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Environmental Baseline Study (EBS)
Work Performed on Claim Nos. 165704, 165705 184642 & 340110 (West Gabbro Project)
Part Lots 6 & 7, Concessions 10 & 11 (Methuen)
Township of Havelock-Belmont-Methuen
County of Peterborough

Prepared For:

Trigan Resources
c/o Oakdrige Golf Course
General Delivery
Ashburn, Ontario
L9L 2A7

Project #: 19-2661

December 2019

ORE
Oakridge Environmental Ltd.
Environmental and Hydrogeological Services

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Oakridge Environmental Limited
Environmental and Hydrogeological Services

December 3, 2019

Trigan Resources Inc.
c/o Oakridge Golf Course
General Delivery
Ashburn, Ontario
L9L 2A7

Attention: Mr. Matt Anderson

Re: Environmental Baseline Study (EBS)
Work Performed on Claim Nos. 165704, 165705, 184642 & 340110
(West Gabbro Project)
Part Lots 6 & 7, Concessions 10 & 11 (Methuen)
Township of Havelock-Belmont-Methuen, County of Peterborough
ORE File No. 19-2661

Dear Mr. Anderson:

Oakridge Environmental Ltd. is pleased to present this Environmental Baseline Study (EBS) covering conditions on the above referenced mining claims. This report is intended to be submitted as part of the annual assessment requirements.

Our report presents information pertaining to the natural environment features located within the claims and provides general recommendations with respect to future investigations and constraints that may affect mining activities. As such, the information provided herein should be considered in association with any future development plans for the site.

Should you have any questions, please contact our office at any time.

Yours truly,
Oakridge Environmental Limited

Rob West, HBSc. CSEB
Senior Environmental Scientist

Table of Contents

Environmental Baseline Study (EBS)
Work Performed on Claim Nos. 165704, 165705, 184642 & 340110
(West Gabbro Project)
Part of Lots 6 & 7, Concessions 10 & 11 (Methuen)
Township of Havelock-Belmont-Methuen
County of Peterborough

1.0 Introduction

1.1 General

Oakridge Environmental Ltd. is pleased to present this Environmental Baseline Study (EBS) covering conditions within Claim Nos. 165704, 165705, 184642 and 340110. The Claims are situated in the Township of Havelock-Belmont-Methuen (Methuen), County of Peterborough (Figure 1) and are held by:

Trigan Resources Inc.
35 Lauren Rd
Port Perry, ON, L9L 2A7
Attn. Mr. Matt Anderson

This report provides the results and analysis of our background data collection and detailed site inspections completed in 2019. It is intended that this EBS be submitted for assessment credit purposes.

Trigan Resources Inc. owns a large block of Mining Claims in the former Methuen Township within which the subject claims are centrally located, as illustrated by Figure 2. The claim group covers a large body of metagabbro and related rocks that are under exploration for several target commodities.

The objective of this EBS is to define the base environmental conditions within the subject Claims and assess which areas, if any, contain sensitive ecological features. Ultimately, any future development of the Claims will need to accommodate these environmental features. The EBS includes preliminary vegetation mapping and an assessment of associated hydrological features. As an initial study, it is also our objective to identify data gaps and to provide recommendations to guide more detailed, future studies (especially of the more "sensitive" areas).

The work outlined herein was completed by the following individuals:

Mr. Rob West, Senior Environmental Scientist, Peterborough, Ontario,

assisted by,

Mr. Darryl Mitchell, Environmental Technician, Peterborough, Ontario.

1.2 Site Description and Access

The subject claims consist of four (4) contiguous claims (i.e., Nos. 165704, 165705, 184642 and 340110), situated within a 40-unit claim group that covers a total area of approximately 92 ha (227 acres). The location of the subject Claims within the larger claim group is provided by Figure 2.

To access the site from Peterborough, at Highway 115, continue eastward to the intersection of Highway 115 and Highway 7 (Figure 1). Proceed onto Highway 7 eastward to the intersection of Highway 28. Follow Highway 28 (northbound) approximately 16 km to County Road 6 (formerly known as Stony Lake Road). Follow County Road 6 approximately 26.5 km eastward, south of Stony Lake, to County Road 44.

The nearest access trail is located approximately 4.5 km north of the intersection of County Road 6 and County Road 44. The trail is accessed off County Road 6 via a small parking area 270 m south of County Road 56 (Northey's Bay Road). This trail is unmarked and is utilized by snowmobilers and hunters to enter the Crown lands.

The claim group is located within a large expanse of Crown lands situated east of the eastern end of Stony Lake (Figure 2). Several parcels of privately owned land occur between County Road 6 and the claim group, essentially isolating the site from public roadway access. Therefore, public access to the subject Claims and the claim group is via a network of trails that start from County Road 6 or via the CN Railway off County Road 44 and Fire Route 51, south of Long Lake. Much of this area contains registered and unregistered hunting camps, with numerous recreational trails for ATVs and snowmobiles.

The subject Claims are comprised of upland wooded areas, wetlands, small lakes, and drainage features. The site is relatively undeveloped with the exception of the ATV trails. Wetlands, varying in size and composition, are scattered throughout the Claims among the undulating rock ridge outcrops. The upland areas of the site are dominated by a relatively mature mixed forest community with an open forest floor possessing rich-wood species and extensive canopy. The bedrock dominated ridges and dome features possess patchy woodland cover with rock barren habitats in areas where bedrock is at the surface.

2.0 Scope of Work

In conducting this EBS, the following tasks have been completed:

- Available background data regarding the subject Claims have been compiled and reviewed.

- The Claims were attended for the purpose of conducting detailed inspections. These included delineation and mapping of various ecological and hydrological features utilizing a mapping-grade differential Global Positioning System (dGPS) and air photo interpretation.

- Lists of floral and faunal species have been prepared for the site. The on-site vegetation communities have been classified under the Ecological Land Classification (ELC) for Southern Ontario. On-site soils data were collected within each ELC community via hand auger and classified under the Field Manual for Describing Soils in Ontario (2009).

- Wetlands and other aquatic environments were mapped and delineated using the industry standard Ontario Wetland Evaluation System (OWES) protocol.

- Species at Risk (SAR) surveys were completed to identify individual species, with emphasis on potential SAR habitat. Surveys were conducted to identify potential habitat and presence of individuals. However, given the timing of the study, certain SAR (eg., avifauna) were undetectable due to migration and overwintering.

- Key Natural Heritage Features (KNHF) and Hydrologically Sensitive Features (HSF) identified on the site (and as indicated by available mapping) were examined and their boundaries defined.

- This report was prepared outlining our findings, conclusions and recommendations with respect to potential constraints and data gaps.

3.0 Previous Work

Previous work on the subject Claims has included geological mapping, geophysical surveys and extensive biogeochemical surveys. The geological mapping focussed on determination of the limits of the metagabbro body and its surrounding lithologies, expanding on the work of (Phipps, 2008). The geophysical and biogeochemical surveys were conducted to identify anomalies for follow-up exploration.

We are not aware of any previous ecological work having been completed on the Claims.

4.0 Physical Setting

4.1 Topography and Drainage

The site lies within Ecoregion 5e in the southern portion of the Canadian Shield. The

site consists of typical Canadian Shield terrain, comprised of undulating rock outcrops and pockets of predominantly granular soils. Small vernal ponds/pools and isolated pocket wetlands occur between the elevated rock ridges.

The Claims area is generally dominated by bedrock outcrop ridges with very rare pockets of thin, discontinuous granular overburden materials. Most low-lying areas are dominated by extensive wetland areas that contain thick layers of organic material overlying sandy silty bottoms or rock substrates.

The maximum local relief within the survey area is somewhat subdued, at approximately 10 m with the average relief typically being <5 m (Figure 3). The topography is essentially dominated by the bedrock structure, which is somewhat dome-like. Drainage is generally from north to south in the Claims area, although the drainage pattern is somewhat distorted by numerous parallel rock ridges and linear valleys.

In the survey area, drainage tends to be slow, with stagnant conditions common in the summer.

4.2 Geological Setting

The claim group containing the subject Claims is situated less than 2 km north of the southern boundary of the Canadian Shield. While this area is known to contain Paleozoic outliers (such as those near Oak Lake), none have been observed within the claim group. Overburden cover is minimal in the area.

The claim group occurs within the "Belmont Domain", a sub-component of the Elzevir Terrain within the Central Metasedimentary Belt of the Grenville Province (Precambrian). The Elzevir Terrain is characterized by volcanic and related sedimentary rocks which formed around a group of "volcanic centres". These span much of north-central Hastings County and northern Peterborough County, extending from the southern edge of the shield to about Bancroft in the north. These rocks are intruded by a series of gabbroic complexes which are remarkably similar in chemical composition (e.g., Thanet Complex, Tudor Metagabbro, Cordova Gabbro, Duck Lake Sill, etc.).

The closest volcanic centre to the claim group would likely have been about 15 km to the southeast where the "Belmont Volcanics" occur. To the northwest, the volcanics yield to a thick band of volcanically derived metasediments which underlie the Oak Lake area, immediately east of the claim group. Structurally, this sequence is referred to as the Oak Lake Antiform.

The metagabbro[1] body that contains the subject Claims is a relatively small un-named mafic intrusive body (Figure 4). This small pluton, referred to herein as the "West Gabbro", occurs at the core of a small synform feature with an arcuate, ENE-WSW axial trend. Granitic gneiss and metasediments are wrapped around the pluton. Late transgressive granitic intrusions and inclusions of metasediment occur within the gabbro body. These are evident in the diamond drill core logs from a previous drill program (Phipps, 2003).

Published mapping of the area (Kingston, 1985) shows the gabbro pluton as an oval shaped body with a generally east-west long axis. In the field, the pluton has a much more complex and irregular shape which includes a series of finger-like granite porphyry bands that appear to extend into the pluton.

According to Ontario Geological Survey Special Volume 4 (Geology of Ontario), a variety of metallic mineralization types are known to occur in the gabbros of the Central Metasediment Belt. These include magmatic deposits consisting of disseminated copper and nickel. Iron and titanium deposits are also known in the gabbros. Stratiform sulphide lenses have reportedly been identified, consisting of chalcopyrite, pyrrhotite, pyrite, and sphalerite. Occurrences of stratabound volcanogenic massive sulphides are also known or suspected in the region.

All Precambrian rocks in the area have been metamorphosed to middle-upper amphibolite facies (Bartlett, 1982).

5.0 Information Resources

5.1 Ontario Breeding Bird Atlas

The Ontario Breeding Bird Atlas (OBBA) is an organization comprised mainly of volunteers who monitor birds across selected regions of Ontario. Birds are recorded to occur within defined 10 km^2 areas denoted as "regional squares". Two versions of the Atlas have been published, with the 2nd edition comprising the most recent data from 2001-2005.

Data from the OBBA are used as an indicator or tool to assist in identifying important species and/or habitats that may occur in the area of the subject site, prior to conducting site surveys. The atlas also helps to define the timing necessary for the bird surveys (e.g., morning or evening) and the season in which to detect them.

[1] Published mapping suggests that bodies of this type (in this area) may include diorite, gabbro, hornblendite, pyroxenite, anorthosite, metagabbro and amphibolite.

The subject Claims occur within the 10 km^2 area mapped as 18TQ64, Region 16, Peterborough. The Summary Sheets for this atlas area are provided in Appendix A.

From our review of the information, significant breeding species that could potentially be associated with habitats in the site area, include the following:

Common Name	**Scientific Name**	**Status**
Eastern Wood-Pewee	*Contopus virens*	Special Concern
Bank Swallow	*Riparia riparia*	Threatened
Barn Swallow	*Hirundo rustica*	Threatened
Wood Thrush	*Hylocichla mustelina*	Threatened
Canada Warbler	*Cardellina canadensis*	Special Concern
Eastern Whip-poor-will	*Antrostomus vociferus*	Threatened
Common Nighthawk	*Chordeiles minor*	Special Concern
Least Bittern	*Ixobrychus exilis*	Threatened
Evening Grosbeak	*Coccothraustes vespertinus*	Special Concern

Brief descriptions of each of the listed species and associated preferred habitats are included in Appendix A. The site inspections included a review of potential SAR habitat and targeted searches for the listed species.

5.2 Natural Heritage Information Centre (NHIC)

The NHIC is an online database managed by the Ministry of Natural Resources and Forestry (MNRF). Within the database, Ontario has been divided into a grid consisting of a series of 1 km^2 areas or *regional squares,* each given a unique identifier (similar to the OBBA, described above). The squares can be searched for historical *Species at Risk* (SAR) occurrences and for *Areas of Natural and Scientific Interest* (ANSI).

The subject Claims are not located within any 1 km square areas. As such, the nearest squares to the Claims boundaries were reviewed, including the following:

18TQ6243 - 1 km north of study area

17QK3741 - 125 m west of study area

17QK3739 - 160 m southwest of study area

17QK3739 - 1 km southwest of study area

17QK3839 - 1 km south of study area

18TQ6139 - 1 km south of study area

18TQ6339 - 1 km southwest of study area

Based on our review, the following natural areas were determined to be located within the 1 km squares:

- Peterborough Crown Game Preserve - 1.4 km north of study area
- Mixed Wader Nesting Colony - location not given
- Julia Creek Wetlands (PSW)[2] - 1.5 km southwest
- Hull South Bay PSW - 1.4 km southwest
- Quakenbush Provincial Park - 2 km south

The species found in the adjacent 1 km square areas include the following:

Common Name	**Scientific Name**	**Status**	**Date of Sighting**
Blanding's Turtle	*Emydoidea blandingii*	Threatened	1988 & 2002
Cerulean Warbler	*Setophaga cerulea*	Threatened	2008
Butternut	*Juglans Cinerea*	Endangered	2009
Five-lined Skink	*Plestiodon fasciatus*	Special Concern	2009
Eastern Meadowlark	*Sturnella magna*	Threatened	2002
Eastern Wood-Pewee	*Contopus virens*	Special Concern	Not Listed
Flooded Jellyskin	*Leptogium rivulare*	S3 - Not at Risk	2012

Description of the species are provided in Appendix B.

5.3 eBird

The eBird website consists of a database whereby citizen-science individuals provide site level birding data for locations known as "hot-spots". The bird species data are entered into the database and can be updated by individuals who consistently return to the site.

The nearest eBird hotspot is Petroglyphs Provincial Park, located approximately 4.5 km northwest of the centre of the claim group. Due to the distance from the site, the data associated with this hotspot is not overly relevant.

5.4 iNaturalist Database

ORE staff conducted a search of the iNaturalist website database to determine if this

[2] Provincially Significant Wetland.

database has any significant species occurrences in the vicinity of the subject Claims.

The database query revealed the following records:

- Cup Plant (*Silphium perfoliatum*), reported approximately 1.4 km southwest of the study area on August 6, 2017. This plant is not a Species at Risk in Ontario, however, it has a provincial rank of S3 which is considered to be "Vulnerable" by Nature Serve. Nature Serve is a consortium that identifies the frequency of plant occurrence in the province and also on a North American or National level.

- Yellow-banded Bumble Bee (*Bombus terricola*), reported approximately 2.1 km north of the study area on August 9, 2018.

  Yellow-banded Bumble Bee is listed as "Special Concern" by *Species at Risk Ontario* (SARO) and is not protected under the *Endangered Species Act* (ESA). This species is a forage and habitat generalist, able to use a variety of nectar bearing plants and environmental conditions. It can be found in mixed woodlands, particularly for nesting and overwintering, as well as a variety of open habitat such as native grasslands, farmlands and urban areas. Nest sites are often underground in abandoned rodent burrows or within decomposing logs.

- Lilypad Clubtail (*Arigomphus furcifer*), reported approximately 2.3 km southwest of the study area on June 16, 2018. This dragonfly is not a Species at Risk in Ontario. Lilypad Clubtail has a provincial rank of S3 according to the NHIC and therefore has a Vulnerable status according to the Nature Serve network.

- Blanding's Turtle (*Emydoidea blandingii*), reported approximately 2.4 km north of the study area on April 27, 2018

  Blanding's Turtle is listed as "Threatened" by SARO and is protected under the ESA. It tends to inhabit shallow waters within large wetlands or shallow lakes that have abundant aquatic plants. However, they have been known to travel up to 2 km from a body of water for nesting and/or mating purposes. This species is most easily identified by its bright yellow throat and chin.

- Snapping Turtle (*Chelydra serpentina*), reported approximately 2.4 km northwest of the study area on August 20, 2018.

  Snapping Turtle is listed as "Special Concern" by SARO and is not protected under the ESA. Special Concern species habitats are protected under the

Significant Wildlife Habitat Mitigation Support Tool (SWHMiST). Snapping Turtles spend most of their lives in water. They prefer shallow waters so they can hide under the soft mud and leaf litter, with only their noses exposed to the surface to breathe. During the nesting season (from early to mid-summer), females travel overland in search of a suitable nesting site, usually well drained gravelly or sandy areas along streambanks. Snapping Turtles often take advantage of man-made structures for nest sites, such as the gravel shoulders of roads and inactive open pits.

- Five-lined Skink (*Plestiodon fasciatus*), reported approximately 2.5 km northwest of the site on May 1, 2018.

  Common Five-lined Skink (Southern Shield Population) is listed as Special Concern by SARO and is not protected under the ESA. This species of lizard basks on sunny rocks and logs to maintain a preferred body temperature (28 - 36°C). During the winter, they hibernate in crevices among rocks or buried in the soil. The Southern Shield population can be found underneath rocks, the outside of downed trees, inside rotting logs, or on open bedrock surfaces in forests. They are also opportunists in that they will use human structures such as wooden decks and cinder blocks for cover. Therefore, the hunt camps that occur within the claim group could be potential habitat for this species.

- Monarch (*Danaus plexippus*), reported approximately 3 km northwest of the study area on July 21, 2019.

  Monarch is listed as "Special Concern" by SARO and is not protected under the ESA. Throughout their life cycle, Monarchs use two (2) different types of habitat in Ontario. Only the caterpillars feed on milkweed plants and are confined to meadows and open areas where milkweed grows. Adult butterflies can be found in more diverse habitats where they feed on nectar from a variety of wildflowers. Monarchs spend the winter in central Mexico. The summer habitat here in Ontario is plentiful, however, their habitat in Mexico has declined.

- *Phaeocalicium polyporaeum*, reported approximately 3.1 km north of the study area on December 20, 2017. This species of lichen is not a Species at Risk in Ontario. It has an S-rank of S4? which corresponds to "may be common/secure or could be vulnerable".

5.5 Land Information Ontario (LIO) Database

The MNRF's Land Information Ontario (LIO) database was referenced to provide background information on the site. LIO data provide geographic information on Ontario's road network, wetlands, water bodies, wooded areas, parks, and protected areas, among other features. A summary of LIO data available for the features within the subject property is presented below.

The LIO database recognizes fifteen (15) Unevaluated Wetlands within the subject Claims (Figure 2). The wetlands are designated as "Swamp" and "Marsh". These features have a combined total area of 11.5 ha, equivalent to approximately 8% of the total Claim area. Wetlands identified by LIO range from 0.4 ha to 1.5 ha. LIO data suggests there are two (2) Provincially Significant Wetlands (PSW) located proximal to the subject property consisting of the Hull Bay Wetlands and the Julia Creek Wetlands, located 1.5 km southwest, and 1.4 km southwest of the Claims, respectively.

Two (2) tracts of woodland were identified on-site, (separated by the railway line), measuring 55.1 ha and 6.6 ha respectively, for a total area of 61.7 ha (67% of the total area). The woodlands on-site are classified by the MNRF as *Non-sensitive*.

Five (5) water bodies were delineated on-site from the LIO data. The open bodies of water were classified as Permanent Lakes with a combined area of 6.2 ha (~6.7% of the total Claim area). Thirteen (13) sections of Permanent Stream were identified on-site, comprising five (5) main stream systems. All streams were classified as Primary Streams, with a total length of 3,642.56 m.

Site inspections were conducted to confirm and update (where necessary) the above information. Results from the site inspections are presented in the following sections.

5.6 Ontario Flow Assessment Tool (OFAT)

The Ontario Flow Assessment Tool (OFAT) is an online tool developed by the MNRF to assist in the flow evaluation of Ontario watersheds. OFAT uses data from the LIO database to interpret watershed characteristics. The tool can be used to develop a map of watersheds, characterize the watershed's physical characteristics, and to estimate average stream flows.

From the data provided by the OFAT, assumptions can be made for drainage patterns and stream flow direction. Figure 5 shows the general drainage patterns and the three (3) main subwatersheds (within the Kawartha Lakes and Trent-Crowe tertiary watersheds) in which the subject claims occur. A brief discussion of each subwatershed is presented below.

The OFAT data suggest that Subwatershed 1 drains west, ultimately into Stony Lake. This subwatershed, according to OFAT, is not connected to Long Lake nor Horse Lake. Alterations to wetlands within this subwatershed could result in changes to the drainage regime of the subwatershed, ultimately affecting Stony Lake. Any future plans to develop the Claims will need to account for any potential impacts to Stony Lake as a result of wetland alteration within Subwatershed 1.

OFAT data suggest that Subwatershed 1 forms part of the Kawartha Lakes tertiary watershed.

OFAT data suggest that Subwatershed 2 drains southward into Long Lake. This subwatershed, according to OFAT, is not hydrologically connected to either Stony Lake nor Horse Lake. However, the topographic mapping (Figure 3) suggests there are connecting streams between this subwatershed and Subwatershed 1. Further investigations will be required to clarify the conditions in this area. However, to allow for inaccuracies in the OFAT tool, any proposed alterations to wetlands within Subatershed 2 should account for potential impacts to Stony Lake, in the interim.

OFAT data suggest that Subwatershed 3 drains southeastward into Horse Lake. This subwatershed, according to OFAT, is not hydrologically connected to either Stony Lake nor Long Lake.

OFAT data suggest that Subwatersheds 2 and 3 both ultimately drain southeastward into the Long Lake - South Lake system, and form part of the Trent-Crowe tertiary watershed.

The OFAT was used to determine if the watersheds associated with the subject Claims are hydrologically connected to any nearby PSW. Although the mapping tool provides coarse watershed mapping and is subject to various limitations, it has been determined that only Subwatershed 1 is hydrologically connected to the Hull South Bay PSW.

6.0 Bio-physical Findings

6.1 Methodologies

6.1.1 General

For this study, ORE staff conducted site inspections on the following dates:

Date of Inspection	**Survey Time**	**Temp. ^{O}C**	**Beaufort (Wind) Scale**	**Conditions**
October 23, 2019	11 AM to 4 PM	10	2 - Light Breeze	60% cloud cover, no precipitation
October 25, 2019	10 AM to 4 PM	13	1- Light Air	100% cloud cover, no precipitation

Flora and fauna were recorded and site features were mapped using a differential GPS and recent aerial photography. Where possible, adjacent site features were also taken into consideration.

The inspections were completed outside of the breeding bird period, and other important seasonal inspection periods. Therefore, the site was reviewed primarily to determine if suitable habitat is present for any species listed in the database searches. Future confirmatory surveys should be completed as per the MNRF protocols during the optimum time periods.

6.1.2 Vegetation

A preliminary characterization of the various vegetation communities has been completed (at a reconnaissance level) generally based on the methodologies included in the *Ecological Land Classification (ELC) - First Approximation and It's Applications* (1998) as part of a preliminary mapping exercise. The classification of each vegetation community has been determined in accordance with the draft catalogue issued in 2008 (which provides more vegetation community classifications than the 1998 version). The draft 2008 guide also provides the classification coding included in the 1998 ELC manual for cross-reference purposes. Typically, the 1998 First Approximation is supposed to be used and the 2008 draft version used only to supplement the 1998 classifications. However, the majority of consultants appear to be utilizing the draft 2008 classifications for consistency.

Prior to conducting the site inspections, aerial photography of the subject Claims was analysed to roughly delineate communities based on recognizable vegetation differences. Dominant vegetation types were recorded and boundaries of the various communities were mapped onto the aerial photograph. A differential Global Positioning System (dGPS) unit was utilized to delineate the changeover between vegetation communities to refine the air photo mapping. Soil characteristics were defined using the methods outlined in the *Field Manual for Describing Soils in Ontario* (2009).

In addition to identifying and mapping the ELC communities, ORE staff assessed each vegetation community from the perspective of whether they are provincially rare (S-ranks in the NHIC database), are hydrologically sensitive, and/or whether they are suitable habitat for any Ontario Species at Risk.

6.1.3 Wetland Delineation

The on-site wetlands were identified and delineated using criteria from the Ontario Ministry of Natural Resources and Forestry's (OMNRF) Ontario Wetland Evaluation System (OWES), 2013 3rd Edition. The OWES provides protocols for evaluators to delineate wetland boundaries, determine vegetation communities, determine locations for seeps and springs, and ascertain drainage patterns.

The classification and delineation of wetlands must include consideration of various factors:

- Area of ground covered by vegetation;
- Proportion of hydrophytic vegetation (determined using the 50/50 Upland to Wetland Vegetation Rule);
- Presence of hydric mineral and organic substrates (determined using the protocols from the Ontario Ecological Land Classification, 1998), and
- Topography.

Considering the above factors, the wetland boundaries were determined and mapped using a combination of air photo interpretation and a mapping grade dGPS. In addition, Land Information Ontario's (LIO) database was queried to establish historical wetland boundaries within and surrounding the subject Claims. Those boundaries were confirmed and updated using protocols described in the OWES.

ORE staff did not fully evaluate the wetlands according to the OWES, but rather mapped the wetland boundaries while determining the general wetland vegetation types present.

6.1.4 Watercourse Assessment

LIO data suggests that there are five (5) main watercourses associated with the subject Claims. ORE staff attended each watercourse (where feasible) to characterize the general conditions and to confirm their locations using a mapping grade dGPS unit. Inspections were completed to identify whether the watercourse was dry or wet, establish a flow direction and determine whether the flows are permanent or intermittent. Drainage channels and streams between wetlands were also mapped using a mapping grade dGPS unit.

6.1.5 Species at Risk

Inspections were completed to determine the presence of any Species at Risk (SAR) as well as potential SAR habitat. Depending on the species' federal or provincial status, required protection/mitigation measures vary. Background information was gathered from a review of various databases, including OBBA, NHIC, eBird and iNaturalist to determine the historical presence of any SAR proximal to the Claims. Wandering transects were completed to search for the species and/or their habitat identified in the queries. Wetlands were also scanned using binoculars for avifauna, mammals and basking turtles and amphibians.

It should be noted that SAR surveys were not completed under ideal conditions given the lateness in the year.

6.2 Ecological Land Classification (ELC)

The following vegetation communities were detected during our site inspections.

Upland System

1. Dry Oak - Pine Mixed Forest (FOM1)
2. Dry Acidic Open Rock Barren (RBO3-1)
3. Fresh - Moist Poplar - White Birch Mixed Forest (FOM8)

Wetland System

4. Mineral Thicket Swamp (SWT2)
5. Red Maple Mineral Deciduous Swamp (SWD3-1)
6. Shrub Fen (FES1)
7. Open Fen (FEO1)
8. Mineral Shallow Marsh (MAS2)
9. Open Aquatic (OAO)

Other

10. Transportation - Railway (CVI_1)

Figure 6 illustrates the distribution of vegetation communities within the subject Claims. Appendix C presents a list of floral species identified during the inspections.

Representative photos of the various vegetative communities are provided in Figure 7. Appendix D presents the soils data obtained from the manual auger probes denoted on Figure 6.

These habitats and their associated vegetation and environmental characteristics are discussed below.

1. Dry Oak - Pine Mixed Forest (FOM1)

The ELC describes this community as having conifer tree species >25% and deciduous tree species >25% of the canopy cover. The canopy is typically open in nature and is comprised of Red Oak (*Quercus rubra*), White Oak (*Quercus alba*), Chinquapin Oak (*Quercus muehlenbergii*), Pitch Pine (*Pinus rigida*), White Pine (*Pinus strobus*) and Red Pine (*Pinus resinosa*) in variable mixtures. The soils have dry (0) to moderately fresh (1) moisture regimes, and they occur as shallow soils over bedrock, rock, sands and coarse loams.

This is the most predominant upland community found on the site. It is interspersed with the Dry Acidic Open Rock Barren (RBO3-1) communities where soils to support a woodland habitat are lacking.

Corresponding community in the Field Guide to Forest Ecosystems of Central Ontario:

- ES14.1: White Pine - Largetooth Aspen - Red Oak, dry to moderately fresh. V34: White Pine - Red Oak, Bracken Fern - Wintergreen.

Soils in this community were sampled by manual auger and found to be extremely shallow (5.8 cm and 18 cm respectively). They occurred directly over bedrock and were comprised of loams and sandy loams. No mottles or gleys were encountered.

The dominant tree species are already provided in the name. This community also contains an abundance of dry-upland rich-wood understorey and base cover species. The shrub-layer included Bush Honeysuckle (*Diervilla lonicera*), Downy Serviceberry (*Amelanchier laevis*), Striped Maple (*Acer pensylvanicum*), Beaked Hazel *(Corylus cornuta*) and Spotted Wintergreen (*Chimaphila maculata*). The base layer contained Bracken Fern (*Pteridium aquilinum*), Large-leaved Aster (*Eurybia macrophylla*), White-grained Mountain-rice (*Oryzopsis asperifolia*), and Wild Sarsaparilla (*Aralia nudicaulis*). This type of woodland is typically mature and the forest floor can be open and airy.

Many of the ATV/Hunting trails within the Claims are targeted within this community due to its openness and well drained/dry character.

2. Dry Acidic Open Rock Barren (RBO3-1)

This community is described as having tree cover ≤25%, and shrub cover ≤25%. It is found where conditions are most extreme and consists of acidic, bare rock surfaces or small patches of very shallow substrates.

This community is abundant on the site, interspersed on upland areas with Dry Oak - Pine Mixed Forest (FOM1).

Typically, this type of habitat contains Poverty Oatgrass dominated surfaces where some thin veneers of soil occur in the rock depressions. The rock surface also allows for an abundance of lichens to grow on the surface such as Reindeer Lichen (*Cladonia rangiferina*), Cumberland rock-shield (*Xanthoparmelia cumberlandia*) and Rock Tripe (*Umbilicaria species*). Some of the Rock Barren areas that possess a thin veneer of soil can also possess Staghorn Sumac (*Rhus typhina*) and Poison Ivy (*Toxicodendron radicans*).

A small pocket of soil was sampled in this community by manual auger and was found to be extremely shallow, with a depth of 8 cm reached before refusal on bedrock. The soil was a dry sandy loam. No mottles or gleys were encountered.

Many of ATV/Hunting trails within the Claims occur within this community due to its openness and the fact that it is typically well drained/dry.

3. Fresh - Moist Poplar - White Birch Mixed Forest (FOM8)

This community is dominated by Trembling Aspen (*Populus tremuloides*), Largetooth Aspen (*Populus grandidentata*) and White Birch (*Betula papyrifera*), with Balsam Fir (*Abies balsamea*), Hemlock (*Tsuga canadensis*) and Black Spruce (*Picea mariana*) associates. It is typically a young (early successional) forest following a disturbance.

This ecosite is found on lower slopes, seepage areas and bottomland topographic positions on the site.

Corresponding community in the Field Guide to Forest Ecosystems of Central Ontario:

- ES17.2: Poplar - White Birch, Fresh to Moist. V23: White Birch - White Pine - Trembling Aspen, Beaked Hazel - Mountain Maple.

This community is dominated by the tree species listed in its name, it also contains the following species in the understorey Beaked Hazel, Bush Honeysuckle, Mountain Maple (*Acer spicatum*), and Northern Wild Raisin (*Viburnum nudum*). The base layer consisted of Starflower Solomon-seal (*Maianthemum stellatum*), Wild Sarsaparilla,

Bracken Fern, Large-leaved Aster, Rose-twisted-stalk (*Streptopus lanceolatus*), White-grained Mountain-Rice, Bunchberry (*Cornus canadensis*) and Spinulose Wood-fern (*Dryopteris carthusiana*).

A soil sample was obtained from this community by manual auger. It reached a depth of 42 cm before meeting refusal on bedrock. The soil was a silt loam. Groundwater was encountered at 22 cm, but no mottles or gleys were encountered.

4. Mineral Thicket Swamp (SWT2)

According to the ELC, a Mineral Thicket Swamp must contain greater than 25% tree and shrub cover and be dominated by hydrophytic tree and shrub species. It can experience variable flooding regimes and would possess 20% or more vernal pooling. During the drought periods in the late summer, the vernal pools can be dry.

The Mineral Thicket Swamp community occurs across the site, most predominantly in low lying areas along the edges of water bodies and drainage watercourses. Typically, this thicket-type swamp habitat would occur as a rim around a pond or small lake. The thicket swamp types ranged from Red-Osier Dogwood (*Cornus sericea*) to Pussy Willow (*Salix discolor*) and Speckled Alder (*Alnus incana*) dominated wetland regimes. Often these types of thicket swamp occur in monotones within the wetland, however, on occasion they occurred in mixtures.

5. Red Maple Mineral Deciduous Swamp (SWD3-1)

This ecosite is described as having tree cover >25%, and deciduous tree species comprise >75% of the canopy cover. The Red Maple Mineral Deciduous Swamp is dominated by Red Maple, but may also contain Silver Maple, Swamp Maple and/or Manitoba Maple. It occurs in areas where flooding duration is short, and the substrate is often aerated by early to mid-summer.

This community occurs in the southeast portion of the site, in a low lying area surrounded by FOM1 and RBO3-1. In the northern portion of this ecosite, it transitions to Open Fen (FEO1).

As the name suggests, Red Maple (*Acer rubrum*) is the dominate species in this habitat. Typically, this type of wooded swamp habitat is at the end of the maturity spectrum and contains large trees with plenty of interstitial openings among the trees. The predominant groundcover in this swamp habitat is ferns, such as Sensitive Fern (*Onoclea sensibilis*), Spinulose Wood-Fern, Ostrich Fern (*Matteuccia struthiopteris*), Northern Beech-Fern (*Phegopteris connectilis*).

6. Shrub Fen (FES1)

The Shrub Fen community has tree cover ≤10% and shrub cover >25%. In this community, sedges, grasses and low (<2 m) shrubs dominate. The substrate is organic and consists of brown moss or sedge peat. It is rarely flooded, but always saturated.

Shrub Fen is found in two locations on the site, in low depressions where drainage is slow and poor, allowing for the accumulation of peat.

This type of habitat typically occurrs in broad flat bedrock channels between ridges. Both groundwater and precipitation inputs typically support this type of wetland community throughout the year even during the driest part of the summer season (baseflow). The flora in the fen consisted of the following species Leatherleaf (*Chamaedaphne calyculata*), Tamarack (*Larix laricina*), Labrador Tea (*Ledum groenlandicum*), Sheep Laurel (*Kalmia angustifoli*), White Meadow-sweet (*Spiraea alba*), Bog Rosemary (*Andromeda polifolia*), and Cotton Grasses (*Eriophorum species*).

Typically fens are less acidic and are associated with limestone. As such, these wet areas may occur within outliers of Paleozoic limestone. In Precambrian terrains, fens can occur within bodies of calcareous metasedimentary rock (marble), some of which may not have been mapped, simply because they have been obscured by wetland.

7. Open Fen (FEO1)

The Open Fen community has tree cover ≤10% and shrub cover ≤25%. In this community, sedges, grasses and low (< 2 m) shrubs dominate. The substrate is organic and consists of brown moss or sedge peat. It is rarely flooded, but always saturated.

Shrub Fen is found in two locations on the site, in low depressions where drainage is slow and poor, allowing for the accumulation of peat. The open fen is dominated by sedges and grasses. The predominant sedge species that occur in the majority of fens in the claim group consists of Tussock Sedge (*Carex stricta*) and Sartwell's Sedge (*Carex sartwellii*). Both of these species can form monotones within fens and shallow marshy areas.

The sedges form mats of what appear to be grasslands in the fen. The clusters of sedge form on the organic mounds in the micro-mounding within the wetland. These are examples of poor fens where they have a lower diversity, but enough fen indicators such as *Sphagnum species* around the edges of the sedge dominated interiors. Poor fens are mesotrophic peatlands, are intermediate between mineral-nourished (minerotrophic) and precipitation-dominated (ombrotrophic) peatlands, meaning they receive mineral content from the underlying rocks, however it is predominantly the intermittent precipitation in the valleys that dissolve the high mineral content rather than it being an

entirely groundwater based fen system.

8. Mineral Shallow Marsh (MAS2)

According to ELC, the Mineral Shallow Marsh (MAS2-1) primarily possesses less than 25% tree and shrub cover while hydrophytic emergent macrophyte cover must be greater than 25%. Grasses, sedges and rushes are usually dominant. Parent mineral substrates often consist of sand, gravel or cobble. Shallow marshes tend to have water up to 2 m deep.

This community is associated with low lying, saturated areas on the site, on the edges of waterbodies and watercourses. The mineral shallow marsh areas occur overtop of the Precambrian rock areas and possess acidic waters that support the shallow rooted marshy species. This community is typically dominated by cattail species (*Typha latifolia and augustifolia*) and/or inclusions of grasses such as Reed Canary Grass (*Phalaris arundinacea*), sedges such as Lake-bank Sedge (*Carex lacustris*), and rushes such as Dark Green Bulrush (*Scirpus atrovirens*), Canada Rush (*Juncus canadensis*), Softstem Bulrush (*Schoenoplectus tabernaemontani*), and Path Rush (*Juncus tenuis*).

9. Open Aquatic (OAO)

The ELC (2008) describes OAO as an environment containing no macrophyte vegetation and no tree or shrub cover. This ecosite tends to be dominated by plankton and has a lake trophic status.

This ecosite occurs as open lakes throughout the landscape of the site. These lakes may include rims of the wetland vegetation types mentioned above or in some cases where the bedrock declines quickly at the shoreline edge and there is no wetland transition.

10. Transportation - Railway (CVI_1)

This ecosite is not present in the 1998 ELC, but it is provided in the 2008 ELC. There is no description given in the 2008 ELC manual, however, it represents the railway line and railbed that traverses the subject Claims.

The rail corridor typically does not extend more than 6 m to 8 m across. The swath is typically narrower where it cuts through bedrock ridges and wider where it crosses lowlands, where fill (and ballast) has been placed to support the rail bed.

Railways typically possess an abundance of non-native weedy species and grasses as the harsh conditions allow only these species to survive. Typically trees and shrubs are

removed within the corridor to maintain rail access and prevent trees from falling across the tracks.

6.3 Wetland Delineation

Five (5) types of wetlands were observed on-site and are described above. LIO mapping identifies all wetlands on-site as "unevaluated", comprising a total of 11.5 ha. ORE staff confirmed and updated the wetland boundaries for some of these features, which are illustrated on Figure 6. Based on those updated boundaries, approximately 11.9 ha of wetland occur within the Claims. This represents 12.9% of the total area. The on-site wetlands are generally connected either through overland flows or via connected watercourses. The general location of on-site watercourses and overland flow drainage areas are shown on Figure 6.

It is important to note that our delineations did not continue beyond the boundaries of the subject Claims. As such, connectivity of on-site wetlands to off-site wetlands was not assessed. Further assessments should be completed to determine connectivity between the wetlands. A complete wetland evaluation should also be completed by a qualified person to determine the wetland's significance as per the OWES.

6.4 Wildlife Assessment / SAR Presence

6.4.1 Mammals

No rare or significant mammal species were identified during the site inspections. There are no records of any SAR mammals identified on-site as per the information provided in the NHIC query. However, there are woodland roosting habitats on-site that would likely appeal to a variety of bat species, some of which are SAR (e.g., Little Brown Bat - *Myotis lucifugus*).

The fractured bedrock, fissures and cracks in the bedrock ridges/domes within the Claims could potentially provide suitable hibernaculum for bat species. The MNRF Guelph District (and others) have developed protocols for detecting bats. The protocols suggest that the optimal time for detecting bats is during the month of June when bats are breeding and most active/talkative. Future work could focus on confirming presence or absence of any SAR bat species within the claims.

The Claims possess an abundance of furbearers such as Beaver, Muskrat, Coyote, Black Bear, Red Fox, etc. It is possible that trap lines for furbearing species exist within the claim group, although, no traps were observed. It is also possible that the claim areas are part of the traditional territories used by nearby First Nations for trapping or gathering.

It may be beneficial to determine whether the Claims contain any traditional trapping ties and/or determine if anyone has obtained a permit from MNRF to trap within the Claims.

A full list of the mammals identified on-site are presented in Appendix C.

6.4.2 Herpetiles

No species of herpetile were identified on-site. It would be beneficial to include amphibian surveys in the spring season for a more accurate herpetile inventory.

Surveys were conducted for basking turtles, although none were observed. Given the time of year the surveys were conducted, ORE staff did not expect to see any turtles. The NHIC query identified the Blanding's Turtle within the 1 km square areas surrounding the Claims. Although this species was not detected, there is an abundance of habitat for this species within the wetland communities. The locations of these ecosites are provided on Figure 6. Given the wetland and beaver pond conditions occur throughout the claims, there is a high probability that this species will occur within the boundaries of the subject Claims.

The Five Lined Skink has also been identified to occur within the NHIC 1 km square areas surrounding the subject claims. Surveys were conducted but no Five Lined Skink were observed. Again, the surveys were not conducted during the most ideal time of year to detect this lizard species. Habitat on the Claims is ideal for this lizard species as there are plenty of bedrock outcrops, woodlands and wetlands that provide food, shelter and hibernaculum. There is a high probability that this species is present within the Claim area.

Although there were no SAR herpetile sightings, additional surveys during spring emergence and nesting periods are recommended to confirm the presence or absence of any/all SAR.

6.4.3 Fish and Fish Habitat

The Open Aquatic ecosites provide the best habitat for fish. Some areas of wetland and streams will also provide marginal habitat. Many of the watercourses and drainage areas on-site did not possess any flows during our inspections, therefore, should not be considered significant habitat for fish. During the spring freshet - melt period, it is possible that the streams and drainage areas would flow sufficiently to allow fish to migrate between wetlands and open water areas, although this will vary annually.

Given the above, it is unlikely that significant fish migration between wet features

would occur, due to the very short-lived flows that would occur in these watercourses. As such, they likely have minimal importance with regard to fisheries.

A survey was not completed by ORE to assess for the presence of fish species. However, ORE staff expect that the lakes and wetlands would contain common coarse fish species in addition to Centrarchids. It may be beneficial to install traps in the water bodies to determine the types of fish that are present.

6.4.4 Vascular Plants and Lichens

Surveys were conducted for vascular plant and lichen SAR, however, none were observed. A complete list of vascular plant and lichen species identified on-site is provided in Appendix C.

More detailed inventories should be completed to confirm presence or absence of any plant and lichen SAR.

6.4.5 Avifauna

During our inspections, a total of twenty-six (26) bird species were identified on-site, none of which were significant. Among the birds listed within the OBBA square for this site, the following species could find adequate habitat within the claim area:

- **Barn Swallow (*Threatened*)** - Adjacent properties contain structures that would be appealing for this species to nest within. In addition, there is an abundance of dead tree snags near the watercourses which could appeal to this species. ORE notes that there are currently no man-made structures within the Claims that would provide sufficient habitat, although site could be utilized for foraging purposes. The probability of Barn Swallow being present on-site is very low.

- **Black Tern (*Special Concern*)** - There is plenty of marshy wetland habitat available on-site that would provide adequate habitat and nesting areas for Black Tern. The open aquatic areas of the lake would also provide sufficient feeding grounds for this species. However, this species typically occurs within large wetlands and lakes, which is not abundant in the subject claim group. Therefore, the probability of Black Tern being present on-site is considered low to moderate.

- **Canada Warbler** (*Special Concern*) - The subject property provides both mixed and deciduous forests that abut waterways in the claim group that may be suitable habitat to breed and nest within. However, it prefers

coniferous lined creeks and rivers that flow periodically throughout the year. Some parts of the Claim contain coniferous rims but lack the channel-type features that this species prefers. The probability of Canada Warbler being present on-site is considered low to moderate.

- **Chimney Swift** (*Threatened*) - Historically, this species would inhabit open cavities in standing trees. However, it has adapted over time to utilize similar habitats in urban settlements such as chimneys to nest within. There are plenty of trees with cavities available on-site, although it may be attracted to the nearby cottages in the area which are more spacious for this communal species. The probability of Chimney Swift being present on-site is considered low.

- **Eastern Whip-poor-will** (*Threatened*) - The mixed forest community is excellent habitat for this species to breed, nest and forage within. It would utilize the tall pines to call from during the breeding bird period. This species is also known to forage for insects overtop of wetlands of which there is an abundance of lakes and wetlands on-site. This species' potential habitat is identified as the FOM1 and FOM8 ecosites on Figure 6. The probability of Whip-poor-will being present on-site is considered high.

- **Eastern Wood-Pewee** (*Special Concern*) - The subject Claims provide a large tract of deciduous forest for this species to breed within. This species' potential habitat is identified as the FOM1 and FOM8 ecosite on Figure 6. Similar to the above, the probability of Eastern Wood-Pewee being present on-site is considered high.

- **Golden-Winged Warbler** (*Special Concern*) - The Thicket Swamp habitat is the preferred habitat of this species, the subject Claims provide an abundance of this type of habitat in the transition area between the upland shores and the marshy areas. This species' habitat is identified as the SWT2 ecosite that contains Willow, Speckled Alder and Red-osier Dogwood thicket habitat. The probability of Golden-winged Warbler being present on-site is believed to be moderate.

- **Wood Thrush** (*Special Concern*) - The subject Claims provide secondary succession mixed and deciduous forests for this species to breed within. The woodlands have been harvested in the past, therefore, secondary succession woodlands are present within the claim group. This species' potential habitat is identified as the parts of the FOM1 and FOM8 ecosites that contain wooded areas that possess an abundance of understorey shrubs with little interstitial space between the mature trees. The probability of Wood Thrush being present on-site is considered high.

Species that possess a Special Concern designation are not regulated under the ESA. These species are protected under the Significant Wildlife Habitat (SWH) criteria for Ecoregion 5E. According to the Significant Wildlife Habitat Mitigation Support Tool (SWHMiST) the habitat of Special Concern species are not to be impacted, however, provided the mitigation measures outlined in the SWHMiST are applied (as per the type of the development listed in the SWHMiST), the development could potentially proceed.

Species that possess a Threatened or Endangered status according to the Species at Risk Ontario (SARO) website database, receive both individual and habitat protection under the ESA. The delineated habitat, if its presence is confirmed on-site, would therefore represent a potential constraint and a SAR permit from the Ministry of Environment, Parks and Conservation would be required to potentially harm, harass or alter/destruct the habitat of the said species.

Additional assessments conducted within the breeding fauna period would be necessary to confirm or exclude the presence of any potential SAR identified within the background information.

7.0 Conclusions & Recommendations

7.1 In general, we concur with the LIO database with respect to the features illustrated by Figure 2. As a result of our field inspections, minor adjustments to the boundaries of wetlands were completed, as illustrated on Figure 6. The adjustments have resulted in a 0.17 ha increase in wetland area, in comparison to the LIO delineations. This was verified through in-field observations, supplemented by collecting wetland/upland transition boundary data, according the Ontario Wetland Evaluation System (OWES).

7.2 Although comprehensive wetland evaluations were beyond the scope of this study, the general wetland-types were verified and additional data were obtained regarding their composition and connectivity to surrounding features. All wetlands on-site provide ecological and hydrological value, whether within or outside of the Claims.

7.3 Fens were detected within the wetland areas. As these tend to occur in association with carbonate-rich substrates, their presence suggests that marble or zones of carbonate alteration may be present in the bedrock. As carbonate-rich zones have not previously identified within the subject Claims, these features may warrant further investigation.

7.4 The subject Claims straddle the boundaries of three subwatersheds.

Subwatershed 1 ultimately drains westward, toward Stony Lake. This subwatershed is

considered the most sensitive as development could potentially affect Stony Lake and/or the Provincially Significant Wetlands that occur in the western end of Stony Lake.

Subwatersheds 2 and 3 drain to the southeast, toward the Long Lake - South Lake system. Subwatershed 2 drains southward directly into Long Lake. Subwatershed 3 drains southeastward into Horse Lake and ultimately to South Lake. These subwatersheds are not hydrologically connected to either Stony Lake or Horse Lake, according to OFAT.

Future ecological and hydrological studies should be conducted to more accurately determine the watershed mapping within the Claims. Future studies are recommended to determine flows and hydrologic connectivity between the lakes and wetlands on-site. Each wetland and watercourse should be assessed according to their relevance in the landscape. This would include evaluation and a detailed inventory of the species within these systems.

7.5 Two (2) upland forest communities were delineated within the subject Claims, both being parts of a larger continuous tract of forest in the region. These upland forest communities are valuable with respect to their ecological and hydrological roles. Therefore, it is recommended that these forests be reviewed in the context of their significance and their overall content.

There is the potential for a number of forest dwelling *Species At Risk* such as birds and reptiles to occur within the upland woodlands within the Claims. Therefore, a more detailed inventory of the woodlands and of the fauna they support should be conducted to determine the forest's relative significance in the area. The review should also include a forestry resource assessment.

7.6 While future development will necessarily result in the removal of some trees and other vegetation, it should be possible to mitigate those removals by restoring the forest and waterways elsewhere to produce an *"overall net benefit"* with respect to the lands and species. This type of mitigation should be considered at the development design stage. A progressive-type rehabilitation process that actively follows the extraction limit/works is recommended.

7.7 No Species at Risk (SAR) were observed within the subject Claims during the site inspections. However, the inspections were not conducted during the ideal time of year to detect these species. As there appears to be an abundance of potentially suitable habitat on-site that could potentially contain SAR, further assessments in the appropriate seasons are recommended.

7.8 The waterways and forests that occur within the subject Claims possesses fur-bearing animals that Indigenous people in the area may utilize for hunting/trapping and gathering. These groups may also obtain medicines from the woodlands and wetlands within the Claims. As such, consultation with Indigenous communities should be considered prior to any proposed development within the Claims.

End of Environmental Baseline Report

Respectfully Submitted,
Oakridge Environmental Limited

Rob D. West, HBSc. CSEB
Senior Environmental Scientist

Statement of Qualifications

I, Rob D. West have been practising in the fields of Environmental Sciences and Earth Sciences for more than 20 years. I have supervised the design of, collection of data for, and interpretive work involved in this study.

My educational background includes completion of an Honours Bachelor of Science degree from Laurentian University, Sudbury, Ontario, specializing in Ecology, Biology, Vertebrates/ Invertebrates, Vascular/Non Vascular Plants Taxonomy, Environmental Chemistry and Environmental Geology. My expertise also includes:

2012 - MTO/DFO/OMNR Protocol for Protecting Fish & Fish Habitat
2011 - Fish Identification, Royal Ontario Museum
2008 - Electrofishing Techniques, Central Lake Ontario Conservation
2008 - Mussel Identification, Environment Canada
2007 - Ministry of Natural Resources - Data Sensitivity Training (NHIC)
2002 - Ministry of Environment - Well Technician Certification
2001 - Ministry of Natural Resources - Wetland Evaluation Course

I hold memberships or participate in the following:

ESA - Member, Ecological Society of America
CSEB Member, Canadian Society of Environmental Biologists
OBBA - Ontario Breeding Bird Atlasser
PFN - Member, Peterborough Field Naturalists
PADI - Certified Open Water Diver

It is further stated that neither Oakridge Environmental Ltd. nor its employees have any ownership interest in the subject property and that the only remuneration to be received is monetary and that the remuneration is solely related to the work completed as outlined in this report.

Rob West

Oakridge Environmental Ltd.

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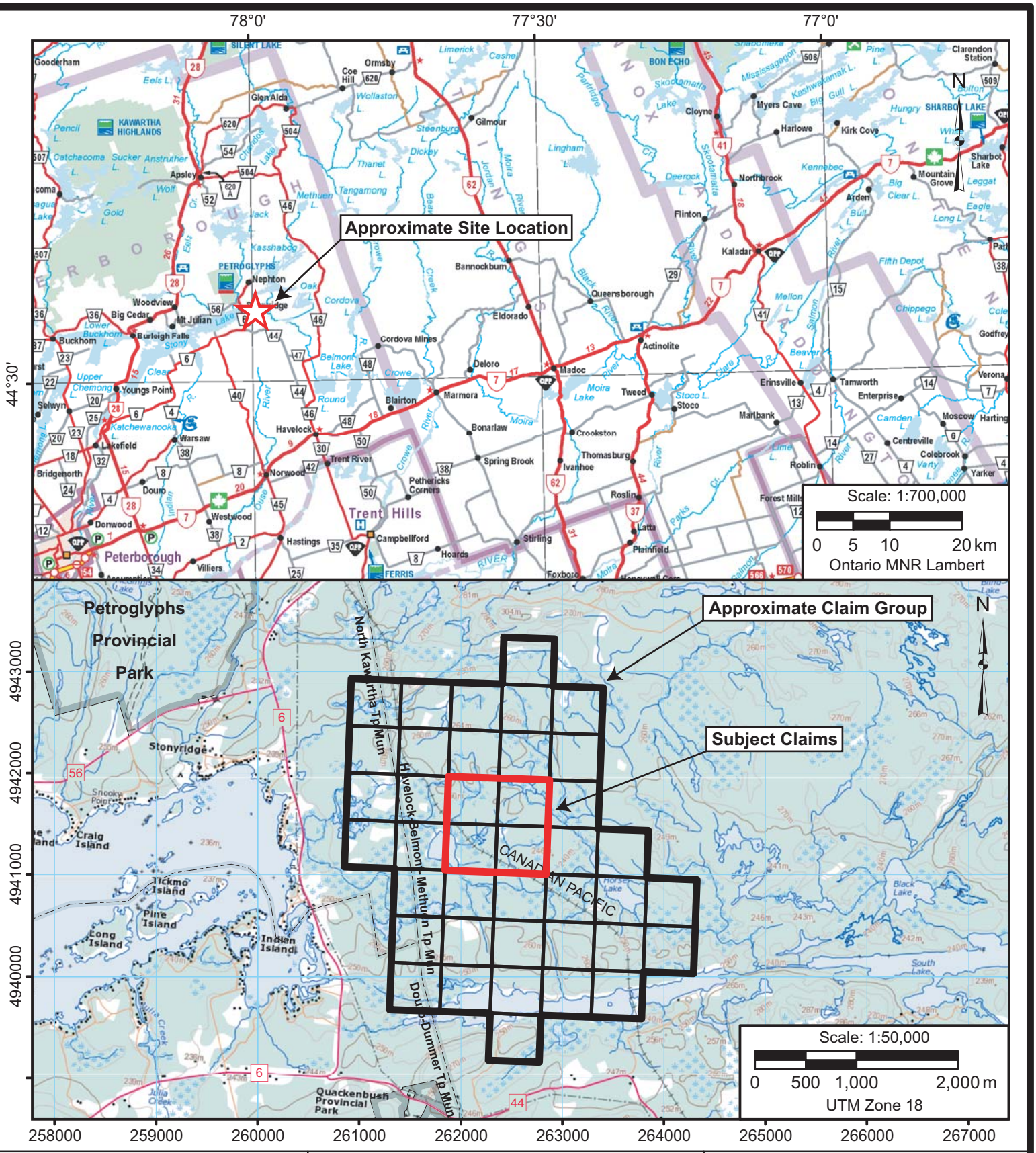
Figures



Notes: Claims from the Ministry of Northern Development and Mines (2019), Mining Lands Administration System.

Base maps from the Ministry of Transportation (2018), The Official Road Map of Ontario, and Natural Resources Canada (2013), Toporama.

Optimized for Oakridge Environmental Ltd. printing.

Environmental Baseline Study (EBS)
Work Performed on Claim Nos. 165704, 165705, 184642 & 340110 (West Gabbro Project)
Part Lots 6 & 7, Concessions 10 & 11 (Methuen)
Township of Havelock-Belmont-Methuen,
County of Peterborough

North American Datum 1983

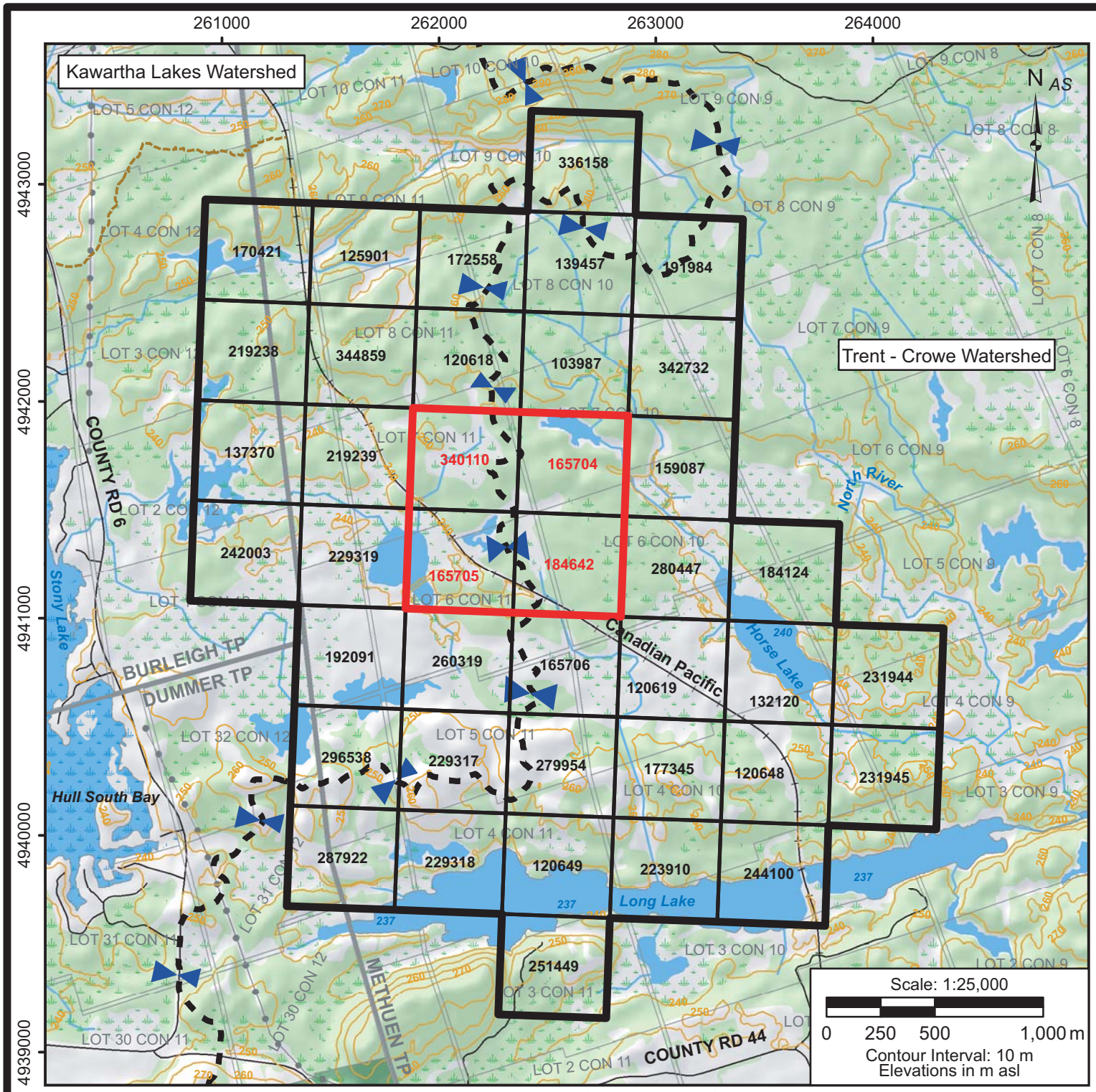
TITLE
General Location

ORE Oakridge Environmental Ltd.
Environmental and Hydrogeological Services

PROJECT # 19-2661

DATE December 2019

FIGURE NO. **1**



North American Datum 1983 UTM Zone 18

Environmental Baseline Study (EBS)
Work Performed on Claim Nos. 165704, 165705, 184642 & 340110 (West Gabbro Project)
Part Lots 6 & 7, Concessions 10 & 11 (Methuen)
Township of Havelock-Belmont-Methuen,
County of Peterborough

LEGEND

- Approximate Claim Group
- Subject Claims
- Watershed Boundary Line
- Access Trail (Route A)
- Wetland
- Provincially Significant Wetland
- Watercourse
- Waterbody
- Wooded Area
- Contour
- Building (to scale)
- Utility Line
- Road
- Railway
- Regulated Park / Conservation Area
- Township / Lot Fabric

Notes: Claims from the Ministry of Northern Development and Mines (2019), Mining Lands Administration System.
Base map provided by the Ministry of Natural Resources and Forestry (2019).
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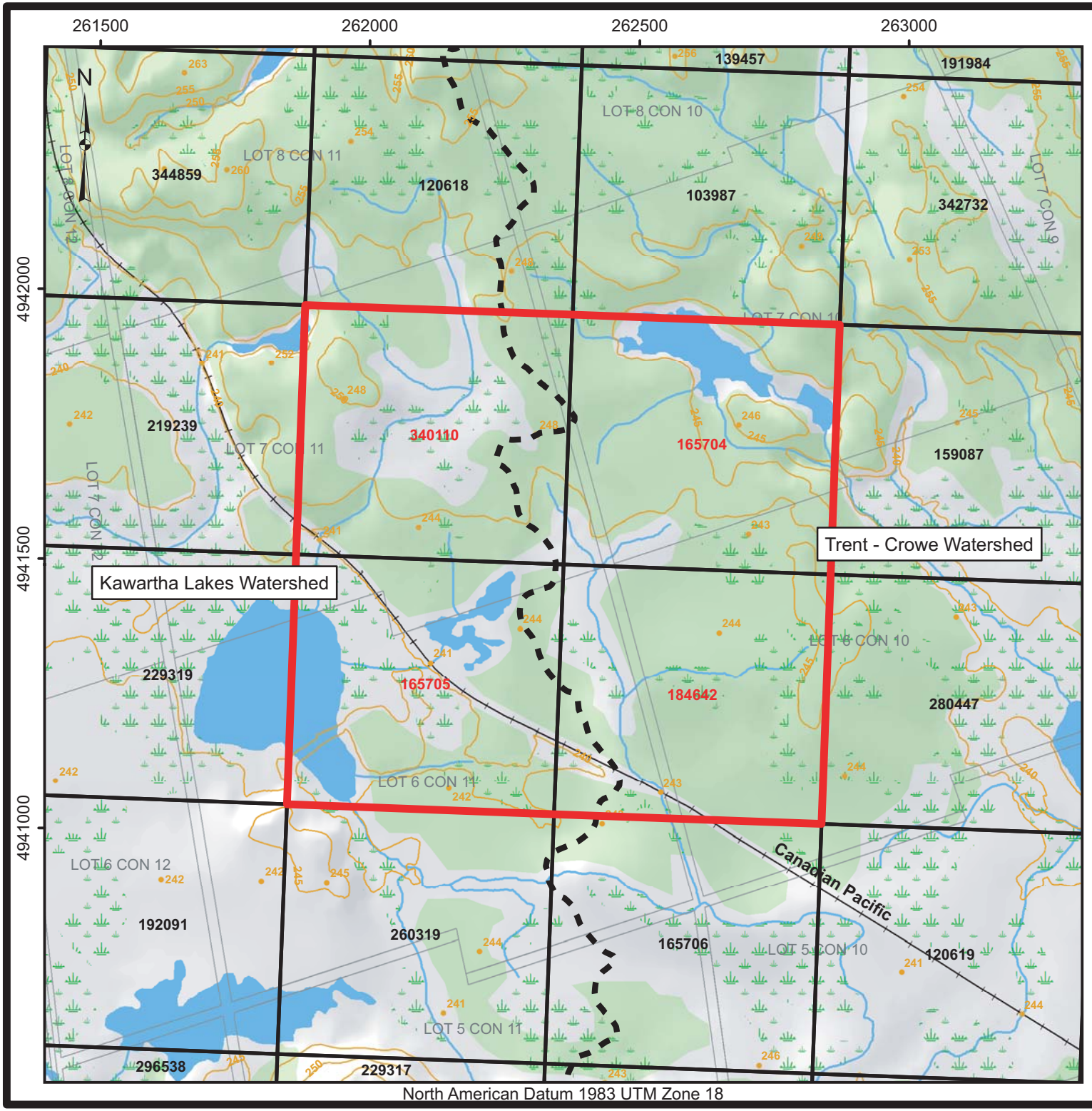
TITLE

Claim Map

ORE Oakridge Environmental Ltd.
Environmental and Hydrogeological Services

PROJECT #	FIGURE NO.
19-2661	2
DATE	
December 2019	



Environmental Baseline Study (EBS)
Work Performed on Claim Nos. 165704, 165705, 184642 & 340110 (West Gabbro Project)
Part Lots 6 & 7, Concessions 10 & 11 (Methuen)
Township of Havelock-Belmont-Methuen,
County of Peterborough

LEGEND

- Approximate Claim Group
- Subject Claims
- Watershed Boundary Line
- Wetland
- Watercourse
- Waterbody
- Wooded Area
- Spot Height
- Contour
- Railway
- Lot Fabric

Scale: 1:10,000

0 100 200 400 m

Contour Interval: 5 m
Elevations in m asl

Notes: Claims from the Ministry of Northern Development and Mines (2019), Mining Lands Administration System.

Base map provided by the Ministry of Natural Resources and Forestry (2019).

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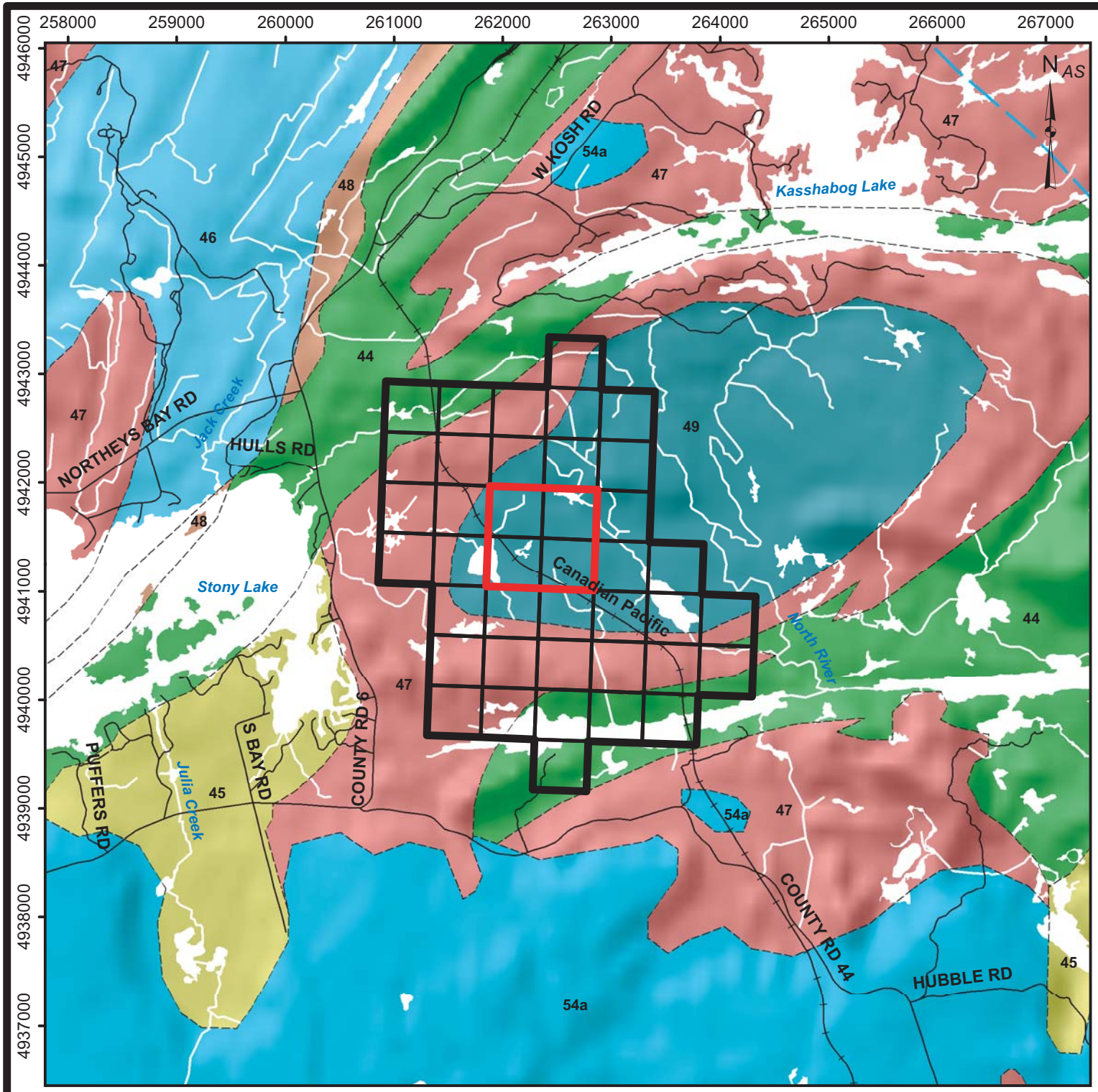
TITLE

Topography and Drainage

ORE Oakridge Environmental Ltd.
Environmental and Hydrogeological Services

PROJECT #	FIGURE NO.
19-2661	3
DATE	
December 2019	



North American Datum 1983 UTM Zone 18

Environmental Baseline Study (EBS)
Work Performed on Claim Nos. 165704, 165705, 184642 & 340110 (West Gabbro Project)
Part Lots 6 & 7, Concessions 10 & 11 (Methuen)
Township of Havelock-Belmont-Methuen,
County of Peterborough

LEGEND

- Approximate Claim Group
- Extent of Claim Boundaries
- Contact (sharp, interpreted)
- Fault (interpreted)
- 54 — Limestone, dolostone, shale, arkose, sandstone
  54a Ottawa Gp.; Simcoe Gp.; Shadow Lake Fm.

Grenville Province

- 49 — Mafic to Ultramafic Plutonic Rocks
- 48 — Alkalic Plutonic Rocks
- 47 — Early Felsic Plutonic Rocks

Grenville Supergroup and Flinton Group

- 46 — Carbonate Metasedimentary Rocks
- 45 — Clastic Metasedimentary Rocks
- 44 — Mafic to Felsic Metavolcanic Rocks

Scale: 1:50,000

0 500 1,000 2,000 m

Notes: Claims from the Ministry of Northern Development and Mines (2019), Mining Lands Administration System.
Geology from the Ontario Geological Survey (2011), 1:250 000 scale bedrock geology of Ontario.

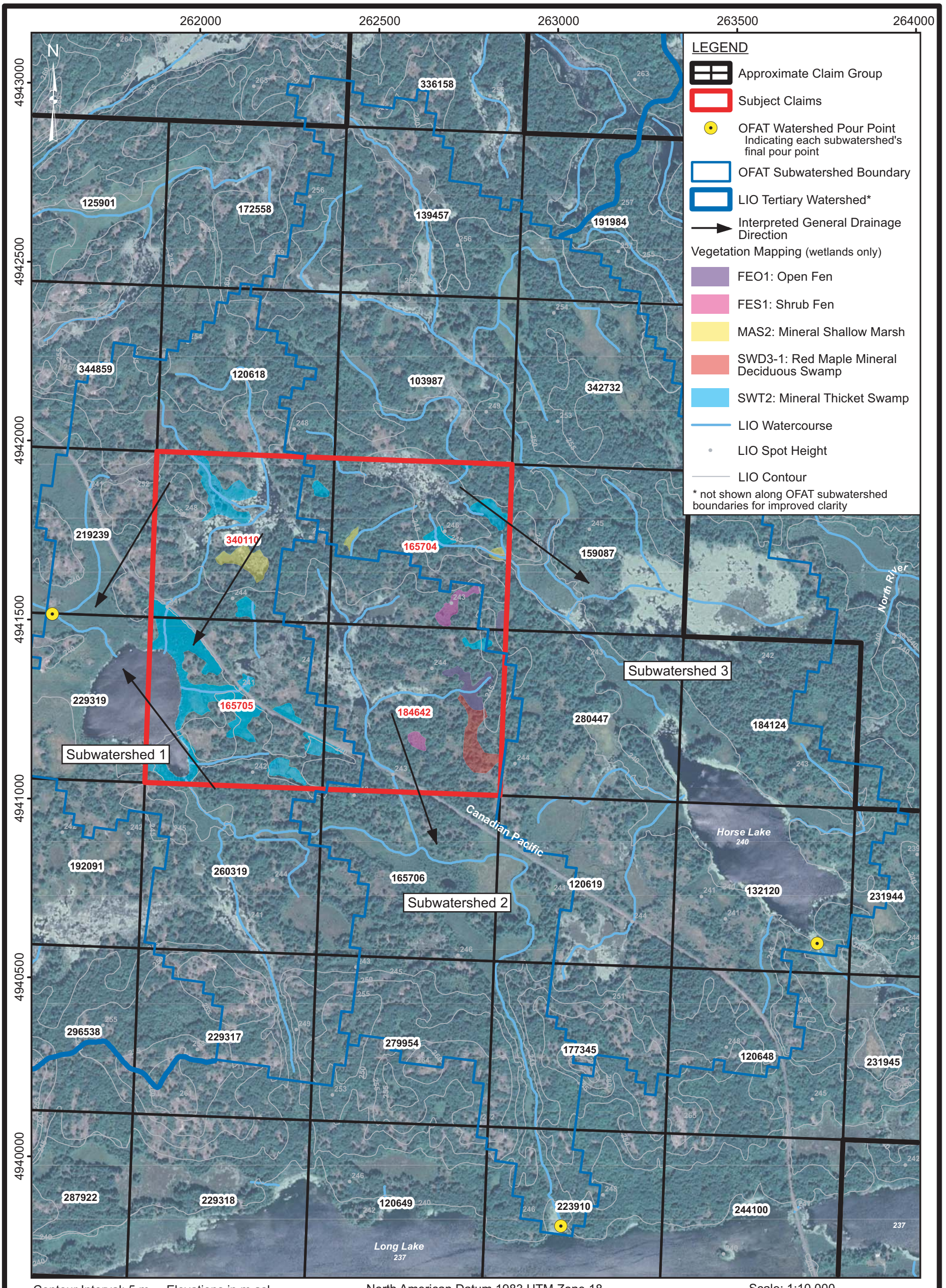
Base map provided by the Ministry of Natural Resources and Forestry (2019).
Optimized for Oakridge Environmental Ltd. printing.

TITLE

Bedrock Geology

ORE Oakridge Environmental Ltd.
Environmental and Hydrogeological Services

PROJECT #	FIGURE NO.
19-2661	4
DATE: December 2019	



Contour Interval: 5 m Elevations in m asl North American Datum 1983 UTM Zone 18 Scale: 1:10,000

Notes: Claims from the Ministry of Northern Development and Mines (2019), Mining Lands Administration System.

OFAT features from the Ministry of Natural Resources and Forestry (2019), Ontario Flow Assessment Tool.

LIO features provided by the Ministry of Natural Resources and Forestry (2019).

Imagery provided by Google (2019).

Optimized for Oakridge Environmental Ltd. (ORE) printing.

Environmental Baseline Study (EBS)
Work Performed on Claim Nos. 165704, 165705, 184642 & 340110 (West Gabbro Project)

Part Lots 6 & 7, Concessions 10 & 11 (Methuen)
Township of Havelock-Belmont-Methuen,
County of Peterborough

ORE Oakridge Environmental Ltd.
Environmental and Hydrogeological Services

0 150 300 600 m

TITLE
OFAT Watershed Mapping

PROJECT # 19-2661

DATE December 2019

FIGURE NO. **5**

738000 738500 739000

4942000 4941500

344859 120618 103987 159087 219239 340110 165704 HA-19-1 HA-19-2 HA-19-3 HA-19-4 165705 229319 184642 280447 260319 165706 120619

N

North American Datum 1983 UTM Zone 18

Environmental Baseline Study (EBS)
Work Performed on Claim Nos. 165704, 165705, 184642 & 340110 (West Gabbro Project)

Part Lots 6 & 7, Concessions 10 & 11 (Methuen)
Township of Havelock-Belmont-Methuen,
County of Peterborough

LEGEND

- Approximate Claim Group
- Subject Claims
- 1 Mineral Thicket Swamp (SWT2)
- 2 Red Maple Mineral Deciduous Swamp (SWD3-1)
- 3 Open Aquatic (OAO)
- 4 Mineral Shallow Marsh (MAS2)
- 5 Fresh - Moist Poplar - White Birch Mixed Forest (FOM8)
- 6 Dry Oak - Pine Mixed Forest (FOM1)/ Dry Acidic Open Rock Barren (RBO3-1)
- 7 Shrub Fen (FES1)
- 8 Open Fen (FEO1)
- 9 Transportation - Railway (CVI_1)
- Hand Auger Locations

Scale: 1:4,000

0 50 100 200 m

Notes: Claims from the Ministry of Northern Development and Mines (2019), Mining Lands Administration System.

Feature locations determined using a mapping grade differential Global Positioning System (dGPS +/- 0.5 m).

Imagery provided by Google (2019).

Optimized for Oakridge Environmental Ltd. printing.

TITLE

Vegetation Communities

ORE Oakridge Environmental Ltd.
Environmental and Hydrogeological Services

PROJECT # 19-2661

DATE December 2019

FIGURE NO. **6**

Photo A (Left): Access to the subject claims was gained through the Transportation - Railway (CVI_1) corridor that runs through the centre of the entire claim group. It passes through rock outcrops, forests and wetlands.

Photo B (Right): The Dry Oak - Pine Mixed Forest (FOM1) is shown in this photo. This community is dominated by Red Oak (Quercus rubra) and White Pine (Pinus strobus), with White Oak (Quercus alba) to a much lesser degree. This ecosite is dominant across the uplands on the subject claims, interspersed with Dry Acidic Open Rock Barrens (RBO3-1).

Photo C (Left): This photo shows a characteristic Dry Acidic Open Rock Barren (RBO3-1), with patches of bare bedrock, covered with mosses and lichens Occasional grasses and herbs can be found growing in the fissures of the rock, and in shallow pockets where soil is able to accumulate. This ecosite is found interspersed with Dry Oak - Pine Mixed Forest (FOM1) throughout the subject claims.

Site photos were taken on October 23, 2019 and October 25, 2019.

Environmental Baseline Study (EBS)
Work Performed on Claim Nos. 165704, 165705, 184642 & 340110 (West Gabbro Project)
Part Lots 6 & 7, Concessions 10 & 11 (Methuen)
Township of Havelock-Belmont-Methuen,
County of Peterborough

TITLE
Site Photos

ORE
Oakridge Environmental Ltd.
Environmental and Hydrogeological Services

PROJECT # 19-2661

DATE December 2019

FIGURE NO. **7**

Photo D (Left): Here is an additional photo of a Dry Acidic Open Rock Barren (RBO3-1), showing one that contains deeper soils. The presence of deeper soils allows for the growth of more vegetation, while still retaining its open nature. Knobs of bedrock can still be seen in pockets among the vegetation.

Photo E (Right): A characteristic Mineral Thicket Swamp (SWT2) is depicted in this photo. A thicket swamp is compsed predominantly of hydrophytic shrub species, often in dense numbers. Permanent standing water is often present. Within the subject claims, this ecosite occurs most often along waterbodies, and low lying watercourses.

Photo F (Left): Open Fen (FEO1) is found in two locations within the subject claims. This type of community is rarely flooded, but always saturated. These open fens are dominated by sedges, often forming dense, single-species expanses. They occur in lowland areas with poor drainage.

Site photos were taken on October 23, 2019 and October 25, 2019.	**Environmental Baseline Study (EBS)** **Work Performed on Claim Nos. 165704, 165705, 184642 & 340110 (West Gabbro Project)** Part Lots 6 & 7, Concessions 10 & 11 (Methuen) Township of Havelock-Belmont-Methuen, County of Peterborough	TITLE **Site Photos**
	ORE Oakridge Environmental Ltd. Environmental and Hydrogeological Services	PROJECT # 19-2661 DATE December 2019 FIGURE NO. **8**

Photo G (Left): The Red Maple Mineral Deciduous Swamp (SWD3-1) is shown in this photo. This community is located in the southeast corner of the subject claims, and it is domanted by Red Maple (Acer rubrum) trees. Hydrophytic sedges, grasses, ferns and mosses were present on the saturated ground.

Photo H (Right): This photo shows a mosaic of communities. Dry Oak - Pine Mixed Forest (FOM1) is visible in the foreground, showing its relatively open nature and shallow soils over bedrock. An Open Aquatic (OAO) ecosite is present beyond the rocky shore. This OAO was formed by the construction of a beaver dam.

Photo I (Left): The large lake that is found in the centre of the subject claims is shown in this photo. It is classified as an Open Aquatic ecosite (OAO), because of the large expanse of open water it contains. There is little transition between this OAO and the FOM1 that surrounds it, due to the abruptness of the rocky shores.

Site photos were taken on October 23, 2019 and October 25, 2019.

Environmental Baseline Study (EBS)
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Part Lots 6 & 7, Concessions 10 & 11 (Methuen)
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County of Peterborough

TITLE
Site Photos

ORE Oakridge Environmental Ltd.
Environmental and Hydrogeological Services

PROJECT # 19-2661

DATE December 2019

FIGURE NO. **9**

Appendix A

OBBA Data

Square Summary (18TQ64)

#species (1st atlas)				#species (2nd atlas)				#hours		#pc done	
poss	prob	conf	total	poss	prob	conf	total	1st	2nd	road	offrd
14	43	27	84	34	26	35	95	11	42	30	2

Region summary (#16: Peterborough)

#squares	#sq with data		#species		#pc done	target #pc
	1st	2nd	1st	2nd		
60	60	60	171	185	1995	750

Target number of point counts in this square: 21 road side, 4 off road (1 in treed wetlands, 3 in deciduous forest). Please try to ensure that each off-road station is located such that the entire 100m radius circle is within the prescribed habitat.

SPECIES	Code		%		SPECIES	Code		%		SPECIES	Code		%	
	1st	2nd	1st	2nd		1st	2nd	1st	2nd		1st	2nd	1st	2nd
Canada Goose		FY	31	93	Cooper's Hawk	H		28	41	Barred Owl		H	48	63
Mute Swan			0	1	Northern Goshawk		NY	26	38	Long-eared Owl			5	13
Wood Duck	P	FY	90	96	Red-should Hawk †			35	63	North Saw-whet Owl			53	30
Gadwall ‡			1	3	Broad-winged Hawk	H	P	66	86	Common Nighthawk	A	P	73	40
American Black Duck	FY	H	63	41	Red-tailed Hawk	P	H	78	68	Whip-poor-will	S	T	75	53
Mallard	P	FY	93	100	American Kestrel			70	66	Chimney Swift			76	21
Blue-winged Teal			48	40	Merlin		P	3	46	Ruby-thr Hummingbird	H	FY	98	96
Northern Shoveler ‡			3	3	Virginia Rail		A	21	71	Belted Kingfisher	P	A	100	98
Northern Pintail ‡			3	0	Sora			20	36	Red-headed Woodpecker †			30	10
Green-winged Teal			0	18	Common Moorhen			23	15	Yellow-bellied Sapsucker	T	A	95	100
Ring-necked Duck			18	46	American Coot ‡			10	5	Downy Woodpecker	P	FY	91	98
Hooded Merganser		H	36	83	Coot/Moorhen			0	0	Hairy Woodpecker	T	NY	95	100
Common Merganser	H	H	30	50	Killdeer	H	A	90	85	Black-backed Woodpecker			13	21
Red-breast Merganser ‡			3	0	Rock Dove			61	73	Northern Flicker	P	T	100	98
Ruffed Grouse	H	S	91	100	Spotted Sandpiper	N	P	76	66	Pileated Woodpecker	T	T	93	100
Wild Turkey			0	56	Upland Sandpiper			31	26	Olive-sided Flycatcher			53	28
Common Loon	FY	FY	85	95	Common Snipe		V	63	78	Eastern Wood-Pewee	P	S	96	100
Pied-billed Grebe		S	8	48	American Woodcock		H	71	78	Yellow-bellied Flycatcher		P	21	16
Double-crest Cormorant ‡§			3	1	Wilson's Phalarope †			1	1	Alder Flycatcher		S	60	96
American Bittern	T		55	81	Ring-billed Gull ‡§		H	1	8	Willow Flycatcher			35	50
Least Bittern †		AE	18	25	Herring Gull §		NE	45	45	Least Flycatcher	T	S	98	100
Great Blue Heron §	NY	NY	100	91	Caspian Tern †	FY		1	1	Eastern Phoebe	AE	NY	96	100
Green Heron §			55	50	Black Tern † §			30	21	Gr Crested Flycatcher	P	FY	100	100
Black-crown N.-Heron † §			3	0	Common Tern §	CF		18	5	Eastern Kingbird	CF	FY	100	100
Turkey Vulture	P	P	90	100	Mourning Dove	P	P	75	96	Loggerhead Shrike †			13	1
Osprey		AE	78	80	Black/Yell-billed Cuckoo			0	46	Yellow-throated Vireo	S		50	53
Bald Eagle †			6	6	Black-billed Cuckoo		S	48	80	Blue-headed Vireo			35	68
Northern Harrier			63	46	Eastern Screech-Owl			11	15	Warbling Vireo	T	S	98	98
Sharp-shinned Hawk			45	60	Great Horned Owl		H	75	46	Philadelphia Vireo ‡			6	8

next page >>

Ontario Breeding Bird Atlas - Summary Sheet for Square 18TQ64 (page 2 of 3)

SPECIES	Code		%		SPECIES	Code		%		SPECIES	Code		%	
	1st	2nd	1st	2nd		1st	2nd	1st	2nd		1st	2nd	1st	2nd
Red-eyed Vireo	P	FY	100	100	Gray Catbird	NE	T	98	86	Canada Warbler	H		66	83
Gray Jay			20	21	Northern Mockingbird ‡			1	1	Eastern Towhee		S	45	45
Blue Jay	P	P	100	100	Brown Thrasher	CF	H	95	81	Chipping Sparrow	CF	FY	100	100
American Crow	P	CF	98	100	European Starling	CF		96	91	Clay-colored Sparrow ‡			1	20
Common Raven	FY	D	46	78	Cedar Waxwing	P	P	100	100	Field Sparrow	CF	S	68	73
Horned Lark			30	28	Golden-winged Warbler			53	40	Vesper Sparrow			75	43
Purple Martin			53	28	Blue/Gold-wing Warbler			0	25	Savannah Sparrow			78	73
Tree Swallow	AE	P	100	100	Brewster's Warbler †			1	8	Grasshopper Sparrow			15	28
North Rgh-wing Swallow	P	H	66	53	Tennessee Warbler ‡			1	1	Song Sparrow	CF	AE	100	100
Bank Swallow §	AE		76	36	Nashville Warbler	P	H	100	100	Swamp Sparrow	P	CF	100	100
Cliff Swallow §	P		81	36	Northern Parula			20	18	White-throat Sparrow	T	S	100	100
Barn Swallow	NU	NU	96	95	Yellow Warbler	CF	FY	100	100	Dark-eyed Junco	P	S	30	35
Black-capped Chickadee	FY	CF	100	100	Chestn-sided Warbler	P	A	98	100	Scarlet Tanager	P	S	91	98
Red-breast Nuthatch	P	FY	71	91	Magnolia Warbler		S	60	75	Northern Cardinal			23	48
White-breast Nuthatch	S	P	91	100	Cape May Warbler ‡			1	8	Rose-breast Grosbeak	A	P	100	100
Brown Creeper	CF	S	55	83	Black-thr Blue Warbler	D	S	43	78	Indigo Bunting	P	FY	100	98
House Wren	S	S	76	78	Yellow-rumped Warbler	P	FY	83	91	Bobolink			85	68
Winter Wren	H		80	93	Black-thr Green Warbler	CF	CF	73	100	Red-wing Blackbird	CF	AE	100	100
Sedge Wren			11	20	Blackburnian Warbler			66	78	Eastern Meadowlark			70	63
Marsh Wren		S	25	51	Pine Warbler	CF	FY	40	88	Western Meadowlark ‡			1	1
Golden-crown Kinglet			33	55	Prairie Warbler †		NE	3	6	Common Grackle	CF	CF	100	100
Ruby-crown Kinglet			20	15	Cerulean Warbler †			8	5	Brown-head Cowbird	FY	S	98	95
Blue-gr Gnatcatcher ‡			11	1	Black-white Warbler	P	S	100	100	Orchard Oriole ‡			1	3
Eastern Bluebird			45	66	American Redstart	A	D	95	100	Baltimore Oriole	P	S	100	90
Veery	D	CF	100	100	Ovenbird	A	A	100	100	Purple Finch	FY	FY	88	100
Swainson's Thrush			36	40	North Waterthrush	S	S	96	100	House Finch			5	43
Hermit Thrush	S	S	66	78	Louis Waterthrush †			1	0	Red Crossbill			20	5
Wood Thrush	P		91	96	Mourning Warbler			75	83	Pine Siskin			33	41
American Robin	NE	CF	100	100	Common Yellowthroat	P	AE	100	100	American Goldfinch	P	P	98	100

[<< previous page](#)

[next page >>](#)

SPECIES	Code		%	
	1st	2nd	1st	2nd
Evening Grosbeak		S	48	71
House Sparrow			70	50

This list includes all species found during the Ontario Breeding Bird Atlas (1st atlas: 1981-1985, 2nd atlas: 2001-2005) in the region #16 (Peterborough). Underlined species are those that you should try to add to this square. They have not yet been reported during the 2nd atlas, but were found during the 1st atlas in this square or have been reported in more than 50% of the squares in this region during the 2nd atlas so far. In the species table, "BE 2nd" and "BE 1st" are the codes for the highest breeding evidence for that species in square 18TQ64 during the 2nd and 1st atlas respectively. The % columns give the percentage of squares in that region where that species was reported during the 2nd and 1st atlas (this gives an idea of the expected chance of finding that species in region #16). Rare/Colonial Species Report Forms should be completed for species marked: § (Colonial), ‡ (regionally rare), or † (provincially rare). Current as of 17/10/2019. An up-to-date version of this sheet is available from http://www.birdsontario.org/atlas/summaryform.jsp?squareID=18TQ64

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Bank Swallow is listed as "Threatened" by SARO and is protected under the ESA. This avian species nests in burrows into the banks of silt and sand deposits. Nests tend to be found on the shorelines of rivers and lakes. The Bank Swallow may also inhabit sand and gravel pits. Typically, this species forages on insects in flight, but will also glean insects off the water.

Barn Swallow is listed as "Threatened" by SARO and is protected under the ESA. The Barn Swallow inhabits open-rural and urban sites where buildings are situated near watercourses. Nesting is typically sporadic within loose colonies on building structures, bridges and other suitable overhanging structures. The cup-like mud nest is adhered to areas beneath the roof of the structure to conceal the nest from predators and keep it dry. The Barn Swallow feeds on insects by catching them on the wing.

Canada Warbler is listed as "Special Concern" by SARO, and is not protected under the ESA. It prefers large tracts of mixed forests on bottomlands within wetlands or drainage courses. The species nests within the upper extremities of the canopy in deciduous and coniferous trees. The Canada Warbler feeds on beetles, caterpillars and common insects. Typically, this species prefers creeks and mixed forests with a coniferous edge along a moving creek, tributary or river system.

Common Nighthawk is listed as "Special Concern" by SARO, and is not protected under the ESA. The Common Nighthawk is part of the Nightjar family which prefers forest openings, bogs and sometimes open field/meadow areas. Nesting is on bare ground where both adults feed the young. Feeding can take place during day or night, while the species constantly forages for all types of insects.

Eastern Whip-poor-will is listed as "Threatened" by SARO and is protected under the ESA. The Whip-poor-will prefers a combination of large natural tracts of secondary succession forest, watercourses and edge habitat consisting of meadow areas, with open deciduous and pine woodlands. The Whip-poor-will does not construct a nest, but rather uses the soft leaf litter on the ground to form a nest and lay the eggs directly on the ground. The Whip-poor-will is a nighttime hunter, calling its own name while searching for large flying insects, beetles, moths, mosquitos and sometimes grasshoppers. The Whip-poor-will often choose pine species adjacent to waterways to call from.

Eastern Wood-Pewee is listed as "Special Concern" by SARO and is not protected under the ESA. This species prefers mixed deciduous and coniferous woodlands which are open or considered edge habitat. Nesting occurs on a tree branch as the species catches insects from a perch.

Evening Grosbeak is listed as "Special Concern" by SARO and is not protected under the ESA. During the breeding season, Evening Grosbeak is generally found

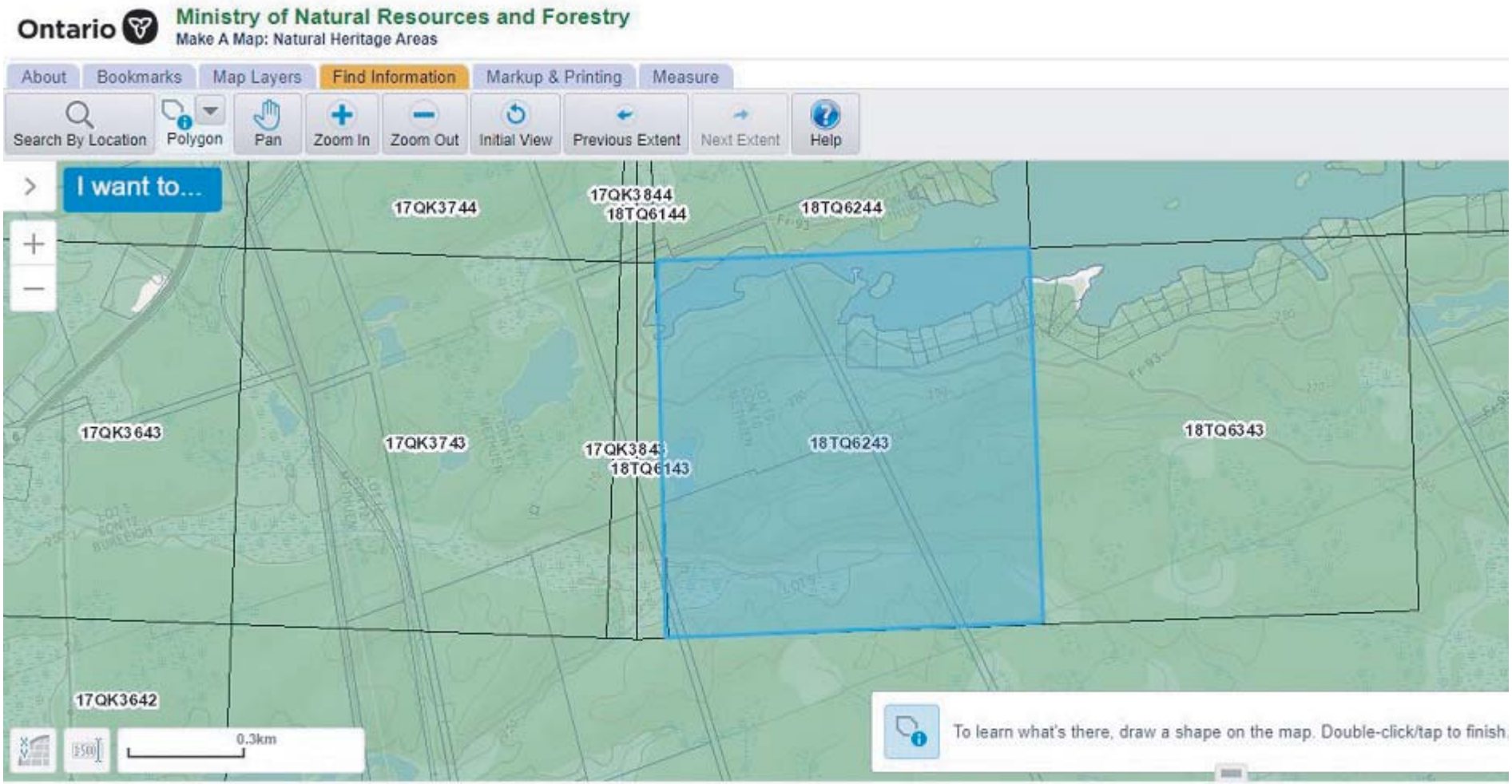
in open, mature mixed-wood forests dominated by fir species, White Spruce and/or Trembling Aspen. Its abundance is strongly linked to the cycle of its primary prey, the Spruce Budworm. Outside the breeding season, the species depends mostly on seed crops.

Least Bittern is listed as "Threatened" by SARO and is protected under the ESA. The Least Bittern inhabits freshwater marshes where tall, impenetrable stands of emergent vegetation are utilized for coverage. The Least Bittern may build up a hunting platform in search of small fish, insects, and amphibians.

Wood Thrush is listed as “Threatened” by SARO and is protected under the ESA. The Wood Thrush enjoys relatively undisturbed, mature woodlands. Nesting occurs low in the fork of a tree as this species forages for berries and insects at ground level. Similar to the Eastern Wood-Pewee, this species prefers large tracts of woodland.

Appendix B

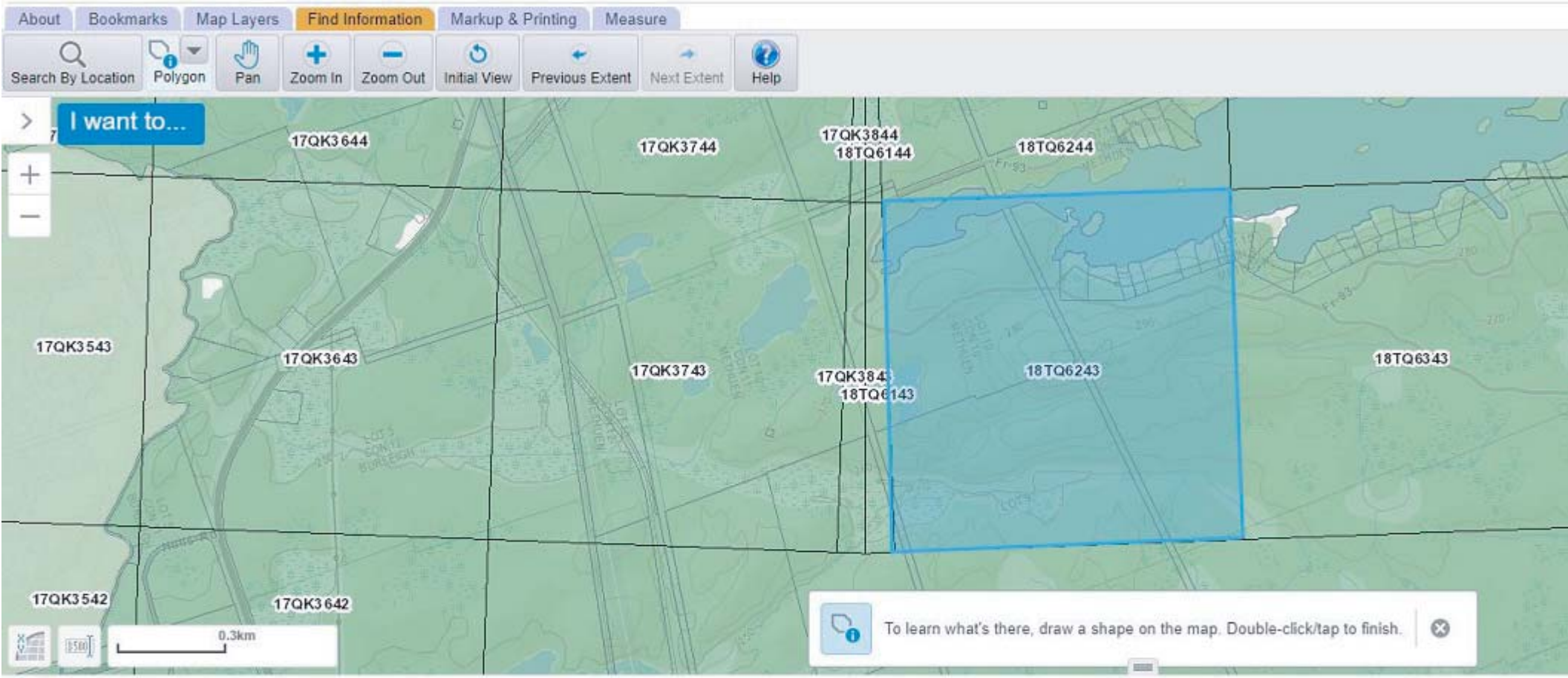
NHIC Data



NHIC Data -- Grid ID = 1067483

Element Type	Common Name	Scientific Name	SRank	SARO Status	COSEWIC Status	Last Obs Date	EO ID
SPECIES	Common Five-lined Skink (Southern Shield population)	Plestiodon fasciatus pop. 2	S3	SC	SC	2009-09-06	103773
SPECIES	Blanding's Turtle	Emydoidea blandingii	S3	THR	END	2002-06-23	113598

Ontario Ministry of Natural Resources and Forestry
Make A Map: Natural Heritage Areas

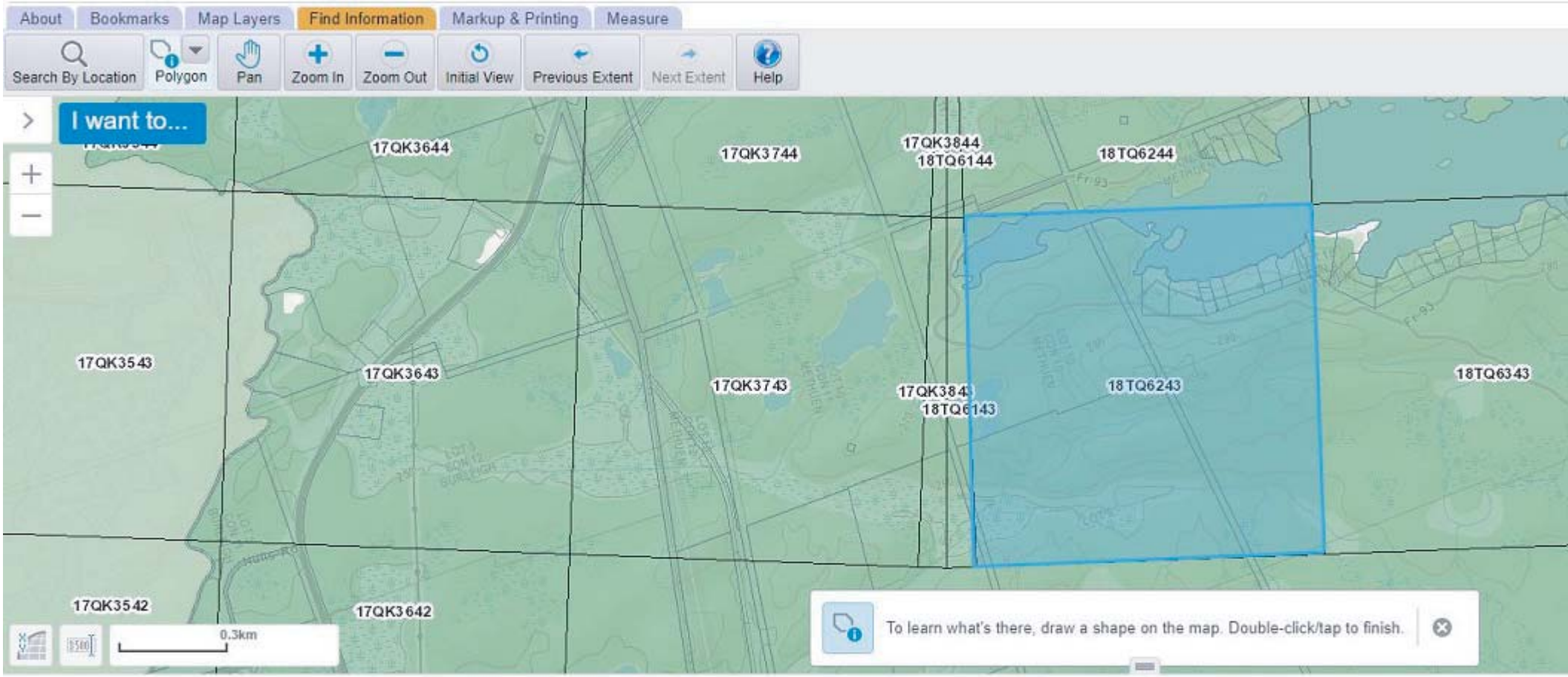


NHIC Data -- Grid ID = 1067490

Element Type	Common Name	Scientific Name	SRank	SARO Status	COSEWIC Status	Last Obs Date	EO ID
NATURAL AREA	Peterborough Crown Game Preserve						10743
SPECIES	Common Five-lined Skink (Southern Shield population)	Plestiodon fasciatus pop. 2	S3	SC	SC	2009-09-06	103773
SPECIES	Blanding's Turtle	Emydoidea blandingii	S3	THR	END	2002-06-23	113598
WILDLIFE CONCENTRATION AREA	Mixed Wader Nesting Colony					1989-12-29	957738
WILDLIFE CONCENTRATION AREA	Mixed Wader Nesting Colony					1991-06-29	957739

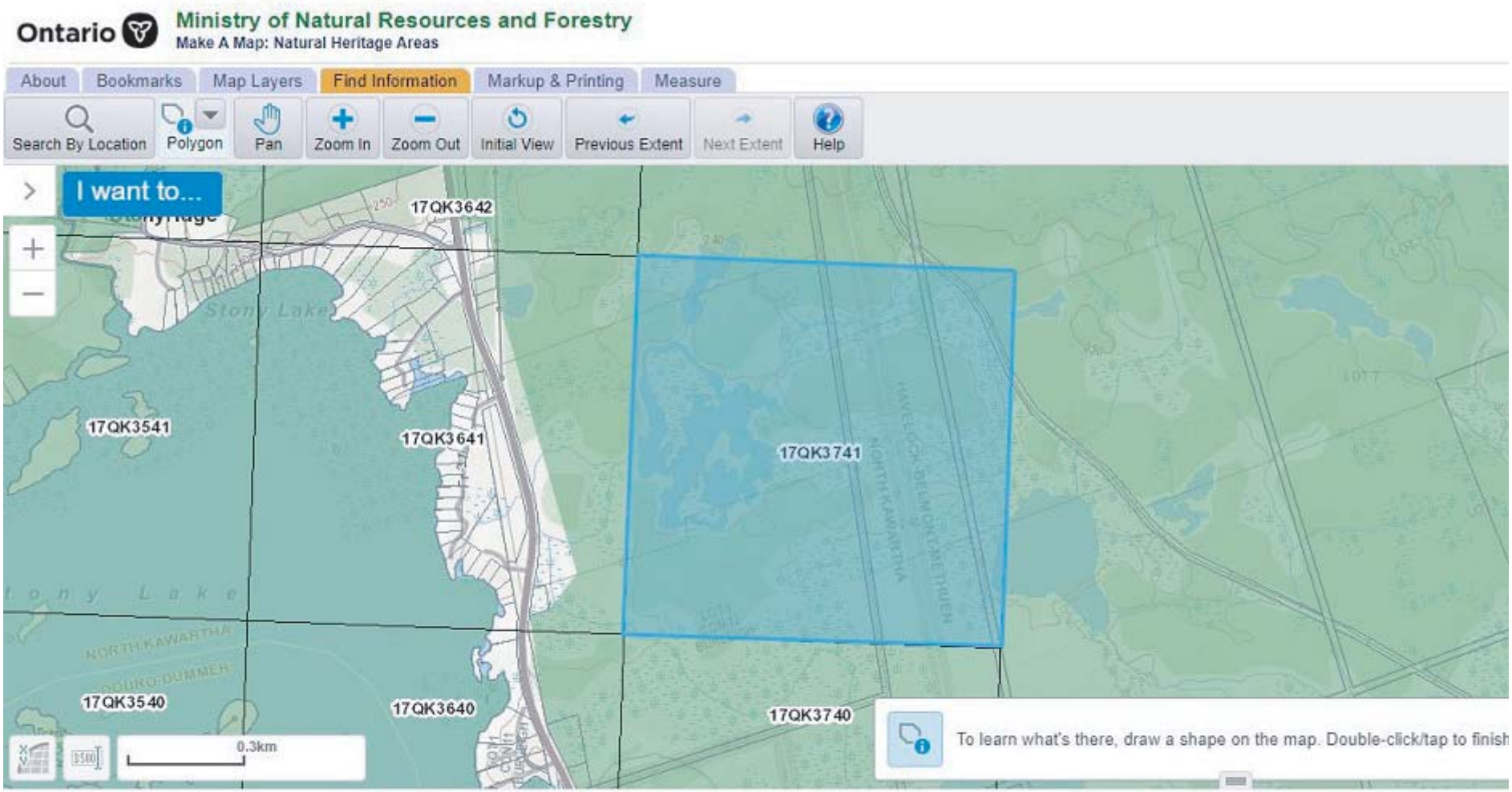
Ontario **Ministry of Natural Resources and Forestry**

Make A Map: Natural Heritage Areas



NHIC Data -- Grid ID = 1067489

Element Type	Common Name	Scientific Name	SRank	SARO Status	COSEWIC Status	Last Obs Date	EO ID
SPECIES	Common Five-lined Skink (Southern Shield population)	Plestiodon fasciatus pop. 2	S3	SC	SC	2009-09-06	103773
SPECIES	Blanding's Turtle	Emydoidea blandingii	S3	THR	END	2002-06-23	113598
WILDLIFE CONCENTRATION AREA	Mixed Wader Nesting Colony					1998-circa	957740



NHIC Data – Grid ID = 1065284

Element Type	Common Name	Scientific Name	SRank	SARO Status	COSEWIC Status	Last Obs Date	EO ID
SPECIES	Common Five-lined Skink (Southern Shield population)	Plestiodon fasciatus pop. 2	S3	SC	SC	2009-09-06	103773

[Français]

Ontario

Ministry of Natural Resources and Forestry

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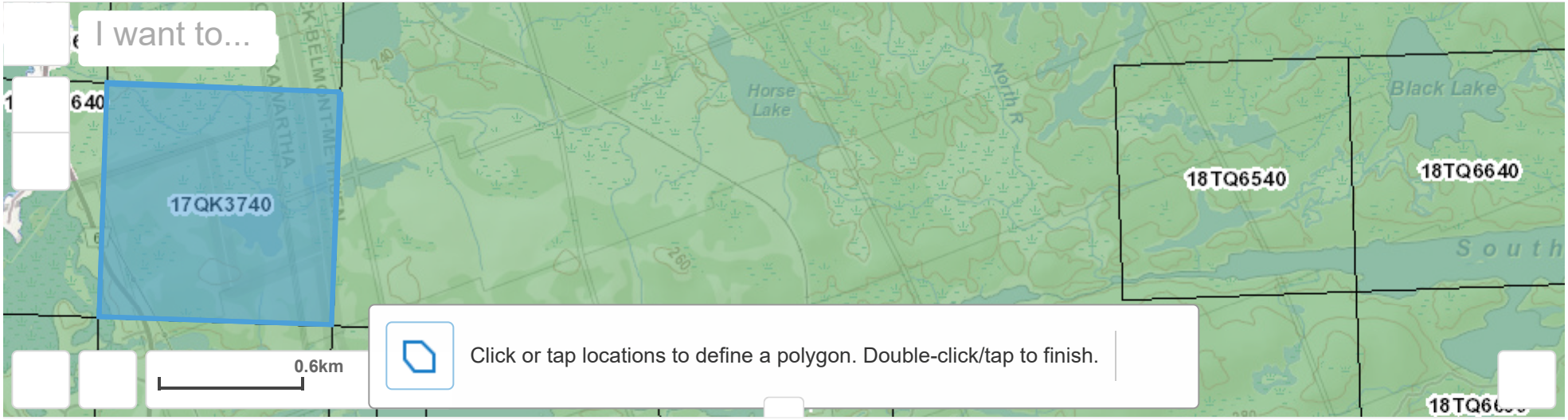

NHIC Data -- Grid ID = 1065191

Element Type	Common Name	Scientific Name	SRank	SARO Status	COSEWIC Status	Last Obs Date	EO ID	Detail
NATURAL AREA	Julia Creek Wetlands						1334	http://r
NATURAL AREA	Julia Creek Wetland						8190	http://r
NATURAL AREA	Pine Island South						8230	http://r
SPECIES	Cerulean Warbler	Setophaga cerulea	S3B	THR	END	2008-06-08	115898	http://r

[Français]

Ontario

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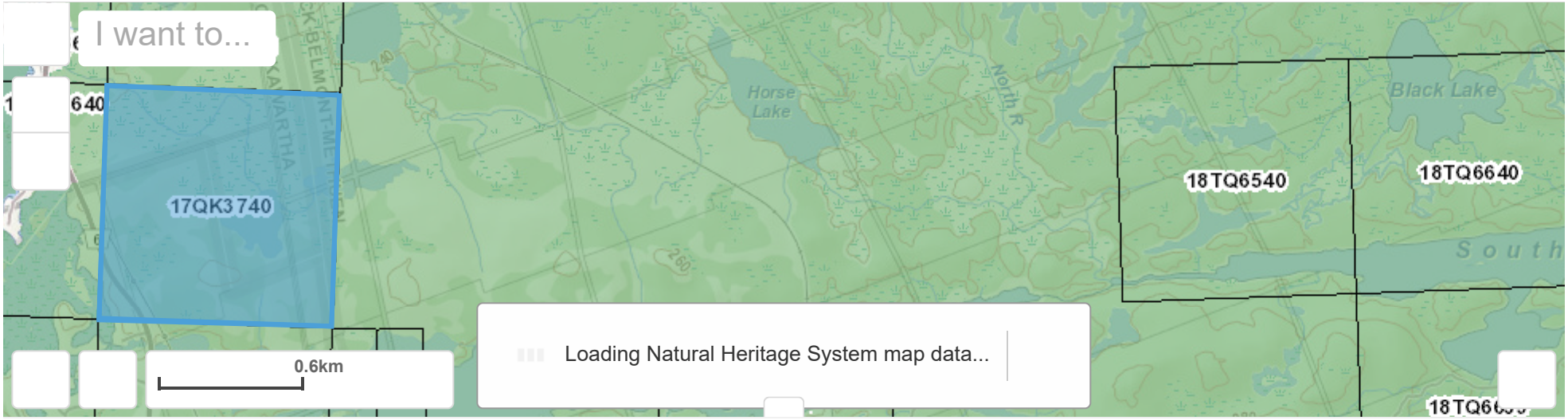
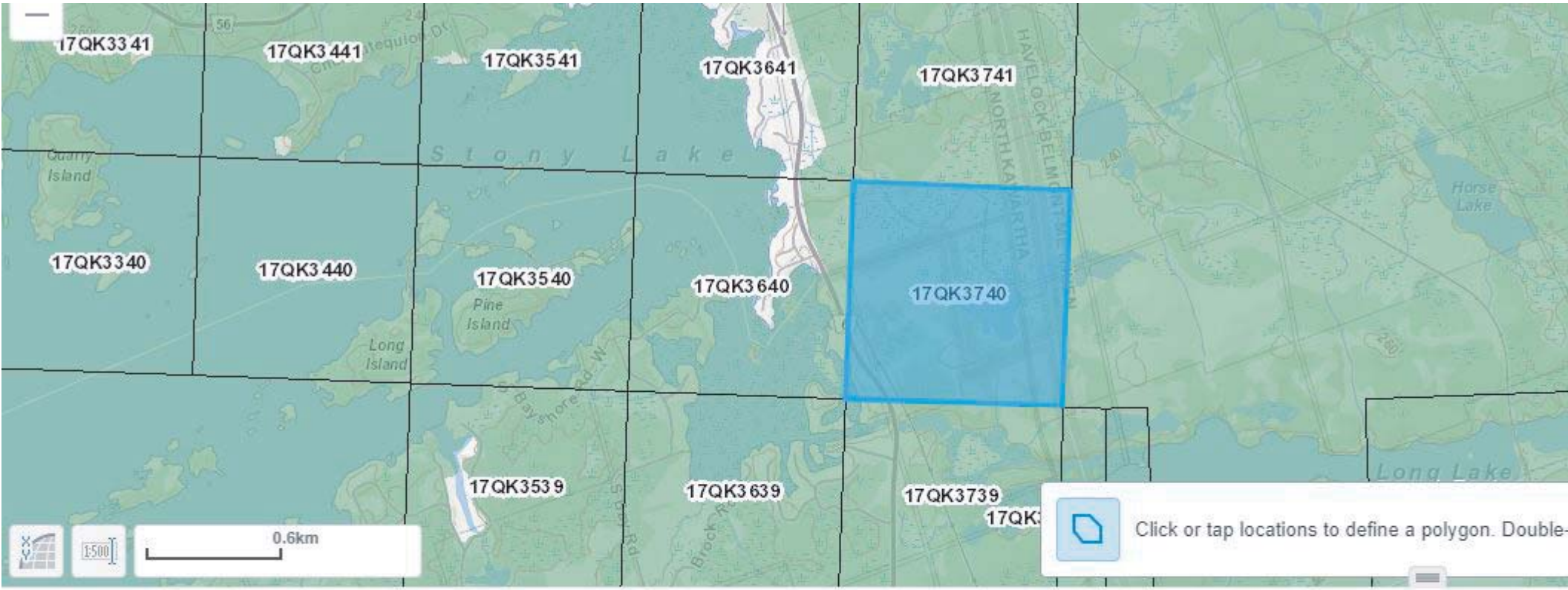


NHIC Data -- Grid ID = 1065192

Element Type	Common Name	Scientific Name	SRank	SARO Status	COSEWIC Status	Last Obs Date	EO ID	Details U
NATURAL AREA	Pine Island South						8230	http://nhic
NATURAL AREA	Hull South Bay						19816	http://nhic
SPECIES	Cerulean Warbler	Setophaga cerulea	S3B	THR	END	2008-06-08	115898	http://nhic



NHIC Data -- Grid ID = 106520

Element Type	Common Name	Scientific Name	SRank	SARO Status	COSEWIC Status	Last Obs Date	EO ID	D
NATURAL AREA	QUACKENBUSH PROVINCIAL PARK						3191	h
NATURAL AREA	QUACKENBUSH PARK RESERVE						10677	h
SPECIES	Butternut	Juglans cinerea	S2?	END	END	2009-05-24	95371	h
SPECIES	Cerulean Warbler	Setophaga cerulea	S3B	THR	END	2008-06-08	115898	h
SPECIES	Flooded Jellyskin	Leptogium rivulare	S3	NAR	SC	2012-06-08	116238	h
SPECIES	Eastern Wood-pewee	Contopus virens	S4B	SC	SC		180294	h

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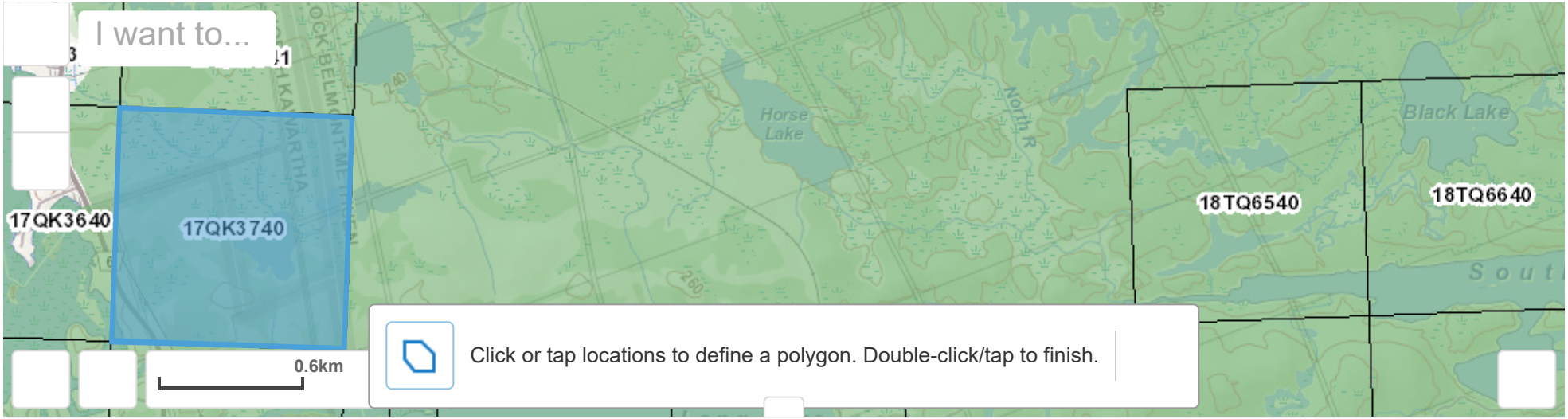

NHIC Data -- Grid ID = 1065202

Element Type	Common Name	Scientific Name	SRank	SARO Status	COSEWIC Status	Last Obs Date	EO ID	De
NATURAL AREA	Hull South Bay						19816	http
SPECIES	Blanding's Turtle	Emydoidea blandingii	S3	THR	END	1988-05-22	113603	http
SPECIES	Cerulean Warbler	Setophaga cerulea	S3B	THR	END	2008-06-08	115898	http
SPECIES	Eastern Wood-pewee	Contopus virens	S4B	SC	SC		180294	http

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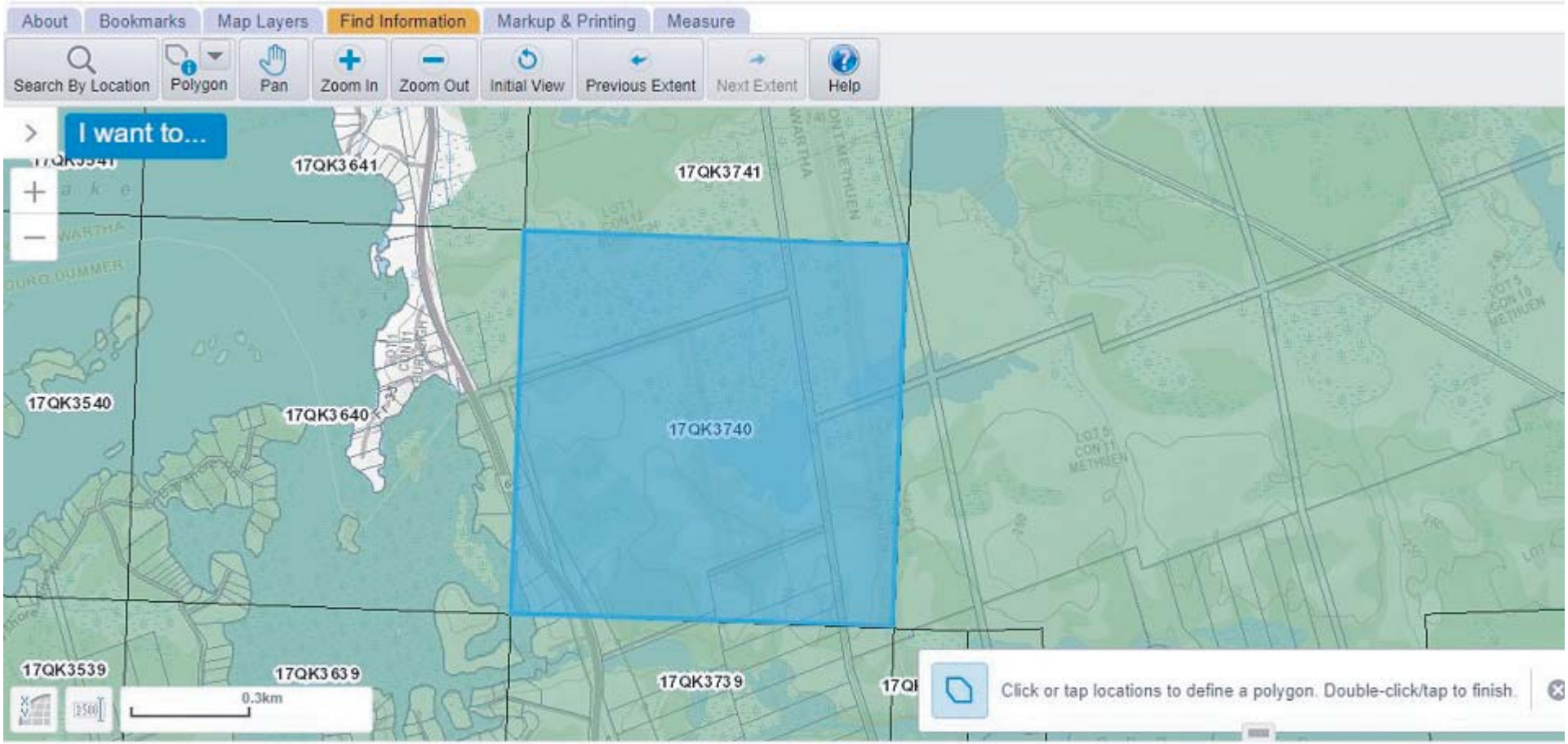

NHIC Data -- Grid ID = 1065283

Element Type	Common Name	Scientific Name	SRank	SARO Status	COSEWIC Status	Last Obs Date	EO ID
NATURAL AREA	Hull South Bay						19816
SPECIES	Common Five-lined Skink (Southern Shield population)	Plestiodon fasciatus pop. 2	S3	SC	SC	2009-09-06	103773

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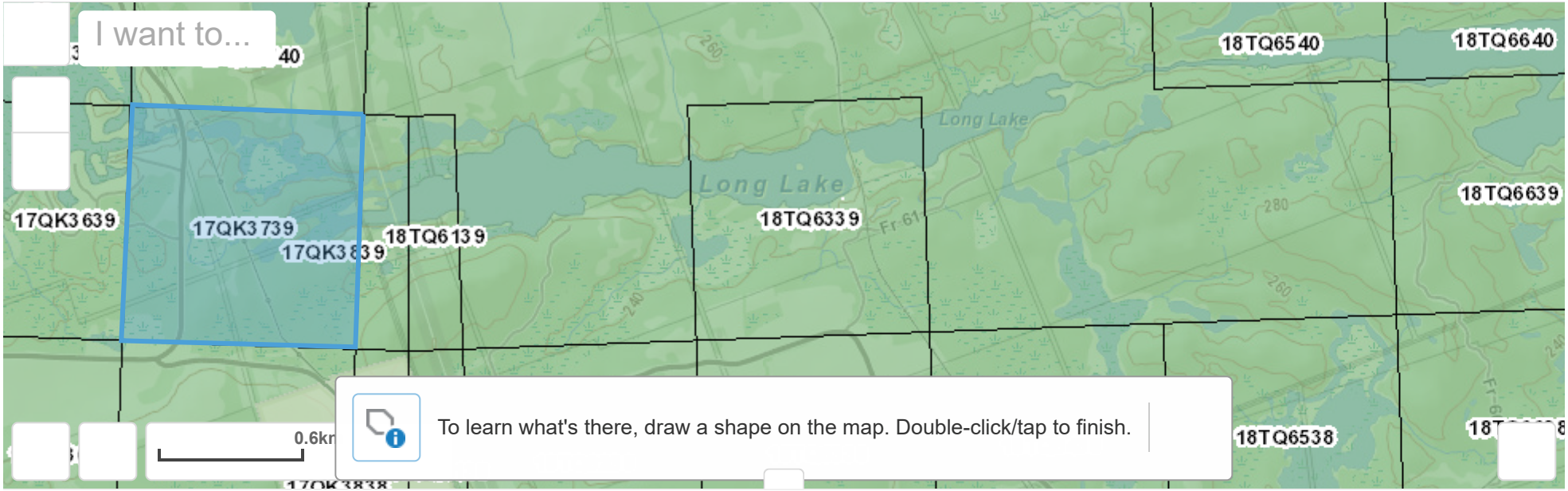

NHIC Data -- Grid ID = 1065191

Element Type	Common Name	Scientific Name	SRank	SARO Status	COSEWIC Status	Last Obs Date	EO ID	Detail
NATURAL AREA	Julia Creek Wetlands						1334	http://r
NATURAL AREA	Julia Creek Wetland						8190	http://r
NATURAL AREA	Pine Island South						8230	http://r
SPECIES	Cerulean Warbler	Setophaga cerulea	S3B	THR	END	2008-06-08	115898	http://r

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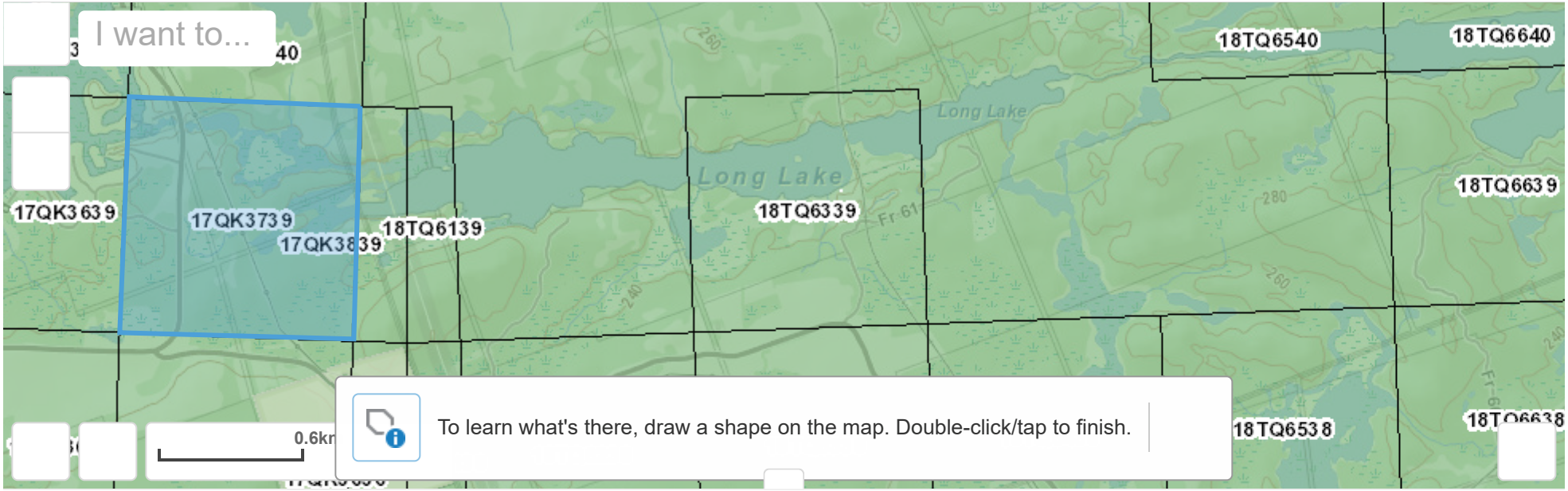
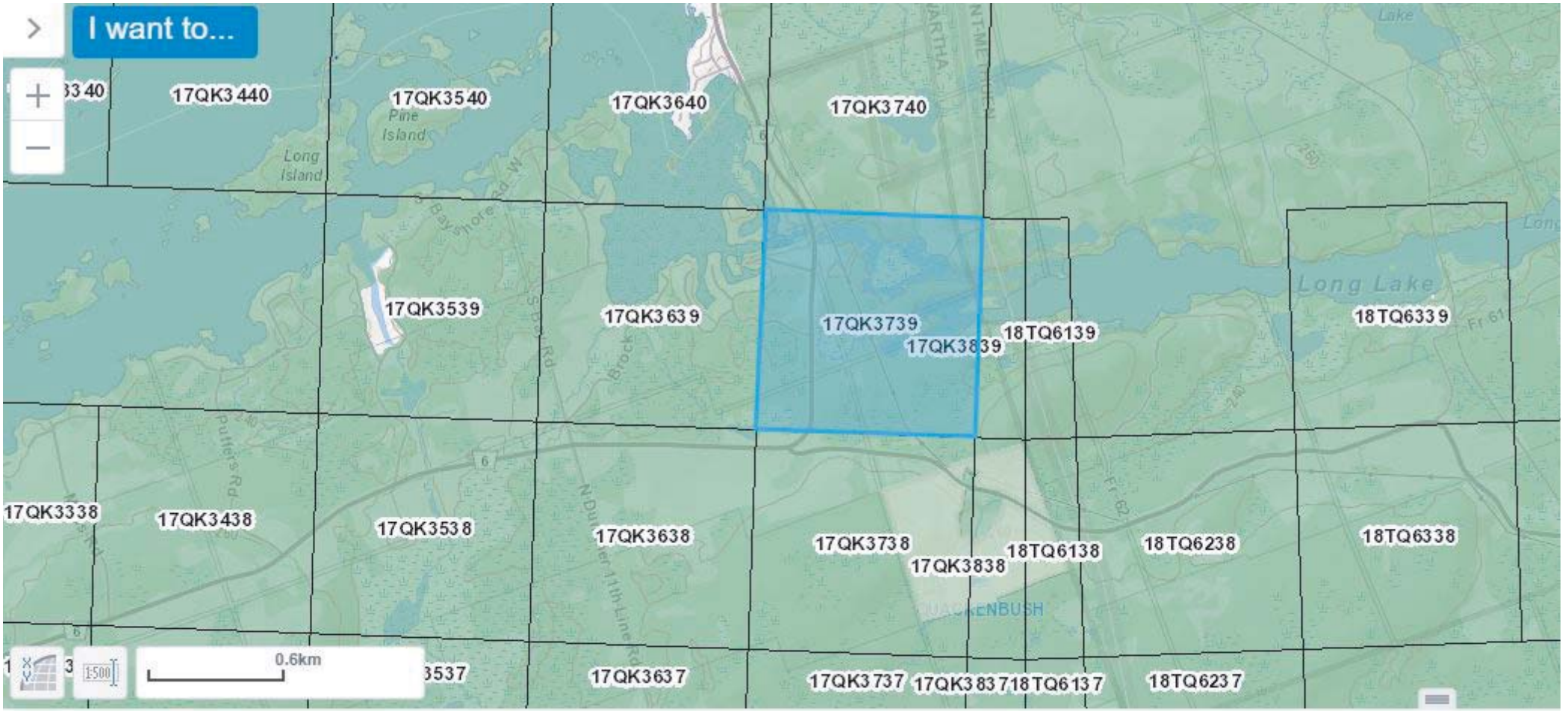
Search By Location | Polygon | Pan | Zoom In | Zoom Out | Initial View | Previous Extent | Next Extent | Help



NHIC Data -- Grid ID = 1065192

Element Type	Common Name	Scientific Name	SRank	SARO Status	COSEWIC Status	Last Obs Date	EO ID	Details U
NATURAL AREA	Pine Island South						8230	http://nhic
NATURAL AREA	Hull South Bay						19816	http://nhic
SPECIES	Cerulean Warbler	Setophaga cerulea	S3B	THR	END	2008-06-08	115898	http://nhic



NHIC Data -- Grid ID = 1065

Element Type	Common Name	Scientific Name	SRank	SARO Status	COSEWIC Status	Last Obs Date	EO ID
NATURAL AREA	QUACKENBUSH PROVINCIAL PARK						3191
NATURAL AREA	QUACKENBUSH PARK RESERVE						10677
SPECIES	Butternut	Juglans cinerea	S2?	END	END	2009-05-24	95371
SPECIES	Cerulean Warbler	Setophaga cerulea	S3B	THR	END	2008-06-08	115898
SPECIES	Flooded Jellyskin	Leptogium rivulare	S3	NAR	SC	2012-06-08	116238
SPECIES	Eastern Wood-pewee	Contopus virens	S4B	SC	SC		180294

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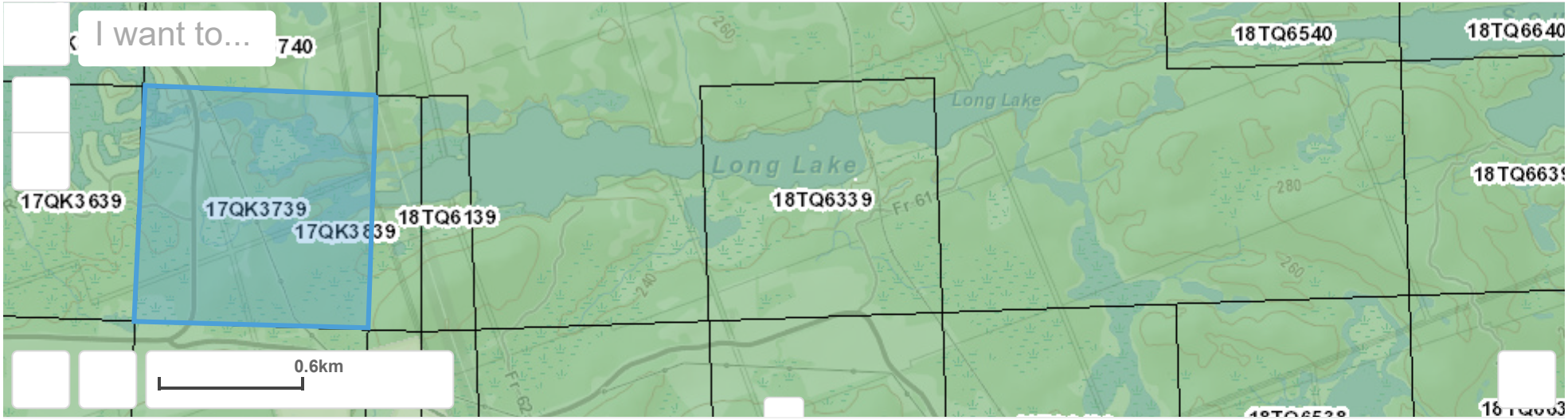
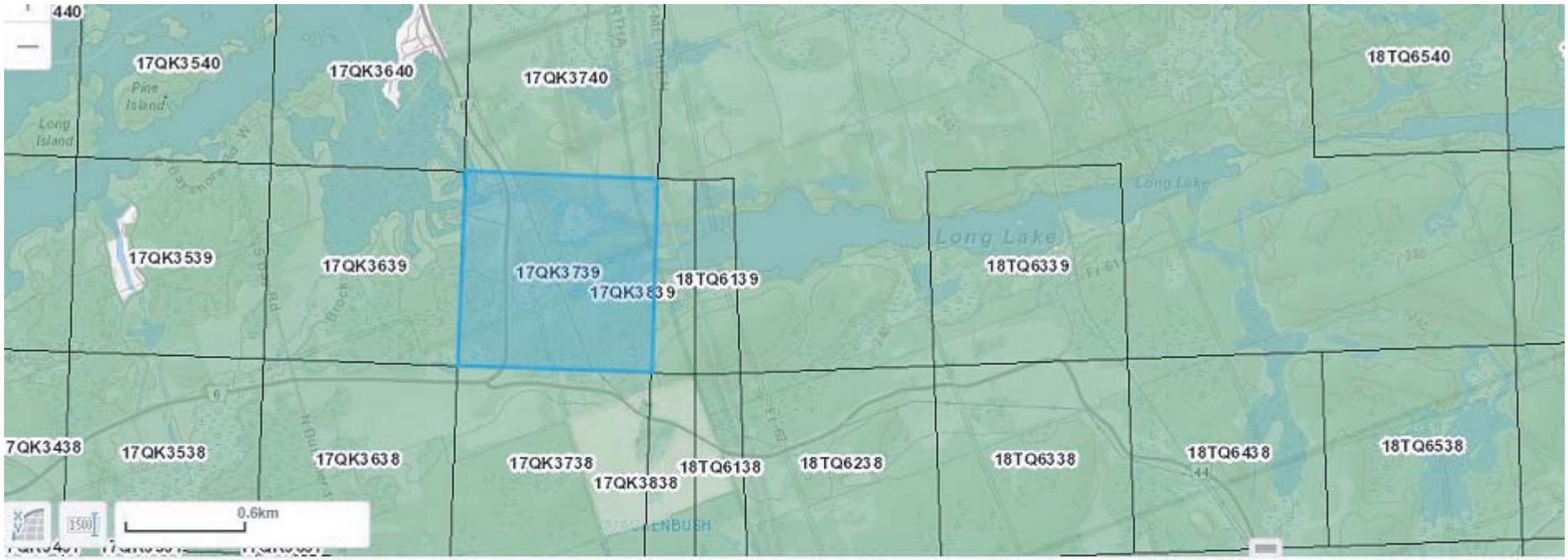


NHIC Data -- Grid ID = 1065202

Element Type	Common Name	Scientific Name	SRank	SARO Status	COSEWIC Status	Last Obs Date	EO ID	De
NATURAL AREA	Hull South Bay						19816	http
SPECIES	Blanding's Turtle	Emydoidea blandingii	S3	THR	END	1988-05-22	113603	http
SPECIES	Cerulean Warbler	Setophaga cerulea	S3B	THR	END	2008-06-08	115898	http
SPECIES	Eastern Wood-pewee	Contopus virens	S4B	SC	SC		180294	http



NHIC Data -- Grid ID = 1065283

Element Type	Common Name	Scientific Name	SRank	SARO Status	COSEWIC Status	Last Obs Date	EO ID
NATURAL AREA	Hull South Bay						19816
SPECIES	Common Five-lined Skink (Southern Shield population)	Plestiodon fasciatus pop. 2	S3	SC	SC	2009-09-06	103773

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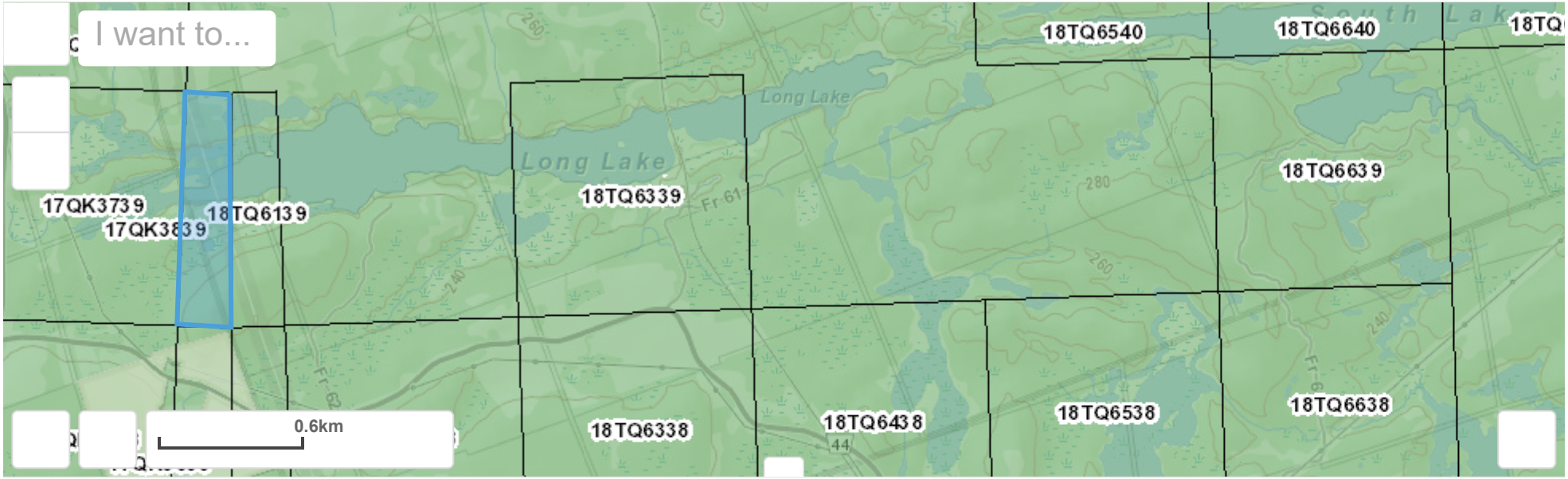

NHIC Data -- Grid ID = 1065202

Element Type	Common Name	Scientific Name	SRank	SARO Status	COSEWIC Status	Last Obs Date	EO ID	De
NATURAL AREA	Hull South Bay						19816	http
SPECIES	Blanding's Turtle	Emydoidea blandingii	S3	THR	END	1988-05-22	113603	http
SPECIES	Cerulean Warbler	Setophaga cerulea	S3B	THR	END	2008-06-08	115898	http
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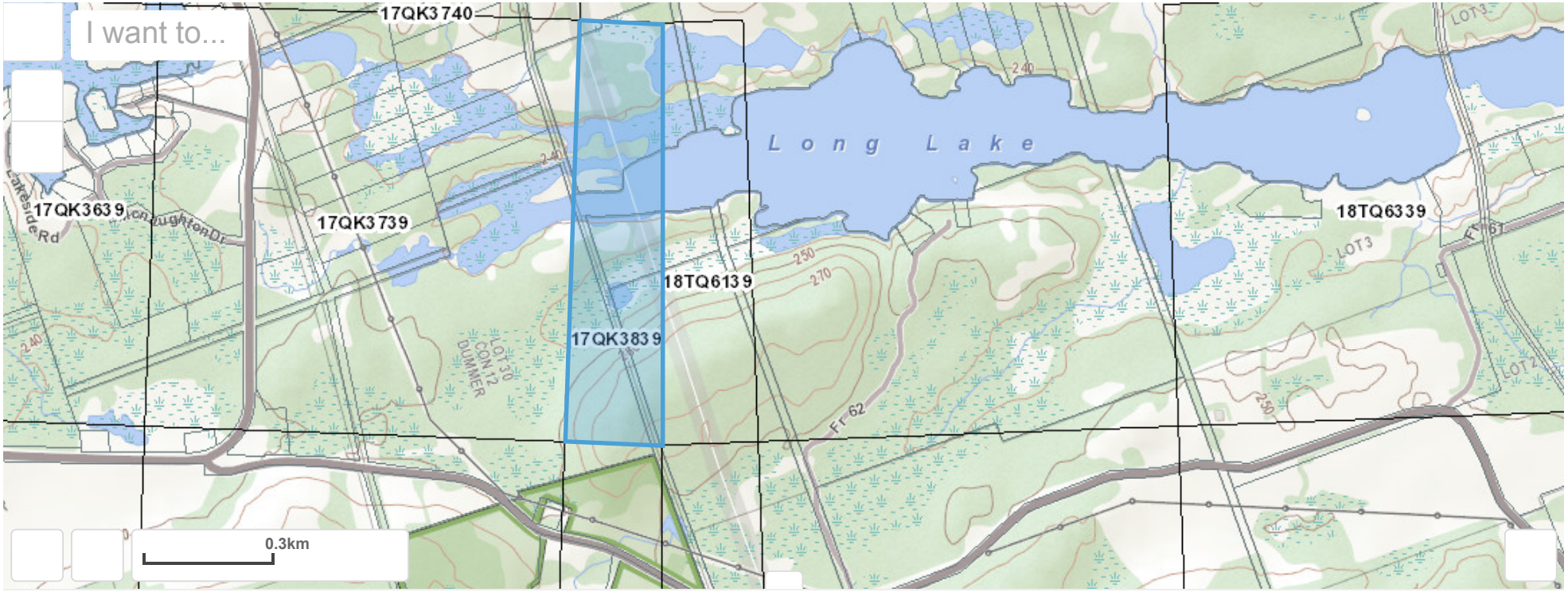

NHIC Data -- Grid ID = 1065212

Element Type	Common Name	Scientific Name	SRank	SARO Status	COSEWIC Status	Last Obs Date	EO ID	Details URL
SPECIES	Cerulean Warbler	Setophaga cerulea	S3B	THR	END	2008-06-08	115898	http://nhic.mnr.gov.on.ca/repo

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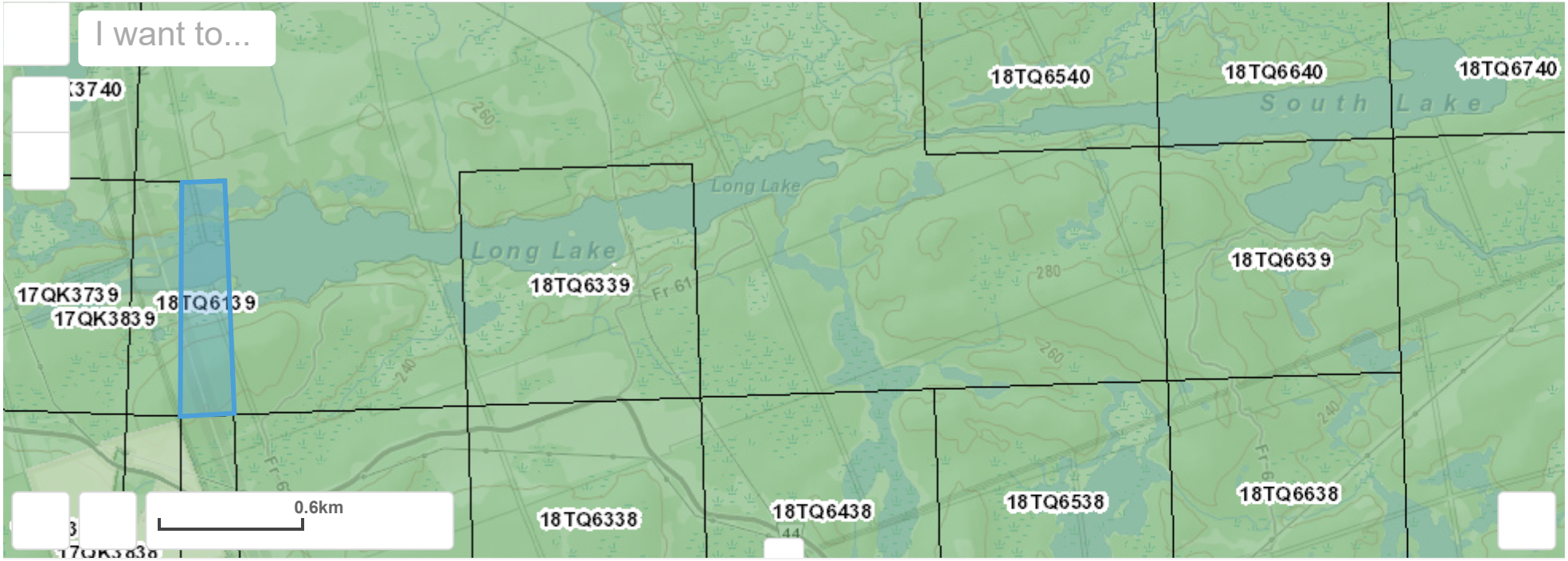
Search By Location | Polygon | Pan | Zoom In | Zoom Out | Initial View | Previous Extent | Next Extent | Help



NHIC Data -- Grid ID = 1067399

Element Type	Common Name	Scientific Name	SRank	SARO Status	COSEWIC Status	Last Obs Date	EO ID	Details URL
SPECIES	Cerulean Warbler	Setophaga cerulea	S3B	THR	END	2008-06-08	115898	http://nhic.m

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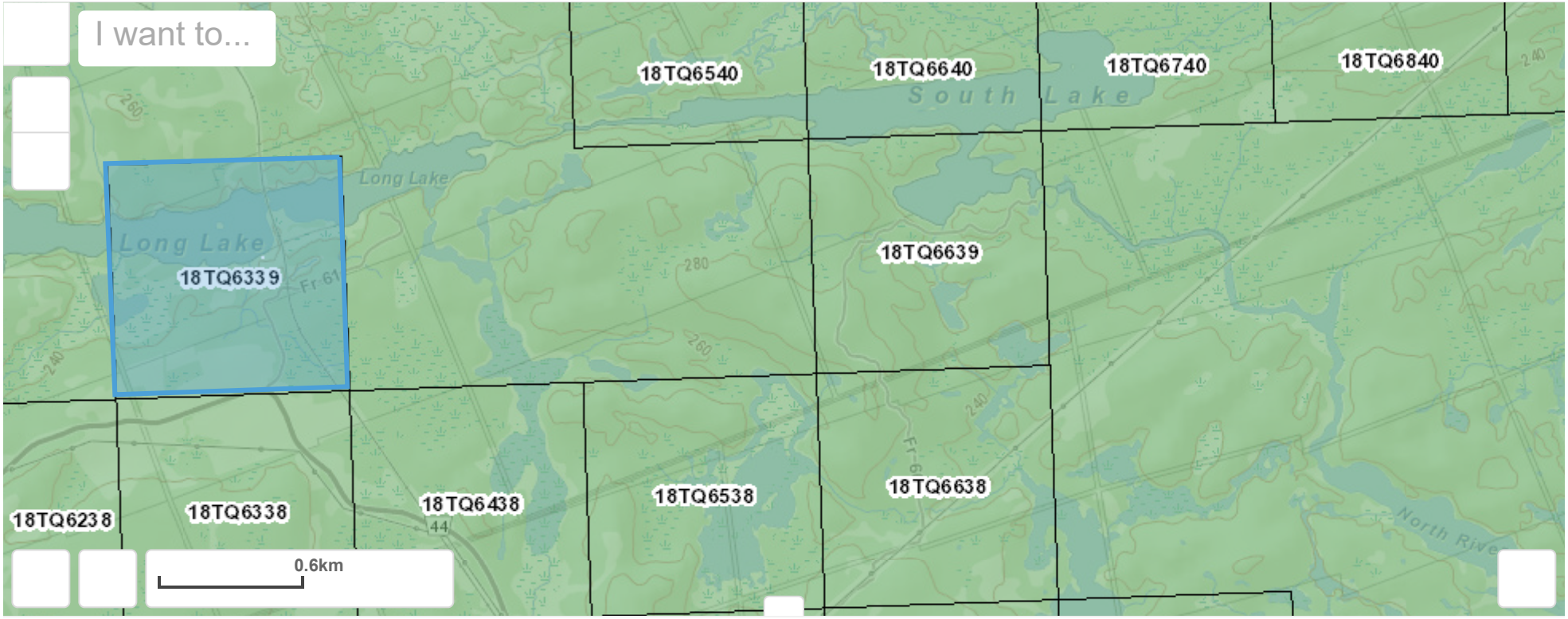
Search By Location | Polygon | Pan | Zoom In | Zoom Out | Initial View | Previous Extent | Next Extent | Help



NHIC Data -- Grid ID = 1067419

Element Type	Common Name	Scientific Name	SRank	SARO Status	COSEWIC Status	Last Obs Date	EO ID	Details UR
SPECIES	Eastern Meadowlark	Sturnella magna	S4B	THR	THR	2002-06-10	109218	http://nhic.n

Blanding's Turtle is listed as "Threatened" by *Species At Risk Ontario* (SARO) and is protected under the *Endangered Species Act* (ESA). It tends to inhabit shallow waters within large wetlands or shallow lakes that have lots of aquatic plants. However, they have been known to travel hundreds of meters from a main body of water for nesting or mating. This species is most easily identified by its bright yellow throat and chin.

Butternut is listed as "Endangered" by SARO and is protected under the ESA. Butternut usually grows alone or in small groups in deciduous forests. It prefers moist, well-drained soil and is often found along streams. It may also be found on well-drained gravel sites and rarely on dry rocky soil. This species does not do well in the shade, and often grown in sunny openings and near forest edges.

Cerulean Warbler is listed as "Threatened" by SARO and is protected under the ESA. They spend their summers (breeding seasons) in mature, deciduous forests with large, tall trees and an open under storey. In late summer, they begin their long migration to wintering grounds in the Andes Mountains in South America. The Cerulean Warbler feeds mainly on insects during the breeding season and on nectar during the non-breeding season. Young birds are fed primarily butterfly larvae. The Cerulean Warbler feeds mainly on insects during the breeding season and on nectar during the non-breeding season. Young birds are fed primarily butterfly larvae.

Common Five-Lined Skink (Southern Shield Population) is listed as "Special Concern" by SARO and is not protected under the ESA. The Southern Shield Population can be found underneath rocks on open bedrock in forests. During the winter, they hibernate in crevices among rocks or buried in the soil.

Eastern Meadowlark is listed as "Threatened" by SARO and is protected under the ESA. The Eastern Meadowlark is similar to Bobolink, as this species also prefers large tracts of agricultural fields or tallgrass prairies to nest within. Eastern Meadowlark is a ground nester, thus requires the tallgrass to conceal its nest and eggs. Feeding includes beetles, crickets and spiders.

Eastern Wood-Pewee is listed as "Special Concern" by SARO and is not protected under the ESA. This species prefers mixed deciduous and coniferous woodlands which are open or considered edge habitat. Nesting occurs on a tree branch as the species catches insects from a perch.

Flooded Jellyskin is a species of lichen that is not considered a Species at Risk in Ontario by SARO.

Appendix C

Species List

Species Occurrences

Birds

COMMON NAME	SCIENTIFIC NAME	SRANK	COSEWIC	SARO
Turkey Vulture	Cathartes aura	S5B		
Wood Duck	Aix sponsa	S5		
Common Goldeneye	Bucephala clangula	S5		
Mallard	Anas platyrhynchos	S5		
Canada Goose	Branta canadensis	S5		
Ring-necked Duck	Aythya collaris	S5		
Hooded Merganser	Lophodytes cucullatus	S5B,S5N		
Common Merganser	Mergus merganser	S5B,S5N		
Mourning Dove	Zenaida macroura	S5		
Ruffed Grouse	Bonasa umbellus	S4		
Wild Turkey	Meleagris gallopavo	S5		
Red-breasted Nuthatch	Sitta canadensis	S5		
Blue Jay	Cyanocitta cristata	S5		
Northern Cardinal	Cardinalis cardinalis	S5		
Black-capped Chickadee	Poecile atricapillus	S5		
Cedar Waxwing	Bombycilla cedrorum	S5B		
American Goldfinch	Spinus tristis	S5B		
Golden-crowned Kinglet	Regulus satrapa	S5B		
American Robin	Turdus migratorius	S5B		
Song Sparrow	Melospiza melodia	S5B		
Dark-eyed Junco	Junco hyemalis	S5B		
Common Grackle	Quiscalus quiscula	S5B		
American Crow	Corvus brachyrhynchos	S5B		
European Starling	Sturnus vulgaris	SNA		
Great Blue Heron	Ardea herodias	S4		
Green Heron	Butorides virescens	S4B		
Hairy Woodpecker	Picoides villosus	S5		

Bryophytes

COMMON NAME	SCIENTIFIC NAME	SRANK	COSEWIC	SARO
White Pincushion Moss	Leucobryum glaucum	S5		
Juniper Haircap Moss	Polytrichum juniperinum	S5		

Lichen

COMMON NAME	SCIENTIFIC NAME	SRANK	COSEWIC	SARO
A Lichen	Umbilicaria deusta	S5		
Boreal Pixie-cup Lichen	Cladonia borealis	S5		
A Lichen	Cladonia rangiferina	S5		
A Lichen	Xanthoparmelia cumberlandia	S5		
A Lichen	Hypogymnia physodes	S5		
A Lichen	Cladonia stygia	S5		
A Lichen	Cladonia stellaris	S5		
Dog Lichen	Peltigera canina	S5		

Mammals

COMMON NAME	SCIENTIFIC NAME	SRANK	COSEWIC	SARO
White-tailed Deer	Odocoileus virginianus	S5		
Red Fox	Vulpes vulpes	S5		
North American River Otter	Lontra canadensis	S5		
Coyote	Canis latrans	S5		
American Black Bear	Ursus americanus	S5	NAR	NAR
Eastern Cottontail	Sylvilagus floridanus	S5		
Porcupine	Erethizon dorsatum	S5		
Muskrat	Ondatra zibethicus	S5		
Beaver	Castor canadensis	S5		
Red Squirrel	Tamiasciurus hudsonicus	S5		
Eastern Chipmunk	Tamias striatus	S5		

Vascular Plants

COMMON NAME	SCIENTIFIC NAME	SRANK	COSEWIC	SARO
Broad-leaved Arrowhead	Sagittaria latifolia	S5		
Wild Sarsaparilla	Aralia nudicaulis	S5		
Hairy Sweet Cicely	Osmorhiza claytonii	S5		
Wild Carrot	Daucus carota	SNA		
Lesser Duckweed	Lemna minor	S5		
Spotted Joe Pye Weed	Eutrochium maculatum var. maculatum	S5		
Flat-top White Aster	Doellingeria umbellata var. umbellata	S5		
Large-leaved Aster	Eurybia macrophylla	S5		

Calico Aster	Symphyotrichum lateriflorum var. lateriflorum	S5
Annual Ragweed	Ambrosia artemisiifolia	S5
Canada Goldenrod	Solidago canadensis var. canadensis	S5
Zigzag Goldenrod	Solidago flexicaulis	S5
New England Aster	Symphyotrichum novae-angliae	S5
Common Boneset	Eupatorium perfoliatum	S5
Oxeye Daisy	Leucanthemum vulgare	SNA
Bull Thistle	Cirsium vulgare	SNA
Common Dandelion	Taraxacum officinale	SNA
Chicory	Cichorium intybus	SNA
Common Yarrow	Achillea millefolium	SNA
Orange Hawkweed	Pilosella aurantiaca	SNA
Common Burdock	Arctium minus	SNA
Cardinalflower	Lobelia cardinalis	S5
Field Chickweed	Cerastium arvense ssp. arvense	SNA
Red-osier Dogwood	Cornus stolonifera	S5
Round-leaved Dogwood	Cornus rugosa	S5
Bunchberry	Cornus canadensis	S5
Sartwell's Sedge	Carex sartwellii	S4
White-grained Mountain-ricegrass	Oryzopsis asperifolia	S5
Reed Canary Grass	Phalaris arundinacea var. arundinacea	S5
Star Sedge	Carex echinata	S5
Bluejoint Reedgrass	Calamagrostis canadensis var. canadensis	S5
Lake Sedge	Carex lacustris	S5
Poverty Oatgrass	Danthonia spicata	S5
Dark-green Bulrush	Scirpus atrovirens	S5
Soft-stemmed Bulrush	Schoenoplectus tabernaemontani	S5
Tawny Cottongrass	Eriophorum virginicum	S5
Tussock Sedge	Carex stricta	S5
Meadow Brome	Bromus erectus	SNA
Nannyberry	Viburnum lentago	S5
Smooth Witherod	Viburnum nudum	S5
Maple-leaved Viburnum	Viburnum acerifolium	S5
Highbush Cranberry	Viburnum opulus ssp. trilobum	S5
Northern Bush-honeysuckle	Diervilla lonicera	S5

Downy Arrowwood	Viburnum rafinesquianum	S5
Canada Fly Honeysuckle	Lonicera canadensis	S5
Tartarian Honeysuckle	Lonicera tatarica	SNA
Northern Bog Rosemary	Andromeda polifolia var. polifolia	S4
Cranberry	Vaccinium microcarpum	S4?
Common Bearberry	Arctostaphylos uva-ursi	S5
Leatherleaf	Chamaedaphne calyculata	S5
Eastern Teaberry	Gaultheria procumbens	S5
Sheep Laurel	Kalmia angustifolia	S5
Common Labrador Tea	Rhododendron groenlandicum	S5
Shinleaf	Pyrola elliptica	S5
Late Lowbush Blueberry	Vaccinium angustifolium	S5
Red Clover	Trifolium pratense	SNA
Tufted Vetch	Vicia cracca	SNA
White Oak	Quercus alba	S5
Beaked Hazelnut	Corylus cornuta	S5
Bur Oak	Quercus macrocarpa	S5
Northern Red Oak	Quercus rubra	S5
Speckled Alder	Alnus incana	S5
Paper Birch	Betula papyrifera	S5
Bracken Fern	Pteridium aquilinum	S5
Marsh Fern	Thelypteris palustris	S5
Northern Beech Fern	Phegopteris connectilis	S5
Sensitive Fern	Onoclea sensibilis	S5
Ostrich Fern	Matteuccia struthiopteris	S5
Spinulose Wood Fern	Dryopteris carthusiana	S5
Common Milkweed	Asclepias syriaca	S5
Spreading Dogbane	Apocynum androsaemifolium	S5
Herb-Robert	Geranium robertianum	S5
American Witch-hazel	Hamamelis virginiana	S4S5
Canada Rush	Juncus canadensis	S5
Path Rush	Juncus tenuis	S5
Common Viper's-bugloss	Echium vulgare	SNA
Self-heal	Prunella vulgaris ssp. vulgaris	SNA
Pickerel Weed	Pontederia cordata	S5
Star-flowered False Solomon's-seal	Maianthemum stellatum	S5

Wild Lily-of-the-valley	Maianthemum canadense ssp. canadense	S5
Eastern Rose Twisted-stalk	Streptopus lanceolatus var. lanceolatus	S5?
Sweet Fern	Comptonia peregrina	S5
Sweet Gale	Myrica gale	S5
Purple Loosestrife	Lythrum salicaria	SNA
Small Yellow Pond-lily	Nuphar microphylla	S3?
Fragrant Water-lily	Nymphaea odorata ssp. odorata	S5?
American Larch	Larix laricina	S5
Black Spruce	Picea mariana	S5
Balsam Fir	Abies balsamea	S5
Common Juniper	Juniperus communis	S5
Eastern Hemlock	Tsuga canadensis	S5
Eastern White Pine	Pinus strobus	S5
Curly Dock	Rumex crispus	SNA
Wild Columbine	Aquilegia canadensis	S5
Tall Buttercup	Ranunculus acris	SNA
Northern Dewberry	Rubus flagellaris	S4
Virginia Saxifrage	Micranthes virginiensis	S5
White Meadowsweet	Spiraea alba var. alba	S5
Purple-flowering Raspberry	Rubus odoratus	S5
Smooth Blackberry	Rubus canadensis	S5
Choke Cherry	Prunus virginiana	S5
Downy Serviceberry	Amelanchier arborea	S5
Wild Red Raspberry	Rubus idaeus ssp. strigosus	S5
White Stonecrop	Sedum album	SNA
Gold-moss	Sedum acre	SNA
Wild Strawberry	Fragaria virginiana ssp. virginiana	SU
Bebb's Willow	Salix bebbiana	S5
Balsam Poplar	Populus balsamifera	S5
Large-toothed Aspen	Populus grandidentata	S5
Trembling Aspen	Populus tremuloides	S5
Pussy Willow	Salix discolor	S5
Striped Maple	Acer pensylvanicum	S4
Staghorn Sumac	Rhus typhina	S5
Red Maple	Acer rubrum	S5
Silver Maple	Acer saccharinum	S5

Mountain Maple	Acer spicatum	S5
Eastern Poison Ivy	Toxicodendron radicans var. radicans	S5
Sugar Maple	Acer saccharum	S5
White Ash	Fraxinus americana	S4
Common St. John's-wort	Hypericum perforatum	SNA
Broad-leaved Cattail	Typha latifolia	S5
Narrow-leaved Cattail	Typha angustifolia	SNA
American Elm	Ulmus americana	S5
Woolly Blue Violet	Viola sororia	S5

Appendix D

Soils Data

ORE
Oakridge Environmental Ltd.
Environmental and Hydrogeological Services
647 Neal Drive, Suite 3, Peterborough, Ontario K9J 6X7
Phone: 705-745-1181 | Fax: 705-745-4163 | www.oakridgeenvironmental.com |

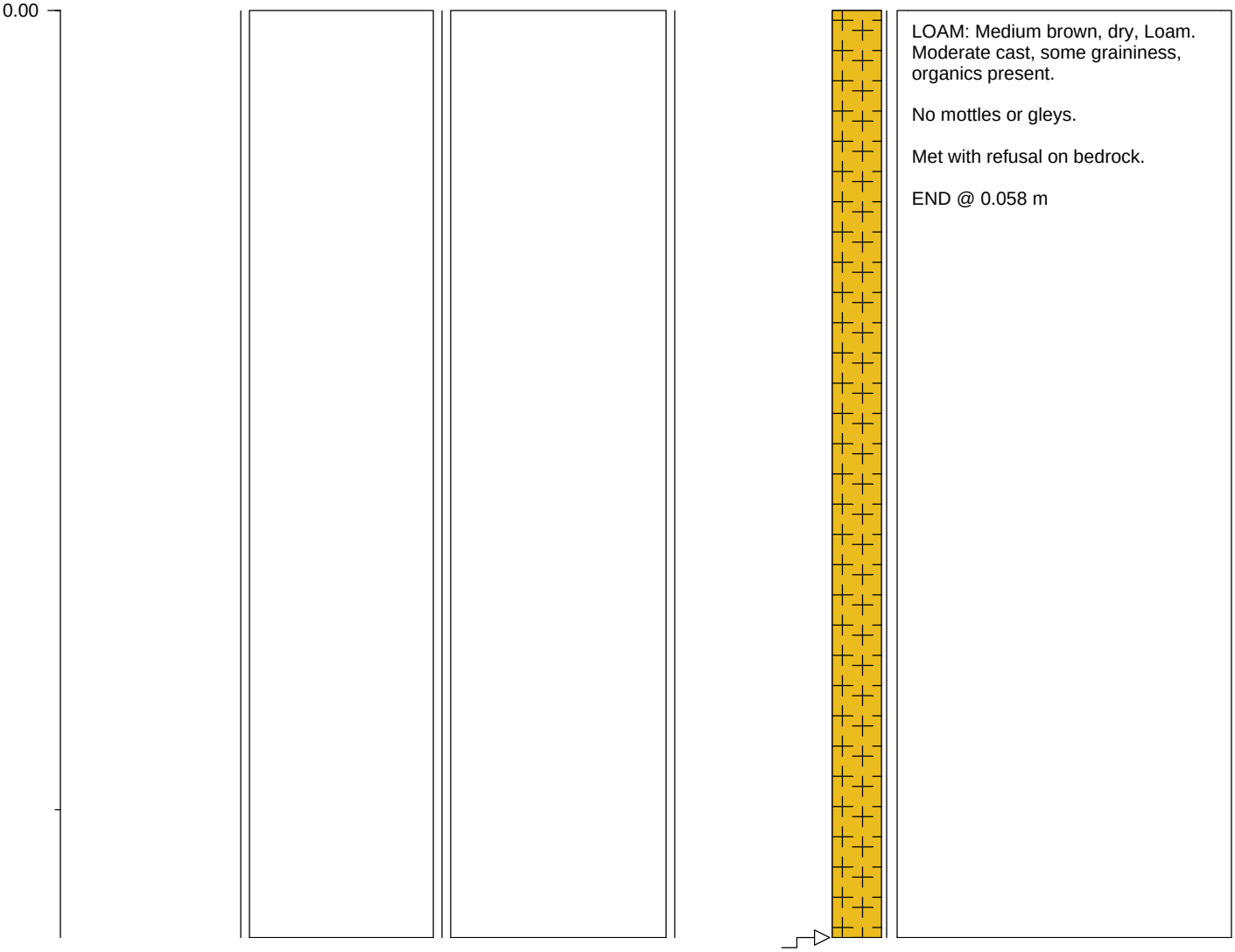
TEST PIT NO.:	**HA-19-1**
TOTAL DEPTH (m):	**0.058 m**
UTM Coordinates:	Elevation (m asl):

PROJECT INFORMATION	CONTRACTOR INFORMATION
PROJECT NO: **19-2661**	EXCAVATION CO.:
SITE LOCATION: **West Gabbro**	BACKHOE TYPE: **Hand Auger**
LOGGED BY: **DRM, SR**	STANDPIPE/PIEZOMETERS:
DATES ASSESSED: **October 25, 2019**	SAMPLING METHODS: **Composite grab**

▽ Seepage ▼ Water Level △ Moist

FIELD BOREHOLE LOG

Depth (m)	Water	Piezometer Installation	Special Notes	Sample #	Depth	Soil Symbol	Soil Description
0.00							LOAM: Medium brown, dry, Loam. Moderate cast, some graininess, organics present. No mottles or gleys. Met with refusal on bedrock. END @ 0.058 m



NOTES: 12 degrees celcius. Dry Oak - Pine Mixed Forest (FOM1)

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TEST PIT NO.: **HA-19-2**

TOTAL DEPTH (m): **0.42 m**

UTM Coordinates:

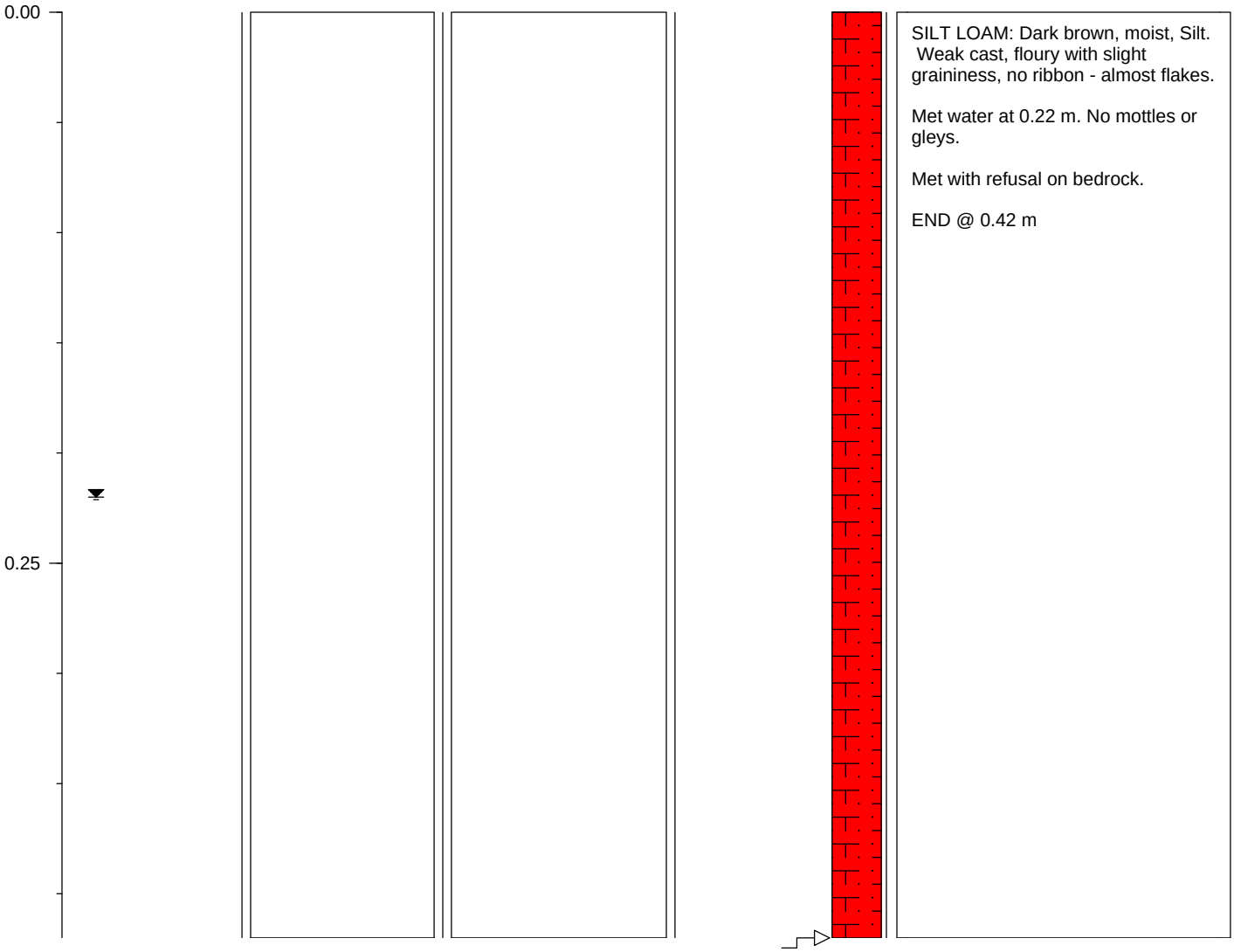
Elevation (m asl):

PROJECT INFORMATION	CONTRACTOR INFORMATION
PROJECT NO: **19-2661**	EXCAVATION CO.:
SITE LOCATION: **West Gabbro**	BACKHOE TYPE: **Hand Auger**
LOGGED BY: **DRM, SR**	STANDPIPE/PIEZOMETERS:
DATES ASSESSED: **October 25, 2019**	SAMPLING METHODS: **Composite grab**

▽ Seepage ▼ Water Level △ Moist

FIELD BOREHOLE LOG

Depth (m)	Water	Piezometer Installation	Special Notes	Sample #	Depth	Soil Symbol	Soil Description



SILT LOAM: Dark brown, moist, Silt. Weak cast, floury with slight graininess, no ribbon - almost flakes.

Met water at 0.22 m. No mottles or gleys.

Met with refusal on bedrock.

END @ 0.42 m

NOTES: 12 degrees celcius. Fresh - Moist Poplar - White Birch Mixed Forest (FOM8)

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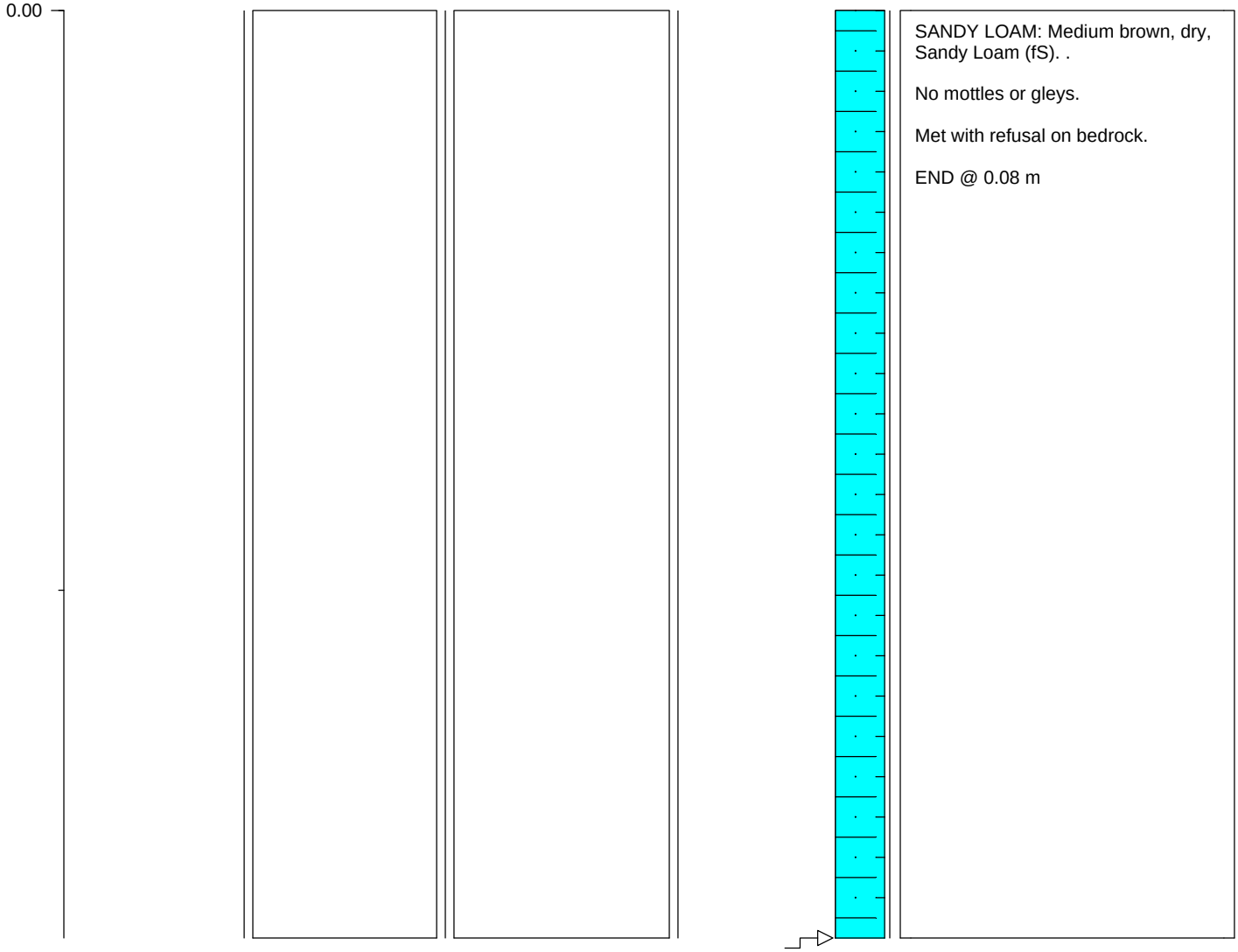
TEST PIT NO.:	**HA-19-3**
TOTAL DEPTH (m):	**0.08 m**
UTM Coordinates:	Elevation (m asl):

PROJECT INFORMATION	CONTRACTOR INFORMATION
PROJECT NO: **19-2661**	EXCAVATION CO.:
SITE LOCATION: **West Gabbro**	BACKHOE TYPE: **Hand Auger**
LOGGED BY: **DRM, SR**	STANDPIPE/PIEZOMETERS:
DATES ASSESSED: **October 25, 2019**	SAMPLING METHODS: **Composite grab**

▽ Seepage ▼ Water Level △ Moist

FIELD BOREHOLE LOG

Depth (m)	Water	Piezometer Installation	Special Notes	Sample #	Depth	Soil Symbol	Soil Description
0.00							SANDY LOAM: Medium brown, dry, Sandy Loam (fS). . No mottles or gleys. Met with refusal on bedrock. END @ 0.08 m



NOTES: 12 degrees celcius. Dry Acidic Open Rock Barren (RBO3-1)

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TEST PIT NO.: **HA-19-4**

TOTAL DEPTH (m): **0.18 m**

UTM Coordinates:

Elevation (m asl):

PROJECT INFORMATION	CONTRACTOR INFORMATION
PROJECT NO: **19-2661**	EXCAVATION CO.:
SITE LOCATION: **West Gabbro**	BACKHOE TYPE: **Hand Auger**
LOGGED BY: **DRM, SR**	STANDPIPE/PIEZOMETERS:
DATES ASSESSED: **October 25, 2019**	SAMPLING METHODS: **Composite grab**

▽ Seepage ▼ Water Level △ Moist

FIELD BOREHOLE LOG

Depth (m)	Water	Piezometer Installation	Special Notes	Sample #	Depth	Soil Symbol	Soil Description
0.00							SANDY LOAM: Medium brown, dry, Sandy Loam (fS). No mottles or gleys. Met with refusal on bedrock. END @ 0.18 m

NOTES: 12 degrees celcius. Dry Pine - Oak Mixed Forest (FOM1)