development potentially affecting a fishery, either directly or indirectly, will also be subject to the federal Fisheries Act.

Terrestrial Natural Heritage

The Niagara Region EIS Guidelines provide the outline for what is required as part of an EIS to ensure that development meets the requirements of the Greenbelt Plan, the Provincial Policy Statement, Regional Policy Plan, and local Official Plans and By-laws, the Niagara Escarpment Plan, and Niagara Peninsula Conservation Authority (NPCA) Policies and Regulations.

Through consultation with the City, the NPCA, and MNRF, the need for an EIS has been established based on the factors outlined in Table 1 which outlines the natural heritage features that trigger the need for an EIS for the proposed project.

Table 1: EIS Triggers			
	Is an EIS required?		
NATURAL HERITAGE FEATURE	***Development involves lands within the natural heritage feature***	***Development involves adjacent lands***	***To be addressed in EIS for Subject Property***
Areas identified as Environmental Protection Area (EPA)			
Provincially Significant Wetland (PSW)	Development not permitted – no EIS	EIS required for development within 120 metres	Yes
Provincially Significant Life Science Area of Natural and Scientific Interest (ANSI)	Development not permitted – no EIS	EIS required within 50 metres	No
Significant Portions of the Habitat of Threatened and Endangered Species	Where habitat requirements are well defined, development not permitted – no EIS. Where habitat requirements not well defined an EIS is required	EIS required for development within 50 metres. Habitat must be defined in consultation with the MNR	Yes
Significant natural heritage features within the Greenbelt Natural Heritage System	Development not permitted – no EIS	EIS required for development within 120 metres	No
Areas identified as Environmental Conservation Area (ECA)			
Significant Woodlands	EIS required Tree Saving Plan required	EIS required for development within 50 metres	Yes
Significant Wildlife Habitat	EIS required	EIS required for development within 50 metres	Yes
Significant Habitat of Species of Concern	EIS required	EIS required for development within 50 metres	Yes
Critical Fish Habitat(type 1)	EIS required	EIS required for development within 30 metres	Yes
Other Fish Habitat (type 2 and 3)	EIS required	EIS required for development within 15 metres	Yes
Significant Valleylands	EIS required	EIS required for development within 50 metres	No
Other Evaluated Wetland	EIS required	EIS required for development within 50 metres	Yes
Other Features in the Greenbelt Plan			
Greenbelt Natural Heritage System	EIS required	EIS not required.	No
Key hydrologic feature	Development not permitted – no EIS	EIS required for development within 120 metres	No

The EIS that will be prepared for this development area will follow the guidelines and report structure that is outlined in the Region of Niagara EIS Guidelines document. Broadly, this will include the preparation of a constraints analysis and environmental impact study report.

As outlined in the EIS Guidelines, impacts shall be assessed for different phases of the development project (e.g. during site preparation and construction, and following the development); this includes identification of direct impacts, indirect impacts, and cumulative impacts. Opportunities to avoid potential impacts will be considered early in the process through a constraint assessment to determine where land-use/natural heritage conflicts can be resolved through design changes. Following this, mitigation, enhancement, and restoration strategies will be explored. Finally, residual impacts that cannot be addressed through design changes and mitigation/enhancement strategies will be identified, and considered for managing through off-site compensation.

Initial steps to ensure impacts of the proposed land development are minimized will require delineation of natural heritage feature boundaries, identifying appropriate setbacks at a local scale (i.e. buffers may vary across the site depending on sensitivities), and key hydrological linkages that are important for sustaining the function of the system

2.0 BACKGROUND INFORMATION

As part of the process to establish these detailed Terms of Reference, a series of meetings and follow-up consultation were held with the City of Niagara Falls, Region of Niagara, NPCA, and MNRF. Each party was requested to provide access to available relevant information to support the preparation of an EIS; the following provides a summary of specific information related to Fisheries and Terrestrial Resources.

Fish and Aquatic Habitat

The Ministry of Natural Resources and Forestry (MNRF) and the Niagara Peninsula Conservation Authority (NPCA) were contacted regarding existing information on the fish habitat and communities in the watercourses on the site. There are no data available from either agency. The nearby and adjacent, Niagara River and Welland River respectively, support diverse fish communities and support recreational fisheries, hence will require consideration in the assessment.

Terrestrial Natural Heritage

The NPCA and MNRF indicated that various types of information are available for the property, including but not limited to natural heritage reports, element occurrence records, and incidental species occurrence records.

Natural heritage information for previous studies will be used for baseline information. NPCA indicated that this information and other species records for the property can be provided.

The Niagara Region Natural Area Inventory will be used to characterize vegetation characteristics and ecological function of similar systems in the area.

Element occurrence records from the MNRF Guelph District and the Natural Heritage Information Centre will be used to identify species at risk, and provincially rare species that are present in the area, and that may occur on the property.

3.0 CONSULTATION

As noted, various meetings and follow-up consultation has been held with the respective stakeholders and agency partners (ref. Appendix A). The following provides a summary of relevant consultation.

Fish and Aquatic Habitat

As noted, neither the MNRF nor the NPCA have any information regarding fish and fish habitat on the site. It was recommended by MNRF that fish sampling and habitat characterization be undertaken and a Licence to Collect Fish for Scientific Purposes for watercourses on the site was issued to C. Portt and Associates. MNRF (ref. Pers. Comm. A. Yagi) also recommended that aquatic habitat on the site, fish access from adjacent waterbodies, and the potential effects of water management on the golf course be assessed. The MNRF and NPCA have both requested that access to the OPG property be arranged and the potential for fish accessing the Con Rail Drain be determined. It was agreed at the April 21, 2015 meeting (ref. Appendix A) with NPCA that a formal headwater drainage feature assessment would not be necessary, given the ephemeral nature of the watercourses/drainage features.

Terrestrial Natural Heritage

Niagara Peninsula Conservation Authority

The NPCA was consulted and staff provided direction on the following items:

- Mapping that shows the extent and location of wetland boundaries and environmental conservation areas boundaries
- Natural Heritage work previously conducted on the property was reported in a 2009 Environmental Impact Statement. NPCA advised that this could be used as a baseline for information on plant communities and species present; NPCA will provide this report to the team.
- That a number of surveys have not been conducted for the site, including bat habitat surveys, crepuscular bird surveys, and White Wood Aster surveys.
- Wetland boundary delineation on the ground would have to be coordinated with MNRF
- Woodlands are identified as Regional Environmental Conservation Area and will need to be assessed using the appropriate criteria for their significance
- Occurrence and habitat for reptiles (including snakes and turtles) can be determined through incidental observations while on-site for other studies
- Corridors and linkages will need to be characterized to connectivity of natural areas to the surrounding system
- Potential impacts to vernal pools can be addressed through understanding changes to their hydrology using topographic information and micro-catchment characteristics; detailed assessment using feature based water balance and/or ground water monitoring would not be required
- Consideration of trails within wetlands and buffers

Ministry of Natural Resources and Forestry

Consultation with the MNRF confirmed that wetland boundary verification will need to be conducted with the MNRF biologist. This will require visiting the site with the MNRF to confirm and survey wetland boundaries. MNRF also indicated that targeted species at risk surveys may need to be conducted for species that are likely to occur on the property.

4.0 WORK PLAN TASKS

A. Fish and Aquatic Habitat

C. Portt and Associates has conducted initial spring inventories as follows, plus based on agency partners consultation, established follow-on tasks related to fisheries management:

1. Request any background information available from the MNRF and NPCA regarding the fish community in the watercourses and acquire a Licence to Collect Fish for Scientific Purposes.
   Completed. Meeting with NPCA and telephone discussion with MNRF

2. Conduct field investigations to characterize the habitat conditions (presence/absence of flow, wetted channel dimensions, substrate, presence/absence of barriers to migration) and look for spawning fish in all watercourses that occur on the property during the spring spawning period.
   Completed April 11, 12, and 21, 2015.

3. Obtain amphibian trapping information conducted upon vernal pools by Dougan and Associates. Fish are often captured incidentally during this work (minnow traps are used) and therefore may indicate which pools are utilized by fish.

4. Conduct fish sampling by either seining or electrofishing later in the spring or in early summer when individuals spawned this spring will be susceptible to capture.
   Completed June 11, 2015.

5. Arrange for access to OPG property to examine the potential for fish access into the Conrail Drain. This has been required by MNRF and NPCA.
   Contact has been made, but date not scheduled.

6. Investigate the potential for water management/augmentation within the existing golf course, and how this affects flows in the study area watercourses. Must contact golf course maintenance department.

7. Re-examine fish habitat, stream flow, and fish communities (by electrofishing/observation) during the usual late summer low flow period.

8. Prepare a report summarizing the background information and the results and significance of the field investigations.

B. Terrestrial Natural Heritage

Dougan & Associates conducted botanical inventories, ecological land classification surveys, breeding bird surveys, and amphibian surveys during the spring of 2015. To date, this information has confirmed that the existing Ministry of Natural Resources and Forestry wetland mapping provides a good representation of the extent and boundaries of existing wetland features on the ground. Other areas of the site are dominated by young deciduous forest, shrub thickets, and open meadows. The wetland features provide high quality habitat for various amphibian species include frogs, toads, and salamanders. Additionally, a diverse bird and wildlife community is support by the mix of habitat types. The following provides specific details as to the scope completed to-date and that which is proposed.

1. *Nocturnal Amphibian Surveys - **Complete***

   Point counts established across the site to document the frog and toad species and relative abundance. Survey conducted April, May, and June.

2. *Breeding Bird Surveys - **Complete***

   Transects and point counts to document breeding birds present across the site. Surveys conducted May and June.

3. *Early Season Ecological Land Classification and Vegetation Inventory - **Complete***

   Site inventory and boundary delineation of vegetation communities across the site and inventory of early season plants. Surveys conducted during May and June.

4. *Wetland Boundary Delineation*

   Field verify the Provincially Significant Wetland boundary through site investigation and on the ground staking. Follow up visit with MNRF biologist to confirm wetland boundary and capture coordinates using high-accuracy GPS (Trimble Geo XH).

5. *Summer & Fall Vegetation Surveys*

   Summer and fall vegetation surveys to complement the spring inventory work that was completed. In addition to documenting the flora present, targeted surveys will be conducted for SAR species such as White Wood Aster. Inventory will be combined with other field visits such as wetland boundary delineation, and other SAR surveys that are required.

6. *Species at Risk Surveys*

   Meeting with NPCA and MNRF to confirm Species at Risk that are known to be present at the site or have high potential to be present. Targeted field inventory to validate NPCA and MNRF information for the species of interest.

7. *Early Season Summary report – **in progress***

   Technical memorandum documenting findings of early season wildlife and plant inventory work. Preliminary ELC mapping and quantitative summary of vegetation communities.

C. Combined EIS Tasks

1. *Characterization and Evaluation of Significance Report*

   Building on the early season summary, field inventory results will be presented in a overall characterization report. The report will document species observed, vegetation community types present, ecological functions of supporting flora and fauna, status of species present, and important policy boundaries (e.g. wetlands, woodlands, Environmental Conservation Areas), fisheries, and associated habitat. Findings will be used to provide recommendations for appropriate setbacks and fisheries management and will be integrated into the land use planning process throughout the characterization stage of the project.

2. *Integration of Land Use Plan and Constraints Report*

   The draft land use plan will be integrated with the terrestrial natural heritage information and fisheries habitat information to identify consistencies and conflicts with features and proposed protection areas. Preliminary restoration opportunities will be identified. At this stage, impacts that can be avoided through updates to the land use plan will be recommended.

3. *Impact Assessment and Management Recommendations Report*

   The impact analysis will summarize the expected direct, indirect, and cumulative impacts that will result from the proposed land use plan. Opportunities for mitigation, restoration, and enhancement will be explored and recommended based on the types and extent of features lost, complementary land use types, and sustainable long-term management strategies. Where necessary to address residual impacts that cannot be addressed on-site, off-site areas will be evaluated through desktop analysis to determine if natural features in the vicinity of the site could be integrated into a broader restoration plan. Based on the proposed restoration and management strategies, monitoring requirements will also be identified.

5.0 SCHEDULE

The EIS will basically involve three (3) primary stages scheduled as follows:

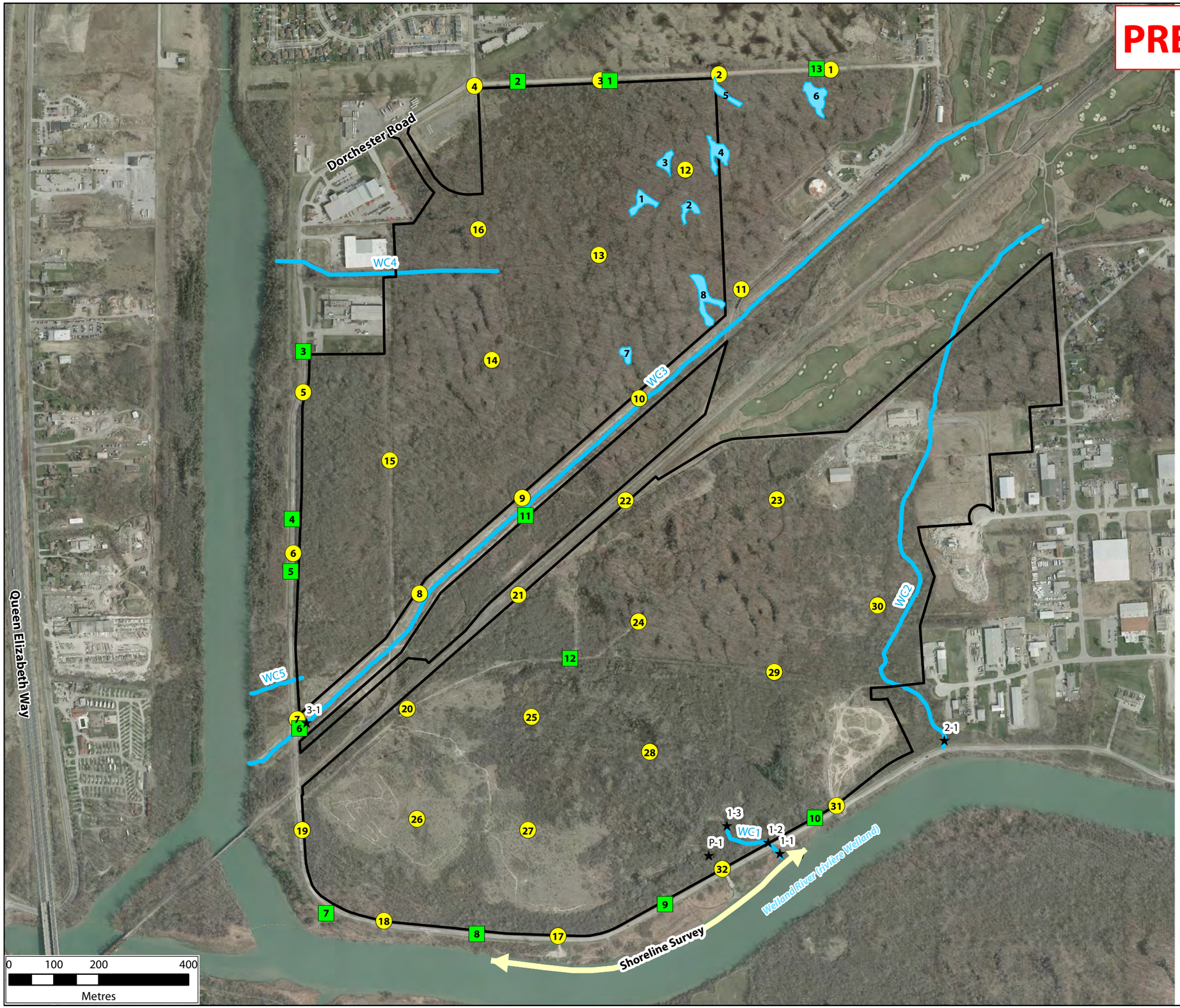
1. *Seasonal Field Data Collection: Spring, Summer, Fall, 2015*
2. *Site Characterization: Fall 2015/Winter 2016*
3. *Impact Assessment/Management Strategies: Winter/Spring 2016*

Appendix A

Agency Consultation

APPENDIX B: WILDLIFE SURVEY LOCATIONS

PRELIMINARY



Legend

- Property Boundary

Wildlife Survey Locations (2015)

- Nocturnal Amphibian Call Station
- Breeding Bird Survey Station
- Salamander Trapping
- Water Courses (2015)
- Shoreline Survey Area
- ★ Electrofishing Survey Points

2013 Imagery provided by the City of Niagara Falls.

Thundering Waters Secondary Plan
Preliminary Natural Heritage
Characterization Report (DRAFT)

Survey Locations

DOUGAN & ASSOCIATES
ECOLOGICAL CONSULTING & DESIGN
27 Wyndham Street South • Guelph ON N1E 5R7
T 519.822.1609 • F 519.822.5389 • www.dougan.ca

PROJECT: DA15-014-03

CLIENT: GR (CAN) Investments Ltd.

N W E S
UTM Zone 17 NAD83

DATE: OCTOBER 2015
SCALE: 1:8,500
DRAWN BY: LC
CHECKED BY: SH

Appendix:

B

APPENDIX C: NHIC QUERY RESULTS

Element Occurance ID	Scientific Name	Comman Name	S Rank	COSEWIC	Last Observed	MNRF Status	Extirpated
104195	Acipenser fulvescens pop. 3	Lake Sturgeon (Great Lakes - Upper St. Lawrence River population)	S2	THR	2011-pre	THR	N
104202	Acipenser fulvescens pop. 3	Lake Sturgeon (Great Lakes - Upper St. Lawrence River population)	S2	THR	2011-09-01	THR	N
107809	Sturnella magna	Eastern Meadowlark	S4B	THR	2008-8-3	THR	N
11200	Polygala incarnata	Pink Milkwort	S1	END	1823	END	Y
11351	Morus rubra	Red Mulberry	S2	END	1890-pre	END	N
11378	Justicia americana	American Water-willow	S1	THR	2007-10-04	THR	N
129	Nycticorax nycticorax	Black-crowned Night-heron	S3B,S3N		1991-06-04		N
16487	RESTRICTED	RESTRICTED			1943-PRE		Y
17278	Phegopteris hexagonoptera	Broad Beech Fern	S3	SC	1890's	SC	Y
2042	Ipomoea pandurata	Big-root Morning Glory	S1		1902-08-15		N
2072	Vaccinium stamineum	Deerberry	S1	THR	1896-05-26	THR	Y
21085	Colinus virginianus	Northern Bobwhite	S1	END	1900	END	Y
2119	Lespedeza frutescens	Violet Bush-clover	S1		1891-07-16		Y
22513	Falco peregrinus	Peregrine Falcon	S3B	SC	2008-06-10	THR	N
23025	Nycticorax nycticorax	Black-crowned Night-heron	S3B,S3N		1991		N
23026	Nycticorax nycticorax	Black-crowned Night-heron	S3B,S3N		1991		N
2403	Nuphar advena	Large Yellow Pond-lily	S3		2004		N
2442	Oenothera gaura	Biennial Gaura	S3		2004		N
2484	Polygonum erectum	Erect Knotweed	SH		1895-09-14		Y
2542	Crataegus pruinosa var. dissona	Northern Hawthorn	S3		1905-09-27		N
2543	Crataegus pruinosa var. dissona	Northern Hawthorn	S3		1982-06-11		N
2545	Crataegus pruinosa var. dissona	Northern Hawthorn	S3		1977-05-18		N
2565	Crataegus formosa	Waxy-fruit Hawthorn	S2		1977-09-16		N
2676	Aureolaria virginica	Downy Yellow False Foxglove	S1		1945-08-02		Y
2727	Hybanthus concolor	Eastern Green-violet	S2		1901-05-16		N
2752	Viola rotundifolia	Round-leaved Yellow Violet	SH		1892-06		Y
2899	Carex hirsutella	Hairy Green Sedge	S3		1981		N
3028	Carex appalachica	Appalachian Sedge	S2S3		1882-07-05		N
3079	Schoenoplectiella smithii	Smith's Bulrush	S3		1896-08		Y
3080	Schoenoplectiella smithii	Smith's Bulrush	S3		1896-09-05		Y
3212	Chamaelirium luteum	Fairywand	SX		1897-06-19		Y
3213	Chamaelirium luteum	Fairywand	SX		1891-06-12		Y
3233	Uvularia perfoliata	Perfoliate Bellwort	S1		1904-05-24		N
32468	Emydoidea blandingii	Blanding's Turtle	S3	THR	1985	THR	N
32852	Aristida dichotoma	Churchmouse Threeawn Grass	S1		1995-09-13		N
33028	Gentianella quinquefolia	Stiff Gentian	S2		1894-09-03		Y
3316	Spiranthes lacera var. gracilis	Southern Slender Ladies'-tresses	S1		1896-09-05		Y
3319	Spiranthes lacera var. gracilis	Southern Slender Ladies'-tresses	S1		1908		Y
33691	Oenothera gaura	Biennial Gaura	S3		1995-09-13		N
3397	Dichanthelium praecocius	White-haired Panicgrass	S3		1902-06-17		N
3463	Muhlenbergia tenuiflora	Slim-flowered Muhly	S2		1849-08-02		N
3466	Muhlenbergia tenuiflora	Slim-flowered Muhly	S2		1948-08-20		N
3488	Sphenopholis nitida	Shiny Wedge Grass	S1		1892-06-26		Y
3548	Smilax rotundifolia	Round-leaved Greenbrier	S2	THR	1989-03-14	THR	N
4960	Crotalus horridus	Timber Rattlesnake	SX	EXP	1941-08-22	EXP	Y
5076	Eurybia divaricata	White Wood Aster	S2	THR	1893	THR	Y
5331	Desmodium ciliare	Hairy Small-leaved Tick-trefoil	SX		1887-07		Y
5532	Crataegus beata	Dunbar's Hawthorn	S1				N
5536	Crataegus intricata	Copenhagan Hawthorn	SH		1912-10-07		N
59422	Juncus acuminatus	Sharp-fruited Rush	S3		1901-07-08		N
59831	Desmodium rotundifolium	Prostrate Tick-trefoil	S2		1906-09-03		N
59930	Linum medium var. medium	Stiff Yellow Flax	S3?		1877-07-27		N
59945	Linum virginianum	Woodland Flax	S2		1897-07-16		N
60032	Nyssa sylvatica	Black Gum	S3		1949-06-03		N
60111	Thaspium barbinode	Hairy-jointed Meadow-parsnip	SH		1901-07-04		N
60276	Monarda didyma	Scarlet Beebalm	S3		1904		N
65007	Dichanthelium clandestinum	Deer-tongue Panicgrass	S2		1995-09-13		N
66852	Eurybia divaricata	White Wood Aster	S2	THR	2002-09-12	THR	N
67477	Pleurobema sintoxia	Round Pigtoe	S1	END	1934-06-20	END	N
67880	Arigomphus villosipes	Unicorn Clubtail	S2S3		1934-06-20		N
67990	Ptychobranchus fasciolaris	Kidneyshell	S1	END	1934-06-20	END	N
7479	Clinostomus elongatus	Redside Dace	S2	END	1960-07-01	END	N
84753	Cornus florida	Eastern Flowering Dogwood	S2?	END	2010-05-19	END	N
92206	Castanea dentata	American Chestnut	S2	END	1901	END	N

Element Occurance ID	Scientific Name	Comman Name	S Rank	COSEWIC	Last Observed	MNRF Status	Extirpated
92208	Chimaphila maculata	Spotted Wintergreen	S1	END	1895	END	N
92209	Hibiscus moscheutos	Swamp Rose-mallow	S3	SC	2004	SC	N
92417	Frasera caroliniensis	American Columbo	S2	END	1890's	END	N
93491	Ligumia nasuta	Eastern Pondmussel	S1	END	1988-06-16	END	N
93594	Peltandra virginica	Green Arrow-arum	S2		2004		N
93603	Spiranthes magnicamporum	Great Plains Ladies'-tresses	S3?		2004		N
93604	Carya laciniosa	Shellbark Hickory	S3		2004		N
93605	Persicaria arifolia	Halberd-leaved Tearthumb	S3		2004		N
94937	Cornus florida	Eastern Flowering Dogwood	S2?	END	2008-06-17	END	N
95005	Cornus florida	Eastern Flowering Dogwood	S2?	END	1986-06-19	END	N
95120	Juglans cinerea	Butternut	S3?	END	2008-08-00	END	N
96036	Chelydra serpentina	Snapping Turtle	S3	SC	2010-06-29	SC	N

APPENDIX D: ECOLOGICAL LAND CLASSIFICATION DATA SHEETS

ELC — SOILS ONTARIO

SITE:
POLYGON:
DATE:
SURVEYOR(S):

Slope / UTM

	P/A	PP	Dr	Position	Aspect	%	Type	Class	Z	EASTING	NORTHING
1											
2											
3											
4											
5											

SOIL	1	2	3	4	5
TEXTURE x HORIZON	WP006				
	A	CL			
		26cm			
	B	SCL			
		75cm			
A TEXTURE					
COURSE FRAGMENTS					
B TEXTURE					
COURSE FRAGMENTS					
C TEXTURE					
COURSE FRAGMENTS					
EFFECTIVE TEXTURE					
SURFACE STONINESS					
SURFACE ROCKINESS					
DEPTH TO / OF					
MOTTLES	20cm				
GLEY					
BEDROCK					
WATER TABLE					
CARBONATES					
DEPTH OF ORGANICS					
PORE SIZE DISC #1					
PORE SIZE DISC #2					
MOISTURE REGIME					
SOIL SURVEY MAP					
LEGEND CLASS					

RWBL
BCCH
AMRO
WTSP
BRCO
YEWA
GRCA
SOSP
Towhee

CUWI / CUTI

Grey dogwood > Crat spp > Rhamcat (Slight.)

Chryso or punctata

WP005 Pit (photo)

ELC — PLANT SPECIES LIST

SITE: Thunder Woods
POLYGON: 0506001
DATE: May 06, 2015
SURVEYOR(S):

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER

ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.
Malus sp					
Popu delt					
Ulmu amer.					
Frax penn.					
Oxyl migr.					
Ribes gland.					
Rubus occi					
Crat sp.		A	A		
Corn race		A	A		
Toxi toxi.					
Ribes idaea					
Prun virg					
Crat sp.					
Rham cat		A	A		

SPECIES CODE	LAYER 1	2	3	4	COL.
Frag virg					
Agri gry					
Tarax off.					
Carex stip					
Polygonum sp					
Grey lute					
Moss.					
Alli pet.					

ELC
COMMUNITY DESCRIPTION & CLASSIFICATION

SITE:		POLYGON:	
SURVEYOR(S):	DATE	TIME: start	
		finish	
UTMZ:	UTME:	UTMN:	

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
G TERRESTRIAL	G ORGANIC	G LACUSTRINE	G NATURAL	G PLANKTON	G LAKE
G WETLAND	G MINERAL SOIL	G RIVERINE	G CULTURAL	G SUBMERGED	G POND
G AQUATIC	G PARENT MIN.	G BOTTOMLAND		G FLOATING-LVD.	G RIVER
	G ACIDIC BEDRK.	G TERRACE		G GRAMINOID	G STREAM
	G BASIC BEDRK.	G VALLEY SLOPE		G FORB	G MARSH
	G CARB. BEDRK.	G TABLELAND		G LICHEN	G SWAMP
		G ROLL. UPLAND		G BRYOPHYTE	G FEN
		G CLIFF		G DECIDUOUS	G BOG
		G TALUS		G CONIFEROUS	G BARREN
		G CREVICE / CAVE		G MIXED	G MEADOW
		G ALVAR			G PRAIRIE
		G ROCKLAND			G THICKET
		G BEACH / BAR			G SAVANNAH
		G SAND DUNE			G WOODLAND
		G BLUFF			G FOREST
					G PLANTATION

SITE	COVER
G OPEN WATER	G OPEN
G SHALLOW WATER	G SHRUB
G SURFICIAL DEP.	G TREED
G BEDROCK	

STAND DESCRIPTION:

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (up to 4 sp) (>> MUCH GREATER THAN; > GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY			
2	SUB-CANOPY			
3	UNDERSTOREY			
4	GRD. LAYER			

HT CODES: 1 = >25 m 2 = 10<HT 25 m 3 = 2<HT 10 m 4 = 1<HT 2 m 5 = 0.5<HT 1 m 6 = 0.2<HT 0.5 m 7 = HT<0.2 m

CVR CODES 0= NONE 1= 0% < CVR 10% 2= 10 < CVR 25% 3= 25 < CVR 60% 4= CVR > 60%

STAND COMPOSITION:	BA:

SIZE CLASS ANALYSIS:		< 10		10 - 24		25 - 50		> 50
STANDING SNAGS:		< 10		10 - 24		25 - 50		> 50
DEADFALL / LOGS:		< 10		10 - 24		25 - 50		> 50

ABUNDANCE CODES: N = NONE R = RARE O = OCCASIONAL A = ABUNDANT

COMM. AGE :		PIONEER		YOUNG		MID-AGE		MATURE		OLD GROWTH

SOIL ANALYSIS:

TEXTURE:	DEPTH TO MOTTLES / GLEY	g =	G=
MOISTURE:	DEPTH OF ORGANICS:		(cm)
HOMOGENEOUS / VARIABLE	DEPTH TO BEDROCK:		(cm)

COMMUNITY CLASSIFICATION:

		ELC CODE
COMMUNITY CLASS:		
COMMUNITY SERIES:		
ECOSITE:		
VEGETATION TYPE:		
INCLUSION		
COMPLEX		

Notes:

ELC
STAND CHARACTERISTICS

SITE: Thundering Waters
POLYGON: 050600
DATE: May 6, 2015
SURVEYOR(S): ZH, DW

TREE TALLY BY SPECIES:

PRISM FACTOR

SPECIES	TALLY 1	TALLY 2	TALLY 3	TALLY 4	TALLY 5	TOTAL	REL. AVG
TOTAL							100
BASAL AREA (BA)							
DEAD							

STAND COMPOSITION:

COMMUNITY PROFILE DIAGRAM

Notes:

WP 004 Dirt course

Substantial Canopy dieback

Elm dominant → Lead elms form thickety open sections.

50 ish yr old forest.

ELC

SOILS ONTARIO

SITE:	
POLYGON:	
DATE:	
SURVEYOR(S):	

	P/A	PP	Dr	Position	Aspect	Slope %	Slope Type	Slope Class	Z	UTM EASTING	UTM NORTHING
1											
2											
3											
4											
5											

SOIL	1	2	3	4	5
TEXTURE x HORIZON					
A TEXTURE					
COURSE FRAGMENTS					
B TEXTURE					
COURSE FRAGMENTS					
C TEXTURE					
COURSE FRAGMENTS					
EFFECTIVE TEXTURE					
SURFACE STONINESS					
SURFACE ROCKINESS					
DEPTH TO / OF					
MOTTLES					
GLEY					
BEDROCK					
WATER TABLE					
CARBONATES					
DEPTH OF ORGANICS					
PORE SIZE DISC #1					
PORE SIZE DISC #2					
MOISTURE REGIME					
SOIL SURVEY MAP					
LEGEND CLASS					

Forms a complex gradient w/ 0506001 (Thicket)

FOD ↔ in canopy gaps

ELC

PLANT SPECIES LIST

SITE:	Thunder
POLYGON:	0506003
DATE:	May 6, 2015
SURVEYOR(S):	ZH, DW

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER

ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	LAYER 2	LAYER 3	LAYER 4	COL.
Ulmus sp.	O	O			
Frax penn.			A	A	
Popu delt	O				
Malus sp		R			
Jugl nigr.					
Kentucky Coffee (?)					
Ulmus ame					
Prunaceae sp		R			X
Prun ser					
Querc (pin)	R				
Acer negund.		-			
AMEARBO					
Loni sp					X
Loni tata.					
Parth vitac.					
Crat sp					
Toxico radi					
Prun virg.					
Rhan cat					

SPECIES CODE	LAYER 1	LAYER 2	LAYER 3	LAYER 4	COL.
Geum sp					
Polyg sp.					
Frag virg					
Allia pet.					
Moss				R	
Potentilla (simplex?)				R	
Circ lut					
Soli sp					

Red(?) ← Ulmus sp.

Photo of unusual

Too early. ← Kentucky Coffee (?)

Plum? Crab apple? Amelanch? ← Prunaceae sp

AMRO
SOSP
BCCH
AMCR
AMGO

Long petioled ← Loni sp

2%

Possibly 2 spp. ← Crat sp

Hairy / featured ← Soli sp

Soli patul

Deer tracks in small slough channel (WP 001

Page .... of ....

Ground cover ~ 20%

Investigate Crat spp in 2-3 weeks (for flwrs

ELC COMMUNITY DESCRIPTION & CLASSIFICATION	SITE:		POLYGON:	
	SURVEYOR(S):	DATE:	TIME. start	
			finish	
	UTMZ:	UTME:	UTMN:	

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
G TERRESTRIAL	G ORGANIC	G LACUSTRINE	G NATURAL	G PLANKTON	G LAKE
G WETLAND	G MINERAL SOIL	G RIVERINE	G CULTURAL	G SUBMERGED	G POND
G AQUATIC	G PARENT MIN.	G BOTTOMLAND		G FLOATING-LVD.	G RIVER
	G ACIDIC BEDRK.	G TERRACE		G GRAMINOID	G STREAM
	G BASIC BEDRK.	G VALLEY SLOPE		G FORB	G MARSH
	G CARB. BEDRK.	G TABLELAND		G LICHEN	G SWAMP
		G ROLL. UPLAND		G BRYOPHYTE	G FEN
		G CLIFF		G DECIDUOUS	G BOG
		G TALUS		G CONIFEROUS	G BARREN
		G CREVICE / CAVE		G MIXED	G MEADOW
		G ALVAR			G PRAIRIE
		G ROCKLAND			G THICKET
		G BEACH / BAR			G SAVANNAH
		G SAND DUNE			G WOODLAND
		G BLUFF			G FOREST
					G PLANTATION
SITE			COVER		
G OPEN WATER			G OPEN		
G SHALLOW WATER			G SHRUB		
G SURFICIAL DEP.			G TREED		
G BEDROCK					

STAND DESCRIPTION:

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (up to 4 sp) (>> MUCH GREATER THAN; > GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY			
2	SUB-CANOPY			
3	UNDERSTOREY			
4	GRD. LAYER			

HT CODES: 1 = >25 m 2 = 10<HT 25 m 3 = 2<HT 10 m 4 = 1<HT 2 m 5 = 0.5<HT 1 m 6 = 0.2<HT 0.5 m 7 = HT<0.2 m

CVR CODES 0= NONE 1= 0% < CVR 10% 2= 10 < CVR 25% 3= 25 < CVR 60% 4= CVR > 60%

STAND COMPOSITION:	BA:

SIZE CLASS ANALYSIS:		< 10		10 - 24		25 - 50		> 50
STANDING SNAGS:		< 10		10 - 24		25 - 50		> 50
DEADFALL / LOGS:		< 10		10 - 24		25 - 50		> 50

ABUNDANCE CODES: N = NONE R = RARE O = OCCASIONAL A = ABUNDANT

COMM. AGE :		PIONEER		YOUNG		MID-AGE		MATURE		OLD GROWTH

SOIL ANALYSIS:

TEXTURE:	DEPTH TO MOTTLES / GLEY	g =	G=
MOISTURE:	DEPTH OF ORGANICS:		(cm)
HOMOGENEOUS / VARIABLE	DEPTH TO BEDROCK:		(cm)

COMMUNITY CLASSIFICATION:

		ELC CODE
COMMUNITY CLASS:		
COMMUNITY SERIES:		
ECOSITE:		
VEGETATION TYPE:		
INCLUSION		
COMPLEX		

Notes:

ELC STAND CHARACTERISTICS	SITE:
	POLYGON:
	DATE:
	SURVEYOR(S):

TREE TALLY BY SPECIES:

PRISM FACTOR

SPECIES	TALLY 1	TALLY 2	TALLY 3	TALLY 4	TALLY 5	TOTAL	REL. AVG
TOTAL							100
BASAL AREA (BA)							
DEAD							

STAND COMPOSITION:

COMMUNITY PROFILE DIAGRAM

Notes:

ELC

SOILS ONTARIO

SITE:
POLYGON:
DATE:
SURVEYOR(S):

Slope | UTM

	P/A	PP	Dr	Position	Aspect	%	Type	Class	Z	EASTING	NORTHING
1											
2											
3											
4											
5											

SOIL	1	2	3	4	5
TEXTURE x HORIZON					
A TEXTURE					
COURSE FRAGMENTS					
B TEXTURE					
COURSE FRAGMENTS					
C TEXTURE					
COURSE FRAGMENTS					
EFFECTIVE TEXTURE					
SURFACE STONINESS					
SURFACE ROCKINESS					
DEPTH TO / OF					
MOTTLES					
GLEY					
BEDROCK					
WATER TABLE					
CARBONATES					
DEPTH OF ORGANICS					
PORE SIZE DISC #1					
PORE SIZE DISC #2					
MOISTURE REGIME					
SOIL SURVEY MAP					
LEGEND CLASS					

MAS2 - Phal arund.

ELC PLANT SPECIES LIST

SITE: Thunder in waters
POLYGON: D506007
DATE: May 6, 2015
SURVEYOR(S): ZH, DW

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER

ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.
Cotn ceri					

SPECIES CODE	LAYER 1	2	3	4	COL.
Phal arun					
Potyg sp.					

e-like

ELC COMMUNITY DESCRIPTION & CLASSIFICATION	SITE:		POLYGON:	
	SURVEYOR(S):	DATE	TIME: start	
			finish	
	UTMZ:	UTME:	UTMN:	

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
G TERRESTRIAL G WETLAND G AQUATIC	G ORGANIC G MINERAL SOIL G PARENT MIN. G ACIDIC BEDRK. G BASIC BEDRK. G CARB. BEDRK.	G LACUSTRINE G RIVERINE G BOTTOMLAND G TERRACE G VALLEY SLOPE G TABLELAND G ROLL. UPLAND G CLIFF G TALUS G CREVICE / CAVE G ALVAR G ROCKLAND G BEACH / BAR G SAND DUNE G BLUFF	G NATURAL G CULTURAL	G PLANKTON G SUBMERGED G FLOATING-LVD. G GRAMINOID G FORB G LICHEN G BRYOPHYTE G DECIDUOUS G CONIFEROUS G MIXED	G LAKE G POND G RIVER G STREAM G MARSH G SWAMP G FEN G BOG G BARREN G MEADOW G PRAIRIE G THICKET G SAVANNAH G WOODLAND G FOREST G PLANTATION
SITE G OPEN WATER G SHALLOW WATER G SURFICIAL DEP. G BEDROCK			**COVER** G OPEN G SHRUB G TREED		

STAND DESCRIPTION:

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (up to 4 sp) (>> MUCH GREATER THAN; > GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY			
2	SUB-CANOPY			
3	UNDERSTOREY			
4	GRD. LAYER			

HT CODES: 1 = >25 m 2 = 10<HT 25 m 3 = 2<HT 10 m 4 = 1<HT 2 m 5 = 0.5<HT 1 m 6 = 0.2<HT 0.5 m 7 = HT<0.2 m

CVR CODES 0= NONE 1= 0% < CVR 10% 2= 10 < CVR 25% 3= 25 < CVR 60% 4= CVR > 60%

STAND COMPOSITION:	BA:

SIZE CLASS ANALYSIS:		< 10		10 - 24		25 - 50		> 50
STANDING SNAGS:		< 10		10 - 24		25 - 50		> 50
DEADFALL / LOGS:		< 10		10 - 24		25 - 50		> 50

ABUNDANCE CODES: N = NONE R = RARE O = OCCASIONAL A = ABUNDANT

COMM. AGE :		PIONEER		YOUNG		MID-AGE		MATURE		OLD GROWTH

SOIL ANALYSIS:

TEXTURE:	DEPTH TO MOTTLES / GLEY	g =	G=
MOISTURE:	DEPTH OF ORGANICS:		(cm)
HOMOGENEOUS / VARIABLE	DEPTH TO BEDROCK:		(cm)

COMMUNITY CLASSIFICATION:

		ELC CODE
COMMUNITY CLASS:		
COMMUNITY SERIES:		
ECOSITE:		
VEGETATION TYPE:		
INCLUSION		
COMPLEX		

Notes:

ELC STAND CHARACTERISTICS	SITE:
	POLYGON:
	DATE:
	SURVEYOR(S):

TREE TALLY BY SPECIES:

PRISM FACTOR

SPECIES	TALLY 1	TALLY 2	TALLY 3	TALLY 4	TALLY 5	TOTAL	REL. AVG
TOTAL							100
BASAL AREA (BA)							
DEAD							

STAND COMPOSITION:

COMMUNITY PROFILE DIAGRAM

Notes:

ELC — SOILS ONTARIO

SITE:
POLYGON:
DATE:
SURVEYOR(S):

	P/A	PP	Dr	Position	Aspect	Slope %	Type	Class	Z	UTM EASTING	UTM NORTHING
1											
2											
3											
4											
5											

Probably SC03 WP?

SOIL	1	2	3	4	5
TEXTURE x HORIZON	A	15 Mottles CL 20			A
SC02	B	65cm	SiCL 45		B
A TEXTURE					
COURSE FRAGMENTS					
B TEXTURE					
COURSE FRAGMENTS					
C TEXTURE					
COURSE FRAGMENTS					
EFFECTIVE TEXTURE					
SURFACE STONINESS					
SURFACE ROCKINESS					
DEPTH TO / OF MOTTLES	15cm				5cm
GLEY	50cm	(faint)			45cm
BEDROCK					
WATER TABLE	20cm				
CARBONATES					
DEPTH OF ORGANICS					
PORE SIZE DISC #1					
PORE SIZE DISC #2					
MOISTURE REGIME					
SOIL SURVEY MAP					
LEGEND CLASS					

Apparent Bare soil in recently flooded areas

Ulmu > Quer

C/ Hcm SiCL

Blue-winged Warbler. ?

KK to verify

BLJA

Log mine

Floodplain like wet forest SWT? / SWD w/ wet thicket elemen

ELC — PLANT SPECIES LIST

SITE: Thunder
POLYGON: 0506004 → 2 Lump w/ 001 ?
DATE: May 6, 2015
SURVEYOR(S): ZH, DW

Complex

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER

ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.
Ulmu ame	A				
Frax penn			A		
Quer rub.	O				
Quer mac					
Rosa sp?					
Spiraea alba.					
Crat sp.					
Rhamnat			A		
Lonitate					
Ribes hirtellum					
Corn seri					
Prun Virg					

SPECIES CODE	LAYER 1	2	3	4	COL.
Alli pet.					
Toxicodendron virginicum					
Oxycoccus sessilifolius					
Allium cernuum?					
Viol papi					
Frag Vig.					
Myosotis					

Page ..... of .....

Super patchy... This area a Complex of FOD w/(CUT / Thicket) SWT

Substantial Canopy dom dieoff.

Wetter & more open than Poly 003

Canopy closure assessment when leaves are out

ELC COMMUNITY DESCRIPTION & CLASSIFICATION	SITE:		POLYGON:	
	SURVEYOR(S):	DATE:	TIME: start	
			finish	
	UTMZ:	UTME:	UTMN:	

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
G TERRESTRIAL G WETLAND G AQUATIC	G ORGANIC G MINERAL SOIL G PARENT MIN. G ACIDIC BEDRK. G BASIC BEDRK. G CARB. BEDRK.	G LACUSTRINE G RIVERINE G BOTTOMLAND G TERRACE G VALLEY SLOPE G TABLELAND G ROLL. UPLAND G CLIFF G TALUS G CREVICE / CAVE G ALVAR G ROCKLAND G BEACH / BAR G SAND DUNE G BLUFF	G NATURAL G CULTURAL	G PLANKTON G SUBMERGED G FLOATING-LVD. G GRAMINOID G FORB G LICHEN G BRYOPHYTE G DECIDUOUS G CONIFEROUS G MIXED	G LAKE G POND G RIVER G STREAM G MARSH G SWAMP G FEN G BOG G BARREN G MEADOW G PRAIRIE G THICKET G SAVANNAH G WOODLAND G FOREST G PLANTATION
SITE G OPEN WATER G SHALLOW WATER G SURFICIAL DEP. G BEDROCK			**COVER** G OPEN G SHRUB G TREED		

STAND DESCRIPTION:

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (up to 4 sp) (>> MUCH GREATER THAN; > GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY			
2	SUB-CANOPY			
3	UNDERSTOREY			
4	GRD. LAYER			

HT CODES: 1 = >25 m 2 = 10<HT 25 m 3 = 2<HT 10 m 4 = 1<HT 2 m 5 = 0.5<HT 1 m 6 = 0.2<HT 0.5 m 7 = HT<0.2 m

CVR CODES 0= NONE 1= 0% < CVR 10% 2= 10 < CVR 25% 3= 25 < CVR 60% 4= CVR > 60%

STAND COMPOSITION:	BA:

SIZE CLASS ANALYSIS:		< 10		10 - 24		25 - 50		> 50
STANDING SNAGS:		< 10		10 - 24		25 - 50		> 50
DEADFALL / LOGS:		< 10		10 - 24		25 - 50		> 50

ABUNDANCE CODES: N = NONE R = RARE O = OCCASIONAL A = ABUNDANT

COMM. AGE :		PIONEER		YOUNG		MID-AGE		MATURE		OLD GROWTH

SOIL ANALYSIS:

TEXTURE:	DEPTH TO MOTTLES / GLEY	g =	G=
MOISTURE:	DEPTH OF ORGANICS:		(cm)
HOMOGENEOUS / VARIABLE	DEPTH TO BEDROCK:		(cm)

COMMUNITY CLASSIFICATION:

		ELC CODE
COMMUNITY CLASS:		
COMMUNITY SERIES:		
ECOSITE:		
VEGETATION TYPE:		
INCLUSION		
COMPLEX		

Notes:

ELC STAND CHARACTERISTICS	SITE:
	POLYGON:
	DATE:
	SURVEYOR(S):

TREE TALLY BY SPECIES:

PRISM FACTOR

SPECIES	TALLY 1	TALLY 2	TALLY 3	TALLY 4	TALLY 5	TOTAL	REL. AVG
TOTAL							100
BASAL AREA (BA)							
DEAD							

STAND COMPOSITION:

COMMUNITY PROFILE DIAGRAM

Notes:

ELC

SOILS ONTARIO

SITE:
POLYGON:
DATE:
SURVEYOR(S):

Slope UTM

	P/A	PP	Dr	Position	Aspect	%	Type	Class	Z	EASTING	NORTHING
1											
2											
3											
4											
5											

SOIL	1	2	3	4	5
TEXTURE x HORIZON					
A TEXTURE					
COURSE FRAGMENTS					
B TEXTURE					
COURSE FRAGMENTS					
C TEXTURE					
COURSE FRAGMENTS					
EFFECTIVE TEXTURE					
SURFACE STONINESS					
SURFACE ROCKINESS					
DEPTH TO / OF					
MOTTLES					
GLEY					
BEDROCK					
WATER TABLE					
CARBONATES					
DEPTH OF ORGANICS					
PORE SIZE DISC #1					
PORE SIZE DISC #2					
MOISTURE REGIME					
SOIL SURVEY MAP					
LEGEND CLASS					

SA

LINBB02

ELC PLANT SPECIES LIST

SITE: Thunder Waters
POLYGON: 0506005
DATE: May 06/15
SURVEYOR(S): DW + ZH

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER

ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.
Salix sp					
Over ash					
Pinu syl	R				
Yellow flowered shrub					X
Corn sp					

SPECIES CODE	LAYER 1	2	3	4	COL.
Carex spp					
Sy[illegible] milkweed					
Potentilla					
Juncus sp.					

Lrgly dead

Not Flowe

Dead trees. (photos)

N

ELC COMMUNITY DESCRIPTION & CLASSIFICATION	SITE:		POLYGON:	
	SURVEYOR(S):	DATE:	TIME: start	
			finish	
	UTMZ:	UTME:	UTMN:	

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
G TERRESTRIAL G WETLAND G AQUATIC	G ORGANIC G MINERAL SOIL G PARENT MIN. G ACIDIC BEDRK. G BASIC BEDRK. G CARB. BEDRK.	G LACUSTRINE G RIVERINE G BOTTOMLAND G TERRACE G VALLEY SLOPE G TABLELAND G ROLL. UPLAND G CLIFF G TALUS G CREVICE / CAVE G ALVAR G ROCKLAND G BEACH / BAR G SAND DUNE G BLUFF	G NATURAL G CULTURAL	G PLANKTON G SUBMERGED G FLOATING-LVD. G GRAMINOID G FORB G LICHEN G BRYOPHYTE G DECIDUOUS G CONIFEROUS G MIXED	G LAKE G POND G RIVER G STREAM G MARSH G SWAMP G FEN G BOG G BARREN G MEADOW G PRAIRIE G THICKET G SAVANNAH G WOODLAND G FOREST G PLANTATION
SITE G OPEN WATER G SHALLOW WATER G SURFICIAL DEP. G BEDROCK			**COVER** G OPEN G SHRUB G TREED		

STAND DESCRIPTION:

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (up to 4 sp) (>> MUCH GREATER THAN; > GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY			
2	SUB-CANOPY			
3	UNDERSTOREY			
4	GRD. LAYER			

HT CODES: 1 = >25 m 2 = 10<HT 25 m 3 = 2<HT 10 m 4 = 1<HT 2 m 5 = 0.5<HT 1 m 6 = 0.2<HT 0.5 m 7 = HT<0.2 m

CVR CODES 0= NONE 1= 0% < CVR 10% 2= 10 < CVR 25% 3= 25 < CVR 60% 4= CVR > 60%

STAND COMPOSITION:	BA:

SIZE CLASS ANALYSIS:		< 10		10 - 24		25 - 50		> 50
STANDING SNAGS:		< 10		10 - 24		25 - 50		> 50
DEADFALL / LOGS:		< 10		10 - 24		25 - 50		> 50

ABUNDANCE CODES: N = NONE R = RARE O = OCCASIONAL A = ABUNDANT

COMM. AGE :		PIONEER		YOUNG		MID-AGE		MATURE		OLD GROWTH

SOIL ANALYSIS:

TEXTURE:	DEPTH TO MOTTLES / GLEY	g =	G=
MOISTURE:	DEPTH OF ORGANICS:		(cm)
HOMOGENEOUS / VARIABLE	DEPTH TO BEDROCK:		(cm)

COMMUNITY CLASSIFICATION:

		ELC CODE
COMMUNITY CLASS:		
COMMUNITY SERIES:		
ECOSITE:		
VEGETATION TYPE:		
INCLUSION		
COMPLEX		

Notes:

ELC STAND CHARACTERISTICS	SITE:
	POLYGON:
	DATE:
	SURVEYOR(S):

TREE TALLY BY SPECIES:

PRISM FACTOR

SPECIES	TALLY 1	TALLY 2	TALLY 3	TALLY 4	TALLY 5	TOTAL	REL. AVG
TOTAL							100
BASAL AREA (BA)							
DEAD							

STAND COMPOSITION:

COMMUNITY PROFILE DIAGRAM

Notes:

FOD

ELC

SOILS ONTARIO

SITE:
POLYGON:
DATE:
SURVEYOR(S):

	P/A	PP	Dr	Position	Aspect	Slope %	Type	Class	Z	UTM EASTING	UTM NORTHING
1											
2											
3											
4											
5											

SOIL	1	2	3	4	5
TEXTURE x HORIZON	SL A / B	CL 65cm C			
A TEXTURE					
COURSE FRAGMENTS					
B TEXTURE					
COURSE FRAGMENTS					
C TEXTURE					
COURSE FRAGMENTS					
EFFECTIVE TEXTURE					
SURFACE STONINESS					
SURFACE ROCKINESS					
DEPTH TO / OF MOTTLES	10cm				
GLEY	30cm				
BEDROCK	45cm				
WATER TABLE					
CARBONATES					
DEPTH OF ORGANICS					
PORE SIZE DISC #1					
PORE SIZE DISC #2					
MOISTURE REGIME					
SOIL SURVEY MAP					
LEGEND CLASS					

Pin oak
OAKS ? Elm
+Hickory
swamp?

Acersacch

Slough forest

Prev coll.

BEECH Hay leaves.

HAWO
PRBWO
NOFL

AMTOsea

CHFR

SPPE GRTR

TUVU x2

NOLF

Coyote Scat
Raccoon Scat

Slough

ELC PLANT SPECIES LIST

SITE: Thundering Waters
POLYGON: 05 Polygon 6
DATE: May 6, 2015
SURVEYOR(S): Jrt, Dkl.

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER
ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.
Pin oak	O				
Bur oak	O				
White oak	O				
Elm spp.	O				
Fras pens			A	A	
Acer x freei	O				
Carya ovata					
Popu trem.					
Prunus avium					
AMELRBU					X
Fagus grand.			A		
Carp caroliniana					
Quer rubra					
Tilia amer.					
Acer saccharum					
Beech leaves.					
Amelanchier	sapling (check)				
Ribes sp	Cano				X
Spicebush.					
Prunus pub.					
Malus sp. (Orchard tree)					
Toxico radi.					
Parth vit.					
Rubus glandi					
Lonicera tata					
Corn rugo.					
Rubus idaeus					
Prun virg.					
Grass sp			A		

SPECIES CODE	LAYER 1	2	3	4	COL.
Frag Virg					
Solid cana					
Podophyll					
Trout lily (Yellow)					
Car mac					
Alli zeti					
Carex sp					
Trillium sp					
Blue violet					
Claytonia virg					
Dentaria heterophy					
Cardamine douglassii					
Ethyrium filix-femina					
Arisaem triphy					
Carex sp				X	
Onoclea sen.					
Agrimoni gryp.					
Rubus allegheniensis					
Trillium triflorum					
Beech drops.					
Claytonia caroliniana					
Epilobium sp					
Cicuta mac.					
Waldesteinia sp					X
Oxalis sp					
Maian canad.					
Streptopus	Rosy twisted stalk ??				
Taraxacum					

CARDEN Red Virginia

CARDIPU

Blanda

Page ..... of .....

Oak-Hickory Fresh-Moist FOD

ELC
COMMUNITY DESCRIPTION & CLASSIFICATION

SITE:		POLYGON:	
SURVEYOR(S):	DATE:	TIME: start	
		finish	
UTMZ:	UTME:	UTMN:	

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
G TERRESTRIAL	G ORGANIC	G LACUSTRINE	G NATURAL	G PLANKTON	G LAKE
G WETLAND	G MINERAL SOIL	G RIVERINE	G CULTURAL	G SUBMERGED	G POND
G AQUATIC	G PARENT MIN.	G BOTTOMLAND		G FLOATING-LVD.	G RIVER
	G ACIDIC BEDRK.	G TERRACE		G GRAMINOID	G STREAM
	G BASIC BEDRK.	G VALLEY SLOPE		G FORB	G MARSH
	G CARB. BEDRK.	G TABLELAND		G LICHEN	G SWAMP
		G ROLL. UPLAND		G BRYOPHYTE	G FEN
		G CLIFF		G DECIDUOUS	G BOG
		G TALUS		G CONIFEROUS	G BARREN
		G CREVICE / CAVE		G MIXED	G MEADOW
		G ALVAR			G PRAIRIE
		G ROCKLAND			G THICKET
		G BEACH / BAR			G SAVANNAH
		G SAND DUNE			G WOODLAND
		G BLUFF			G FOREST
					G PLANTATION
SITE			**COVER**		
G OPEN WATER			G OPEN		
G SHALLOW WATER			G SHRUB		
G SURFICIAL DEP.			G TREED		
G BEDROCK					

STAND DESCRIPTION:

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (up to 4 sp) (>> MUCH GREATER THAN; > GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY			
2	SUB-CANOPY			
3	UNDERSTOREY			
4	GRD. LAYER			

HT CODES: 1 = >25 m 2 = 10<HT 25 m 3 = 2<HT 10 m 4 = 1<HT 2 m 5 = 0.5<HT 1 m 6 = 0.2<HT 0.5 m 7 = HT<0.2 m

CVR CODES 0= NONE 1= 0% < CVR 10% 2= 10 < CVR 25% 3= 25 < CVR 60% 4= CVR > 60%

STAND COMPOSITION:	BA:

SIZE CLASS ANALYSIS:		< 10		10 - 24		25 - 50		> 50
STANDING SNAGS:		< 10		10 - 24		25 - 50		> 50
DEADFALL / LOGS:		< 10		10 - 24		25 - 50		> 50

ABUNDANCE CODES: N = NONE R = RARE O = OCCASIONAL A = ABUNDANT

COMM. AGE :		PIONEER		YOUNG		MID-AGE		MATURE	OLD GROWTH

SOIL ANALYSIS:

TEXTURE:	DEPTH TO MOTTLES / GLEY	g =	G=
MOISTURE:	DEPTH OF ORGANICS:		(cm)
HOMOGENEOUS / VARIABLE	DEPTH TO BEDROCK:		(cm)

COMMUNITY CLASSIFICATION:

		ELC CODE
COMMUNITY CLASS:		
COMMUNITY SERIES:		
ECOSITE:		
VEGETATION TYPE:		
INCLUSION		
COMPLEX		

Notes:

ELC
STAND CHARACTERISTICS

SITE:
POLYGON:
DATE:
SURVEYOR(S):

TREE TALLY BY SPECIES:

PRISM FACTOR

SPECIES	TALLY 1	TALLY 2	TALLY 3	TALLY 4	TALLY 5	TOTAL	REL. AVG
TOTAL							100
BASAL AREA (BA)							
DEAD							

STAND COMPOSITION:

COMMUNITY PROFILE DIAGRAM

Notes:

ELC

SOILS ONTARIO

SITE:
POLYGON:
DATE:
SURVEYOR(S):

	P/A	PP	Dr	Position	Aspect	Slope %	Type	Class	Z	UTM EASTING	UTM NORTHING
1											
2											
3											
4											
5											

SOIL	1	2	3	4	5
TEXTURE x HORIZON					
A TEXTURE					
COURSE FRAGMENTS					
B TEXTURE					
COURSE FRAGMENTS					
C TEXTURE					
COURSE FRAGMENTS					
EFFECTIVE TEXTURE					
SURFACE STONINESS					
SURFACE ROCKINESS					
DEPTH TO / OF					
MOTTLES					
GLEY					
BEDROCK					
WATER TABLE					
CARBONATES					
DEPTH OF ORGANICS					
PORE SIZE DISC #1					
PORE SIZE DISC #2					
MOISTURE REGIME					
SOIL SURVEY MAP					
LEGEND CLASS					

Blue heron Flooby

RBlvo

SPPES audible to east

RWBL

SA

ELC PLANT SPECIES LIST

SITE: Thundering waters
POLYGON: 0506807
DATE: May 6, 2015
SURVEYOR(S): RH, KW

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER

ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.
Acer sacc	R				
Corn seri					
Corn race					

SPECIES CODE	LAYER 1	2	3	4	COL.
Purple loosestrife					
Galium sp					
Ranunculus sp					
Floating aquatic veg < 10%					
Iris versicolor					
Carex spp					
Alisma plant-repeatia					
Lemna					
Carex stricta (?)					
Scirpus sp					
Asclep incarn					

Sloughs

ELC COMMUNITY DESCRIPTION & CLASSIFICATION	SITE:		POLYGON:	
	SURVEYOR(S):	DATE:	TIME: start	
			finish	
	UTMZ:	UTME:	UTMN:	

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
G TERRESTRIAL G WETLAND G AQUATIC	G ORGANIC G MINERAL SOIL G PARENT MIN. G ACIDIC BEDRK. G BASIC BEDRK. G CARB. BEDRK.	G LACUSTRINE G RIVERINE G BOTTOMLAND G TERRACE G VALLEY SLOPE G TABLELAND G ROLL. UPLAND G CLIFF G TALUS G CREVICE / CAVE G ALVAR G ROCKLAND G BEACH / BAR G SAND DUNE G BLUFF	G NATURAL G CULTURAL	G PLANKTON G SUBMERGED G FLOATING-LVD. G GRAMINOID G FORB G LICHEN G BRYOPHYTE G DECIDUOUS G CONIFEROUS G MIXED	G LAKE G POND G RIVER G STREAM G MARSH G SWAMP G FEN G BOG G BARREN G MEADOW G PRAIRIE G THICKET G SAVANNAH G WOODLAND G FOREST G PLANTATION
SITE G OPEN WATER G SHALLOW WATER G SURFICIAL DEP. G BEDROCK			**COVER** G OPEN G SHRUB G TREED		

STAND DESCRIPTION:

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (up to 4 sp) (>> MUCH GREATER THAN; > GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY			
2	SUB-CANOPY			
3	UNDERSTOREY			
4	GRD. LAYER			

HT CODES: 1 = >25 m 2 = 10<HT 25 m 3 = 2<HT 10 m 4 = 1<HT 2 m 5 = 0.5<HT 1 m 6 = 0.2<HT 0.5 m 7 = HT<0.2 m

CVR CODES 0= NONE 1= 0% < CVR 10% 2= 10 < CVR 25% 3= 25 < CVR 60% 4= CVR > 60%

STAND COMPOSITION:	BA:

SIZE CLASS ANALYSIS:		< 10		10 - 24		25 - 50		> 50
STANDING SNAGS:		< 10		10 - 24		25 - 50		> 50
DEADFALL / LOGS:		< 10		10 - 24		25 - 50		> 50

ABUNDANCE CODES: N = NONE R = RARE O = OCCASIONAL A = ABUNDANT

COMM. AGE :		PIONEER		YOUNG		MID-AGE		MATURE		OLD GROWTH

SOIL ANALYSIS:

TEXTURE:	DEPTH TO MOTTLES / GLEY	g =	G=
MOISTURE:	DEPTH OF ORGANICS:		(cm)
HOMOGENEOUS / VARIABLE	DEPTH TO BEDROCK:		(cm)

COMMUNITY CLASSIFICATION:

		ELC CODE
COMMUNITY CLASS:		
COMMUNITY SERIES:		
ECOSITE:		
VEGETATION TYPE:		
INCLUSION		
COMPLEX		

Notes:

ELC STAND CHARACTERISTICS	SITE:
	POLYGON:
	DATE:
	SURVEYOR(S):

TREE TALLY BY SPECIES:

PRISM FACTOR

SPECIES	TALLY 1	TALLY 2	TALLY 3	TALLY 4	TALLY 5	TOTAL	REL. AVG
TOTAL							100
BASAL AREA (BA)							
DEAD							

STAND COMPOSITION:

COMMUNITY PROFILE DIAGRAM

Notes:

ELC

SOILS ONTARIO

SITE:
POLYGON:
DATE:
SURVEYOR(S):

	P/A	PP	Dr	Position	Aspect	Slope %	Type	Class	Z	UTM EASTING	UTM NORTHING
1											
2											
3											
4											
5											

SOIL	1	2	3	4	5
TEXTURE x HORIZON					
A TEXTURE					
COURSE FRAGMENTS					
B TEXTURE					
COURSE FRAGMENTS					
C TEXTURE					
COURSE FRAGMENTS					
EFFECTIVE TEXTURE					
SURFACE STONINESS					
SURFACE ROCKINESS					
DEPTH TO / OF					
MOTTLES					
GLEY					
BEDROCK					
WATER TABLE					
CARBONATES					
DEPTH OF ORGANICS					
PORE SIZE DISC #1					
PORE SIZE DISC #2					
MOISTURE REGIME					
SOIL SURVEY MAP					
LEGEND CLASS					

ELC

PLANT SPECIES LIST

SITE: Thundering waters
POLYGON: 05-062 OOB
DATE: May 6/15
SURVEYOR(S): ZH IDW

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER

ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.
ACEXFRE	A	A	O		
FRXPENN	A	A	A	A	
QUEELIP	O	O			
ULMAMER		O	O		
QUERUBR?					
PRUSERO		R			
CARAVAT	R				
QUEMAGR					
CRAPUNC					
CORSERI					
ROSA-SP					
PRUVIR					
RHACATH					
VIBLENT			O		
CrabApple			O		
RUBIDAE			A		
CRAT-SP			A		
LON-SP TATA			A		
AMEARBO			O		
RIB smooth			O		
RUBALLE					
CORRACE					
SPIALBA					
MAL-SP					

SPECIES CODE	LAYER 1	2	3	4	COL.
AGRGRYP					
RUB. Red.					
OSMSENS					
GERM-SP					
TAROFFI					
POT-SP					
TOXVIRG					
SOL-SP					
FRAVIRG					
CARBLAN?					C previously
ARITRIP					
ERYAMER					
CIRLUTE					
CICMACU					
CAR-SP					

ELC
COMMUNITY DESCRIPTION & CLASSIFICATION

SITE:		POLYGON:	
SURVEYOR(S):	DATE:	TIME: start / finish	
UTMZ:	UTME:	UTMN:	

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
✓ TERRESTRIAL	G ORGANIC	G LACUSTRINE	✓ NATURAL	G PLANKTON	G LAKE
G WETLAND	✓ MINERAL SOIL	G RIVERINE	G CULTURAL	G SUBMERGED	G POND
G AQUATIC	G PARENT MIN.	G BOTTOMLAND		G FLOATING-LVD.	G RIVER
	G ACIDIC BEDRK.	G TERRACE		G GRAMINOID	G STREAM
SITE	G BASIC BEDRK.	G VALLEY SLOPE		G FORB	G MARSH
	G CARB. BEDRK.	✓ TABLELAND		G LICHEN	G SWAMP
G OPEN WATER		G ROLL. UPLAND		G BRYOPHYTE	G FEN
G SHALLOW WATER		G CLIFF	COVER	✓ DECIDUOUS	G BOG
✓ SURFICIAL DEP.		G TALUS		G CONIFEROUS	G BARREN
G BEDROCK		G CREVICE / CAVE	G OPEN	G MIXED	G MEADOW
		G ALVAR	G SHRUB		G PRAIRIE
		G ROCKLAND	✓ TREED		G THICKET
		G BEACH / BAR			G SAVANNAH
		G SAND DUNE			G WOODLAND
		G BLUFF			✓ FOREST
					G PLANTATION

STAND DESCRIPTION:

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (up to 4 sp) (>> MUCH GREATER THAN; > GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY		4	
2	SUB-CANOPY		4	
3	UNDERSTOREY		4	
4	GRD. LAYER		2	

HT CODES: 1 = >25 m 2 = 10<HT 25 m 3 = 2<HT 10 m 4 = 1<HT 2 m 5 = 0.5<HT 1 m 6 = 0.2<HT 0.5 m 7 = HT<0.2 m

CVR CODES 0= NONE 1= 0% < CVR 10% 2= 10 < CVR 25% 3= 25 < CVR 60% 4= CVR > 60%

STAND COMPOSITION:	BA:

SIZE CLASS ANALYSIS:	A	< 10	A	10 - 24	R	25 - 50	N	> 50
STANDING SNAGS:	O	< 10	R	10 - 24	N	25 - 50	N	> 50
DEADFALL / LOGS:		< 10		10 - 24		25 - 50		> 50

ABUNDANCE CODES: N = NONE R = RARE O = OCCASIONAL A = ABUNDANT

COMM. AGE :		PIONEER		YOUNG	X	MID-AGE		MATURE		OLD GROWTH

SOIL ANALYSIS:

TEXTURE:	DEPTH TO MOTTLES / GLEY	g =	G=
MOISTURE:	DEPTH OF ORGANICS:		(cm)
HOMOGENEOUS / VARIABLE	DEPTH TO BEDROCK:		(cm)

COMMUNITY CLASSIFICATION:

		ELC CODE
COMMUNITY CLASS:		
COMMUNITY SERIES:		
ECOSITE:		
VEGETATION TYPE:		
INCLUSION		
COMPLEX		

Notes:

ELC
STAND CHARACTERISTICS

SITE:	
POLYGON:	
DATE:	
SURVEYOR(S):	

TREE TALLY BY SPECIES:

PRISM FACTOR

SPECIES	TALLY 1	TALLY 2	TALLY 3	TALLY 4	TALLY 5	TOTAL	REL. AVG
TOTAL							100
BASAL AREA (BA)							
DEAD							

STAND COMPOSITION:

COMMUNITY PROFILE DIAGRAM

Notes:

ELC

SOILS ONTARIO

SITE:
POLYGON:
DATE:
SURVEYOR(S):

	P/A	PP	Dr	Position	Aspect	Slope %	Slope Type	Slope Class	Z	UTM EASTING	UTM NORTHING
1											
2											
3											
4											
5											

SOIL	1	2	3	4	5
TEXTURE x HORIZON	L / SiCL				
A TEXTURE	Loam				
COURSE FRAGMENTS	NA				
B TEXTURE	SiCL				
COURSE FRAGMENTS	NA				
C TEXTURE					
COURSE FRAGMENTS					
EFFECTIVE TEXTURE					
SURFACE STONINESS					
SURFACE ROCKINESS					
DEPTH TO / OF MOTTLES	20cm				
GLEY	NA				
BEDROCK					
WATER TABLE	NA 765				
CARBONATES					
DEPTH OF ORGANICS					
PORE SIZE DISC #1					
PORE SIZE DISC #2					
MOISTURE REGIME					
SOIL SURVEY MAP					
LEGEND CLASS					

405

ELC PLANT SPECIES LIST

SITE: thundering waters
POLYGON: 05-06-804
DATE: May 6/15
SURVEYOR(S): ZH/DW

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER

ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.
THUOCC	D	O			
QUERUB		O			
CARCAR		O			
QUEMAC	R				
ULMAME		O	O		
TILAME	R				
PRUSER	R				
FAGGRA	R	O	A		
OSTVIR		O			
QUERUB	A				
QUEALB	R				
ACESACS	R				
ACERUB	O				
FRAAME	R				
VACSTAM?			R		
PRUVIR			A		
RUBPUB			O		
LINBOR			O		
ROS-SP			O		
RUBIDAE			O		
BARTHUN			R		
LONTATA			O		

SPECIES CODE	LAYER 1	2	3	4	COL.
FRAAME				A	
CARSP				D	
FRAVIRG				A	
TRIGRAN				O	
GERMAN				O	
POT-SP				O	
POPBELT				O	
ONOSENS				A	
Clumped seed				R	
RANACRE				R	
EQUARVE					

Page ..... of .....

ELC
COMMUNITY DESCRIPTION & CLASSIFICATION

SITE:		POLYGON:	
SURVEYOR(S):	DATE:	TIME: start / finish	
UTMZ:	UTME:	UTMN:	

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
G TERRESTRIAL G WETLAND G AQUATIC	G ORGANIC G MINERAL SOIL G PARENT MIN. G ACIDIC BEDRK. G BASIC BEDRK. G CARB. BEDRK.	G LACUSTRINE G RIVERINE G BOTTOMLAND G TERRACE G VALLEY SLOPE G TABLELAND G ROLL. UPLAND G CLIFF G TALUS G CREVICE / CAVE G ALVAR G ROCKLAND G BEACH / BAR G SAND DUNE G BLUFF	G NATURAL G CULTURAL	G PLANKTON G SUBMERGED G FLOATING-LVD. G GRAMINOID G FORB G LICHEN G BRYOPHYTE G DECIDUOUS G CONIFEROUS G MIXED	G LAKE G POND G RIVER G STREAM G MARSH G SWAMP G FEN G BOG G BARREN G MEADOW G PRAIRIE G THICKET G SAVANNAH G WOODLAND G FOREST G PLANTATION
SITE G OPEN WATER G SHALLOW WATER G SURFICIAL DEP. G BEDROCK			**COVER** G OPEN G SHRUB G TREED		

STAND DESCRIPTION:

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (up to 4 sp) (>> MUCH GREATER THAN; > GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY			
2	SUB-CANOPY			
3	UNDERSTOREY			
4	GRD. LAYER			

HT CODES: 1 = >25 m 2 = 10<HT 25 m 3 = 2<HT 10 m 4 = 1<HT 2 m 5 = 0.5<HT 1 m 6 = 0.2<HT 0.5 m 7 = HT<0.2 m

CVR CODES 0= NONE 1= 0% < CVR 10% 2= 10 < CVR 25% 3= 25 < CVR 60% 4= CVR > 60%

STAND COMPOSITION:	BA:

SIZE CLASS ANALYSIS:		< 10		10 - 24		25 - 50		> 50
STANDING SNAGS:		< 10		10 - 24		25 - 50		> 50
DEADFALL / LOGS:		< 10		10 - 24		25 - 50		> 50

ABUNDANCE CODES: N = NONE R = RARE O = OCCASIONAL A = ABUNDANT

COMM. AGE :		PIONEER		YOUNG		MID-AGE		MATURE		OLD GROWTH

SOIL ANALYSIS:

TEXTURE:	DEPTH TO MOTTLES / GLEY	g =	G=
MOISTURE:	DEPTH OF ORGANICS:		(cm)
HOMOGENEOUS / VARIABLE	DEPTH TO BEDROCK:		(cm)

COMMUNITY CLASSIFICATION:

		ELC CODE
COMMUNITY CLASS:		
COMMUNITY SERIES:		
ECOSITE:		
VEGETATION TYPE:		
INCLUSION		
COMPLEX		

Notes:

ELC
STAND CHARACTERISTICS

SITE:	
POLYGON:	
DATE:	
SURVEYOR(S):	

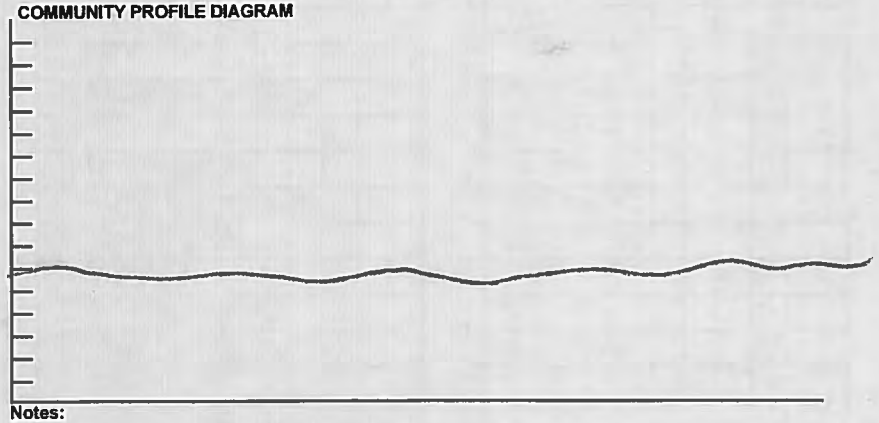
TREE TALLY BY SPECIES:

PRISM FACTOR

SPECIES	TALLY 1	TALLY 2	TALLY 3	TALLY 4	TALLY 5	TOTAL	REL. AVG
TOTAL							100
BASAL AREA (BA)							
DEAD							

STAND COMPOSITION:

COMMUNITY PROFILE DIAGRAM



Notes:

SC05 - soil core

ELC SOILS ONTARIO	SITE:
	POLYGON:
	DATE:
	SURVEYOR(S):

	P/A	PP	Dr	Position	Aspect	Slope %	Slope Type	Slope Class	Z	UTM EASTING	UTM NORTHING
1											
2											
3											
4											
5											

SOIL	1	2	3	4	5
TEXTURE x HORIZON					
A TEXTURE					
COURSE FRAGMENTS					
B TEXTURE					
COURSE FRAGMENTS					
C TEXTURE					
COURSE FRAGMENTS					
EFFECTIVE TEXTURE					
SURFACE STONINESS					
SURFACE ROCKINESS					
DEPTH TO / OF					
MOTTLES					
GLEY					
BEDROCK					
WATER TABLE					
CARBONATES					
DEPTH OF ORGANICS					
PORE SIZE DISC #1					
PORE SIZE DISC #2					
MOISTURE REGIME					
SOIL SURVEY MAP					
LEGEND CLASS					

salix exigua

only cattails

ELC PLANT SPECIES LIST	SITE: thundering waters
	POLYGON: Ditch 05-06-10
	DATE: 05/06
	SURVEYOR(S): DW + ZH

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER

ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	LAYER 2	LAYER 3	LAYER 4	COL.	SPECIES CODE	LAYER 1	LAYER 2	LAYER 3	LAYER 4	COL.
FRXPENN		O				FRAVIRG				A	
ULMAMER						TRIF-SP				A	
ACEXFRE						SOL SP					
SAL FRAG						SOLGRIS					
POPDELT						AGRGRYP					
						LYTSALI					
						DAUCARO					
						TUSFARF					
						VIC-SP					
						PHRAUST					
Crab APPLE											
TOXRADI											
JUNVIRG											
PRUVIRI											
Salix-SP											
CORSERI											
CORRACE											
ROS-SP											

nemorali

GBHE.

Page .... of ....

ELC COMMUNITY DESCRIPTION & CLASSIFICATION	SITE:		POLYGON:	
	SURVEYOR(S):	DATE:	TIME. start	
			finish	
	UTMZ:	UTME:	UTMN:	

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
G TERRESTRIAL G WETLAND G AQUATIC	G ORGANIC G MINERAL SOIL G PARENT MIN. G ACIDIC BEDRK. G BASIC BEDRK. G CARB. BEDRK.	G LACUSTRINE G RIVERINE G BOTTOMLAND G TERRACE G VALLEY SLOPE G TABLELAND G ROLL. UPLAND G CLIFF G TALUS G CREVICE / CAVE G ALVAR G ROCKLAND G BEACH / BAR G SAND DUNE G BLUFF	G NATURAL G CULTURAL	G PLANKTON G SUBMERGED G FLOATING-LVD. G GRAMINOID G FORB G LICHEN G BRYOPHYTE G DECIDUOUS G CONIFEROUS G MIXED	G LAKE G POND G RIVER G STREAM G MARSH G SWAMP G FEN G BOG G BARREN G MEADOW G PRAIRIE G THICKET G SAVANNAH G WOODLAND G FOREST G PLANTATION
SITE G OPEN WATER G SHALLOW WATER G SURFICIAL DEP. G BEDROCK			**COVER** G OPEN G SHRUB G TREED		

STAND DESCRIPTION:

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (up to 4 sp) (>> MUCH GREATER THAN; > GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY			
2	SUB-CANOPY			
3	UNDERSTOREY			
4	GRD. LAYER			

HT CODES: 1 = >25 m 2 = 10<HT 25 m 3 = 2<HT 10 m 4 = 1<HT 2 m 5 = 0.5<HT 1 m 6 = 0.2<HT 0.5 m 7 = HT<0.2 m

CVR CODES 0= NONE 1= 0% < CVR 10% 2= 10 < CVR 25% 3= 25 < CVR 60% 4= CVR > 60%

STAND COMPOSITION:	BA:

SIZE CLASS ANALYSIS:		< 10		10 - 24		25 - 50		> 50
STANDING SNAGS:		< 10		10 - 24		25 - 50		> 50
DEADFALL / LOGS:		< 10		10 - 24		25 - 50		> 50

ABUNDANCE CODES: N = NONE R = RARE O = OCCASIONAL A = ABUNDANT

COMM. AGE :		PIONEER		YOUNG		MID-AGE		MATURE		OLD GROWTH

SOIL ANALYSIS:

TEXTURE:	DEPTH TO MOTTLES / GLEY	g =	G=
MOISTURE:	DEPTH OF ORGANICS:		(cm)
HOMOGENEOUS / VARIABLE	DEPTH TO BEDROCK:		(cm)

COMMUNITY CLASSIFICATION:

		ELC CODE
COMMUNITY CLASS:		
COMMUNITY SERIES:		
ECOSITE:		
VEGETATION TYPE:		
INCLUSION		
COMPLEX		

Notes:

ELC STAND CHARACTERISTICS	SITE:
	POLYGON:
	DATE:
	SURVEYOR(S):

TREE TALLY BY SPECIES:

PRISM FACTOR

SPECIES	TALLY 1	TALLY 2	TALLY 3	TALLY 4	TALLY 5	TOTAL	REL. AVG
TOTAL							100
BASAL AREA (BA)							
DEAD							

STAND COMPOSITION:

COMMUNITY PROFILE DIAGRAM

Notes:

Oldfield Rd. walkout

ELC

SOILS ONTARIO

SITE:
POLYGON:
DATE:
SURVEYOR(S):

	P/A	PP	Dr	Position	Aspect	Slope %	Type	Class	Z	UTM EASTING	UTM NORTHING
1											
2											
3											
4											
5											

SOIL	1	2	3	4	5
TEXTURE x HORIZON					
A TEXTURE					
COURSE FRAGMENTS					
B TEXTURE					
COURSE FRAGMENTS					
C TEXTURE					
COURSE FRAGMENTS					
EFFECTIVE TEXTURE					
SURFACE STONINESS					
SURFACE ROCKINESS					
DEPTH TO / OF					
MOTTLES					
GLEY					
BEDROCK					
WATER TABLE					
CARBONATES					
DEPTH OF ORGANICS					
PORE SIZE DISC #1					
PORE SIZE DISC #2					
MOISTURE REGIME					
SOIL SURVEY MAP					
LEGEND CLASS					

ELC PLANT SPECIES LIST

SITE: Thundering waters
POLYGON: 05-06-011
DATE: 05/06/15
SURVEYOR(S): DW/ZH

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER

ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.
FRXPENN			D		
QUEELIP	A	D			
ACESPRE	A				
ULMRUBR?		O			
QUEMAGR	R				
PRUAVIU			R		
PRUSERO		R	R		
ACESASA					
ULMAMER					
TOXRADI			A		
SPIALBA			O		
LINBENZ			O		
CRA-SP			A		
MALPUMI			R		
RUBIDAE			A		
CORRACE			D		
ROSA-SP			O		
RIB-SP			O		
CRAPUN/CRUS		A	A		
LONTATA			O		
PRUVIR			A		
RHACATH			O		

SPECIES CODE	LAYER 1	2	3	4	COL.
THUOCCI					
POT-SP					
ARITRIF					
TRIGRAN					
FRAVIRG					
ERIANNER					
POPDELT					
CIRLUTE					
STRROSE?					
CLAYUIFO					
ALLPETI					
AGRGRYP					
SOL-SP					
ATHFELI					

Page ..... of .....

ELC COMMUNITY DESCRIPTION & CLASSIFICATION	SITE		POLYGON:	
	SURVEYOR(S)	DATE:	TIME. start	
			finish	
	UTMZ:	UTME:	UTMN	

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
G TERRESTRIAL X WETLAND ? G AQUATIC	G ORGANIC X MINERAL SOIL G PARENT MIN. G ACIDIC BEDRK. G BASIC BEDRK. G CARB. BEDRK.	G LACUSTRINE G RIVERINE G BOTTOMLAND G TERRACE G VALLEY SLOPE X TABLELAND G ROLL. UPLAND G CLIFF G TALUS G CREVICE / CAVE G ALVAR G ROCKLAND G BEACH / BAR G SAND DUNE G BLUFF	X NATURAL G CULTURAL	G PLANKTON G SUBMERGED G FLOATING-LVD. G GRAMINOID G FORB G LICHEN G BRYOPHYTE X DECIDUOUS G CONIFEROUS G MIXED	G LAKE G POND G RIVER G STREAM G MARSH X SWAMP G FEN G BOG G BARREN G MEADOW G PRAIRIE G THICKET G SAVANNAH G WOODLAND X FOREST G PLANTATION
SITE G OPEN WATER G SHALLOW WATER X SURFICIAL DEP. G BEDROCK			**COVER** G OPEN G SHRUB X TREED		

STAND DESCRIPTION:

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (up to 4 sp) (>> MUCH GREATER THAN; > GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY	2	4	QUE RUB > ACE SAC > FRX PEN
2	SUB-CANOPY	3		~~ACE SAC~~ FRX > CRAT-SP
3	UNDERSTOREY	4		ACE SAC FRX > CRAT-SP
4	GRD. LAYER	5-7		

HT CODES: 1 = >25 m 2 = 10<HT 25 m 3 = 2<HT 10 m 4 = 1<HT 2 m 5 = 0.5<HT 1 m 6 = 0.2<HT 0.5 m 7 = HT<0.2 m

CVR CODES 0= NONE 1= 0% < CVR 10% 2= 10 < CVR 25% 3= 25 < CVR 60% 4= CVR > 60%

STAND COMPOSITION:	BA:

		< 10		10 - 24		25 - 50		> 50
SIZE CLASS ANALYSIS:	A		A		O		R	
STANDING SNAGS:					O		N	
DEADFALL / LOGS:					A			

ABUNDANCE CODES: N = NONE R = RARE O = OCCASIONAL A = ABUNDANT

COMM. AGE :		PIONEER		YOUNG	X	MID-AGE		MATURE		OLD GROWTH

SOIL ANALYSIS:

TEXTURE:	DEPTH TO MOTTLES / GLEY	g =	G=
MOISTURE:	DEPTH OF ORGANICS:		(cm)
HOMOGENEOUS / VARIABLE	DEPTH TO BEDROCK:		(cm)

COMMUNITY CLASSIFICATION:

		ELC CODE
COMMUNITY CLASS:		
COMMUNITY SERIES:		
ECOSITE:		
VEGETATION TYPE:		
INCLUSION		
COMPLEX		

Notes:

ELC STAND CHARACTERISTICS	SITE:
	POLYGON:
	DATE:
	SURVEYOR(S):

TREE TALLY BY SPECIES:

PRISM FACTOR

SPECIES	TALLY 1	TALLY 2	TALLY 3	TALLY 4	TALLY 5	TOTAL	REL. AVG
TOTAL							100
BASAL AREA (BA)							
DEAD							

STAND COMPOSITION:

COMMUNITY PROFILE DIAGRAM

Notes:

ELC SOILS ONTARIO	SITE: POLYGON: DATE: SURVEYOR(S):

	P/A	PP	Dr	Position	Aspect	Slope %	Slope Type	Slope Class	UTM Z	UTM EASTING	UTM NORTHING
1											
2											
3											
4											
5											

SOIL	1	2	3	4	5
TEXTURE x HORIZON					
A TEXTURE					
COURSE FRAGMENTS					
B TEXTURE					
COURSE FRAGMENTS					
C TEXTURE					
COURSE FRAGMENTS					
EFFECTIVE TEXTURE					
SURFACE STONINESS					
SURFACE ROCKINESS					
DEPTH TO / OF					
MOTTLES					
GLEY					
BEDROCK					
WATER TABLE					
CARBONATES					
DEPTH OF ORGANICS					
PORE SIZE DISC #1					
PORE SIZE DISC #2					
MOISTURE REGIME					
SOIL SURVEY MAP					
LEGEND CLASS					

ELC PLANT SPECIES LIST	SITE: thunderingwaters POLYGON: 05-06-01B DATE: 05/06 SURVEYOR(S): ZH /DW

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER

ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	LAYER 2	LAYER 3	LAYER 4	COL.
FRXPENN	A		A	A	
ACEXFRE	O				
QUEELIP (palustris)	R				
PARINSE					
CORRACE	A		A		D?
AMEL-SP					
MALPUMI					
RIB_smooth					
TOXRADI					
LINBENZ			R		
RHACATH		O			
Tall Rose					
CRAT-SP		A			
RUBIDAE					
VIBLENT					
PRUVIVI					
SPI ALBA					

SPECIES CODE	LAYER 1	LAYER 2	LAYER 3	LAYER 4	COL.
TOXVIRG					
FRAVIRG					
SOL-SP					
GEUM-S					
TRIGRAN					
ONOSENS					
IRIVERS					SL
ARITRIP					
RANARBU					
PRUnella					

Page .... of ....

ELC COMMUNITY DESCRIPTION & CLASSIFICATION	SITE:		POLYGON:	
	SURVEYOR(S):	DATE:	TIME: start / finish	
	UTMZ:	UTME:	UTMN:	

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
G TERRESTRIAL G WETLAND G AQUATIC	G ORGANIC G MINERAL SOIL G PARENT MIN. G ACIDIC BEDRK. G BASIC BEDRK. G CARB. BEDRK.	G LACUSTRINE G RIVERINE G BOTTOMLAND G TERRACE G VALLEY SLOPE G TABLELAND G ROLL. UPLAND G CLIFF G TALUS G CREVICE / CAVE G ALVAR G ROCKLAND G BEACH / BAR G SAND DUNE G BLUFF	G NATURAL G CULTURAL	G PLANKTON G SUBMERGED G FLOATING-LVD. G GRAMINOID G FORB G LICHEN G BRYOPHYTE G DECIDUOUS G CONIFEROUS G MIXED	G LAKE G POND G RIVER G STREAM G MARSH G SWAMP G FEN G BOG G BARREN G MEADOW G PRAIRIE G THICKET G SAVANNAH G WOODLAND G FOREST G PLANTATION
SITE G OPEN WATER G SHALLOW WATER G SURFICIAL DEP. G BEDROCK			**COVER** G OPEN G SHRUB G TREED		

STAND DESCRIPTION:

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (up to 4 sp) (>> MUCH GREATER THAN; > GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY			
2	SUB-CANOPY			
3	UNDERSTOREY			CRAT. CORNUS ? RHAMNUS
4	GRD. LAYER			

HT CODES: 1 = >25 m 2 = 10<HT 25 m 3 = 2<HT 10 m 4 = 1<HT 2 m 5 = 0.5<HT 1 m 6 = 0.2<HT 0.5 m 7 = HT<0.2 m

CVR CODES 0= NONE 1= 0% < CVR 10% 2= 10 < CVR 25% 3= 25 < CVR 60% 4= CVR > 60%

STAND COMPOSITION:	BA:

SIZE CLASS ANALYSIS:		< 10		10 - 24		25 - 50		> 50
STANDING SNAGS:		< 10		10 - 24		25 - 50		> 50
DEADFALL / LOGS:		< 10		10 - 24		25 - 50		> 50

ABUNDANCE CODES: N = NONE R = RARE O = OCCASIONAL A = ABUNDANT

COMM. AGE :		PIONEER		YOUNG		MID-AGE		MATURE		OLD GROWTH

SOIL ANALYSIS:

TEXTURE:	DEPTH TO MOTTLES / GLEY	g =	G=
MOISTURE:	DEPTH OF ORGANICS:		(cm)
HOMOGENEOUS / VARIABLE	DEPTH TO BEDROCK:		(cm)

COMMUNITY CLASSIFICATION:

		ELC CODE
COMMUNITY CLASS:		
COMMUNITY SERIES:		
ECOSITE:		
VEGETATION TYPE:		
INCLUSION		
COMPLEX		

Notes:

ELC STAND CHARACTERISTICS	SITE:
	POLYGON:
	DATE:
	SURVEYOR(S):

TREE TALLY BY SPECIES:

PRISM FACTOR:

SPECIES	TALLY 1	TALLY 2	TALLY 3	TALLY 4	TALLY 5	TOTAL	REL. AVG
TOTAL							100
BASAL AREA (BA)							
DEAD							

STAND COMPOSITION:

COMMUNITY PROFILE DIAGRAM

Notes:

ELC

SOILS ONTARIO

SITE:
POLYGON:
DATE:
SURVEYOR(S):

Slope | UTM

	P/A	PP	Dr	Position	Aspect	%	Type	Class	Z	EASTING	NORTHING
1											
2											
3											
4											
5											

SOIL	1	2	3	4	5
TEXTURE x HORIZON	A / B	Soil core 6			
A TEXTURE	CLoam				
COURSE FRAGMENTS					
B TEXTURE	Si CL				
COURSE FRAGMENTS					
C TEXTURE					
COURSE FRAGMENTS					
EFFECTIVE TEXTURE					
SURFACE STONINESS					
SURFACE ROCKINESS					
DEPTH TO / OF					
MOTTLES	15cm				
GLEY	30cm				
BEDROCK					
WATER TABLE	45cm				
CARBONATES					
DEPTH OF ORGANICS					
PORE SIZE DISC #1					
PORE SIZE DISC #2					
MOISTURE REGIME					
SOIL SURVEY MAP					
LEGEND CLASS					

0cm
9cm
50cm

AMEROB?
Brown cow
Yellow Warbler
AMEROB
Song sparrow
Baltimore
Chickadee
AMGO3
FISP?

Floodplain
Thicket

ELC
PLANT SPECIES LIST

SITE: Thunderbird waters
POLYGON: 05-08013
DATE: May 08 2015
SURVEYOR(S): DW & KB

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER
ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.
Frax Penn	R				
ULM AME	R				
POP DELT	O				
PRUNA EAS	O				Prev
QUER RUB	R				
RIBE AME			R		
CRAT SP.			O		
VITIS RIP			R		
LONI TAT			O		
RHAM CAT			A		
Rosa sp.			R		
PEW VIR			O		
COR SERI			R		
CORN RACE			R		

SPECIES CODE	LAYER 1	2	3	4	COL.
ASTER SP				O	
TARA OFF				O	
VICA MIN				R	
FRAG VIR				O	
TOXI DEN				R	
AGRI GRIP				O	
TROUT LILY				R	
CIRC LUTE				O	
ALI PETI				O	
INCLUSION					
RHAM CAT			A		
SALI SP	R				
FRAX PENN	A				
CORN RACE			A		
CORN SERI			A		

Dogwood dominant

30-40% cover

* yellow glands discovered

Standing water

ELC
COMMUNITY DESCRIPTION & CLASSIFICATION

SITE:		POLYGON:	
SURVEYOR(S):	DATE:	TIME. start / finish	
UTMZ.	UTME.	UTMN.	

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
G TERRESTRIAL	G ORGANIC	G LACUSTRINE	G NATURAL	G PLANKTON	G LAKE
G WETLAND	G MINERAL SOIL	G RIVERINE	G CULTURAL	G SUBMERGED	G POND
G AQUATIC	G PARENT MIN.	G BOTTOMLAND		G FLOATING-LVD.	G RIVER
	G ACIDIC BEDRK.	G TERRACE		G GRAMINOID	G STREAM
	G BASIC BEDRK.	G VALLEY SLOPE		G FORB	G MARSH
	G CARB. BEDRK.	G TABLELAND		G LICHEN	G SWAMP
SITE		G ROLL. UPLAND	COVER	G BRYOPHYTE	G FEN
		G CLIFF		G DECIDUOUS	G BOG
G OPEN WATER		G TALUS	G OPEN	G CONIFEROUS	G BARREN
G SHALLOW WATER		G CREVICE / CAVE	G SHRUB	G MIXED	G MEADOW
G SURFICIAL DEP.		G ALVAR	G TREED		G PRAIRIE
G BEDROCK		G ROCKLAND			G THICKET
		G BEACH / BAR			G SAVANNAH
		G SAND DUNE			G WOODLAND
		G BLUFF			G FOREST
					G PLANTATION

SWT
LD Standing water in inclusion.

STAND DESCRIPTION:

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (up to 4 sp) (>> MUCH GREATER THAN; > GREATER THAN; = ABOUT EQUAL TO)	
1	CANOPY		2	FRAX ≥ PRUN SP ≥ POP DELT	20%
2	SUB-CANOPY		3		50%
3	UNDERSTOREY				55%
4	GRD. LAYER				

HT CODES: 1 = >25 m 2 = 10<HT 25 m 3 = 2<HT 10 m 4 = 1<HT 2 m 5 = 0.5<HT 1 m 6 = 0.2<HT 0.5 m 7 = HT<0.2 m

CVR CODES 0= NONE 1= 0% < CVR 10% 2= 10 < CVR 25% 3= 25 < CVR 60% 4= CVR > 60%

STAND COMPOSITION:	BA:

SIZE CLASS ANALYSIS:		< 10		10 - 24		25 - 50		> 50
STANDING SNAGS:		< 10		10 - 24		25 - 50		> 50
DEADFALL / LOGS:		< 10		10 - 24		25 - 50		> 50

ABUNDANCE CODES: N = NONE R = RARE O = OCCASIONAL A = ABUNDANT

COMM. AGE :		PIONEER		YOUNG		MID-AGE		MATURE		OLD GROWTH

SOIL ANALYSIS:

TEXTURE:	DEPTH TO MOTTLES / GLEY	g =	G=
MOISTURE:	DEPTH OF ORGANICS:		(cm)
HOMOGENEOUS / VARIABLE	DEPTH TO BEDROCK:		(cm)

COMMUNITY CLASSIFICATION:

		ELC CODE
COMMUNITY CLASS:		
COMMUNITY SERIES:		
ECOSITE:		
VEGETATION TYPE:		SWT
INCLUSION		
COMPLEX		

Notes:

Shrub layer dominant

ELC
SOILS ONTARIO

SITE:
POLYGON:
DATE:
SURVEYOR(S):

	P/A	PP	Dr	Position	Aspect	Slope %	Type	Class	Z	UTM EASTING	UTM NORTHING
1											
2											
3											
4											
5											

SOIL	1	2	3	4	5
TEXTURE x HORIZON					
A TEXTURE					
COURSE FRAGMENTS					
B TEXTURE					
COURSE FRAGMENTS					
C TEXTURE					
COURSE FRAGMENTS					
EFFECTIVE TEXTURE					
SURFACE STONINESS					
SURFACE ROCKINESS					
DEPTH TO / OF					
MOTTLES					
GLEY					
BEDROCK					
WATER TABLE					
CARBONATES					
DEPTH OF ORGANICS					
PORE SIZE DISC #1					
PORE SIZE DISC #2					
MOISTURE REGIME					
SOIL SURVEY MAP					
LEGEND CLASS					

Cut bird

ELC
PLANT SPECIES LIST

SITE: THUNDERING WATERS
POLYGON: 05-15-13
DATE: MAY 15, 2015
SURVEYOR(S): KR, ZH

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER

ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.
Ulm Ame	O				
FRAX PENN	A				
MALU PUMI	R	R			
CRAT PLAT					
CRAT SP.		O			
POPU TRE				R	
Quer rubr.				R	
Quer Ellip					
	R				
ALI ANG			R	R	
VIC CRAC				R	
VIB			R		
CORNSER			R		
RUB IDE			R		
PARTH VIT			O	O	
RHAM CAT			A	A	
CORN RACE			A		
LONI TAT			O		
PRUN VIRG			O		

SPECIES CODE	LAYER 1	2	3	4	COL.
TARA OFF				O	
SYMPH N-A				R	
FRAG VIR				A	
VIC OPU				O	
Geum Sp.				O	
Tox Rad				R	
ROSA ROSEA				R	
BRAS NIGRA				R	
Rubb hirt				R	
Aegopodium				O	

Page ..... of .....

ELC COMMUNITY DESCRIPTION & CLASSIFICATION	SITE: Thunderingwaters	POLYGON: 05-15-13
	SURVEYOR(S): KB + ZH	DATE: May 15, 2015
	TIME: start 10:30	finish
	UTMZ:	UTME:
	UTMN:	

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
✓ TERRESTRIAL	G ORGANIC	G LACUSTRINE	G NATURAL	G PLANKTON	G LAKE
G WETLAND	✓ MINERAL SOIL	G RIVERINE	✓ CULTURAL	G SUBMERGED	G POND
G AQUATIC	G PARENT MIN.	G BOTTOMLAND		G FLOATING-LVD.	G RIVER
	G ACIDIC BEDRK.	✓ TERRACE		G GRAMINOID	G STREAM
SITE	G BASIC BEDRK.	G VALLEY SLOPE	**COVER**	G FORB	G MARSH
G OPEN WATER	G CARB. BEDRK.	G TABLELAND	G OPEN	G LICHEN	G SWAMP
G SHALLOW WATER		G ROLL. UPLAND	✓ SHRUB	G BRYOPHYTE	G FEN
✓ SURFICIAL DEP.		G CLIFF	G TREED	G DECIDUOUS	G BOG
G BEDROCK		G TALUS		G CONIFEROUS	G BARREN
		G CREVICE / CAVE		G MIXED	G MEADOW
		G ALVAR			G PRAIRIE
		G ROCKLAND			✓ THICKET
		G BEACH / BAR			G SAVANNAH
		G SAND DUNE			G WOODLAND
		G BLUFF			G FOREST
					G PLANTATION

STAND DESCRIPTION:

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (up to 4 sp) (>> MUCH GREATER THAN; > GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY	1-2	3	FRAX PENN >
2	SUB-CANOPY	3	2	CRAT. > MALUS
3	UNDERSTOREY	4	4	RHA CAT
4	GRD. LAYER	5	2	RHA CAT

HT CODES: 1 = >25 m 2 = 10<HT 25 m 3 = 2<HT 10 m 4 = 1<HT 2 m 5 = 0.5<HT 1 m 6 = 0.2<HT 0.5 m 7 = HT<0.2 m

CVR CODES 0= NONE 1= 0% < CVR 10% 2= 10 < CVR 25% 3= 25 < CVR 60% 4= CVR > 60%

STAND COMPOSITION:								BA:
SIZE CLASS ANALYSIS:	A	< 10	O	10 - 24	O	25 - 50	R	> 50
STANDING SNAGS:		< 10		10 - 24		25 - 50		> 50
DEADFALL / LOGS:		< 10		10 - 24		25 - 50		> 50

ABUNDANCE CODES: N = NONE R = RARE O = OCCASIONAL A = ABUNDANT

COMM. AGE		PIONEER		YOUNG		MID-AGE		MATURE		OLD GROWTH

SOIL ANALYSIS:

TEXTURE:	DEPTH TO MOTTLES / GLEY	g =	G=
MOISTURE:	DEPTH OF ORGANICS:		(cm)
HOMOGENEOUS / VARIABLE	DEPTH TO BEDROCK:		(cm)

COMMUNITY CLASSIFICATION:

		ELC CODE
COMMUNITY CLASS:		
COMMUNITY SERIES:		
ECOSITE:		
VEGETATION TYPE:		CUT
INCLUSION		
COMPLEX		

Notes:

Cardinal (Female)

- ash seem to be dying back → lots of epicormics + very little leaf out at crown, some insect/woodpecker marks on trees.
- wet pockets w some standing water
- less mature/less canopy closer to one side of road.

ELC

SOILS ONTARIO

SITE:
POLYGON:
DATE:
SURVEYOR(S):

	P/A	PP	Dr	Position	Slope Aspect	%	Type	Class	Z	UTM EASTING	UTM NORTHING
1											
2											
3											
4											
5											

SOIL	1	2	3	4	5
TEXTURE x HORIZON					
A TEXTURE					
COURSE FRAGMENTS					
B TEXTURE					
COURSE FRAGMENTS					
C TEXTURE					
COURSE FRAGMENTS					
EFFECTIVE TEXTURE					
SURFACE STONINESS					
SURFACE ROCKINESS					
DEPTH TO / OF					
MOTTLES					
GLEY					
BEDROCK					
WATER TABLE					
CARBONATES					
DEPTH OF ORGANICS					
PORE SIZE DISC #1					
PORE SIZE DISC #2					
MOISTURE REGIME					
SOIL SURVEY MAP					
LEGEND CLASS					

ELC
PLANT SPECIES LIST

SITE: Thundering waters
POLYGON: 05-08-014
DATE: May 08 2015
SURVEYOR(S): DW + KR

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER

ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.
ULM AME					
FRAX PEN					
CORN RACE				O	
RUB IDE				O	
CRAT SP				R	
Shrub SP				O	
SALI SP				O	X

SPECIES CODE	LAYER 1	2	3	4	COL.
DAUC CAR				O	
TARA OFF				O	
PLAN MAJ				O	
SOLI SP				A	
VICI CRA				O	
ASTER SP.				O	
FRAG VIR				O	
VIT RIP				O	
TRIF PRAT				O	
GRASS SP.				A	
EQUI ARV				O	
ASPARAGUS				R	
KILL MIL				O	
AGCL SYR				R	
PARTH VIT				R	

Garden

FISP
Blue Jay
Robin
VIOLA
Rose breasted
Grosbeak

Prunus

ELC
COMMUNITY DESCRIPTION & CLASSIFICATION

SITE:		POLYGON:	
SURVEYOR(S):	DATE:	TIME: start	
		finish	
UTMZ:	UTME:	UTMN:	

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
G TERRESTRIAL	G ORGANIC	G LACUSTRINE	G NATURAL	G PLANKTON	G LAKE
G WETLAND	G MINERAL SOIL	G RIVERINE	G CULTURAL	G SUBMERGED	G POND
G AQUATIC	G PARENT MIN.	G BOTTOMLAND		G FLOATING-LVD.	G RIVER
	G ACIDIC BEDRK.	G TERRACE		G GRAMINOID	G STREAM
	G BASIC BEDRK.	G VALLEY SLOPE		G FORB	G MARSH
	G CARB. BEDRK.	G TABLELAND		G LICHEN	G SWAMP
		G ROLL. UPLAND		G BRYOPHYTE	G FEN
		G CLIFF		G DECIDUOUS	G BOG
		G TALUS		G CONIFEROUS	G BARREN
		G CREVICE / CAVE		G MIXED	G MEADOW
		G ALVAR			G PRAIRIE
		G ROCKLAND			G THICKET
		G BEACH / BAR			G SAVANNAH
		G SAND DUNE			G WOODLAND
		G BLUFF			G FOREST
					G PLANTATION

SITE	COVER
G OPEN WATER	G OPEN
G SHALLOW WATER	G SHRUB
G SURFICIAL DEP.	G TREED
G BEDROCK	

STAND DESCRIPTION:

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (up to 4 sp) (>> MUCH GREATER THAN; > GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY			
2	SUB-CANOPY			
3	UNDERSTOREY			
4	GRD. LAYER			

HT CODES: 1 = >25 m 2 = 10<HT≤25 m 3 = 2<HT 10 m 4 = 1<HT 2 m 5 = 0.5<HT 1 m 6 = 0.2<HT 0.5 m 7 = HT<0.2 m

CVR CODES 0= NONE 1= 0% < CVR 10% 2= 10 < CVR 25% 3= 25 < CVR 60% 4= CVR > 60%

STAND COMPOSITION:	BA:

SIZE CLASS ANALYSIS:		< 10		10 - 24		25 - 50		> 50	
STANDING SNAGS:		< 10		10 - 24		25 - 50		> 50	
DEADFALL / LOGS:		< 10		10 - 24		25 - 50		> 50	

ABUNDANCE CODES: N = NONE R = RARE O = OCCASIONAL A = ABUNDANT

COMM. AGE :		PIONEER		YOUNG		MID-AGE		MATURE		OLD GROWTH

SOIL ANALYSIS:

TEXTURE:	DEPTH TO MOTTLES / GLEY	g =	G=
MOISTURE:	DEPTH OF ORGANICS:		(cm)
HOMOGENEOUS / VARIABLE	DEPTH TO BEDROCK:		(cm)

COMMUNITY CLASSIFICATION:

		ELC CODE
COMMUNITY CLASS:		
COMMUNITY SERIES:		
ECOSITE:		
VEGETATION TYPE:		
INCLUSION		
COMPLEX		

Notes:

ELC

SOILS ONTARIO

SITE:
POLYGON:
DATE:
SURVEYOR(S):

Slope / UTM

	P/A	PP	Dr	Position	Aspect	%	Type	Class	Z	EASTING	NORTHING
1											
2											
3											
4											
5											

SOIL	1	2	3	4	5
TEXTURE x HORIZON					
A TEXTURE					
COURSE FRAGMENTS					
B TEXTURE					
COURSE FRAGMENTS					
C TEXTURE					
COURSE FRAGMENTS					
EFFECTIVE TEXTURE					
SURFACE STONINESS					
SURFACE ROCKINESS					
DEPTH TO / OF					
MOTTLES					
GLEY					
BEDROCK					
WATER TABLE					
CARBONATES					
DEPTH OF ORGANICS					
PORE SIZE DISC #1					
PORE SIZE DISC #2					
MOISTURE REGIME					
SOIL SURVEY MAP					
LEGEND CLASS					

Standing water

Clearing Soggy in Kelly

Yellow warbler

NOLF

~~DRIES~~

BADR (Pair)

RWBB

ELC PLANT SPECIES LIST

SITE: Thundering waters
POLYGON: 05-08-015
DATE: May 08, 2015
SURVEYOR(S): DW, RB

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER

ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.
POPU DELT	D				
FRAX PENN	O				
UNMANE					
RAT SP					
CALI SP					
CORN RACE					
CORN SERI					

SPECIES CODE	LAYER 1	2	3	4	COL.
PARAG				D	
THIF PIRA				O	
FRAG VIR				R	
PLANT MAJ					
FRAX PENN					
TARAOFF					
CRAT SP.					
CORN RACE					

Incl.

(X) Hiking back

ELC
COMMUNITY DESCRIPTION & CLASSIFICATION

SITE:		POLYGON: 05-08-05	
SURVEYOR(S):	DATE:	TIME: start	
		finish:	
UTMZ:	UTME:	UTMN:	

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
G TERRESTRIAL	G ORGANIC	G LACUSTRINE	G NATURAL	G PLANKTON	G LAKE
G WETLAND	G MINERAL SOIL	G RIVERINE	G CULTURAL	G SUBMERGED	G POND
G AQUATIC	G PARENT MIN.	G BOTTOMLAND		G FLOATING-LVD.	G RIVER
	G ACIDIC BEDRK.	G TERRACE		G GRAMINOID	G STREAM
	G BASIC BEDRK.	G VALLEY SLOPE		G FORB	G MARSH
	G CARB. BEDRK.	G TABLELAND		G LICHEN	G SWAMP
		G ROLL. UPLAND		G BRYOPHYTE	G FEN
		G CLIFF		G DECIDUOUS	G BOG
		G TALUS		G CONIFEROUS	G BARREN
		G CREVICE / CAVE		G MIXED	G MEADOW
		G ALVAR			G PRAIRIE
		G ROCKLAND			G THICKET
		G BEACH / BAR			G SAVANNAH
		G SAND DUNE			G WOODLAND
		G BLUFF			G FOREST
					G PLANTATION

SITE	COVER
G OPEN WATER	G OPEN
G SHALLOW WATER	G SHRUB
G SURFICIAL DEP.	G TREED
G BEDROCK	

Phrag marsh in gray dog inclusion

STAND DESCRIPTION:

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (up to 4 sp) (>> MUCH GREATER THAN; > GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY			
2	SUB-CANOPY			
3	UNDERSTOREY			
4	GRD. LAYER			

HT CODES: 1 = >25 m 2 = 10<HT 25 m 3 = 2<HT 10 m 4 = 1<HT 2 m 5 = 0.5<HT 1 m 6 = 0.2<HT 0.5 m 7 = HT<0.2 m

CVR CODES 0= NONE 1= 0% < CVR 10% 2= 10 < CVR 25% 3= 25 < CVR 60% 4= CVR > 60%

STAND COMPOSITION:	BA:

SIZE CLASS ANALYSIS:		< 10		10 - 24		25 - 50		> 50
STANDING SNAGS:		< 10		10 - 24		25 - 50		> 50
DEADFALL / LOGS:		< 10		10 - 24		25 - 50		> 50

ABUNDANCE CODES: N = NONE R = RARE O = OCCASIONAL A = ABUNDANT

COMM. AGE :		PIONEER		YOUNG		MID-AGE		MATURE		OLD GROWTH

SOIL ANALYSIS:

TEXTURE:	DEPTH TO MOTTLES / GLEY	g =	G=
MOISTURE:	DEPTH OF ORGANICS:		(cm)
HOMOGENEOUS / VARIABLE	DEPTH TO BEDROCK:		(cm)

COMMUNITY CLASSIFICATION:

		ELC CODE
COMMUNITY CLASS:		
COMMUNITY SERIES:		
ECOSITE:		
VEGETATION TYPE:		
INCLUSION		
COMPLEX		

Notes:

ELC

SOILS ONTARIO

SITE:

POLYGON:

DATE:

SURVEYOR(S):

Standing water

RWBB west

	P/A	PP	Dr	Position	Aspect	Slope %	Type	Class	Z	UTM EASTING	UTM NORTHING
1											
2											
3											
4											
5											

SOIL	1	2	3	4	5
TEXTURE x HORIZON					
A TEXTURE					
COURSE FRAGMENTS					
B TEXTURE					
COURSE FRAGMENTS					
C TEXTURE					
COURSE FRAGMENTS					
EFFECTIVE TEXTURE					
SURFACE STONINESS					
SURFACE ROCKINESS					
DEPTH TO / OF					
MOTTLES					
GLEY					
BEDROCK					
WATER TABLE					
CARBONATES					
DEPTH OF ORGANICS					
PORE SIZE DISC #1					
PORE SIZE DISC #2					
MOISTURE REGIME					
SOIL SURVEY MAP					
LEGEND CLASS					

ELC

PLANT SPECIES LIST

SITE: Thundering Waters

POLYGON: 05-08-016

DATE: May 08 2015

SURVEYOR(S): DW & KB

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER

ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.
POP DELT	A				
SAL SP	A				
RHAM CAT	O				
CORN SER	O				
LONI TAT	O				

SPECIES CODE	LAYER 1	2	3	4	COL.
PHRAG AUS					

ELC
COMMUNITY DESCRIPTION & CLASSIFICATION

SITE:		POLYGON:	
SURVEYOR(S):	DATE:	TIME: start / finish	
UTMZ:	UTME:	UTMN:	

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
G TERRESTRIAL	G ORGANIC	G LACUSTRINE	G NATURAL	G PLANKTON	G LAKE
G WETLAND	G MINERAL SOIL	G RIVERINE	G CULTURAL	G SUBMERGED	G POND
G AQUATIC	G PARENT MIN.	G BOTTOMLAND		G FLOATING-LVD.	G RIVER
	G ACIDIC BEDRK.	G TERRACE		G GRAMINOID	G STREAM
	G BASIC BEDRK.	G VALLEY SLOPE		G FORB	G MARSH
	G CARB. BEDRK.	G TABLELAND		G LICHEN	G SWAMP
SITE		G ROLL. UPLAND	COVER	G BRYOPHYTE	G FEN
		G CLIFF		G DECIDUOUS	G BOG
G OPEN WATER		G TALUS	G OPEN	G CONIFEROUS	G BARREN
G SHALLOW WATER		G CREVICE / CAVE	G SHRUB	G MIXED	G MEADOW
G SURFICIAL DEP.		G ALVAR	G TREED		G PRAIRIE
G BEDROCK		G ROCKLAND			G THICKET
		G BEACH / BAR			G SAVANNAH
		G SAND DUNE			G WOODLAND
		G BLUFF			G FOREST
					G PLANTATION

STAND DESCRIPTION:

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (up to 4 sp) (>> MUCH GREATER THAN; > GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY			
2	SUB-CANOPY			
3	UNDERSTOREY			
4	GRD. LAYER			

HT CODES: 1 = >25 m 2 = 10<HT 25 m 3 = 2<HT 10 m 4 = 1<HT 2 m 5 = 0.5<HT 1 m 6 = 0.2<HT 0.5 m 7 = HT<0.2 m

CVR CODES 0= NONE 1= 0% < CVR 10% 2= 10 < CVR 25% 3= 25 < CVR 60% 4= CVR > 60%

STAND COMPOSITION:	BA:

SIZE CLASS ANALYSIS:		< 10		10 - 24		25 - 50		> 50
STANDING SNAGS:		< 10		10 - 24		25 - 50		> 50
DEADFALL / LOGS:		< 10		10 - 24		25 - 50		> 50

ABUNDANCE CODES: N = NONE R = RARE O = OCCASIONAL A = ABUNDANT

COMM. AGE :		PIONEER		YOUNG		MID-AGE		MATURE		OLD GROWTH

SOIL ANALYSIS:

TEXTURE:	DEPTH TO MOTTLES / GLEY	g =	G=
MOISTURE:	DEPTH OF ORGANICS:		(cm)
HOMOGENEOUS / VARIABLE	DEPTH TO BEDROCK:		(cm)

COMMUNITY CLASSIFICATION:

		ELC CODE
COMMUNITY CLASS:		
COMMUNITY SERIES:		
ECOSITE:		
VEGETATION TYPE:		
INCLUSION		
COMPLEX		

Notes:

ELC

SOILS ONTARIO

SITE:

POLYGON:

DATE:

SURVEYOR(S):

	P/A	PP	Dr	Position	Aspect	Slope %	Slope Type	Class	Z	UTM EASTING	UTM NORTHING
1											
2											
3											
4											
5											

SOIL	1	2	3	4	5
TEXTURE x HORIZON					
A TEXTURE					
COURSE FRAGMENTS					
B TEXTURE					
COURSE FRAGMENTS					
C TEXTURE					
COURSE FRAGMENTS					
EFFECTIVE TEXTURE					
SURFACE STONINESS					
SURFACE ROCKINESS					
DEPTH TO / OF					
MOTTLES					
GLEY					
BEDROCK					
WATER TABLE					
CARBONATES					
DEPTH OF ORGANICS					
PORE SIZE DISC #1					
PORE SIZE DISC #2					
MOISTURE REGIME					
SOIL SURVEY MAP					
LEGEND CLASS					

Thicket [illegible] higher Shrub varies than poly 16

5% Canopy 10% Sub 85% understory

Gray Categorized

ELC

PLANT SPECIES LIST

SITE: Thundering waters

POLYGON: 05-08-017

DATE: May 08-2015

SURVEYOR(S): DW + KB

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER

ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	LAYER 2	LAYER 3	LAYER 4	COL.
POP DEL	O	[illegible]			
FRAX PENN	O	[illegible]			
PRUNACEA	O	[illegible]			PREV
QUER ELIP	R				
POPU TRE	R				
AME SP.		R			X
RUB IDEA					
ROSA SP					
LONI TAT					
CORN SERI		R			
RHAM CAT		O			
PRUN VIR		O		O	
CORN RACE		D			
CRAT SP		O			

SPECIES CODE	LAYER 1	LAYER 2	LAYER 3	LAYER 4	COL.
AGRI GRIP					
FIR VIR					
Dafodils					
TARA OFF					
ASTER SP					
GRASS SP					
ALI PETI					
GER MACU					
TOXI RAD					
Phrag AUS					
INCLUSION					
QUER MAC	O				
POP TREM	R				
ULM AME	O				
TOXI RAD					
~~ACER SUGER~~					

[illegible]

L 5% canopy cover

higher meadow cover (50%)

Page .... of ....

ELC
COMMUNITY DESCRIPTION & CLASSIFICATION

SITE:		POLYGON:	
SURVEYOR(S):	DATE:	TIME: start	
		finish	
UTMZ:	UTME:	UTMN:	

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
G TERRESTRIAL	G ORGANIC	G LACUSTRINE	G NATURAL	G PLANKTON	G LAKE
G WETLAND	G MINERAL SOIL	G RIVERINE	G CULTURAL	G SUBMERGED	G POND
G AQUATIC	G PARENT MIN.	G BOTTOMLAND		G FLOATING-LVD.	G RIVER
	G ACIDIC BEDRK.	G TERRACE		G GRAMINOID	G STREAM
	G BASIC BEDRK.	G VALLEY SLOPE		G FORB	G MARSH
	G CARB. BEDRK.	G TABLELAND		G LICHEN	G SWAMP
		G ROLL. UPLAND		G BRYOPHYTE	G FEN
		G CLIFF		G DECIDUOUS	G BOG
		G TALUS		G CONIFEROUS	G BARREN
		G CREVICE / CAVE		G MIXED	G MEADOW
		G ALVAR			G PRAIRIE
		G ROCKLAND			G THICKET
		G BEACH / BAR			G SAVANNAH
		G SAND DUNE			G WOODLAND
		G BLUFF			G FOREST
					G PLANTATION
SITE			**COVER**		
G OPEN WATER			G OPEN		
G SHALLOW WATER			G SHRUB		
G SURFICIAL DEP.			G TREED		
G BEDROCK					

STAND DESCRIPTION:

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (up to 4 sp) (>> MUCH GREATER THAN; > GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY			
2	SUB-CANOPY			
3	UNDERSTOREY			
4	GRD. LAYER			

HT CODES: 1 = >25 m 2 = 10<HT 25 m 3 = 2<HT 10 m 4 = 1<HT 2 m 5 = 0.5<HT 1 m 6 = 0.2<HT 0.5 m 7 = HT<0.2 m

CVR CODES 0= NONE 1= 0% < CVR 10% 2= 10 < CVR 25% 3= 25 < CVR 60% 4= CVR > 60%

STAND COMPOSITION:								BA:	
SIZE CLASS ANALYSIS:		< 10		10 - 24		25 - 50		> 50	
STANDING SNAGS:		< 10		10 - 24		25 - 50		> 50	
DEADFALL / LOGS:		< 10		10 - 24		25 - 50		> 50	

ABUNDANCE CODES: N = NONE R = RARE O = OCCASIONAL A = ABUNDANT

COMM. AGE:		PIONEER		YOUNG		MID-AGE		MATURE		OLD GROWTH

SOIL ANALYSIS:

TEXTURE:	DEPTH TO MOTTLES / GLEY	g =	G=
MOISTURE:	DEPTH OF ORGANICS:		(cm)
HOMOGENEOUS / VARIABLE	DEPTH TO BEDROCK:		(cm)

COMMUNITY CLASSIFICATION:

		ELC CODE
COMMUNITY CLASS:		
COMMUNITY SERIES:		
ECOSITE:		
VEGETATION TYPE:		
INCLUSION		
COMPLEX		

Notes:

Add Juniperus Virg. to drain polygon
Can always go back to Poly 17

ELC

SOILS ONTARIO

SITE:
POLYGON:
DATE:
SURVEYOR(S):

	P/A	PP	Dr	Position	Aspect	Slope %	Type	Class	Z	UTM EASTING	UTM NORTHING
1											
2											
3											
4											
5											

SOIL	1	2	3	4	5
TEXTURE x HORIZON	A 12cm / B				
A TEXTURE	CL				
COURSE FRAGMENTS					
B TEXTURE	SiCL				
COURSE FRAGMENTS					
C TEXTURE					
COURSE FRAGMENTS					
EFFECTIVE TEXTURE					
SURFACE STONINESS					
SURFACE ROCKINESS					
DEPTH TO / OF MOTTLES	15cm				
GLEY	N/A				
BEDROCK					
WATER TABLE					
CARBONATES					
DEPTH OF ORGANICS					
PORE SIZE DISC #1					
PORE SIZE DISC #2					
MOISTURE REGIME					
SOIL SURVEY MAP					
LEGEND CLASS					

Soil core 7

65cm

CLW
60% canopy
closure Gartersnake
on path TE10
EAPB
1 predator)
QBWP
Raw kursinkee
LD Blown in
LD mat. LAYS down
dorsal
Deer tracks

ELC PLANT SPECIES LIST

SITE: Thunderbird Waters
POLYGON: 05-003-08
DATE: May 08 2015
SURVEYOR(S): DW & KB

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER
ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.
ACER SUG					
FRA PEN					
OLM AME					
QUER ELIP					
POPU DELT					
PRUN VIR					
RHAM CAT					
RUBI IDA					
CRAT SP					
LONI TAT					
CORN RACE		A			

SPECIES CODE	LAYER 1	2	3	4	COL.
SOLI SP					
ASTR SP					
TARA OFF					
TOXI RAD					
Potentilla SP.					
FRAG VIR					
ARIS TRIF					
CIRS LUTE					
GEUM SP.					
PART VIT					
AGRI GIP					
ONE SENS					
GRASS SP					
TOXAR V.					

ELC COMMUNITY DESCRIPTION & CLASSIFICATION	SITE:		POLYGON:	
	SURVEYOR(S):	DATE:	TIME: start	
			finish	
	UTMZ:	UTME:	UTMN:	

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
G TERRESTRIAL	G ORGANIC	G LACUSTRINE	G NATURAL	G PLANKTON	G LAKE
G WETLAND	G MINERAL SOIL	G RIVERINE	G CULTURAL	G SUBMERGED	G POND
G AQUATIC	G PARENT MIN.	G BOTTOMLAND		G FLOATING-LVD.	G RIVER
	G ACIDIC BEDRK.	G TERRACE		G GRAMINOID	G STREAM
	G BASIC BEDRK.	G VALLEY SLOPE		G FORB	G MARSH
	G CARB. BEDRK.	G TABLELAND		G LICHEN	G SWAMP
		G ROLL. UPLAND		G BRYOPHYTE	G FEN
		G CLIFF		G DECIDUOUS	G BOG
		G TALUS		G CONIFEROUS	G BARREN
		G CREVICE / CAVE		G MIXED	G MEADOW
		G ALVAR			G PRAIRIE
		G ROCKLAND			G THICKET
		G BEACH / BAR			G SAVANNAH
		G SAND DUNE			G WOODLAND
		G BLUFF			G FOREST
					G PLANTATION

SITE	COVER
G OPEN WATER	G OPEN
G SHALLOW WATER	G SHRUB
G SURFICIAL DEP.	G TREED
G BEDROCK	

STAND DESCRIPTION:

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (up to 4 sp) (>> MUCH GREATER THAN; > GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY			
2	SUB-CANOPY			
3	UNDERSTOREY			
4	GRD. LAYER			

HT CODES: 1 = >25 m 2 = 10<HT 25 m 3 = 2<HT 10 m 4 = 1<HT 2 m 5 = 0.5<HT 1 m 6 = 0.2<HT 0.5 m 7 = HT<0.2 m

CVR CODES 0= NONE 1= 0% < CVR 10% 2= 10 < CVR 25% 3= 25 < CVR 60% 4= CVR > 60%

STAND COMPOSITION:	BA:

SIZE CLASS ANALYSIS:		< 10		10 - 24		25 - 50		> 50
STANDING SNAGS:		< 10		10 - 24		25 - 50		> 50
DEADFALL / LOGS:		< 10		10 - 24		25 - 50		> 50

ABUNDANCE CODES: N = NONE R = RARE O = OCCASIONAL A = ABUNDANT

COMM. AGE		PIONEER		YOUNG		MID-AGE		MATURE		OLD GROWTH

SOIL ANALYSIS:

TEXTURE:	DEPTH TO MOTTLES / GLEY	g =	G=
MOISTURE:	DEPTH OF ORGANICS:		(cm)
HOMOGENEOUS / VARIABLE	DEPTH TO BEDROCK:		(cm)

COMMUNITY CLASSIFICATION:

		ELC CODE
COMMUNITY CLASS:		
COMMUNITY SERIES:		
ECOSITE:		
VEGETATION TYPE:		
INCLUSION		
COMPLEX		

Notes:

Red tail Hawk Raccoon scat
Chorus frogs calling
Dragonflies

WTSP

FOD

ELC
SOILS ONTARIO

SITE:
POLYGON:
DATE:
SURVEYOR(S):

Slope UTM

	P/A	PP	Dr	Position	Aspect	%	Type	Class	Z	EASTING	NORTHING
1											
2											
3											
4											
5											

SOIL	1	2	3	4	5
TEXTURE x HORIZON					
A TEXTURE					
COURSE FRAGMENTS					
B TEXTURE					
COURSE FRAGMENTS					
C TEXTURE					
COURSE FRAGMENTS					
EFFECTIVE TEXTURE					
SURFACE STONINESS					
SURFACE ROCKINESS					
DEPTH TO / OF					
MOTTLES					
GLEY					
BEDROCK					
WATER TABLE					
CARBONATES					
DEPTH OF ORGANICS					
PORE SIZE DISC #1					
PORE SIZE DISC #2					
MOISTURE REGIME					
SOIL SURVEY MAP					
LEGEND CLASS					

Deer tracks
- Similar to FOD sign on May 06
ROBIN
Species of Shrubby Understory
Water

NOCA
Edge effects
Present in patches & direct sunlight reaching understory

Landing

Water

ELC
PLANT SPECIES LIST

SITE:
POLYGON: 05-08-019
DATE: May 5th or 8th?
SURVEYOR(S): DW & KB

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER
ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.
PRUN SP					PREV
FRA X PEN					
ULM AME					
ACER SUG	R				
ACER SACA	R				
QUER ELIP	O				
QUER RUB	O				
QUER MAC	R			R	
CARY OVA	O				
PRUN SER					
CARP CAR	R				
TILI AME	R				
RIBES SP					PREV
LIND BENZ			OA		
RAT GRAND			R		
(*) RIBES SP					
AMEL SP					
RUB ALEG			R		
RUB IDE			O		
PRUN VIR			O		
RHAM CAT			O		

SPECIES CODE	LAYER 1	2	3	4	COL.
CARE SP				O	
POPO BELT				R	
PARTH VIT				O	
FRAG VIR				R	
AGRI GRIP				O	
ASTER SP				O	
TOXI RAD				R	
CRIS LUTE				O	
TOVARA V.				R	
TROUT lily				O	
ARIS TRIF				R	
GER MAC				O	
ONE SENS				R	
CLAY CAR				R	
Ali Peti				R	
VIRG waterleaf				R	
CLAY VIR				R	
PHRAG AUS				R	
(*) THAL SP					

Page ..... of .....

Gray Squirrel
Deer Skull found & Bones
(*) - Northern Flicker
- Path cleared for a hydro corridor.

(Δ) Sharp spine at node
(*) Small not flowering

(*) No yellow glands, weak prickles/hairs & weak spines, hairy leaf

ELC COMMUNITY DESCRIPTION & CLASSIFICATION	SITE:		POLYGON: 05-08-19	
	SURVEYOR(S):	DATE:	TIME: start	
			finish	
	UTMZ:	UTME:	UTMN:	

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
G TERRESTRIAL	G ORGANIC	G LACUSTRINE	G NATURAL	G PLANKTON	G LAKE
G WETLAND	G MINERAL SOIL	G RIVERINE	G CULTURAL	G SUBMERGED	G POND
G AQUATIC	G PARENT MIN.	G BOTTOMLAND		G FLOATING-LVD	G RIVER
	G ACIDIC BEDRK.	G TERRACE		G GRAMINOID	G STREAM
SITE	G BASIC BEDRK.	G VALLEY SLOPE		G FORB	G MARSH
	G CARB. BEDRK.	G TABLELAND		G LICHEN	G SWAMP
G OPEN WATER		G ROLL. UPLAND	COVER	G BRYOPHYTE	G FEN
G SHALLOW WATER		G CLIFF		G DECIDUOUS	G BOG
G SURFICIAL DEP		G TALUS	G OPEN	G CONIFEROUS	G BARREN
G BEDROCK		G CREVICE / CAVE	G SHRUB	G MIXED	G MEADOW
		G ALVAR	G TREED		G PRAIRIE
		G ROCKLAND			G THICKET
		G BEACH / BAR			G SAVANNAH
		G SAND DUNE			G WOODLAND
		G BLUFF			G FOREST
					G PLANTATION

STAND DESCRIPTION:

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (up to 4 sp) (>> MUCH GREATER THAN; > GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY			
2	SUB-CANOPY			
3	UNDERSTOREY			
4	GRD. LAYER			

HT CODES: 1 = >25 m 2 = 10<HT 25 m 3 = 2<HT 10 m 4 = 1<HT≤2 m 5 = 0.5<HT 1 m 6 = 0.2<HT 0.5 m 7 = HT<0.2 m

CVR CODES 0= NONE 1= 0% < CVR 10% 2= 10 < CVR 25% 3= 25 < CVR 60% 4= CVR > 60%

STAND COMPOSITION:	BA:

SIZE CLASS ANALYSIS:		< 10		10 - 24		25 - 50		> 50
STANDING SNAGS:		< 10		10 - 24		25 - 50		> 50
DEADFALL / LOGS:		< 10		10 - 24		25 - 50		> 50

ABUNDANCE CODES: N = NONE R = RARE O = OCCASIONAL A = ABUNDANT

COMM. AGE:		PIONEER		YOUNG		MID-AGE		MATURE		OLD GROWTH

SOIL ANALYSIS:

TEXTURE:	DEPTH TO MOTTLES / GLEY	g =	G=
MOISTURE:	DEPTH OF ORGANICS:		(cm)
HOMOGENEOUS / VARIABLE	DEPTH TO BEDROCK:		(cm)

COMMUNITY CLASSIFICATION:

		ELC CODE
COMMUNITY CLASS:		
COMMUNITY SERIES:		
ECOSITE:		
VEGETATION TYPE:		
INCLUSION		
COMPLEX		

Notes:

Same on other side of Rainbow Lake

Near north eastern tip polygon tapers more, shrubs ring around edges.

ELC SOILS ONTARIO	SITE: POLYGON: DATE: SURVEYOR(S):

	P/A	PP	Dr	Position	Aspect	Slope %	Slope Type	Class	Z	UTM EASTING	UTM NORTHING
1											
2											
3											
4											
5											

SOIL	1	2	3	4	5
TEXTURE x HORIZON	A 13cm — B 50cm —	Soil sample 8			
A TEXTURE	CL				
COURSE FRAGMENTS					
B TEXTURE	SiCL				
COURSE FRAGMENTS					
C TEXTURE					
COURSE FRAGMENTS					
EFFECTIVE TEXTURE					
SURFACE STONINESS					
SURFACE ROCKINESS					
DEPTH TO / OF					
MOTTLES	14				
GLEY	N/A				
BEDROCK					
WATER TABLE					
CARBONATES					
DEPTH OF ORGANICS					
PORE SIZE DISC #1					
PORE SIZE DISC #2					
MOISTURE REGIME					
SOIL SURVEY MAP					
LEGEND CLASS					

(T OD) SWT

Swamp forest

Trees greater than 50 cm DBH are rare

5-20 cm DBH Abundant

20-50 cm DBH is occasional

Swamp forest.

Chorus frogs

Spicebush rattle

Alternate 8 Abundant

Pond 8

ELC PLANT SPECIES LIST	SITE: Thundering waters POLYGON: 05-08 G 20 DATE: May 05, 2015 SURVEYOR(S): DW + KB

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER

ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.
POPU DEL	O				
TILI AME	R				
ULM AME	O				
FAGUS	R				
Hybrid/Silver maple					
Quer ELIP	A				
Quer RUB	R				
FRAX PEN	O				
Tree sp					GPS + Photo
CARP CAR					
QUER MAC					
(*) Acer slv / hybrid?					
ULM AME	R				
BARTH VIT				R	
RHAM CAT				R	
RIBES					
Button bush		A			PERN
? wet shrub					X
Shrub sp					X
SPICEBUSH					

SPECIES CODE	LAYER 1	2	3	4	COL.
TRIOT 1.lv				O	
FRAG VIR				R	
GER MAC				O	
SOLI SP				R	
ASTER SP				O	
PODO PELT				O	
ONE SENI				O	
CARD DIGLAS				R	
MIAN CANA				O	
ARIS TRIF				O	
UVULARIA GRAND				R	
DRIOPT SP				R	
lady fern				R	
Sedge sp				R	X
Lg Carex sp				R	
Blue violet				R	
Carex 3				R	X
Ascl Incar				R	X
Carex 4				R	X
Galium sp					X
equis ARV					
CLAY VIR				R	
PRENANTHES SP				R	
Sm Compound lf				R	X
Imp cap ?				R	
ALI PETI				R	
CIRCU MAC				R	
Potamogeton sp				R	
duckweed				R	
RANU ABOR				R	
IRIS SP					

CUT F

- edge
- edge.

Robin + nest w/ eggs.

- Pond 8 sp
- no flowers

- marsh bed straw

- in pond

* large one near pond 8 w DBH > 100 cm

Page 1 of 8

ELC COMMUNITY DESCRIPTION & CLASSIFICATION	SITE:		POLYGON:	
	SURVEYOR(S):	DATE:	TIME: start	
			finish	
	UTMZ:	UTME:	UTMN:	

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
G TERRESTRIAL	G ORGANIC	G LACUSTRINE	G NATURAL	G PLANKTON	G LAKE
G WETLAND	G MINERAL SOIL	G RIVERINE	G CULTURAL	G SUBMERGED	G POND
G AQUATIC	G PARENT MIN.	G BOTTOMLAND		G FLOATING-LVD.	G RIVER
	G ACIDIC BEDRK.	G TERRACE		G GRAMINOID	G STREAM
	G BASIC BEDRK.	G VALLEY SLOPE		G FORB	G MARSH
	G CARB. BEDRK.	G TABLELAND		G LICHEN	G SWAMP
		G ROLL. UPLAND		G BRYOPHYTE	G FEN
		G CLIFF		G DECIDUOUS	G BOG
		G TALUS		G CONIFEROUS	G BARREN
		G CREVICE / CAVE		G MIXED	G MEADOW
		G ALVAR			G PRAIRIE
		G ROCKLAND			G THICKET
		G BEACH / BAR			G SAVANNAH
		G SAND DUNE			G WOODLAND
		G BLUFF			G FOREST
					G PLANTATION

SITE	COVER
G OPEN WATER	G OPEN
G SHALLOW WATER	G SHRUB
G SURFICIAL DEP.	G TREED
G BEDROCK	

Buttonbush + collected shrub - dominant in Pond 8
↳ Revisit Pond 8 later (alot of sp. diversity)

STAND DESCRIPTION:

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (up to 4 sp) (>> MUCH GREATER THAN; > GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY			60-75%
2	SUB-CANOPY			
3	UNDERSTOREY			
4	GRD. LAYER			

HT CODES: 1 = >25 m 2 = 10<HT 25 m 3 = 2<HT 10 m 4 = 1<HT≤2 m 5 = 0.5<HT 1 m 6 = 0.2<HT 0.5 m 7 = HT<0.2 m

CVR CODES 0= NONE 1= 0% < CVR 10% 2= 10 < CVR 25% 3= 25 < CVR 60% 4= CVR > 60%

STAND COMPOSITION:	BA:

SIZE CLASS ANALYSIS:		< 10		10 - 24		25 - 50		> 50
STANDING SNAGS:		< 10		10 - 24		25 - 50		> 50
DEADFALL / LOGS:		< 10		10 - 24		25 - 50		> 50

ABUNDANCE CODES: N = NONE R = RARE O = OCCASIONAL A = ABUNDANT

COMM. AGE:		PIONEER		YOUNG		MID-AGE		MATURE		OLD GROWTH

SOIL ANALYSIS:

TEXTURE:	DEPTH TO MOTTLES / GLEY	g =	G=
MOISTURE:	DEPTH OF ORGANICS:		(cm)
HOMOGENEOUS / VARIABLE	DEPTH TO BEDROCK:		(cm)

COMMUNITY CLASSIFICATION:

		ELC CODE
COMMUNITY CLASS:		
COMMUNITY SERIES:		
ECOSITE:		
VEGETATION TYPE:		
INCLUSION		
COMPLEX		

Notes:

ELC

SOILS ONTARIO

SITE:
POLYGON:
DATE:
SURVEYOR(S):

	P/A	PP	Dr	Position	Aspect	Slope %	Type	Class	Z	UTM EASTING	UTM NORTHING
1											
2											
3											
4											
5											

SOIL	1	2	3	4	5
TEXTURE x HORIZON		A 10cm B 24inch (55-60 cm)			
A TEXTURE		L			
COURSE FRAGMENTS		—			
B TEXTURE		SiCL			
COURSE FRAGMENTS		—			
C TEXTURE					
COURSE FRAGMENTS					
EFFECTIVE TEXTURE					
SURFACE STONINESS					
SURFACE ROCKINESS					
DEPTH TO / OF					
MOTTLES		—			
GLEY		—			
BEDROCK					
WATER TABLE		—			
CARBONATES					
DEPTH OF ORGANICS		1-2cm			
PORE SIZE DISC #1					
PORE SIZE DISC #2					
MOISTURE REGIME					
SOIL SURVEY MAP					
LEGEND CLASS					

1 more upland 1-2 cm organics — deer stand.

ELC PLANT SPECIES LIST

SITE: Thundering Waters
POLYGON: 05-OSL20
DATE: May 05, 2015
SURVEYOR(S): DW + KB

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER

ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.
MAPLE TREE	O				
Silver maple	O				
CARYOVA	R				
Tili cume		R			
muscle wood		R			
beach	O				
along roadside cleared					
Alis plant				R	
equisetum (bore set)				R	
MALA Afinis				R	
Ranunculus sp				R	
Symph NA				R	
Verb sp.				R	
Sali bebb.				R	
Phal arun				R	
erigeron sp				R	
Cirs Vulg				R	
Dorrow Ethril				R	
Dracle mont				R	
staphylleaceae sp				R	
Sali Zizia				R	
Bristly currant				R	

SPECIES CODE	LAYER 1	2	3	4	COL.
TOUARA VI.					
Maple mesopotal					
⊕ Carex TRINERVIS?				R	
*STREPT				R	
Solomn Seal				O	
Osymund Royal				R	✓
Fern Sp osmcesm				R	✓
Sedge sp (sm)				R	✓
lyco cane.				R	
pilea pumi				R	
duckweed				R	
Sparganium sp				⊕	
ambro Trif ?				R	
hier sp.				R	
Carex Vulp				R	
anem Kink				R	
money wort				R	
Juncus sp				R	
Pot symplex				R	
Carex sp				R	✓
lily of the valley family				R	
Poa sp				R	
neckle sp?				R	✓
Hype perf				R	
Thalictrum sp				R	
lettuce sp.				R	
Purple Cress				R	

⊕ Collect later for verification

Epilobium sp (R)
mustard sp (R)
Forb sp. (meadow Sweet like) R ✓

Forest transition boulder beach as you move north from the road line

Scarlet Tanager (Pair) heard singing

Species recorded below one May 15, 2015 but not 24

Roads

Carex project

Lemon Spreadwing

Forest transition boulder beach as you move north from the road line

Scarlet Tanager (Pair) heard singing

Black dots almost Sphagnum or bryophyte

ELC COMMUNITY DESCRIPTION & CLASSIFICATION

SITE: Thundering Waters		POLYGON: 20	
SURVEYOR(S): LB DW & ZH	DATE: May 8th 2015	TIME: start	finish
UTMZ:	UTME:	UTMN:	

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
G TERRESTRIAL	G ORGANIC	G LACUSTRINE	✓ NATURAL	G PLANKTON	G LAKE
→ G WETLAND	G MINERAL SOIL	G RIVERINE	G CULTURAL	G SUBMERGED	G POND
G AQUATIC	G PARENT MIN.	G BOTTOMLAND		G FLOATING-LVD.	G RIVER
	G ACIDIC BEDRK.	G TERRACE		G GRAMINOID	G STREAM
	G BASIC BEDRK.	G VALLEY SLOPE		G FORB	G MARSH
	G CARB. BEDRK.	G TABLELAND		G LICHEN	G SWAMP
		G ROLL. UPLAND		G BRYOPHYTE	G FEN
		G CLIFF		✓ DECIDUOUS	G BOG
		G TALUS		G CONIFEROUS	G BARREN
		G CREVICE / CAVE		G MIXED	G MEADOW
		G ALVAR			G PRAIRIE
		G ROCKLAND			G THICKET
		G BEACH / BAR			G SAVANNAH
		G SAND DUNE			G WOODLAND
		G BLUFF			✓ FOREST
					G PLANTATION

SITE	COVER
G OPEN WATER	G OPEN
G SHALLOW WATER	G SHRUB
G SURFICIAL DEP.	✓ TREED
G BEDROCK	

STAND DESCRIPTION:

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (up to 4 sp) (>> MUCH GREATER THAN; > GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY	1	4	ACER > Oak > beech
2	SUB-CANOPY			
3	UNDERSTOREY	4	3	Spice bush (closer to 60%)
4	GRD. LAYER		3	(closer to 25%)

HT CODES: 1 = >25 m 2 = 10<HT 25 m 3 = 2<HT 10 m 4 = 1<HT 2 m 5 = 0.5<HT 1 m 6 = 0.2<HT 0.5 m 7 = HT<0.2 m

CVR CODES 0= NONE 1= 0% < CVR 10% 2= 10 < CVR 25% 3= 25 < CVR 60% 4= CVR > 60%

STAND COMPOSITION:	BA:

SIZE CLASS ANALYSIS:	A	< 10	A	10 - 24	O	25 - 50	R	> 50
STANDING SNAGS:	R	< 10	R	10 - 24	N	25 - 50	N	> 50
DEADFALL / LOGS:	O	< 10	O	10 - 24	R	25 - 50	N	> 50

ABUNDANCE CODES: N = NONE R = RARE O = OCCASIONAL A = ABUNDANT

COMM. AGE:		PIONEER		YOUNG		MID-AGE	✓	MATURE		OLD GROWTH

SOIL ANALYSIS:

TEXTURE:	DEPTH TO MOTTLES / GLEY	g =	G=
MOISTURE:	DEPTH OF ORGANICS:		(cm)
HOMOGENEOUS / VARIABLE	DEPTH TO BEDROCK:		(cm)

COMMUNITY CLASSIFICATION:

		ELC CODE
COMMUNITY CLASS:		
COMMUNITY SERIES:		
ECOSITE:		
VEGETATION TYPE:		FOD
INCLUSION		
COMPLEX		

Notes:

- Section of Poly 20 is up wetter on Western edge, ~~[illegible]~~
- many pockets of standing water
- lots of construction noise
- becomes more beech maple dominant & more open in the understory in the NW corner

Chehobe

-Polygon 20 may be large enough w enough mast producing sp. to be considered a "Foraging Area w abundant mast".

-Not old enough for old growth

-button bush Swamp (wall) incl(?) if large enough would be an S3 rare habitat.

-12 12" plastic dice along ~~[illegible]~~ ~~[illegible]~~ access road.

ELC

SOILS ONTARIO

SITE:
POLYGON:
DATE:
SURVEYOR(S):

	P/A	PP	Dr	Position	Aspect	Slope %	Type	Class	Z	UTM EASTING	UTM NORTHING
1											
2											
3											
4											
5											

SOIL	1	2	3	4	5
TEXTURE × HORIZON	A (15cm) / B / C (30 inches)	60cm			
A TEXTURE	SL - Fine sandy loam				
COURSE FRAGMENTS	—				
B TEXTURE	SiL				
COURSE FRAGMENTS	—				
C TEXTURE	LvfS				
COURSE FRAGMENTS	—				
EFFECTIVE TEXTURE					
SURFACE STONINESS	—				
SURFACE ROCKINESS					
DEPTH TO / OF					
MOTTLES	—				
GLEY	—				
BEDROCK	—				
WATER TABLE	22-23cm				
CARBONATES					
DEPTH OF ORGANICS	-1cm				
PORE SIZE DISC #1					
PORE SIZE DISC #2					
MOISTURE REGIME					
SOIL SURVEY MAP					
LEGEND CLASS					

Need elevation of Polygon

ELC PLANT SPECIES LIST

SITE: Thunder Waters
POLYGON: 05-15-21
DATE: May 19 2015
SURVEYOR(S): [redacted] ZM RB

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER

ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.
POPU DEL	O				
SALIX SP	O				
Ulm amer	R				
FRAX PENN	R				
Quer EPI				R	
SALI EXIG			R		
PARTH VIT					
SALI BEB			R		✓
VIT OPUL			R		
VIT RIP			R		
FRAN ALN			R		
CORY SER			R		
CORN RACE			A		
CRAT SP.			O		
PRUN VIR			O		
RAT PUN			R		

SPECIES CODE	LAYER 1	2	3	4	COL.
FRAG VIR				A	
Equi ARVE				O	
Plant Lanc				O	
SYMPH LANC				O	
APA OFF				R	
SOL CANA				R	
Lami Amp				R	
Carex brisc				R	?
heliopsis					✓ Helopsis?
mentha arve				R	
Eurthamia gra				R	
trif SP.					
ASCL INC				R	
SALI CAPOSephola				R	
SALI BISCOLOR				R	
JUNO ARTIOSephila				R	?
LICOPUS UNI				R	
TUSS FARF				R	
CRISANTHIMUM SP				O	
TOXI RAD				O	
SYMPH lanc				O	

Page ..... of .....

Crack? Likely smaller than PP data

deer trail + Tracks

Rabbit remains (Scat only) (Photo taken)

1 introduced one

ELC COMMUNITY DESCRIPTION & CLASSIFICATION

SITE: Thundering Waters		POLYGON: 05-15-21	
SURVEYOR(S): KB + ZH	DATE:	TIME: start	
		finish	
UTMZ:	UTME:	UTMN:	

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
✓ TERRESTRIAL	G ORGANIC	G LACUSTRINE	G NATURAL	G PLANKTON	G LAKE
G WETLAND	✓ MINERAL SOIL	G RIVERINE	✓ CULTURAL	G SUBMERGED	G POND
G AQUATIC	G PARENT MIN.	G BOTTOMLAND		G FLOATING-LVD	G RIVER
	G ACIDIC BEDRK.	G TERRACE		G GRAMINOID	G STREAM
	G BASIC BEDRK.	G VALLEY SLOPE		G FORB	✓ MARSH
	G CARB. BEDRK.	G TABLELAND		G LICHEN	✓ SWAMP
SITE		G ROLL. UPLAND	**COVER**	G BRYOPHYTE	G FEN
		G CLIFF		✓ DECIDUOUS	G BOG
G OPEN WATER		G TALUS	G OPEN	G CONIFEROUS	G BARREN
✓ SHALLOW WATER		G CREVICE / CAVE	✓ SHRUB	G MIXED	G MEADOW
✓ SURFICIAL DEP		G ALVAR	G TREED		G PRAIRIE
G BEDROCK		G ROCKLAND			✓ THICKET
		G BEACH / BAR			G SAVANNAH
		G SAND DUNE			G WOODLAND
		G BLUFF			G FOREST
					G PLANTATION

STAND DESCRIPTION:

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (up to 4 sp) (>> MUCH GREATER THAN; > GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY	2	3	POPU DEL = SALIX SP
2	SUB-CANOPY	4	4	RHA CAT = GRN RACE
3	UNDERSTOREY			CRAT SP.
4	GRD. LAYER		4	GRASS DOMINATED (P...)

HT CODES: 1 = >25 m 2 = 10<HT 25 m 3 = 2<HT 10 m 4 = 1<HT≤2 m 5 = 0.5<HT 1 m 6 = 0.2<HT 0.5 m 7 = HT<0.2 m

CVR CODES 0= NONE 1= 0% < CVR 10% 2= 10 < CVR 25% 3= 25 < CVR 60% 4= CVR > 60%

STAND COMPOSITION:	BA:

SIZE CLASS ANALYSIS:		< 10		10 - 24		25 - 50		> 50
STANDING SNAGS:		< 10		10 - 24		25 - 50		> 50
DEADFALL / LOGS:		< 10		10 - 24		25 - 50		> 50

ABUNDANCE CODES: N = NONE R = RARE O = OCCASIONAL A = ABUNDANT

COMM. AGE		PIONEER		YOUNG		MID-AGE		MATURE		OLD GROWTH

SOIL ANALYSIS:

TEXTURE:	DEPTH TO MOTTLES / GLEY	g =	G=
MOISTURE:	DEPTH OF ORGANICS:		(cm)
HOMOGENEOUS / VARIABLE	DEPTH TO BEDROCK:		(cm)

COMMUNITY CLASSIFICATION:

		ELC CODE
COMMUNITY CLASS:		
COMMUNITY SERIES:		
ECOSITE:		
VEGETATION TYPE:	Dec Wood SWT ?	SWT
INCLUSION		
COMPLEX		

Notes:

Standing water in a channel like feature

must have had standing water in spring

- likely mature into a young Pin Oak Swamp.

- Shrubs become more clumped & patchier as you move east

ELC

SOILS ONTARIO

SITE:
POLYGON:
DATE:
SURVEYOR(S):

Slope / UTM

	P/A	PP	Dr	Position	Aspect	%	Type	Class	Z	EASTING	NORTHING
1											
2											
3											
4											
5											

SOIL	1	2	3	4	5
TEXTURE x HORIZON	A				
A TEXTURE	Cl clay loam				
COURSE FRAGMENTS	very few				
B TEXTURE					
COURSE FRAGMENTS					
C TEXTURE					
COURSE FRAGMENTS					
EFFECTIVE TEXTURE					
SURFACE STONINESS					
SURFACE ROCKINESS					
DEPTH TO / OF					
MOTTLES					
GLEY					
BEDROCK					
WATER TABLE					
CARBONATES					
DEPTH OF ORGANICS					
PORE SIZE DISC #1					
PORE SIZE DISC #2					
MOISTURE REGIME					
SOIL SURVEY MAP					
LEGEND CLASS					

24"

Northern Flicker
Ring billed gull
Robin?

ELC PLANT SPECIES LIST

SITE: Thunderbird Waters
POLYGON: 2 05 - 15 - 02
DATE: May 15, 2015
SURVEYOR(S): KAB & ZH

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER

ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.
ULM AME				R	
POPU DELT	R				
JUNI VIR				R	
OLIVE ?			R		✓
CRAT SP			O		
PRUN VIR			·	O	
MALUS SP				R	
CORN SERI			O		
CRAT PUNC?			A		

SPECIES CODE	LAYER 1	2	3	4	COL.
FRAG VIR				O	
CRYSAN				O	
DAU CAR				O	
SYMPH NA				O	
hieracium sp				O	
SOLI GRICILLA				R	
SYSRI MONT				R	
SOLI J.				R	
TRIF SP.				R	
RUBU ARV				R	
Carex Sp					✓
Antirara CANA				R	
Symph euro				R	
Plants Lanc				R	
CAREX FLAVA ?				R	✓
AGRI GRIP				R	
SOLI CANA				R	

Lowbush Cranberry Shrub
remo- ? early
Small Thicket

ELC
COMMUNITY DESCRIPTION & CLASSIFICATION

SITE:		POLYGON: 05-15-22	
SURVEYOR(S):	DATE:	TIME: start	
		finish	
UTMZ:	UTME:	UTMN:	

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
G TERRESTRIAL	G ORGANIC	G LACUSTRINE	G NATURAL	G PLANKTON	G LAKE
G WETLAND	G MINERAL SOIL	G RIVERINE	G CULTURAL	G SUBMERGED	G POND
G AQUATIC	G PARENT MIN.	G BOTTOMLAND		G FLOATING-LVD.	G RIVER
	G ACIDIC BEDRK.	G TERRACE		G GRAMINOID	G STREAM
SITE	G BASIC BEDRK.	G VALLEY SLOPE	COVER	G FORB	G MARSH
G OPEN WATER	G CARB. BEDRK.	G TABLELAND	G OPEN	G LICHEN	G SWAMP
G SHALLOW WATER		G ROLL. UPLAND	G SHRUB	G BRYOPHYTE	G FEN
G SURFICIAL DEP		G CLIFF	G TREED	G DECIDUOUS	G BOG
G BEDROCK		G TALUS		G CONIFEROUS	G BARREN
		G CREVICE / CAVE		G MIXED	G MEADOW
		G ALVAR			G PRAIRIE
		G ROCKLAND			G THICKET
		G BEACH / BAR			G SAVANNAH
		G SAND DUNE			G WOODLAND
		G BLUFF			G FOREST
					G PLANTATION

STAND DESCRIPTION:

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (up to 4 sp) (>> MUCH GREATER THAN; > GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY			
2	SUB-CANOPY			
3	UNDERSTOREY			
4	GRD. LAYER			

HT CODES: 1 = >25 m 2 = 10<HT 25 m 3 = 2<HT 10 m 4 = 1<HT≤2 m 5 = 0.5<HT 1 m 6 = 0.2<HT 0.5 m 7 = HT<0.2 m

CVR CODES 0= NONE 1= 0% < CVR 10% 2= 10 < CVR 25% 3= 25 < CVR 60% 4= CVR > 60%

STAND COMPOSITION:	BA:

SIZE CLASS ANALYSIS:		< 10		10 - 24		25 - 50		> 50
STANDING SNAGS:		< 10		10 - 24		25 - 50		> 50
DEADFALL / LOGS:		< 10		10 - 24		25 - 50		> 50

ABUNDANCE CODES: N = NONE R = RARE O = OCCASIONAL A = ABUNDANT

COMM. AGE		PIONEER		YOUNG		MID-AGE		MATURE		OLD GROWTH

SOIL ANALYSIS:

TEXTURE:	DEPTH TO MOTTLES / GLEY	g =	G=
MOISTURE:	DEPTH OF ORGANICS:		(cm)
HOMOGENEOUS / VARIABLE	DEPTH TO BEDROCK:		(cm)

COMMUNITY CLASSIFICATION:

		ELC CODE
COMMUNITY CLASS:		
COMMUNITY SERIES:		
ECOSITE:		
VEGETATION TYPE:		
INCLUSION		
COMPLEX		

Notes:

- dry ish
- water course in lower section of polygon
- Shrub layer is in many spots 40% but in others it is between 25-60% leaning towards 60%
- hawthorn savannah?
- 40 maybe 60 dense in some parts.

ELC

SOILS ONTARIO

SITE:
POLYGON:
DATE:
SURVEYOR(S):

	P/A	PP	Dr	Position	Aspect	Slope %	Slope Type	Slope Class	Z	UTM EASTING	UTM NORTHING
1											
2											
3											
4											
5											

SOIL	1	2	3	4	5
TEXTURE x HORIZON A	Loam	10cm			
B	CL	50cm			
A TEXTURE	L				
COURSE FRAGMENTS	NO				
B TEXTURE	CL				
COURSE FRAGMENTS	NO				
C TEXTURE	/				
COURSE FRAGMENTS	/				
EFFECTIVE TEXTURE					
SURFACE STONINESS					
SURFACE ROCKINESS					
DEPTH TO / OF MOTTLES	25				
GLEY	/				
BEDROCK	/				
WATER TABLE	>50cm				
CARBONATES					
DEPTH OF ORGANICS	1cm				
PORE SIZE DISC #1					
PORE SIZE DISC #2					
MOISTURE REGIME					
SOIL SURVEY MAP					
LEGEND CLASS					

ELC PLANT SPECIES LIST

SITE: Thundering waters
POLYGON: 05-15-23
DATE: May 15-2015
SURVEYOR(S): KB ZH

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER

ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.
FRAX PENN	O				
POPU DEL	R				
JUG NIG	R				
[illegible] QUA				R	
SALIX SP.	O				
ROSA SP			O		
LINN BOR			R		
VIBURN			R		
RUB IDE				R	
RIBE GLAN				R	
CORN SERI				R	
PARTH VIT				O	
VIT RIP				O	
CRAT SP.				O	
RHAM CAT				A	
PRUN VIR					
CORN RACE				A	

SPECIES CODE	LAYER 1	2	3	4	COL.
ACER ARG				O	
CRAT GRAC				O	
SAMB SP				O	VR (Poya2)
CIR LUTE				O	
FRAG VIR				O	
SOLI CANA				R	
TARA OFF				R	
VIOLA AFIN				R	
ALI PETI				R	
TARA RAD				R	?
VERB SP				R	
CIRS VULG				R	
ONOSENS					
GEUM SP					
ARITRID					

(Crack or white)

ELC COMMUNITY DESCRIPTION & CLASSIFICATION	SITE:		POLYGON:	
	SURVEYOR(S):	DATE:	TIME: start	
			finish	
	UTMZ:	UTME:	UTMN:	

Some tributaries coming out of poly 22 into this poly.

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
X TERRESTRIAL	G ORGANIC	G LACUSTRINE	G NATURAL	G PLANKTON	G LAKE
G WETLAND	X MINERAL SOIL	G RIVERINE	X CULTURAL	G SUBMERGED	G POND
G AQUATIC	G PARENT MIN.	G BOTTOMLAND		G FLOATING-LVD	G RIVER
	G ACIDIC BEDRK.	G TERRACE		G GRAMINOID	G STREAM
SITE	G BASIC BEDRK.	G VALLEY SLOPE	COVER	G FORB	G MARSH
	G CARB. BEDRK.	X TABLELAND		G LICHEN	G SWAMP
G OPEN WATER		G ROLL. UPLAND	G OPEN	G BRYOPHYTE	G FEN
G SHALLOW WATER		G CLIFF	X SHRUB	X DECIDUOUS	G BOG
X SURFICIAL DEP		G TALUS	X TREED	G CONIFEROUS	G BARREN
G BEDROCK		G CREVICE / CAVE		G MIXED	G MEADOW
		G ALVAR			G PRAIRIE
		G ROCKLAND			X THICKET
		G BEACH / BAR			G SAVANNAH
		G SAND DUNE			G WOODLAND
		G BLUFF			X FOREST
					G PLANTATION

STAND DESCRIPTION:

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (up to 4 sp) (>> MUCH GREATER THAN; > GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY			FLX PENN
2	SUB-CANOPY			
3	UNDERSTOREY			
4	GRD. LAYER			

HT CODES: 1 = >25 m 2 = 10<HT 25 m 3 = 2<HT 10 m 4 = 1<HT 2 m 5 = 0.5<HT 1 m 6 = 0.2<HT 0.5 m 7 = HT<0.2 m

CVR CODES 0= NONE 1= 0% < CVR 10% 2= 10 < CVR 25% 3= 25 < CVR 60% 4= CVR > 60%

STAND COMPOSITION:	BA:

SIZE CLASS ANALYSIS:	A	< 10	A	10 - 24	O	25 - 50	N	> 50
STANDING SNAGS:	O	< 10	O	10 - 24	R	25 - 50	N	> 50
DEADFALL / LOGS:	A	< 10	A	10 - 24	O	25 - 50	N	> 50

ABUNDANCE CODES: N = NONE R = RARE O = OCCASIONAL A = ABUNDANT

COMM. AGE		PIONEER		YOUNG		MID-AGE		MATURE		OLD GROWTH

SOIL ANALYSIS:

TEXTURE:	DEPTH TO MOTTLES / GLEY	g =	G=
MOISTURE:	DEPTH OF ORGANICS:		(cm)
HOMOGENEOUS / VARIABLE	DEPTH TO BEDROCK:		(cm)

COMMUNITY CLASSIFICATION:

		ELC CODE
COMMUNITY CLASS:		
COMMUNITY SERIES:		
ECOSITE:		
VEGETATION TYPE:		
INCLUSION		
COMPLEX		

Notes:

ELC

SOILS ONTARIO

SITE:
POLYGON:
DATE:
SURVEYOR(S):

	P/A	PP	Dr	Position	Aspect	Slope %	Type	Class	Z	UTM EASTING	UTM NORTHING
1											
2											
3											
4											
5											

SOIL	1	2	3	4	5
TEXTURE x HORIZON	A B	0-5cm 25			
A TEXTURE	CL				
COURSE FRAGMENTS	Yes				
B TEXTURE	L				
COURSE FRAGMENTS	Yes				
C TEXTURE					
COURSE FRAGMENTS					
EFFECTIVE TEXTURE					
SURFACE STONINESS					
SURFACE ROCKINESS					
DEPTH TO / OF					
MOTTLES	5cm				
GLEY	N				
BEDROCK					
WATER TABLE	50				
CARBONATES					
DEPTH OF ORGANICS	5cm				
PORE SIZE DISC #1					
PORE SIZE DISC #2					
MOISTURE REGIME					
SOIL SURVEY MAP					
LEGEND CLASS					

ELC PLANT SPECIES LIST

SITE: Thunderwing Waters
POLYGON: 24
DATE: 05/15/15
SURVEYOR(S): ZH/KB

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER

ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.
MAL_SP		A			VOCU
ERXPEN	A	A	A	A	
~~QUEPALU~~				R	
ULMAMER		O			
TILAMER	R		O		
QUERUBR	R				
POPDELT	O				
ACERUBR	O				
QUEMACR	O				
QUEMBA	R				
VIB ARROW			O		
CORSER			O		
LONTATA			O		
CORRACE			Ø		
TOXRADI			O		
UTRIPA		O	O		
CRASP		A			
LIGBULG		A	R		
RHACATH		A	A		
PRUVIR			A		
RIBCOLAN			A		

SPECIES CODE	LAYER 1	2	3	4	COL.
ALPRAT				A	
FRAUIRG				A	
GEUMSP				A	
TOXVIRG				A	
TAROFF				O	
CIRLUTE				A	
CARSP				O	C in 22/23
ASTNOVA				R	
SOL_SP				O	
EQUARVE					
CAPGRAC					
LYTSALI					
GERMACU					

Swamp?

Puntarlen?

- crow
- wet
- several culverts along road.

ELC COMMUNITY DESCRIPTION & CLASSIFICATION	SITE:		POLYGON:	
	SURVEYOR(S):	DATE:	TIME: start	
			finish	
	UTMZ:	UTME:	UTMN:	

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
G TERRESTRIAL	G ORGANIC	G LACUSTRINE	G NATURAL	G PLANKTON	G LAKE
G WETLAND	G MINERAL SOIL	G RIVERINE	G CULTURAL	G SUBMERGED	G POND
G AQUATIC	G PARENT MIN.	G BOTTOMLAND		G FLOATING-LVD.	G RIVER
	G ACIDIC BEDRK.	G TERRACE		G GRAMINOID	G STREAM
	G BASIC BEDRK.	G VALLEY SLOPE		G FORB	G MARSH
	G CARB. BEDRK.	G TABLELAND		G LICHEN	G SWAMP
		G ROLL. UPLAND		G BRYOPHYTE	G FEN
		G CLIFF		G DECIDUOUS	G BOG
		G TALUS		G CONIFEROUS	G BARREN
		G CREVICE / CAVE		G MIXED	G MEADOW
		G ALVAR			G PRAIRIE
		G ROCKLAND			G THICKET
		G BEACH / BAR			G SAVANNAH
		G SAND DUNE			G WOODLAND
		G BLUFF			G FOREST
					G PLANTATION

SITE	COVER
G OPEN WATER	G OPEN
G SHALLOW WATER	G SHRUB
G SURFICIAL DEP.	G TREED
G BEDROCK	

STAND DESCRIPTION:

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (up to 4 sp) (>> MUCH GREATER THAN; > GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY			
2	SUB-CANOPY			
3	UNDERSTOREY			
4	GRD. LAYER			

HT CODES: 1 = >25 m 2 = 10<HT 25 m 3 = 2<HT 10 m 4 = 1<HT≤2 m 5 = 0.5<HT 1 m 6 = 0.2<HT 0.5 m 7 = HT<0.2 m

CVR CODES 0= NONE 1= 0% < CVR 10% 2= 10 < CVR 25% 3= 25 < CVR 60% 4= CVR > 60%

STAND COMPOSITION:	BA:

SIZE CLASS ANALYSIS:		< 10		10 - 24		25 - 50		> 50
STANDING SNAGS:		< 10		10 - 24		25 - 50		> 50
DEADFALL / LOGS:		< 10		10 - 24		25 - 50		> 50

ABUNDANCE CODES: N = NONE R = RARE O = OCCASIONAL A = ABUNDANT

COMM. AGE:		PIONEER		YOUNG		MID-AGE		MATURE		OLD GROWTH

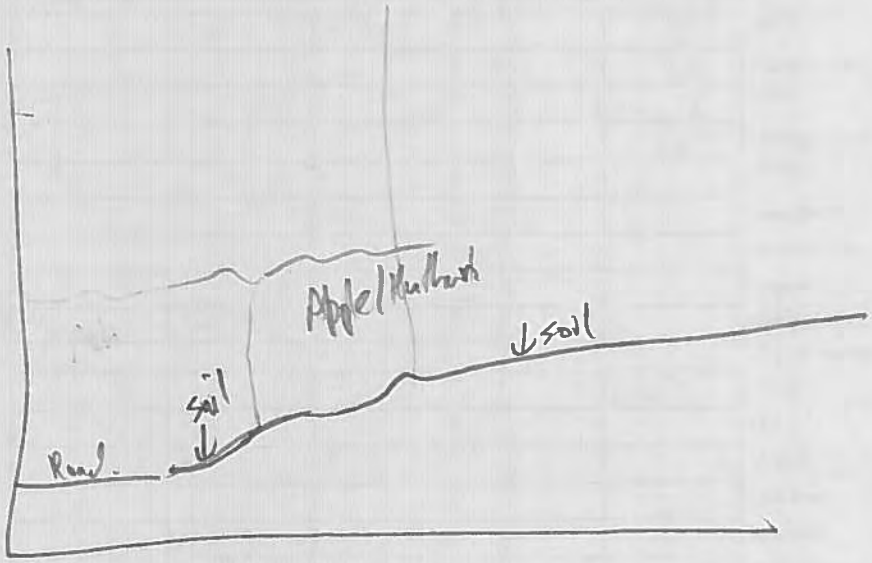
SOIL ANALYSIS:

TEXTURE:	DEPTH TO MOTTLES / GLEY	g =	G=
MOISTURE:	DEPTH OF ORGANICS:		(cm)
HOMOGENEOUS / VARIABLE	DEPTH TO BEDROCK:		(cm)

COMMUNITY CLASSIFICATION:

		ELC CODE
COMMUNITY CLASS:		
COMMUNITY SERIES:		
ECOSITE:		
VEGETATION TYPE:		
INCLUSION		
COMPLEX		

Notes:



ELC

SOILS ONTARIO

SITE:
POLYGON:
DATE:
SURVEYOR(S):

	P/A	PP	Dr	Position	Aspect	Slope %	Slope Type	Slope Class	Z	UTM EASTING	UTM NORTHING
1											
2											
3											
4											
5											

SOIL	1	2	3	4	5
TEXTURE x HORIZON	9cm Ah / 20cm B / 70cm+ C	SiCl / SiCl			
A TEXTURE					
COURSE FRAGMENTS					
B TEXTURE					
COURSE FRAGMENTS					
C TEXTURE					
COURSE FRAGMENTS					
EFFECTIVE TEXTURE					
SURFACE STONINESS					
SURFACE ROCKINESS					
DEPTH TO / OF					
MOTTLES	/				
GLEY	/				
BEDROCK	/				
WATER TABLE	/				
CARBONATES	/				
DEPTH OF ORGANICS					
PORE SIZE DISC #1					
PORE SIZE DISC #2					
MOISTURE REGIME					
SOIL SURVEY MAP					
LEGEND CLASS					

GPS 0917.

GPS
090 SMALL DUG POND
092 Large Salix
093 Fern
OLD DUG OUT AREA

ELC PLANT SPECIES LIST

SITE: THUNDERING WATERS
POLYGON: 25-1
DATE: JUNE 3/2015
SURVEYOR(S): SH

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER
ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

BIRDS
VEER
BWWA
GCFL
EATWP

SPECIES CODE	LAYER 1	2	3	4	COL.
POPU DELT	O	R			
MALU PUMI	R	O			
FRAX PENN	O	A	A	D	
SALI BLAN	R				
ULMU AMER	R	R		R	*
CARY OVAT		R	R	R	
PRUN AMER	R				
QUER PALU	R				
CARY CORD		R			
ROSA RACE			A	O	
RIBE GLAN		O	O		
LIND BENZ		R			
LONI TATA		R	R		
VIBU OPUL		O			
PRUN VIRG		O			
PRIVET			O		
CRAT PUNC		A	A		
CRAT ?		A	A		
TOXI RADI		O	O	O	
PART VITA		A	A	A	
EQUI ARVE				A	
VITI RIPA				A	
RHAM CATH		A	A	A	

SPECIES CODE	LAYER 1	2	3	4	COL.
CARE BLAN?				A	x
ERIG PHIL				R	
GLYS STRI				O	
GEUM SP				O	
ARIS TRYP				O	
CIRC LUTI				A	
ONOC SENS				R	
Fern (Polypod?)				R	x
CARE ARCT				R	x
SANG CANA				R	
POPO PELT				R	
RANU ABORT				R	
VIOLA SP				R	
LAPS COMM				R	

093 - check

ELC
COMMUNITY DESCRIPTION & CLASSIFICATION

SITE:		POLYGON:	
SURVEYOR(S):	DATE:	TIME: start / finish	
UTMZ:	UTME:	UTMN:	

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
G TERRESTRIAL	G ORGANIC	G LACUSTRINE	G NATURAL	G PLANKTON	G LAKE
G WETLAND	G MINERAL SOIL	G RIVERINE	G CULTURAL	G SUBMERGED	G POND
G AQUATIC	G PARENT MIN.	G BOTTOMLAND		G FLOATING-LVD.	G RIVER
	G ACIDIC BEDRK.	G TERRACE		G GRAMINOID	G STREAM
SITE	G BASIC BEDRK.	G VALLEY SLOPE	COVER	G FORB	G MARSH
G OPEN WATER	G CARB. BEDRK.	G TABLELAND	G OPEN	G LICHEN	G SWAMP
G SHALLOW WATER		G ROLL. UPLAND	G SHRUB	G BRYOPHYTE	G FEN
G SURFICIAL DEP.		G CLIFF	G TREED	G DECIDUOUS	G BOG
G BEDROCK		G TALUS		G CONIFEROUS	G BARREN
		G CREVICE / CAVE		G MIXED	G MEADOW
		G ALVAR			G PRAIRIE
		G ROCKLAND			G THICKET
		G BEACH / BAR			G SAVANNAH
		G SAND DUNE			G WOODLAND
		G BLUFF			G FOREST
					G PLANTATION

STAND DESCRIPTION:

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (up to 4 sp) (>> MUCH GREATER THAN; > GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY			POPU DELT ~ FRAX PENN > ULMU AMER
2	SUB-CANOPY			RHAM CATH ~ CRAT SP ~ FRAX PENN
3	UNDERSTOREY			FRAX PENN > RHAM CATH
4	GRD. LAYER			RHAM CATH > CIRC LUT

HT CODES: 1 = >25 m 2 = 10<HT<25 m 3 = 2<HT<10 m 4 = 1<HT<2 m 5 = 0.5<HT<1 m 6 = 0.2<HT<0.5 m 7 = HT<0.2 m

CVR CODES 0= NONE 1= 0% < CVR < 10% 2= 10 < CVR < 25% 3= 25 < CVR < 60% 4= CVR > 60%

STAND COMPOSITION:	BA:

SIZE CLASS ANALYSIS:	A	< 10	A	10 - 24	R	25 - 50	R	> 50
STANDING SNAGS:	O	< 10	O	10 - 24	R	25 - 50	R	> 50
DEADFALL / LOGS:	O	< 10	O	10 - 24	O	25 - 50	R	> 50

ABUNDANCE CODES: N = NONE R = RARE O = OCCASIONAL A = ABUNDANT

COMM. AGE :		PIONEER		YOUNG		MID-AGE		MATURE		OLD GROWTH

SOIL ANALYSIS:

TEXTURE:	DEPTH TO MOTTLES / GLEY	g =	G=
MOISTURE:	DEPTH OF ORGANICS:		(cm)
HOMOGENEOUS / VARIABLE	DEPTH TO BEDROCK:		(cm)

COMMUNITY CLASSIFICATION:

		ELC CODE
COMMUNITY CLASS:	CUT	
COMMUNITY SERIES:		
ECOSITE:		
VEGETATION TYPE:		
INCLUSION		
COMPLEX		

Notes:

ELC
STAND CHARACTERISTICS

SITE:	
POLYGON:	
DATE:	
SURVEYOR(S):	

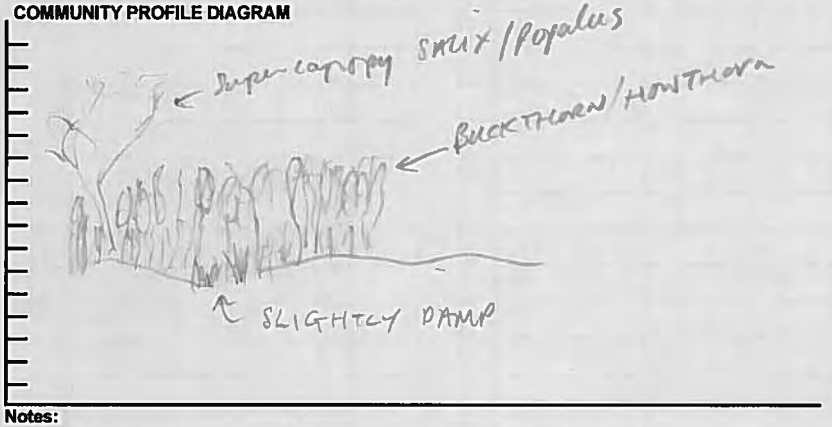
TREE TALLY BY SPECIES:

PRISM FACTOR

SPECIES	TALLY 1	TALLY 2	TALLY 3	TALLY 4	TALLY 5	TOTAL	REL. AVG
TOTAL							100
BASAL AREA (BA)							
DEAD							

STAND COMPOSITION:

COMMUNITY PROFILE DIAGRAM



Notes:

VERY SUBTLE ROLLING TOPOGRAPHY.
LOW AREAS SUPPORT SOME WETLAND INDICATORS, eg. ONOC SENS, GLYC STRI

PREDOMINANTLY MESIC UPLAND WITH OCCAS CRAT SP, RHAM CATH, FRAX PENN UNDERSTOREY

ELC

SOILS ONTARIO

SITE:
POLYGON:
DATE:
SURVEYOR(S):

SWD + MAS inclusion? or Idy?

	P/A	PP	Dr	Position	Aspect	Slope %	Type	Class	Z	UTM EASTING	UTM NORTHING
1											
2											
3											
4											
5											

SOIL	1	2	3	4	5
TEXTURE x HORIZON					
A TEXTURE					
COURSE FRAGMENTS					
B TEXTURE					
COURSE FRAGMENTS					
C TEXTURE					
COURSE FRAGMENTS					
EFFECTIVE TEXTURE					
SURFACE STONINESS					
SURFACE ROCKINESS					
DEPTH TO / OF					
MOTTLES					
GLEY					
BEDROCK					
WATER TABLE					
CARBONATES					
DEPTH OF ORGANICS					
PORE SIZE DISC #1					
PORE SIZE DISC #2					
MOISTURE REGIME					
SOIL SURVEY MAP					
LEGEND CLASS					

Pin

GPS
94 N
95 W
100 ← 1 tree.

Pin Oak! Cottonwood on outside

ELC PLANT SPECIES LIST

SITE: THUNDERING WATERS
POLYGON: 25.2 (Large Swamp/MAS)
DATE: June 3, 2015
SURVEYOR(S): SH

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER
ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.
POPU DELT	O				
QUER PALU	R				
FRAX PENN	R				
ULMU AMER	R				
SALI	A				/
CORN RACE			R		
TOXI RADI				R	
RUBU IDAE	A				
CRAT MOND		R			
CORN SERI			A	A	
RHAM FRAN			O	O	
RHAM CATH			D	O	

SPECIES CODE	LAYER 1	2	3	4	COL.
CARE (LACU)				R	X
SYMP LAEV				R	
CARE STRI				R	
CYPE SYRI				D	
GALIUM SP.				R	X
EUPATORIUM				R	
SCIR				A	
CAREX VULP				R	
CAREX (OVALES)				R	
CIRS MACU				R	
ASCL INCA				R	
SPAR EURY				R	
ASCL INCA				R	
SCHO TABE				R	
LYCO AMER				R	
ALISMA PLAN				R	

Young Flowering Plants

KBGR

RBNO EHNO

PICS

ELC

SOILS ONTARIO

SITE:

POLYGON:

DATE:

SURVEYOR(S):

	P/A	P	Dr	Type	Class	%	Slope N pos	Slope Nlength	Slope E pos	Slope Elength	Z	UTM EAST	UTM NORTH
1													
2													
3													
4													
5													
6													
7													
8													

SOIL ASSESSMENT:	1	2	3	4	5	6	7	8
TEXTURE x HORIZON								
A TEXTURE								
COURSE FRAGMENTS								
B TEXTURE								
COURSE FRAGMENTS								
C TEXTURE								
COURSE FRAGMENTS								
EFFECTIVE TEXTURE								
SURFACE STONINESS								
SURFACE ROCKINESS								
DEPTH TO / OF								
DISTINCT MOTTLES								
PROMINENT MOTTLES								
MOTTLES + GLEY								
GLEY								
BEDROCK								
CARBONATES								
DEPTH OF ORGANICS								
PORE SIZE DISC #1								
PORE SIZE DISC #2								
MOISTURE REGME								
SOIL SURVEY MAP UNIT(S)								
LEGEND CLASS								
TEXTURE								

Maturity (Loeb(P) Wet Meadow? Crescent? see photos along trail

common Yellow thrush

Tree standing 26.1

ELC PLANT SPECIES LIST

SITE: Niagara H2O

POLYGON: 20

DATE: June 3/15

SURVEYOR(S): ZH

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER

ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COLL.
POPDELD	R				
FRXPENN	O	O	O	A	
ACENEGU	R				
ULMAMER	O				
ULMRUBR?	R				Bark
① POPDELT	D				
LONTATA					
① VIBTRIL					
① CORRACE			A		
RIBGLAN			<R	R	Smooth
PRUVIRG			<O		
TOXRADI			R	R	
RUBIDAE				R	
PARINSE			O	O	
ULTRUBA					
CRA-SP		A			* No Fl.
CRAPRUN		A			
① RHACATH					
① CORSERI					

SPECIES CODE	LAYER 1	2	3	4	COLL.
* ASTLOLA				R	
* LOLPRAT/PRAT				O	
TRI-RED					
* CHRLEUC					
* DACGLOM					
* SOL ALTI/CA					
FRAVIRG				A	
RANACRI				R	
* ACH MILL				R	
* DAUCARO				R	
PLECRAC					
ASTLANC				A	
CARGRAC				O	
LAPCOMM				R	
COELUM-SP				A	
GLY SP?				A	X
ONOSENS				R	
HYPPERF				O	
ARITRIP				R	
BLACK Mustard				R	
OXA MONT				O	
CIRLUTE				A	
Epilobium-SP?				O	X
TORVIRG				R	
POTSIMP				O	
HARGEF1				R	
JUN-SP				O	XX
MOSS				A	X
LYS NUMM					
VIN MINU					
POAPRAT					
POACOMP					
SOL JUNC					

* edge only

① Indicates JUNK (see photos)

SITE:		POLYGON:	
SURVEYOR(S):	DATE:	TIME: start / finish	
UTMZ:	UTMZ:	UTMN:	

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
☒ TERRESTRIAL	☐ ORGANIC	☐ LACUSTRINE	☐ NATURAL	☐ PLANKTON	☐ LAKE
☐ WETLAND	☐ MINERAL SOIL	☐ RIVERINE	☒ CULTURAL	☐ SUBMERGED	☐ POND
☐ AQUATIC	☒ PARENT MIN.	☐ BOTTOMLAND		☐ FLOATING-LVD.	☐ RIVER
	☐ ACIDIC BEDRK.	☐ TERRACE		☐ GRAMINOID	☐ STREAM
	☐ BASIC BEDRK.	☐ VALLEY SLOPE		☐ FORB	☐ MARSH
	☐ CARB. BEDRK.	☐ TABLELAND		☐ LICHEN	☐ SWAMP
SITE		☐ ROLL. UPLAND	COVER	☐ BRYOPHYTE	☐ FEN
☐ OPEN WATER		☐ CLIFF		☐ DECIDUOUS	☐ BOG
☐ SHALLOW WATER		☐ TALUS	☐ OPEN	☐ CONIFEROUS	☐ BARREN
☒ SURFICIAL DEP.		☐ CREVICE / CAVE	☐ SHRUB	☐ MIXED	☐ MEADOW
☐ BEDROCK		☐ ALVAR	☒ TREED		☐ PRAIRIE
		☐ ROCKLAND			☐ THICKET
		☐ BEACH / BAR			☐ SAVANNAH
		☐ SAND DUNE			☐ WOODLAND
		☐ BLUFF			☐ FOREST
					☐ PLANTATION

STAND DESCRIPTION:

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (up to 4 sp) (>> MUCH GREATER THAN; > GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY	2	1	ULMAMER > ERYPENN
2	SUB-CANOPY	3	4	CRASP > CORRAC > RHACATH
3	UNDERSTOREY			CORRAC > ERYPENN
4	GRD. LAYER			

HT CODES: 1 = >25 m 2 = 10<HT≤25 m 3 = 2<HT≤10 m 4 = 1<HT≤2 m 5 = 0.5<HT≤1 m 6 = 0.2<HT≤0.5 m 7 = HT<0.2 m

CVR CODES 0= NONE 1= 0% < CVR ≤ 10% 2= 10 < CVR ≤ 25% 3= 25 < CVR ≤ 60% 4= CVR > 60%

STAND COMPOSITION:								BA:
SIZE CLASS ANALYSIS:	A	< 10	A	10 - 24	C	25 - 50	R	> 50
STANDING SNAGS:	O	< 10	O	10 - 24	R	25 - 50	N	> 50
DEADFALL / LOGS:		< 10		10 - 24		25 - 50		> 50

ABUNDANCE CODES: N = NONE R = RARE O = OCCASIONAL A = ABUNDANT

COMM. AGE:		PIONEER		YOUNG		MID-AGE		MATURE		OLD GROWTH

SOIL ANALYSIS:

TEXTURE:	DEPTH TO MOTTLES / GLEY	g =	G=
MOISTURE:	DEPTH OF ORGANICS:		(cm)
HOMOGENEOUS / VARIABLE	DEPTH TO BEDROCK:		(cm)

COMMUNITY CLASSIFICATION:

COMMUNITY CLASS:		CODE:
COMMUNITY SERIES:		CODE:
ECOSITE:		CODE:
VEGETATION TYPE:		CODE:
INCLUSION		CODE:
COMPLEX		CODE:

Notes:

ELC

STAND & SOIL CHARACTERISTICS

SITE:	Thunderwing Rd
POLYGON:	26
DATE:	June 3/15
SURVEYOR(S):	ZH

TREE TALLY BY SPECIES:

PRISM FACTOR

SPECIES	TALLY 1	TALLY 2	TALLY 3	TALLY 4	TALLY 5	TALLY 6	TALLY 7	TALLY 8	TOTAL	REL. AVG
TOTAL										100
BASAL AREA (BA)										
DEAD										

STAND COMPOSITION:

SOIL ASSESSMENT:	1	2	3	4	5	6	7	8
EFFECTIVE TEXTURE								
DEPTH TO: MOTTLES (g)	g=	g=	g=	g=	g=	g=	g=	g=
GLEY (G)	G=	G=	G=	G=	G=	G=	G=	G=
DEPTH OF ORGANICS								
DEPTH TO BEDROCK								
MOISTURE REGIME								

COMMUNITY PROFILE DIAGRAM

Notes:

Slightly more mature than 26.0

SOILS ONTARIO

SITE:	
POLYGON:	
DATE:	
SURVEYOR(S):	

Slope | UTM

	P/A	PP	Dr	Position	Aspect	%	Type	Class	Z	EASTING	NORTHING
1											
2											
3											
4											
5											

SOIL TEXTURE x HORIZON	1	2	3	4	5
A TEXTURE					
COURSE FRAGMENTS					
B TEXTURE					
COURSE FRAGMENTS					
C TEXTURE					
COURSE FRAGMENTS					
EFFECTIVE TEXTURE					
SURFACE STONINESS					
SURFACE ROCKINESS					
DEPTH TO / OF					
MOTTLES					
GLEY					
BEDROCK					
WATER TABLE					
CARBONATES					
DEPTH OF ORGANICS					
PORE SIZE DISC #1					
PORE SIZE DISC #2					
MOISTURE REGIME					
SOIL SURVEY MAP					
LEGEND CLASS					

ALA-SP 2 CRATAEGUS

less dense understory 25-50%

Skipper blue

likely → R

0.5-1m deep water ponded slough

CORR

Broad leafed 2-10m

Tree stand-

ELC PLANT SPECIES LIST

SITE:	Niagara Thunder
POLYGON:	26.0
DATE:	June 3/15
SURVEYOR(S):	ZH

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER

ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

	SPECIES CODE	LAYER 1	2	3	4	COL.
	ULMAMER	O			*	
	SALAMA	R				
	QUEBICO?			O		✓
	CARYA-SP				O	
	QUEMACR		O	O		
*	FRXPENN	O	O	O	A	
	PRUNUT			R		
	ROSMUL					
	CRAPUNC					
	RUBIDAE				O	
	ULMTHE			R		
	CRAT-SP		D			
	RHACATH		A			
	MYRLUS	O				
	TOXRADI				O	
	ROSA-SP					
	UTRMIA					
*	PARINS				A	
	LONDATA			O		
	RIBGLAN			A		
	UNULC			R		
	FRAAMER					
	CORRAER					
	SOLULC					

	SPECIES CODE	LAYER 1	2	3	4	COL.
	HEMFUL					
	CAR-SP					
	PRAALT				R	
	ELE-SP				R	X
	LYCUNIF				R	
	CIRARV				R	
	VICCRAC				O	
	ONOSENS				R	
	EUPPUM					
	POECILI				R	
	IMPCAPE				R	
	Blackberry?					X
	ALLO-SP					✓
	ALLPET				R	
	GRASS SP					2c.
	EQUARVE					
	DRY-SP				R	X
	ERIANNU					
	CARGRAS				O	
	CAR-SP				A	Blackberry? X
	CIRCUTE				A	
	COELSP				A	
	TOUVIRG				A-O	
	ARC-SP				R	
	RANARBOR				O	
	VIO-SP				O	
	POAPRAT					

Lupus? no fls

O Ford / Ditch → constructed?

ELC
SOILS ONTARIO

SITE:
POLYGON:
DATE:
SURVEYOR(S):

	P/A	P	Dr	Type	Class	Slope %	N pos	Nlength	E pos	Elength	Z	UTM EAST	UTM NORTH
1													
2													
3													
4													
5													
6													
7													
8													

SOIL ASSESSMENT:	1	2	3	4	5	6	7	8
TEXTURE x HORIZON								
A TEXTURE								
COURSE FRAGMENTS								
B TEXTURE								
COURSE FRAGMENTS								
C TEXTURE								
COURSE FRAGMENTS								
EFFECTIVE TEXTURE								
SURFACE STONINESS								
SURFACE ROCKINESS								
DEPTH TO / OF								
DISTINCT MOTTLES								
PROMINENT MOTTLES								
MOTTLES + GLEY								
GLEY								
BEDROCK								
CARBONATES								
DEPTH OF ORGANICS								
PORE SIZE DISC #1								
PORE SIZE DISC #2								
MOISTURE REGIME								
SOIL SURVEY MAP UNIT(S)								
LEGEND CLASS								
TEXTURE								

Less canopy, more dense understory

ELC
PLANT SPECIES LIST

SITE:
POLYGON: 27b
DATE:
SURVEYOR(S):

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER
ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COLL.
ACERUBR	A				
PRUSER1				R	
QUEPALU	O				
POPDELT	O				
ULMAMER	A				
SALALBA					
ILEVERT					
SALBEBB				R	
SORAME				R	
RUBSP			R		Canes x2
TOXRYTH			A		
LIUBENZ			R		

SPECIES CODE	LAYER 1	2	3	4	COLL
CAR SP					X
CARGRAN					
BROSTR1				O	
AGROGYP				R	
Sm Fern (moss)				R	
IMPCAPS					
JUN SP					
Bladderseds				A	X
CARPENN				R	
GLYSTR1				A	
CARSTIP					
CAR SP				R	2 CAT
LYCUNIF					
LYTSALI					
PHALARU				R	
CAR SP				R	X
CAR SP				R	X
TYPLATI				A	
CARATR1 ?				L	X
EUPPERF					
CAR MACK					
AMPBRAN					
MEDLUPU				R	
PLANMAJ				R	
LYCAMA					
CAR SP					X

Page ..... of .....

ELC
COMMUNITY DESCRIPTION & CLASSIFICATION

SITE:		POLYGON:	
SURVEYOR(S):	DATE:	TIME: start / finish	
UTMZ:	UTMZ:	UTMN:	

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
☐ TERRESTRIAL ☐ WETLAND ☐ AQUATIC	☐ ORGANIC ☐ MINERAL SOIL ☐ PARENT MIN. ☐ ACIDIC BEDRK. ☐ BASIC BEDRK. ☐ CARB. BEDRK.	☐ LACUSTRINE ☐ RIVERINE ☐ BOTTOMLAND ☐ TERRACE ☐ VALLEY SLOPE ☐ TABLELAND ☐ ROLL. UPLAND ☐ CLIFF ☐ TALUS ☐ CREVICE / CAVE ☐ ALVAR ☐ ROCKLAND ☐ BEACH / BAR ☐ SAND DUNE ☐ BLUFF	☐ NATURAL ☐ CULTURAL	☐ PLANKTON ☐ SUBMERGED ☐ FLOATING-LVD ☐ GRAMINOID ☐ FORB ☐ LICHEN ☐ BRYOPHYTE ☐ DECIDUOUS ☐ CONIFEROUS ☐ MIXED	☐ LAKE ☐ POND ☐ RIVER ☐ STREAM ☐ MARSH ☐ SWAMP ☐ FEN ☐ BOG ☐ BARREN ☐ MEADOW ☐ PRAIRIE ☐ THICKET ☐ SAVANNAH ☐ WOODLAND ☐ FOREST ☐ PLANTATION

SITE
☐ OPEN WATER
☐ SHALLOW WATER
☐ SURFICIAL DEP.
☐ BEDROCK

COVER
☐ OPEN
☐ SHRUB
☐ TREED

STAND DESCRIPTION:

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (up to 4 sp) (>> MUCH GREATER THAN; > GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY			
2	SUB-CANOPY			
3	UNDERSTOREY			
4	GRD. LAYER			

HT CODES: 1 = >25 m 2 = 10<HT≤25 m 3 = 2<HT≤10 m 4 = 1<HT≤2 m 5 = 0.5<HT≤1 m 6 = 0.2<HT≤0.5 m 7 = HT<0.2 m

CVR CODES 0= NONE 1= 0% < CVR ≤ 10% 2= 10 < CVR ≤ 25% 3= 25 < CVR ≤ 60% 4= CVR > 60%

STAND COMPOSITION:	BA:

SIZE CLASS ANALYSIS:		< 10		10 - 24		25 - 50		> 50
STANDING SNAGS:		< 10		10 - 24		25 - 50		> 50
DEADFALL / LOGS:		< 10		10 - 24		25 - 50		> 50

ABUNDANCE CODES: N = NONE R = RARE O = OCCASIONAL A = ABUNDANT

COMM. AGE:		PIONEER		YOUNG		MID-AGE		MATURE		OLD GROWTH

SOIL ANALYSIS:

TEXTURE:	DEPTH TO MOTTLES / GLEY	g =	G=
MOISTURE:	DEPTH OF ORGANICS:		(cm)
HOMOGENEOUS / VARIABLE	DEPTH TO BEDROCK:		(cm)

COMMUNITY CLASSIFICATION:

COMMUNITY CLASS:		CODE:
COMMUNITY SERIES:		CODE:
ECOSITE:		CODE:
VEGETATION TYPE:		CODE:
INCLUSION		CODE:
COMPLEX		CODE:

Notes:

ELC
STAND & SOIL CHARACTERISTICS

SITE:	
POLYGON:	27b (left side of Part)
DATE:	
SURVEYOR(S):	

TREE TALLY BY SPECIES:

PRISM FACTOR

SPECIES	TALLY 1	TALLY 2	TALLY 3	TALLY 4	TALLY 5	TALLY 6	TALLY 7	TALLY 8	TOTAL	REL. AVG
TOTAL										100
BASAL AREA (BA)										
DEAD										

STAND COMPOSITION:

SOIL ASSESSMENT:	1	2	3	4	5	6	7	8
EFFECTIVE TEXTURE								
DEPTH TO: MOTTLES (g)	g=	g=	g=	g=	g=	g=	g=	g=
GLEY (G)	G=	G=	G=	G=	G=	G=	G=	G=
DEPTH OF ORGANICS								
DEPTH TO BEDROCK								
MOISTURE REGIME								

COMMUNITY PROFILE DIAGRAM

Notes:

ELC

SOILS WORKSHEET

SITE:	
POLYGON:	
DATE:	
SURVEYOR(S):	

Slope UTM

	P/A	PP	Dr	Position	Aspect	%	Type	Class	Z	EASTING	NORTHING
2											
3											
4											
5											

SOIL	1	2	3	4	5
TEXTURE x HORIZON					
A TEXTURE					
COURSE FRAGMENTS					
B TEXTURE					
COURSE FRAGMENTS					
C TEXTURE					
COURSE FRAGMENTS					
EFFECTIVE TEXTURE					
SURFACE STONINESS					
SURFACE ROCKINESS					
DEPTH TO / OF					
MOTTLES					
GLEY					
BEDROCK					
WATER TABLE					
CARBONATES					
DEPTH OF ORGANICS					
PORE SIZE DISC #1					
PORE SIZE DISC #2					
MOISTURE REGIME					
SOIL SURVEY MAP					
LEGEND CLASS					

ELC

PLANT SPECIES LIST

SITE:	
POLYGON:	27a
DATE:	
SURVEYOR(S):	

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER

ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.
FRXPEN				A	
QUEMAC					
OSTVIR					
ULMAME					
ACESACA					
CAR Sheq	a			a	
~~ACESACA~~					
ACERUBR					
CARCARO					
FAGGRAN	R				
THUOCC	R				
PRUVIR					
QUEALBA	R				
QUERUBR	R				
QUEPALU	A				
POPDELT	R				
VIBACER			R		
HAMVIRG				R	
VIBAMAN				R	
CEPOCCI			A		
CORSER					
RHAFRA					
PRUVIR					
CRAPRUC				R	
VITRIPA				O	
RUBIPAF				A	
SOLDULC					

SPECIES CODE	LAYER 1	2	3	4	COL.
IMPCAPE				A	
ASTLAEVC				O	
ERUVIRG				A	
ERAVIRG				O	
GEUM-SP				O	
CAR GRAY?				A	x
SOLRUGO				D	
ELYVIRG				R	
CAR OVAL SP				O	x
GLYSTRI				O	
POPDELT				R	
CAR RIPAD/ROS				R	x
~~GERRIPARIUM~~					
COM-SP				O	
POTSTMP				O	
EPI-SP				R	26
HIERAT				R	
HYP-SP					x
VERO EPI					
ASTMACR					
ONOSENS					
CARCARE					
ORY-small					x
Tall sedge sp.	25.2			D	
SILSNAI				O	
Leersia virginica				O	
STEROSE					
SOLCAES?					
MYO-SP					26
EUPPERF					
ATRHUMI					

ALLPETI

CARTENE? X

D on slough

Acrods

Ovules

Rose bearded grosbeak

Bbs Drawn American lady?

1 open sedge meadow

In pocket

smooth

IMAGE 1046-48

ELC
COMMUNITY DESCRIPTION & CLASSIFICATION

SITE:		POLYGON:	
SURVEYOR(S):	DATE:	TIME: start / finish	
UTMZ:	UTME:	UTMN:	

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
G TERRESTRIAL	G ORGANIC	G LACUSTRINE	✓ NATURAL	G PLANKTON	G LAKE
✓ WETLAND	G MINERAL SOIL	G RIVERINE	G CULTURAL	G SUBMERGED	G POND
G AQUATIC	✓ PARENT MIN.	G BOTTOMLAND		G FLOATING-LVD.	G RIVER
	G ACIDIC BEDRK.	G TERRACE		G GRAMINOID	G STREAM
	G BASIC BEDRK.	✓ VALLEY SLOPE		G FORB	G MARSH
	G CARB. BEDRK.	G TABLELAND		G LICHEN	✓ SWAMP
		G ROLL. UPLAND		G BRYOPHYTE	G FEN
		G CLIFF		✓ DECIDUOUS	G BOG
		G TALUS		G CONIFEROUS	G BARREN
		G CREVICE / CAVE		G MIXED	G MEADOW
		G ALVAR			G PRAIRIE
		G ROCKLAND			G THICKET
		G BEACH / BAR			G SAVANNAH
		G SAND DUNE			G WOODLAND
		G BLUFF			G FOREST
					G PLANTATION

SITE	COVER
G OPEN WATER	G OPEN
G SHALLOW WATER	G SHRUB
✓ SURFICIAL DEP.	✓ TREED
G BEDROCK	

STAND DESCRIPTION:

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (up to 4 sp) (>> MUCH GREATER THAN; > GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY			
2	SUB-CANOPY			
3	UNDERSTOREY			
4	GRD. LAYER			

HT CODES: 1 = >25 m 2 = 10<HT 25 m 3 = 2<HT 10 m 4 = 1<HT 2 m 5 = 0.5<HT 1 m 6 = 0.2<HT 0.5 m 7 = HT<0.2 m

CVR CODES 0= NONE 1= 0% < CVR 10% 2= 10 < CVR 25% 3= 25 < CVR 60% 4= CVR > 60%

STAND COMPOSITION:	BA:

SIZE CLASS ANALYSIS:		< 10		10 - 24		25 - 50		> 50
STANDING SNAGS:		< 10		10 - 24		25 - 50		> 50
DEADFALL / LOGS:		< 10		10 - 24		25 - 50		> 50

ABUNDANCE CODES: N = NONE R = RARE O = OCCASIONAL A = ABUNDANT

COMM. AGE:		PIONEER		YOUNG	✓	MID-AGE	✓	MATURE		OLD GROWTH

SOIL ANALYSIS:

TEXTURE:	DEPTH TO MOTTLES / GLEY	g =	G=
MOISTURE:	DEPTH OF ORGANICS:		(cm)
HOMOGENEOUS / VARIABLE	DEPTH TO BEDROCK:		(cm)

COMMUNITY CLASSIFICATION:

		ELC CODE
COMMUNITY CLASS:		
COMMUNITY SERIES:		
ECOSITE:		
VEGETATION TYPE:		
INCLUSION		
COMPLEX		

Notes:

ELC
STAND CHARACTERISTICS

SITE:	
POLYGON:	
DATE:	
SURVEYOR(S):	

TREE TALLY BY SPECIES:

PRISM FACTOR

SPECIES	TALLY 1	TALLY 2	TALLY 3	TALLY 4	TALLY 5	TOTAL	REL. AVG
TOTAL							100
BASAL AREA (BA)							
DEAD							

STAND COMPOSITION:

COMMUNITY PROFILE DIAGRAM

Notes:

ELC

SOILS ONTARIO

SITE:
POLYGON:
DATE:
SURVEYOR(S):

GPS 102

	P/A	PP	Dr	Slope: Position	Aspect	%	Type	Class	Z	UTM: EASTING	NORTHING
1											
2											
3											
4											
5											

SOIL	1	2	3	4	5
TEXTURE x HORIZON	10cm Ah B1 30cm b2 48cm B3 60 cm				
A (Ah) TEXTURE	S,Cl				
COURSE FRAGMENTS					
B TEXTURE	Si,CL				
COURSE FRAGMENTS					
C TEXTURE	SiCL	B3→C1			
COURSE FRAGMENTS					
EFFECTIVE TEXTURE (B3)					
SURFACE STONINESS					
SURFACE ROCKINESS					
DEPTH TO / OF					
MOTTLES	11cm				
GLEY	30cm				
BEDROCK					
WATER TABLE					
CARBONATES					
DEPTH OF ORGANICS					
PORE SIZE DISC #1					
PORE SIZE DISC #2					
MOISTURE REGIME					
SOIL SURVEY MAP					
LEGEND CLASS					

ELC

PLANT SPECIES LIST

SITE: THUNDERING WATERS
POLYGON: 27
DATE: JUN 31/2015
SURVEYOR(S): SH

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER

ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SNAG

SPECIES CODE	LAYER 1	2	3	4	COL.	SPECIES CODE	LAYER 1	2	3	4	COL.
ULMU AMER	O					IMPA CAPE				A	
QUER PALU	A					SYMP LANC				D	
QUER MACR	R					GLYC STRI				A	
CARY CORD		R		R		CARE HYST?				R	X ?
PRUN SERO	R					FRAG VIRG				R	
CARY OVAT	R					RANU ABOR				O	
ACER SACH	O					GRASS				R	X - Poa nem?
QUER BICO	R					CARE ROSE				R	
FRAX PENN	O	O	A	A		CARE LACU				R	X ?
						ONOC SENS				O	
						BOHE CYLI				R	
						ARROWHEAD				R	PIC
						CARE RETRO				O	?
						ASCL INCA				R	
						LEER SMOOTH				R	
						~~ONOC SENS~~					
						CARE INTU				R	
						DRYO SP.				R	X
						CICU MACU				R	
						? CARE GRAC				R	
						ASTE MACR				R	PHOTO
CRAT CRUS		R				Ranunculus				R	X
LIND BENZ			R			CIRC LUTE				R	
SALI BEBB			R			GEUM SP				R	
RUBU IDAE			O	O		TOVA VIRG				R	
VITI RIPA			A	A							
PART VITA			A	A							
CORN RACE			A								
LONI TATA			O								
RHAM CATH		A									
ROSA SP.			O								
TOXI RADI			A	A							

Page .... of ....

ELC COMMUNITY DESCRIPTION & CLASSIFICATION	SITE:		POLYGON:	
	SURVEYOR(S):	DATE:	TIME: start	
			finish	
	UTMZ:	UTME:	UTMN:	

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
G TERRESTRIAL G WETLAND G AQUATIC	G ORGANIC G MINERAL SOIL G PARENT MIN. G ACIDIC BEDRK. G BASIC BEDRK. G CARB. BEDRK.	G LACUSTRINE G RIVERINE G BOTTOMLAND G TERRACE G VALLEY SLOPE G TABLELAND G ROLL. UPLAND G CLIFF G TALUS G CREVICE / CAVE G ALVAR G ROCKLAND G BEACH / BAR G SAND DUNE G BLUFF	G NATURAL G CULTURAL	G PLANKTON G SUBMERGED G FLOATING-LVD. G GRAMINOID G FORB G LICHEN G BRYOPHYTE G DECIDUOUS G CONIFEROUS G MIXED	G LAKE G POND G RIVER G STREAM G MARSH G SWAMP G FEN G BOG G BARREN G MEADOW G PRAIRIE G THICKET G SAVANNAH G WOODLAND G FOREST G PLANTATION
SITE G OPEN WATER G SHALLOW WATER G SURFICIAL DEP. G BEDROCK			**COVER** G OPEN G SHRUB G TREED		

STAND DESCRIPTION:

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (up to 4 sp) (>> MUCH GREATER THAN; > GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY			QUER PALU > ULMU AMUR > ACER SACC
2	SUB-CANOPY			
3	UNDERSTOREY			
4	GRD. LAYER			

HT CODES: 1 = >25 m 2 = 10<HT 25 m 3 = 2<HT 10 m 4 = 1<HT 2 m 5 = 0.5<HT 1 m 6 = 0.2<HT 0.5 m 7 = HT<0.2 m

CVR CODES 0= NONE 1= 0% < CVR 10% 2= 10 < CVR 25% 3= 25 < CVR 60% 4= CVR > 60%

STAND COMPOSITION:	BA:

SIZE CLASS ANALYSIS:		< 10		10 - 24		25 - 50		> 50
STANDING SNAGS:		< 10		10 - 24		25 - 50		> 50
DEADFALL / LOGS:		< 10		10 - 24		25 - 50		> 50

ABUNDANCE CODES: N = NONE R = RARE O = OCCASIONAL A = ABUNDANT

COMM. AGE:		PIONEER		YOUNG		MID-AGE		MATURE		OLD GROWTH

SOIL ANALYSIS:

TEXTURE:	DEPTH TO MOTTLES / GLEY	g =	G=
MOISTURE:	DEPTH OF ORGANICS:		(cm)
HOMOGENEOUS / VARIABLE	DEPTH TO BEDROCK:		(cm)

COMMUNITY CLASSIFICATION:

		ELC CODE
COMMUNITY CLASS:		
COMMUNITY SERIES:		
ECOSITE:		
VEGETATION TYPE:		
INCLUSION		
COMPLEX		

Notes:

ELC STAND CHARACTERISTICS	SITE:
	POLYGON:
	DATE:
	SURVEYOR(S):

TREE TALLY BY SPECIES:

PRISM FACTOR

SPECIES	TALLY 1	TALLY 2	TALLY 3	TALLY 4	TALLY 5	TOTAL	REL. AVG
TOTAL							100
BASAL AREA (BA)							
DEAD							

STAND COMPOSITION:

COMMUNITY PROFILE DIAGRAM

Notes:

226 971 9810

ELC SOILS ONTARIO

SITE:	
POLYGON:	
DATE:	
SURVEYOR(S):	

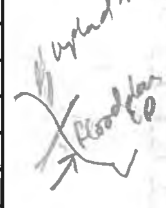
	P/A	PP	Dr	Position	Aspect	Slope %	Type	Class	Z	UTM EASTING	UTM NORTHING
1											
2											
3											
4											
5											

SOIL	1	2	3	4	5
TEXTURE x HORIZON	Ah 10cm / B / 60cm	- No mottles	- Midslope	GPS 104	
A TEXTURE	SiCl				
COURSE FRAGMENTS					
B TEXTURE	SiCl				
COURSE FRAGMENTS					
C TEXTURE					
COURSE FRAGMENTS					
EFFECTIVE TEXTURE					
SURFACE STONINESS					
SURFACE ROCKINESS					

DEPTH TO / OF

	1	2	3	4	5
MOTTLES					
GLEY					
BEDROCK					
WATER TABLE					
CARBONATES					
DEPTH OF ORGANICS					
PORE SIZE DISC #1					
PORE SIZE DISC #2					
MOISTURE REGIME					
SOIL SURVEY MAP					
LEGEND CLASS					

GPS 103 Top of slope leads to floodplain



Swamp white

ELC PLANT SPECIES LIST

SITE:	THUNDERING WATERS
POLYGON:	28
DATE:	JUN 3/2015
SURVEYOR(S):	SH

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER

ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.
QUER	A	/			
FRAX PENN	A	A			
PRUN SERO	R				
FRAX AMER	O				
CARY	A				
ULMU AMER	O				
QUER RUBR	R				
GL					
RIBE GLAN				R	
PRUN VIRG			O		
PART VITA			A	A	
TOXI RADI			O	O	
CRAT PUNC		O			
RHAM CATH		A	A		

SPECIES CODE	LAYER 1	2	3	4	COL.
ALLI PETI					
POA SP.					
GERANIUM SP.				R	
IMPA CAPE				O	
EUPA PERF				R	
PHAL ARUN				R	
LAPO CANA				R	
CARE				R	CRIN ?
SYMP LANC				O	
SURL LUTI				R	
FRAG VIRG				R	
AURANTICU				R	orange fruits Three blade
GLYC STRI				O	
LYSI NUMM				R	
TOXI VIRG				R	

Page .... of ....

ELC COMMUNITY DESCRIPTION & CLASSIFICATION	SITE:		POLYGON:	
	SURVEYOR(S):	DATE:	TIME: start	
			finish	
	UTMZ:	UTME:	UTMN:	

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
G TERRESTRIAL G WETLAND G AQUATIC	G ORGANIC G MINERAL SOIL G PARENT MIN. G ACIDIC BEDRK. G BASIC BEDRK. G CARB. BEDRK.	G LACUSTRINE G RIVERINE G BOTTOMLAND G TERRACE G VALLEY SLOPE G TABLELAND G ROLL. UPLAND G CLIFF G TALUS G CREVICE / CAVE G ALVAR G ROCKLAND G BEACH / BAR G SAND DUNE G BLUFF	G NATURAL G CULTURAL	G PLANKTON G SUBMERGED G FLOATING-LVD. G GRAMINOID G FORB G LICHEN G BRYOPHYTE G DECIDUOUS G CONIFEROUS G MIXED	G LAKE G POND G RIVER G STREAM G MARSH G SWAMP G FEN G BOG G BARREN G MEADOW G PRAIRIE G THICKET G SAVANNAH G WOODLAND G FOREST G PLANTATION
SITE G OPEN WATER G SHALLOW WATER G SURFICIAL DEP. G BEDROCK			**COVER** G OPEN G SHRUB G TREED		

STAND DESCRIPTION:

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (up to 4 sp) (>> MUCH GREATER THAN; > GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY			
2	SUB-CANOPY			
3	UNDERSTOREY			
4	GRD. LAYER			

HT CODES: 1 = >25 m 2 = 10<HT 25 m 3 = 2<HT 10 m 4 = 1<HT<2 m 5 = 0.5<HT 1 m 6 = 0.2<HT 0.5 m 7 = HT<0.2 m

CVR CODES 0= NONE 1= 0% < CVR 10% 2= 10 < CVR 25% 3= 25 < CVR 60% 4= CVR > 60%

STAND COMPOSITION:	BA:

SIZE CLASS ANALYSIS:		< 10		10 - 24		25 - 50		> 50
STANDING SNAGS:		< 10		10 - 24		25 - 50		> 50
DEADFALL / LOGS:		< 10		10 - 24		25 - 50		> 50

ABUNDANCE CODES: N = NONE R = RARE O = OCCASIONAL A = ABUNDANT

COMM. AGE :		PIONEER		YOUNG		MID-AGE		MATURE		OLD GROWTH

SOIL ANALYSIS:

TEXTURE:	DEPTH TO MOTTLES / GLEY	g =	G=
MOISTURE:	DEPTH OF ORGANICS:		(cm)
HOMOGENEOUS / VARIABLE	DEPTH TO BEDROCK:		(cm)

COMMUNITY CLASSIFICATION:

		ELC CODE
COMMUNITY CLASS:		
COMMUNITY SERIES:		
ECOSITE:		
VEGETATION TYPE:		
INCLUSION		
COMPLEX		

Notes:

ELC STAND CHARACTERISTICS	SITE:
	POLYGON:
	DATE:
	SURVEYOR(S):

TREE TALLY BY SPECIES:

PRISM FACTOR

SPECIES	TALLY 1	TALLY 2	TALLY 3	TALLY 4	TALLY 5	TOTAL	REL. AVG
TOTAL							100
BASAL AREA (BA)							
DEAD							

STAND COMPOSITION:

COMMUNITY PROFILE DIAGRAM

Notes:

ELC

SOILS ONTARIO

SITE:
POLYGON:
DATE:
SURVEYOR(S):

	P/A	PP	Dr	Position	Aspect	Slope %	Type	Class	Z	UTM EASTING	UTM NORTHING
1											
2											
3											
4											
5											

SOIL	1	2	3	4	5
TEXTURE x HORIZON					
A TEXTURE					
COURSE FRAGMENTS					
B TEXTURE					
COURSE FRAGMENTS					
C TEXTURE					
COURSE FRAGMENTS					
EFFECTIVE TEXTURE					
SURFACE STONINESS					
SURFACE ROCKINESS					
DEPTH TO / OF					
MOTTLES					
GLEY					
BEDROCK					
WATER TABLE					
CARBONATES					
DEPTH OF ORGANICS					
PORE SIZE DISC #1					
PORE SIZE DISC #2					
MOISTURE REGIME					
SOIL SURVEY MAP					
LEGEND CLASS					

Conifer & Snake

ELC
PLANT SPECIES LIST

SITE: Thunder Hill
POLYGON: 29
DATE: June 3/15
SURVEYOR(S): ZH

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER

ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.
POPDEL	O				
~~SALIBARRA~~					
CORCAR			O		
CRATRUE			R		
MALCORO			R		
CAR SP			O		
RHACATH			O		

SPECIES CODE	LAYER 1	2	3	4	COL.
TRIPRAT				A	
LORARBA				A	
PHRAUST				L	
FRAVIRG				O	
VICCRAC				A	
CORVARI				O	
CHRLEUC					
DAUCARO					
CIRNUTA					
STAROPH					
CONARVE					
ELYCANA					
POAPRAT					
ALALANC					
SOLALTI					
CORRACE					
CORVARI					
APO_SP (AMNA					Upright
SOL_SUME					
SYMONT				R	
CARPELL				R	
TYP_LATI				R	wet pocket
MENARVA					

PRAT

Bare soil - trail

ELC COMMUNITY DESCRIPTION & CLASSIFICATION	SITE:		POLYGON:	
	SURVEYOR(S):	DATE:	TIME: start	
			finish	
	UTMZ:	UTME:	UTMN:	

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
G TERRESTRIAL	G ORGANIC	G LACUSTRINE	G NATURAL	G PLANKTON	G LAKE
G WETLAND	G MINERAL SOIL	G RIVERINE	G CULTURAL	G SUBMERGED	G POND
G AQUATIC	G PARENT MIN.	G BOTTOMLAND		G FLOATING-LVD.	G RIVER
	G ACIDIC BEDRK.	G TERRACE		G GRAMINOID	G STREAM
	G BASIC BEDRK.	G VALLEY SLOPE		G FORB	G MARSH
	G CARB. BEDRK.	G TABLELAND		G LICHEN	G SWAMP
		G ROLL. UPLAND		G BRYOPHYTE	G FEN
		G CLIFF		G DECIDUOUS	G BOG
		G TALUS		G CONIFEROUS	G BARREN
		G CREVICE / CAVE		G MIXED	G MEADOW
		G ALVAR			G PRAIRIE
		G ROCKLAND			G THICKET
		G BEACH / BAR			G SAVANNAH
		G SAND DUNE			G WOODLAND
		G BLUFF			G FOREST
					G PLANTATION

SITE	COVER
G OPEN WATER	G OPEN
G SHALLOW WATER	G SHRUB
G SURFICIAL DEP.	G TREED
G BEDROCK	

STAND DESCRIPTION:

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (up to 4 sp) (>> MUCH GREATER THAN; > GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY			
2	SUB-CANOPY			
3	UNDERSTOREY			
4	GRD. LAYER			

HT CODES: 1 = >25 m 2 = 10<HT 25 m 3 = 2<HT 10 m 4 = 1<HT 2 m 5 = 0.5<HT 1 m 6 = 0.2<HT 0.5 m 7 = HT<0.2 m

CVR CODES 0= NONE 1= 0% < CVR 10% 2= 10 < CVR 25% 3= 25 < CVR 60% 4= CVR > 60%

STAND COMPOSITION:	BA:

SIZE CLASS ANALYSIS:		< 10		10 - 24		25 - 50		> 50
STANDING SNAGS:		< 10		10 - 24		25 - 50		> 50
DEADFALL / LOGS:		< 10		10 - 24		25 - 50		> 50

ABUNDANCE CODES: N = NONE R = RARE O = OCCASIONAL A = ABUNDANT

COMM. AGE:		PIONEER		YOUNG		MID-AGE		MATURE		OLD GROWTH

SOIL ANALYSIS:

TEXTURE:	DEPTH TO MOTTLES / GLEY	g =	G=
MOISTURE:	DEPTH OF ORGANICS:		(cm)
HOMOGENEOUS / VARIABLE	DEPTH TO BEDROCK:		(cm)

COMMUNITY CLASSIFICATION:

		ELC CODE
COMMUNITY CLASS:		
COMMUNITY SERIES:		
ECOSITE:		
VEGETATION TYPE:		
INCLUSION		
COMPLEX		

Notes:

ELC STAND CHARACTERISTICS	SITE:
	POLYGON:
	DATE:
	SURVEYOR(S):

TREE TALLY BY SPECIES:

PRISM FACTOR

SPECIES	TALLY 1	TALLY 2	TALLY 3	TALLY 4	TALLY 5	TOTAL	REL. AVG
TOTAL							100
BASAL AREA (BA)							
DEAD							

STAND COMPOSITION:

COMMUNITY PROFILE DIAGRAM

Notes:

ELC Boundaries 06/12/15 ZH


Gulf Coast
Image © 2015 DigitalGlobe
Google earth


5/28/2014 12 am
5/2014
1/2015
Drummond Rd
nd Heights
Oldfield Rd
Fern Ave
Sunrise Ct
Jubilee Ct
Valiant St
Dorchester Rd
Chippawa Pkwy
© 2015 Google
Google earth
1934
17 T 654216.61 m E 4768584.89 m N elev 181 m eye alt 2.77 km

Plant Identification Notes

Project Name: Thundery Waters **Project Number:** DA15-014-01

Identified by: ZM.

Unit No	Date Coll	Date Id'd	Species	Updated on field sheets?	Updated on server?	Comments
	May 6/15	May 7/15	Lonicera dioica			- Sample discarded.
			Amelanchier arborea			" "
3,6			Ribes cynosbati			Discarded.
6			Viburnum? cassinoides? or Aronia melanocarpa?			Young leaves? collect fruit later when mature.
			Scirpus cyperinus			thought openings/ ponds in swamp.
			Riccia fluitans			Floating in swamp ponds & sloughs
			Carex diandra? ↳ smaller specimen.			- poor specimen
			Carex blanda? ✓			- need more mature specimen Not pressed
21	May 15/15	May 21/15	Viburnum rafinesqueanum.			- not pressed
			Salix bebbiana			" "
			Eleocharis erythropoda			- pressed, collect again when ripe
22			Eleagnus umbellata			- not pressed
			C. leptoneura			
			C. garberi			pressed.
			C. cryptolepis			
			S. discolor			not pressed

APPENDIX E: SALAMANDER DNA TESTING RESULTS

Appendix E: Results from DNA testing of Salamander tail tips collected from the Thundering Waters property (spring 2015):

Pond	Trap	Trap Sample No.	Date	UTM	ID
1	**2**	1	08-Apr-15	654300.00 m E 4769302.00 m N	**LLLJ**
1	**5**	1	13-Apr-15	654300.00 m E 4769302.00 m N	**LL**
1	**5**	1	10-Apr-15	654300.00 m E 4769302.00 m N	**LLJ**
1	**5**	2	10-Apr-15	654300.00 m E 4769302.00 m N	**LLJ**
1	**5**	3	10-Apr-15	654300.00 m E 4769302.00 m N	**LLJ**
1	**5**	4	10-Apr-15	654300.00 m E 4769302.00 m N	**LLLJ**
1	**5**	5	10-Apr-15	654300.00 m E 4769302.00 m N	**LLJ**
1	**5**	6	10-Apr-15	654300.00 m E 4769302.00 m N	**LL**
1	**5**	7	10-Apr-15	654300.00 m E 4769302.00 m N	**LLJ**
1	**5**	8	10-Apr-15	654300.00 m E 4769302.00 m N	**LLJ**
1	**5**	9	10-Apr-15	654300.00 m E 4769302.00 m N	**LL**
1	**5**	10	10-Apr-15	654300.00 m E 4769302.00 m N	**LLJ**
1	**5**	11	10-Apr-15	654300.00 m E 4769302.00 m N	**LLJ**
1	**5**	12	10-Apr-15	654300.00 m E 4769302.00 m N	**LL**
1	**5**	1	08-Apr-15	654300.00 m E 4769302.00 m N	**LLLJ**
1	**5**	2	08-Apr-15	654300.00 m E 4769302.00 m N	**LLLJ**
2	**1**	1	10-Apr-15	654409.00 m E 4769296.00 m N	**LLJ**
2	**4**	1	10-Apr-15	654409.00 m E 4769296.00 m N	**LL**
2	**4**	2	10-Apr-15	654409.00 m E 4769296.00 m N	**LL**
2	**4**	1	08-Apr-15	654409.00 m E 4769296.00 m N	**LLJ**
3	**1**	1	10-Apr-15	654350.00 m E 4769391.00 m N	**LL**
3	**1**	2	10-Apr-15	654350.00 m E 4769391.00 m N	**?**
3	**1**	1	08-Apr-15	654350.00 m E 4769391.00 m N	**LLJ**
3	**2**	1	10-Apr-15	654350.00 m E 4769391.00 m N	**LL**
3	**2**	2	10-Apr-15	654350.00 m E 4769391.00 m N	**LLJ**
3	**2**	1	08-Apr-15	654350.00 m E 4769391.00 m N	**LL**
3	**2**	2	08-Apr-15	654350.00 m E 4769391.00 m N	**LLJ**
3	**4**	1	13-Apr-15	654350.00 m E 4769391.00 m N	**LL**
3	**4**	2	13-Apr-15	654350.00 m E 4769391.00 m N	**LL**
4	**1**	1	13-Apr-15	654472.00 m E 4769409.00 m N	**LL**
4	**1**	1	08-Apr-15	654472.00 m E 4769409.00 m N	**LLJ**
4	**2**	1	10-Apr-15	654472.00 m E 4769409.00 m N	**LL**
4	**3**	1	10-Apr-15	654472.00 m E 4769409.00 m N	**LLJ**
6	**1**	1	08-Apr-15	654694.00 m E 4769529.00 m N	**LLJ**
6	**2**	1	13-Apr-15	654694.00 m E 4769529.00 m N	**LLJ**
6	**2**	1	10-Apr-15	654694.00 m E 4769529.00 m N	**LLLJ**
6	**2**	2	10-Apr-15	654694.00 m E 4769529.00 m N	**LL**

6	**3**	1	10-Apr-15	654694.00 m E 4769529.00 m N	**LLJ**
6	**5**	1	13-Apr-15	654694.00 m E 4769529.00 m N	**LLJ**
7	**1**	1	10-Apr-15	654267.00 m E 4768964.00 m N	**LL**
7	**1**	2	10-Apr-15	654267.00 m E 4768964.00 m N	**LL**
7	**2**	1	10-Apr-15	654267.00 m E 4768964.00 m N	**LL**
7	**2**	2	10-Apr-15	654267.00 m E 4768964.00 m N	**LL**
7	**3**	1	10-Apr-15	654267.00 m E 4768964.00 m N	**LLJ**
7	**4**	1	08-Apr-15	654267.00 m E 4768964.00 m N	**LL**
7	**5**	1	08-Apr-15	654267.00 m E 4768964.00 m N	**LL**
8	**1**	1	10-Apr-15	654434.00 m E 4769119.00 m N	**LLJ**
8	**1**	2	10-Apr-15	654434.00 m E 4769119.00 m N	**LL**
8	**4**	1	10-Apr-15	654434.00 m E 4769119.00 m N	**LL**
8	**4**	2	10-Apr-15	654434.00 m E 4769119.00 m N	**LL**
8	**4**	3	10-Apr-15	654434.00 m E 4769119.00 m N	**LL**
8	**4**	4	10-Apr-15	654434.00 m E 4769119.00 m N	**LL**
8	**4**	5	10-Apr-15	654434.00 m E 4769119.00 m N	**LL**
8	**4**	6	10-Apr-15	654434.00 m E 4769119.00 m N	**LL**
8	**4**	7	10-Apr-15	654434.00 m E 4769119.00 m N	**LL**
8	**4**	8	10-Apr-15	654434.00 m E 4769119.00 m N	**LL**
8	**4**	9	10-Apr-15	654434.00 m E 4769119.00 m N	**LL**
8	**4**	10	10-Apr-15	654434.00 m E 4769119.00 m N	**LL**
8	**4**	11	10-Apr-15	654434.00 m E 4769119.00 m N	**LLJ**
8	**4**	12	10-Apr-15	654434.00 m E 4769119.00 m N	**LL**
8	**4**	13	10-Apr-15	654434.00 m E 4769119.00 m N	**LL**
8	**4**	14	10-Apr-15	654434.00 m E 4769119.00 m N	**LL**
8	**4**	15	10-Apr-15	654434.00 m E 4769119.00 m N	**LL**
8	**4**	16	10-Apr-15	654434.00 m E 4769119.00 m N	**LL**
8	**4**	17	10-Apr-15	654434.00 m E 4769119.00 m N	**LL**

APPENDIX F: NOCTURNAL AMPHIBIAN CALL SURVEY SUMMARY

Station[1]	Date (2015)	Proximity	Frog Species[2] and Breeding Evidence Codes[3]					
			Spring Peeper *Pseudacris crucifer*	**American Toad** *Anaxyrus americanus*	**Western Chorus Frog** *Pseudacris triseriata*	**Northern Leopard Frog** *Lithobates pipiens*	**Gray Treefrog** *Hyla versicolor*	**Wood Frog** *Lithobates sylvaticus*
1 (180°)	April 19	< 100 m	L2(4)					
		> 100 m	L2(5)	L2(3), L2(5)	L2(8)			
	May 28	< 100 m						
		> 100 m						
	June 24	< 100 m					L1(1)	
		> 100 m		L1(1)				
2 (180°)	April 19	< 100 m	L2(3)		L2(3), L2(8)			
		> 100 m						
	May 28	< 100 m						
		> 100 m	L1(1)					
	June 24	< 100 m		L1(1)			L1(1)	
		> 100 m						
3 (90°)	April 19	< 100 m			L2(3)			
		> 100 m	L2(3)					
	May 28	< 100 m						
		> 100 m	L1(1)				L1(1)	
	June 24	< 100 m						
		> 100 m						
4 (100°)	April 19	< 100 m						
		> 100 m	Distant					
	May 28	< 100 m						
		> 100 m	L1(1)				L1(3), L1(1)	
	June 24	< 100 m						
		> 100 m					L1(1)	
5 (100°)	April 19	< 100 m	L2(5)		L2(3)			
		> 100 m						
	May 28	< 100 m					L1(2)	
		> 100 m						
	June 24	< 100 m						
		> 100 m						
6 (50°)	April 19	< 100 m	L2(3), L1(1)	L2(7)	L1(1)	L1(1)		
		> 100 m	L2(8) offsite		L1(2)			
	May 28	< 100 m					L1(1)	
		> 100 m						
	June 24	< 100 m						
		> 100 m						
7 (30°)	April 19	< 100 m	L2(4)	L2(5)	L2(3)			
		> 100 m						
	May 28	< 100 m						
		> 100 m					L1(1)	
	June 24	< 100 m						
		> 100 m						
8 (20°)	April 19	< 100 m	L2(3), L2(3)		L1(1)			
		> 100 m		L2(5)/L3				
	May 28	< 100 m	L1(1)				L1(2)	

Station[1]	Date (2015)	Proximity	Frog Species[2] and Breeding Evidence Codes[3]					
			Spring Peeper *Pseudacris crucifer*	**American Toad** *Anaxyrus americanus*	**Western Chorus Frog** *Pseudacris triseriata*	**Northern Leopard Frog** *Lithobates pipiens*	**Gray Treefrog** *Hyla versicolor*	**Wood Frog** *Lithobates sylvaticus*
		> 100 m						
	June 24	< 100 m						
		> 100 m						
9 (0°)	April 19	< 100 m	L3		L3, L3			
		> 100 m						
	May 28	< 100 m					L1(2), L2(3)	
		> 100 m						L1(1)
	June 24	< 100 m					L1(1)	
		> 100 m						
10 (0°)	April 19	< 100 m		L3(2)	L2(3), L2(3)			
		> 100 m						
	May 28	< 100 m					L1(1)	
		> 100 m					L1(1)	
	June 24	< 100 m					L1(1)	
		> 100 m					L1(2)	
11 (130°)	May 28	< 100 m					L1(1), L2(2)	
		> 100 m					L2(3)	
	June 24	< 100 m					L1(1), L1(1), L2(2)	
		> 100 m					L2(2)	
12 (110°)	May 28	< 100 m					L2(2), L1(2), L1(1)	
		> 100 m					L3	
	June 24	< 100 m					L1(1), L1(1), L2(2), L1(1)	
		> 100 m						
13 (185°)	May 28	< 100 m						
		> 100 m						
	June 24	< 100 m					L1(2), L1(1)	
		> 100 m					L1(1)	

Legend

1. Point count station locations are depicted on Figure 3. Numbers in the brackets indicate survey direction in degrees.
2. Nomenclature, common names and scientific names follow Scientific and Standard English Names of Amphibians and Reptiles of North America North of Mexico (Crother *et al*., (2008)).
3. Breeding Evidence Codes based on the Marsh Monitoring Program (BSC, 2009).

   L1 = Level 1 = Individuals can be counted; calls not simultaneous;
   L2 = Level 2 = Calls distinguishable; some calls simultaneous;
   L3 = Level 3 = Full chorus; calls continuous and overlapping. A more accurate abundance estimate is not possible;
   ( ) = numbers in brackets following L1 or L2 refer to estimates of individuals present

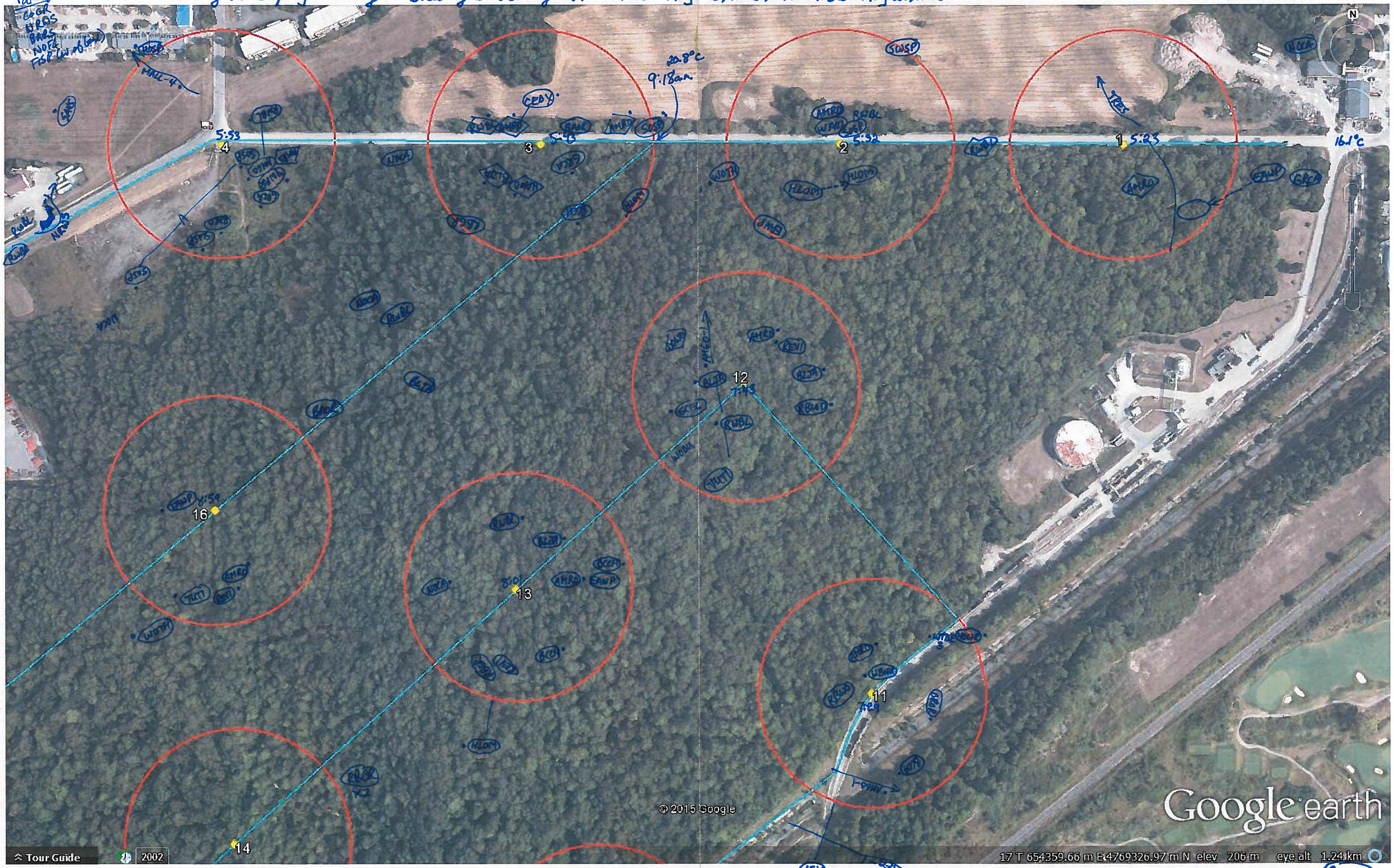
References

BSC (Bird Studies Canada). 2009. Marsh Monitoring Program Participant's Handbook for Surveying Amphibians. 2009 Edition. 13 pages. Published by Bird Studies Canada in cooperation with Environment Canada and the U.S. Environmental Protection Agency. February 2009.

Crother, B. I. (ed.). 2008. Scientific and Standard English Names of Amphibians and Reptiles of North America North of Mexico, pp. 1–84. SSAR Herpetological Circular 37.

APPENDIX G: BREEDING BIRD SURVEY DATA

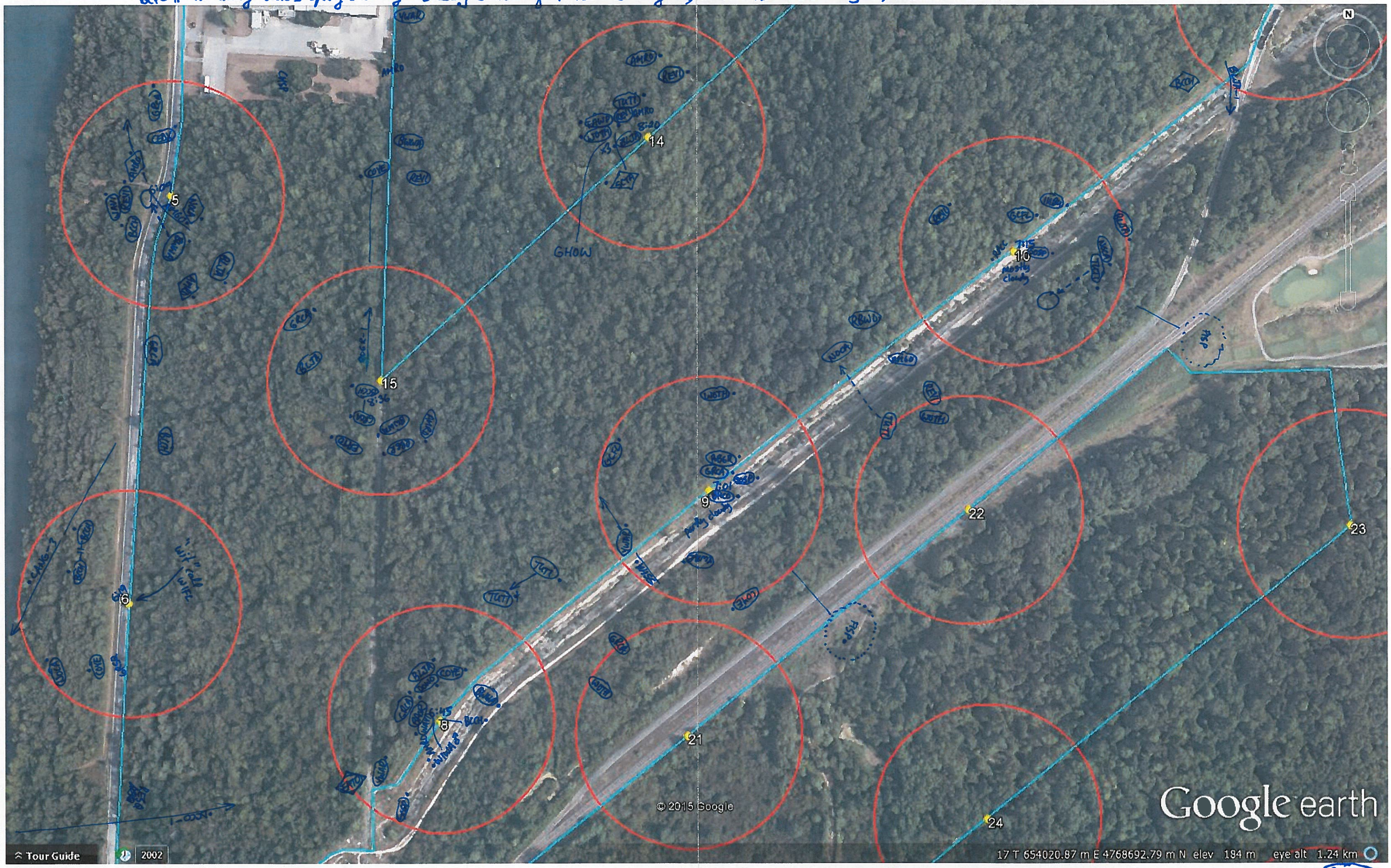
Pal Finger DA15-014-01 Thundering Waters Spring Inventory – Breeding Bird Survey #1. Pts. 1-16 = May 28, 2015; Pts. 17-32 = May 29, 2015



Surveyor = Karl Konze

Mostly sunny on May 28, 2015. Winds from WNW. Speeds variable (near calm to 15 km/hr.). Partly sunny to mostly cloudy. Winds light from south, 0-9 km/hr. ← May 29th

DA15-014-01 BCFL-18 Thundering Waters Spring Inventory – Breeding Bird Survey #1 Pts. 1-16 = May 28, 2015 Pts. 17-32 = May 29, 2015



Surveyor = Karl Konze Mostly sunny on May 28, 2015. Winds from wNW. Speeds variable (near calm to 15 km/hr.) Partly sunny to mostly cloudy on May 29, 2015. Winds light from south, 0-9 km/hr.

DA15-014-01 Thundering Waters Spring Inventory – Breeding Bird Survey #1 Pts. 1-16 = May 28, 2015 Pts. 17-32 = May 29, 2015

Surveyor = Karl Konze Mostly sunny on May 28, 2015. Winds from WNW. Speeds variable (near calm to 15 km/hr). Partly sunny to mostly cloudy on May 29th, 2015. Winds light from south, 0-9 km/hr.

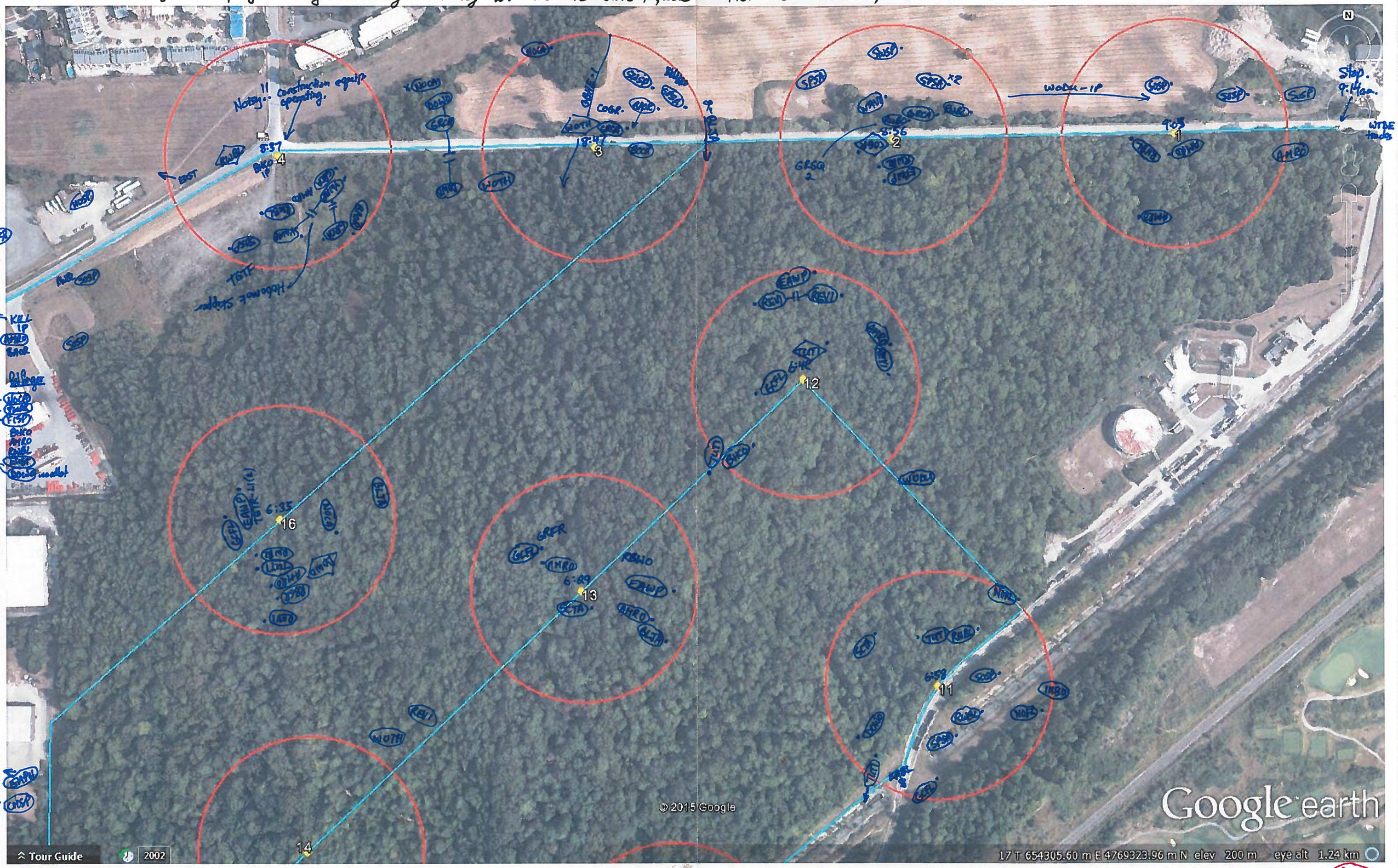
DA15-014-01 Thundering Waters Spring Inventory – Breeding Bird Survey #1. Pts. 1-16 = May 28, 2015 Pts. 17-32 = May 29, 2015

Surveyor = Karl Konze Mostly sunny on May 28, 2015. Winds from WNW. Speeds variable (near calm to 15 km/hr). Partly sunny to mostly cloudy on May 29, 2015. Winds light from south, 0-9 km/hr.

DA15-014-01 Thundering Waters Spring Inventory – Breeding Bird Survey #1. Pts. 1-16 = May 28, 2015 Pts. 17-32 = May 29, 2015

Surveyor = Karl Kanze Mostly sunny on May 28, 2015. Winds from WNW. Speeds variable (near calm to 15 km/hr.). Partly sunny to mostly cloudy. Winds light from south, 0-9 km/hr. ← May 29, 2015

DA15-014-01 Thundering Waters Spring Inventory - Breeding Bird Survey #2. Pts. 1-16 = June 4th, 2015 Pts. 17-32 = June 5th, 2015



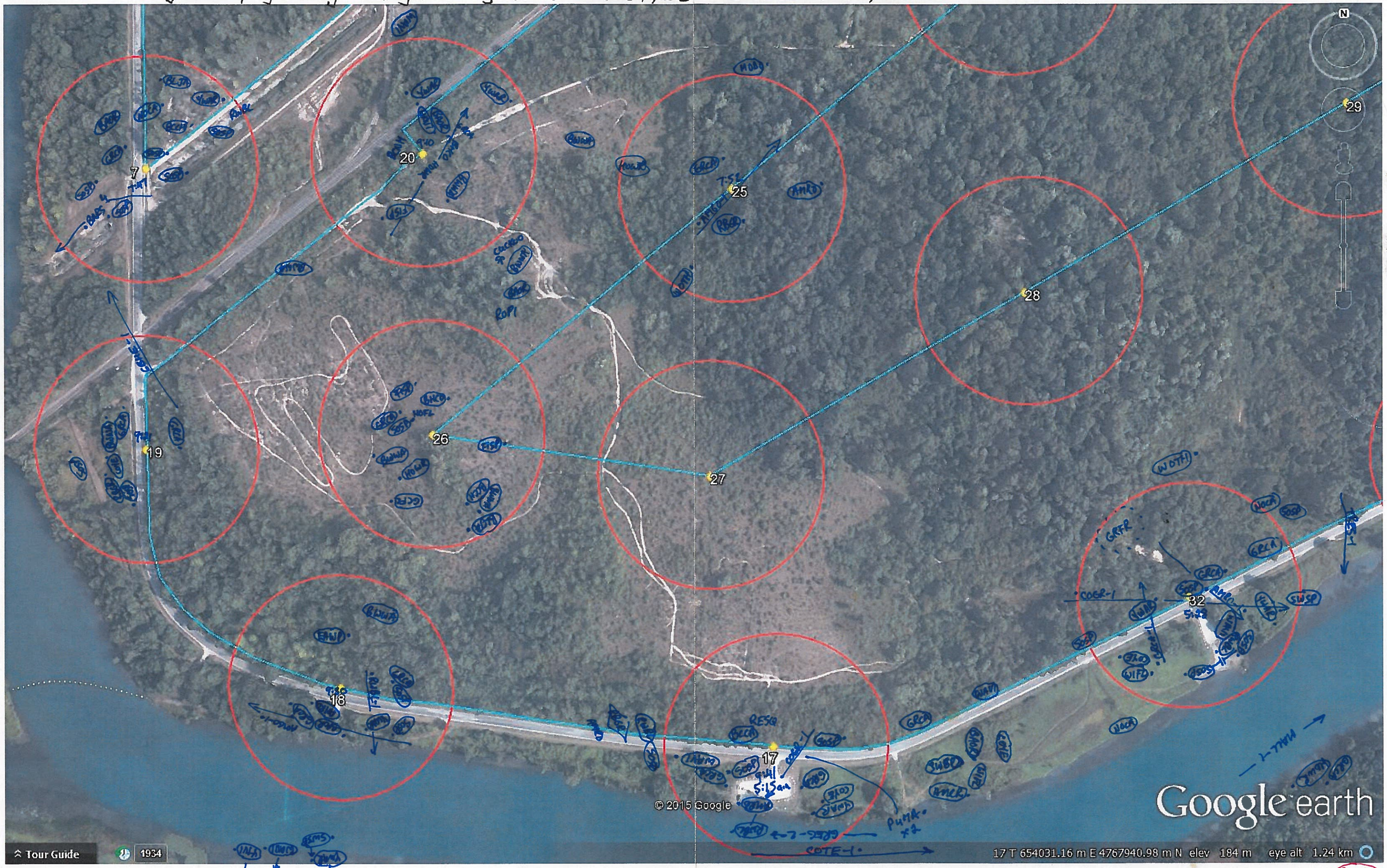
Surveyor = Karl Konze

Conditions were sunny & clear on June 4th; becoming totally cloudy by the end. 11.4°-18.8°C, Mostly calm. — June 5th a mix of sun & cloud & mostly calm. 16.8°-21°C.

DA15-014-01 Thundering Waters Spring Inventory – Breeding Bird Survey #2. Pts. 1-16 = June 4th, 2015 Pts. 17-32 = June 5th, 2015

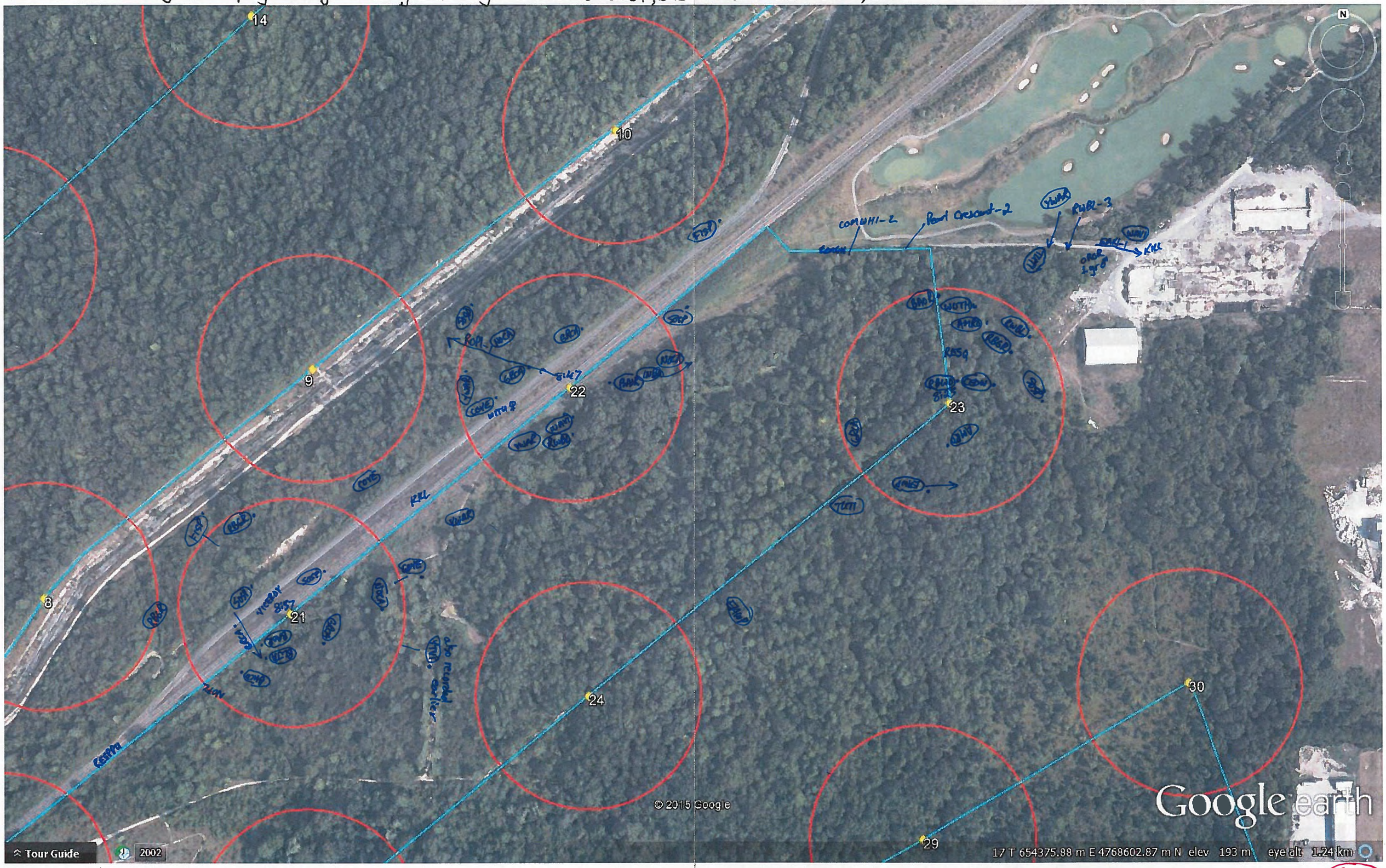
Surveyor = Karl Konze Conditions were sunny & clear on June 4th; becoming totally cloudy by the end. 11.4 – 18.8°C, Mostly calm. – June 5th a mix of sun & cloud & mostly calm. 16.8°C – 21°C.

DA15-014-01 Thundering Waters Spring Inventory – Breeding Bird Survey #2. Pts. 1-16 = June 4th, 2015 Pts. 17-32 = June 5th, 2015



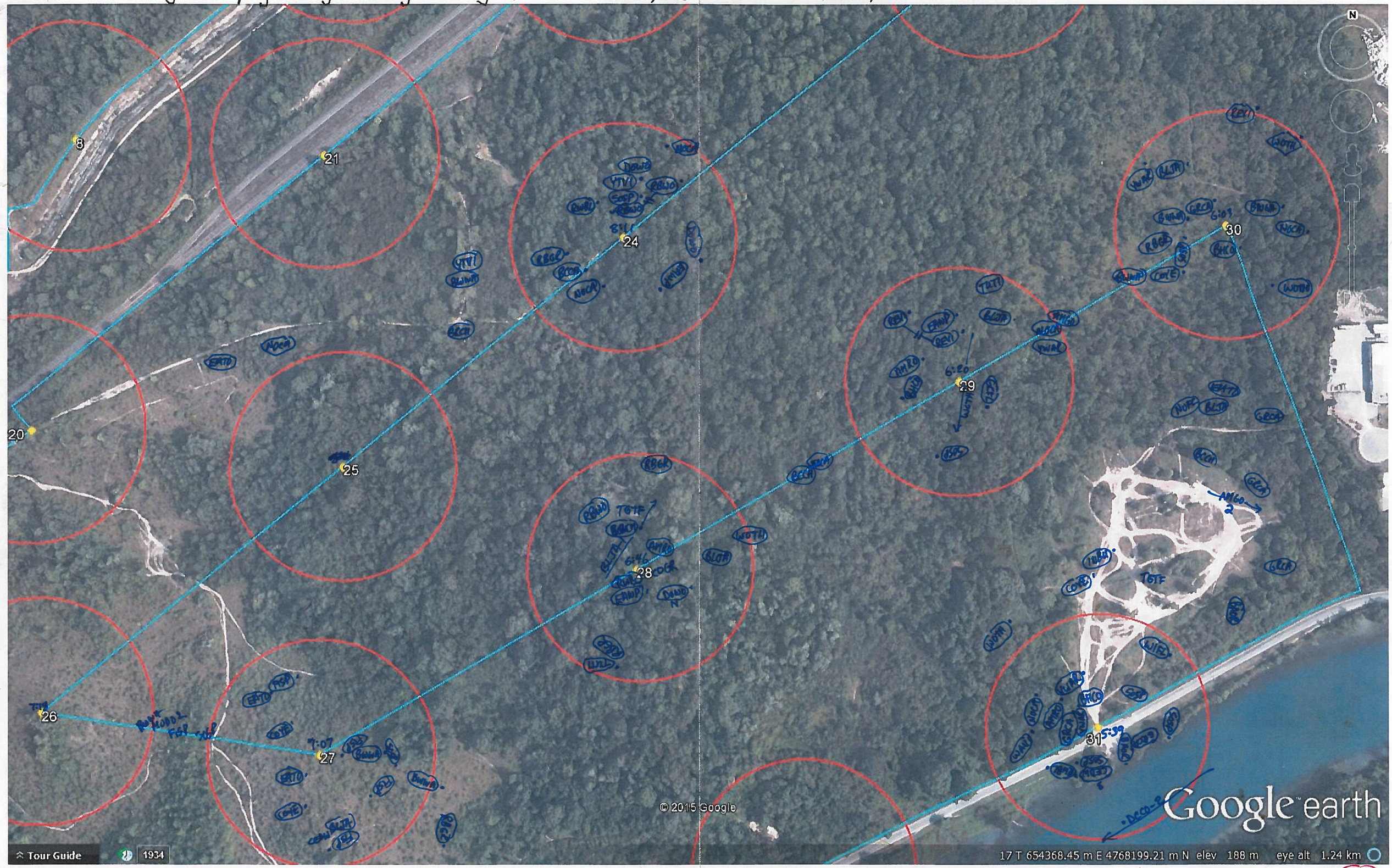
Surveyor = Karl Konze Conditions were sunny & clear on June 4th. Becoming totally cloudy by the end. 11.4 - 18.8 °C. Mostly calm. — June 5th a mix of sun & cloud & mostly calm. 16.8 °C - 21 °C.

DA15-014-01 Thundering Waters Spring Inventory — Breeding Bird Survey #2. Pts. 1-16 = June 4th; 2015 Pts. 17-32 = June 5th; 2015



Surveyor = Karl Konze Conditions were sunny & clear on June 4th. becoming totally cloudy by the end. 11.4-18.8°c. Mostly calm. — June 5th. a mix of sun & cloud & mostly calm. 16.8°c - 21°c

DA15-014-01 Thundering Waters Spring Inventory — Breeding Bird Survey #2. Pts. 1-16 = June 4th; 2015 Pts. 17-32 = June 5th; 2015



Surveyor = Karl Konze Conditions were sunny & clear on June 4th. becoming totally cloudy by the end. 11.4-18.8°C. Mostly calm. — June 5th. a mix of sun & cloud & mostly calm. 16.8°C - 21°C.

APPENDIX H: PHOTO INVENTORY WATERCOURSE SURVEYS

Photograph 1. April 11, 2015. Shoreline view of Welland River. While there were shallow wet areas inland, there was no connection to the river.

Photograph 2. April 11, 2015. Shoreline view of Welland River.

Photograph 3. April 11, 2015. Watercourse 1, approximately midway between source and the Welland River.

Photograph 4. April 21, 2015. Emergent vegetation Immediately upstream of Dorchester Road culvert in Watercourse 1, near the Welland River.

Photograph 5. October 6, 2015. Mouth of Watercourse 1 showing emergent and submergent rooted aquatic vegetation. Welland River in background.

Photograph 6. April 12, 2015. Downstream view in the upstream end of Watercourse 2 within the subject property.

Photograph 7. April 12, 2015. Meandering clay/mud channel of Watercourse 2, approximately 592 m upstream from the Welland River.

Photograph 8. April 21, 2015. Watercourse 2 with coarse material mixed into the clay/mud substrate, approximately 113 m from the Welland River.

Photograph 9. April 12, 2015. Structure of Watercourse 3.

Photograph 10. October 6, 2015. Collapsed rock-filled gabions in sloped section of Watercourse 3, approximately 30 m upstream from mouth.