Appendix C

Bracebridge North Transportation Corridor Class Environmental Assessment Study: Natural Environment Conditions

District Municipality of Muskoka

Bracebridge North Transportation Corridor Class Environmental Assessment Study: Natural Environment Conditions

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Table of Contents

List of Figures

List of Tables

Appendices

1. Introduction

This Natural Environmental Conditions Report is part of a Municipal Class Environmental Assessment (EA) for a proposed transportation corridor north of the Town of Bracebridge urban area between Highway 11 and Muskoka Road 11. The District Municipality of Muskoka (DMM) initiated this study in January 2012.

The scope of this Natural Environmental Conditions Report is to provide an inventory of natural heritage features and to determine the level of significance of terrestrial and aquatic natural heritage features within the project study area. The assessment of alternatives and impact analysis are provided as part of the overall Environmental Study Report (ESR).

This Natural Environmental Conditions Report provides;

- a summary of the legislative requirements,
- a summary of previous background studies, as part of a records review, prepared for the study area and surrounding areas,
- a description of natural heritage features within the study area,
- an assessment of significance of the existing natural heritage features based on the records review and field investigations, and
- recommendations for further study and mitigation measures.

1.1 Background and Earlier Studies

A number of studies have been undertaken in the area over the years. The 1992 MTO Preliminary Design Study for the Ultimate Freeway Design for Highway 11 from Muskoka Road 169 in Gravenhurst to the north junction of Muskoka Road 3 in Hunstville concluded that the existing interchange at Muskoka Road 117 should be retained and that a new interchange should be constructed north of High Falls Road with a new entrance to the Bracebridge Resource Management Centre.

The 1994 Town of Bracebridge Transportation Study recommended the development of two new arterial routes around the urban core of Bracebridge: one to the south-west and one to the north. The northern route was to connect to Highway 11 via the interchange north of High Falls Road that was proposed in the MTO's 1992 study. At the time that the MTO study report was published, the Town of Bracebridge study was sufficiently far advanced that the north route was identified in the MTO report. Both the south-west route and the north route were incorporated into the Town's Official Plan. Schedule "C" of the Official Plan illustrates conceptual layouts for the two routes.

The 2010 Transportation Environmental Study Report for Highway 11 Access Review of Highway Falls Road/ Holiday Park Drive identified a new preferred solution for access to Highway 11 that did not include a new interchange. Specifically, the preferred alternative, alternative 5b, involves the connection of Holiday Park Drive to Muskoka Road 117 via a new bridge over the Muskoka River on the east side of Highway 11, and the connection of High Falls Road to Holiday Park Drive by an overpass on Highway 11.

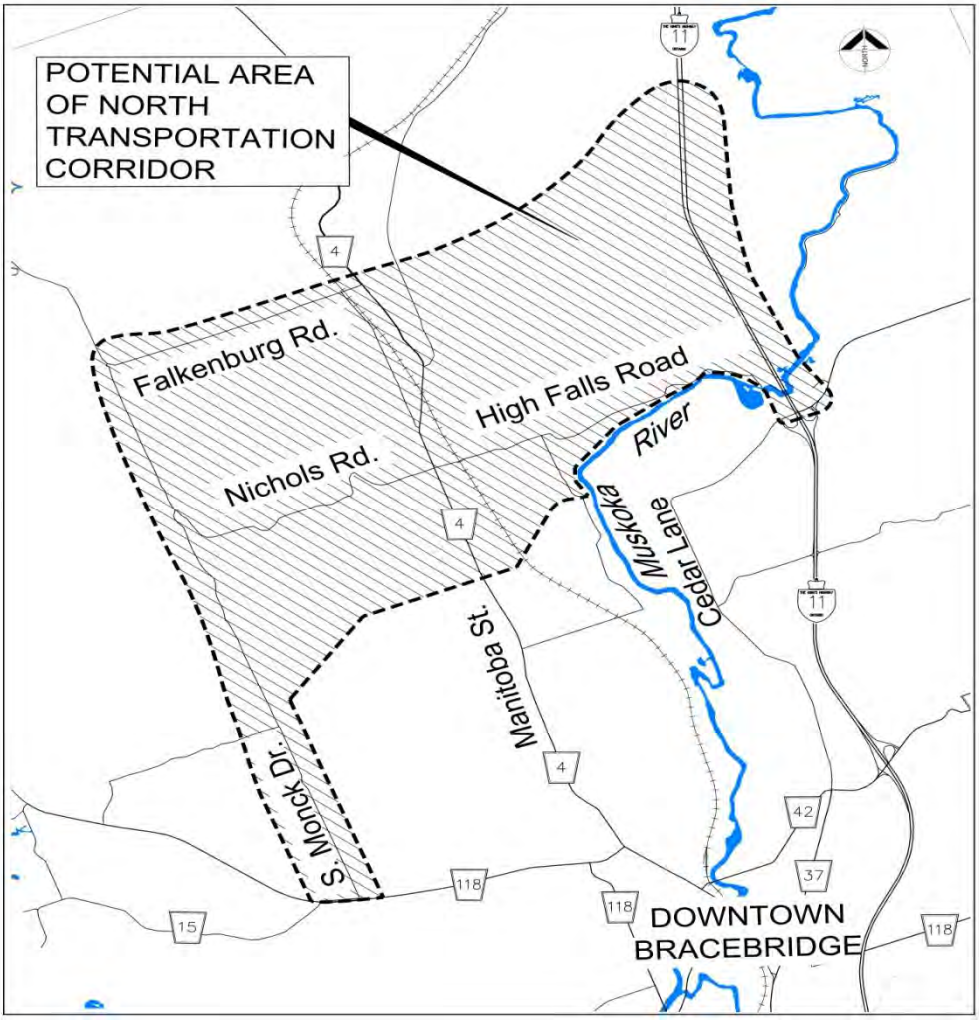
In August 2010 the District Municipality of Muskoka (DMM) submitted a motion to MTO noting their preference for a new interchange similar to the one recommended in the MTO 1992 study. They also supported several of MTO's other alternatives that were not recommended in the 2010 study.

Following DMM motions summarized above, the MTO submitted their TESR with alternative 5b as the recommended plan. DMM requested a bump-up but this was denied by the Minister of the Environment. MTO noted to DMM that it would be necessary to undertake a municipal Class EA for the North Transportation Corridor to identify the preferred alternative from a municipal perspective and recommend a location for a connection with Highway 11. DMM retained AECOM to complete this Class EA study.

1.2 Study Area

The Study Area is located in the Town of Bracebridge and the Township of Muskoka Lakes within The District Municipality of Muskoka and is illustrated in **Figure 1**.

Figure 1. Study Area



1.3 Relevant Legislation

Consideration of legislation and policies at all three levels of government, federal, provincial and municipal is required for the project. Some legislation and policies apply more directly than others with respect to natural heritage

features and functions. The following is an outline of the legislation and policies relevant to natural heritage features and functions as they relate to the Environmental Assessment Study:

Table 1-1 Relevant Legislation, Policies & Guidelines

Level of Government	Legislation	Policies/Regulations	Guidelines
Federal	*Fisheries Act*	*Policy for the Management of Fish Habitat*	
	Migratory Birds Act		
	Species at Risk Act		
Provincial	*Planning Act*	*Provincial Policy Statement (1997)*	Natural Heritage Reference Manual (1999)
	Endangered Species Act	*Ontario Regulation 230/08 updated July 2013*	
	Public Lands Act		
	Lakes and Rivers Improvements Act		
Municipal	*Official Plans*	*Environmental Policies*	

The following legislative requirements are relevant to the alternatives and the natural features within the study area.

1.3.1 Federal Legislation

Applicable Federal Legislation includes:

Fisheries Act - The Fisheries Act is one of Canada's most important pieces of legislation for the protection and management of aquatic species and habitat. The Act is administered by the Department of Fisheries and Oceans (DFO). Changes in Regulations came into force on November 25th 2013 that focus the Act's regulatory regime on managing threats to the sustainability and ongoing productivity of Canada's commercial, recreational and Aboriginal fisheries.

Migratory Birds Act - Canada's *Migratory Birds Convention Act* is intended to protect migratory birds, their habitat and their nests. The act includes more than 700 species of birds, including songbirds, woodland birds, waterfowl, shorebirds and seabirds. The Canadian Wildlife Service administers the act, but numerous other agencies are responsible for consideration of migratory birds under the act.

The *Migratory Birds Convention Act* prohibits the destruction of the nests of migratory birds during the breeding season and prohibits the release of harmful substances in areas frequented by migratory birds.

The application of the *Migratory Birds Convention Act* is likely to be relevant only to the removal of the limited number of trees and woody vegetation identified within the study area. In order to avoid any contravention of the act,

recommendations will be made to 1) avoid construction during breeding and nesting periods for migratory birds, and 2) to conduct nest surveys prior to construction in relevant areas. These will be outlined within the Environmental Study Report.

Species at Risk Act - The Species at Risk Act (SARA, 2002) is a federal legislation, whose goal is to monitor and protect disappearing species; provide recovery strategies for extirpated, endangered or threatened species, as well as to manage species of special concern.

1.3.2 Provincial Legislation

Applicable Provincial Legislation includes:

Planning Act/Provincial Policy Statement - The Ontario Provincial Policy Statement (PPS) is issued under Section 3 of the Ontario Planning Act, R.S.O. 1990. Section 3 of the Act requires that decisions affecting planning matters "shall be consistent with" policy statements issued under the Act. The current PPS came into effect in March 1st, 2005, and applies to all applications submitted on or after this date. The PPS provides policy direction on land use planning and development matters that are of provincial interest which protect the natural environment as well as public health and safety.
The PPS identifies seven types of natural heritage features to be protected:

- significant habitat of endangered species and threatened species;
- provincially significant wetlands;
- significant woodlands south and east of the Canadian Shield;
- significant valleylands south and east of the Canadian Shield;
- significant wildlife habitat;
- significant areas of natural and scientific interest, and;
- fish habitat.

Lakes & Rivers Improvement Act - Approval may be required under the *Lakes and Rivers Improvement Act* (LRIA), if any dyking, dredging or damming activities are planned along or near watercourses or wetland areas. This is governed by the MNR.

Public Lands Act - Except for federal canals and harbours, the beds of most lakes and streams are public land in Ontario. A Work Permit under the *Public Lands Act* (PLA) may be required if work is proposed in water or near shore (shoreline) areas below the spring high water mark. This is governed by the MNR.

Endangered Species Act - The *Endangered Species Act* (ESA, 2007), provides a protection and recovery strategy for Species at Risk in Ontario. The Regulations apply to Extirpated (a wildlife species that no longer exists in the wild in Canada, but exists elsewhere in the wild); Endangered (a wildlife species that is facing imminent extirpation or extinction); and Threatened (a wildlife species that is likely to become endangered if nothing is done to reverse the factors leading to its extirpation or extinction species). Special Concern species are those that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats, however, these species are not protected under the ESA. Through a Species at Risk screening and consultation with MNR, it will be determined through the project process any permitting requirements, should the project directly affect a Species at Risk. Note that as of July 1, 2013, the ESA has been updated by MNR and provides new regulations with regard to species habitat.

1.3.3 Municipal Legislation

Applicable Municipal Legislation includes the Official Plans for the City of Bracebridge and District of Muskoka.

1.4 Agency Consultation

The study area is located within the jurisdiction of the Parry Sound MNR. There are no Conservation Authorities located within the study area. Throughout the study process, MNR was contacted through face-to-face meetings, conference calls and email correspondence. The Muskoka Field Naturalists also provided their comments concerning the proposed new by-pass.

1.4.1 Ministry of Natural Resources

Throughout the study process, AECOM has been in regular contact with MNR regarding natural heritage related issues for the study area.

The following outlines some key points of contact:

In March 2012, AECOM submitted a request for information to MNR.

On April 10, 2012, an agency meeting was held at The District of Muskoka office. Kim Benner, Ariel Zwicker and Nicole Tuyten from MNR were in attendance. The purpose of the study, timelines and alternative solutions to be considered were discussed.

On May 11, 2012, a letter from AECOM was submitted to Karrie Bennett outlining an understanding of MNR issues/comments.

On January 3, 2013, an agency meeting was held at MNR's office in Bracebridge concerning the red oak stands and deer yard.

On January 11, 2013, a conversation between Jillian deMan of AECOM and Phung Tran of MNR was held to confirm information required for data request from MNR to be complete including that of the deer yard and oak monitoring stands.

On January 15, 2013, a conversation between Jillian deMan of AECOM and Mike White of MNR was held to discuss the oak monitoring stands and to schedule a field visit.

On January 17, 2013, a field visit was held with Jillian deMan of AECOM and Mike White of MNR to observe and locate the oak monitoring stands.

On January 24, 2013, Phung Tran of MNR submitted to AECOM the remainder of data requested.

On February 12, 2013, a conversation between Jillian deMan of AECOM and Ron Black of MNR discussed the methods to be used to refine the limits of the deer yard.

On February 21, 2013, Jillian deMan of AECOM requested confirmation from Ron Black the appropriate scheduling of deer yard survey.

On February 22, 2013, Ron Black of MNR left Jillian deMan a voicemail indicated the "go-ahead" for deer yard surveys.

On March 13, 2013, Jillian deMan of AECOM submitted to Ron Black, Megan Bonenfant and Kim Benner of MNR a copy of the results of the deer yard survey saved as: "MEMO-2013-03-13-Deer yard survey-60241537".

On March 20, 2013, a conference call was held with MNR and AECOM to discuss the findings of the deer yard survey.

On November 25, 2013, an agency meeting was held at MNR's office in Bracebridge concerning the deer yard area.

Appendix A provides copies of relevant correspondence between the study team and agencies during the consultation process.

1.4.2 Muskoka Field Naturalists

The Muskoka Field Naturalists (MFN) are a local not-for-profit organization representing over 100 active members dedicated to the study, conservation, and enjoyment of nature. David Goodyear, the president of MFN contacted the project team on November 14, 2013 through email with an attached letter dated November 12, 2013 with concerns related to the proposed new by-pass. MFN is concerned with the portion of the preferred and alternate routes that extend south along South Monck Drive specifically with regard to the following species that have been observed by their members:

Great Blue Heron (Ardea herodias) colony – an active colony is known within wetlands to the north.

Canada Warbler (*Cardellina canadensis*) – observed during breeding season within a swamp thicket (identified as W2 within the Public Open House Summary Report). A species considered Threatened under the Species at Risk Act and Special Concern under the Endangered Species Act. Road development in Canada Warbler breeding habitat and wetland conversion have been cited as threats to breeding success.

Golden-winged Warbler (*Vermivora chrysoptera*) – observed during breeding season within a swamp thicket (identified as W2 within the Public Open House Summary Report). A species considered Threatened under the Species at Risk Act and Special Concern under the Endangered Species Act.

Eastern Whip-poor-will (*Antrostomus vociferus*) – observed for a number of years during breeding season in the areas surrounding the intersections of South Monck Drive, Crawford Road and Partridge Lane. A species considered Threatened under the Species at Risk Act and Threatened under the Endangered Species Act. Collisions and vehicles have been identified as a significant threat to Whip-poor-will, who commonly sit on roads or road shoulders at night.

Bobolink (*Dolichonyx oryzivorus*) – observed within hayfields adjacent to South Monck Drive. A species considered Threatened under the Endangered Species Act.

Appendix A documents the correspondence.

2. Natural Environment Conditions

The following section documents the existing natural environmental conditions found within the study area and the greater landscape. The natural environment existing conditions were determined through a combination of background review, aerial photographic interpretation, field work and consultation with local agencies. This review and assessment provides the basis for the aquatic, terrestrial and wildlife sub-sections presented below. The background information collected included a search of the City of Bracebridge Official Plan, District Municipality of Muskoka Official Plan, the Ontario Ministry of Natural Resources (MNR) Natural Heritage Information Centre (NHIC) Database – Biodiversity Explorer tool, communication with MNR– Muskoka District, and a search of the Atlas of the Breeding Birds of Ontario. Fieldwork completed focused along the alternative. Recommendations for further detailed work are provided in Section 4.0 to be completed during Detailed Design.

The majority of the study area is comprised of natural vegetation types with forest, wetland and water in the form of permanent and intermittent watercourses. Crown land occurs central portion of the study area with private land for the remainder.

2.1 Aquatic Environment

An aquatic inventory of the study area was completed to document the existing aquatic conditions and to relate the assessments of stream systems to their potential to provide fish habitat. The following section presents the results from aquatic habitat assessments conducted within the study area and a review of background documents.

2.1.1 Muskoka River Watershed

The Muskoka River Watershed is located on the Canadian Shield in Central Ontario and contains over 500,000 hectares of forests, wetlands, settlement, agricultural areas and water. The Muskoka River begins in the Algonquin Highlands within Algonquin Provincial Park and flows to Lake Huron at Georgian Bay (Muskoka Heritage Foundation *et al.*, 2007). There are 42 water control structures (dams) within the Muskoka River Watershed that are used to control and maintain water levels on the lakes and rivers throughout the watershed. Twenty-nine (29) of these structures are owned/operated by the Ministry of Natural Resources and eleven (11) are owned and operated by the waterpower industry. The District Municipality of Muskoka owns and operates one dam and the remaining structure is privately owned and operated. The Muskoka River is divided into three branches, the North, South and Lower. The North Branch Muskoka River Subwatershed is the portion which the study area is located. The subwatershed is approximately 25,123 ha in size and flows from Mary Lake in Port Sydney to Lake Muskoka, downstream from Bracebridge for 28 km (Watershed Report Card, 2010). Muskoka River occurs along the eastern portion of the study area and is the receiving water body for the watercourses within the study area. Minimal background data was available for watercourses within the study area.

2.1.2 Fish Species

The Muskoka River Watershed contains predominantly cool and cold-water fish species. The upper part of the watershed, including the North Branch Muskoka River Subwatershed, supports species such as Lake Trout (*Salvelinus namaycush*) and Brook Trout (*Salvelinus fontinalis*). Smallmouth Bass (*Micropterus dolomieu*) has been stocked within its lakes and Rainbow Trout (*Oncorhynchus mykiss*) and Brown Trout (*Salmo trutta*) have been stocked in selected portions of the watershed. Through discussions and email correspondence with MNR, it was stated that most watercourses within the study area are coldwater and contain Brook Trout.

2.1.3 Aquatic Habitat Investigations

High level investigations were completed from July 9th to 13th, 2012 to identify watercourses, drainage features and potential fish habitat within the study area along the alternative routes. The location and presence/absence of water bodies were confirmed during these investigations. Water bodies originally interpreted from aerial photography and were found not to be present during field investigations were documented. General characteristics of the water bodies and fish habitat assessments were also documented along with details for both riverine and wetland/beaver pond habitat. Fish community surveys were not completed as part of this field program.

The fish habitat assessments documented the characteristics and major physical attributes of each water body found, including water quality parameters. A variety of details including both flow characteristics and land influences were also considered and include:

1. **Surrounding land use** – classifies potential pollution sources and adjacent land use that may affect the water body.

2. **Riparian zone and canopy cover** – a healthy riparian zone consists of vegetation characterized by trees, shrubs, grasses and herbaceous plants. These plants help buffer the water body from runoff, provide shade and create habitat for fish and insects.

3. **Stream banks** – characteristics assessed include signs of erosion and bank scouring, undercut banks, evidence of the normal water mark and high water mark which indicate the water level fluctuation.

4. **In-stream characteristics** – details include substrate type (e.g. silt, gravel, cobble), aquatic vegetation, small and large woody debris. All of these in-stream characteristics provide habitat and cover for fish species and benthic macroinvertebrates, which are an important food source for fish.

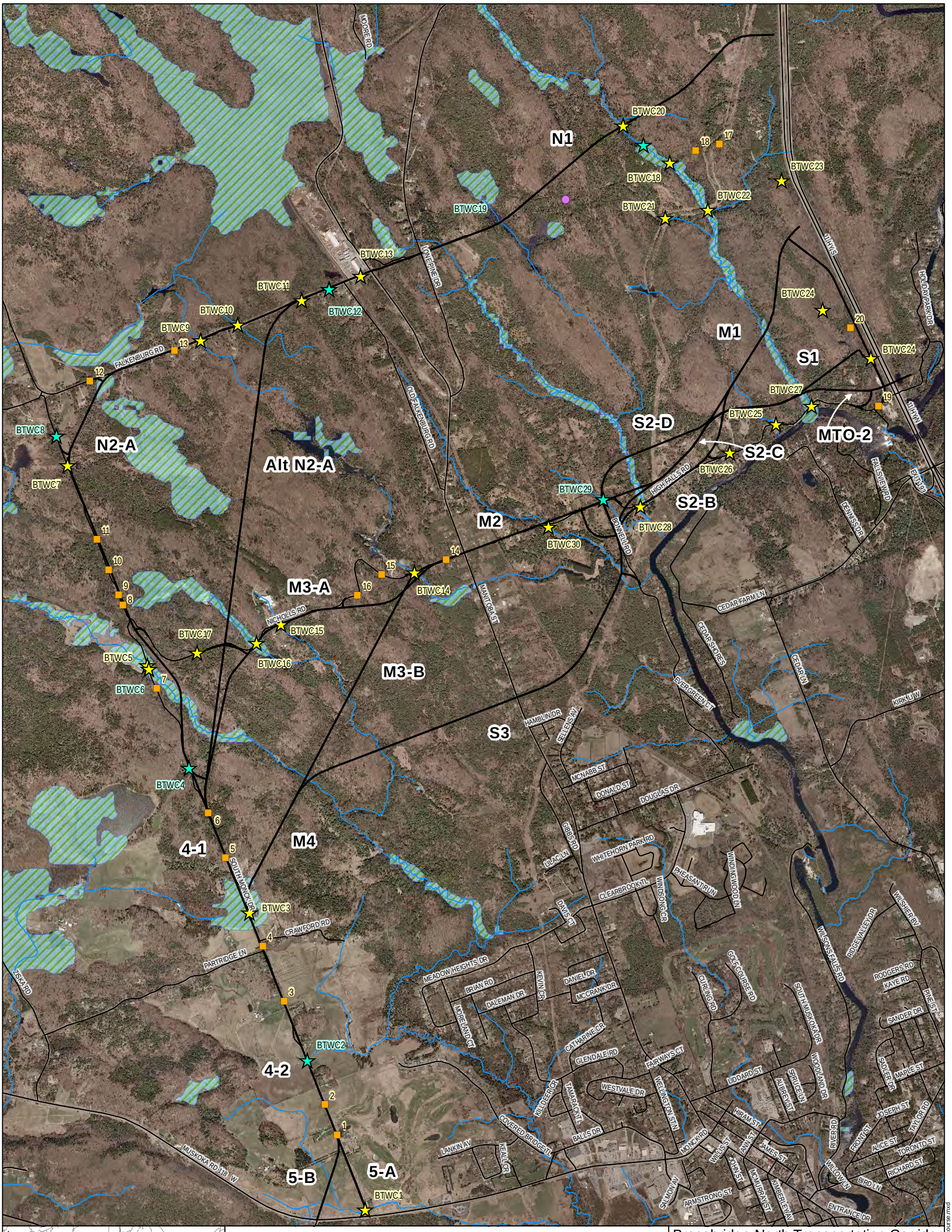
5. **Stream morphology** – this includes the wetted width of the active channel and average wetted depth. Also a description of the stream morphology:
    a. **Runs** - typically deep, fast moving water with little to no turbulence of water.
    b. **Riffles** – shallow, fast moving water typically running over rocks. Riffles provide areas of high oxygenated waters.
    c. **Flats** – low flowing water with a smooth un-agitated surface.
    d. **Pools** – deep pockets of slow moving water that provide ideal refuge habitat for fish.

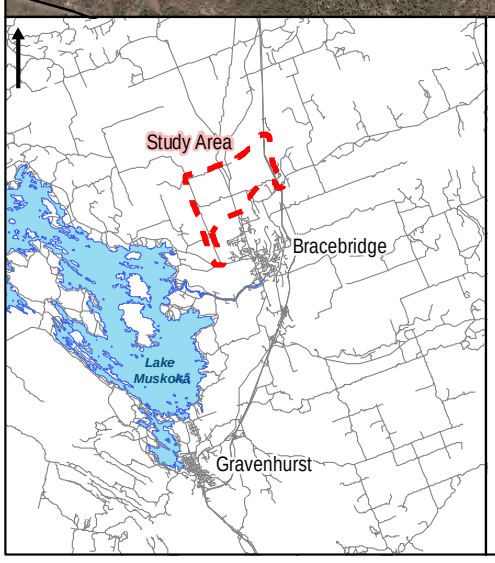
6. **General water characteristics** – water colour and clarity, *in-situ* water quality measurements (temperature, dissolved oxygen, conductivity and pH), presence and description of algae, and description of flow.

Several intermittent drainage features were also identified along the study corridor and details were noted if there was water present, a defined channel and general surrounding conditions.

Representative photographs were taken at each site to aid in describing the drainage features and fish habitat within the study area. Coordinates for all the crossings and survey areas were recorded with a handheld global positioning system (GPS).

Figure 2 presents the aquatic conditions of the study area.





Legend

- Culvert, Seasonal Drainage
- Vernal Pool, Seasonal Drainage
- Water Crossing, Fish Habitat
- Water Crossing, Seasonal Drainage
- Route Options
- Watercourses
- Roads
- Wetlands

N

Bracebridge North Transportation Corridor Class Environmental Assessment Study: Natural Environment Conditions

Wetlands and Watercourses

March 2013	1:24,000	Datum: NAD83 Zone17 Source: Bracebridge
P#: 60241537	V#: 001	

AECOM

Figure 2

0 412.5 825 1,650
Meters

Map location: P:\60241537\000-CADD\GIS data\Design\Report Maps\Wetland_Watercourse.mxd

2.1.4 Aquatic Habitat Assessment of study area Watercourses

The results of the drainage and fish habitat assessment are provided below in Table 2-1. As a note, watercourses and the location of aquatic habitat assessments were numbered in the field for identification. These reference numbers are presented in the table below as well as in **Figure 2**.

Table 2-1: Data from Aquatic Habitat Assessment

Watercourse Identifier (refer to Figure 2, Appendix A)	**Description**	**Water Quality**	**Fish Habitat Potential**
BTWC1	This watercourse flows in a south easterly direction under Monck Road towards the Muskoka River. At the time of the investigation there was only pooled water in the channel and culvert; no flow was observed. The watercourse flows through a meadow marsh wetland (MAM 2-2 in Table 8 below) via a narrow (0.6 m wide) channel. On the east side of the road the water was pooling downstream of the culvert. It is not known what was causing the water to pool. The watercourse flows through a golf course. Both the east and west channel receive runoff from the adjacent roadside ditches. Substrates in the channel consist of gravel and sand. Erosion was observed around the culvert on the west side of Monck Road. This watercourse is likely an intermittent system based on the pooling water and lack of flow.	Water Temperature: 15.58°C Conductivity: 1120 us/cm Dissolved Oxygen: 1.68 mg/L (17.4%) pH: 6.7	High potential for fish habitat
Culvert 1	Black plastic culvert for roadside ditches with reed canary grass present. No water present. Not fish habitat.	n/a	No potential
Culvert 2	Black plastic culvert for roadside ditch. No water present; choked with reed canary grass and other grasses. No fish habitat.	n/a	No potential
BTWC2	Channel through farmers field on both sides via black plastic culvert. Channel is dry on east side with a small pocket of water on the west side. Seasonal Drainage	Too shallow	Provision of seasonal flows
Culvert 3	Roadside ditch with no water.	n/a	No potential
Culvert 4	Black plastic culver for roadside ditch with no flow, however a streambed is apparent.	n/a	No potential
BTWC3	This watercourse braids through a swamp thicket wetland community. No defined channel was observed. The water colour was a very dark brown. Substrates were fines with an abundance of organic material. Both submergent and emergent vegetation was present. The water was stagnant with no observed flow. Green frogs were heard calling.	Water Temperature: 22.73°C (Air temp: 31°C) Conductivity: 114 us/cm Dissolved Oxygen: 3.34 mg/L (38.4%) pH: 5.95	High potential for fish habitat

Watercourse Identifier (refer to Figure 2, Appendix A)	Description	Water Quality	Fish Habitat Potential
Culvert 5	No defined channel on west side. No water present, but the ground is moist. Within coniferous forest. On east side, pooled water with no flow is present. Water is a brown colour.	Water Temperature: 19.46°C (Air temp: 31°C) Conductivity: 76 us/cm Dissolved Oxygen: 0.75 mg/L (8.4%) pH: 6.24	No potential
Culvert 6	Buried culvert in road, no obvious sign of water inputs or outputs.	n/a	No potential
BTWC4	Defined channel present with low gradual banks in deciduous forest. No flow, but some pools of water present. Culvert is perched on the west side.	n/a	Provision of seasonal flows
Culvert 7	Perched small corrugated culvert on east side. No water present within defined channel in deciduous forest. West side there is no defined channel and no water.	n/a	No potential
BTWC5/BTWC6	This is a medium sized tributary that flows in a south easterly direction to the Muskoka River. It flows through a large wetland community under two CSP culverts approximately 20 m apart. The west side meanders through the wetland and was very slow moving at the time of the investigation. The water was a brown colour and slightly turbid. Substrates consisted of fines with organics and there were pondweed species present. The east side of the watercourse runs parallel with Monck Road before flowing east into a wetland community. Signs of erosion along the stream bank were observed at this location. Substrates were mixed with gravel, sand and silt with emergent grasses and pondweeds for aquatic vegetation. Unidentified cyprinids were observed on either side of Monck Road at both culverts. This permanent watercourse provides direct fish habitat.	<u>BTWC5</u> Water Temperature: 20.08°C (Air temp: 31°C) Conductivity: 45 us/cm Dissolved Oxygen: 1.74 mg/L (18.7%) pH: 6.31 <u>BTWC6</u> Water Temperature: 21.19°C (Air temp: 31°C) Conductivity: 43 us/cm Dissolved Oxygen: 2.86 mg/L (32.3%) pH: 6.33	Fish habitat present
Culverts 8-11	Several culverts were identified along the existing roads and are provided in Figure 1. Given the rolling topography found within the study area, these culverts convey water from one side of the road to the other during seasonal conditions and precipitation events. These culverts have been placed to protect the road from flooding and moving	n/a	n/a

Watercourse Identifier (refer to Figure 2, Appendix A)	Description	Water Quality	Fish Habitat Potential
	water from higher elevations. Majority of these culverts consisted of either black plastic culvert pipes or small dimension CSP culverts. These locations were identified as having no defined channel, however there was evidence of water movement through the area including flattened vegetation and areas where no vegetation grew. At the time of the July 2012 investigations, majority of these locations were dry, however, in some low lying spots there were areas where water had pooled at the culvert or the ground was moist. Details per each culvert are provided below.		
Culvert 8	No defined channel on either side of road. Recieves roadside runoff and surface flow. Within deciduous forest.	n/a	No potential
Culvert 9	Defined channel present at culvert. No water observed on east side, but soils are moist. West side there is standing water, but very shallow (0.15cm)	Water Temperature: 17.76°C (Air temp: 32°C) Conductivity: 29 us/cm Dissolved Oxygen: 0.58 mg/L (6.2%) pH: 5.58	No potential
Culvert 10	On west side, no defined channel or water observed. East side, there is a ditch with leaf litter which likely flows north, then east through the forest.	n/a	No potential
Culvert 11	On west and east side, no defined channel, but likely receives water from overland flow through forest.	n/a	No potential
BTWC7	On the west side, low connectivity via a channel. A pool occurs at the culvert that is 5m x 2m with no flow. Water is a brown colour and the culvert is perched. There is also a pool approximate 5mx8m on the east side as well with no flow. A film is on the water.	Water Temperature: 22.98°C (Air temp: 32°C) Conductivity: 41 us/cm Dissolved Oxygen: 3.47 mg/L (40.6%) pH: 6.2	Moderate potential for fish habitat
BTWC8	Small pool of water on west side. Some water (0.10 cm depth) on east side. No flow but choked with rushes and grasses.	n/a	Provision of seasonal flows
Culvert 12	Higher elevation on north side. Culvert likely receives water through roadside ditch.	n/a	No potential
Culvert 13	No water present. Culvert likely receives water through roadside ditch.	n/a	No potential
BTWC 9	Small, narrow channel flows through forest and under Falkenburg Road through plastic culvert. At the time of the investigation there was very low flow and poor connectivity between the north and south side of the	n/a	Potential for Fish Habitat

Watercourse Identifier (refer to Figure 2, Appendix A)	Description	Water Quality	Fish Habitat Potential
	channel. The channels are partially defined with riparian grasses overhanging. A pond was observed on the south side of the road however due to property access could not determine if connected to channel.		
BTWC10	A small narrow watercourse flows under Falkenburg Road through a large black plastic culvert. The roadside ditch is steep and reinforced with armour stone. There was very little flow at the time of the investigation and water was pooled on the north side of the road. The watercourse receives runoff from roadside ditches on both the north and south side of the road. The south channel is choked with cattails. The water was a brown colour and had a humic film along the surface.	Water Temperature: 20.87°C (Air temp: 33°C) Conductivity: 296 us/cm Dissolved Oxygen: 5.73 mg/L (64.5%) pH: 6.55	Moderate potential for fish habitat
BTWC11	A small narrow watercourse flows under Falkenburg Road through a large black plastic culvert. There was very little flow at the time of the investigation and water was pooled on the north side of the road with a lack of connectivity. The watercourse receives runoff from roadside ditches on both the north and south side of the road. The south channel is choked with horsetails and the northside with cattails.	n/a	Moderate potential for fish habitat
BTWC12	A wetland community occurs on the south side that is dry with no defined channel. Some pockets of water occur with no flow to the north amongst alders and cattails.	n/a	Provision of seasonal flows
BTWC13	This watercourse was flowing at the time of the investigation, through a defined channel approximately 1 m wide. Substrates were fines and the channel was covered with overhanging grasses and shrubs. Water depth was approximately 0.10 m deep and stream morphology was 100% flat. The watercourse receives water from roadside ditches.	Water Temperature: 15.97°C (Air temp: 33°C) Conductivity: 681 us/cm Dissolved Oxygen: 6.16 mg/L (72.9%) pH: 6.50	High potential for fish habitat
Culvert 14	Culvert receives flows from road and overland.	n/a	No potential
BTWC14	At the time of the investigation this watercourse had very low flow and poor connectivity between the north and south side of the road. The channel is approximately 2.5 m wide and less than 0.10 m deep. During low flow connections the culvert on the south side may become perched creating a barrier to fish passage. The channel on the north side of the road was dominated with aquatic vegetation including milfoil and pondweed species.	Water Temperature: 22.17°C (Air temp: 33°C) Conductivity: 81 us/cm Dissolved Oxygen: 3.42 mg/L (39.6%) pH: 6.56	High potential for fish habitat

Watercourse Identifier (refer to Figure 2, Appendix A)	Description	Water Quality	Fish Habitat Potential
Culvert 15	Water from overland flow and roadside ditch is conveyed north.	n/a	No potential
Culvert 16	Receives water from overland flow and roadside ditch.	n/a	No potential
BTWC 15	This watercourse flows under Nicholl's Road through a black plastic culvert. The channel on the north side of the road is approximately 2.0 m wide. The riparian cover consists of willow shrub, alders and grasses with emergent rushes in the channel and dense submergent vegetation. The channel on the south side of the road narrows to 1.0 m and is approximately 0.10 m deep. Substrates consist of red coloured fines with some gravel.	Water Temperature: 22.17°C (Air temp: 32°C) Conductivity: 71 us/cm Dissolved Oxygen: 9.20 mg/L (105.5%) pH: 6.46	High potential for fish habitat
BTWC 16	This watercourse flows in a southerly direction under Nicholl's Road. On the south side the channel is well defined and is approximately 1.5 m wide and 0.15 m deep. There is a large pool on the north side of the road with an approximate depth of 0.50 m deep. The water is a very dark brown in colour and substrates consist of fines with high organic material. The roadside banks around the culverts are deteriorating and unstable.	Water Temperature: 30.52°C (Air temp: 32°C) Conductivity: 30 us/cm Dissolved Oxygen: 5.87 mg/L (78.7%) pH: 6.37 water quality taken in pool	High potential for fish habitat
BTWC 17	At the time of the investigation there was very little water flow in the channel. The north side of the culvert was blocked with woody debris and water was pooled. The south side of the road only contained pockets of water and was surrounded by alder and willow shrubs. Water colour was dark brown and substrates consisted of fines with organics.	Water Temperature: 19.07°C (Air temp: 28°C) Conductivity: 68 us/cm Dissolved Oxygen: 0.31 mg/L (3.4%) pH: 5.87	Moderate potential for fish habitat
Culvert 17	Dry channel within forest	n/a	No potential
Culvert 18	Dry channel within forest	n/a	No potential
BTWC 18	This watercourse is a natural meandering channel that flows through an alder thicket swamp along the TransCanada Trail. The swamp is approximately 25 m wide that is bordered by coniferous forest on either side. The channel is approximately 4.30 m wide and the average depth is 0.40 m. Substrates consist of fines with areas of gravels and cobbles with organics. The banks are gradual, stable and well vegetated with lots of overhanging vegetation.	Water Temperature: 18.98°C (Air temp: 28°C) Conductivity: 49 us/cm Dissolved Oxygen: 4.46 mg/L (48%)	High potential for fish habitat

Watercourse Identifier (refer to Figure 2, Appendix A)	Description	Water Quality	Fish Habitat Potential
		pH: 6.44	
BTWC 19	Drainage is channelized within a meadow marsh with areas of standing water. A small opening under the trail provides connection. Areas of standing water are present with no flow. Algae mats observed and Green frog heard.	n/a	Provision of seasonal flows
BTWC 20	This watercourse meanders through a wetland community at the bottom of a ravine feature. The channel is approximately 2.5 m wide and 0.30 m deep. Substrates consist of fines with gravel areas with woody debris and aquatic vegetation. The stream was flowing at the time of the investigation and cyprinids were observed.	Water Temperature: 17.25°C (Air temp: 28°C) Conductivity: 45 us/cm Dissolved Oxygen: 7.12 mg/L (74%) pH: 6.71	Fish habitat present
BTWC 21	This watercourse is an open water marsh that narrows into a channel through the forest. The channel is approximately 0.5 m wide and 0.10 m deep. Substrates in the channel consist of cobble and silt. There is poor connectivity between the open water marsh and defined channel.	Water Temperature: 15.35°C (Air temp: 28°C) Conductivity: 36 us/cm Dissolved Oxygen: 4.03 mg/L (40.4%) pH: 6.17	High potential for fish habitat
BTWC 22	This channel has been dammed by a beaver and in existence for a while. The beaver pond is very large and the dam structure is approximately 4-5 feet tall and 50 m long. The dam is well vegetated and stable with areas of water flowing out across the length of the dam. Cyprinids were observed in the pond. The watercourse flows south from the beaver dam and into a channel that is approximately 0.60 m wide and 0.20 m deep. Cyprinids were observed in the channel just downstream of the beaver dam. The stream morphology is a mix of riffle/run/pool sequence. The trail crosses through the watercourse and evidence of ATV activity in the channel was observed.	Water Temperature: 23.81°C (Air temp: 28°C) Conductivity: 46 us/cm Dissolved Oxygen: 6.05 mg/L (71.8%) pH: 6.63	Fish habitat present
BTWC 23	This watercourse meanders through the forest and is a very narrow channel of approximately 0.40 m wide and 0.10 m deep. The substrates are a dark brown wilt with pockets of organic material and sand	Water Temperature: 13.83°C (Air temp: 28°C) Conductivity: 313 us/cm Dissolved Oxygen: 9.69 mg/L (94%)	High potential for fish habitat

Watercourse Identifier (refer to Figure 2, Appendix A)	Description	Water Quality	Fish Habitat Potential
		pH: 7.06	
BTWC 24	This watercourse meanders through the forest along the TransCanada Trail. The channel is narrow at 0.40 m wide and water depth was approximately 0.20 m deep. Substrates were fines with pockets of sand, gravel, organics and woody debris. Sever erosion of the stream bank was observed on the west side.	Water Temperature: 18.42°C (Air temp: 28°C) Conductivity: 2113 us/cm Dissolved Oxygen: 6.80 mg/L (73%) pH: 7.03	High potential for fish habitat
Culvert 19	A black plastic culvert that receives flow from a wetland to the north. Algae observed and water is a brown/green colour.	Water Temperature: 21.27°C (Air temp: 28°C) Conductivity: 816 us/cm Dissolved Oxygen: 5.77 mg/L (65.1%) pH: 6.66	No potential for fish habitat
BTWC 25	This watercourse runs under High Falls Road through a black plastic culvert. The watercourse meanders through a cultural meadow. The channel is narrow at 0.40 m and water depth was approximately 0.10 m. Substrates consist of sand, gravel and cobble. The road embankments are very steep leading down to the watercourse and receives runoff from adjacent roadside ditches.	Water Temperature: 13.88°C (Air temp: 28°C) Conductivity: 56 us/cm Dissolved Oxygen: 11.22 mg/L (10.9%) pH: 7.55	High potential for fish habitat
BTWC 26	This is a small watercourse that flows towards the Muskoka River. The channel is approximately 0.20 m wide and water depth was less than 0.10 m deep. The channel was overgrown with cattails and other wetland vegetation.	n/a	Moderate potential for fish habitat
BTWC 27	This watercourse flows through a steep ravine and under High Falls Road in to the Muskoka River. The channel is approximately 5.0 m wide and water depth was approximately 0.35 m deep. Substrates consisted of silt, sand, gravel and cobble. Old bridge posts were observed in the channel. Water celery was abundant in the channel. The water was slow moving at the confluence with the Muskoka River.	Water Temperature: 18.56°C (Air temp: 26°C) Conductivity: 228 us/cm Dissolved Oxygen:	Fish habitat present

Watercourse Identifier (refer to Figure 2, Appendix A)	Description	Water Quality	Fish Habitat Potential
		7.54 mg/L (80.3%) pH: 6.98	
BTWC 28	This channel is rock lines on north side and flows out of a forest into an alder thicket wetland. The channel is approximately 1.0 m wide and water depth is 0.20 m deep. The channel is choked with emergent grasses.	Water Temperature: 13.92°C (Air temp: 26°C) Conductivity: 39 us/cm Dissolved Oxygen: 10.83 mg/L (105%) pH: 7.23	Moderate potential for fish habitat
BTWC 29	Channel observed with no water present	n/a	Provision of seasonal flow
BTWC 30	This is a small narrow, rock lined channel that flows into a meadow community. The channel was overgrown with vegetation. Water was present at the culvert.	Water Temperature: 21.81°C (Air temp: 26°C) Conductivity: 340 us/cm Dissolved Oxygen: 6.71 mg/L (76.8%) pH: 7.23	High potential for fish habitat

Considering the data collected from the aquatic habitat assessments during the field investigations, background review and aerial photographic interpretation, the following summary statements can be made:

i) The Bracebridge North Transportation Corridor study area is located in the North Branch subwatershed of the Muskoka River Watershed;
ii) The Muskoka watershed contains predominately cool and cold water fish species;
iii) There are a mix of wetlands, beaver ponds and both permanent and intermittent streams;
iv) There are four (4) permanent watercourses that likely provide fish habitat within the study area;
v) There were two un-mapped watercourses located near Highway 11 and the OFSC Trails towards the eastern limit of the study area. Both were flowing at the time of investigation;
vi) Several intermittent channels convey seasonal flow and provide connectivity between wetlands and beaver pond; and
vii) Muskoka River is located adjacent to study area and is the receiving water body of all four watercourses in the study area.

2.2 Terrestrial Environment

A terrestrial inventory of the study area was completed to document the existing terrestrial conditions at the site and to relate ecological form and function to wildlife habitat for Species at Risk (SAR) and Endangered or Threatened species that have been recorded within the area as well as to determine the presence of Significant Wildlife Habitat. Terrestrial vegetation communities were classified and mapped using the Ecosystem Land Classification (ELC) for Southern Ontario (Lee *et al.* 1998). Wetland communities at the site were also delineated using the protocols described in the Ontario Wetland Evaluation System (OWES) Northern Manual (OMNR, 2013).

The survey of the terrestrial features was completed in conjunction with aquatic habitat assessments in the July 2012. Due to the large size of the study area, the evaluation and classification of the terrestrial communities was completed through a preliminary interpretation of aerial imagery to identify the various vegetation communities that are present. This information was then used to create a monitoring plan where sampling stations were established within each unique vegetation community with the information from these features being applied to other similar habitats within the study area.

Incidental wildlife and bird observations were also recorded during these surveys to supplement the date obtained through the background research.

2.2.1 Ecosystem Land Classification

Aerial photography obtained from Bing Imagery, licensed through ArcGIS was used to identify and delineate forest and wetland communities within the study area. This information was integral to the preparation of a successful evaluation of the natural features at the site during the surveys as it ensured a minimum of one survey station was established within each unique ecosystem.

A total of 15 terrestrial survey stations were visited by an AECOM Terrestrial Ecologist between July 4, 2012 and July 6, 2012. A transect was completed at each survey station to collect information on the representative conditions within that vegetation community including habitat that was representative of the conditions within that particular vegetation community.

There are several features which play important roles in the development of forest communities in central Ontario other than just the trees identified in the canopy. These include the climate in which the forest is growing; understory vegetation present within the community; the type of soil upon which the community is found; and other physical site features (Hills and Pierpoint 1960, Hills, 1961). For this reason detailed data from each transect included information pertaining to site topography, soil composition and a detailed vegetation inventory of plant species in all layers of the community (i.e. canopy, sub-canopy, shrub layer and ground layer). In addition to providing detailed information for each ecosystem within the study area the data obtained from the terrestrial surveys was also used to correct the boundaries of the forest and wetland communities created during the preliminary mapping stage to accurately reflect the conditions at the site.

Using information collected from the terrestrial survey stations, vegetation communities were classified and delineated using the ELC system Southern Ontario. Based on these systems the vegetation communities were separated into two separate groups, wetlands or uplands. Wetlands comprise a large part of the northern Ontario landscape and are defined as “land that is saturated with water long enough to promote wetland or aquatic process as indicated by poorly drained soils, hydrophytic vegetation and various kinds of biological activity which are adapted to a wet environment” (National Wetlands Working Group, 1988). They are ecologically, hydrologically and socially important, providing habitat for many species of plants and animals, and acting as both retention and playing an important role in the hydrological cycle and supporting commercially valuable forests (Harris *et al.* 1996).

The study area is located near the southern edge of the Georgian Bay Lake Ecoregion (Ecoregion 5E), which is part of the Humid High Moderate Temperature Ecoclimate Region (Ecoregions Working Group, 1989). Land cover within this region is dominated by mixed forest (32.0%), deciduous forest (22.2%), coniferous forest (12.1%) sparse forest (11.3%), water (11.0%) and pasture (3.0%) (OMNR, 2009). Tree species in this ecoregion primarily consists of eastern white pine, red pine, eastern hemlock, yellow birch, sugar maple, beech, black cherry, basswood and white ash constituting the main forest species (Hills, 1959; Rowe, 1972).

A total of 15 communities, identified in **Table 2-2**, and presented in **Figure 3**, were identified through the aerial photography interpretation and field evaluation of the forest and wetland communities within the study area. The dominant community within the study area is a dry – fresh hardwood – hemlock mixed forest. Other upland communities that were identified within the study area include a coniferous forest, dry – fresh poplar mixed forest, dry – fresh oak – red maple deciduous forest, dry – fresh sugar maple deciduous forest, red pine coniferous plantation, white pine coniferous plantation, scotch pine coniferous plantation and a dry – moist old field meadow. All terrestrial communities identified within the study area are common within Central Ontario.

Wetland types within the study area include marsh and swamp habitat. A total of 3 wetland types were identified within the study area including a thicket swamp, a reed-canary grass meadow marsh and a bluejoint organic meadow marsh. All wetland types present within the study area appear to be common in the region.

Table 2-2 ELC Codes and Descriptions for the study area

ELC Codes	Description	Community Description
10 FOC	Coniferous Forest	The Coniferous Forest (FOC) is dominated by a red pine (*Pinus resinosa*) canopy and sub-canopy. The shrub layer, which covers between 25 to 60% of the community, is dominated by immature sugar maple (*Acer saccharum*) and red maple (*Acer rubrum*) saplings. The ground layer is primarily comprised of bracken fern (*Pteridium aquilnum*), sugar maple seedlings and Canada mayflower (*Maianthemum canadense*).
12/14 FOM 3-1	Dry - Fresh Hardwood - Hemlock Mixed Forest	The Dry – Fresh Hardwood – Hemlock Mixed Forest is the largest forest community within the study area. Red maple is consistently dominant throughout the canopy and sub-canopy of this community with white pine (*Pinus strobus*), balsam fir (*Abies balsamea*), eastern hemlock (*Tsuga Canadensis*) and sugar maple varying in abundance. The shrub layer, which covers between 25 to 60% of the community, is dominated by immature red maple, sugar maple, balsam fir and eastern hemlock saplings. The ground layer is comprised primarily of bracken fern, Wild Sarsaparilla (*Aralia nudicaulis*) and Canada mayflower.

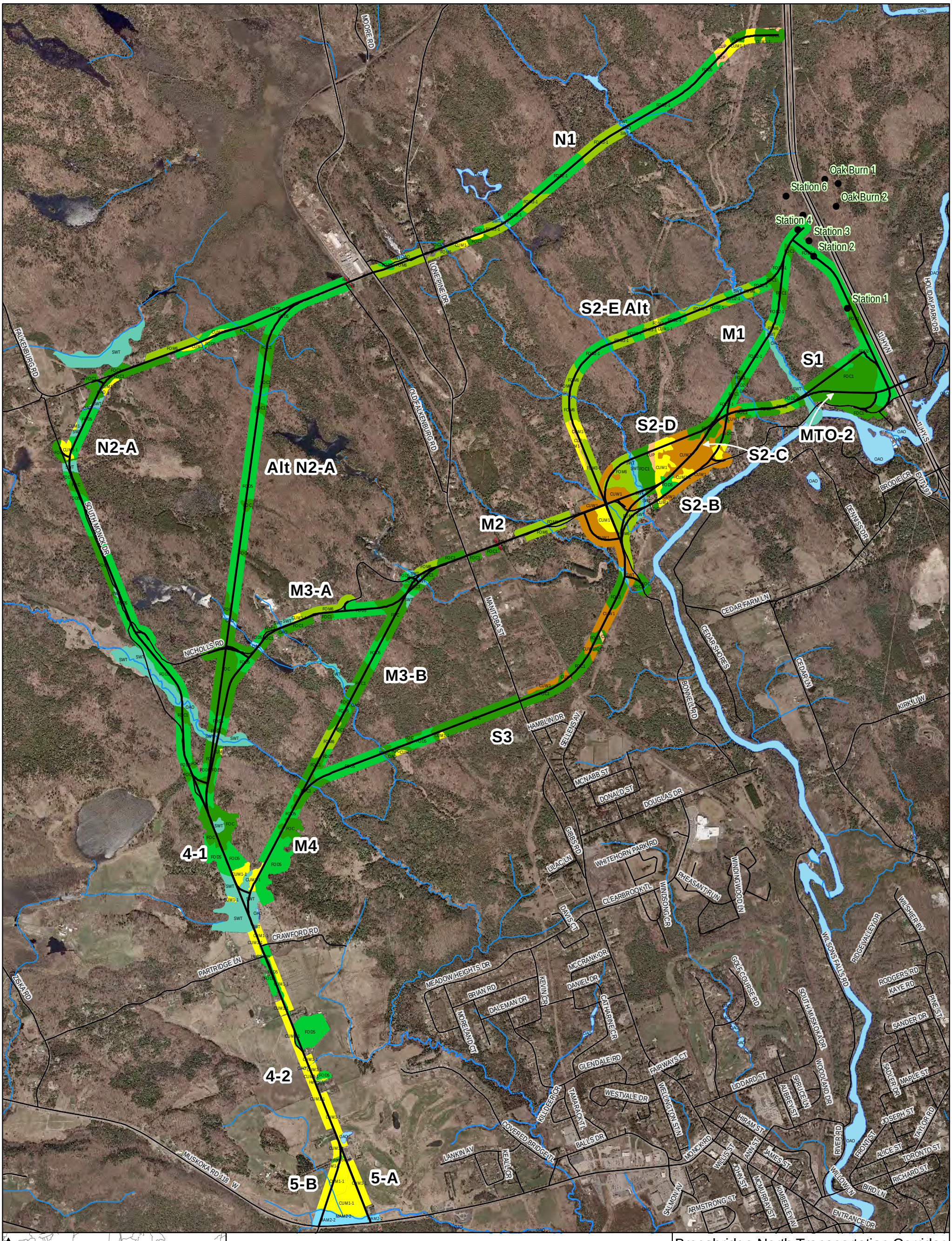
ELC Codes	Description	Community Description
15 FOM 5-2	Dry – Fresh Poplar Mixed Forest	The canopy of the Dry – Fresh Poplar Mixed Forest is dominated by trembling aspen (*Populus tremuloides*) with some white spruce (*Picea glauca*) and white pine. The sub-canopy of this community is comprised primarily of white spruce and white pine with some trembling aspen and sugar maple. No information pertaining to the composition or abundance of the species on the shrub or ground layers was obtained for this community as it was assessed using a road side survey as access to the property had not been obtained.
13 FOD 2-1	Dry – Fresh Oak – Red Maple Deciduous Forest	The canopy and sub-canopy of the Fresh Oak – Red Maple Deciduous Forest is comprised primarily of sugar maple with some red oak and red maple. The shrub layer of this community is immature sugar maple and red maple saplings. The ground layer of this community consists of sugar maple seedlings, intermediate woodfern (*Dryopteris intermedia*) and bracken fern.
8 FOD 5	Dry – Fresh Sugar Maple Deciduous Forest	The canopy of the Dry – Fresh Sugar Maple Deciduous Forest is dominated by sugar maple with some trembling aspen, white pine and balsam poplar (*Populus balsamifera*). The sub-canopy and shrub layer are primarily comprised of sugar maple and white pine. The ground layer of this community is dominated by sugar maple seedlings with some bracken fern and wild sarsaparilla.
11 CUP 3-1	Red Pine Coniferous Plantation	The Red Pine Coniferous Plantation is characterized by a dense red pine canopy. The sub-canopy of this community, which covers 10 to 25% of the community, was dominated by red maple. The shrub layer of this community, which also covers 10 to 25% of the community, consisted primarily of balsam fir. The ground layer of this community, which covered less than 10% of the community contained Canada mayflower.
6/10 CUP 3-2	White Pine Coniferous Plantation	The White Pine Coniferous Plantation is characterized by a dense white pine canopy that contained sporadic balsam fir and trembling aspen. The sub-canopy of this community, which covers 10 to 25% of the community, was dominated by white pine with some balsam poplar. No information pertaining to the composition or abundance of the species on the shrub or ground layers was obtained for this community as it was assessed using a road side survey as access to the property had not been obtained.
5 CUP 3-3	Scotch Pine Coniferous Plantation	The Scotch Pine Coniferous Plantation is characterized by a dense scotch pine canopy and sparse scotch-pine sub-canopy. No information pertaining to the composition or abundance of the species on the shrub or ground layers was obtained for this community as it was assessed using a road side survey as access to the property had not been obtained.

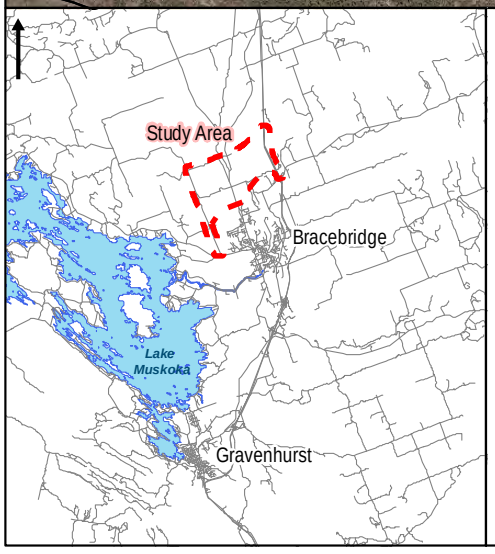
ELC Codes	Description	Community Description
2 CUM 1-1A	Dry-Moist Old Field Meadow	The Dry-Moist Old Field Meadow is characterized by a variety of grass species that can commonly be associated with hay/straw fields and early successional meadows including smooth brome (*Bromus inermis*), timothy-grass (*Phleum pretense*) and orchard grass (*Dactylis glomerata*). Part of this community is still actively being managed for agricultural purposes (i.e. hay, straw, pasture).
15 CUM1-1B	Dry-Moist Old Field Meadow	The Dry-Moist Old Field Meadow is located along the trans Canada pipeline that bisects the eastern half of the study area. The canopy/sub-canopy of this community is contains sporadic pockets of white pine and trembling aspen. The ground layer of this community is dominated by pockets of white meadowsweet and bracken fern and a consistent cover of a variety of grasses.
3 SWT	Thicket Swamp	The Thicket Swamp community is characterized by a dense speckled alder (*Alnus incana*) shrub layer with some sandbar willow (*Salix exigua*) and pussy willow (*Salix discolour*). The ground layer of this community contained areas of open standing and flowing water with a variety of sedge (*Carex sp.*) and rush (*Juncus sp.*) species.
1 MAM 2-2	Reed-canary Grass Mineral Meadow Marsh	The Reed-canary Grass Mineral Meadow Marsh is characterized by a dense ground layer dominated by reed-canary grass (*Phalaris arundinacea*).
7 MAM 3-1	Bluejoint Organic Meadow Marsh	The Bluejoint Organic Meadow Marsh contains a sparse canopy that covers less than 10% of the community and contains red maple and white birch (*Betula papyrifera*). The shrub layer of this community is also fairly sparse containing white meadowsweet (*Spiraea alba*) and sandbar willow. The ground layer is the dominant layer within this community and is dominated by bluejoint (*Calamagrostis Canadensis*) with some woolgrass (*Scirpus cyperinus*).

Appendix B presents a list of floral species observed. **Appendix C** presents the field data collected.

2.2.2 Wetland Delineation

Wetlands are defined in the OWES as “Lands that are seasonally or permanently flooded by shallow water as well as lands where the water table is close to the surface; in either case the presence of abundance water has caused the formation of hydric soils and has favour the dominance of either hydrophytic or water tolerant plants” (OMNR, 2002). They provide specialized habitat for a variety of species that require the unique combination offered by the transition habitat present between lowland and upland habitat (OMNR, 2011). Wetlands also perform several other important functions such as flood attenuation, water quality improvement and groundwater recharge (OMNR, 2011). It is for this reason that wetlands are often afforded extra consideration when development activities are proposed within/adjacent to this habitat. It is also the reason that the wetland habitat present within the study area was delineated using the OWES Northern Manual. The delineation of the wetland areas can be found on both **Figures 2 and 3.**





Legend

Route Options | Watercourses | Roads

CUM | CUP | CUW | FOC | FOD | FOM | MAM | SWT | OAO | Hedgerow

N

ELC Codes	Definitions	ELC Codes	Definitions
CUM1	Mineral Cultural Meadow Ecosite	FOD5	Dry-Fresh Sugar Maple Deciduous Forest Ecosite
CUM1-1	Dry-Moist Old Field Meadow Type	FOM3-1	Dry-Fresh Hardwood - Hemlock Mixed Forest Type
CUP	Cultural Plantation	FOM6	Fresh-Moist Hemlock Mixed Forest Ecosite
CUW1	Mineral Cultural Woodlot Ecosite	FOM5-2	Dry-Fresh Poplar Mixed Forest Type
FOC	Coniferous Forest	MAM2-2	Reed-canary Grass Mineral Meadow Marsh Type
FOC1	Dry-Fresh Pine Coniferous Forest Ecosite	OAO	Open Water
FOD2-1	Dry-Fresh Oak-Red Maple Deciduous Forest Type	SWT	Thicket Swamp

Bracebridge North Transportation Corridor Class Environmental Assessment Study: Natural Environment Conditions

Ecological Land Classification

March 2014	1:24,000	Datum: NAD83 Zone17 Source: Bracebridge
P#: 60241537	V#: 001	**Figure 3**

AECOM

0 412.5 825 1,650
Meters

Map location: P:\60241537\000-CADD\GIS data\Design\Report Maps\ELC.mxd

The OWES is based on scientific criteria to serve the needs of Ontario's planning process (OMNR, 2011). It recognizes the importance of wetlands to maintain important ecosystem functions, provide social benefits to the surrounding community, moderate storm flow and improve water quality and provide habitat for rare species (OMNR, 2011). The OWES provides a standardized method to evaluate the significance of a wetland based on these and other factors which allows the province to determine which wetlands are provincially significant.

Information that was collected during the site visits included the identification of wetland communities and the delineation of their boundaries; documenting vegetation forms; searching for rare plant and animal species; recording evidence of disturbance; hunting and fishing; checking soil/substrate types and searching for seeps and marl deposits.

Wetland communities within the study area were typically observed within low-lying areas along watercourses or in depressions within the topography. In some cases wetland areas were a result of flooding from beaver dams. **Figures 2 and 3** presents the location of the wetland boundaries.

The rise in concern for wetlands in within the District of Muskoka has also given way to the formation of the Muskoka Heritage Areas Policy Review Program's wetland evaluation system through a joint initiative with the Ministry of Natural Resources and the Muskoka Heritage Foundation (Muskoka Water Web). Heritage Areas are lands designated as significant in Muskoka. Some of the wetlands

2.2.3 Oak Monitoring Stands

Through discussions and email correspondence with MNR, longterm oak monitoring stands were identified within the study area. To pinpoint their exact location, fieldwork was undertaken with one of AECOM's ecologists and MNR's forester on Thursday January 17th, 2013. A total of nine (9) oak monitoring stands were located in the field to aid in the evaluation of alternative routes. Six (6) monitoring stands are located west of Highway 11 while three (3) are located east of the same highway. The monitoring stands were geo-referenced with a hand-held geo-referencing device. The location of these areas are found on Figure 3.

Additional information concerning these areas can be found in **Appendix D**.

2.3 Wildlife

The Provincial Policy Statement (PPS) was created to provide direction on matters of provincial interest related to land use planning and development. Through the application of this policy appropriate development is allowed while protecting resources of provincial interest, public health and the quality of the natural environment (OMMAH, 2005). The policies with respect to Significant Wildlife Habitat are defined in the PPS while the identification of the various types of this habitat and methods for the evaluation of these features are defined through the application of the Significant Wildlife Habitat Technical Guide (OMNR, 2000) and the Natural Heritage Reference Manual (OMNR, 2010).

Wildlife habitat is any area where plants, animals and other organisms live and find adequate amounts of food, water, shelter and space needed to sustain their populations. This may also include areas where species concentrate at a vulnerable point in their annual or life cycle; and areas which are important to migratory or non-migratory species (OMNR, 2000). To be considered significant wildlife habitat, the habitat must be ecologically important in terms of features, functions, representation or amount, and contributing to the quality and diversity of an identifiable geographic area or Natural Heritage System (OMNR, 2000).

The Ontario Ministry of Natural Resources (OMNR) has divided significant wildlife habitat into four broad categories to make its identification and evaluation more comprehensive (OMNR, 2000). These include seasonal concentration areas, rare vegetation communities or specialized habitat for wildlife, habitat of species of conservation concern, (not including habitat of endangered and threatened species) and animal movement corridors. Some of these features can be identified using maps and aerial photographs while others can only be identified through field surveys.

Detailed information obtained from background sources and the evaluation of the forest and wetland communities were used to identify and evaluate any potential significant wildlife habitat that may be present within the study area. Due to the nature of some of the habitat types identified in the significant wildlife habitat guide and the challenges associated with their identification, the potential significant wildlife habitat identified in this report may not be entire.

2.3.1 Significant Wildlife Habitat

The information provided in this section is based on information obtained from background research and the 2012 and 2013 site visits. Significant wildlife habitat that may be present within the study area and that referenced in this section may not be conclusive as some of the habitat which is included in the significant wildlife guide is often difficult to locate. Potential significant wildlife habitat that may be present within the study area include winter deer yards, colonial bird nesting sites, reptile hibernacula, habitat for area-sensitive species, forests providing a high diversity of habitats, old-growth or mature forest stands, amphibian woodland breeding ponds, specialised raptor nesting habitat, and seeps and springs.

2.3.2 Winter Deer Yards

White-tailed Deer do not typically move well in deep snow in years where a large amount accumulates (i.e. depths of snow greater than 50cm). Under such conditions, deer begin to move to sheltered areas where they will remain in the general vicinity until early April (comm., Ron Black, MNR). These areas, known as deer yards, are typically comprised of a core that contains a dense canopy (>60%) of pines, hemlock, cedar and spruce trees that provide shelter, ease of movement, food and protection from predators. In severe winters with deep snow, deer may be confined to the core part of these yards while in more mild winters they may be found in loose aggregations surrounding the core part of the yard. Deer yards are typically surrounded by mixed or deciduous forests. Deer tend to display high site fidelity to a deer yard typically visiting the same yard year after year. Consequently, deer typically do not react well to a loss of a deer yard (MNR, 2000).

Background information obtained from the MNR indicate that there is a large deer yard present in the large forested area in the northeastern half of the study area.

On February 26th and 27th, 2013 two AECOM ecologists conducted deer surveys specifically for the Bracebridge North Transportation Corridor Environmental Assessment. Surveys were conducted to determine whether the lands directly north of High Falls Road provided habitat for deer wintering yards (alternative S2-D).

The surveys consisted of four transects which were 1 kilometer long, 500 metres on either side of the designated corridor running north off of High Falls Road. Each transect was spaced 200 m apart (east-west) along the corridor. The four transects included 11 plots which were spaced 100 metres apart.

In each plot the following was completed:

- Determination of the ecosite of each community using Ecological Land Classification (ELC)
- Determination of the crown conifer cover percentage at each cardinal point including the centre
- Prism sweeps describing species and diameter at breast height

- Recorded evidence of habitat use by qualitatively assessing each plot taking note of total number of available stems and total number of stems which have been browsed by deer
- Recorded tracks observed within each plot
- Co-ordinates were recorded where deer trails/beds were observed along transect lines
- Any other pertinent observations

A total of 30 plots were completed along the four designated transects. Due to private property boundaries, some of the required plots could not be completed. In addition, only plots located north of High Falls Road were completed during surveys.

Common tracks observed within each plot and along the transect lines included Coyote (*Canis latrans*), Snowshoe Hare (*Lepus americanus*), Eastern Gray Squirrel (*Sciurus carolinensis*), Fisher (*Martes pennanti*), White-tailed Deer (*Odocoileus virginianus*) and Ruffed Grouse (*Bonasa umbellus*).

No sign of substantial deer populations were evident during surveys. One deer trail was observed which was located along Transect C in plot 7. It is estimated a total of three deer had used this trail. The majority of browse observed within these plots had been dominated by Snowshoe Hare. The snow depth along the four transects was recorded at approximately 70 cm. The species composition and conifer closure did not meet the requirements for deer wintering. In particular very few plots had any cedar or hemlock species or deer evidence. Therefore, deer yard wintering habitat was not present within the data plots conducted by AECOM. These results were confirmed with MNR during a conference call on March 20th, 2013.

Appendix E presents the survey methods and results of the deer yard survey.

2.3.3 Colonial Nesting Birds

Several species of herons, gulls, terns and swallows are known to nest in colonies. In some one or two colonies can support the entire local population of these species. Also several of these species display high levels of site fidelity returning to the same locations year after year. This is why there is often a great deal of importance placed on the preservation of these features (MNR, 2000).

Background information obtained from the Muskoka Heritage Trust indicate that a Great Blue Heron colony is present to the north east of the Beaver pond located on the Upjohn Nature Preserve located at the intersection of Monk Road and Nichols Road. The Muskoka Field Naturalists also indicated the presence of a Heron colony within this area through their correspondence dated November 12th, 2013. The exact location of this colony has not been confirmed as AECOM field staff were unable to locate these nests during their site visit in July 2012.

2.3.4 Reptile Hibernacula

Some species of snakes and turtles overwinter in sizable concentrations in sites known as hibernacula. A single unidentified snake was observed at the site during the 2012 site visit. Snakes generally hibernate underground in burrows, rock outcroppings or the foundations of old buildings (MNR, 2000). The presence of this snake could indicate that reptile hibernacula may be present in the study area.

2.3.5 Habitat for Area Sensitive Species

The minimum forest habitat for area-sensitive species is at least 100 m from any edge habitat. Large and un-fragmented forest habitat provide habitat for several species of mammals and birds that is important for their long-term survival. Bird species which are area sensitive typically require large tracks to undisturbed habitat to reduce competition from other species provide cover from predators and reduce the ability of nest parasites, such as Brown-headed Cowbird, from reducing the productivity of these birds. Large forests with closed canopy and large trees and a variety of vegetation layers typically support greater species diversity due to the range of habitat they provide (OMNR, 2000). Several area sensitive bird species were observed within the study area indicating that area-sensitive habitat is present within the study area. It is important to note that area sensitive habitat is much more common in central and northern Ontario than it is in southern Ontario.

2.3.6 Forests providing a high diversity of habitats

Forests that have a variety of vegetation communities, dominant tree cover, numerous vegetation layers, an abundance of fallen logs and complexes of upland and wetland habitats also may also have high diversity of flora and fauna. The presence of these features within a forest community can be beneficial to many species such as squirrels, cavity nesting birds like Woodpeckers, Barred Owls and Wood Ducks and resting habitat for mammals like Racoon and Porcupine. Older forests also typically have more cavity trees that support a higher diversity of species. Forests that have numerous vertical layers of vegetation can also increase site diversity due to the many microhabitats that they provide for wildlife (MNR, 2000).

Studies to verify the presence of this type of habitat were not completed as part of this study. However due to the complex topography, age and structure of the forest in the northern half of the study area it is possible that parts of this area could be considered to provide a high diversity of habitats.

2.3.7 Old-growth or mature forest stands

The definition of an old-growth forest varies depending on tree species however generally these sites will have a large proportion of trees that are in older age classes, many of which will be over 120 to 140 years old. Other features that are characteristic of an old-growth or mature forest include a broad spectrum of tree sizes and heights, an uneven canopy with scattered gaps due to fallen trees and an abundance of fallen logs in various stages of decomposition.

Studies to verify the presence of this type of habitat were not completed as part of this study. However it is possible that portions of the forest habitat in the north east part of the study area may be considered to be old-growth or mature.

2.3.8 Amphibian woodland breeding ponds

Ideal breeding ponds are unpolluted, contain a variety of vegetation structures, are located adjacent closed-canopy woodlands with a somewhat dense undergrowth and contain fallen logs (MNR, 2000). As surveys were completed later in the spring only bodies of water and wetlands that contained water later into the summer or are permanent in nature were documented during the 2012 site investigation. Some of these sites are likely suitable habitat for amphibian and salamander breeding however other sites that only flood briefly in the spring and area smaller in nature and not visible from an air photo may not have been located. It is possible that other low lying wet areas or vernal pools that support amphibian and salamander breeding may be present within the study area.

2.3.9 Specialized raptor nesting habitat

Specialized habitat for raptors that nest in forests closed canopies with large enough trees to support their nests and a minimum number of trees and shrubs in the understory to ensure the flight zone under the canopy is open. Shorelines of productive water bodies with large trees may also provide suitable habitat for Osprey (MNR, 2000).

Studies to verify the presence of this type of habitat were not completed as part of this study. However due to the large amount of forest habitat in the northern part of the study area and the presence of mature forest habitat near the river it is possible that specialized raptor nesting habitat may be present within the study area.

2.3.10 Specialized habitat

Seeps and springs provide habitat for several species during different seasons due to their high diversity of plants and lack of snow on the ground in the winter and cool conditions during the summer. Although only a few seeps were documented during the site investigation it is highly likely that there are several throughout the study area.

The only Species of Conservation Concern which was documented in the study area or may be present based on information obtained from background information was the Bald Eagle.

2.3.11 Wildlife Observations

Incidental wildlife observations were recorded during the 2012 site visit. These observations included documentation of wildlife sightings, tracks and animal scat. Recording these wildlife observations is an inexpensive and effective method of collecting information about wildlife that may be using the study area.

Wildlife that is representative of the Georgian Bay ecoregion includes little brown bat, American Black Bear, Moose, Fisher, North American River Otter, Beaver, Common Loon, Osprey, Broad-winged Hawk, Ruby-throated Hummingbird, Pileated Woodpecker, Yellow-bellied Sapsucker, Winter Wren, Veery, Blackburnian Warbler, Black-throated Blue Warbler, Yellow-rumped Warbler, Scarlet Tanager, Rose-breasted Grosbeak, Red-spotted Newt, Northern Two-lined Salamander, Four-toed Salamander, Grey Treefrog, Pickerel Frog, American Bullfrog, Snapping Turtle, Smooth Green Snake and Northern Ring-necked Snake (MNR, 2009).

The majority of the incidental wildlife observations recorded by AECOM were birds and will be addressed in Section 2.3.12. Aside from birds there were very few incidental wildlife observations observed aside from an identified snake species, White-tailed Deer tracks and a beaver dam.

2.3.12 Breeding Birds

A background search was completed using the Ontario Breeding Bird Atlas to identify which species of birds have been recorded in the study area. Data obtained from the one Breeding Bird Atlas square (17PK39) that covers the study area identified a total of 94 species of birds (see **Appendix F**), which displayed various levels of breeding evidence in the area surrounding the study area (Cadman *et al.* 2005). Species that are included in the Ontario Endangered Species Act that were identified in the Breeding Bird Atlas includes Barn Swallow (Threatened), Canada Warbler (Special Concern) and Eastern Meadowlark (Threatened). The Canada Warbler is also listed as Threatened species under the Federal Species at Risk Act.

Barn Swallow can be found in a wide variety of habitats including agricultural areas, cities, and suburbs and along highways. Breeding habitat usually contains open areas, such as fields, meadows and marshes, for foraging with

nesting sites that includes a vertical or horizontal substrate or structure underneath some form of roof or ceiling near a body of water that provides mud for nest-building (Brown and Bomberger, 1999). No barn swallows were observed during the 2012 site investigations.

Canada Warblers can be observed in a wide variety of forest communities during the breeding season, however, they are typically most abundant in cool, moist forests with a mix of coniferous and deciduous trees, a dense understory and complex ground cover, often with standing water and trees that emerge from the sub canopy (Cink and Collins, 2002). It is typically associated with areas that are covered with moss, nesting on or near the ground in the pockets of moss hummocks, upturned tree-roots or small depressions with deep litter and dense saplings (Cink and Collins, 2002). Compared to other warbler species the Canada Warbler spends relatively little time on its breeding grounds as it is one of the last warblers to arrive and one of the first to leave its nesting areas (Cink and Collins, 2002). Information collected from the forest and wetland evaluations indicate that a trembling aspen mixed wood forest that occupies a large portion of the study area would likely provide suitable breeding habitat for Canada Warbler. No Canada Warblers were observed during the 2012 site investigations. However, the Muskoka Field Naturalists group has indicated its presence during the breeding season for the last couple of years. They also indicated the presence of Golden-winged Warbler and Eastern Whip-poor-will.

Eastern Meadowlark is most commonly associated with native grasslands, pastures, tall-grass prairies and savannas but can also be found in hay and alfalfa fields, the weedy borders of agricultural fields, roadsides, orchards, golf courses, reclaimed strip mines, airports and shrubby overgrown fields (Jaster *et al.* 2012). No Eastern Meadowlark were observed during the 2012 site investigations.

A total of 37 bird species, included in Table 2-3, were identified within the study area during the site investigation through incidental observations that occurred at various times of the day outside of the timing window identified in the Canadian Wildlife Service Forest Bird Monitoring Program protocol. The majority of the species observed are common central Ontario with the exception of the Bobolink, which is designated as a threatened species under the Ontario Endangered Species Act (ESA). All of the species observed within the study area are common to Central Ontario. Several of the species that were observed are known area sensitive species (OMNR, 2000). Area sensitive species are those that respond negatively to decreasing habitat patch size (Koford *et al.* 1994).

Table 2-3: Observed Birds within the study area

Species	Breeding Evidence	Special Designation
American Crow	Observed	
American Robin	Calling in suitable habitat	
Black-capped Chickadee	Observed	
Black-throated Blue Warbler	Calling in suitable habitat	
Black-throated Green Warbler	Calling in suitable habitat	Area Sensitive Species
Blue Jay	Observed	Area Sensitive Species
Blue-headed Vireo	Calling in suitable habitat	Area Sensitive Species
Bobolink	Calling in suitable habitat	ESA: Threatened, COSEWIC: Threatened, Areas Sensitive Species
Broad-winged Hawk	Pair together, assumed mated	Areas Sensitive Species
Brown Creeper	Calling in suitable habitat	Areas Sensitive Species
Cedar Waxwing	Calling in suitable habitat	
Chestnut-sided Warbler	Calling in suitable habitat	
Chipping Sparrow	Calling in suitable habitat	
Common Raven	Observed	
Common Yellow-throat	Calling in suitable habitat	

Species	Breeding Evidence	Special Designation
Dark-eyed Junco	Observed	
Downy Woodpecker	Calling in suitable habitat	
Eastern Kingbird	Calling in suitable habitat	
Eastern Phoebe	Calling in suitable habitat	
Great-crested Flycatcher	Calling in suitable habitat	
Hairy Woodpecker	Observed	Areas Sensitive Species
House Wren	Calling in suitable habitat	
Indigo Bunting	Calling in suitable habitat	
Northern Parula	Singing Male	Areas Sensitive Species
Ovenbird	Calling in suitable habitat	Areas Sensitive Species
Pileated Woodpecker	Calling in suitable habitat	Areas Sensitive Species
Red-eyed Vireo	Calling in suitable habitat	
Red-winged Blackbird	Calling in suitable habitat	
Savannah Sparrow	Calling in suitable habitat	Areas Sensitive Species
Scarlet Tanager	Calling in suitable habitat	Areas Sensitive Species
Song Sparrow	Calling in suitable habitat	
Swamp Sparrow	Calling in suitable habitat	
Tree Swallow	Observed	
White-throated Sparrow	Calling in suitable habitat	
Winter Wren	Calling in suitable habitat	Areas Sensitive Species
Wood Thrush	Calling in suitable habitat	
Yellow-bellied Sapsucker	Observed	Areas Sensitive Species

2.3.13 Species at Risk

As the province has not been surveyed comprehensively for the presence of SAR; the absence of a species within the NHIC database for a particular area when completing a 1km search does not necessarily indicate the absence of the species within the study area. Therefore, the 1 km search was supplemented the records obtained from the Atlas of Breeding Birds of Ontario. The intention of the exercise is to use all available resources to create a comprehensive list of all potential SAR species located within the study area.

In order to better understand which species may be located within study area, a habitat assessment of each Endangered or Threatened species identified from the background search was completed to narrow down possible candidate species that are more likely to be present within the study area. This assessment is based upon a combination of available information: i) the presence/absence of suitable preferred habitat identified during site investigations, and ii) known populations, obtained through range maps COSEWIC reports, and MNR records.

Appendix G outlines each of the species identified their Species at Risk Act (SARA) and Species at Risk in Ontario (SARO) designation, a description of their preferred habitat and the likelihood of the habitat found within the study area.

Table 2-4 presents the SAR known for the study area and their habitat. This species list was obtained from MNR. Table 2-5 presents SAR determined through the study entitled *The Species at Risk: Potentially Suitable Habitat Mapping* Final Draft Report completed by Glenside Ecological Services Limited in November of 2009. Table 2-6 presents SAR determined through the study entitled *Muskoka Official Plan Review Background Study: Urban Centres Natural Heritage Review* (AECOM and SLR, 2011).

Table 2-4: Species at Risk known within the study area and their habitat

Monck South Ward	
Name	**Habitat Preferences** (Species habitat preference where obtained from the Species at Risk Registry)
Barn Swallow	Species can be found using ledges and walls of man-made structures typically found in and around buildings, barns, garages, and sheds etc. Nests in May to July.
Blanding's Turtle	Species is generally situated in shallow water marshes, bogs, ponds or swamps. As well as in coves in larger lakes with soft muddy bottoms and aquatic vegetation. Species basks on logs, stumps, or banks. The surrounding natural habitat is important in summer as they frequently move from aquatic habitat to terrestrial habitats. Species generally hibernates in bogs, and is not readily observed. Species nest in June.
Bobolink	Large, open expansive grasslands with dense ground cover; hayfields, meadows or fallow fields; marshes; requires tracts of grassland >50 ha.
Chimney Swift	This species is mainly associated with urban and rural areas where they can find chimneys to use as nesting and resting sites. However, it is likely that a small portion of the population continues to use hollow trees. Species nests from May to July.
Eastern Hog-nosed Snake	This species prefers habitats with sandy, well-drained soil and open vegetative cover, such as open woods, brushland, fields, forest edges and disturbed sites. The species is often found near water. Eastern Hog-nosed Snakes are often found in shoreline areas and rely on driftwood and other ground cover in beach and beach dune habitats, where toads, are found. They can live in slightly cooler areas if there are exposed to south-facing sandy slopes that provide soil conditions that are warm enough for incubation. Species mate from August to September and nests from late June to mid-July and
Eastern Meadowlark	The Eastern Meadowlark is most common in native grasslands, pastures and savannahs. It also uses a wide variety of other anthropogenic grassland habitats, including hayfields, weedy meadows, young orchards, golf courses, restored surface mines, grassy roadside verges, young oak plantations, grain fields, herbaceous fencerows, and grassy airfields. Species may also be observed nesting in row crop fields such as corn and soybean, but these crops are considered low-quality habitat. The Eastern Meadowlark nests from May to July.
Eastern Ribbonsnake	The Eastern Ribbonsnake is a semi-aquatic species. It is most frequently observed along the edges of shallow ponds, streams, marshes, swamps, or bogs bordered by dense vegetation that provides cover. Abundant exposure to sunlight is also a key component, as well as adjacent upland areas which may be used for nesting. Species are active from May to October.
Least Bittern	This species can be found in deep marshes, swamps, bogs; marshy

Monck South Ward	
Name	**Habitat Preferences** (Species habitat preference where obtained from the Species at Risk Registry)
	borders of lakes, ponds, streams, ditches; dense emergent vegetation of cattail, bulrush, sedge. Species generally nests in cattails, and is intolerant of loss of habitat and human disturbance. Speices is active from mid-May to July however nests from June to July.
Massasauga	Species can be found in tall grass prairie to cedar bogs to shorelines. Granite rock tables in the Georgian Bay area and brush piles in the Ojibway prairie provide snakes with similar hot spots to bask in. Sufficient moisuture is apparently key to surviving the winter, and the hibernacula (overwintering sites) of Massasaugas are often associated with wetlands or small, wet depressions in the terrain. Species is active from May to mid-September.
Milksnake	Species can be found in farmlands, meadows, hardwood or aspen stands, as well as pine forest with brushy or woody cover. Species may also be found near river bottoms or bog woods. They occasionally hide under logs, stones, or boards or in outbuildings and often uses communal nest sites. Species is active from May to October.
Peregrine Falcon	Species can be found in various types of habitats, from Arctic tundra to coastal areas and from prairies to urban centres. They usually nest alone on cliff ledges or crevices, preferably 50 to 200 m in height, however can be found on the ledges of tall buildings or bridges, always near good foraging areas. Suitable nesting sites are usually dispersed, but can be common locally in some areas. Species nest in April.
Snapping Turtle	Although Snapping Turtles have been observed in shallow water in almost every kind of freshwater habitat, their preferred habitat is characterized by slow-moving water with a soft mud bottom and dense aquatic vegetation. Established populations are most often located in ponds, sloughs, shallow bays or river edges, and slow streams, or areas combining several of these wetland habitats. Individual turtles will persist in urbanized water bodies, such as golf course ponds and irrigation canals, but it is unlikely that a population could become established in such habitats. Species is active from April to October and nest in June.
Whip-Poor-Will	Whip-poor-will breeding habitat is highly dependent on forest structure rather than species composition, although common tree associations in both summer and winter are pine and oak. The species avoids both wide-open spaces and dense forest, and prefers to nest in semi-open forests or patchy forests with clearings, such as barrens or forests that are regenerating following major disturbances. Other necessary breeding habitat elements are thought to involve ground-level vegetation and woodland size. Individuals will often feed in nearby shrubby pastures or wetlands with perches. Species is active from May to June with nesting occurring during the lasts week in May at dusk.

In order to better understand the potential Species at Risk within the study area The *Species at Risk: Potentially Suitable Habitat Mapping* Final Draft Report completed by Glenside Ecological Services Limited in November of 2009 was also reviewed. Based on the suitable habitat mapping provided within the Species at Risk document the following 14 species have the potential to be located within our study area:

Table 2-5: Species obtained from *Species at Risk: Potentially Suitable Habitat Mapping* - Final Draft Report

Name
American Ginseng (*Panax quinquefolius)*
Branched bartonia
Broad beech fern
Forked three-awned grass
West Virginia White (*Pieris virginiensis*)
Cerulean Warbler
Golden-winged Warbler (*Vermivora chrysoptera*)
Bald Eagle (right along the edge of the Muskoka River)
Kirkland's Warbler (*Dendroica kirtlandii*)
Blanding's Turtle
Least Bittern
Yellow Rail (*Coturnicops noveboracensis*)
Eastern Hog-nose Snake (*Heterodon platirhinos*)
Milksnake

Table 2-6: Species at Risk Identified for Bracebridge within *Muskoka Natural Heritage Review*

Name
Golden-winged Warbler
Five-lined Skink
Ribbonsnake
Milksnake

Only one SAR was observed during the site visit, a single Bobolink was observed in a field to the east of Monck Road in the southern half of the study area. Preferred habitat for Species at Risk that may be present near the study area were cross referenced with information collected from the 2012 site visits and background reports to determine

if species may be present within the study area. Based on this analysis, habitat for Butternut, Henslow's Sparrow, Bobolink, Cerulean Warbler, Eastern Meadowlark, Bald Eagle, Broad Beech Fern, Canada Warbler, Golden-winged Warbler, Eastern Whip-poor-will, Northern Long-eared Bat, Milksnake, Chimney Swift, American Ginseng, and Hognose Snake may potentially be located within the study area. Of these, Canada Warbler, Golden-winged Warbler and Eastern Whip-poor-will were observed by members of the Muskoka Field Naturalists club during breeding season over the past couple of years.

Appendix G presents this assessment.

2.3.14 Species of Conservation Concern

As defined in the *Significant Wildlife Habitat Technical Guide* (MNR, 2000), Species of Conservation Concern are species that have been designated as such according to the Species at Risk in Ontario (SARO) or have been given a provincial S-Rank of S1-S3. This designation does not include species classified as either Endangered or Threatened within Ontario. Species designated as Species of Conservation Concern are uncommon or rare species that do not exhibit high population densities, require fairly specialized habitat, have narrow tolerances for survival that are not thoroughly understood, and because their habitat is rare (SWH, 2000). Species of Conservation concern do not receive any protection under provincial legislation, however they are identified to create awareness of their habitats.

Information obtained from NHIC and provided by MNR were used to identify Species of Conservation Concern that occur or have the potential to occur within the study area is included in **Appendix H**.

The results of the NHIC search of the study area returned records of a Prairie Warbler, Caspian Tern, Black-crowned Night-heron, Amber-winged Spreadwing, Azure Bluet, Mottled Bluet, Green-striped Darner, Harlequin Darner, Cyrano Darner, Lilypad Clubtail, Uhler's Sundragon, Variegated Meadowhawk, Early Hairstreak, beautiful serviceberry, uttyroot, yellow bartonia, crowned beggarticks, triangle moonwort, rugulose grapefern, white-tinged sedge, silvery-flowered sedge, field sedge, northern long sedge, prickly hornwort, houghton's flatsedge, ram's-head lady's slipper, returned one record of a Bald Eagle. Bald Eagles are designated as S2 and Special Concern under the ESA.

3. Summary

The purpose of this report was to define the natural heritage conditions within the study area. These conditions help to define mitigation measures required to protect the terrestrial and aquatic environment, including construction timing windows and setbacks as well as restoration of affected habitats.

The following provides a summary of the natural heritage conditions:

Aquatic Habitat

There are four (4) permanent watercourses that likely provide fish habitat within the study area. There were two un-mapped watercourses located near Highway 11 and the OFSC Trails towards the eastern limit of the study area. Both were flowing at the time of investigation. Several intermittent channels convey seasonal flow and provide connectivity between wetlands and beaver pond; and the Muskoka River located adjacent to study area is the receiving water body of all four watercourses in the study area.

Ecological Land Classification and Plants

A total of 15 communities were identified using aerial photography interpretation and field evaluation of the forest and wetland communities within the study area. The dominant community within the study area is a dry – fresh hardwood – hemlock mixed forest. Other upland communities that were identified within the study area include a coniferous forest, dry – fresh poplar mixed forest, dry – fresh oak – red maple deciduous forest, dry – fresh sugar maple deciduous forest, red pine coniferous plantation, white pine coniferous plantation, scotch pine coniferous plantation and a dry – moist old field meadow. All terrestrial communities identified within the study area are common within Central Ontario. Within the areas of direct influence, detailed botanical surveys will be required to confirm presence/absence of rare floral species and understand the degree of tree/vegetation loss.

Wetlands

Wetland types within the study area include marsh and swamp habitat. A total of 3 wetland types were identified within the study area including a thicket swamp, a reed-canary grass meadow marsh and a bluejoint organic meadow marsh. All wetland types present within the study area appear to be common in the region. Field verification is required to confirm boundaries and significance. These wetlands are unevaluated and may require evaluation according to the Ontario Wetland Evaluation System (OMNR, 2013 3rd edition).

Breeding Birds

A total of 37 bird species were identified within the study area during the site investigation through incidental observations that occurred at various times of the day outside of the timing window identified in the Canadian Wildlife Service Forest Bird Monitoring Program protocol. The majority of the species observed are common in Central Ontario with the exception of the Bobolink, which is designated as a threatened species under the Ontario Endangered Species Act (ESA).

The Muskoka Field Naturalists have identified the presence of a Great Blue Heron colony, Canada Warbler, Golden-winged Warbler, Eastern Whip-poor-will and Bobolink. Canada Warbler, Golden-winged Warbler and Whip-poor-will are considered Species at Risk under the Ontario ESA. Field verification is required to confirm their presence/absence during Detailed Design.

Wildlife Habitat

Potential significant wildlife habitat that may be present within the study area include winter deer yards, colonial bird nesting sites, reptile hibernacula, habitat for area-sensitive species, forests providing a high diversity of habitats, old-growth or mature forest stands, amphibian woodland breeding ponds, specialised raptor nesting habitat, and seeps and springs.

Species at Risk

Only one Species at Risk (SAR) was observed during the site visit, a single Bobolink was observed in a field to the east of Monck Road in the southern half of the study area. Preferred habitat for Species at Risk that may be present near the study area were cross referenced with information collected from the 2012 site visits to determine if species may be present within the study area. Based on this analysis, habitat for Butternut, Henslow's Sparrow, Bobolink, Cerulean Warbler, Eastern Meadowlark, Bald Eagle, Broad Beech Fern, Canada Warbler, Golden-winged Warbler, Eastern Whip-poor-will, Northern Long-eared Bat, Milksnake, Chimney Swift, American Ginseng, Hognose Snake, and Five lined Skink may potentially be located within the study area. Of these, Canada Warbler, Golden-winged Warbler and Eastern Whip-poor-will were observed by members of the Muskoka Field Naturalists club during breeding season over the past couple of years.

Provincially Significant Species

The results of the NHIC search of the study area returned records of a Prairie Warbler, Caspian Tern, Black-crowned Night-heron, Amber-winged Spreadwing, Azure Bluet, Mottled Bluet, Green-striped Darner, Harlequin Darner, Cyrano Darner, Lilypad Clubtail, Uhler's Sundragon, Variegated Meadowhawk, Early Hairstreak, beautiful serviceberry, uttyroot, yellow bartonia, crowned beggarticks, triangle moonwort, rugulose grapefern, white-tinged sedge, silvery-flowered sedge, field sedge, northern long sedge, prickly hornwort, houghton's flatsedge, ram's-head lady's slipper, returned one record of a Bald Eagle. Bald Eagles are designated as S2 and Special Concern under the ESA.

4. Mitigation and Recommendations

A preferred route was determined through the evaluation of alternatives and is described within the Environmental Study Report (ESR). The following mitigation strategies and recommendations for further study should be reviewed and confirmed during Detailed Design. These strategies/recommendations are provided to mitigate anticipated negative effects to the environment as described within the ESR.

4.1 Mitigation Strategy

4.1.1 Aquatic Species and Habitat

Potential temporary loss of aquatic habitat and function at five (5) new watercourse crossings containing coldwater habitatmay result from the construction of the preferred alignment.

Negative effects would be mitigated and compensated for (as required) by undertaking construction outside of the relevant fish spawning timing window; limiting removal of riparian vegetation; stabilizing banks and implementing a restoration plan based on consultation with review agencies.

4.1.1.1 Riparian Zone Protection

Where no in-water work is required, general recommendations still apply to protect riparian zones surrounding watercourses. Best Management Practices, including the use of standard erosion and sediment control devices, should be reviewed at the detailed design stage. These plans should adhere to the principles of reducing the risk of erosion control measures and trapping mobilized sediment as close to the source as possible. Sediment and erosion control measures should be inspected daily with particular scrutiny after rain events, and repaired as necessary. All sediment and erosion control measures should remain intact until vegetation cover is established on all exposed soil.

A construction plan should identify a contingency plan for accidental sediment release. An emergency spill kit shall be kept on-site in case of any fuel or chemical leaks.

Disruption to riparian vegetation should be minimized by defining the necessary work area using construction fencing. Post construction restoration efforts should include fast-growing tree and/or shrubs where riparian vegetation has been removed. Restoration works should only incorporate locally sourced native plants appropriate for site conditions.

4.1.1.2 Authorization and Mitigation for In-Water Work

In-water work is not anticipated or planned at the watercourse crossings, however, it may be required as a result of culvert extensions and/or new stream crossings, etc. In the event of harmful alteration, disruption or destruction of fish habitat (HADD), Department of Fisheries and Oceans (DFO) approvals may be required. In order to obtain Authorization for Works or Undertakings Affecting Fish Habitat, a detailed Letter of Intent to Implement Construction Measures will need to be submitted to DFO via a designated delegate agency. Additionally, construction mitigation measures (to minimize intrusion) and a Fisheries Habitat Compensation Plan (to replace habitat lost) will need to be developed, in accordance with DFO's No Net Loss Policy.

Screening of potential HADDs requires General Arrangements of each crossing for accuracy and efficiency. As such, authorizations will be explored during detail design.

In order to reduce and/or eliminate potential impacts to fisheries habitat and aquatic resources, design modifications and avoidance/mitigation techniques will be considered. Detailed design will consult a qualified engineer to identify appropriate timing for any in-stream works. The timing window is intended to protect fish communities present. To protect downstream fisheries resources, standard erosion and sediment control devices shall be used in areas requiring excavation or in-channel works in order to slow runoff velocities and reduce erosive forces, including:

a) Rock checks or silt fence flow checks are to be placed in all ditches immediately upstream of their discharge into a watercourse;
b) Straw bale dams are to be placed in advance of sewer inlets;
c) Finished slopes shall be graded to an acceptable slope minimum and completed with plantings. Large cuts shall be terraced to minimize surface erosion;
d) All excavated materials requiring stockpiling should be in accordance with OPSS 180.07.06 and placed in pre-determined locations. The perimeters of stockpiles should be encircled with silt fencing, according to OPSD 219.110;
e) Any in-water work that is necessary must be conducted in dry conditions within the appropriate fisheries timing window.
f) Cleaning and refuelling of machinery should be prohibited within 50 m of a watercourse to prevent the discharge of petroleum products;
g) Excess silt fence, straw bales and rip-rap shall be maintained on-site, prior to the commencement of grading operations and throughout the duration of the construction, in case of an emergency; and
h) The integrity of all sediment trapping devices should be monitored regularly (at least weekly, and immediately following rain events) and properly maintained. Such structures should be removed only after the soils of the construction areas have been stabilized and then only after the trapped sediments have been removed.

It is acknowledged that the proposed crossings may involve spanning fish habitat for some locations while requiring the extension of culverts or culvert replacements in others. Recognizing the environmental constraints and sensitivities of the crossings, standard/common Pathways of Effects Mitigation measures (DFO Risk Management Framework) will be utilized. Further to this however, additional construction mitigation measures may also include:

a) Adherence to cold water construction timing window (July 1 - September 15);
b) Permit(s) to Take Water during construction will be obtained if required;
c) Ensure bridge/culvert span maximizes light penetration if feasible to encourage riparian vegetation growth underneath the structure; and,
d) Replace riparian vegetation lost during construction of bridge abutments and re-naturalize as soon as possible after construction to minimize erosion of bare riparian sections.

4.1.2 Terrestrial Species and Habitat

Potential impacts to the terrestrial environment include the loss of portions of unevaluated wetland, coniferous forest, dry-fresh poplar mixed forest, dry-fresh oak-red maple deciduous forest, dry-fresh sugar maple deciduous forest, red pine coniferous plantation, white pine coniferous plantation, scotch pine coniferous plantation and old field meadow. The following provides appropriate mitigation measures to ensure net losses are minimized and to minimize construction and post-construction impacts.

4.1.2.1 Vegetation

The preferred corridor will result in the permanent loss of trees and shrubs. Trees or large shrubs identified for preservation within and immediately adjacent to construction zones shall be protected with appropriate hoarding (fence or similar structure using OPSD 220.01) at an appropriate distance from the tree stem, as determined by a qualified professional. In sensitive areas, higher quality tree protection fencing will be used. Tree wells may be necessary where significant grading affects soil levels surrounding large trees. In the event that roots or branches of trees to be protected are inadvertently damaged during construction, they should be pruned clean as soon as possible. Exposed roots should then be covered with topsoil.

Trees identified for removal shall be properly inventoried at the Detailed Design stage in order to quantify and plan for compensation with an appropriate landscape planting plan (with locally native, non-invasive species and species that blend into the surrounding environment). At the time of construction, trees should be marked and felled into the work area to avoid damage to adjacent vegetation. A restoration/landscaping plan will be prepared during Detailed Design. Vegetation removal will be scheduled to occur outside the breeding bird period (May 1st to July 31st). Should avoidance of the breeding bird period not be possible, and removal is scheduled within this period, active nest surveys prior to construction shall be undertaken.

Riparian trees (trees located within 30 m of any watercourse) identified for removal should be inventoried at the Detailed Design stage. All restoration plantings should be an appropriate species for the growing conditions at the site.

Where construction is to occur within 30m of a naturally vegetated feature, install and maintain protective fencing to clearly define the construction area and prevent accidental damage to vegetation or intrusion into the natural feature.

All exposed surfaces susceptible to erosion should be revegetated through the placement of seeding, mulching or sodding immediately upon completion of construction activities or within 45 days of exposure and with sufficient time to allow for successful establishment prior to winter. Native plants and seeds shall be favoured in all restoration.

Vegetation restoration plans can be developed to replace lost vegetation with new vegetation and opportunities to replace trees at a higher rate than the removal can be explored as part of the Detail Design. The planting of new vegetation in areas that would not be affected by the future transportation corridor in advance of the construction activities would grow prior to the new corridor being required. Areas for potential vegetative restoration would be defined in consultation with review agencies and municipal departments during the preliminary design phase for the preferred corridor.

With respect to erosion control, the following should be implemented:

- Develop and implement an erosion and sediment control plan before commencement of construction.
- Utilize erosion blankets, erosion control fencing, straw bales, siltation bags, etc. for construction activities within 30 m of a wetland, woodland or water body, to mitigate potential excessive erosion and sedimentation. Extra erosion and sediment control materials should be kept on hand, (*i.e.*, heavy-duty silt fencing, straw bales).
- Check that sediment and erosion controls are in good repair and properly functioning prior to conducting daily work and re-install or repair as required prior to commencing daily construction activities. Check sediment and erosion controls before and after significant rainfall events to ensure they are effective.
- Keep sediment and erosion control measures in place until disturbed areas have been stabilized (*i.e.*, re-vegetated).

- To avoid sedimentation in wetlands and watercourses, schedule grading within 30 m of a watercourse or wetland to avoid times of high runoff volumes, wherever possible. Temporarily suspend work if high runoff volume is noted or excessive flows of sediment discharges occur until contingency measures are in place.
- Re-vegetate temporary disturbance areas (i.e. roads, laydown areas, etc.) to pre-construction conditions as soon as possible after construction activities are complete using species native to the area in naturally vegetated areas.

4.1.3 Wildlife

Potential impacts to wildlife include loss of deer wintering habitat, fragmentation and obstruction of wildlife movement and loss of potentially significant wildlife habitat and Species at Risk habitat. The following provides appropriate mitigation measures to ensure net losses are minimized and to minimize construction and post-construction impacts.

4.1.3.1 Deer Yard and Wildlife Movement

The preferred corridor will cross through woodlands and a deer wintering area and will create a new barrier to wildlife movement in the area which may result in increased wildlife road mortality. In order to mitigate this, wildlife fencing and crossings will be established in key areas to allow the safe passage of wildlife across the highway. The provision of suitable culverts and structures to allow for wildlife passage should be considered on a site specific basis. As well, considerations to prevent wildlife and vehicular interactions should be considered. This should minimize anticipated negative effects to deer yard and wildlife movement as telemetry data obtained from a study completed in Quebec entitled, “Construction of a Highway Section Within a White-Tailed Deep Winter Yard Near Quebec City, Canada; Mitigation Measures, Monitoring, and Preliminary Results” (Leblanc *et al.* 2007) indicate that deer with split winter home ranges continued to use both sides of a new section of a highway when wildlife passage corridors and deer-proof fencing was used. Specific details of these crossings will be determined during Detail Design in consultation with the Ministry of Natural Resources and the District Municipality of Muskoka, however, to aid in agency discussion during later stages of the project, the following measures as described in literature include but are not limited to:

- Selecting sizeable roadway and linkage alignments to avoid unsafe intersections (e.g. at curves);
- Use of plantings and wing-walls to direct wildlife using the linage to culvert/structure crossings;
- Install wildlife fencing along primary linkages and deer wintering areas to direct wildlife to the culvert/structure crossing; and
- Design culverts/structures to accommodate wildlife movement.

The design of these crossings would include recommendations for focusing wildlife movements to appropriate crossing locations and/or structures. These measures would depend on site specific features and reported collision hazards. Culverts 1.8 m in height, or greater, with larger spans have been used successfully for wildlife crossings.

During construction, the following is recommended:

- Clearly post construction speed limits (30km/h). Install and maintain wildlife crossing and speed limit signs on access roads.
- Locate Project components outside of natural features, to the extent possible, to avoid direct impacts to wildlife habitat.
- Schedule vegetation removal to occur outside the breeding bird period (May 1 to July 31). Undertake active nest surveys prior to construction if clearing of vegetation must take place during this period.

4.1.3.2 Significant Wildlife Habitat

Potential significant wildlife habitat that may be present within the study area include winter deer yards, colonial bird nesting sites, reptile hibernacula, habitat for area-sensitive species, forests providing a high diversity of habitats, old-growth or mature forest stands, amphibian woodland breeding ponds, specialised raptor nesting habitat, and seeps and springs. Further surveys will be conducted at the Detailed Design phase to confirm presence or absence of Significant Wildlife Habitat. If any species are found during these surveys, appropriate mitigation or compensation plans will be developed in consultation with the Ministry of Natural Resources.

4.1.3.3 Species at Risk

Species at Risk (SAR) may be present in the preferred alternative. While suitable habitat for Butternut, Henslow's Sparrow, Bobolink, Cerulean Warbler, Eastern Meadowlark, Eastern Musk Turtle, Bald Eagle, Broad Beech Fern, Canada Warbler, Golden-winged Warbler, Eastern Whip-poor-will, Northern Long-eared Bat, Milksnake, Chimney Swift, American Ginseng, Hognose Snake, Five-lined Skink and Northern Map Turtle was observed, only one SAR was identified, a single Bobolink in a field east of Monck Drive, in the preferred corridor at the time of the field studies carried out in support of the EA study. Further surveys will be conducted at the Detailed Design phase to confirm presence or absence of SAR. If any species are found during these surveys, appropriate mitigation or compensation plans will be developed in consultation with the Ministry of Natural Resources.

4.1.4 Construction Mitigation

During construction, the following shall be implemented:

Equipment Use

- Ensure machinery is maintained free of fluid leaks.
- Where feasible, light vehicles with wide tires having a large surface area (rather than tracked vehicles) and lighter machinery (e.g. hand-held equipment) should be used in and around natural areas.
- Any vehicles used within natural areas should use wide-based tires. Tracked vehicles should be avoided.
- Locate site maintenance, vehicle washing and refuelling stations where contaminants are handled at least 30 m away from natural features or water bodies. Use spill collection pads for vehicle refuelling and maintenance.

Grading and Excavation

- Minimize changes in land contours and natural drainage; maintain timing and quantity of flows. Any grading of lands adjacent to natural heritage features should match existing grades at the identified set-back, or buffer from the features.

Material Stockpiling and Handling

- Control soil / water contamination through best management practices, including:
  - Store any stockpiled materials at least 30 m away from a wetland, woodland or water body to prevent deleterious substances from inadvertently discharging to the environment;
  - Develop a spill response plan and train staff on associated procedures;
  - Maintain emergency spill kits on site; and,

- Dispose of any waste material from construction activities by authorized and approved off-site vendors.

As noted above, the recommendations outlined in this section will be further detailed during the detailed design stage of the project.

4.1.5 Mitigation Summary

Table 4-1 provides a summary of Mitigation Recommendations.

Table 4-1: Mitigation Summary

FISHERIES	
1.	Implement construction controls between construction zone and watercourses to minimize fisheries disruption. Details to be developed at detail design stage.
2.	Fisheries Compensation package to be developed during detail design for the affected creek crossings that have been considered a Harmful, Alteration Disruption Destruction (HADD) of fish habitat, as per the DFO's Policy for the Management of Fish Habitat.
3.	Obtain Fisheries and Oceans Canada (DFO) authorization prior to any construction as well as any other approvals (ORCA, MNR, etc.) during Detailed Design.
4.	Restrict in-stream work to appropriate timing windows (timing window to be confirmed with MNR during Detail Design).
5.	Maintain flows during construction.
6.	Monitoring programs will be undertaken by the Municipality at least one year prior to site alteration to assess needs for dewatering, potential impacts to fish communities and fish habitat, and to plan mitigation measures where necessary.
7.	Thermal mitigation strategies will be implemented as part of Stormwater Management designs.
VEGETATION	
8.	Limits of work to be delineated in field prior to construction commencement to minimize environmental impacts in sensitive areas.
9.	A restoration/landscaping plan will be prepared during detail design and will include but not limited to the following: • Inventory of all trees to be removed; at time of construction they will be marked and felled into the work area to avoid damage to adjacent vegetation • pre-stress trees in advance of grading operations • vegetation that is subject to significant environmental damage should be fertilized and pruned to accelerate recovery; fertilization should not be undertaken for any plantings within 50 metres of a watercourse to eliminate the risk of introduction of additional nutrients to the watercourse • landscape planting plan to include locally native, non-invasive species and species that blend into the surrounding environment and complement the existing plant species composition. • restoration of the vegetation removed will be completed within an appropriate location within the study area through consultation with MNR where appropriate. • trees or large shrubs identified for preservation within and immediately adjacent to construction zones will be protected with appropriate hoarding (fence or similar structure using OPSD 220.01) at an appropriate distance outside tree/large shrub drip-lines, as determined by a qualified professional. • in sensitive areas, higher quality tree protection fencing will be used; in the event that roots or branches of trees to be protected are inadvertently damaged during construction, they will be pruned clean as soon as possible. Exposed roots will be covered with topsoil.

	• all plantings shall be undertaken in areas of visible topsoil, otherwise clean top soil should be introduced to the site to increase the success of all rehabilitative plantings. • all exposed surfaces susceptible to erosion should be revegetated through the placement of seeding, mulching or sodding immediately upon completion of construction activities or within 45 days of exposure and with sufficient time to allow for successful establishment prior to winter. Seed mixes should be approved by MNR where appropriate.
10.	Restoration measures will focus on existing natural areas to; i) link isolated features, increasing landscape connectivity, ii) encourage the growth of various habitat types, increasing biodiversity, and iii) target key wildlife species (i.e Species at Risk) to increase suitable habitat.
11.	Utilize lighting that minimizes light trespass at night and its encroachment on natural features.
12.	Design structures to reduce shading on natural features.
13.	Riparian corridors will be restored to 30 m of vegetation along each side of the watercourse, to the extent possible.
WILDLIFE	
14.	To facilitate wildlife movement and minimize mortalities, amphibian/small mammal crossing structures will be designed and implemented within appropriate areas through consultation with MNR.
15.	Warning signs with an advisory speed tab will be implemented through core area crossings.
16.	Construction will be timed to avoid sensitive bird breeding times (i.e April through July).
17.	Bridge design will incorporate design elements to encourage nesting/roosting for birds and bats
18.	Where appropriate, perches/platforms will be erected to encourage raptor nesting/perching
19.	Sound barricades to minimize noise impacts to resident wildlife will be implemented where appropriate

4.2 Recommendations for Further Study

The following recommendations are intended to be scoped with the relevant agencies during Detailed Design to ensure appropriate data is collected for required permits and approvals. These surveys are also intended to aid in determination of presence/absence of Significant Wildlife Habitat as well as Species at Risk habitat.

4.2.1 Aquatic Habitat Surveys

As aquatic habitat assessments were completed within areas accessible via the existing road network, additional aquatic habitat assessments are required within the areas where the preferred alternative crosses existing watercourses. Field investigations should confirm the following: thermal regime; flow regime; source of flow (i.e. presence of groundwater seepages); general habitat description; drainage function; channel stability; fish habitat (direct/indirect or none); fish migration barriers; habitat sensitivity (low, moderate, high, rare or no); fish community and presence of key habitat features.

4.2.2 Terrestrial Habitat Surveys

To determine the presence/absence of terrestrial/forest habitats, old-growth, mature forest stands, seeps and springs, as well as the presence/absence of plant SAR including American Ginseng, Broad Beech Fern and Butternut and provincially rare species, detailed investigations along the preferred route should be conducted. This is considering investigations for the Class EA were restricted to roadside surveys. Site visits should be conducted to capture the flowering periods of known SAR (as stated above) and provincially rare species (see Appendix H).

When wetland communities are observed, each should be delineated and assessed according to the Ministry of Natural Resources Wetland Evaluation Guidelines for Southern Ontario (3rd Edition). All vegetation communities should be delineated according to MNR's Ecological Land Classification most up-to-date protocols.

4.2.3 Deer Yard Surveys

Should confirmation of the location and boundary of the deer yard be required, surveys as described in Appendix F should be conducted in consultation with MNR. Generally, transects within appropriate areas should be investigated where plots spaced 100 metres within each transect conducted. In each plot the following should be collected:

- Determine the ecosite of each community using Ecological Land Classification (ELC),
- Determine the crown conifer cover percentage at each cardinal point including the centre,
- Prism sweeps describing species and diameter at breast height,
- Record evidence of habitat use by qualitatively assessing each plot taking note of total number of available, stems and total number of stems which have been browsed by deer, and
- Record tracks observed within each plot.

4.2.4 Breeding Bird Surveys

Information obtained from the *Muskoka Official Plan Review Background Study: Urban Centres Natural Heritage Review* (AECOM and SLR, 2011) and Muskoka Field Naturalists indicate that the preferred alternative passes through potential habitat concentrations for Golden-winged Warbler. In addition to this, the Muskoka Field Naturalists have also observed Canada Warbler and Eastern Whip-poor-will. Based on this information, additional breeding bird surveys, focusing on the potential habitat concentration areas for Golden-winged Warbler, Canada Warbler and Eastern Whip-poor-will are recommended prior to the completion of the detailed design to confirm that no bird SAR are present in these areas. These surveys are recommended as breeding bird surveys completed for this Natural Environment Conditions Report were primarily limited to public lands and road right-of-ways as limited access to private lands had been obtained at the time the surveys were completed.

These surveys should follow the protocol provided in the Canadian Wildlife Service Forest Bird Monitoring Program as there are several components of this protocol that ensure that the data obtained from these surveys is representative and unbiased. These components include proper site and station selection, standardized survey procedures and the provision of timing windows and weather conditions which identify when surveys can be completed (CWS, 2009).

These stations should be established in the potential habitat concentrations for Golden-winged Warbler, as identified in the *Muskoka Official Plan Review Background Study: Urban Centres Natural Heritage Review (AECOM and SLR, 2011).*

4.2.5 Reptile Surveys

Information obtained from the *Muskoka Official Plan Review Background Study: Urban Centres Natural Heritage Review* (Kamstra and Leadbeater, 2011) and the SAR habitat assessment conducted as part of this report indicate that the preferred alternative passes through potential habitat concentrations of Milksnake, Five-lined Skink, and Ribbonsnake. Based on this information targeted reptile surveys along preferred alternative, focusing on the potential habitat concentration areas, are recommended prior to the completion of the detailed design to confirm that no reptile SAR are present in these area. These surveys are recommended as targeted reptile surveys were not completed as part of the initial evaluation of the natural heritage features at the site. These surveys will consist of a visual encounter and road cruising surveys.

Visual encounter surveys consist of a visual search of appropriate habitat under appropriate weather conditions (i.e. spring, summer, fall). Downed wood or other objects under which amphibians or reptiles may be hiding should be moved, and then replaced, during these surveys. Consultation with the Ministry of Natural Resources should be completed prior to these surveys as a permit under the Endangered Species Act may be required (Konze and Margaret, 1997).

Road cruising surveys for reptile species should be completed during the daylight in the spring and fall, when activity levels are the highest. Snakes are most likely to be encountered in sunny but cool weather when they frequently bask on roads, particularly paved roads, which are warmer than the surrounding habitat (Konze and Margaret, 1997).

4.2.6 Amphibian Surveys

To determine the presence of amphibian woodland breeding ponds, amphibian surveys are recommended along the preferred alternative. Daytime site visits should be conducted to examine wooded areas for the presence of vernal pools. To identify potential viable vernal pools, the following parameters should be examined:

- Small, isolated pools (lacking the presence of fish populations);
- The identified pools must have the potential to hold water at least until July or
- Have water depths of at least 30cm in early spring to be considered suitable amphibian breeding habitat. The 30 cm depth criterion is consistent with the recommendations of Calhoun and deMaynadier (2004);
- Good surrounding upland forested habitat;

Auditory surveys are also recommeneded following the protocols as outlined in the Marsh Monitoring Protocol, the standardized field methodology for audio-surveying breeding frogs and toads. Amphibian surveys should be completed at pre-determined survey stations esthablished during the daytime vernal pool surveys.

4.2.7 Bat Surveys

To determine the presence/absence of Northern Long-eared Bat, surveys along the preferred route should focus on locating bat hibernacula, maternity colonies and migratory stopover areas. Visual observations and acoustic monitoring are the most effective methods for confirming the location of bat hibernacula according to MNR's, "Bats and Bat Habitats: Guidelines for Wind Power Projects" document (MNR, 2011). To determine maternity colonies and migratory stopover areas, MNR should be consulted for the most up-to-date survey methods.

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Appendix A: Agency Correspondence

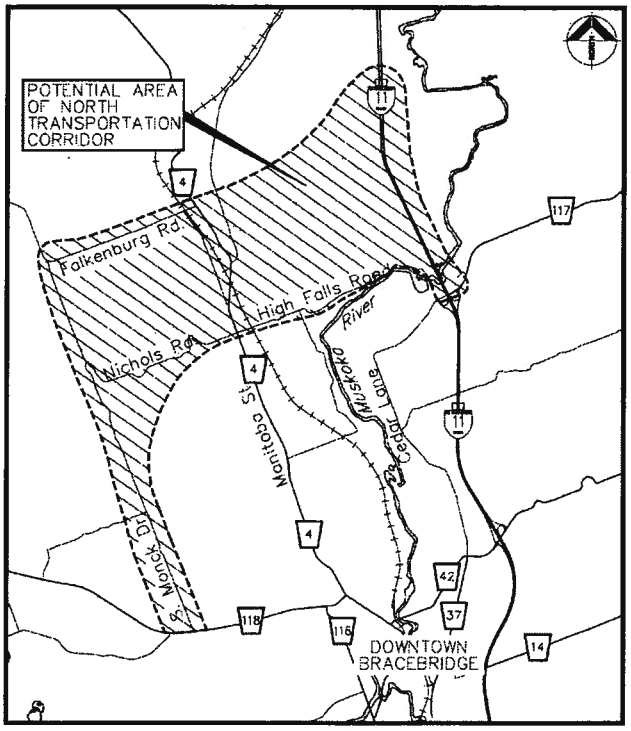
THE DISTRICT MUNICIPALITY OF MUSKOKA

Managing Our Legacy Together

Notice of Study Commencement

Bracebridge North Transportation Corridor
Class Environmental Assessment Study

In January, The District Municipality of Muskoka initiated a Class Environmental Assessment (EA) Study for a proposed transportation corridor north of the Town of Bracebridge urban area between Highway 11 and Muskoka Road 118. This long term transportation planning study will be carried out in accordance with the requirements for a Schedule 'C' project under the *Municipal Class Environmental Assessment* document.



The EA process for this project will involve identifying transportation problems and opportunities, developing and analyzing alternatives, assessing technical and environmental issues and proposing ways to address those issues, all leading to the development of a preferred design for the project.

Two public open houses will be held during the course of the study to provide an opportunity for the public to review and discuss the project with representatives of the Project Team. The open houses are anticipated to occur in summer 2012 and winter/spring 2013. A notice advertising the open houses will be published in local newspapers and on the project web site at: www.bracebridge-ntc.ca

Upon completion of this study an Environmental Study Report will be available for public review and comment. A notice of study completion will be published at that time.

There is an opportunity at any time during the EA process for interested persons to provide comments. Any comments received pertaining to the study will be collected under the *Environmental Assessment Act* and, with the exception of personal information, will become part of the public record.

For further information on this project, or to be added to our mailing list, please contact:

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Minutes of Meeting

Date of Meeting	April 10, 2012	Start Time	1:00	Project Number	60241537
Project Name	Bracebridge North Transportation Corridor EA Study				
Location	The District Municipality of Muskoka 70 Pine Street, Bracebridge Birch room				
Regarding	Agency Meeting				
Attendees	Craig Douglas (District Municipality of Muskoka), Chris Stilwell (AECOM), Vanessa Skelton (AECOM), Gary Epp (AECOM), Andrew Stacey (Town of Bracebridge), Ron Walton (Town of Bracebridge), Kim Benner (MNR), Ariel Zwicker (MNR), Nicole Tuyten (MNR)				
Distribution	attendees				
Minutes Prepared By	V. Skelton				

PLEASE NOTE: **If this report does not agree with your records of the meeting, or if there are any omissions, please advise, otherwise we will assume the contents to be correct.**

	Action
Introduction	
• The purpose of the meeting is to invite the stakeholders to be involved and to get input from the stakeholders. There will another meeting next week in North Bay with MTO.	
Project Background	
• A review of previous transportation studies was provided. These studies concerned the north and west transportation corridors and access modifications on Highway 11.	
• The purpose of this study was explained. The TESR completed by MTO provided a location for connection to High Falls Road. The District of Muskoka preferred another configuration for the connection that would serve the future north transportation corridor outlined in the Town of Bracebridge Official Plan. MTO requires a separate EA completed by the District to determine a more precise location for the north transportation corridor before reviewing the recommended plan in the TESR.	
• The Town of Bracebridge indicated that the development of transportation corridors around the urban area were an important objective for the Town. The purpose of the 1994 study was to indicate the logical route for these corridors in order to protect the land. MTO was a participant in the 1994 study. The preference from the Town's perspective is to locate the north transportation corridor and the connection to Highway 11 north of High Falls Road.	

• Using High Falls Road as part of the north transportation corridor was not a preferred option because the road is not constructed as an arterial corridor.	
• The EA study will consider access to Holiday Park Drive, MNR office and Bracebridge Resource Centre. Service roads may be required to provide access.	
• The timeline for the MTO Highway 11 construction was understood to be 20-30 years. This is also the approximate timeline for the north transportation corridor.	
Need and Opportunity	
• One of the first steps in the EA process is to establish the problems and opportunities.	

• The opportunities associated with this EA are:
  • That the MTO is eliminating at grade intersections along Highway 11 while maintaining existing connections through service roads. Therefore there is an opportunity to enhance the connections to Highway 11 to better serve the Town of Bracebridge population and future growth.
  • There is an opportunity to provide road alignments that can improve safety
  • There is an opportunity to provide an alternate route for new developments and connections to new developments	

• The problems associated with this EA are that there is limited downtown capacity and that there is limited connectivity across the Muskoka River.	
• The increase in traffic on High Falls Road from 500-600 vehicles per day in 2008 to 1500 vehicles per day in 2011 shows that there is a tendency for people to use a northern route to access Highway 11.	
Alternative Solutions	

• The alternative solutions to be considered in the EA are:
  • Do nothing
  • Improve existing routes through realignment, intersection improvements, removing parking, widening
  • New corridor	

• In the evaluation, land use will be an evaluation factor.	
Data Collection	
• Traffic data was collected at three intersections in March. Turning movement counts were completed by both the District and AECOM and were compared to hourly directional counts that were collected at the same time. AADT counts from 1990 to 2011 were provided by the District for the roads in the study area. Collision data was also provided by the District. • Traffic data was available for spring, summer and fall.	
• A team of ecologists and biologists from AECOM will undertake the data collection for the natural environment. It is necessary to match the level of effort and detail to the long term horizon of this project. Sufficient information will be required to provide input for route selection. • It is preferable if field investigations focus on areas of concern for MNR. • The District should have basic information that is available from MNR. Some of this information was used in the MTO study. • Research plots are located within Crown Lands north-west of the MNR office. Data is available for Crown Land. • AECOM will prepare a letter that requests information that may be outstanding,	AECOM

verifies information already obtained and identifies concerns that MNR may have with respect to this project. • Data collection will be undertaken within the road allowance and on public property and access will have a bearing on where the natural survey can be completed. The topography and many wetlands will make data collection challenging. • AECOM will endeavour to collect information regarding Species at Risk identified for the area.	
Existing Conditions	
• With the data provided by the District growth rates were calculated and there has been an average annual growth in traffic in the study area of 2%. • Traffic from the summer period was used as the average condition in order to be consistent with previous studies. • If the corridor connection to Highway 11 is too far to the north, it will serve fewer residents of the Town of Bracebridge. Also, proximity to the next interchange to the north is a consideration. • Existing road allowances are sometimes used by residents for access to hunt camps and bush lots.	
• A list of Species at Risk (version 3) is available from MNR. Phung Tran is the contact at MNR. The Georgian Bay Biosphere website has a tool for SAR lists. • A report, "Potentially Suitable Habitat Mapping" is also available and MNR provided input to the report but has not reviewed the report. • Wetland inventories for evaluated wetlands are available from the District. No new wetland evaluations have been conducted for unevaluated wetlands within the study area. • MNR would prefer a reduced footprint for the connection to Highway 11 rather than creating a new corridor. Access to the Resource Management Centre and MNR offices is also important to maintain. • General guidelines provided by MNR were provided. They suggest trying to avoid crown land and fragmentation of crown land and sensitive areas. Also, plan should try to minimize the number of water crossings and the size of the crossings. • Fencing for deer may need to be considered. • MNR requested that they be sent a list of EA requirements (Class C, number of notices, number of public meetings) • With respect to MNR permitting: works on Crown Lands requires a *Public Lands Act* Permit; on private lands, culverts >20m in length require a permit under the *Lakes and River Improvement Act*. For any watercrossings that do not require MNR permits, the proponent should go directly to the Department of Fisheries and Oceans (DFO).	AECOM AECOM
Design Criteria	
• An Open House will be held in the summer and agencies will be informed. • At the Alternative Designs stage of the EA, the agencies will have an opportunity to comment. • Design criteria: 80 km/h design speed although compromises for vertical alignment may need to be made. It will be a two-lane facility.	
Other business	

• The Town has trail mapping that can be added to the map. Also, the connection to the Southwest corridor could be added to the map for context. • There has been an emphasis on the promotion of active transportation and a connection to the Resource Centre would be important. Also, little disruption to existing trails would be preferred. • Township of Muskoka Lakes should be contacted to be part of EA study. • Kim Benner will remain contact person at MNR.	AECOM/District
Next Meeting	
• The next meeting will be held in October 2012 for the assessment and evaluation of alternatives.	

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May 11 2012

Karrie Bennett
Ministry of Natural Resources
R.R. 2, Highway 11 @ High Falls Road
Bracebridge, ON
P1L 1W9

Dear Ms. Bennett:

Project No: 60241537

Regarding: Bracebridge North Transportation Corridor
Environmental Assessment Study
Agency Consultation - MNR

Further to our meeting on April 10 2012, we are writing to request the ministry's comments and identification of preliminary issues as they may relate to the Bracebridge North Transportation Corridor Environmental Assessment.

For your reference, please find attached the Notice of Study Commencement and a study area map that provides background and a description of the study and study area. Also attached is a copy of the minutes from our April 10 2012 meeting.

As noted during our meeting, the intent of the study is to identify a transportation route that will connect to an appropriate location for an interchange with Highway 11. The actual implementation and construction of the route is not likely to be realized for many years. For this reason, the selection of a preferred route will be general in its location and is intended to minimize environmental impacts with respect to significant features and functions within the study area.

With respect to natural heritage information for the study area, we understand that we have access to the Ministry of Natural Resources' (MNR) resource mapping through GIS files provided through our client, the District of Muskoka. We also recognize that other files, including wetland evaluations, can be obtained from our client.

With respect to Species at Risk (SAR) information, we have received files from Phung Tran of your office with the version 3 SAR list. Thank you for that information. If we have any questions with regard to the SAR list or related issues we will contact Phung Tran.

Based on our discussions on April 10 2012, we understand the following to be MNR's preliminary comments with respect to the Bracebridge North Transportation Corridor Environmental Assessment:

- MNR would prefer a reduced footprint for the connection to Highway 11 rather than a new corridor,
- MNR would prefer avoidance of crown lands and, or avoidance of the severance of crown lands by a new transportation corridor,
- The number of watercourse crossings and the size of crossing structures should be minimized,
- Field investigations should attempt to capture breeding periods and growing seasons of relevant Species at Risk,
- Wildlife mitigation measures such as fencing for deer should be considered for any planning and design of the proposed route, and
- Future permitting for the proposed route will likely include a *Public Lands Act* Permit, a permit under the *Lakes and Rivers Improvement Act*, and potential permits under the *Fisheries Act* through the Department of Fisheries and Oceans (DFO).

If the ministry has any additional issues to note at this time, we would appreciate receiving comments. Furthermore, if there are any additional sources of natural heritage information for the study area that we may not be aware of, we would appreciate identification of those resources.

If you have any questions or concerns, please do not hesitate to contact me at 519-650-8693 (office).

AECOM Canada Ltd.

Gary A. Epp, M.Sc., Ph.D.
Manager of Ecological Services

GAE:ge
Encl.

c:	C. Douglas	District of Muskoka
	C. Stiwell	AECOM
	V. Skeleton	AECOM
	V. McGirr	AECOM

Deman, Jillian

From: Aitken, Robert
Sent: Wednesday, December 19, 2012 9:37 AM
To: Stilwell, Chris; McGirr, Valerie
Cc: Epp, Gary; Deman, Jillian
Subject: FW: Bracebridge Transportation By-pass Environmental Assessment.
Attachments: RedOakTourDay3.pdf

Hello everyone,

Included in the email below is the response from the MNR regarding the red oak forest research plots and their co-ordinates. Kim indicated that due to the time and effort that has been placed into these plots the MNR preference would be that we look at options that do not affect these plots.

From a brief look at the report they provided these plots appear to have been created in the late 70's with the majority of activity occurring since 1998). All of the plots focus on red oak regeneration in different situations (after burns, logging, canopy gaps, etc.). Anyway now that we have this information we can map these plots and see where they are in comparison to our options and then proceed from there.

If you have any questions feel free to let me know.

Thanks,

Rob Aitken
Guelph: 519.840.2222
Kitchener: 519.650.8624

From: Benner, Kim (MNR) [mailto:kim.benner@ontario.ca]
Sent: Wednesday, December 19, 2012 9:16 AM
To: Aitken, Robert
Subject: RE: Bracebridge Transportation By-pass Environmental Assessment.

Hi Robert,

There are forestry research plots on the west side of Hwy 11 north of our High Falls office. Attached is a report that goes over the research that has occurred there (it focuses on red oak regeneration), the GPS coordinates for the plots, as well as, an overview of the results of the research. This research is ongoing and monitoring and maintenance of the plots occurs regularly.

There are 6 plots on the west side of the Highway within a km of our office and the GPS coordinates of 5 of the plots are listed below (cut and copied from the report for your convenience):

E 0633311 N 4995088

E 0633091 N 4995418

E 0632988 N 4995558

E 0632960 N 4995725

E 0632937 N 4995771

You will note in the report that there are several locations of research work on the east side, as well with some GPS coordinates for these sites.

The report will give you a flavour for the time frame and results to date of the work that has been done on red oak. There has been quite an investment in terms of staff time and research dollars in that work. Our office encourages by-pass options to be considered that would not impact these research plots.

Please let me know if you have any questions regarding the above.

Thanks!

Kim

Kim Benner
District Planner
Bracebridge Area Office
Parry Sound District MNR
(705) 646-5520
(705) 645-8372 (fax)

From: Aitken, Robert [mailto:Robert.Aitken@aecom.com]
Sent: Tuesday, December 18, 2012 5:06 PM
To: Benner, Kim (MNR)
Cc: Zwicker, Ariel (MNR); Tuyten, Nicole (MNR)
Subject: FW: Bracebridge Transportation By-pass Environmental Assessment.

Hi Kim,

I just wanted to follow up with you regarding the email I sent last week about the Red Oak Forest Research Plots located along highway 11 north of Bracebridge.

I have attached the maps and write up that we received from a report completed by Stantec and my previous emails. If you require any additional information please do not hesitate to let me know.

Thank You,

Rob Aitken B. Sc. (Hons.)
Terrestrial Ecologist
Environment
D. 519.840.2222
robert.aitken@aecom.com

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From: Bennett, Karrie (MNR) [mailto:karrie.bennett@ontario.ca]
Sent: Thursday, December 13, 2012 2:23 PM
To: Benner, Kim (MNR)
Cc: Aitken, Robert
Subject: FW: Bracebridge Transportation By-pass Environmental Assessment.

HI Kim,

This e-mail sounds like Rob still has me as a contact for the BB District Planner. It's all yours know! ☺

KARRIE BENNETT
LANDS & WATERS TECHNICIAN
MINISTRY OF NATURAL RESOURCES

From: Aitken, Robert [mailto:Robert.Aitken@aecom.com]
Sent: December 13, 2012 1:11 PM
To: Bennett, Karrie (MNR)
Subject: Bracebridge Transportation By-pass Environmental Assessment.

Hello Karrie,

I thought that I should follow up with my phone call yesterday regarding the Red Oak Forest Research Plots located along Highway 11 just north of Bracebridge. I wanted to pass along the map and brief write up regarding the plots that were taken from a Stantec Report on the Highway 11 Access Review.

If you could let me know if you have any additional information regarding these plots (i.e. GPS co-ordinates, status (active/inactive), when they were established, how long they will remain active for, purpose, etc.) that might be relevant for us to include in our Environmental Assessment that would be greatly appreciated.

If you require any additional information or have any questions please do not hesitate to let me know.

Thank You,

Rob Aitken B. Sc. (Hons.)
Terrestrial Ecologist
Environment
D. 519.840.2222
robert.aitken@aecom.com

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Minutes of Meeting

Date of Meeting	January 3, 2013	Start Time	9:00 am	Project Number	60241537
Project Name	Bracebridge North Transportation Corridor EA Study				
Location	MNR Office, Bracebridge				
Regarding	BRMC, Red Oak Stands, Deer Yard				
Attendees	Nicole Tuyten, Ariel Zwicker, Kim Benner, Phung Tran (MNR), Kevin Austin (District Municipality of Muskoka), Chris Stilwell (AECOM)				
Distribution	Attendees, C. Douglas, (DMM), J. DeMan, G. Epp, V. McGirr, D. Chartrand (AECOM)				
Minutes Prepared By	C. Stilwell				

PLEASE NOTE: **If this report does not agree with your records of the meeting, or if there are any omissions, please advise, otherwise we will assume the contents to be correct.**

	Action
Project Background and Meeting Purpose	
• CS noted that the purpose of the meeting was to solicit MNR feedback on the impact of the middle and north interchange locations on the Bracebridge Resource Management Centre (BRMC) plus impacts of alternative route on the Red Oak Stands and a southern portion of the deer yard near High Falls Road. The feedback would be used as part of the evaluation criteria for the selection of the preferred alternative route and interchange.	
• KA and CS summarized the background of the study.	
• Using the overall study area drawing with alternative routes, CS and KA explained the three Highway 11 interchange locations and the various alternative routes that connect to MR118.	
Interchange Location Criteria	
• CS noted that AECOM has followed the MTO interchange design criteria in the work presented. In particular the bullnose-to-bullnose spacings between Cedar Lane/ MR 117 interchange and the interchange alternatives were designed to meet or exceed the requirements in the safety reference.	
• The spacing of the middle interchange is the minimum (1711m) from the Cedar Lane/ MR 117 interchange.	
• The spacing of the north interchange is significantly greater than the minimum distance required but is placed further north to avoid placing the interchange on the curve in Highway 11 while striving to stay as close to Town as possible.	
• The southern partial interchange follows the requirements set out in the reference document for successive exit ramps or successive entrance ramps.	
Alternative Routes	
• CS noted that generally the topography was somewhat better north of the deer yard but there is a rocky knoll (and cemetery) in the vicinity of Manitoba Street along the	

north route. The topography to the west of the middle and south interchanges is difficult with incised valleys and considerable slopes.	
• The southern alignments that cross High Falls Road and traverse in and out of the Muskoka River Valley would be challenging. CS noted that he was attempting to determine if an additional alternative could cut across a small southerly portion of the deer yard.	
• It was explained that it was recognized that the deer yard, which covers much of the area between High Falls Road and Falkenburg / Naismith Road, was a constraint and fragmentation has been largely avoided.	
Request for Information (Values)	
• Need to make a formal information request to Phung Tran (Values Request) for all alternative routes (or entire study area) if not already done. o Example of values: Red Shouldered Hawk nests near Muskoka River.	AECOM
• Review files and see what has been done to date. Was a formal request made already? Contact Phung as required (705-646-5557; phung.tran@ontario.ca).	AECOM
• Convert alternative route plan to GIS (ArcView / ArcGIS) and send to Phung so she can identify values.	AECOM
• Need to advise Phung of what values have been evaluated so far so she doesn't duplicate effort.	AECOM
Bracebridge Resource Management Centre	
• MTO has already approved through their TESR that they will be constructing a service road on the east side of Highway 11 that will impact the BRMC to some extent.	
• Show general footprint dimensions of north and middle interchange on plan and profile drawings to show extent of impact of interchanges on the BRMC. o Send all drawings in pdf to Ariel Zwicker, Kim Benner and Nicole Tuyten.	AECOM
• MNR would prefer we did not impact BRMC. Middle interchange is better in this regard.	
Deer Yard	
• It is possible to cut across the southern tip of the deer yard but a tracking program needs to be completed to confirm if the deer yard limit is still valid (1997 vintage info) and what mitigation measures need to be proposed, if any.	AECOM
• Tracking needs to be done this winter.	
Red Oak Stands	
• Consult North Bay MNR Science Group to get more info, if available, on Red Oak Stands (size, age, condition, active project, absolute need to protect, etc.).	MNR
• MNR Bracebridge advised that Red Oaks must be protected / avoided but it is not their project (belongs to North Bay office) so needs to be confirmed.	
• If MNR North Bay indicates that the Red Oak stands must be protected, but they don't have any more details on size, etc., a field investigation can be completed to assess avoidance, mitigation, etc.	AECOM
Other	
• Show Crown Land on large alternative route plan.	AECOM
• MNR prefers Crown Land is not segregated but it is not prohibited by policy.	
Next Meeting	
• No commitments were discussed for a follow-up meeting.	

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Communication Record

Date	Friday, January 11, 2013	Time	4pm
Between	Jillian deMan, Terrestrial and Wetland Ecologist AECOM	and	Phung Tran, Species at Risk Biologist Ministry of Natural Resources, Bracebridge
Telephone #	705-645-8753	Project #	60241537
Project Name	Bracebridge Transportation By-Pass		
Subject	Information Request, Deer Yard and Red Oak Stand Details		

PLEASE NOTE: **If this communication record does not agree with your records of the meeting, or if there are any omissions, please advise. Otherwise it will be assumed that the contents of this record are correct.**

Comments

The following provides the main points of conversation:

Data Request

- The data request sent by Gary Epp in March 2012 and the subsequent email, including shapefiles of the alternative routes, from Jillian deMan in January 2013 is sufficient information to complete the data request.
- Don't anticipate too much more than what AECOM already has. For example, there is a known hawk nest within the area.
- This should be complete within the next two weeks.

Deer Yard Data

- Phung will be sending AECOM MNR's typical field protocols for identifying deer wintering yards
- MNR in the past has identified yards through a combination of aerial surveys and ground work
- Need deep snow to undertake the ground work.

Oak Monitoring Stands

- AECOM has reviewed the report provided to them from MNR entitled, "Day 3: Stop 1, Group Openings ..."
- Kim Benner is determining if MNR has anymore data concerning these areas.

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Communication Record

Date	Tuesday, January 15, 2013	Time	11am and 4pm
Between	Jillian deMan, Terrestrial and Wetland Ecologist AECOM	and	Mike White and Kim Benner, Species at Risk Biologist Ministry of Natural Resources, Bracebridge
Telephone #	705-645-8754	Project #	60241537
Project Name	Bracebridge Transportation By-Pass		
Subject	Red Oak Stand Details		

PLEASE NOTE: **If this communication record does not agree with your records of the meeting, or if there are any omissions, please advise. Otherwise it will be assumed that the contents of this record are correct.**

Comments

The following provides the main points of conversation:

11am – left message with Kim Benner asking if she found any additional information concerning the oak tree stands

4pm – Kim left a voicemail referring Jillian to Mike White at the Bracebridge office.

4:11pm – Jillian called Mike White. Mike explained that he had put in a project request to site these stands in the spring. Jillian suggested these be completed right away so the information is available for the EA and arranged for a field visit with Mike White for Thursday, January 17, 2013.

4:30pm – Kim Benner called Jillian. She expressed her apprehensiveness towards AECOM citing the oak monitoring stands. She felt that this meant that an alternative had been settled within proximity to these stands. Jillian responded saying that this information was beneficial for the overall evaluation of all alternatives and that it was important for the project team to know exactly where these areas were.

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Communication Record

Date	Tuesday, January 22, 2013	Time	4pm
Between	Jillian deMan, Terrestrial and Wetland Ecologist AECOM	and	Phung Tran, SAR MNR Ministry of Natural Resources, Bracebridge
Telephone #	705-646-5557	Project #	60241537
Project Name	Bracebridge Transportation By-Pass		
Subject	Data Request Status		

PLEASE NOTE: **If this communication record does not agree with your records of the meeting, or if there are any omissions, please advise. Otherwise it will be assumed that the contents of this record are correct.**

Comments

The following provides the main points of conversation:

- Phung will be sending the data requested by tomorrow, if not, by the end of the week. This will include several word documents of deer yard fieldwork protocols.
- Friday is Phung's last day in the Bracebridge office. Her replacement is Megan Bonafont.

Deman, Jillian

From: Tran, Phung (MNR) [phung.tran@ontario.ca]
Sent: Thursday, January 24, 2013 8:48 AM
To: Deman, Jillian
Cc: Stilwell, Chris; McGirr, Valerie; Epp, Gary; Bonenfant, Megan (MNR); Benner, Kim (MNR)
Subject: RE: Bracebridge GIS Options
Attachments: SAR in PS District v3.0.xls; Deer Yard Critical Thermal Cover Stand Inventory.doc; Procedure for Inventory Cruising in Selected Thermal Cover Stands.doc

Hi Jillian,

Please be aware that lack of information does not necessarily mean that no values exist but likely because there have not been detailed assessments completed in many of these areas recently.

In addition to using the SAR Excel Tool (attached) to screen for possible SAR and their habitat, there are Blanding's turtle and Eastern hog-nosed snake recorded observations in the area (about 1km away from the routes identified).

There are several hawk nests in the vicinity of the routes you provided. There are red-shouldered hawk nests records at approximately 631810E, 4993724N, at 632936E, 4995409N and at 630203E, 4995410N. All these are from 1990 so they are old and we have no updated information for them (I believe they are on private land). We have a record of a nest at 628726E, 4993008N from aerial moose surveys conducted in 1997 and is recorded as either Osprey nest or Great Blue Heron nest/colony (not confirmed). We also have a Merlin nest record at 633561E, 4994306N however Merlins don't tend to use the same nest for more than a year. Please use this information as a flag of potential Significant Wildlife Habitat in the area.

Please find attached procedures that our biologist uses to determine thermal cover habitat for deer. Our deer yards are generally made up of stratum 1 and stratum 2 habitat. Critical thermal cover habitat can be found in either stratum 1 or 2 areas. As discussed during our phone call and at the meeting in Bracebridge on January 3rd, the deer yard information are from aerial surveys and habitat/boundaries will need to be confirmed on-the-ground to identify significant wildlife habitat that could be impacted by proposed activities.

From the mapping I was provided at the meeting, it looks like your crew has done some work identifying aquatic habitat. Many of these watercourses are recorded as coldwater with brook trout listed. We also have brook trout spawning habitat identified in watercourses at High Falls Road.

I understand you received information regarding the red oak research plots from Kim Benner. If you have any questions regarding this information or need clarification, please contact Megan Bonenfant (I have cc'd her on this response) after this week.

Regards,
Phung

Phung Tran
Landscape Planning Biologist
Parry Sound District MNR
705-646-5557

From: Deman, Jillian [mailto:Jillian.Deman@aecom.com]
Sent: January 10, 2013 3:48 PM
To: Tran, Phung (MNR)
Cc: Stilwell, Chris; McGirr, Valerie; Epp, Gary
Subject: Bracebridge GIS Options

Hello Phung,

As per my voicemail, attached are the shapefiles and associative pdfs of the alternative routes for the Bracebridge North Transportation Corridor EA.

I would like to discuss this project in terms of our information requests and details with regards to the data (i.e. how the deer wintering yard limits have been delineated in the past and information concerning the red oak monitoring stands).

Perhaps tomorrow is a good time to chat?

I hope you are well and I look forward to our conversation.

Thanks,

Jill

Jillian deMan, H.B.Sc
Terrestrial & Wetland Ecologist
D 519.650-8694 C 519.504-0966
jillian.deman@aecom.com

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Communication Record

Date	February 11, 2013	Time	9:26am to 9:55am
Between	Ron Black Ministry of Natural Resources, Parry Sound Office	and	Jillian deMan AECOM, Kitchener Office
Telephone #	705-773-4225	Project #	60241537
Project Name	Bracebridge North Transportation Corridor EA		
Subject	Scope for Refinement of Deer Yard		

PLEASE NOTE: If this communication record does not agree with your records of the meeting, or if there are any omissions, please advise. Otherwise it will be assumed that the contents of this record are correct.

Comments

Jill deMan called Kim Benner at Bracebridge MNR to ask who to contact concerning clarification of the deer yard protocols entitled, "Procedure for Inventory Cruising in Selected Thermal Cover Stands in Deer Winter Habitat" sent by Phung Tran of MNR on January 24, 2013.

In light of Phung Tran leaving the MNR Bracebridge office, Megan Bonenfant is her replacement and was not available Monday February 11th, 2013. Kim suggested Jill speak with Ron Black, who wrote the protocols, but requested that she be sent a summary of the conversation.

Ron Black was called at 9:26am. The following are the main points of the conversation:

- Considering the warm weather this winter, deer distribution overall is very broad.
- There are two Stratums when defining deer yards; Stratum One indicates the core and Stratum Two indicates where deer generally winter.
- The original data that was provided to AECOM concerning the limits of the deer wintering area was part of Stratum Two. The mapping was completed using aerial survey work in 1987 and then subsequently verified in 2007 through observations on the ground.
- When provided a pdf version of the Alternatives (same mapping provided to Phung Tran on January 10th, 2013), and shown key locations of the areas that require more detailed information for refinement, Ron had the following recommendations with regards to fieldwork:

1. Transects need to be 1 kilometre long, 500 metres on either side of the corridor within forested area.
2. Transects should be spaced at least 200 metres apart along the corridor.

3. Plots within each transect should be spaced at least 100 metres apart.
4. For each plot, information that is essential to gather includes ecosite mapping, estimation of crown conifer closure (four estimates at each corner of the plot and one in the centre), prism sweep data including tree size within the categories as stated in the protocols sent by Phung, and any tracks/incidental observations located during the surveys.

Deman, Jillian

From: Deman, Jillian
Sent: Tuesday, February 12, 2013 10:22 AM
To: 'ron.black@ontario.ca'; 'kim.benner@ontario.ca'; 'megan.bonenfant@ontario.ca'
Cc: Stilwell, Chris; McGirr, Valerie; Epp, Gary
Subject: Bracebridge North Transportation Corridor EA - Summary of Conversation with Ron Black re: Deer Wintering Yard
Attachments: COM - MNR - 2013-02-11-Deer Yard Field Methods-60241537.pdf

Hello Ron,

Attached is a summary of our conversation yesterday concerning methods for defining Wintering Deer Habitat in relation to the Bracebridge North Transportation Corridor EA.

Let me know if you have any further comments/clarification with regard to this communication record.

It was nice speaking with you,

Jill

Jillian deMan, H.B.Sc
Terrestrial & Wetland Ecologist
D 519.650-8694 C 519.504-0966
jillian.deman@aecom.com

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Deman, Jillian

From: Deman, Jillian
Sent: Thursday, February 21, 2013 5:19 PM
To: 'Black, Ron (MNR)'
Cc: 'Benner, Kim (MNR)'; 'Bonenfant, Megan (MNR)'; Stilwell, Chris; McGirr, Valerie; Epp, Gary; 'jan.mcdonnell@ontario.ca'
Subject: Bracebridge North Transportation Corridor EA - Deer Yard Refinement Fieldwork Scheduling

Hello Ron,

As per my voicemail, I am scheduling a crew to tentatively conduct fieldwork for the deer yard refinement next week. I spoke with Jan McDonnell at the Bracebridge office and she indicated to me that as of this past Tuesday (Feb.19), average snow depth is 49.2 cm.

I know that the weather forecast for this weekend is calling for rain and snow with more snow on Monday (perhaps). I would like to know if you think it is appropriate to conduct fieldwork next week given the weather forecast and the depth of snow.

Jan will be sending me an update on Monday of the current snow depth for the site.

Hope you are well,

Jill

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Deman, Jillian

From: Deman, Jillian
Sent: Friday, February 22, 2013 9:10 AM
To: Stilwell, Chris
Cc: McGirr, Valerie; Epp, Gary
Subject: FW: Message from Ron Black, MNR re: deer survey timing (917057464233)
Attachments: VoiceMessage.wav

Hello Chris,

MNR says we are good to go (see voice message).

Have a great day!

Jill

Jillian deMan, H.B.Sc
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From: Cisco Unity Connection Messaging System [mailto:unityconnection@usden3vm003.na.aecomnet.com]
Sent: Friday, February 22, 2013 8:49 AM
To: Jillian Deman
Subject: Message from Unknown sender (917057464233)

Deman, Jillian

From: noreply-sendfiles@aecom.com
Sent: Wednesday, March 13, 2013 5:10 PM
To: Deman, Jillian
Subject: Confirmation: Your files have been sent

This is an automatic notification from AECOM's File Transfer system that you have successfully sent 1 file

Recipient(s): ron.black@ontario.ca;megan.bonenfant@ontario.ca;kim.benner@ontario.ca;james.kamstra@aecom.com;tom.shorney@aecor

Message: Hello Ron, Megan and Kim

Find attached AECOM's field data collected during the deer survey work. This is for our discussion during our call next Wedne

Thanks,

Jill

Jillian deMan, H.B.Sc
Terrestrial & Wetland Ecologist
D 519.650-8694 C 519.504-0966
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www.aecom.comThis file will be available for download until 3/20/2013

File	Description	Size
MEMO-2013-03-13-Deer yard survey-60241537.pdf		9,057KB

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Deman, Jillian

From: Deman, Jillian
Sent: Friday, January 17, 2014 8:15 AM
To: Deman, Jillian
Subject: FW: Muskoka Field Naturalists comments regarding Northern Bypass

FYI

-----Original Message-----
From: Stilwell, Chris
Sent: Friday, November 15, 2013 11:13 AM
To: Epp, Gary; Deman, Jillian
Cc: McGirr, Valerie; Ghioureliotis, Catherine
Subject: FW: Muskoka Field Naturalists comments regarding Northern Bypass

Hi,

FYI / FYA below from Client.

Thanks,

Chris

Chris Stilwell, P. Eng.
Manager, Bracebridge Office
Water - Community Infrastructure
T 705.645.5992 ext. 3252012 C 705.641.1629
chris.stilwell@aecom.com

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----- Original Message -----
From: David Goodyear [mailto:David.Goodyear@TLDSB.ON.CA]
Sent: Thursday, November 14, 2013 05:01 PM
To: Douglas, Craig

Subject: Muskoka Field Naturalists comments regarding Northern Bypass

Hi, Craig

Please find attached a letter from the Muskoka Field Naturalists regarding some concerns we have with the proposed northern transportation corridor.
I hope we haven't missed the public review deadline.

Thanks,

David Goodyear

November 12, 2013

Craig Douglas, P. Eng.
District Municipality of Muskoka
Manager of Engineering Services
70 Pine Street
Bracebridge, Ontario
P1L 1N3

Dear Mr. Douglas:

Please consider the following concerns of the Muskoka Field Naturalists regarding the proposed transportation corridor north of the Town of Bracebridge urban area between Highway 11 and Muskoka Road 118. The Muskoka Field Naturalists is a local not-for-profit organization representing over 100 active members dedicated to the study, conservation, and enjoyment of nature.

In particular, we are concerned with the portion of the preferred and alternate routes that will extend south along South Monck Drive. This is a relatively quiet corner of Muskoka with a diverse variety of habitats and an abundance of wildlife, as noted in the Public Open House Summary Report.

Significant wildlife habitat is present in the forested northern portion of the study area (adjacent to South Monck Drive, north of Crawford Road), including wetlands and an active Great Blue Heron colony. Increased traffic and noise levels in this area would impact the continued success of this colony.

A thicket swamp, identified as Wetland 2 (W2) on the Terrestrial Conditions map included in the Public Open House Summary Report, which lies immediately south of where the preferred route would join with South Monck Drive, is an important habitat for a number of sensitive species. Canada Warbler and Golden-winged Warbler, both of which are designated Threatened under the Species at Risk Act (SARA), have been observed during breeding season in this wetland. Road development in Canada Warbler breeding habitat and wetland conversion have been cited as threats to Canada Warbler breeding success (http://www.sararegistry.gc.ca). This wetland is also an important habitat for American Bittern, Green Heron, and Virginia Rail.

Eastern Whip-poor-will, which is also designated Threatened under the Species at Risk Act (SARA), has been observed for a number of years during breeding season in the areas surrounding the intersections of South Monck Drive, Crawford Road, and Partridge Lane. These observations have been contributed to the Eastern Whip-poor-will Project currently being conducted by Bird Studies Canada. According to the SARA Registry (http://www.sararegistry.gc.ca), collisions with vehicles have been identified as a significant threat to Whip-poor-wills, which commonly sit on roads or road shoulders at night. The

development of a major transportation corridor through this area would increase the likelihood of vehicle collisions with Whip-poor-wills.

Bobolink, which is a Threatened species under the Ontario Species at Risk Act (SARA), as identified in the Public Open House Summary Report, has been observed in hay fields adjacent to South Monck Drive. Again, the development of a major transportation corridor that further fragments and disturbs important Bobolink habitat in this area could have a detrimental effect on local populations.

We hope you will consider our concerns with the proposed transportation corridor north of the Bracebridge urban area and that they will form part of the official Environmental Assessment Public Review.

Yours sincerely,

David Goodyear

David Goodyear
President
Muskoka Field Naturalists

Deman, Jillian

From: Stilwell, Chris
Sent: Thursday, December 05, 2013 8:38 AM
To: Austin, Kevin; Benner, Kim (MNR); Leduc, Leeanne (MNR); Douglas, Craig
Cc: Ghioureliotis, Catherine; Epp, Gary; McGirr, Valerie; Ghioureliotis, Catherine
Subject: FW: MNR Meeting Minutes
Attachments: Ltr from John & Erika Black Re Bracebridge North Transporation Corridon Class EA Log 113913.pdf; MIN-2013-11-26-MNRDeerYard-60241537.pdf

Hi,

Please find attached minutes from our meeting on November 26.

Please note that the Deer Yard Memo was previously sent to MNR via File Share.

Kim or Leanne, could you please see that the minutes get distributed to other attendees from MNR?

Thanks,

Chris

Chris Stilwell, P. Eng.
Manager, Bracebridge Office
Water - Community Infrastructure
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Bracebridge, ON P1L 1R1
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www.aecom.com

From: Epp, Gary
Sent: Wednesday, December 04, 2013 12:30 PM
To: Stilwell, Chris
Cc: Ghioureliotis, Catherine; McGirr, Valerie; Deman, Jillian
Subject: MNR Meeting Minutes

Hi Chris,

Please find attached the meeting minutes for the Meeting with MNR on November 25th. I have also attached the Deer Yard Memo and the letter from the residents to attach to the minutes.

Please review, edit and distribute as you see fit.

Thanks,

Gary

Gary A. Epp, B.Sc.(Hons.),M.Sc., Ph.D
Director of Ecology,
Water & Natural Resources, Environment
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Appendix B: Floral Species List

Appendix B. Floral Species List
60241537

BOTANICAL NAME		COMMON NAME	COEFFICIENT OF CONSERVATISM	WETNESS INDEX	WEEDINESS INDEX	PROVINCIAL STATUS	OMNR STATUS	COSEWIC STATUS	GLOBAL STATUS	LOCAL STATUS CENTRAL REGION
PTERIDOPHYTES		**FERNS & ALLIES**								
Dennstaedtiaceae		**Bracken Fern Family**								
Pteridium	*aquilinum var. latiusculum*	Eastern Bracken-fern	2	3		S5			G5T	
Dryopteridaceae		**Wood Fern Family**								
Athyrium	*species*	Lady Fern Species								
Dryopteris	*intermedia*	Evergreen Wood Fern	5	0		S5			G5	
Matteuccia	*struthiopteris*	Ostrich Fern	5	-3		S5			G5	
Onoclea	*sensibilis*	Sensitive Fern	4	-3		S5			G5	
Equisetaceae		**Horsetail Family**								
Equisetum	*arvense*	Field Horsetail	0	0		S5			G5	
Equisetum	*sylvaticum*	Wood Horsetail	7	-3		S5			G5	
Lycopodiaceae		**Clubmoss Family**								
Diphasiastrum	*complanatum*	Northern Running-pine	8	2		S5			G5	
Lycopodium	*obscurum*	Ground-pine	6	3		S4			G5	
Osmundaceae		**Royal Fern Family**								
Osmunda	*claytoniana*	Interrupted Fern	7	-1		S5			G5	
Osmunda	*regalis var. spectabilis*	Royal Fern	7	-5		S5			G5T	
Thelypteridaceae		**Marsh Fern Family**								
Phegopteris	*connectilis*	Northern Beech Fern	8	5		S5			G5	
GYMNOSPERMS		**CONIFERS**								
Thuja	*occidentalis*	Eastern White Cedar	4	-3		S5			G5	
Pinaceae		**Pine Family**								
Abies	*balsamea*	Balsam Fir	5	-3		S5			G5	
Larix	*laricina*	Tamarack	7	-3		S5			G5	
Picea	*glauca*	White Spruce	6	3		S5			G5	
Pinus	*resinosa*	Red Pine	8	3		S5			G5	
Pinus	*strobus*	Eastern White Pine	4	3		S5			G5	
Tsuga	*canadensis*	Eastern Hemlock	7	3		S5			G5	
Taxaceae		**Yew Family**								
Taxus	*canadensis*	American Yew	7	3		S5			G5	

BOTANICAL NAME		COMMON NAME	COEFFICIENT OF CONSERVATISM	WETNESS INDEX	WEEDINESS INDEX	PROVINCIAL STATUS	OMNR STATUS	COSEWIC STATUS	GLOBAL STATUS	LOCAL STATUS CENTRAL REGION
DICOTYLEDONS		**DICOTS**								
Aceraceae		**Maple Family**								
Acer	*rubrum*	Red Maple	4	0		S5			G5	
Acer	*saccharum*	Sugar Maple	4	3		S5			G5T?	
Acer	*spicatum*	Mountain Maple	6	3		S5			G5	
Araliaceae		**Ginseng Family**								
Aralia	*nudicaulis*	Wild Sarsaparilla	4	3		S5			G5	
Asclepiadaceae		**Milkweed Family**								
Asclepias	*syriaca*	Common Milkweed	0	5		S5			G5	
Asteraceae		**Composite or Aster Family**								
Symphyotrichum	*lanceolatum*	Tall White Aster	3	-3		S5			G5T?	
Eurybia	*macrophylla*	Large-leaved Aster	5	5		S5			G5	
Eupatorium	*perfoliatum*	Perfoliate Thoroughwort/Boneset	2	-4		S5			G5	
Euthamia	*graminifolia*	Flat-topped Bushy Goldenrod	2	-2		S5			G5	
Hieracium	*species*	Hawkweed species								
Hieracium	*aurantiacum*	Devil's Paintbrush		5	-2	SE5			G?	
Prenanthes	*alba*	White Rattlesnake-root	6	3		S5			G5	
Solidago	*altissima*	Tall Goldenrod	1	3		S5				
Solidago	*canadensis*	Canada Goldenrod	1	3		S5			G5	
Solidago	*juncea*	Early Goldenrod	3	5		S5			G5	
Solidago	*rugosa ssp. rugosa*	Rough Goldenrod	4	-1		S5			G5T?	
Balsaminaceae		**Touch-me-not Family**								
Impatiens	*capensis*	Spotted Touch-me-not	4	-3		S5			G5	
Betulaceae		**Birch Family**								
Alnus	*incana spp. rugosa*	Speckled Alder	6	-5		S5			G5T5	
Betula	*alleghaniensis*	Yellow Birch	6	0		S5			G5	
Betula	*papyrifera*	White Birch		2		S5			G5	
Corylus	*cornuta*	Beaked Hazel	5	5		S5			G5T	
Caprifoliaceae		**Honeysuckle Family**								
Diervilla	*lonicera*	Bush Honeysuckle	5	5		S5			G5	
Lonicera	*canadensis*	American Fly Honeysuckle	6	3		S5			G5	
Sambucus	*racemosa var. racemosa*	Red-berried Elderberry	5	2		S5			G5T4T5	
Cornaceae		**Dogwood Family**								

BOTANICAL NAME		COMMON NAME	COEFFICIENT OF CONSERVATISM	WETNESS INDEX	WEEDINESS INDEX	PROVINCIAL STATUS	OMNR STATUS	COSEWIC STATUS	GLOBAL STATUS	LOCAL STATUS CENTRAL REGION
Cornus	*alternifolia*	Alternate-leaved Dogwood	6	5		S5			G5	
Cornus	*canadensis*	Bunchberry	7	0		S5			G5	
Fabaceae		**Pea Family**								
Medicago	*lupulina*	Black Medick		1	-1	SE5			G?	
Vicia	*cracca*	Tufted Vetch		5	-1	SE5			G?	
Fagaceae		**Beech Family**								
Fagus	*grandifolia*	American Beech	6	3		S5			G5	
Quercus	*rubra*	Red Oak	6	3		S5			G5	
Guttiferae		**St. John's-wort Family**								
Hypericum	*perforatum*	Common St. John's-wort		5	-3	SE5			G?	
Prunella	*vulgaris ssp. vulgaris*	Common Heal-all		0	-1	SE3			G5T?	
Oleaceae		**Olive Family**								
Fraxinus	*americana*	White Ash	4	3		S5			G5	
Fraxinus	*nigra*	Black Ash	7	-4		S5			G5	
Oxalidaceae		**Wood Sorrel Family**								
Oxalis	*acetosella ssp. montana*	True Wood-sorrel	8	3		S5			G5	
Primulaceae		**Primrose Family**								
Trientalis	*borealis ssp. borealis*	Star-flower	6	-1		S5			G5T?	
Pyrolaceae		**Wintergreen Family**								
Pyrola	*elliptica*	Shinleaf	5	5		S5			G5	
Ranunculaceae		**Buttercup Family**								
Coptis	*trifolia*	Goldthread	7	-3		S5			G5T5	
Thalictrum	*pubescens*	Tall Meadow-rue	5	-2		S5			G5	
Rosaceae		**Rose Family**								
Crataegus	*species*	Hawthorn species								
Fragaria	*virginiana*	Virginia Strawberry	2	1		SU			G5T?	
Prunus	*serotina*	Black Cherry	3	3		S5			G5	
Rubus	*species*	Raspberry species								
Rubus	*allegheniensis*	Alleghany Blackberry	2	2		S5			G5	
Rubus	*idaeus*	Red Raspberry				SE1			G5T5	
Spiraea	*alba*	Narrow-leaved Meadow-sweet	3	-4		S5			G5	

BOTANICAL NAME		COMMON NAME	COEFFICIENT OF CONSERVATISM	WETNESS INDEX	WEEDINESS INDEX	PROVINCIAL STATUS	OMNR STATUS	COSEWIC STATUS	GLOBAL STATUS	LOCAL STATUS CENTRAL REGION
Salicaceae		**Willow Family**								
Populus	*balsamifera ssp. balsamifera*	Balsam Poplar	4	-3		S5			G5T?	
Populus	*tremuloides*	Trembling Aspen	2	0		S5			G5	
Salix	*discolor*	Pussy Willow	3	-3		S5			G5	
Salix	*exigua*	Sandbar Willow	3	-5		S5			G5	
Salix	*petiolaris*	Slender Willow	3	-4		S5			G4	
Salix	*pyrifolia*	Balsam Willow	10	-4		S5			G5	
Tiliaceae		**Linden Family**								
Tilia	*americana*	American Basswood	4	3		S5			G5	
Ulmaceae		**Elm Family**								
Ulmus	*americana*	White Elm	3	-2		S5			G5?	
Verbenaceae		**Vervain Family**								
Verbena	*hastata*	Blue Vervain	4	-4		S5			G5	
MONOCOTYLEDONS		**MONOCOTS**								
Cyperaceae		**Sedge Family**								
Carex	*species*	Sedge species								
Carex	*crinita*	Fringed Sedge	6	-4		S5			G5	
Carex	*gracillima*	Graceful Sedge	4	3		S5			G5	
Carex	*intumescens*	Bladder Sedge	6	-4		S5			G5	
Carex	*stricta*	Tussock Sedge	4	-5		S5			G5	
Scirpus	*atrovirens*	Dark-green Bulrush	3	-5		S5			G5?	
Scirpus	*cyperinus*	Wool-grass	4	-5		S5			G5	
Iridaceae		**Iris Family**								
Iris	*versicolor*	Multi-coloured Blue-flag	5	-5		S5			G5	
Juncaceae		**Rush Family**								
Juncus	*effusus*	Common rush								
Liliaceae		**Lily Family**								
Maianthemum	*canadense*	Wild Lily-of-the-valley	5	0		S5			G5	
Trillium	*grandiflorum*	White Trillium	5	5		S5			G5	
Poaceae		**Grass Family**								
Agrostis	*scabra*	Fly-away Grass	6	0		S5			G5	

BOTANICAL NAME		COMMON NAME	COEFFICIENT OF CONSERVATISM	WETNESS INDEX	WEEDINESS INDEX	PROVINCIAL STATUS	OMNR STATUS	COSEWIC STATUS	GLOBAL STATUS	LOCAL STATUS CENTRAL REGION
Calamagrostis	*canadensis*	Blue-joint Grass	4	-5		S5			G5	
Elymus	*hystrix*	Bottle-brush Grass	5	5		S5			G5	
Glyceria	*striata*	Fowl Meadow Grass	3	-5		S5			G5	
Phalaris	*arundinacea*	Reed Canary Grass	0	-4		S5			G5	
Poa	*palustris*	Fowl Meadow Grass	5	-4		S5			G5	
Poa	*pratensis ssp. pratensis*	Kentucky Bluegrass	0	1		S5			G5T	
Typhaceae		**Cattail Family**								
Typha	*latifolia*	Broad-leaved Cattail	3	-5		S5			G5	

FLORISTIC SUMMARY & ASSESSMENT

Species Diversity

Total Species:	**94**	
Native Species:	**88**	93.62%
Exotic Species	**6**	6.38%
Total Taxa in Region (List Region, Source)	10000	
% Regional Taxa Recorded	0.94%	
Regionally Significant Species	0	
S1-S3 Species	0	
S4 Species	1	
S5 Species	93	

Co-efficient of Conservatism and Floral Quality Index

Co-efficient of Conservatism (CC) (average)		**4.59**	
CC 0 to 3	*lowest sensitivity*	22	25.00%
CC 4 to 6	*moderate sensitivity*	44	50.00%
CC 7 to 8	*high sensitivity*	13	14.77%
CC 9 to 10	*highest sensitivity*	1	1.14%
Floral Quality Index (FQI)		**43.03**	

Presence of Weedy & Invasive Species

mean weediness		**-1.60**	
weediness = -1	*low potential invasiveness*	3	50.00%
weediness = -2	*moderate potential invasiveness*	1	16.67%
weediness = -3	*high potential invasiveness*	1	16.67%

Presence of Wetland Species

average wetness value	**0.14**

BOTANICAL NAME	COMMON NAME	COEFFICIENT OF CONSERVATISM	WETNESS INDEX	WEEDINESS INDEX	PROVINCIAL STATUS	OMNR STATUS	COSEWIC STATUS	GLOBAL STATUS	LOCAL STATUS CENTRAL REGION
upland	13	13.83%							
facultative upland	25	26.60%							
facultative	15	15.96%							
facultative wetland	24	25.53%							
obligate wetland	9	9.57%							

Appendix C: Terrestrial Field Data

ELC Community Description and Classification

Map #: Bracebridge		Polygon: 1	
Surveyor(s): BA	Date: July 4, 2012	Time start: —	finish: —
UTMZ:	UTMZ:	UTMN:	

Polygon Description

System	Substrate	Topographic Feature	Plant Form	Community
☐ Terrestrial	☐ Organic	☐ Lacustrine	☐ Plankton	☐ Lake
☒ Wetland	☒ Mineral Soil	☐ Riverine	☐ Submerged	☐ Pond
☐ Aquatic	☐ Parent Min.	☒ Bottomland	☐ Floating-LVD.	☐ River
Site	☐ Acidic Bedrk	☐ Terrace	☒ Graminoid	☐ Stream
☐ Open Water	☐ Basic Bedrk	☐ Valley Slope	☐ Forb	☐ Marsh
☐ Shallow Water	☐ Carb. Bedrk	☐ Tableland	☐ Lichen	☐ Swamp
☒ Surficial Dep.		☐ Roll. Upland	☐ Bryophyte	☐ Fen
☐ Bedrock		☐ Cliff	☐ Deciduous	☐ Bog
History		☐ Talus	☐ Coniferous	☐ Barren
☐ Natural		☐ Crevice/Cave	☐ Mixed	☒ Meadow
☒ Cultural		☐ Alvar		☐ Prairie
Cover		☐ Rockland		☐ Thicket
☒ Open		☐ Beach / Bar		☐ Savannah
☐ Shrub		☐ Sand Dune		☐ Woodland
☐ Treed		☐ Bluff		☐ Forest
				☐ Plantation

Stand Description

Layer	HT	CVR	Species in order of decreasing dominance
1		0	
2		0	
3		0	
4	5	4	PHAARUN

HT Codes: 7 <0.2m 6 >0.2-0.5m 5 >0.5-1m 4 >1-2m 3 >2-6m 2 >6-25m 1 >25m
CVR Codes: 0 = none 1 0% - 10% 2 10 - 25% 3 25 - 60% 4 > 60%

Stand Composition:	Size Class Analysis								
	Living	N	<10	N	10-24	N	25-50	N	>50
	Snags	N	<10	N	10-24	N	25-50	N	>50
BA:	Deadfall/Logs	N	<10	N	10-24	N	25-50	N	>50

Abundance Codes: N = None R = Rare O = Occasional A = Abundant

Comm. Age: [X] Pioneer [ ] Young [ ] Mid-Age [ ] Mature [ ] Old Growth

Ecosite		Code	
Vegetation Type		Code	
Inclusion		Code	
Complex		Code	

Community Profile Diagram/Comments

Reed Canary Grass Meadow

Notes:

Tree Tally by Species

Plot Number: 2

Species	Tally 1	Tally 2	Tally 3	Total	Rel Avg
Total					100
Basal Area					

Soils Ontario and ELC Soils Description

		Pit/Auger #				Summary
Site Metrics	UTM	Zone				Moisture Regime
		Easting				
		Northing				
	Slope	Position				
		Aspect				Drainage
		Percent				
		Slope Length				
Depth to...		Mottles				
		Gley				Effective Texture (indicate below)
		Water Table				
		Carbonates				
		Bedrock				
Soil Horizon Description	1	Depth from zero	% CF	% CF	% CF	% CF
		Texture				
	2	Depth from zero	% CF	% CF	% CF	% CF
		Texture				
	3	Depth from zero	% CF	% CF	% CF	% CF
		Texture				
	4	Depth from zero	% CF	% CF	% CF	% CF
		Texture				
		% Surface Stone/Rock				
		Moisture Regime				
		Drainage				

VASCULAR PLANT SPECIES LIST

AECOM

Project: Bracebridge EA
Date: July 4, 2012

Species	Overall Abundance	Canopy	Sub-canopy	Understory	Ground Layer	Species	Overall Abundance	Canopy	Sub-canopy	Understory	Ground Layer	Species	Overall Abundance	Canopy	Sub-canopy	Understory	Ground Layer
Trees						**Herbaceous Vegetation**						**Herbaceous Vegetation**					
						CAREX SP.					A						
						PHAARUN					O						
						POAPALU					O						
						ASCSYRI					R						
						SYMLANC					R						
						THAPUBE					R						
						VICCARA					R						
						MEDLUPU					R						
						TYPHLATI					O						
Shrubs/Vines																	
SAMRACE				R													
ALNINCA				R													
SPIALBA				R													

R = Rare, O = Occasional, A = Abundant, D = Dominant

Polygon #: 1
Staff Name(s): RA

ELC
Community Description and Classification

Map #: Bracebridge		Polygon: 2	
Surveyor(s): RA	Date: July 4, 2012	Time start: –	finish: –
UTMZ:	UTMZ:	UTMN:	

Polygon Description

System	[illegible]	[illegible]	[illegible]	[illegible]
☒Terrestrial	☐Organic	☐Lacustrine	☐Plankton	☐Lake
☐Wetland	☒Mineral Soil	☐Riverine	☐Submerged	☐Pond
☐Aquatic	☐Parent Min.	☐Bottomland	☐Floating-LVD.	☐River
[illegible]	☐Acidic Bedrk	☐Terrace	☒Graminoid	☐Stream
☐Open Water	☐Basic Bedrk	☐Valley Slope	☐Forb	☐Marsh
☐Shallow Water	☐Carb. Bedrk	☒Tableland	☐Lichen	☐Swamp
☒Surficial Dep.		☐Roll. Upland	☐Bryophyte	☐Fen
☐Bedrock		☐Cliff	☐Deciduous	☐Bog
[illegible]		☐Talus	☐Coniferous	☐Barren
☐Natural		☐Crevice/Cave	☐Mixed	☒Meadow
☒Cultural		☐Alvar		☐Prairie
[illegible]		☐Rockland		☐Thicket
☒Open		☐Beach / Bar		☐Savannah
☐Shrub		☐Sand Dune		☐Woodland
☐Treed		☐Bluff		☐Forest
				☐Plantation

Stand Description

Layer	HT	CVR	[illegible]
1		0	
2		0	
3		0	
4	5	4	BROINER = PHLPRAT = DACGLOM

HT Codes: 7 <0.2m 6 >0.2-0.5m 5 >0.5-1m 4 >1-2m 3 >2-6m 2 >6-25m 1 >25m
CVR Codes: 0 = none 1 0% - 10% 2 10 - 25% 3 25 - 60% 4 > 60%

[illegible]	[illegible]								
	[illegible]	N	<10	N	10-24	N	25-50	N	>50
	[illegible]	N	<10	N	10-24	N	25-50	N	>50
BA:	[illegible]	N	<10	N	10-24	N	25-50	N	>50

Abundance Codes: N = None R = Rare O = Occasional A = Abundant

Comm. Age	☒ Pioneer	☐ Young	☐ Mid-Age	☐ Mature	☐ Old Growth

[illegible]		[illegible]	
[illegible]		[illegible]	
[illegible]		[illegible]	
[illegible]		[illegible]	

Community Profile Diagram/Comments

Hay/grass Fields

Notes:

Tree Tally by Species

[illegible]: 2

Species	[illegible]	Tally 2	Tally 3	[illegible]	[illegible]	Rel. Avg.
[illegible]						100

Soils Ontario and ELC Soils Description

						Summary
	Pit/Auger #					
Site Metrics	UTM	Zone				Moisture Regime
		Easting				
		Northing				
	Slope	Position				Drainage
		Aspect				
		Percent				
		Slope Length				
Depth to...	Mottles					Effective Texture (indicate below)
	Gley					
	Water Table					
	Carbonates					
	Bedrock					

Soil Horizon Description	1	Depth from zero		% CF		% CF		% CF		% CF
		Texture								
	2	Depth from zero		% CF		% CF		% CF		% CF
		Texture								
	3	Depth from zero		% CF		% CF		% CF		% CF
		Texture								
	4	Depth from zero		% CF		% CF		% CF		% CF
		Texture								
		% Surface Stone/Rock								
	Moisture Regime									
	Drainage									

ELC Community Description and Classification

Map #: Bracebridge		Polygon: 3	
Surveyor(s): RA	Date: July 4, 2012	Time start: –	finish: –
UTMZ:	UTMZ:	UTMN:	

Polygon Description

System	[illegible]	[illegible]	[illegible]	[illegible]
☐ Terrestrial ☒ Wetland ☐ Aquatic	☐ Organic ☒ Mineral Soil ☐ Parent Min. ☐ Acidic Bedrk ☐ Basic Bedrk ☐ Carb. Bedrk	☐ Lacustrine ☐ Riverine ☒ Bottomland ☐ Terrace ☐ Valley Slope ☐ Tableland ☐ Roll. Upland ☐ Cliff ☐ Talus ☐ Crevice/Cave ☐ Alvar ☐ Rockland ☐ Beach / Bar ☐ Sand Dune ☐ Bluff	☐ Plankton ☐ Submerged ☐ Floating-LVD. ☐ Graminoid ☐ Forb ☐ Lichen ☐ Bryophyte ☒ Deciduous ☐ Coniferous ☐ Mixed	☐ Lake ☐ Pond ☐ River ☐ Stream ☐ Marsh ☒ Swamp ☐ Fen ☐ Bog ☐ Barren ☐ Meadow ☐ Prairie ☐ Thicket ☐ Savannah ☐ Woodland ☐ Forest ☐ Plantation
[illegible]				
☐ Open Water ☐ Shallow Water ☒ Surficial Dep. ☐ Bedrock				
[illegible]				
☒ Natural ☐ Cultural				
[illegible]				
☐ Open ☒ Shrub ☐ Treed				

Stand Description

Layer	HT	CVR	[illegible]
1		0	
2	2	1	FRANIGR>> ACERUBR>
3	4	6	ALNINCA>> SALEXIG = SALDISC.
4			CAREX SP.> JUNEFFU>

HT Codes: 7 <0.2m 6 >0.2-0.5m 5 >0.5-1m 4 >1-2m 3 >2-6m 2 >6-25m 1 >25m
CVR Codes: 0 = none 1 0% - 10% 2 10 - 25% 3 25 - 60% 4 > 60%

[illegible]	[illegible]	A	<10	R	10-24	N	25-50	N	>50
	[illegible]	R	<10	R	10-24	N	25-50	N	>50
BA:	[illegible]	N	<10	N	10-24	N	25-50	N	>50

Abundance Codes: N = None R = Rare O = Occasional A = Abundant

[illegible]	☐ Pioneer	☒ Young	☐ Mid-Age	☐ Mature	☐ Old Growth

[illegible]		[illegible]	
[illegible]		[illegible]	
[illegible]		[illegible]	
[illegible]		[illegible]	

Community Profile Diagram/Comments

Speckled Alder Shrub Swamp

Notes:

Tree Tally by Species

[illegible]: 2

Species	[illegible]	Tally 2	Tally 3	[illegible]	[illegible]	Rel. Avg
[illegible]						100

Soils Ontario and ELC Soils Description

		Pit/Auger #					Summary
Site Metrics	UTM	Zone					Moisture Regime
		Easting					
		Northing					
	Slope	Position					
		Aspect					Drainage
		Percent					
		Slope Length					
Depth to...		Mottles					
		Gley					Effective Texture (indicate below)
		Water Table					
		Carbonates					
		Bedrock					
Soil Horizon Description	1	Depth from zero	% CF	% CF	% CF	% CF	
		Texture					
	2	Depth from zero	% CF	% CF	% CF	% CF	
		Texture					
	3	Depth from zero	% CF	% CF	% CF	% CF	
		Texture					
	4	Depth from zero	% CF	% CF	% CF	% CF	
		Texture					
		% Surface Stone/Rock					
	Moisture Regime						
	Drainage						

VASCULAR PLANT SPECIES LIST

Project: Bracebridge
Date: July 4, 2012

AECOM

Species	Overall Abundance	ABUNDANCE / LAYER				Species	Overall Abundance	ABUNDANCE / LAYER				Species	Overall Abundance	ABUNDANCE / LAYER			
		Canopy	Sub-canopy	Understory	Ground Layer			Canopy	Sub-canopy	Understory	Ground Layer			Canopy	Sub-canopy	Understory	Ground Layer
Trees						**Herbaceous Vegetation**						**Herbaceous Vegetation**					
ACERUBR			R	R		TYPLATI					R						
Tamarack			R			JUNEFFU					O						
FRANIGRA			O	R		EUPMACU					O						
White Spruce			P			HYPPERF					R						
						IRIVERS					O						
						ONOSENS					R						
						CARCRINE					R						
						SOLRUGO					R						
						GLYSTRI					O						
						JUNEFFU					O						
						AGRSCABR					R						
						SYNLANC					R						
						PHAARUN					O						
						IMPCAPE					O						
						Ostrich Fern					O						
						VERLIATA					R						
						CAREX SP.					O						
Shrubs																	
SALEXIG/PETI				A													
SALDISC				A													
SALPYRI				O													
ALNINCA				D													
SPIALBA				O													
SAMRACE				R													

R = Rare, O = Occasional, A = Abundant, D = Dominant

Polygon #: 3
Staff Name(s): RA

ELC Community Description and Classification	Map #: Bracebridge		Polygon: 4 =14	
	Surveyor(s): RA	Date: July 4, 2012	Time start:	finish:
	UTMZ:	UTMZ:	UTMN:	

Polygon Description

System				
❑Terrestrial ❑Wetland ❑Aquatic	❑Organic ❑Mineral Soil ❑Parent Min. ❑Acidic Bedrk ❑Basic Bedrk ❑Carb. Bedrk	❑Lacustrine ❑Riverine ❑Bottomland ❑Terrace ❑Valley Slope ❑Tableland ❑Roll. Upland ❑Cliff ❑Talus ❑Crevice/Cave ❑Alvar ❑Rockland ❑Beach / Bar ❑Sand Dune ❑Bluff	❑Plankton ❑Submerged ❑Floating-LVD. ❑Graminoid ❑Forb ❑Lichen ❑Bryophyte ❑Deciduous ❑Coniferous ❑Mixed	❑Lake ❑Pond ❑River ❑Stream ❑Marsh ❑Swamp ❑Fen ❑Bog ❑Barren ❑Meadow ❑Prairie ❑Thicket ❑Savannah ❑Woodland ❑Forest ❑Plantation
❑Open Water ❑Shallow Water ❑Surficial Dep. ❑Bedrock				
❑Natural ❑Cultural				
❑Open ❑Shrub ❑Treed				

Stand Description

1			
2			
3			
4			

HT Codes: 7 <0.2m 6 >0.2-0.5m 5 >0.5-1m 4 >1-2m 3 >2-6m 2 >6-25m 1 >25m
CVR Codes: 0 = none 1 0% - 10% 2 10 - 25% 3 25 - 60% 4 > 60%

		<10	10-24	25-50	>50
		<10	10-24	25-50	>50
		<10	10-24	25-50	>50

Abundance Codes: N = None R = Rare O = Occasional A = Abundant

	☐ Pioneer	☐ Young	☐ Mid-Age	☐ Mature	☐ Old Growth

Community Profile Diagram/Comments

Notes:

Tree Tally by Species

	2

Species		Tally 2	Tally 3			
						100

Soils Ontario and ELC Soils Description

		Pit/Auger #				Summary
Site Metrics	UTM	Zone				Moisture Regime
		Easting				
		Northing				
	Slope	Position				
		Aspect				Drainage
		Percent				
		Slope Length				
Depth to...		Mottles				
		Gley				Effective Texture (indicate below)
		Water Table				
		Carbonates				
		Bedrock				

Soil Horizon Description										
	1	Depth from zero		% CF		% CF		% CF		% CF
		Texture								
	2	Depth from zero		% CF		% CF		% CF		% CF
		Texture								
	3	Depth from zero		% CF		% CF		% CF		% CF
		Texture								
	4	Depth from zero		% CF		% CF		% CF		% CF
		Texture								
		% Surface Stone/Rock								
	Moisture Regime									
	Drainage									

VASCULAR PLANT SPECIES LIST

Project: Braebridge
Date: July 4, 2012

AECOM

Species	Overall Abundance	ABUNDANCE / LAYER			
		Canopy	Sub-canopy	Understory	Ground Layer
Trees					
ACERUBR		D	D	D	D
BETALGA		O			
Hemlock		O	O		
BETPAPI			O		
PINSTRO		O			
POPTREM		O			R
QUERUBR					R
ULMAMER			O		
Shrubs					
YEW					R

Species	Overall Abundance	ABUNDANCE / LAYER			
		Canopy	Sub-canopy	Understory	Ground Layer
Herbaceous Vegetation					
Lady Fern					O
ONOSENS					O
ELYMACA					R
CARCORN					R
Interrupted Fern					O
SOLRUG					R
Bracken Fern					O
EQUARVE					R

Species	Overall Abundance	ABUNDANCE / LAYER			
		Canopy	Sub-canopy	Understory	Ground Layer
Herbaceous Vegetation					

R = Rare, O = Occasional, A = Abundant, D = Dominant

Polygon #: 4 = 14
Staff Name(s): RA

ELC Community Description and Classification	Map #: Bracebridge	Polygon: 5	
	Surveyor(s): RA	Date: July 5, 2012	Time start: – finish: –
	UTMZ:	UTMZ:	UTMN:

Polygon Description

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
☒Terrestrial ☐Wetland ☐Aquatic **[illegible]** ☐Open Water ☐Shallow Water ☒Surficial Dep. ☐Bedrock **[illegible]** ☐Natural ☒Cultural **[illegible]** ☐Open ☐Shrub ☒Treed	☐Organic ☒Mineral Soil ☐Parent Min. ☐Acidic Bedrk ☐Basic Bedrk ☐Carb. Bedrk	☐Lacustrine ☐Riverine ☐Bottomland ☐Terrace ☐Valley Slope ☒Tableland ☐Roll. Upland ☐Cliff ☐Talus ☐Crevice/Cave ☐Alvar ☐Rockland ☐Beach / Bar ☐Sand Dune ☐Bluff	☐Plankton ☐Submerged ☐Floating-LVD. ☐Graminoid ☐Forb ☐Lichen ☐Bryophyte ☐Deciduous ☒Coniferous ☐Mixed	☐Lake ☐Pond ☐River ☐Stream ☐Marsh ☐Swamp ☐Fen ☐Bog ☐Barren ☐Meadow ☐Prairie ☐Thicket ☐Savannah ☐Woodland ☐Forest ☒Plantation

Stand Description

[illegible]	HT	CVR	[illegible]
1	2	4	PINSYLV
2	2	2	PINSYLV
3	–	–	Unknown (ASA)
4	–	–	Unknown (ASA

HT Codes: 7 <0.2m 6 >0.2-0.5m 5 >0.5-1m 4 >1-2m 3 >2-6m 2 >6-25m 1 >25m
CVR Codes: 0 = none 1 0% - 10% 2 10 - 25% 3 25 - 60% 4 > 60%

[illegible]	[illegible]							
	[illegible]	O	<10	A	10-24	R	25-50	N	>50
BA:	[illegible]	R	<10	R	10-24	N	25-50	N	>50
	[illegible]	R	<10	R	10-24	N	25-50	N	>50

Abundance Codes: **N** = None **R** = Rare **O** = Occasional **A** = Abundant

[illegible]	☐ Pioneer	☒ Young	☒ Mid-Age	☐ Mature	☐ Old Growth

[illegible]		[illegible]	
[illegible]		[illegible]	
[illegible]		[illegible]	
[illegible]		[illegible]	

Community Profile Diagram/Comments

Scots Pine Plantation

Notes:

Tree Tally by Species

[illegible]: 2

Species	[illegible]	Tally 2	Tally 3	[illegible]	[illegible]	Rel. Avg.
[illegible]						100

Soils Ontario and ELC Soils Description

		Pit/Auger #				Summary
Site Metrics	UTM	Zone				Moisture Regime
		Easting				
		Northing				
	Slope	Position				
		Aspect				Drainage
		Percent				
		Slope Length				
Depth to...		Mottles				
		Gley				Effective Texture (indicate below)
		Water Table				
		Carbonates				
		Bedrock				
Soil Horizon Description	1	Depth from zero / % CF				% CF
		Texture				
	2	Depth from zero / % CF				% CF
		Texture				
	3	Depth from zero / % CF				% CF
		Texture				
	4	Depth from zero / % CF				% CF
		Texture				
		% Surface Stone/Rock				
		Moisture Regime				
		Drainage				

ELC Community Description and Classification

Map #: Bracebridge		Polygon: 6	
Surveyor(s): RA	Date: July 4, 2012	Time start: –	finish:
UTMZ:	UTMZ:	UTMN:	

Polygon Description

System	[illegible]	[illegible]	[illegible]	[illegible]
☒ Terrestrial	☐ Organic	☐ Lacustrine	☐ Plankton	☐ Lake
☐ Wetland	☒ Mineral Soil	☐ Riverine	☐ Submerged	☐ Pond
☐ Aquatic	☐ Parent Min.	☐ Bottomland	☐ Floating-LVD.	☐ River
[illegible]	☐ Acidic Bedrk	☐ Terrace	☐ Graminoid	☐ Stream
☐ Open Water	☐ Basic Bedrk	☐ Valley Slope	☐ Forb	☐ Marsh
☐ Shallow Water	☐ Carb. Bedrk	☒ Tableland	☐ Lichen	☐ Swamp
☒ Surficial Dep.		☐ Roll. Upland	☐ Bryophyte	☐ Fen
☐ Bedrock		☐ Cliff	☐ Deciduous	☐ Bog
[illegible]		☐ Talus	☒ Coniferous	☐ Barren
☒ Natural		☐ Crevice/Cave	☐ Mixed	☐ Meadow
☒ Cultural		☐ Alvar		☐ Prairie
[illegible]		☐ Rockland		☐ Thicket
☐ Open		☐ Beach / Bar		☐ Savannah
☐ Shrub		☐ Sand Dune		☐ Woodland
☒ Treed		☐ Bluff		☒ Forest
				☒ Plantation

Stand Description

Layer	HT	CVR	[illegible]
1	1	4	PINSTRO >> PICABIE = POPTREM
2	2	2	PINSTRO > PICABIE
3	–	–	Unknown ASA
4	–	–	Unknown ASA

HT Codes: 7 <0.2m 6 >0.2-0.5m 5 >0.5-1m 4 >1-2m 3 >2-6m 2 >6-25m 1 >25m
CVR Codes: 0 = none 1 0% - 10% 2 10 - 25% 3 25 - 60% 4 > 60%

[illegible]									
	[illegible]	O	<10	A	10-24	O	25-50	R	>50
BA	[illegible]	N	<10	N	10-24	N	25-50	N	>50

Abundance Codes: **N** = None **R** = Rare **O** = Occasional **A** = Abundant

Com. Age		
☐ Pioneer	☐ Young	☒ Mid-Age
☐ Mature	☐ Old Growth	

Ecosite		Code	
Vegetation Type		Code	
Inclusion		Code	
Complex		Code	

Community Profile Diagram/Comments

White Pine Stand/Plantation

Notes:

Tree Tally by Species

Plot [illegible] 2

Species	[illegible]	Tally 2	Tally 3	[illegible]	[illegible]	[illegible]
[illegible]						100

Soils Ontario and ELC Soils Description

		Pit/Auger #				Summary
Site Metrics	UTM	Zone				Moisture Regime
		Easting				
		Northing				
	Slope	Position				
		Aspect				Drainage
		Percent				
		Slope Length				
Depth to…		Mottles				
		Gley				Effective Texture (indicate below)
		Water Table				
		Carbonates				
		Bedrock				

Soil Horizon Description										
1	Depth from zero		% CF		% CF		% CF		% CF
	Texture								
2	Depth from zero		% CF		% CF		% CF		% CF
	Texture								
3	Depth from zero		% CF		% CF		% CF		% CF
	Texture								
4	Depth from zero		% CF		% CF		% CF		% CF
	Texture								
	% Surface Stone/Rock								
Moisture Regime									
Drainage									

AECOM

VASCULAR PLANT SPECIES LIST

Project: Bracebridge
Date: July 4, 2012

Species	Overall Abundance	Canopy	Sub-canopy	Understory	Ground Layer
Trees					
PINSTRO		O	O		
PICABIE		O	O		
ACERUBR				O	O
BETPAPI				R	
POPTREM		O			
Tamarack			R	R	R
Shrubs/Vines					

Species	Overall Abundance	Canopy	Sub-canopy	Understory	Ground Layer
Herbaceous Vegetation					

Species	Overall Abundance	Canopy	Sub-canopy	Understory	Ground Layer
Herbaceous Vegetation					

R = Rare, O = Occasional, A = Abundant, D = Dominant

Polygon #: 6
Staff Name(s): RA

ELC Community Description and Classification

Map #: Bracebridge		Polygon: 7	
Surveyor(s): RA	Date: July 4, 2012	Time start: —	finish: —
UTMZ:	UTMZ:	UTMN:	

Polygon Description

System	Soil	Site	Vegetation	Community
☒Terrestrial	☐Organic	☐Lacustrine	☐Plankton	☐Lake
☐Wetland	☒Mineral Soil	☐Riverine	☐Submerged	☐Pond
☐Aquatic	☐Parent Min.	☒Bottomland	☐Floating-LVD.	☐River
Site	☐Acidic Bedrk	☐Terrace	☒Graminoid	☐Stream
☐Open Water	☐Basic Bedrk	☐Valley Slope	☐Forb	☒Marsh
☐Shallow Water	☐Carb. Bedrk	☐Tableland	☐Lichen	☐Swamp
☒Surficial Dep.		☐Roll. Upland	☐Bryophyte	☐Fen
☐Bedrock		☐Cliff	☐Deciduous	☐Bog
Origin		☐Talus	☐Coniferous	☐Barren
☒Natural		☐Crevice/Cave	☐Mixed	☐Meadow
☐Cultural		☐Alvar		☐Prairie
Cover		☐Rockland		☐Thicket
☒Open		☐Beach / Bar		☐Savannah
☐Shrub		☐Sand Dune		☐Woodland
☐Treed		☐Bluff		☐Forest
				☐Plantation

Stand Description

Layer	HT	CVR	Species Composition
1	–	O	
2	2	1	ACERUBR = BETPAPI
3	4	2	SPIALBA > SALEXIG
4	5	4	CALCANA >> SCICYPR

HT Codes: 7 <0.2m 6 >0.2-0.5m 5 >0.5-1m 4 >1-2m 3 >2-6m 2 >6-25m 1 >25m
CVR Codes: 0 = none 1 0% - 10% 2 10 - 25% 3 25 - 60% 4 > 60%

Stand Composition								
	R	<10	R	10-24	N	25-50	N	>50
	N	<10	N	10-24	N	25-50	N	>50
	R	<10	R	10-24	N	25-50	N	>50

Abundance Codes: N = None R = Rare O = Occasional A = Abundant

Stand Age: ☐ Pioneer ☒ Young ☐ Mid-Age ☐ Mature ☐ Old Growth

Topography		Water	
Physiography		Land Use	
Anthropogenic		Additional	

Community Profile Diagram/Comments

CALCANA Meadow Marsh

Notes:

Tree Tally by Species

Species	1	2	3	4	5	Total
						100

Soils Ontario and ELC Soils Description

										Summary
Site Metrics		Pit/Auger #								
	UTM	Zone								
		Easting								Moisture Regime
		Northing								
	Slope	Position								
		Aspect								
		Percent								Drainage
		Slope Length								
Depth to...		Mottles								
		Gley								
		Water Table								Effective Texture (indicate below)
		Carbonates								
		Bedrock								
Soil Horizon Description	1	Depth from zero		% CF		% CF		% CF		% CF
		Texture								
	2	Depth from zero		% CF		% CF		% CF		% CF
		Texture								
	3	Depth from zero		% CF		% CF		% CF		% CF
		Texture								
	4	Depth from zero		% CF		% CF		% CF		% CF
		Texture								
		% Surface Stone/Rock								
		Moisture Regime								
		Drainage								

VASCULAR PLANT SPECIES LIST

Project: Bracebridge
Date: July 4, 2012

AECOM

Species	Overall Abundance	ABUNDANCE / LAYER			
		Canopy	Sub-canopy	Understory	Ground Layer
Trees					
ACERUBR			R	R	
BETPAPI			A	R	
Shrubs/Vines					
SPIALBA				A	
ALNINCA				R	
SALEXIG/PETO				O	
SAMRACE				R	

Species	Overall Abundance	ABUNDANCE / LAYER			
		Canopy	Sub-canopy	Understory	Ground Layer
Herbaceous Vegetation					
CALCANA					D
SOLRUGO					O
SCICYPR					A
JUNEFFUS					O
EUPPERF					R
EUPMACU					O
OSMREGA					R
CAREORN					R
PHAARUN					R
ONOSENS					R
TYPLATI					R
LADY FERN					O

Species	Overall Abundance	ABUNDANCE / LAYER			
		Canopy	Sub-canopy	Understory	Ground Layer
Herbaceous Vegetation					

R = Rare, O = Occasional, A = Abundant, D = Dominant

Polygon #: 7
Staff Name(s): RA

ELC Community Description and Classification	**Map #:** Bracebridge		**Polygon:** 8	
	Surveyor(s): RA	**Date:** July 4, 2012	**Time** start: –	finish: –
	UTMZ:	**UTMZ:**	**UTMN:**	

Polygon Description

System	[illegible]	[illegible]	[illegible]	[illegible]
☒ Terrestrial	☐ Organic	☐ Lacustrine	☐ Plankton	☐ Lake
☐ Wetland	☒ Mineral Soil	☐ Riverine	☐ Submerged	☐ Pond
☐ Aquatic	☐ Parent Min.	☐ Bottomland	☐ Floating-LVD.	☐ River
Site	☐ Acidic Bedrk	☐ Terrace	☐ Graminoid	☐ Stream
☐ Open Water	☐ Basic Bedrk	☒ Valley Slope	☐ Forb	☐ Marsh
☐ Shallow Water	☐ Carb. Bedrk	☒ Tableland	☐ Lichen	☐ Swamp
☒ Surficial Dep.		☒ Roll. Upland	☐ Bryophyte	☐ Fen
☐ Bedrock		☐ Cliff	☒ Deciduous	☐ Bog
[illegible]		☐ Talus	☐ Coniferous	☐ Barren
☒ Natural		☐ Crevice/Cave	☐ Mixed	☐ Meadow
☐ Cultural		☐ Alvar		☐ Prairie
[illegible]		☐ Rockland		☐ Thicket
☐ Open		☐ Beach / Bar		☐ Savannah
☐ Shrub		☐ Sand Dune		☐ Woodland
☒ Treed		☐ Bluff		☒ Forest
				☐ Plantation

Stand Description

Layer	Ht	Cvr	[illegible]
1	1	4	ACESACC >> POPTREM = PINSTRO > POPPALS
2	2	3	ACESACC > PINSTRO
3	4	2	ACESACC >> PINUS
4	6	2	ACESACC = Broken Fern > ARANUDI

HT Codes: 7 <0.2m 6 >0.2-0.5m 5 >0.5-1m 4 >1-2m 3 >2-6m 2 >6-25m 1 >25m
CVR Codes: 0 = none 1 0% - 10% 2 10 - 25% 3 25 - 60% 4 > 60%

[illegible]	[illegible]							
	[illegible]	O	<10	A	10-24	A	25-50	R	>50
	[illegible]	O	<10	R	10-24	R	25-50	N	>50
BA:	[illegible]	O	<10	R	10-24	R	25-50	N	>50

Abundance Codes: **N** = None **R** = Rare **O** = Occasional **A** = Abundant

Comm. Age	☐ Pioneer	☐ Young	☐ Mid-Age	☒ Mature	☐ Old Growth

Ecosite		[illegible]	
Vegetation Type		[illegible]	
Inclusion		[illegible]	
Complex		[illegible]	

Community Profile Diagram/Comments

Sugar Maple Forest

Notes:

Tree Tally by Species

[illegible] 2

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]						100

Soils Ontario and ELC Soils Description

		Pit/Auger #				Summary
Site Metrics	UTM	Zone				Moisture Regime
		Easting				
		Northing				
	Slope	Position				Drainage
		Aspect				
		Percent				
		Slope Length				
Depth to...		Mottles				Effective Texture (indicate below)
		Gley				
		Water Table				
		Carbonates				
		Bedrock				

Soil Horizon Description									
1	Depth from zero		% CF		% CF		% CF		% CF
	Texture								
2	Depth from zero		% CF		% CF		% CF		% CF
	Texture								
3	Depth from zero		% CF		% CF		% CF		% CF
	Texture								
4	Depth from zero		% CF		% CF		% CF		% CF
	Texture								
	% Surface Stone/Rock								
Moisture Regime									
Drainage									

VASCULAR PLANT SPECIES LIST

Project: Bracebridge
Date: July 4, 2017

AECOM

Species	Overall Abundance	ABUNDANCE / LAYER			
		Canopy	Sub-canopy	Understory	Ground Layer
Trees					
PINSTRO		O	A	O	
ACESACC		D	D	D	O
ULMAMER			O	D	
PRUSERO			O	O	O
ACCRUBR			R	R	
FRAAMER			R	R	R
POPTREM		O	O	A	
TILAMER			O	O	
Hemlock			O		
QUERUBR				R	R
POPBALS		O			
Shrubs					
RUBIDAE				O	
Herbaceous Vegetation					
SOLALTI					O
SYMMACR					O
Bracken Fern					O
Lady Fern					R
POLPUBE					O
PRE ALBA					O
Herbaceous Vegetation					
Herbaceous Vegetation					

R = Rare, O = Occasional, A = Abundant, D = Dominant

Polygon #: 8
Staff Name(s): RA

ELC Community Description and Classification

Map #: Bracebridge	Polygon: 10
Surveyor(s): RA	Date: July 5, 2012
Time start: –	finish: –
UTMZ:	UTMZ: / UTMN:

Polygon Description

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
☒Terrestrial	☐Organic	☐Lacustrine	☐Plankton	☐Lake
☐Wetland	☒Mineral Soil	☐Riverine	☐Submerged	☐Pond
☐Aquatic	☐Parent Min.	☐Bottomland	☐Floating-LVD.	☐River
[illegible]	☐Acidic Bedrk	☐Terrace	☐Graminoid	☐Stream
☐Open Water	☐Basic Bedrk	☒Valley Slope	☐Forb	☐Marsh
☐Shallow Water	☐Carb. Bedrk	☒Tableland	☐Lichen	☐Swamp
☒Surficial Dep.		☐Roll. Upland	☐Bryophyte	☐Fen
☐Bedrock		☐Cliff	☐Deciduous	☐Bog
[illegible]		☐Talus	☒Coniferous	☐Barren
☐Natural		☐Crevice/Cave	☐Mixed	☐Meadow
☒Cultural		☐Alvar		☐Prairie
[illegible]		☐Rockland		☐Thicket
☐Open		☐Beach / Bar		☐Savannah
☐Shrub		☐Sand Dune		☐Woodland
☒Treed		☐Bluff		☐Forest
				☒Plantation

Stand Description

Layer	[illegible]	[illegible]	[illegible]
1	1	4	PINSTRO
2	2	2	ACESACC >>BETPAD
3	4	3	ACESACC > ACERUBR
4	6	3	ACESACC > Broken Fern

HT Codes: 7 <0.2m 6 >0.2-0.5m 5 >0.5-1m 4 >1-2m 3 >2-6m 2 >6-25m 1 >25m
CVR Codes: 0 = none 1 0% - 10% 2 10 - 25% 3 25 - 60% 4 > 60%

Stand Composition	[illegible]		<10		10-24		25-50		>50
	[illegible]	O	<10	A	10-24	O	25-50	N	>50
	[illegible]	R	<10	R	10-24	N	25-50	N	>50
BA:	[illegible]	R	<10	R	10-24	N	25-50	N	>50

Abundance Codes: N = None R = Rare O = Occasional A = Abundant

Comm. Age	☐ Pioneer	☐ Young	☒ Mid-Age	☐ Mature	☐ Old Growth

[illegible]		[illegible]	
[illegible]		[illegible]	
[illegible]		[illegible]	
[illegible]		[illegible]	

Community Profile Diagram/Comments

White/Red Pine Stand

Notes:

Tree Tally by Species

[illegible]: 2

Species	[illegible]	Tally 2	Tally 3	[illegible]	[illegible]	Rel. Avg.
[illegible]						100

Soils Ontario and ELC Soils Description

		Pit/Auger #				Summary
Site Metrics	UTM	Zone				
		Easting				Moisture Regime
		Northing				
	Slope	Position				
		Aspect				
		Percent				Drainage
		Slope Length				
Depth to...		Mottles				
		Gley				Effective Texture (indicate below)
		Water Table				
		Carbonates				
		Bedrock				

Soil Horizon Description										
1	Depth from zero		% CF		% CF		% CF		% CF
	Texture								
2	Depth from zero		% CF		% CF		% CF		% CF
	Texture								
3	Depth from zero		% CF		% CF		% CF		% CF
	Texture								
4	Depth from zero		% CF		% CF		% CF		% CF
	Texture								
	% Surface Stone/Rock								
Moisture Regime									
Drainage									

VASCULAR PLANT SPECIES LIST

Project: Bracebridge
Date: July 5, 2012

AECOM

Species	Overall Abundance	ABUNDANCE / LAYER			
		Canopy	Sub-canopy	Understory	Ground Layer
Trees					
PINSTRO		D		O	
ACESACC				A	A
FAGGRAN				O	
ABIBALS					R
ACERUBR				O	
ULMAMER			R		
BETPAPI		R		R	
PINRUBR		D			
Shrubs					

Species	Overall Abundance	ABUNDANCE / LAYER			
		Canopy	Sub-canopy	Understory	Ground Layer
Herbaceous Vegetation					
Braken Fern					D
Starflower					O
FRAVIRG					O
Hawkweed Sp					O
MIACANA					A
ELYHIST					O

Species	Overall Abundance	ABUNDANCE / LAYER			
		Canopy	Sub-canopy	Understory	Ground Layer
Herbaceous Vegetation					

R = Rare, O = Occasional, A = Abundant, D = Dominant

Polygon #: 10
Staff Name(s): RA

ELC Community Description and Classification

Map #: Bracebridge		Polygon: 11	
Surveyor(s): RA	Date: July 5, 2012	Time start: –	finish: –
UTMZ:	UTMZ:	UTMN:	

Polygon Description

System				
☒Terrestrial ☐Wetland ☐Aquatic	☐Organic ☒Mineral Soil ☐Parent Min. ☐Acidic Bedrk ☐Basic Bedrk ☐Carb. Bedrk	☐Lacustrine ☐Riverine ☐Bottomland ☐Terrace ☒Valley Slope ☒Tableland ☐Roll. Upland ☐Cliff ☐Talus ☐Crevice/Cave ☐Alvar ☐Rockland ☐Beach / Bar ☐Sand Dune ☐Bluff	☐Plankton ☐Submerged ☐Floating-LVD. ☐Graminoid ☐Forb ☐Lichen ☐Bryophyte ☐Deciduous ☒Coniferous ☐Mixed	☐Lake ☐Pond ☐River ☐Stream ☐Marsh ☐Swamp ☐Fen ☐Bog ☐Barren ☐Meadow ☐Prairie ☐Thicket ☐Savannah ☐Woodland ☐Forest ☒Plantation
Site ☐Open Water ☐Shallow Water ☒Surficial Dep. ☐Bedrock				
History ☐Natural ☒Cultural				
Cover ☐Open ☐Shrub ☒Treed				

Stand Description

Layer	HT	CVR	
1	1	4	PINRUGO
2	2	2	ACERUBR
3	4	2	ABIBALS
4			ELYHIST > MIARACE

HT Codes: 7 <0.2m 6 >0.2-0.5m 5 >0.5-1m 4 >1-2m 3 >2-6m 2 >6-25m 1 >25m
CVR Codes: 0 = none 1 0% - 10% 2 10 - 25% 3 25 - 60% 4 > 60%

		A	<10	A	10-24	O	25-50	N	>50
		R	<10	R	10-24	R	25-50	N	>50
BA		R	<10	R	10-24	R	25-50	N	>50

Abundance Codes: **N** = None **R** = Rare **O** = Occasional **A** = Abundant

	☐ Pioneer	☐ Young	☒ Mid-Age	☐ Mature	☐ Old Growth

Community Profile Diagram/Comments

Red Pine Stand

Notes:

Tree Tally by Species

	2

Species		Tally 2	Tally 3			Rel. Avg.
						100

Soils Ontario and ELC Soils Description

						Summary
Site Metrics	Pit/Auger #					
	UTM Zone					Moisture Regime
	UTM Easting					
	UTM Northing					
	Slope Position					Drainage
	Slope Aspect					
	Slope Percent					
	Slope Length					
Depth to...	Mottles					Effective Texture (indicate below)
	Gley					
	Water Table					
	Carbonates					
	Bedrock					

Soil Horizon Description										
1	Depth from zero		% CF		% CF		% CF		% CF
	Texture								
2	Depth from zero		% CF		% CF		% CF		% CF
	Texture								
3	Depth from zero		% CF		% CF		% CF		% CF
	Texture								
4	Depth from zero		% CF		% CF		% CF		% CF
	Texture								
	% Surface Stone/Rock								
Moisture Regime									
Drainage									

VASCULAR PLANT SPECIES LIST

Project: Bracebridge
Date: July 5, 2012

AECOM

Species	Overall Abundance	ABUNDANCE / LAYER			
		Canopy	Sub-canopy	Understory	Ground Layer
Trees					
PINRUBR		D			
ACERUBR				O	
ABIBALS				O	
POPTREM					R
QUERUBR					R
FRAAMER					R
Shrubs/Vines					
Soft Raspberry					O

(See Back)

Species	Overall Abundance	ABUNDANCE / LAYER			
		Canopy	Sub-canopy	Understory	Ground Layer
Herbaceous Vegetation					
MIACANA					O
HYPPERF					R
Bottle Brush Grass					O
DRYINTE					R
PREALBA					R
POAPRAT					O
SOLRUGO					O
ASCSYRI					O
Bracken Fern					O
ABANUDA					O
PYROLA ELLIPTICA					R

Species	Overall Abundance	ABUNDANCE / LAYER			
		Canopy	Sub-canopy	Understory	Ground Layer
Herbaceous Vegetation					

R = Rare, O = Occasional, A = Abundant, D = Dominant

Polygon #: 11
Staff Name(s): BA

ELC Community Description and Classification

Map #: Bracebridge		Polygon: 12	
Surveyor(s): RA	Date: July 5, 2012	Time start:	finish:
UTMZ:	UTMZ:	UTMN:	

Polygon Description

System	[illegible]	[illegible]	[illegible]	[illegible]
☒Terrestrial	☐Organic	☐Lacustrine	☐Plankton	☐Lake
☐Wetland	☒Mineral Soil	☐Riverine	☐Submerged	☐Pond
☐Aquatic	☐Parent Min.	☐Bottomland	☐Floating-LVD.	☐River
[illegible]	☐Acidic Bedrk	☐Terrace	☐Graminoid	☐Stream
☐Open Water	☐Basic Bedrk	☒Valley Slope	☐Forb	☐Marsh
☐Shallow Water	☐Carb. Bedrk	☒Tableland	☐Lichen	☐Swamp
☒Surficial Dep.		☐Roll. Upland	☐Bryophyte	☐Fen
☐Bedrock		☐Cliff	☐Deciduous	☐Bog
[illegible]		☐Talus	☐Coniferous	☐Barren
☒Natural		☐Crevice/Cave	☒Mixed	☐Meadow
☐Cultural		☐Alvar		☐Prairie
[illegible]		☐Rockland		☐Thicket
☐Open		☐Beach / Bar		☐Savannah
☐Shrub		☐Sand Dune		☐Woodland
☒Treed		☐Bluff		☒Forest
				☐Plantation

Stand Description

Layer	HT	CVR	[illegible]
1	1	4	ACERUBR > PINSTRO > ABIEBALS = Hemlock = ACESACC
2	2	3	ACERUBR ≥ ACESACC = ABIEBALS = Hemlock
3	4	3	ACERUBR > ACESACC > ABIEBALS = Hemlock
4	6	3	Bracken Fern = ARANUDI > MIACANA

HT Codes: 7 <0.2m 6 >0.2-0.5m 5 >0.5-1m 4 >1-2m 3 >2-6m 2 >6-25m 1 >25m
CVR Codes: 0 = none 1 0% - 10% 2 10 - 25% 3 25 - 60% 4 > 60%

[illegible]	[illegible]								
	[illegible]	O	<10	A	10-24	A	25-50	O	>50
	[illegible]	R	<10	R	10-24	R	25-50	R	>50
[illegible]	[illegible]	O	<10	R	10-24	R	25-50	R	>50

Abundance Codes: N = None R = Rare O = Occasional A = Abundant

[illegible] ☐ Pioneer ☐ Young ☒ Mid-Age ☒ Mature ☐ Old Growth

[illegible]		[illegible]	
[illegible]		[illegible]	
[illegible]		[illegible]	
[illegible]		[illegible]	

Community Profile Diagram/Comments

Large Forest community with Red Maple throughout mixed [illegible] with varying amounts of White Pine / Balsam Fir / Eastern Hemlock and Sugar Maple

Notes:

Tree Tally by Species

[illegible] 2

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]						100

Soils Ontario and ELC Soils Description

			Pit/Auger #				Summary
Site Metrics	UTM	Zone					
		Easting					Moisture Regime
		Northing					
	Slope	Position					
		Aspect					
		Percent					Drainage
		Slope Length					
Depth to...		Mottles					
		Gley					Effective Texture (indicate below)
		Water Table					
		Carbonates					
		Bedrock					

Soil Horizon Description	1	Depth from zero	% CF		% CF		% CF		% CF
		Texture							
	2	Depth from zero	% CF		% CF		% CF		% CF
		Texture							
	3	Depth from zero	% CF		% CF		% CF		% CF
		Texture							
	4	Depth from zero	% CF		% CF		% CF		% CF
		Texture							
		% Surface Stone/Rock							
	Moisture Regime								
	Drainage								

AECOM

VASCULAR PLANT SPECIES LIST

Project: Bracebridge
Date: July 5, 2012

Species	Overall Abundance	Canopy	Sub-canopy	Understory	Ground Layer	Species	Overall Abundance	Canopy	Sub-canopy	Understory	Ground Layer	Species	Overall Abundance	Canopy	Sub-canopy	Understory	Ground Layer
Trees						**Herbaceous Vegetation**						**Herbaceous Vegetation**					
ACERUBR		A			O	MIACANA					O						
PINSTRO		A				TRIGRAN					R						
PRUSERO		R		R		Bracken Fern					O						
ULMAMER			R			ELMHIST					O						
TILAMER					R	DRYINTE					A						
ACESACC		O	O	O	A	STRAMPL					O						
POPTREM						SMIRACE					R						
FAGGRAN					R	PREALBA					R						
QUERUBR					R	Interrupted Fern					O						
BETPAPI		O	O			ARANUDI					O						
THUOCCI			O		O	Shinleaf					R						
Hemlock		O	O	O	O	Lady Fern					R						
FRAAMER		R			R	CARGRAC					R						
BETALGA		R				SOLRUGO					R						
Tamarack		R			R	CORCANA					R						
White Spruce		R	R	R	R	ONOSENS					O						
						OXAMONT					R						
						ABIBALGA					R						
						PRUVUL					R						
Shrubs/Vines						Starflower					R						
CORALTE				R	O	Goldenthread					O						
Beaked Hazel				"	O	SEIATRO					R						
Mountain Maple				"	O	CARBECK					R						
Unknown Shrub				"	R	Bladder Sedge					R						
Bush Honeysuckle				"	R	Woodland Horsetail					R						
RUBALLG				R	.	Ground Spruce Clubmoss					R						
						Early Goldenrod (CF)					R						

R = Rare, O = Occasional, A = Abundant, D = Dominant

Polygon #: 12
Staff Name(s): RA

ELC
Community Description and Classification

Map #: Bracebridge		Polygon: 13	
Surveyor(s): RA	Date: July 5, 2012	Time start: –	
		finish:	
UTMZ:	UTMZ:	UTMN:	

Polygon Description

System				
☒Terrestrial	☐Organic	☐Lacustrine	☐Plankton	☐Lake
☐Wetland	☒Mineral Soil	☐Riverine	☐Submerged	☐Pond
☐Aquatic	☐Parent Min.	☐Bottomland	☐Floating-LVD.	☐River
	☐Acidic Bedrk	☐Terrace	☐Graminoid	☐Stream
☐Open Water	☐Basic Bedrk	☒Valley Slope	☐Forb	☐Marsh
☐Shallow Water	☐Carb. Bedrk	☒Tableland	☐Lichen	☐Swamp
☒Surficial Dep.		☐Roll. Upland	☐Bryophyte	☐Fen
☐Bedrock		☐Cliff	☒Deciduous	☐Bog
		☐Talus	☐Coniferous	☐Barren
☒Natural		☐Crevice/Cave	☐Mixed	☐Meadow
☐Cultural		☐Alvar		☐Prairie
		☐Rockland		☐Thicket
☐Open		☐Beach / Bar		☐Savannah
☐Shrub		☐Sand Dune		☐Woodland
☒Treed		☐Bluff		☒Forest
				☐Plantation

Stand Description

Layer	HT	CVR	
1	1	4	ACESACC > QUERUBR > ACERUBR
2	2	2	ACESACC >> ACERUBR
3	4	3	ACESACC >> ACERUBR
4	6	2	ACESACC > DRYINTE = ABANUDI = Broken Fern

HT Codes: 7 <0.2m 6 >0.2-0.5m 5 >0.5-1m 4 >1-2m 3 >2-6m 2 >6-25m 1 >25m
CVR Codes: 0 = none 1 0% - 10% 2 10 - 25% 3 25 - 60% 4 > 60%

		O	<10	A	10-24	A	25-50	O	>50
		O	<10	R	10-24	R	25-50	R	>50
BA		R	<10	R	10-24	R	25-50	R	>50

Abundance Codes: N = None R = Rare O = Occasional A = Abundant

	☐ Pioneer	☐ Young	☐ Mid-Age	☒ Mature	☐ Old Growth

Community Profile Diagram/Comments

Sugar Maple Forest with Red Oak/Red Maple/Balsam Fir/Hemlock/
Yellow Birch associates

Notes:

Tree Tally by Species

	2

Species		Tally 2	Tally 3			Rel. Avg.
						100

Soils Ontario and ELC Soils Description

		Pit/Auger #				Summary
Site Metrics	UTM	Zone				Moisture Regime
		Easting				
		Northing				
	Slope	Position				
		Aspect				Drainage
		Percent				
		Slope Length				
Depth to...		Mottles				
		Gley				Effective Texture (indicate below)
		Water Table				
		Carbonates				
		Bedrock				

Soil Horizon Description									
1	Depth from zero		% CF		% CF		% CF		% CF
	Texture								
2	Depth from zero		% CF		% CF		% CF		% CF
	Texture								
3	Depth from zero		% CF		% CF		% CF		% CF
	Texture								
4	Depth from zero		% CF		% CF		% CF		% CF
	Texture								
	% Surface Stone/Rock								
Moisture Regime									
Drainage									

VASCULAR PLANT SPECIES LIST

AECOM

Project: Bracebridge
Date: July 5, 2017

Species	Overall Abundance	Canopy	Sub-canopy	Understory	Ground Layer
Trees					
ACESACC		D	D	O	O
PRUSERO		R	O	O	R
BETALLA		R	O	O	R
QUERUBR		O		O	R
ACERUBR		O		O	R
Hemlock		R			R
TILAMER				R	R
FRAAMER				R	R
ULMAMER				R	
FAGGRAN		R			R
Shrubs/Vines					
RUBIS (soft)					R
Unknown shrub (twin leaf)					R
RUBALBA					R
LONCANA					R
CORALTE					R

Species	Overall Abundance	Canopy	Sub-canopy	Understory	Ground Layer
Herbaceous Vegetation					
SOL CANA					O
Broken Fern					O
ARANUDI					A
SOLRUGO					O
GYLSTRI					R
DRYINTE					O
Unknown Fern					A
PREALBA					O
ELYHIST					O
PRUVULG					R
LECVULG					R
Interrupted Fern					O
Wood Sorrel					R
TRIGRAN					O
SYMMACRO					O
Narrow Beech Fern					R
ONOSENS					R
CARGRAC					R
ASCSYRI					R

Species	Overall Abundance	Canopy	Sub-canopy	Understory	Ground Layer
Herbaceous Vegetation					

R = Rare, O = Occasional, A = Abundant, D = Dominant

Polygon #: 13
Staff Name(s): RA

ELC Community Description and Classification

Map #: Bracebridge		Polygon: 14	
Surveyor(s): RA	Date: July 5, 2012	Time start: –	finish: –
UTMZ:	UTMZ:	UTMN:	

Polygon Description

System	[illegible]	[illegible]	[illegible]	[illegible]
☒Terrestrial ☐Wetland ☐Aquatic [illegible] ☐Open Water ☐Shallow Water ☒Surficial Dep. ☐Bedrock [illegible] ☒Natural ☐Cultural [illegible] ☐Open ☐Shrub ☒Treed	☐Organic ☒Mineral Soil ☐Parent Min. ☐Acidic Bedrk ☐Basic Bedrk ☐Carb. Bedrk	☐Lacustrine ☐Riverine ☐Bottomland ☒Terrace ☒Valley Slope ☐Tableland ☐Roll. Upland ☐Cliff ☐Talus ☐Crevice/Cave ☐Alvar ☐Rockland ☐Beach / Bar ☐Sand Dune ☐Bluff	☐Plankton ☐Submerged ☐Floating-LVD. ☐Graminoid ☐Forb ☐Lichen ☐Bryophyte ☐Deciduous ☐Coniferous ☒Mixed	☐Lake ☐Pond ☐River ☐Stream ☐Marsh ☐Swamp ☐Fen ☐Bog ☐Barren ☐Meadow ☐Prairie ☐Thicket ☐Savannah ☐Woodland ☒Forest ☐Plantation

Stand Description

Layer	HT	CVR	[illegible]
1	1	4	PINSTRO = ACERUBR = Hemlock > ABIBALS > BETPAPI
2	2	3	"
3	4	1	ACERUBR = ABIBALS = Hemlock
4	6	2	ACESACC > MIACANA

HT Codes: 7 <0.2m 6 >0.2-0.5m 5 >0.5-1m 4 >1-2m 3 >2-6m 2 >6-25m 1 >25m
CVR Codes: 0 = none 1 0% - 10% 2 10 - 25% 3 25 - 60% 4 > 60%

[illegible]	[illegible]							
	[illegible]	O	<10	A	10-24	A	25-50	R	>50
[illegible]	[illegible]	R	<10	R	10-24	R	25-50	R	>50

O	<10	A	10-24	A	25-50	R	>50
R	<10	R	10-24	R	25-50	R	>50
O	<10	R	10-24	R	25-50	N	>50

Abundance Codes: N = None R = Rare O = Occasional A = Abundant

[illegible] ☐ Pioneer ☐ Young ☒ Mid-Age ☐ Mature ☐ Old Growth

[illegible]		[illegible]	
[illegible]		[illegible]	
[illegible]		[illegible]	
[illegible]		[illegible]	

Community Profile Diagram/Comments

Large community with pockets where each dominate

Notes:

Tree Tally by Species

[illegible] 2

Species	[illegible]	Tally 2	Tally 3	[illegible]	[illegible]	[illegible]
[illegible]						100

Soils Ontario and ELC Soils Description

		Pit/Auger #				Summary
Site Metrics	UTM	Zone				Moisture Regime
		Easting				
		Northing				
	Slope	Position				Drainage
		Aspect				
		Percent				
		Slope Length				
Depth to...		Mottles				Effective Texture (indicate below)
		Gley				
		Water Table				
		Carbonates				
		Bedrock				

Soil Horizon Description	1	Depth from zero		% CF		% CF		% CF		% CF
		Texture								
	2	Depth from zero		% CF		% CF		% CF		% CF
		Texture								
	3	Depth from zero		% CF		% CF		% CF		% CF
		Texture								
	4	Depth from zero		% CF		% CF		% CF		% CF
		Texture								
		% Surface Stone/Rock								
	Moisture Regime									
	Drainage									

VASCULAR PLANT SPECIES LIST

Project: Bracebridge
Date: July 5, 2022

AECOM

Species	Overall Abundance	ABUNDANCE / LAYER			
		Canopy	Sub-canopy	Understory	Ground Layer
Trees					
PINSTRO		D	D		R
ACERUBR		D	O		
BETPAP1		O	O		
ABIBALS		O		O	
Hemlock		D	O	O	
ACESACC		R		O	A
FAGGRAN				R	R
QUERUBR				R	
POPGRAN		R			
Shrubs/Vines					
CORALTE					O

Species	Overall Abundance	ABUNDANCE / LAYER			
		Canopy	Sub-canopy	Understory	Ground Layer
Herbaceous Vegetation					
MIACANA					A
DRYINTE					O
SOLRUGO					R
Shinleaf					O
Ground Cedar					O
ARANUDI					O
Solomon Seal					R
Ground Pine					O

Species	Overall Abundance	ABUNDANCE / LAYER			
		Canopy	Sub-canopy	Understory	Ground Layer
Herbaceous Vegetation					

R = Rare, O = Occasional, A = Abundant, D = Dominant

Polygon #: 14
Staff Name(s): RA

ELC Community Description and Classification	Map #: Bracebridge		Polygon: 15	
	Surveyor(s): RA	Date: July 6, 2012	Time start: –	finish: –
	UTMZ:	UTMZ:	UTMN:	

Polygon Description

System	Substrate	Topographic Feature	Plant Form	Community
☒Terrestrial	☐Organic	☐Lacustrine	☐Plankton	☐Lake
☐Wetland	☒Mineral Soil	☐Riverine	☐Submerged	☐Pond
☐Aquatic	☐Parent Min.	☐Bottomland	☐Floating-LVD.	☐River
Site	☐Acidic Bedrk	☐Terrace	☐Graminoid	☐Stream
☐Open Water	☐Basic Bedrk	☒Valley Slope	☐Forb	☐Marsh
☐Shallow Water	☐Carb. Bedrk	☒Tableland	☐Lichen	☐Swamp
☒Surficial Dep.		☒Roll. Upland	☐Bryophyte	☐Fen
☒Bedrock		☐Cliff	☐Deciduous	☐Bog
History		☐Talus	☐Coniferous	☐Barren
☒Natural		☐Crevice/Cave	☒Mixed	☐Meadow
☐Cultural		☐Alvar		☐Prairie
Cover		☐Rockland		☐Thicket
☐Open		☐Beach / Bar		☐Savannah
☐Shrub		☐Sand Dune		☐Woodland
☒Treed		☐Bluff		☒Forest
				☐Plantation

Stand Description

Layer	HT	CVR	Species
1	2	6	POPTREM > PICGLAU = PINSTRO
2	2	3	PICGLAU = PINSTRO > POPTREM > ACESACC
3	–	–	Unknown (ASA)
4	–	–	Unknown (ASA)

HT Codes: 7 <0.2m 6 >0.2-0.5m 5 >0.5-1m 4 >1-2m 3 >2-6m 2 >6-25m 1 >25m
CVR Codes: 0 = none 1 0% - 10% 2 10 - 25% 3 25 - 60% 4 > 60%

Stand Composition:	Size Class Analysis	A	<10	A	10-24	R	25-50	N	>50
	Standing Snags	R	<10	R	10-24	N	25-50	N	>50
BA:	Deadfall / Logs	R	<10	R	10-24	R	25-50	N	>50

Abundance Codes: N = None R = Rare O = Occasional A = Abundant

Comm. Age:	☐ Pioneer	☒ Young	☒ Mid-Age	☐ Mature	☐ Old Growth

Ecosite		Code:	
Vegetation Type		Code:	
Inclusion		Code:	
Complex		Code:	

Community Profile Diagram/Comments

POPTREM throughout community with varying amounts of PICGLAU + PINSTRO throughout

Notes:

Tree Tally by Species

Plot Prism: 2

Species	Tally 1	Tally 2	Tally 3	Tally 4	Total	% Avg
Total						100

Soils Ontario and ELC Soils Description

		Pit/Auger #				Summary
Site Metrics	UTM	Zone				Moisture Regime
		Easting				
		Northing				
	Slope	Position				
		Aspect				Drainage
		Percent				
		Slope Length				
Depth to...		Mottles				
		Gley				Effective Texture (indicate below)
		Water Table				
		Carbonates				
		Bedrock				

Soil Horizon Description									
1	Depth from zero		% CF		% CF		% CF		% CF
	Texture								
2	Depth from zero		% CF		% CF		% CF		% CF
	Texture								
3	Depth from zero		% CF		% CF		% CF		% CF
	Texture								
4	Depth from zero		% CF		% CF		% CF		% CF
	Texture								
	% Surface Stone/Rock								
Moisture Regime									
Drainage									

VASCULAR PLANT SPECIES LIST

Project: Brace bridge
Date: July 5, 2012

AECOM

Species	Overall Abundance	ABUNDANCE / LAYER			
		Canopy	Sub-canopy	Understory	Ground Layer
Trees					
POPTREM			O		
PINSTRO			O		
PRUSERO			R		
CRAT SP			R		
ABIBALS				R	
Tamarack			O		
Shrubs					
SPIALBA				D	
RUBALLG					A

Species	Overall Abundance	ABUNDANCE / LAYER			
		Canopy	Sub-canopy	Understory	Ground Layer
Herbaceous Vegetation					
POAPRAT					A
VICCARRA					O
SOLRUGO					O
EUTGRAM					O
HYPPERF					O
Bracken Fern					D
PHEPRAT					O
ASCSYRI					R
Orange Hawkweed					R
Early Goldenrod					R

Species	Overall Abundance	ABUNDANCE / LAYER			
		Canopy	Sub-canopy	Understory	Ground Layer
Herbaceous Vegetation					

R = Rare, O = Occasional, A = Abundant, D = Dominant

Polygon #: 15
Staff Name(s): RA

ELC Community Description and Classification	Map #:		Polygon:	
	Surveyor(s):	Date:	Time start: finish:	
	UTMZ:	UTMZ:	UTMN:	

Polygon Description

System	[illegible]	[illegible]	[illegible]	Community
❑Terrestrial ❑Wetland ❑Aquatic	❑Organic ❑Mineral Soil ❑Parent Min. ❑Acidic Bedrk ❑Basic Bedrk ❑Carb. Bedrk	❑Lacustrine ❑Riverine ❑Bottomland ❑Terrace ❑Valley Slope ❑Tableland ❑Roll. Upland ❑Cliff ❑Talus ❑Crevice/Cave ❑Alvar ❑Rockland ❑Beach / Bar ❑Sand Dune ❑Bluff	❑Plankton ❑Submerged ❑Floating-LVD. ❑Graminoid ❑Forb ❑Lichen ❑Bryophyte ❑Deciduous ❑Coniferous ❑Mixed	❑Lake ❑Pond ❑River ❑Stream ❑Marsh ❑Swamp ❑Fen ❑Bog ❑Barren ❑Meadow ❑Prairie ❑Thicket ❑Savannah ❑Woodland ❑Forest ❑Plantation
Site: ❑Open Water ❑Shallow Water ❑Surficial Dep. ❑Bedrock				
[illegible]: ❑Natural ❑Cultural				
Cover: ❑Open ❑Shrub ❑Treed				

Stand Description

Layer	HT	CVR	[illegible]
1			
2			
3			
4			

HT Codes: **7** <0.2m **6** >0.2-0.5m **5** >0.5-1m **4** >1-2m **3** >2-6m **2** >6-25m **1** >25m
CVR Codes: **0** = none **1** 0% - 10% **2** 10 - 25% **3** 25 - 60% **4** > 60%

[illegible]			<10	10-24	25-50	>50
		[illegible]	<10	10-24	25-50	>50
BA:		[illegible]	<10	10-24	25-50	>50

Abundance Codes: **N** = None **R** = Rare **O** = Occasional **A** = Abundant

Comm. Age:	☐ Pioneer	☐ Young	☐ Mid-Age	☐ Mature	☐ Old Growth

Ecosite		Code:	
Vegetation Type		Code:	
Inclusion		Code:	
Complex		Code:	

Community Profile Diagram/Comments

Notes:

Tree Tally by Species

[illegible] 2

Species	[illegible]	Tally 2	Tally 3	[illegible]	[illegible]	[illegible]
[illegible]						100
[illegible]						
[illegible]						

Soils Ontario and ELC Soils Description

		Pit/Auger #				Summary
Site Metrics	UTM	Zone				Moisture Regime
		Easting				
		Northing				
	Slope	Position				
		Aspect				Drainage
		Percent				
		Slope Length				
Depth to...		Mottles				
		Gley				Effective Texture (indicate below)
		Water Table				
		Carbonates				
		Bedrock				

Soil Horizon Description	1	Depth from zero		% CF		% CF		% CF		% CF
		Texture								
	2	Depth from zero		% CF		% CF		% CF		% CF
		Texture								
	3	Depth from zero		% CF		% CF		% CF		% CF
		Texture								
	4	Depth from zero		% CF		% CF		% CF		% CF
		Texture								
		% Surface Stone/Rock								
	Moisture Regime									
	Drainage									

ELC Community Description and Classification

Map #: Bracebridge		Polygon: 15	
Surveyor(s): RA	Date: July 5, 2012	Time start: –	finish: –
UTMZ:	UTMZ:	UTMN:	

Polygon Description

System				
☒Terrestrial ☐Wetland ☐Aquatic	☐Organic ☒Mineral Soil ☐Parent Min. ☐Acidic Bedrk ☐Basic Bedrk ☐Carb. Bedrk	☐Lacustrine ☐Riverine ☐Bottomland ☐Terrace ☒Valley Slope ☒Tableland ☐Roll. Upland ☐Cliff ☐Talus ☐Crevice/Cave ☐Alvar ☐Rockland ☐Beach / Bar ☐Sand Dune ☐Bluff	☐Plankton ☐Submerged ☐Floating-LVD. ☒Graminoid ☐Forb ☐Lichen ☐Bryophyte ☒Deciduous ☐Coniferous ☐Mixed	☐Lake ☐Pond ☐River ☐Stream ☐Marsh ☐Swamp ☐Fen ☐Bog ☐Barren ☒Meadow ☐Prairie ☒Thicket ☐Savannah ☐Woodland ☐Forest ☐Plantation
☐Open Water ☐Shallow Water ☒Surficial Dep. ☐Bedrock				
☒Natural ☐Cultural				
☒Open ☒Shrub ☐Treed				

Stand Description

Layer	HT	CVR	
1		0	
2	2	2	PINSTRO>POPTREM
3	6	4	Bracken Fern >SPIALBA
4	7	4	POAPRAT

HT Codes: 7 <0.2m 6 >0.2-0.5m 5 >0.5-1m 4 >1-2m 3 >2-6m 2 >6-25m 1 >25m
CVR Codes: 0 = none 1 0% - 10% 2 10 - 25% 3 25 - 60% 4 > 60%

Stand composition:									
		O	<10	N	10-24	N	25-50	N	>50
		N	<10	N	10-24	N	25-50	N	>50
BA:		N	<10	N	10-24	N	25-50	N	>50

Abundance Codes: N = None R = Rare O = Occasional A = Abundant

Comm. Age	☒ Pioneer	☐ Young	☐ Mid-Age	☐ Mature	☐ Old Growth

Ecosite			
Vegetation Type			
Inclusion			
Complex			

Community Profile Diagram/Comments

Broken Fern / SPIALBA CUT/CUM

Notes:

Tree Tally by Species

	2

Species						
						100

Soils Ontario and ELC Soils Description

		Pit/Auger #				Summary
Site Metrics	UTM	Zone				Moisture Regime
		Easting				
		Northing				
	Slope	Position				
		Aspect				Drainage
		Percent				
		Slope Length				
Depth to...		Mottles				Effective Texture (indicate below)
		Gley				
		Water Table				
		Carbonates				
		Bedrock				

Soil Horizon Description										
1	Depth from zero		% CF		% CF		% CF		% CF	
	Texture									
2	Depth from zero		% CF		% CF		% CF		% CF	
	Texture									
3	Depth from zero		% CF		% CF		% CF		% CF	
	Texture									
4	Depth from zero		% CF		% CF		% CF		% CF	
	Texture									
	% Surface Stone/Rock									
Moisture Regime										
Drainage										

VASCULAR PLANT SPECIES LIST

Project: Broccbridge
Date: July 4, 2012

AECOM

Species	Overall Abundance	ABUNDANCE / LAYER			
		Canopy	Sub-canopy	Understory	Ground Layer
Trees					
FRANIGR			D		
ACERUBR			D	O	
ULMAMER			O	O	
PINSTRO		R	A		
POPTREM		D	A		
White Spruce		R	A		
BETPAP			A		
TILAMER			A		
THUOCC			A	R	
Shrubs/Vines					
SPIALBA				D	
ALNINC				O	

Species	Overall Abundance	ABUNDANCE / LAYER			
		Canopy	Sub-canopy	Understory	Ground Layer
Herbaceous Vegetation					
PHAARUN					O
IMPCAPE					O
JUNEFFU					O
CARSTRI					R
Scirpus Atrovirens (GH)					O

Species	Overall Abundance	ABUNDANCE / LAYER			
		Canopy	Sub-canopy	Understory	Ground Layer
Herbaceous Vegetation					

R = Rare, O = Occasional, A = Abundant, D = Dominant

Polygon #: 9
Staff Name(s): RA

Appendix D: Oak Monitoring Information

AECOM
50 Sportsworld Crossing Road, Suite 290 519.650.5313 tel
Kitchener, ON, Canada N2P 0A4 519.650.3424 fax
www.aecom.com

Communication Record

Date	Thursday, January 17, 2013	Time	10am to 1:30pm
Between	Jillian deMan, Terrestrial and Wetland Ecologist AECOM	and	Mike White, Forester, MNR – Bracebridge and Kim Benner, District Planner Ministry of Natural Resources, Bracebridge
Telephone #	Site visit	Project #	60241537
Project Name	Bracebridge Transportation By-Pass		
Subject	Red Oak Stand Location Fieldwork		

PLEASE NOTE: If this communication record does not agree with your records of the meeting, or if there are any omissions, please advise. Otherwise it will be assumed that the contents of this record are correct.

Comments

The following provides the main points of conversation:

- Located six monitoring stands west of Hwy 11 and three monitoring stands east of Hwy 11
- MNR does not have a lot of data, or it seems, concerning these areas. This is despite observing several colours of flagging tape within each of the plots. Mike will be investigating this further.
- The monitoring stands were geo-referenced using a hand-held GPS by Jillian. They were labeled; Oak 1, Oak 2, Oak 3, Oak 4, Oak 5, Oak 6, Oak burn 1, Oak burn 2 and Oak plant.
- These points were later (January 22, 2013), mapped by Rayna Carmichael.
- The area in which Oak 1 through Oak 6 stands are located is slated for selective harvest within the next 5 years.
- The Oak 1 through Oak 6 stands contain young trees that are on average 15 years in age (as suspected by Mike). They are visible from the trail as they are shorter, more dense and younger than the surrounding forest.
- The Forest Management Plans for this area can be found online. If we are having difficulty finding these, Mike can send them to AECOM directly.
- Metal stakes with blue flagging tape was found within Oak 1 through Oak 6. Mike was not sure what these meant, but they looked new.
- The Oak Burn stands 1 and 2 have been burned at least 3 times. It is not known when the last burn occurred.
- The Oak Plant stand is one that was planted with several oak trees. Now, it seems over-run by beech.

- There is an additional area which contains strips of oaks. This was part of a study which studied the best way to produce the most suckering. It was trimming the oak plants to the bare ground. This project cost MNR at least 1 million, as several hundred oaks that were genetically identical were used for the study. There were six strips approx 66ft wide and 150ft long planted by hand. Mike could not locate this area.
- Phung Tran will be leaving the Bracebridge office next week. Her replacement is Megan Bonafont. Kim Benner assured Jillian that this transition will be seemless.

Additional data for each of the plots are as follows:

Oak 1 – rep photos taken. Young maples dominate with some oak. It appears this plot has been clipped recently, possibly by the Junior Rangers. GPS co-ordinates taken.

Oak 2 – rep photos taken. East facing stand. Not a lot of oak re-growth. Dominated by ironwood and maple

Oak 3 – rep photos taken.

Oak 4 – rep photos taken. A snow gauge is located within this stand. At time of investigation, snow depth was 8 cm.

Oak 5 – rep photos taken. Dominant trees include maple and ironwood.

Oak 6 – rep photos taken.

Oak burn 1 – Jillian and Mike identified the location of this area. Jillian later in the day identified the extent looking at tree age, flagging tape and areas that appeared to be grubbed along the edge. Rep photos taken.

Oak burn 2 – Jillian and Mike identified the location of this area. Jillian later in the day identified the extent looking at tree age, flagging tape and areas that appeared to be grubbed along the edge. Rep photos taken.

Oak Plant – planted oaks. Rep photos taken. Jillian and Mike identified the location of this area. Jillian later in the day identified the extent looking at tree age and flagging tape/pins.

Day 3: Stop 1
Group Openings – across from Bracebridge District Office or Bracebridge Resource Management Centre – West Side Story

1. Small group opening

(WGS 84/Zone 17T E 0633311 N 4995088)

Site History:

- 1978 - Single tree selection cut
    - This light cut released natural regeneration that was already established in understory of hardwood stand
- 1998 – Expanded small gaps created during previous cut
    - Oak regeneration responded well but all suppressed by competing vegetation
- 2000 – counted all oak regeneration = 435 in this gap = 12,000 stems/ha
- July 15, 2006 – Release of red oak regeneration by manual cutting (sandviks and clippers) of competitors at 50-75 cm above the ground.
    - Oak did not respond right away – stagnated until 2008, when a small growth response was observed.
    - Frost and scale insects affected the released/exposed red oak in 2007

Lesson learned:

- If oak gets suppressed, it doesn't respond to release treatment right away – delayed response.
- Might be attributed to a rebuilding of the root system before allocating resources to shoot growth.
- Slow response might cause them to get overtopped again by recovering competing vegetation.

Do not let red oak regeneration get overtopped and suppressed!

Figure 1. Scale insect on red oak.

Figure 2. Released red oak in small group opening.

2. Un-cut area next to group opening #1

- Advanced red oak regeneration in understory
- Cycling through before and since 1978 selection cut
- Most about 30 cm tall

Question:
How badly suppressed can oak growing in the understory of a full canopy be before they stop responding to release?

3. Large group opening – east exposure

(WGS 84/Zone 17T E 0633091 N 4995418)

Site History:

- 1978 - Single tree selection cut
    - This light cut released natural regeneration that was already established in understory of hardwood stand
- 1998 – Created large opening (1.5 times canopy height) with an eastern exposure, mid-slope
    - Natural oak regeneration became established but only 1 or 2 survived
    - Most died from suppression by competing vegetation
    - Most aggressive competitors were stump sprouts from small diameter hardwoods (ironwood, red maple, sugar maple, etc)
    - Some oak died after reaching 3.5 m in height!

Lesson learned:

- The most aggressive competitors are stump sprouts from small diameter (5-15 cm) hardwoods
- Oak regeneration can die from suppression even after it reaches 3.5 m in height

Treat stumps of competing hardwoods to prevent stump sprouting!
Do not get complacent – don't stop monitoring!

Figure 3. Rapid growth of maple and other hardwoods creates very low light levels under which red oak cannot survive.

4. Large group opening – east exposure

(WGS 84/Zone 17T E 0632988 N 4995558)

Site History:

- 1978 - Single tree selection cut
    - This light cut released natural regeneration that was already established in understory of hardwood stand
- 1998 – Created large opening (1.5 times canopy height), eastern exposure, mid-slope
    - Same observations as previous opening
    - Oak stump sprouts are the only survivors, but still don't look very good
    - Tending is critical

Lesson learned:

- Tending is critical when creating group openings.
- Tending is more critical on north and east slopes – tend sooner, wider, and possible more often.
- Tending may be less critical or fewer treatments may be needed on top of slope, and on west and south exposures.

Figure 4. Oak stump sprouts are almost the only survivors in large group openings.

5. Large group opening – east exposure – planted and tended

(WGS 84/Zone 17T E 0632960 N 4995725)

Site History:

- 1978 - Single tree selection cut
    - This light cut released natural regeneration that was already established in understory of hardwood stand
- 1998 – Created large opening (1.5 times canopy height), eastern exposure, mid-slope
- 1999 – Planted red oak in north end of the opening.
- 2006 – Release of red oak regeneration by manual cutting (sandviks and clippers) of competitors at 50-75 cm above the ground.
    - Oak did not respond right away – stagnated until 2008, when a small growth response was observed.
    - Frost and scale insects affected the released/exposed red oak in 2007
    - If not tended, it would have looked like the previous two openings.

6. Large group opening – top of slope, shallow soil, planted white pine, natural red oak

(WGS 84/Zone 17T E 0632937 N 4995771)

Site History:

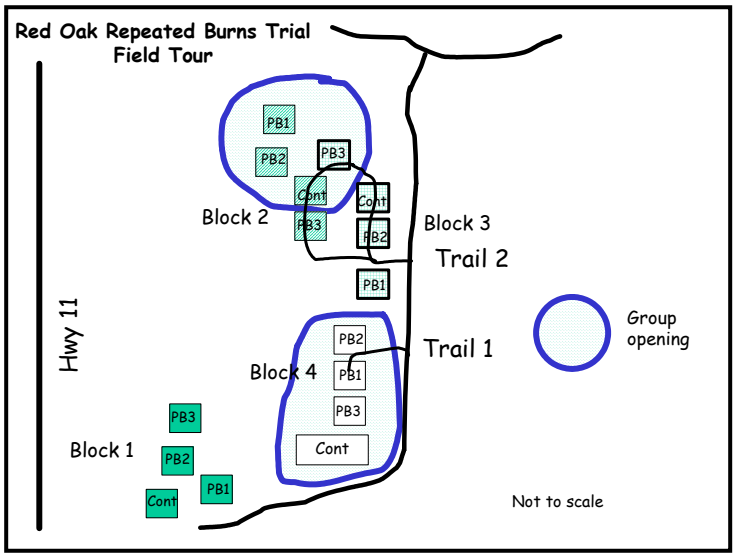
- 1978 - Single tree selection cut
    - This light cut released natural regeneration that was already established in understory of hardwood stand
- 1998 – Created large opening (1.5 times canopy height), eastern exposure, top of slope, shallow soil
- 1999 – Planted white pine
    - Lots of oak regeneration – waist-high under bracken fern, taller near the hardwoods
    - Oak is more exposed on this site – more susceptible to deer, frost, scale insects, and maybe moose
    - Best quality oak seem to be those with lateral competition
    - Easy site – only condition where you might get away with no tending or only treating competitor stump sprouts
    - If not tending at all – hardwood competitors will get best microsites.

Lesson learned:

- Oak quality is improved if it has some lateral competition
- Over-exposed oak are more susceptible to deer, frost, scale insects, and moose
- Less tending is needed on thin soils on ridge tops or top of slopes – but if no tending at all, competing hardwoods will get best microsites.

Some competition can improve quality, but too much competition can cause mortality.

Day 3: Stop 2
Bracebridge Resource Management Centre (BRMC) – East Side Story
Repeat Prescribed Burns for Red Oak Regeneration



Red Oak Tour # 2 – September 8 to 12, 2008

WGS 84/Zone 17T E 0633208 N 4995822

Objective

To examine the effects of consecutive prescribed burns on the sprouting capacity, survival, and growth of red oak regeneration, and the development of other woody vegetation.

Site History

- Initiated in 1992 by Dave Deugo, Parry Sound District, Andy Mutchmor and Andrée Morneault, Southcentral Sciences Section, Ontario Ministry of Natural Resources.
- Forest Resource Inventory in 1981 described the stand as Or_5 Mh_3 By_1 Po_1, 140 years old, 80% stocked.
- In 1990, stand was cut using the shelterwood method. New stand composition was Or_9 Mh_1.
- By 1992, red oak stocking was approximately 30,000 stems per hectare: 41% of all woody stems on the site. Other woody vegetation ranged from 33,000 to 66,000 stems per hectare. Red maple was the most abundant woody plant, followed by sugar maple, ironwood, viburnum, and beaked hazel. Most woody vegetation overtopped the regenerating oak.
- Burns implemented on selected plots in spring 1992, 1993, and 1994
- Large group openings (0.5 ha – 80 m diameter) created over Blocks 3 and 4 in winter 2002/2003.

Study Design

- Randomized complete block design, blocked on slope position
- 4 Blocks, 4 treatment plots (30 x 30 m) per block
- 4-10 m^2 circular sample subplots per treatment plot
- Treatments include prescribed burning in:
    - spring of 1992 (PB1),
    - spring of 1992, and 1993 (PB2)
    - spring of 1992, 1993, and 1994 (PB3), and
    - no burning (Control).
- Ninety-six red oak seedlings per treatment were numbered and pinned; half were 1- to 2-years old and the remaining ranged from 3- to 10-years old. Seedling survival and growth were recorded before the burns and periodically after the treatments were completed.
- The percent ground cover, heights and density of each tree (included red oak), tall shrub, and tall herbaceous species were also assessed within 10 m^2 plots (4 plots per treatment x 4 replicates = 16 plots).
- The first burn was ignited May 7, 1992, the second on April 27, 1993 and the third on May 2, 1994.

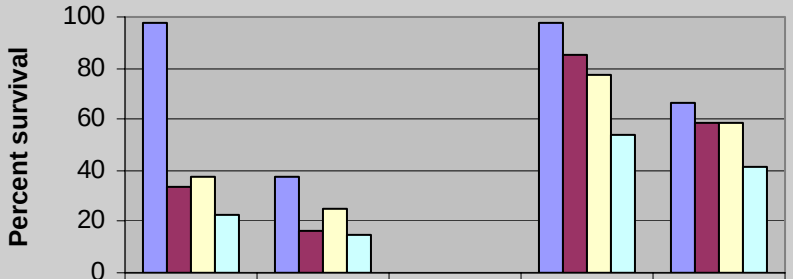
Preliminary Results and Trends

Oak survival

- Oak seedling survival appears to be related to their age before treatment. Increasing the number of consecutive burns reduced the ability of seedlings to re-sprout and survive, especially in the 1- to 2-year-old oaks (Figure 1). After 7

years, survival of the 1-2 year old red oak seedlings in the control plots was reduced to 38%, probably a result of poor light conditions.

Figure 1. Effect of red oak seedling age before treatment on survival after treatment.



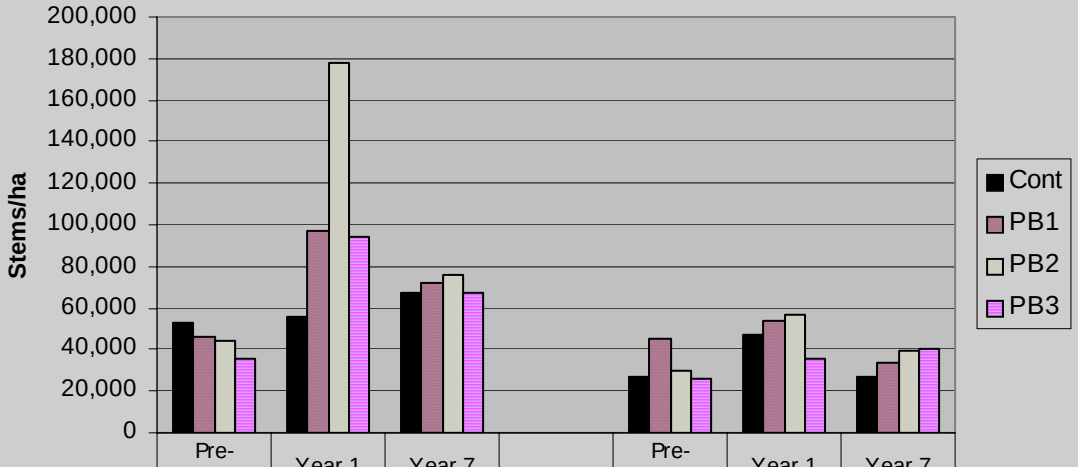
	Year 1	Year 7		Year 1	Year 7
Cont	98	38	0	98	67
PB1	33	17	0	85	58
PB2	38	25	0	77	58
PB3	23	15	0	54	42

1-2 year old **3-10 year old**

Number of stems

- The immediate effect of the burns on the total number of stems of woody vegetation (other than red oak), as noted one year after treatment (Year 1), was an exponential increase in number of stems after each consecutive burn (Figure 2).
- There were almost twice as many stems on the burn once (PB1) treatment than on the no-burn treatment (Cont) and there were almost twice as many stems on the burn two times (PB2) treatment compared to the burn once treatment.
- This exponential response did not occur after the third burn.
- Most species of vegetation respond to fire by producing increasing numbers of sprouts at the base of the stems with each fire - thus the exponential response.
- Red oak is one of the species that does not respond in that way.
- However, most species are not able to maintain that sprouting response after three consecutive burns.
- During the next 7 years, there was a thinning of sprouts, with the weaker, smaller diameter stems dying off and only the strongest surviving (Figure 2, Year 7).
- Woody vegetation is still more numerous than red oak on all treatments.

Figure 2. Number of stems over time in response to treatments.

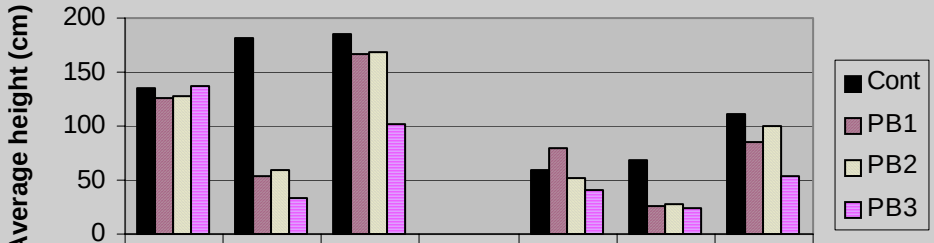


	Pre-treatment	Year 1	Year 7		Pre-treatment	Year 1	Year 7
Cont	52,813	56,000	67688	0	27,063	47,000	27,000
PB1	45,750	97,000	71813	0	45,063	54,000	34,000
PB2	44,563	178,000	76313	0	29,813	57,000	39,000
PB3	35,625	94,000	67688	0	26,063	36,000	40,000
	Woody Vegetation				**Red Oak**		

Height

- The immediate effect of the burn treatments (Year 1, Figure 3) was a reduction in the height of all vegetation.
- By Year 7, the woody vegetation exceeded pre-treatment heights in all burn treatments except the burn three times (PB3) treatment. Red oak is overtopped by neighbouring woody vegetation in all treatments.

Figure 3. Height of vegetation in response to treatments.



	Pre-burn	Year 1	Year 7		Pre-burn	Year 1	Year 7
Cont	136	181	186	0	59	68	112
PB1	126	54	166	0	79	26	85
PB2	128	60	168	0	51	27	100
PB3	137	33	101	0	40	25	54

Woody Vegetation **Red Oak**

Bracken fern and blackberry

- Repeated burns stimulate bracken fern, especially the three-burn treatment (Figure 4). Burning also stimulated blackberry, but consecutive burns tended to reduce its cover (Figure 5). This reflects the different reproductive strategies of the two species. Bracken fern produces new fronds from buds on its extensive root system that are stimulated to grow when the above ground portion is killed by fire. The root system is located in the mineral soil where it is protected from the heat produced by surface fires. New blackberry plants are produced from seeds that are dormant in the duff layer. They are stimulated by a disturbance, such as fire, to germinate and grow. Existing stems are killed by fire. Most seeds will germinate after one fire, but fewer are left to continue producing new plants after each fire.

Figure 4. Percent Ground Cover of bracken fern one year after treatment.

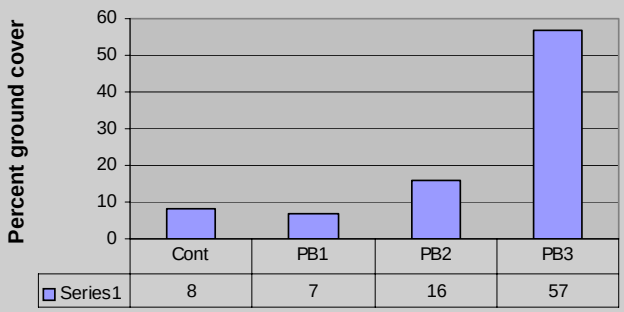
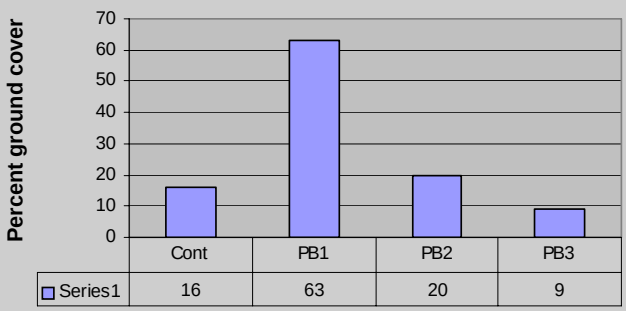


Figure 5. Percent ground cover of blackberry one year after treatment.



Blowdown

- In 1996, a windstorm blew down some overstory trees in the trial area. This opened the canopy in several of the plots. When the data for those plots was examined, it appeared as though red oak increased in height growth in response to the increased light (Figure 6) and was now in a co-dominant position (Figure 7). In the burn twice treatment (PB2), 7 plots were opened up and 9 plots were not, providing us with the opportunity of compare the response of red oak to this overstory release.

Figure 6. Height growth of pinned oak in response to blowdown in PB2 plots

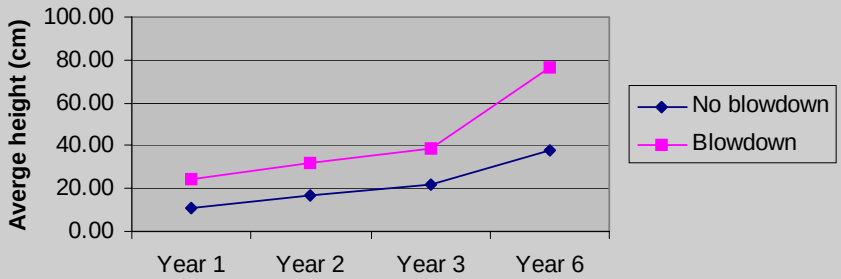
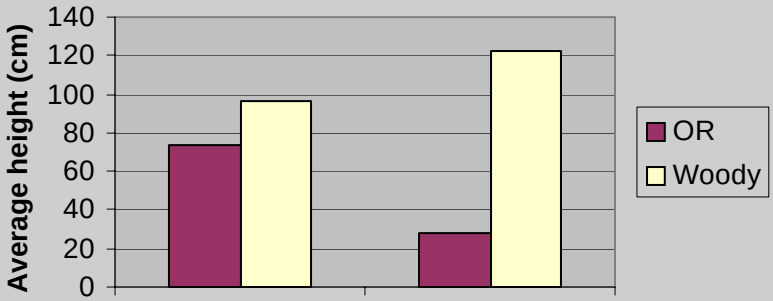


Figure 7. Average height of red oak and woody vegetation in plots that were burned twice: with blowdown in 1996 and without.



Conclusions and Insights

- Older seedlings (3 years old or more) withstand repeated burns better than young seedlings. Operational implications: if you are using prescribed fire in an area and relying on sprouting of natural regeneration, wait at least 3 years before implementing multiple burn treatments.
- Overstory crown thinning within a few years following the final burn treatment will favour red oak regeneration.
- The immediate effect of burning is a reduction in the height of existing vegetation. This provides the manager with a short window of opportunity to encourage vigorous growth of red oak. This can be done by increasing light to the regenerating oak through a crown thinning, and by carefully monitoring the relative growth of red oak and competing vegetation for timely intervention with a broadcast (another burn) or selective control treatment (basal bark, manual tending). Do not wait 7 years!
- Three burns appear to set existing vegetation back to zero. Competition is controlled, few red oak seedlings survive, and bracken fern increases in cover. Re-growth of trees (including red oak) and tall shrubs appears to be dependant on new recruitment.

Lessons Learned:

- For ridge tops dominated by an oak overstory, with a low density of tolerant hardwoods, one burn may be sufficient to reduce competition and encourage oak density. A selective tending treatment may not be required, but an overstory crown thinning should be planned within a few years to encourage red oak growth.
- For upper slopes dominated by an oak overstory, but with a higher density of tolerant hardwood regeneration, two burns followed by an overstory treatment appears to be most effective. A selective tending treatment may also be required.
- For lower slopes and slope bottoms, three burns may be required to reduce competition. A bumper acorn crop or planting will be required to establish oak regeneration after competition control.

Different number of burns needed based on slope position and/or understory dominance by tolerant hardwoods.

Project 2. Red Oak Response to Overstory and Understory Removal

Objective:

To measure the response of red oak and major competitors (red maple and ironwood) to overstory removal and competition control.

Methods:

This study was established within the repeated burns trail using Blocks 3 and 4. Thirty red oak seedlings were located, tagged and pinned in each of the old treatment plots: 10 in each of three height classes: <50 cm, 50-1.5 m, > 1.5 m.

Half of the red oak stems in each height class were randomly chosen and released using a basal bark treatment of all non-oak stems within a 1 m radius of the selected red oak. These treated stems will be used to assess the response of red oak to overstory and understory release.

The untreated red oak will be used to assess the effect of simply removing the overstory. One red maple and one ironwood stem located closest to untreated red oak will also be used to assess the effect of overstory removal on the most common competitors, thus providing much needed data on the relative response of red oak and its competitors following a removal cut.

Measurements were taken before understory and overstory removal treatments in summer 2002. The overstory was removed in winter 2002/2003 and the oak and competition were re-located in summer 2003. The oak and competitors were re-measured in 2007. Measurements include: total height, diameter at 10 cm above the ground, DBH (for the taller stems), and dominance class (a measure of competitive status: open grown, co-dominant, or suppressed). Data analysis and reports are in progress.

Figure 1. Red oak in control plot. As seen on other stops, red oak can grow on shallow dry sites without vegetation management; however, only trees in specific microsites (e.g. lack of overtopping vegetation) are able to thrive. Those that survive, like the one that Jon Marriott is holding, have nice form (e.g. straight stems, no lower branches). So, the ones that manage to grow have good form, but not there are not enough.

Figure 2. One burn stimulates the regrowth of all vegetation and red oak must battle it out with the rest. On shallow, dry sites, one burn reduces the height of the competing vegetation, thus equalizing the competitive status of trees. A larger number of red oak will grow into a co-dominant position compared to the control plots. However, on rich sites, another treatment would be needed within a few years to ensure red oak survival.

Figure 3. Two burns appear to favour red oak over other competitors on these shallow, dry sites. A blow-down event that opened up the canopy 3 years after the second burn simulated an early overstory removal on this plot. This treatment resulted in the tallest oak, the tallest competitors, and the most oak in dominant and co-dominant positions.

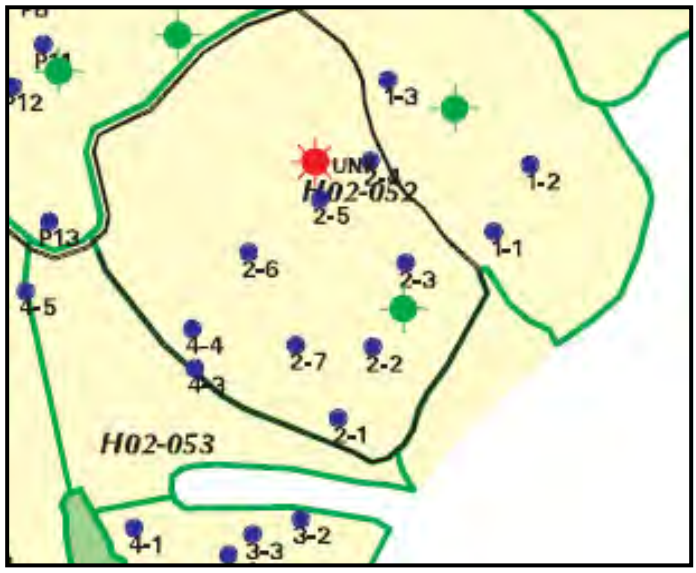
Figure 4. Three consecutive burns killed all existing hardwoods trees and shrubs and left a carpet of bracken fern on the site. The seedbed remained receptive for several years, allowing new red oak seedlings to establish under the bracken.

Figure 5. On left, red oak seedling struggling to survive under bracken fern. On right, red oak seedling that made it through. The effect of bracken fern on red oak survival is not well understood. How many will make it through? When the oak make it through, they are very vulnerable to deer browsing.

Day 3: Stop 3
Bracebridge Resource Management Centre (BRMC) – East Side Story - Group openings

Site History:

- 2002 Group selection
- 2002 planted with red oak container and bareroot stock
- 2003 basal bark treatment
- 2006 manual tending
- Main competitors are rubus species (raspberry and blackberry)
- First opening failed – why?
    - Bad planting stock?
    - Too much raspberry?
- Second opening succeeded – why?



2002 Red oak planting:
4-4: 95 bareroot
4-3: 173 bareroot
2-1: 58 container, 91 bareroot (*WGS 84/Zone 17T E 0633695 N 4990096)*
2-3: 110 container
2-4: 250 bareroot (*WGS 84/Zone 17T E 0633711 N 4996449)*

Planting occurred before the harvest operation – how much disturbance occurred during the harvest? What season did they harvest? Maybe there was more machine traffic and disturbance in the first opening.

Figure 1. Group opening with no oak. Group number 2-1 was planted with almost 150 red oak seedlings in 2002. But very few to be found in 2008. We spent 15 minutes looking for red oak and each person in the photo on the right is standing next to an oak – no oak in between them. Why such poor survival? Was it the raspberry? The effect of red raspberry on red oak is not well understood.

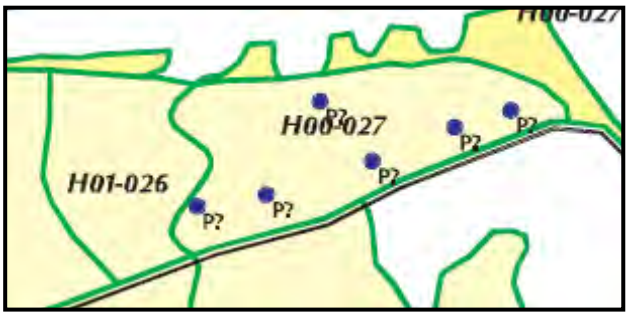
Figure 2. Group opening with oak. Group number 2-4 was planted with 250 red oak in 2002 and most are doing fine in 2008. Some are over 1 m in height and above the competition. What was the difference? Site and competitive species may have been a factor. This opening had a mix of raspberry and blackberry and the cover of those species was a less dense than in the previous opening.

Shelterwood

(*WGS 84/Zone 17T E 0633901 N 4996711, E 0633993 N 4996740, E 0634169 N 4996815)*

Site History:

- 2000-2001 Regeneration cut of the shelterwood system
    - No market for poor quality maple and birch
    - Not thinned from below
    - Site can grow good quality pine and oak
    - Released advanced red oak regeneration
    - New red oak regeneration established after cut



- Planted some pine in 2001 following blade scarification in small openings
    - Natural white pine and red oak established in scarified patches
    - Appears too open for good quality oak – frost, deer, scale insects
- 2007 (H00) and 2008 (H01): Red oak tended using bend-and-break technique
    - Vegetation is re-growing
    - Does bend and break work better on some species than others?

- Oak will need to keep ahead of re-growth – was it too suppressed before treatment? Will it have a delayed response?
- Should the vegetation be cut lower?

Points for discussion:

- Red oaks are smaller on the skid trail – why?
  - More deer browse?
  - Compaction?
  - Both?
- Red oaks off skid trail are sometimes smaller, sometimes taller – why?
  - More competition?
- Always less competition on skid trails
- Thinning from below in shelterwood cuts is critical when managing for red oak and white pine. What are the options when this is not done? These species appear to grow well under high shade if they have no competition (white pine) or no overtopping competition (red oak) in the understory, or in low shade, where there is no residual canopy, and they are only being shaded, but not completely overtopped by neighbouring understory vegetation. But what can you do if the stand hasn't been thinned from below when the shelterwood cut was done?
  - More tending?
  - Release cut?
  - Final removal?

Figure 1. Area in foreground was scrapped with bulldozer blade and natural white pine and red oak established. The area in the background is reflective of the rest of the stand. There is some red oak scattered throughout the area, especially on and along skid trials, but maintaining the survival and vigor of this regeneration will be a challenge, and will be highly unlikely without another treatment.

Figure 3. Oak and pine in area that was scraped with small bulldozer.

Day3: Stop4
Bracebridge Resource Management Centre:
Red Oak Plantings in Strip cuts

WGS 84/Zone 17T E 0633272 N 4995077

Figure 1. Strip cuts on west side of Hwy 11, across from the Bracebridge Resource Management Centre (1986).

Figure 2. Site preparation – heavy bulldozer blading (1986).

Site A – Root Pruning and Top Clipping of Planted Nursery Stock

Year Planted: 1987
Site Preparation: Bulldozer blading

Planting History:

- 1+2 red oak nursery stock planted spring 1986.
- Stock was root pruned as recommended by Paul Johnson's research work in U.S (Fig 3)
- Stock was top clipped in spring 1987.
- Research indicated that this combination of treatments leads to vigorous sprouting.

Conclusions:

- Combination of top clipping and open growing resulted in multiple stems and heavy browsing.
- Noted a variability of stock appearance, possibly related to the site, light and stock source.
- Stems bordering the edges of strips show more height growth and less browsing by deer.

Figure 3. Root pruning the 1+2 bareroot red oak planting stock (1987).

Site B – No Root Pruning or Top Clipping of Planted Nursery Stock

Year Planted: 1987
Site Preparation: Bulldozer blading

Planting History:

- 1+2 red oak nursery stock planted spring 1987.
- This stock was NOT root pruned and top clipped.
- Some stock was planted in vexar netting which helped prevent browsing when stock grew inside the netting.

Conclusions:

- Variability is growth is evident, similar to Site A, likely due to browsing and genetics of nursery stock.
- When comparing treatments, there appears to be no difference in stock height or survival.
- It appears that root pruning and top clipping did not provide and appreciable return for these extra treatments on this landform (well-drained, flat sandy plain).

Figure 4. Planting without root pruning (left) and vexar netting (right) in 1987.

Site C – Acorn Sowing Trial

Year Planted: 1988
Site Preparation: Bladed prior to sowing

Planting History:

- Acorns were sown 2 feet apart using three types of planting tools: spear, dibble and spade

Conclusions:

- The red oak growing on the outside rows, closest to the shade competition had better survival rates than rows closer to the centre of the strip.
- There was higher mortality than in strips planted with bare-root stock.

Lessons Learned:

- **Big stock is great but costly**
- **1 yr olds OK**
- **Heavy losses to browsing if growing alone**
  - **some competition is good**
- **Heavy losses to competition if overtopped**
- **Sowing was not as effective as planting**
- **Protection? Probably not with vexar netting**

Observations from 2008 tour:

- The strips are now fully stocked to red oak. Most of the oak are still showing poor form associated with open-grown conditions during establishment (Fig. 5).
- Conversions using strip cuts can work!
- Heavy site preparation on this type of site can essentially sanitize the site from competing vegetation. Strips that were not as heavily bladed or that did not get site preparation had less success – too much competition.
- Vexar netting did not break down and it sometimes actually killed the oak by girdling.

Figure 5. Red oak saplings are now 4 m to 5 m in height and approaching 10 cm in DBH. Deer browsing damage is no longer evident; however, the branchiness caused by the open grown conditions during establishment is still affecting the form of the trees.

Appendix E: Breeding Bird Data

Common Name	Scientific Name	Status						Area-sensitive (OMNR[c])	Significant in Region 6 (south-central)	Significant in Region 7 (south)
		Species at Risk (national) [a]	SARA (*Species at Risk Act*) status	SARA Schedule	Species at Risk (SARO)[a]	Provincially Rare (NHIC breeding season SRANK) [b]	Identified in Partners in Flight Ontario BCR 13 Landbird Conservation Plan			
Alder Flycatcher	*Empidonax alnorum*									
American Crow	*Corvus brachyrhynchos*									
American Goldfinch	*Cardeulis tristis*									
American Redstart	*Setophaga ruticilla*							A		
American Robin	*Turdus migratorius*									
American Woodcock	*Scolopax minor*									
Barn Swallow	*Hirundo rustica*				THR					
Barred Owl	*Strix varia*							A		Y
Belted Kingfisher	*Ceryle alcyon*						√			
Black-and-white Warbler	*Mniotilta varia*							A		
Blackburnian Warbler	*Dendroica fusca*							A		Y
Black-capped Chickadee	*Poecile atricapillus*									
Black-throated Blue Warbler	*Dendroica caerulescens*							A		
Black-throated Green Warbler	*Dendroica virens*							A		
Blue Jay	*Cyanocitta cristata*									
Broad-winged Hawk	*Buteo platypterus*							A		
Brown Creeper	*Certhia americana*							A		
Brown Thrasher	*Toxostoma rufum*						√			
Brown-headed Cowbird	*Molothrus ater*									
Canada Goose	*Branta canadensis*									
Canada Warbler	*Wilsonia canadensis*	THR	No status	No Schedul	SC		√	A		
Carolina Wren	*Thryothorus ludovicianus*					S3S4				
Cedar Waxwing	*Bombycilla cedrorum*									
Chestnut-sided Warbler	*Dendroica pensylvanica*									
Chipping Sparrow	*Spizella passerina*									
Clay-colored Sparrow	*Spizella pallida*									Y
Common Grackle	*Quiscalus quiscula*									
Common Merganser	*Mergus merganser*							A		Y
Common Raven	*Corvus corax*									
Common Yellowthroat	*Geothlyphis trichas*									
Downy Woodpecker	*Picoides pubescens*									
Eastern Bluebird	*Sialia sialis*	NAR								
Eastern Kingbird	*Tyrannus tyrannus*						√			
Eastern Meadowlark	*Sturnella magna*				THR		√	A		

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Eastern Phoebe	*Sayornis phoebe*									
Eastern Wood-Pewee	*Contopus virens*						√			
European Starling	*Sturnus vulgaris*									
Evening Grosbeak	*Coccothraustes vespertinus*									
Field Sparrow	*Spizella pusilla*						√			
Gray Catbird	*Dumetella carolinensis*									
Gray Jay	*Perisoreus canadensis*									
Great Blue Heron	*Ardea herodias*									
Great Crested Flycatcher	*Myiarchus crinitus*									
Great Horned Owl	*Bubo virginianus*									
Hairy Woodpecker	*Picoides villosus*							A		
Hermit Thrush	*Catharus guttatus*							A		Y
House Finch	*Carpodacus mexicanus*									
House Wren	*Troglodytes aedon*									
Indigo Bunting	*Passerina cyanea*									
Killdeer	*Charadrius vociferus*									
Least Flycatcher	*Empidonax minimus*							A		
Magnolia Warbler	*Dendroica magnolia*							A		Y
Mallard	*Anas platyrhynchos*									
Merlin	*Falco columbarius*	NAR								
Mourning Dove	*Zenaida macroura*									
Mourning Warbler	*Oporornis philadelphia*									
Nashville Warbler	*Vermivora ruficapilla*									
Northern Cardinal	*Cardinalis cardinalis*									
Northern Flicker	*Colaptes auratus*						√			
Northern Rough-winged Swallow	*Stelgidopteryx serripennis*									
Northern Waterthrush	*Seiurus noveboracensis*									
Osprey	*Pandion haliaetus*									Y
Ovenbird	*Seiurus aurocapillus*							A		
Pileated Woodpecker	*Dryocopus pileatus*							A		
Pine Siskin	*Cardeulis pinus*									Y
Purple Finch	*Carpodacus purpureus*									
Red Crossbill	*Loxia curvirostra*								Y	Y
Red-breasted Nuthatch	*Sitta canadensis*							A		

Common Name	Scientific Name	Status						Area-sensitive (OMNR[c])	Significant in Region 6 (south-central)	Significant in Region 7 (south)
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Red-eyed Vireo	*Vireo olivaceus*									
Red-winged Blackbird	*Agelaius phoeniceus*									
Rock Pigeon	*Columba livia*									
Rose-breasted Grosbeak	*Pheucticus ludovicianus*						√			
Ruby-throated Hummingbird	*Archilochus colubris*									
Ruffed Grouse	*Bonasa umbellus*									
Savannah Sparrow	*Passerculus sandwichensis*						√	A		
Scarlet Tanager	*Piranga olivacea*							A		
Sharp-shinned Hawk	*Accipiter striatus*	NAR						A		
Song Sparrow	*Melospiza melodia*									
Swamp Sparrow	*Melospiza georgiana*									
Tree Swallow	*Tachycineta bicolor*									
Turkey Vulture	*Cathartes aura*									
Veery	*Catharus fuscescens*							A		
Vesper Sparrow	*Pooecetes gramineus*						√			
Warbling Vireo	*Vireo gilvus*									
White-breasted Nuthatch	*Sitta carolinensis*							A		
White-throated Sparrow	*Zonotrichia albicollis*									
White-winged Crossbill	*Loxia leucoptera*								Y	Y
Wild Turkey	*Meleagris gallopavo*									
Winter Wren	*Troglodytes troglodytes*							A		
Wood Duck	*Aix sponsa*									
Wood Thrush	*Hylocichla mustelina*						√			
Yellow Warbler	*Dendroica petechia*									
Yellow-bellied Sapsucker	*Sphyrapicus varius*							A		
Yellow-rumped Warbler	*Dendroica coronata*									Y

Appendix F: Deer Yard Survey

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Memorandum

To	File	Page 1
CC		
Subject	Bracebridge North Transportation Corridor EA – Deer Wintering Yard Surveys	
From	Tom Shorney, Ecologist, AECOM Canada	
Date	March 13th, 2013	60241537

On February 26th and 27th, 2013 two AECOM ecologists conducted surveys in Bracebridge, Ontario regarding the Bracebridge North Transportation Corridor Environmental Assessment. Surveys were conducted to determine whether the lands directly north of High Falls Road provided habitat for deer wintering yards. MNR had previously identified a deer wintering area in this location.

Methods

The surveys consisted of four transects which were 1 kilometre long, 500 metres on either side of the designated corridor running north off of High Falls Road. Each transect was spaced 200 m apart (east-west) along the corridor. The four transects included 11 plots which were spaced 100 metres apart (Refer to Attachment A, Field Maps).

In each plot the following was completed:

- Determined the ecosite of each community using Ecological Land Classification (ELC)
- Determined the crown conifer cover percentage at each cardinal point including the centre
- Prism sweeps describing species and diameter at breast height
- Recorded evidence of habitat use by qualitatively assessing each plot taking note of total number of available stems and total number of stems which have been browsed by deer
- Recorded tracks observed within each plot
- Co-ordinates were recorded where deer trails/beds were observed along transect lines
- Any other pertinent observations

Results

A total of 30 plots were completed along the four designated transects. Due to private property boundaries, some of the required plots could not be completed. In addition, only plots located north of High Falls Road were completed during surveys (Refer to Attachment B, Field Data).

Common tracks observed within each plot and along the transect lines included coyote (*Canis latrans*), snowshoe hare (*Lepus americanus*), Eastern gray squirrel (*Sciurus carolinensis*), fisher (*Martes pennanti*), white-tailed deer (*Odocoileus virginianus*) and ruffed grouse (*Bonasa umbellus*).

Although the habitat surveyed was suitable for wintering deer yards, no sign of substantial deer populations were evident. One deer trail was observed which was located along Transect C in plot 7. It is estimated a total of three deer had used this trail. The majority of browse observed within these plots had been dominated by snowshoe hare. The snow depth along the four transects was recorded at approximately 70 cm.

Attachment A: Field Maps

Deer Survey Field Map
Bracebridge North Transportation Corridor EA

AECOM

March 2013

631488.5
4994444.3
A11

631676.8
4994512.8
B11

631864.5
4994581.2
C11

632051.9
4994649.4
D11

631522.7
4994351.4
A10

631710.1
4994419.6
B10

631898.4
4994488.2
C10

632085.5
4994556.3
D10

631557.2
4994256.7
A9

631744.7
4994325.4
B9

631932.5
4994393.4
C9

632119.9
4994462.2
D9

631590.4
4994163.5
A8

631778.7
4994232.1
B8

631966.4
4994300.4
C8

632153.5
4994368.6
D8

631625.5
4994069
A7

631813.2
4994137.4
B7

632000.9
4994205.4
C7

632188.3
4994274.6
D7

631659
4993976
A6

631846.9
4994044.7
B6

632034.7
4994112.7
C6

632222.1
4994181
D6

500m
400m
300m
200m
100m
0m

0 50 100 200
Meters

Deer Survey Field Map
Bracebridge North Transportation Corridor EA

AECOM

March 2013

631659
4993976
A6

631846.9
4994044.7
B6

632034.7
4994112.7
C6

632222.1
4994181
D6

0m

631693.7
4993881
A5

631881.5
4993949.7
B5

632069.3
4994017.7
C5

632256.5
4994087.2
D5

100m

631727.6
4993788.4
A4

631915.4
4993856.7
B4

632102.8
4993925.6
C4

632290.4
4993993.4
D4

200m

631762.1
4993693.8
A3

631949.9
4993762.1
B3

632137.5
4993830.4
C3

632325
4993899.1
D3

300m

HIGH FALLS RD

631796.5
4993598.8
A2

631983.8
4993667.3
B2

632172
4993735.8
C2

632358.5
4993803.7
D2

400m

631831.1
4993506.3
A1

632018.2
4993574.3
B1

632206.3
4993643
C1

632393.7
4993710.4
D1

500m

CEDAR SHORES

0 50 100 200
Meters

Attachment B: Field Data

Bracebridge North Transportation Corridor EA
PN. 60241537

Deer Yard Critical Thermal Cover Stand Inventory

Date: February 26, 201	Crew Members: J. Kamstra, T. Shorney	Transect #: A

							Tree Count							
			GPS Reading UTM			Species	Pole (10-24cm)		Sm Saw (26-36cm)		Med Saw (38-48cm		Lg saw (50+cm)	
Plot #	Feature	# Beds	Easting	Northing	+/-		AGS	UGS	AGS	UGS	AGS	UGS	AGS	UGS
A4						Pinstro							1	
						Abibal	1							
						Picgla			1					
Conifer Crown Closure (Estimate % for plot centre and 10 m from centre in 4 cardinal directions				**N: 0%**			**E: 0%**			Comments: Very open, with young conifer - Trembling aspen moving in. **CUW1**				
					C: 0%									
				S: 70%			**W: 40%**							
Plot #						Pinstro	11	1	3				1	
A5						Poptre	3		2					
						Prusero		1						
Conifer Crown Closure (Estimate % for plot centre and 10 m from centre in 4 cardinal directions				**N: 0%**			**E: 90%**			Comments: **FOC1 -** Dry-Fresh White Pine Coniferous Forest				
					C: 80%									
				S: 80%			**W: 90%**							
Plot #						Pinstro	1				1		1	
A6						Abibal	2							
						querub								
						Picgla	1							
						Pruser	1							
						Dead		1						
Conifer Crown Closure (Estimate % for plot centre and 10 m from centre in 4 cardinal directions				**N: 25%**			**E: 0%**			Comments: Edge of **CUW1:** Cultural Woodland and **FOM5**: Dry-Fresh White Birch-Poplar-Conifer Forest. Centre of plot is in the CUW1.				
					C: 0%									
				S: 0%			**W: 90%**							

Bracebridge North Transportation Corridor EA
PN. 60241537

Deer Yard Critical Thermal Cover Stand Inventory

Date: February 26, 201 | Crew Members: J. Kamstra, T. Shorney | Transect #: A

							Tree Count							
			GPS Reading UTM			Species	Pole (10-24cm)		Sm Saw (26-36cm)		Med Saw (38-48cm		Lg saw (50+cm)	
Plot #	Feature	# Beds	Easting	Northing	+/-		AGS	UGS	AGS	UGS	AGS	UGS	AGS	UGS
A7						Tsucan	1							
						Betpap			1			1		
						Poptre			1	2	1			
						Abibal	1			1				
						Acerub	1	2		1				
						Acesac				1				
						Picgla				1				
Conifer Crown Closure (Estimate % for plot centre and 10 m from centre in 4 cardinal directions				**N: 50%**			**E: 70%**		Comments: **FOM5:** Dry-Fresh White Birch-Poplar-Conifer Mixed Forest. Hemlock along ridge outside of plot.					
					C: 80%									
				S: 40%			**W: 0%**							
Plot #						Poptre	9		5		1			
A8						Pinstr								
						Abibal			1					
Conifer Crown Closure (Estimate % for plot centre and 10 m from centre in 4 cardinal directions				**N: 0%**			**E: 0%**		Comments: Plot location dominated by poplar. **FOM5**: Dry-Fresh White Birch-Poplar Conifer Mixed Forest. One set of old deer tracks intersecting plot.					
					C: 0%									
				S: 10%			**W: 0%**							
Plot #						Pinstr			1		4		2	
A9						Pruser	1							
Conifer Crown Closure (Estimate % for plot centre and 10 m from centre in 4 cardinal directions				**N: 60%**			**E: 20%**		Comments: **CUW1:** White Pine Cultural Woodland					
					C: 30%									
				S: 0%			**W: 40%**							

Bracebridge North Transportation Corridor EA
PN. 60241537

Deer Yard Critical Thermal Cover Stand Inventory

Date: February 26, 201	Crew Members: J. Kamstra, T. Shorney	Transect #: A

							Tree Count							
			GPS Reading UTM			Species	Pole (10-24cm)		Sm Saw (26-36cm)		Med Saw (38-48cm		Lg saw (50+cm)	
Plot #	Feature	# Beds	Easting	Northing	+/-		AGS	UGS	AGS	UGS	AGS	UGS	AGS	UGS
A10						Pinstr	2	2	10		3		2	
						Picgla			4					
Conifer Crown Closure (Estimate % for plot centre and 10 m from centre in 4 cardinal directions				**N: 40%**			**E: 70%**			Comments: **FOC1:** Dry-Fresh Pine Coniferous Forest Ecosite				
					C: 90%									
				S: 90%			**W: 90%**							
Plot #						Thuocc	2	1	1		2			
A11						Abibal	1							
						Tsucan			1		2			
						Tilame	1		1		2			
						Acerub			1					
						Betall	3		3					
						Picgla					1			
						Ulmame	1							
Conifer Crown Closure (Estimate % for plot centre and 10 m from centre in 4 cardinal directions				**N: 30%**			**E: 10%**			Comments: **FOM6**: Fresh-Moist Hemlock Mixed Forest. Plot was on steep slope - approx. 25 deg. Angle.				
					C: 80%									
				S: 10%			**W: 90%**							
Plot #														
Conifer Crown Closure (Estimate % for plot centre and 10 m from centre in 4 cardinal directions				**N:**			**E:**			Comments:				
					C:									
				S:			**W**							

Bracebridge North Transportation Corridor EA
PN. 60241537

Deer Yard Critical Thermal Cover Stand Inventory

Date: February 26, 201	Crew Members: J. Kamstra, T. Shorney	Transect #: B

							Tree Count							
			GPS Reading UTM			Species	Pole (10-24cm)		Sm Saw (26-36cm)		Med Saw (38-48cm		Lg saw (50+cm)	
Plot #	Feature	# Beds	Easting	Northing	+/-		AGS	UGS	AGS	UGS	AGS	UGS	AGS	UGS
B4						Picgla							1	
						Betall			3		2			
						Popgra					2			
						Abibal	1							
						Pinstr					1			
						Tsucan					1			
						Acesac			1					
Conifer Crown Closure (Estimate % for plot centre and 10 m from centre in 4 cardinal directions				**N: 10%**			**E: 70%**		Comments: **FOM6**: Fresh-Moist Hemlock Mixed Forest.					
					C: 35%									
				S: 60%			**W: 10%**							
Plot #						Popgra			3	1	4		1	
B5						Tsucan			6		2			
						Acerub	2		4					
						Betpap			1					
Conifer Crown Closure (Estimate % for plot centre and 10 m from centre in 4 cardinal directions				**N: 90%**			**E: 0%**		Comments: Plot is within transitional zone. Ecosite along slope **FOC3:** Fresh-Moist Hemlock Coniferous Forest and along tableland **FOM3**: Dry-Fresh Hardwood-Hemlock Mixed					
					C: 0%									
				S: 25%			**W: 70%**							
Plot #						Pinstr							2	
B6						Betpap	1		2				1	
						Tsucan			5		5			
						Acerub		1	3					
						Acesac			1					
Conifer Crown Closure (Estimate % for plot centre and 10 m from centre in 4 cardinal directions				**N: 20%**			**E: 25%**		Comments: **FOC3:** Fresh-Moist Hemlock Confierous Forest.					
					C: 90%									
				S: 80%			**W: 10%**							

Bracebridge North Transportation Corridor EA
PN. 60241537

Deer Yard Critical Thermal Cover Stand Inventory

Date: February 26, 201	Crew Members: J. Kamstra, T. Shorney	Transect #: B

							Tree Count							
			GPS Reading UTM			Species	Pole (10-24cm)		Sm Saw (26-36cm)		Med Saw (38-48cm		Lg saw (50+cm)	
Plot #	Feature	# Beds	Easting	Northing	+/-		AGS	UGS	AGS	UGS	AGS	UGS	AGS	UGS
B7						Picgla			3					
						Tsucan	1		3		4			
						Acerub	1		1					
						Acesac	1		3		1			
						Betall								
Conifer Crown Closure (Estimate % for plot centre and 10 m from centre in 4 cardinal directions				**N: 10%**			**E: 70%**		Comments: **FOM6**: Fresh-Moist Hemlock Mixed Forest.					
					C: 25%									
				S: 25%			**W: 10%**							
Plot #						Betall							1	
B8						Picgla	1		3					
						Popgra			2		8			
						Tsucan	4		4		2			
						Thuocc	1							
						Betpap	1							
Conifer Crown Closure (Estimate % for plot centre and 10 m from centre in 4 cardinal directions				**N: 70%**			**E: 20%**		Comments: Transitional point along ridge. Upland community **FOD3**: Dry-Fresh Poplar Forest and on slope **FOC3**: Fresh-Moist Hemlock Coniferous Forest.					
					C: 70%									
				S: 10%			**W: 60%**							
Plot #						Acerub			1					
B9						Acesac	7		1		2	1		
						Popgra	1		9					
						Tsucan	1		2					
						Querub			1					
Conifer Crown Closure (Estimate % for plot centre and 10 m from centre in 4 cardinal directions				**N: 0%**			**E: 70%**		Comments: Plot at the transition zone of **FOD5**: Dry-Fresh Sugar Maple Deciduous Forest and **FOM3**: Dry-Fresh Hardwood-Hemlock Mixed Forest.					
					C: 0%									
				S: 80%			**W: 10%**							

Bracebridge North Transportation Corridor EA
PN. 60241537

Deer Yard Critical Thermal Cover Stand Inventory

Date: February 26, 201	Crew Members: J. Kamstra, T. Shorney	Transect #:

							Tree Count							
			GPS Reading UTM			Species	Pole (10-24cm)		Sm Saw (26-36cm)		Med Saw (38-48cm		Lg saw (50+cm)	
Plot #	Feature	# Beds	Easting	Northing	+/-		AGS	UGS	AGS	UGS	AGS	UGS	AGS	UGS
B10						Popgra			1		1			
						Ostvir	2							
						Acerub	2		2					
						Acesac	4		3					
						Ulmame		1						
Conifer Crown Closure (Estimate % for plot centre and 10 m from centre in 4 cardinal directions			**N: 0%**			**E: 0%**			Comments: **FOD5**: Dry-Fresh Sugar Maple Deciduous Forest.					
					C: 0%									
			S: 0%			**W: 0%**								
Plot #						Acesac	9			2				
B11						Tilame	1							
						Querub			3		2			
						Dead ash				1				
Conifer Crown Closure (Estimate % for plot centre and 10 m from centre in 4 cardinal directions			**N: 0%**			**E: 0%**			Comments: Very rocky topography. **FOD5**: Dry-Fresh Sugar Maple Deciduous Forest.					
					C: 0%									
			S: 0%			**W: 0%**								
Plot #														
Conifer Crown Closure (Estimate % for plot centre and 10 m from centre in 4 cardinal directions			**N:**			**E:**			Comments:					
					C:									
			S:			**W**								

Bracebridge North Transportation Corridor EA
PN. 60241537

Deer Yard Critical Thermal Cover Stand Inventory

Date: February 27, 201	Crew Members: J. Kamstra, T. Shorney	Transect #: C

							Tree Count							
			GPS Reading UTM			Species	Pole (10-24cm)		Sm Saw (26-36cm)		Med Saw (38-48cm		Lg saw (50+cm)	
Plot #	Feature	# Beds	Easting	Northing	+/-		AGS	UGS	AGS	UGS	AGS	UGS	AGS	UGS
C6														
Conifer Crown Closure (Estimate % for plot centre and 10 m from centre in 4 cardinal directions				**N: 0%**			**E: 0%**		Comments: Open meadow along pipeline. **CUM1**: Cultural Meadow.					
					C: 0%									
				S: 0%			**W: 0%**							
Plot #						Pinstro	1		1		1		1	
C7						Betpap	1							
						Acesac	1							
						Poptre			2		1			
						Picgla	4		1		1			
						Acerub	4							
						Abibal	1							
Conifer Crown Closure (Estimate % for plot centre and 10 m from centre in 4 cardinal directions				**N: 60%**			**E: 25%**		Comments: **FOC1**: Dry-Fresh Pine Coniferous Forest.					
					C: 40%									
				S: 0%			**W: 0%**							
Plot #						Pinstro	5		2		3			
C8						Pruser	1							
Conifer Crown Closure (Estimate % for plot centre and 10 m from centre in 4 cardinal directions				**N: 70%**			**E: 50%**		Comments: **FOC1**: Dry-Fresh Pine Coniferous Forest.					
					C: 90%									
				S: 70%			**W: 60%**							

Bracebridge North Transportation Corridor EA
PN. 60241537

Deer Yard Critical Thermal Cover Stand Inventory

Date: February 27, 201	Crew Members: J. Kamstra, T. Shorney	Transect #: C

							Tree Count							
			GPS Reading UTM			Species	Pole (10-24cm)		Sm Saw (26-36cm)		Med Saw (38-48cm		Lg saw (50+cm)	
Plot #	Feature	# Beds	Easting	Northing	+/-		AGS	UGS	AGS	UGS	AGS	UGS	AGS	UGS
C9						Pinstro			2		3	1	1	1
						Tsucan	1							
						Acerub	1							
Conifer Crown Closure (Estimate % for plot centre and 10 m from centre in 4 cardinal directions				**N: 30%**			**E: 20%**		Comments: **FOC1**: Dry-Fresh Pine Coniferous Forest.					
					C: 65%									
				S: 10%			**W: 40%**							
Plot #						Faggra							1	
C10						Acesac					1			
						Tsucan			5		3	1		
						Acerub			1					
						Betalle			1					
Conifer Crown Closure (Estimate % for plot centre and 10 m from centre in 4 cardinal directions				**N: 70%**			**E: 100%**		Comments: **FOM3**: Dry-Fresh Hardwood-Hemlock Mixed Fore					
					C: 10%									
				S: 10%			**W: 80%**							
Plot #						Querub			1		2		1	
C11						Acerub			1					
						Tsucan			5	1	5		1	
Conifer Crown Closure (Estimate % for plot centre and 10 m from centre in 4 cardinal directions				**N: 40%**			**E: 80%**		Comments: **FOC3**: Fresh-Moist Hemlock Coniferous Forest					
					C: 90%									
				S: 90%			**W: 40%**							

Bracebridge North Transportation Corridor EA
PN. 60241537

Deer Yard Critical Thermal Cover Stand Inventory

Date: February 27, 201	Crew Members: J. Kamstra, T. Shorney	Transect #: D

							Tree Count							
			GPS Reading UTM			Species	Pole (10-24cm)		Sm Saw (26-36cm)		Med Saw (38-48cm		Lg saw (50+cm)	
Plot #	Feature	# Beds	Easting	Northing	+/-		AGS	UGS	AGS	UGS	AGS	UGS	AGS	UGS
D4						Pinsyl					1			
						Pruser	2							
						Pinser			1		2			
Conifer Crown Closure (Estimate % for plot centre and 10 m from centre in 4 cardinal directions				**N: 0%**			**E: 60%**		Comments: Plot within close proximity to road. **CUW1**: White Pine/Scotch Pine/Black cherry Cultural Woodland.					
					C: 0%									
				S: 50%			**W: 0%**							
Plot #						Pruser	1							
D5						Pinstr	2		1					
Conifer Crown Closure (Estimate % for plot centre and 10 m from centre in 4 cardinal directions				**N: 10%**			**E: 90%**		Comments: Habitat is very open with rolling hills. **CUW1**: White Pine/White Spruce Cultural Woodland.					
					C: 0%									
				S: 0%			**W: 0%**							
Plot #						Pinstr	2		4		6		2	
D6														
Conifer Crown Closure (Estimate % for plot centre and 10 m from centre in 4 cardinal directions				**N: 90%**			**E: 20%**		Comments: **FOC1**: Dry-Fresh Pine Coniferous Forest.					
					C: 60%									
				S: 80%			**W: 40%**							

Bracebridge North Transportation Corridor EA
PN. 60241537

Deer Yard Critical Thermal Cover Stand Inventory

Date: February 27, 201	Crew Members: J. Kamstra, T. Shorney	Transect #: D

							Tree Count							
			GPS Reading UTM			Species	Pole (10-24cm)		Sm Saw (26-36cm)		Med Saw (38-48cm		Lg saw (50+cm)	
Plot #	Feature	# Beds	Easting	Northing	+/-		AGS	UGS	AGS	UGS	AGS	UGS	AGS	UGS
D7						Pinstr	2		6	1	3		1	
						Acerub			1		1			
						Pinser	1							
Conifer Crown Closure (Estimate % for plot centre and 10 m from centre in 4 cardinal directions				**N:**			**E:**		Comments: Open canopy where plot is located. **FOC1**: Dry-Fresh Pine Coniferous Forest.					
					C:									
				S:			**W**							
Plot #						Pinstr			7		7			
D8						Acerub	3		2		1			
						Picgla			1		1			
Conifer Crown Closure (Estimate % for plot centre and 10 m from centre in 4 cardinal directions				**N: 20%**			**E: 30%**		Comments: This plot contained an open canopy. **FOM2:** Dry-Fresh White Pine-Maple-Oak Mixed Forest.					
					C: 10%									
				S: 10%			**W: 25%**							
Plot #						Pinstr	1				2			
D9						Acerub			3					
Conifer Crown Closure (Estimate % for plot centre and 10 m from centre in 4 cardinal directions				**N: 0%**			**E: 0%**		Comments: Snow depth was taken within this plot - 70 cm. **CUW1**: White Pine-Red Maplle Cultural Woodland.					
					C: 0%									
				S: 0%			**W: 90%**							

Bracebridge North Transportation Corridor EA
PN. 60241537

Deer Yard Critical Thermal Cover Stand Inventory

Date: February 27, 201	Crew Members: J. Kamstra, T. Shorney	Transect #: D

							Tree Count							
			GPS Reading UTM			Species	Pole (10-24cm)		Sm Saw (26-36cm)		Med Saw (38-48cm		Lg saw (50+cm)	
Plot #	Feature	# Beds	Easting	Northing	+/-		AGS	UGS	AGS	UGS	AGS	UGS	AGS	UGS
D10						Pinstr			2		1		2	
						Pruser	1							
						Acerub			1					
Conifer Crown Closure (Estimate % for plot centre and 10 m from centre in 4 cardinal directions				**N: 60%**			**E: 0%**		Comments: **CUW1**: White Pine-White Spruce Cultural Woodland.					
					C: 20%									
				S: 50%			**W: 60%**							
Plot #						Pinstr	1		2					
D11														
Conifer Crown Closure (Estimate % for plot centre and 10 m from centre in 4 cardinal directions				**N: 0%**			**E: 20%**		Comments: Community contains sporadic trees along pipeline. Cultural savannah with trees.					
					C: 0%									
				S: 0%			**W: 0%**							
Plot #														
Conifer Crown Closure (Estimate % for plot centre and 10 m from centre in 4 cardinal directions				**N:**			**E:**		Comments:					
					C:									
				S:			**W**							

	Plot #	Deciduous Browse Species List	1 Percent of Stems with Current Annual Growth Browsed	2 Percent of Current Annual Growth Browsed	3 Hedging Evidence (Yes / No)	Comments
1. Percent of Stems with Current Annual Growth Browsed Light 0 – 25% Moderate – 26 – 50% Heavy – 51 – 100% Over-browsed – some current annual growth from 2 years ago browsed	A4	N/A	N/A	N/A	N/A	Evidence of some snowshoe hare brows and old tracks within plot. Species browsed include beaked hazel and pin cherry. Old coyote tracks through plot.
2. Percent of Current Annual Growth Browsed Light 0 – 25% Moderate – 26 – 50% Heavy – 51 – 100%	A5	Acesac	1%	1%	No	Very little evidence of hare browse. Some evi
3. Hedging means stems that have been repeatedly over browsed until deformed or dead.	A6	Acerub	1%	1%	No	Abundance of snowshoe hare tracks. Coyote

	Plot #	Deciduous Browse Species List	1 Percent of Stems with Current Annual Growth Browsed	2 Percent of Current Annual Growth Browsed	3 Hedging Evidence (Yes / No)	Comments
1. Percent of Stems with Current Annual Growth Browsed Light 0 – 25% Moderate – 26 – 50% Heavy – 51 – 100% Over-browsed – some current annual growth from 2 years ago browsed	A7	N/A	N/A	N/A	N/A	Majority of saplings in plot are coniferous. Very little snowshoe hare browse.
2. Percent of Current Annual Growth Browsed Light 0 – 25% Moderate – 26 – 50% Heavy – 51 – 100%	A8	Acerub	1%	1%	No	One set of deer tracks through southern portion of plot. Old snowshoe hare tracks observed. Red maple sapling abundant in plot.
3. Hedging means stems that have been repeatedly over browsed until deformed or dead.	A9	N/A	N/A	N/A	N/A	Abundance of snowshoe hare tracks within plot. Some hare browse observed. No evidence of deer browse. Plot is situated in open area - very little cover.

	Plot #	Deciduous Browse Species List	1 Percent of Stems with Current Annual Growth Browsed	2 Percent of Current Annual Growth Browsed	3 Hedging Evidence (Yes / No)	Comments
1. Percent of Stems with Current Annual Growth Browsed Light 0 – 25% Moderate – 26 – 50% Heavy – 51 – 100% Over-browsed – some current annual growth from 2 years ago browsed	A10	N/A	N/A	N/A	N/A	Very little food supply for deer - majority coniferous species. Fisher tracks through southern portion of plot. No deciduous regeneration. Some snowshoe hare tracks.
2. Percent of Current Annual Growth Browsed Light 0 – 25% Moderate – 26 – 50% Heavy – 51 – 100%	A11	Querub Acerub	1% 2%	1% 2%	No	Browse mainly on lower portion of slope near stream. No deer tracks observed. Older browse observed.
3. Hedging means stems that have been repeatedly over browsed until deformed or dead.						

	Plot #	Deciduous Browse Species List	1 Percent of Stems with Current Annual Growth Browsed	2 Percent of Current Annual Growth Browsed	3 Hedging Evidence (Yes / No)	Comments
1. Percent of Stems with Current Annual Growth Browsed Light 0 – 25% Moderate – 26 – 50% Heavy – 51 – 100% Over-browsed – some current annual growth from 2 years ago browsed	B4	N/A	N/A	N/A	N/A	Coyote tracks through plot. Very little deciduous regeneration within plot. Plot situated along slope.
2. Percent of Current Annual Growth Browsed Light 0 – 25% Moderate – 26 – 50% Heavy – 51 – 100%	B5	N/A	N/A	N/A	N/A	Coyote tracks observed along top of ridge. No deciduous regeneration.
3. Hedging means stems that have been repeatedly over browsed until deformed or dead.	B6	N/A	N/A	N/A	N/A	Fisher tracks observed within southern portion of plot. No deciduous regenertation.

	Plot #	Deciduous Browse Species List	1 Percent of Stems with Current Annual Growth Browsed	2 Percent of Current Annual Growth Browsed	3 Hedging Evidence (Yes / No)	Comments
1. Percent of Stems with Current Annual Growth Browsed Light 0 – 25% Moderate – 26 – 50% Heavy – 51 – 100% Over-browsed – some current annual growth from 2 years ago browsed	B7	N/A	N/A	N/A	N/A	Grouse Tracks observed within plot. No deciduous regeneration.
2. Percent of Current Annual Growth Browsed Light 0 – 25% Moderate – 26 – 50% Heavy – 51 – 100%	B8	N/A	N/A	N/A	N/A	No evidence of tracks. Very little deciduous regeneration. The plot is along transition of community types. Very little evidence of hare browse.
3. Hedging means stems that have been repeatedly over browsed until deformed or dead.	B9	Acesac	2%	2%	Yes	Plot is at the top of ridge between 2 vegetation communities. Very little deciduous regeneration within plot. No evidence of tracks.

	Plot #	Deciduous Browse Species List	1 Percent of Stems with Current Annual Growth Browsed	2 Percent of Current Annual Growth Browsed	3 Hedging Evidence (Yes / No)	Comments
1. Percent of Stems with Current Annual Growth Browsed Light 0 – 25% Moderate – 26 – 50% Heavy – 51 – 100% Over-browsed – some current annual growth from 2 years ago browsed	B11	Acesac Faggra	1% 1%	1% 1%	No	Very little regeneration. No tracks observed.
2. Percent of Current Annual Growth Browsed Light 0 – 25% Moderate – 26 – 50% Heavy – 51 – 100%						
3. Hedging means stems that have been repeatedly over browsed until deformed or dead.						

	Plot #	Deciduous Browse Species List	1 Percent of Stems with Current Annual Growth Browsed	2 Percent of Current Annual Growth Browsed	3 Hedging Evidence (Yes / No)	Comments
1. Percent of Stems with Current Annual Growth Browsed Light 0 – 25% Moderate – 26 – 50% Heavy – 51 – 100% Over-browsed – some current annual growth from 2 years ago browsed	C6	N/A	N/A	N/A	N/A	Snowshoe hare tracks observed. Trail cam and deer lick within cultural meadow. Very open habitat.
2. Percent of Current Annual Growth Browsed Light 0 – 25% Moderate – 26 – 50% Heavy – 51 – 100%	C7	N/A	N/A	N/A	N/A	Well used deer trail within plot (approx. three deer). Deer trail slightly snow covered. No beds observed. No deciduous regeneration observed within the plot.
3. Hedging means stems that have been repeatedly over browsed until deformed or dead.	C8	N/A	N/A	N/A	N/A	No tracks observed within plot. Some evidence of hare browse on coniferous trees.

	Plot #	Deciduous Browse Species List	1 Percent of Stems with Current Annual Growth Browsed	2 Percent of Current Annual Growth Browsed	3 Hedging Evidence (Yes / No)	Comments
1. Percent of Stems with Current Annual Growth Browsed Light 0 – 25% Moderate – 26 – 50% Heavy – 51 – 100% Over-browsed – some current annual growth from 2 years ago browsed	C9	Acerub	5%	5%	Yes	Snow covered hare tracks. Some deer browse observed.
2. Percent of Current Annual Growth Browsed Light 0 – 25% Moderate – 26 – 50% Heavy – 51 – 100%	C10	N/A	N/A	N/A	N/A	The hemlock in this plot is producing excellent cover. No tracks observed. No evidence of browse.
3. Hedging means stems that have been repeatedly over browsed until deformed or dead.	C11	Querub	1%	1%	No	Evidence of porcupine trails throughout plot - trail going down steep ridge. Snow depth approx. 25 cm deep - due to hemlock cover. Very little deciduous regeneration. Steep rocky topography. Some rabbit browse observed.

	Plot #	Deciduous Browse Species List	1 Percent of Stems with Current Annual Growth Browsed	2 Percent of Current Annual Growth Browsed	3 Hedging Evidence (Yes / No)	Comments
1. Percent of Stems with Current Annual Growth Browsed Light 0 – 25% Moderate – 26 – 50% Heavy – 51 – 100% Over-browsed – some current annual growth from 2 years ago browsed	D4	Pruser	1%	1%	No	Some old tracks visible - fresh snow partially covering, unable to determine species. Majority of browse attributed to hare.
2. Percent of Current Annual Growth Browsed Light 0 – 25% Moderate – 26 – 50% Heavy – 51 – 100%	D5	N/A	N/A	N/A	N/A	Old hare tracks covered by fresh snowfall. No deciduous regeneration within plot. No Browse observed.
3. Hedging means stems that have been repeatedly over browsed until deformed or dead.	D6	Pruser	1%	1%	No	Snow covered hare tracks. Border of CUW ar

	Plot #	Deciduous Browse Species List	1 Percent of Stems with Current Annual Growth Browsed	2 Percent of Current Annual Growth Browsed	3 Hedging Evidence (Yes / No)	Comments
1. Percent of Stems with Current Annual Growth Browsed Light 0 – 25% Moderate – 26 – 50% Heavy – 51 – 100% Over-browsed – some current annual growth from 2 years ago browsed	D7	N/A	N/A	N/A	N/A	Grouse tracks observed throughout plot. Old snow covered hare tracks. No deciduous regeneration observed within plot. Some hare browse observed.
2. Percent of Current Annual Growth Browsed Light 0 – 25% Moderate – 26 – 50% Heavy – 51 – 100%	D8	N/A	N/A	N/A	N/A	No deciduous regeneration observed within plot. Snow covered hare tracks. Evidence of snowmobile through plot. Grouse tracks through plot.
3. Hedging means stems that have been repeatedly over browsed until deformed or dead.	D9	N/A	N/A	N/A	N/A	Very open canopy in plot. Very little deciduous regeneration within plot. Grouse tracks observed through plot. Sled trail observed through plot. Snow covered hare tracks. Hare browse observed.

	Plot #	Deciduous Browse Species List	1 Percent of Stems with Current Annual Growth Browsed	2 Percent of Current Annual Growth Browsed	3 Hedging Evidence (Yes / No)	Comments
1. Percent of Stems with Current Annual Growth Browsed Light 0 – 25% Moderate – 26 – 50% Heavy – 51 – 100% Over-browsed – some current annual growth from 2 years ago browsed	D10	N/A	N/A	N/A	N/A	Very open canopy. No deciduous regeneration within plot. No tracks observed. No browse.
2. Percent of Current Annual Growth Browsed Light 0 – 25% Moderate – 26 – 50% Heavy – 51 – 100%	D11	N/A	N/A	N/A	N/A	Abundant rasberry within herbaceous layer. No deciduous regeneration. Very open along pipeline.
3. Hedging means stems that have been repeatedly over browsed until deformed or dead.						

Crew Members: James Kamstra, Tom Shorney

Transect Position:	GPS Readings		Observations
	Easting	Northing	
D6	632215	4994210	East of plot - Deer tracks, looks like approx. 3 deer have used trail.
Between Transect C and D (Fisher tracks)	631859	4994293	Fisher tracks observed, very fresh with what looks to be fresh scat. Tracks were along ridge going east to west. Tracks were not observed along a transect - we were investigating potential deer yard habitat.

Appendix G: Species at Risk Habitat Assessment

Taxonomy	Species	ESA Status	SARA Status	COSEWIC Status	Preferred Habitat[1, 2]	Known Species Range[1, 2]	Source Identifying Species Record	Habitat Present within the Study Area
Plants	American Ginseng *Panax quinquefolius*	END			In Ontario, American Ginseng typically grows in rich, moist, but well-drained, and relatively mature, deciduous woods dominated by Sugar Maple (Acer saccharum), White Ash (Fraxinus americana) and American Basswood (Tilia americana). It usually grows in deep, nutrient rich soil over limestone or marble bedrock.	American Ginseng ranges from Louisiana and Georgia north to New England and Minnesota. In Canada, it is found in southwestern Quebec and southern Ontario.	Species at Risk: Potentially Suitable Habitat Mapping-Final Draft Report	Suitable Habitat Present
Plants	Butternut *Juglans cinerea*	END	END Schedule 1	END	In Ontario, Butternut usually grows alone or in small groups in deciduous forests. It prefers moist, well-drained soil and is often found along streams. It is also found on well-drained gravel sites and rarely on dry rocky soil. This species does not do well in the shade, and often grows in sunny openings and near forest edges. This species can typically be associated with the following ELC communities: FOD and mature hedgerows; Soil: dry rocky or moist (4, 5, 6) to fresh (2, 3).	Butternut can be found throughout central and eastern North America. In Canada, Butternut occurs in Ontario, Quebec and New Brunswick. In Ontario, this species is found throughout the southwest, north to the Bruce Peninsula, and south of the Canadian Shield.	Species at Risk: Potentially Suitable Habitat Mapping-Final Draft Report	Suitable Habitat Present
Reptiles	Common Five-lined Skink (Carolinian population) *Plestiodon fasciatus*	END	END Schedule 1	END	Common Five-lined Skinks like to bask 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. There are two populations of Common Five-lined Skink in Ontario and they each occupy different types of habitat. The Carolinian population can be found under woody debris in clearings with sand dunes, open forested areas, and wetlands. This species can typically be associated with the following ELC communities: SDO, SDS, SDT, TPS, CUS, CUW, FOM, FOD and MAM where suitable cover and basking habitat is present.	In Canada, the species is limited to two distinct areas, along the southern margin of the Canadian Shield, and in the Carolinian Zone where it is found near the shores of Lakes Erie, St. Clair and Huron.	MNR Correspondence	Suitable Habitat Not Present
Plants	Forked Three-awned Grass *Aristida basiramea*	END	END Schedule 1	END	Forked Three-awned Grass grows on open, bare ground or in sparsely-covered grassy areas, often in bare spots between patches of other species of grasses. In Ontario and Quebec it appears to be restricted to dry, open sand barrens, which occur on low, sand ridges or dunes, located on post-glacial shorelines. The maintenance of this type of habitat requires periodic disturbances, such as fire or drought, to prevent other plants from dominating the area. However, some forms of disturbance facilitate the establishment of invasive plant species that can outcompete Forked Three-awned Grass. This species can be associated with the following ELC communities: SB and CUM1-1 communities with sandy soils near SB communities.	Forked Three-awned Grass is found primarily in the Midwestern United States, west from Colorado, south to Texas, east to Maine, and north to central Minnesota, northern Wisconsin and northern Michigan. In Canada, Forked Three-awned Grass is found only in southwestern Quebec and southern Ontario in north Simcoe County and adjacent Beausoleil Island, with one likely introduced population found in the Rainy River area of northwestern Ontario.	Species at Risk: Potentially Suitable Habitat Mapping-Final Draft Report	Suitable Habitat Not Present
Birds	Kirtland's Warbler *Dendroica kirtlandii*	END			Kirtland's Warblers have very specific habitat requirements, typically nesting in well-drained sandy soils covered in large forests of young jack pine, a habitat often created by fire. They lay their nests on the ground, hidden away under low living branches of young jack pines with a thick cover of understory plants, such as grasses, sweet-fern and blueberry. Mature pines that no longer have branches near the ground do not provide sufficient cover.	Kirtland's Warblers primarily breed in central Michigan and migrate to the Bahamas for winter. A few are seen annually at Point Pelee National Park and other migration hotspots in southwestern Ontario, and they have long been suspected of occasional nesting in Ontario, in pockets of suitable habitat. To date, breeding evidence has been acquired at only two sites, the most recent being in 2007 at Canadian Forces Base Petawawa.	Species at Risk: Potentially Suitable Habitat Mapping-Final Draft Report	Suitable Habitat Not Present
Birds	Barn Swallow *Hirundo rustica*	THR	No Status	THR	Barn Swallows often live in close association with humans, building their cup-shaped mud nests almost exclusively on human-made structures such as open barns, under bridges and in culverts. The species is attracted to open structures that include ledges where they can build their nests, which are often re-used from year to year. They prefer unpainted, rough-cut wood, since the mud does not adhere as well to smooth surfaces. This species can typically be associated with the following ELC communities: TPO, CUM1, MAM, MAS, OAO, SAS1, SAM1, SAF1; containing or adjacent structures that are suitable for nesting.	The Barn Swallow may be found throughout southern Ontario and can range as far north as Hudson Bay, wherever suitable locations for nests exist.	• Atlas of Breeding Birds of Ontario Search squares 17PK39 NHIC 1km Search	Suitable Habitat Present

Taxonomy	Species	ESA Status	SARA Status	COSEWIC Status	Preferred Habitat[1, 2]	Known Species Range[1, 2]	Source Identifying Species Record	Habitat Present within the Study Area
Reptiles	Blanding's Turtle *Emydoidea blandingii*	THR	THR Schedule 1	THR	Blanding's Turtles live in shallow water, usually in large wetlands and shallow lakes with lots of water plants. It is not unusual, though, to find them hundreds of metres from the nearest water body, especially while they are searching for a mate or traveling to a nesting site. Blanding's Turtles hibernate in the mud at the bottom of permanent water bodies from late October until the end of April. This species can typically be associated with the following ELC communities: SWT2, SWT3, SWD, SWM, MAS2, SAS1, SAM1, where open water is present.	The Blanding's Turtle is found in and around the Great Lakes Basin, with isolated populations elsewhere in the United States and Canada. In Canada, the Blanding's Turtle is separated into the Great Lakes-St. Lawrence population and the Nova Scotia population. Blanding's Turtles can be found throughout southern, central and eastern Ontario.	NHIC 1km Search Species at Risk: Potentially Suitable Habitat Mapping-Final Drfat Report	Suitable Habitat Not Present
Birds	Bobolink *Dolichonyx oryzivorus*	THR	No Status	THR	Historically, Bobolinks lived in North American tallgrass prairie and other open meadows. With the clearing of native prairies, Bobolinks moved to living in hayfields. Bobolinks often build their small nests on the ground in dense grasses. Both parents usually tend to their young, sometimes with a third Bobolink helping. This species can typically be associated with the following ELC communities: TPO, TPS, CUM1 and MAM2.	The Bobolink breeds across North America. In Ontario, it is widely distributed throughout most of the province south of the boreal forest, although it may be found in the north where suitable habitat exists.	NHIC 1km Search Breeding Bird Atlas Square 17PK39	Suitable Habitat Present
Plants	Branched Bartonia *Bartonia paniculata*	THR	THR Schedule 1	THR	Branched Bartonia grows in open graminoid or low shrub sphagnum bog or fen with a peat substrate and scattered Larch and Black Spruce. The temperature at this locations may be cooler than the surrounding area due to the saturated nature of the peat and the proximity of these locaitons to Georgian Bay. Species that are considered to be associates of Branched Bartonia include; Black Chokeberry (*Aronia melanocarpa*), Virginia Cotton-grass (*Eriophorum virginicum*) Tamarack (*Larix laricina*), Mountain-holly (*Nemopanthus mucronatus*), White-fringed Orchid (*Platanthera blephariglottis*), Rose Pogonia (*Pogonia ophioglossoides*), White Beak-rush (*Rhynchospora alba*) and Virginia Chain Fern (*Woodwardia virginica*). This species can be associated with the following ELC communities: FEO, FES, BOO and BOS.	Branched Bartonia is only known to occur in southcentral Ontario in the Muskoka District and Parry Sound District.	Species at Risk: Potentially Suitable Habitat Mapping-Final Draft Report	Suitable Habitat Not Present
Birds	Cerulean Warbler *Dendroica cerulea*	THR	SC Schedule 1	END	Cerulean Warblers 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. This species can typically be associated with the following ELC communities: FOD and SWD that are mature and contain an open understory.	The Cerulean Warbler's breeding range extends from extreme southwestern Quebec and southern Ontario west to Minnesota and Nebraska and south to Texas and other Gulf states across to North Carolina. In southern Ontario, populations appear to be separated into two distinct bands: one from southern Lake Huron to western Lake Ontario, and further north, the other from the Bruce Peninsula and Georgian Bay area to the Ottawa River.	Species at Risk: Potentially Suitable Habitat Mapping-Final Draft Report	Suitable Habitat Present
Birds	Chimney swift *Chaetura pelagica*	THR	THR Schedule 1	THR	Before European settlement Chimney Swifts mainly nested on cave walls and in hollow trees or tree cavities in old growth forests. Today, they are more likely to be found in and around urban settlements where they nest and roost (rest or sleep) in chimneys and other manmade structures. They also tend to stay close to water as this is where the flying insects they eat congregate. Foraging habitat for this species can be associated with the following ELC codes: TPO, CUM1, MAM, MAS, OAO, SAS1, SAM1, SAF1 containing or adjacent structures with suitable nesitng habitat (i.e. chimnies).	he Chimney Swift breeds in eastern North America, possibly as far north as southern Newfoundland. In Ontario, it is most widely distributed in the Carolinian zone in the south and southwest of the province, but has been detected throughout most of the province south of the 49th parallel. It winters in northwestern South America.	NHIC 1km Search	Suitable Habitat Present
Reptiles	Eastern Hog-nosed Snake *Heterodon platirhinos*	THR	THR Schedule 1	THR	The Eastern Hog-nosed Snake specializes in hunting and eating toads, and usually only occurs where toads can be found. Eastern Hog-nosed Snakes prefersandy, well-drained habitats such as beaches and dry forests where they can lay their eggs and hibernate. They use their up-turned snout to dig burrows below the frost line in the sand where eggs are deposited. This species can be associated with the following ELC codes: BBO and FOD. Sandy soils required.	The Eastern Hog-nosed Snake is only found in eastern North America, with about ten per cent of its range occurring in Canada. The Canadian population is limited to Ontario where it can be found in two areas: The Carolinian Region and Great Lakes-St. Lawrence Region.	NHIC 1km Search Species at Risk:Potentially Suitable Habitat Mapping-Final Draft Report	Suitable Habitat Present

Taxonomy	Species	ESA Status	SARA Status	COSEWIC Status	Preferred Habitat[1, 2]	Known Species Range[1, 2]	Source Identifying Species Record	Habitat Present within the Study Area
Birds	Eastern Meadowlark *Sturnella magna*	THR	No Status	THR	Eastern Meadowlarks breed primarily in moderately tall grasslands, such as pastures and hayfields, but are also found in alfalfa fields, weedy borders of croplands, roadsides, orchards, airports, shrubby overgrown fields, or other open areas. Small trees, shrubs or fence posts are used as elevated song perches. This species can typically be associated with the following ELC communities: TPO, TPS, CUM1, CUS, MAM2 and MAS2 with elevated song perches.	In Ontario, the Eastern Meadowlark is primarily found south of the Canadian Shield but it also inhabits the Lake Nipissing, Timiskaming and Lake of the Woods areas.	• Atlas of Breeding Birds of Ontario Search squares 17PK39 NHIC 1km Search	Suitable Habitat Present
Birds	Eastern Whip-poor-will *Caprimulgus vociferus*	THR	THR Schedule 1	THR	The Eastern Whip-poor-will is usually found in areas with a mix of open and forested areas, such as savannahs, open woodlands or openings in more mature, deciduous, coniferous and mixed forests. It forages in these open areas and uses forested areas for roosting (resting and sleeping) and nesting. It lays its eggs directly on the forest floor, where its colouring means it will easily remain undetected by visual predators. This species can typically be associated with the following ELC communiteis: TPS, TPW, CUW, FOD, FOC and FOM where open areas are present.	The Eastern Whip-poor-will's breeding range includes two widely separate areas. It breeds throughout much of eastern North America, reaching as far north as southern Canada and also from the southwest United States to Honduras. In Canada, the Whip-poor-will can be found from east-central Saskatchewan to central Nova Scotia and in Ontario they breed as far north as the shore of Lake Superior. Although Eastern Whip-poor-wills were once widespread throughout the central Great Lakes region of Ontario, their distribution in this area is now fragmented. The Whip-poor-will migrates to Mexico and Central America, where it stays throughout the cold Canadian winter.	NHIC 1km Search	Suitable Habitat Present
Birds	Least Bittern *Ixobrychus exilis*	THR	THR Schedule 1	THR	In Ontario, the Least Bittern is found in a variety of wetland habitats, but strongly prefers cattail marshes with a mix of open pools and channels. This bird builds its nest above the marsh water in stands of dense vegetation, hidden among the cattails. The nests are almost always built near open water, which is needed for foraging. This species eats mostly frogs, small fish, and aquatic insects. This speice can typically be associated with the following ELC communities: MAS2-1, MAS3-1, SA and OAO.	In Ontario, the Least Bittern is mostly found south of the Canadian Shield, especially in the central and eastern part of the province. Small numbers also breed occasionally in northwest Ontario. This species has disappeared from much of its former range, especially in southwestern Ontario, where wetland loss has been most severe. In winter, Least Bitterns migrate to the southern United States, Mexico and Central America.	NHIC 1km Search Species at Risk:Potentially Suitable Habitat Mapping-Final Draft Report	Suitable Habitat Not Present
Reptiles	Massasauga *Sistrurus catenatus*	THR	No Status	THR	Massasaugas live in different types of habitats throughout Ontario, including tall grass prairie, bogs, marshes, shorelines, forests and alvars. Within all of these habitats, Massasaugas require open areas to warm themselves in the sun. Pregnant females are most often found in open, dry habitats such as rock barrens or forest clearings where they can more easily maintain the body temperature required for the development of their offspring. Non-pregnant females and males forage and mate in lowland habitats such as grasslands, wetlands, bogs and the shorelines of lakes and rivers. Massasaugas hibernate underground in crevices in bedrock, sphagnum swamps, tree root cavities and animal burrows where they can get below the frost line but stay above the water table. This species can be associated with the following ELC communities: TP, BO, MA, FO, AL, RB, and CUM with open areas.	In Canada, the Massasauga is found only in Ontario, primarily along the eastern side of Georgian Bay and on the Bruce Peninsula. Two small populations are also found in the Wainfleet Bog on the northeast shore of Lake Erie and near Windsor. The Massasauga was once more widespread in southwestern Ontario, especially along the shores of the Great Lakes.	NHIC 1km Search	Suitable Habitat Not Present
Birds	Bald Eagle *Haliaeetus leucocephalus*	SC	No Status	Not at Risk	Bald Eagles nest in a variety of habitats and forest types, almost always near a major lake or river where they do most of their hunting. While fish are their main source of food, Bald Eagles can easily catch prey up to the size of ducks, and frequently feed on dead animals, including White-tailed Deer. They usually nest in large trees such as pine and poplar. During the winter, Bald Eagles sometimes congregate near open water such as the St. Lawrence River, or in places with a high deer population where carcasses might be found. This species can typically be associated with the following ELC communities: FOC, FOM, FOD, SWC, SWM and SWD. Nests typically located near major bodies of water.	Bald Eagles are widely distributed throughout North America. In Ontario, they nest throughout the north, with the highest density in the northwest near Lake of the Woods. Historically they were also relatively common in southern Ontario, especially along the shore of Lake Erie, but this population was all but wiped out 50 years ago. After an intensive re-introduction program and environmental clean-up efforts, the species has rebounded and can once again be seen in much of its former southern Ontario range.	Species at Risk: Potentially Suitable Habitat Mapping-Final Draft Report	Suitable Habitat Not Present

Taxonomy	Species	ESA Status	SARA Status	COSEWIC Status	Preferred Habitat[1, 2]	Known Species Range[1, 2]	Source Identifying Species Record	Habitat Present within the Study Area
Plants	Broad Beech Fern *Phegopteris hexagonoptera*	SC	SC Schedule 3	SC	The Broad Beech Fern prefers to grow in rich soils in deciduous forests, often in areas dominated by maple and beech trees. It requires moist soil and usually grows in full shade. This species can typically be associated with the following ELC communities: FOD5 and FOD6 with moist soils and closed canopies.	The Broad Beech Fern grows in eastern North America from the southern Great Lakes region west to southeast Kansas and northeast Oklahoma, south to northeast Texas and the Gulf Coast and east to the Atlantic coast. In Ontario, the species is found in forest remnants in southern Muskoka, along Lake Erie, and in the eastern Lake Ontario-St. Lawrence River region.	Species at Risk: Potentially Suitable Habitat Mapping-Final Draft Report	Suitable Habitat Present
Birds	Canada Warbler *Wilsonia canadensis*	SC	THR Schedule 1	THR	The Canada Warbler breeds in a range of deciduous and coniferous, usually wet forest types, all with a well-developed, dense shrub layer. Dense shrub and understory vegetation help conceal Canada Warbler nests that are usually located on or near the ground on mossy logs or roots, along stream banks or on hummocks. This species can typically be associated with the following ELC communities: FOC3, FOC4, FOM6, FOM7, FOM8, FOD6, FOD7, FOD8, FOD9, SWC, SWM and SWD with a well-developed shrub layer.	The Canada Warbler only breeds in North America and 80 per cent of its known breeding range is in Canada. Its primary breeding range is in the Boreal Shield, extending north into the Hudson Plains and south into the Mixedwood Plains. Although the Canada Warbler breeds at low densities across its range, in Ontario, it is most abundant along the Southern Shield.	• Atlas of Breeding Birds of Ontario Search squares 17PK39	Suitable Habitat Present
Reptiles	Eastern Ribbonsnake *Thamnophis sauritus*	SC	SC Schedule 1	SC	The Eastern Ribbonsnake is usually found close to water, especially in marshes, where it hunts for frogs and small fish. A good swimmer, it will dive in shallow water, especially if it is fleeing from a potential predator. At the onset of cold weather, these snakes congregate in underground burrows or rock crevices to hibernate together. This species can typically be associated with the following ELC communities: FOC, FOM, FOD, SWC, SWM, SWD, MAM, MAS, OAO, SAS, SAM and SAF containing or near year round standing or flowing water.	The Eastern Ribbon Snake is found from southern Ontario west to Michigan and Wisconsin (isolated pockets), south to Illinois and Ohio, and east to New York State and Nova Scotia, where there is an isolated population. In Ontario, this snake occurs throughout southern and eastern Ontario and is locally common in parts of the Bruce Peninsula, Georgian Bay and eastern Ontario.	NHIC 1km Search	Suitable Habitat Present
Birds	Golden-winged Warbler *Vermivora chrysoptera*	SC	THR Schedule 1	THR	Golden-winged Warblers prefer to nest in areas with young shrubs surrounded by mature forest – locations that have recently been disturbed, such as field edges, hydro or utility right-of-ways, or logged areas. This species can typically be associated with the following ELC communities: CUM, CUT and CUW surrounded by mature forest communities.	The Golden-winged Warbler is found in southern Saskatchewan, Manitoba, Ontario, and Quebec, as well as the north-eastern United States. In Ontario, these birds breed in central-eastern Ontario, as far south as Lake Ontario and the St. Lawrence River, and as far north as the northern edge of Georgian Bay. Golden-winged Warblers have also been found in the Lake of the Woods area near the Manitoba border, and around Long Point on Lake Erie. Golden-winged Warblers spend the winter in Central America, some Caribbean islands, and the northern part of South America.	Species at Risk: Potentially Suitable Habitat Mapping-Final Draft Report	Suitable Habitat Present
Reptiles	Milksnake *Lampropeltis triangulum*	SC	SC Schedule 1	SC	The Milksnake can be found in a range of habitats including rocky outcrops, fields and forest edges. In southern Ontario, it is often found in old farm fields and farm buildings where there is an abundance of mice. The Milksnake hibernates underground, in rotting logs or in the foundations of old buildings. This species can be associated with the following ELC communities: BL, TA, AL, RB, TP, CUM, FOC, FOM and FOD.	The Milksnake range extends from Quebec and Maine south to Alabama and Georgia, and west to Minnesota and Iowa. In Ontario, it is widespread and locally common in southern Ontario, and can be found as far north as Lake Nipissing and Sault Ste. Marie.	NHIC 1km Search Species at Risk:Potentially Suitable Habitat Mapping-Final Draft Report	Suitable Habitat Present
Birds	Peregrine Falcon *Falco peregrinus*	SC	SC Schedule 1	SC	Peregrine Falcons usually nest on tall, steep cliff ledges close to large bodies of water. Although most people associate Peregrine Falcons with rugged wilderness, some of these birds have adapted well to city life. Urban peregrines raise their young on ledges of tall buildings, even in busy downtown areas. Cities offer peregrines a good year-round supply of pigeons and starlings to feed on. This species can be associated with the following ELC communities: CLO.	Although Peregrine Falcons now nest in and around Toronto and several other southern Ontario cities, the majority of Ontario's breeding population is found around Lake Superior in northwestern Ontario.	NHIC 1km Search	Suitable Habitat Not Present

Taxonomy	Species	ESA Status	SARA Status	COSEWIC Status	Preferred Habitat[1, 2]	Known Species Range[1, 2]	Source Identifying Species Record	Habitat Present within the Study Area
Reptiles	Snapping turtle *Chelydra serpentina*	SC	SC Schedule 1	SC	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 gravelly or sandy areas along streams. Snapping Turtles often take advantage of man-made structures for nest sites, including roads (especially gravel shoulders), dams and aggregate pits. This species can typically be associated with the following ELC communities: OAO, SA near gravelly or sandy areas.	The Snapping Turtle's range extends from Ecuador to Canada. In Canada this turtle can be found from Saskatchewan to Nova Scotia. It is primarily limited to the southern part of Ontario. The Snapping Turtle's range is contracting.	NHIC 1km Search	Suitable Habitat Present
Insects	West Virginia White *Pieris virginiensis*	SC			The West Virginia White lives in moist, deciduous woodlots. This butterfly requires a supply of toothwort, a small, spring-blooming plant that is a member of the mustard family, since it is the only food source for larvae.	The West Virginia White is found from Quebec and Ontario south through New England and the Appalachian region to Georgia. Although common in parts of the United States, this butterfly is rare in Ontario, where it has been seen at about 50 sites. The majority of sites in the province are in central and southern Ontario, but it also extends north to Manitoulin and St. Joseph islands. The largest populations are in the western Lake Ontario region.	Species at Risk:Potentially Suitable Habitat Mapping-Final Draft Report	Suitable Habitat Not Present
Birds	Yellow Rail *Coturnicops noveboracensis*	SC	SC Schedule 1	SC	Yellow Rails are secretive birds and live deep in the reeds, sedges, and marshes of shallow wetlands, where they nest on the ground. The marshy areas used by Yellow Rails have an overlying dry mat of dead vegetation that is used to make roofs for nests. This species can typically be associated with the following ELC communities: MAS.	The Yellow Rail ranges across much of central Canada and parts of the northern United States. In Ontario, it is mainly found in the Hudson Bay Lowlands region, and is only found in localized marshes in southern Ontario. The breeding status of Yellow Rail in boreal regions south of the Hudson Bay Lowlands is uncertain. It winters along the southeastern coast of the United States and the Gulf of Mexico.	Species at Risk:Potentially Suitable Habitat Mapping-Final Draft Report	Suitable Habitat Not Present

Taxonomy	Species	ESA Status	SARA Status	COSEWIC Status	Preferred Habitat[1, 2]	Known Species Range[1, 2]	Source Identifying Species Record	Habitat Present within the Study Area

Glossary

EXP	ESA - Extripated - a species that no longer exists in the wild in Ontario but still occurs elsewhere.
	SARA - Extripated - a wildlife species that no longer exists in the wild in Canada, but exists elsewhere in the wild.
END	ESA - Endangered - a species facing imminent extinction or extirpation in Ontario which is a candidate for regulation under Ontario's Endangered Species Act.
	SARA - Endangered - a wildlife species that is facing imminent extirpation or extinction.
THR	ESA - Threatened - a species that is at risk of becoming endangered in Ontario if limiting factors are not reversed.
	SARA - Threatened - a wildlife species that is likely to become endangered if nothing is done to reverse the factors leading to its extirpation or extinction.
SC	ESA - Special Concern (formerly Vulnerable) - a species with characteristics that make it sensitive to human activities or natural events.
	SARA - Special Concern - a wildlife species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats.
OMNR	Ontario Ministry of Natural Resources
ESA	Endangered Species Act
SARA	Species at Risk Act (Federal)
Schedule 1	The official list of species that are classified as extirpated, endangered, threatened, and of special concern.
Schedule 2	Species listed in Schedule 2 are species that had been designated as endangered or threatened, and have yet to be re-assessed by COSEWIC using revised criteria. Once these species have been re-assessed, they may be considered for inclusion in Schedule 1.
Schedule 3	Species listed in Schedule 3 are species that had been designated as special concern, and have yet to be re-assessed by COSEWIC using revised criteria. Once these species have been re-assessed, they may be considered for inclusion in Schedule 1.
COSEWIC	Committee on the Stauts of Endangerd Wildlife in Canada - a committee of experts that assesses and designates which wild species are in some danger of disappearing from Canada.

References

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4 - McCarty, John P. 1996. Eastern Wood-Pewee (Contopus virens), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: http://bna.birds.cornell.edu/bna/species/245doi:10.2173/bna.245

Appendix H: NHIC List

Unique Identifier (Element ID)	EO ID	Scientific Name	English Name	G-rank	S-rank	COSEWIC Status	SARO Status	Canada General Status	Ontario General Status	UTM Zone	Easting (nearest km)	Northing (nearest km)	EO Rank	EO Rank Date	First Observed Date	Last Observed Date
180726	35563	Mustela nivalis	Least Weasel	G5	SU			Secure	Undetermined	17	665000	5005000	H	1/29/2002	1/1/1974	1/1/1974
180726	35570	Mustela nivalis	Least Weasel	G5	SU			Secure	Undetermined	17	662000	5017000	F	1/29/2002	12/14/1991	12/14/1991
180671	35619	Myotis septentrionalis	Northern Long-eared Bat	G4	S3			Sensitive	Sensitive	17	644000	5017000	H	2/6/2002	8/23/1929	8/23/1929
180671	35609	Myotis septentrionalis	Northern Long-eared Bat	G4	S3			Sensitive	Sensitive	17	589000	4968000	H	1/1/2009	1983	1983
180671	35610	Myotis septentrionalis	Northern Long-eared Bat	G4	S3			Sensitive	Sensitive	17	634000	4965000	H	2/1/2002	8/26/1911	8/26/1911
180063	21351	Ixobrychus exilis	Least Bittern	G5	S4B	THR	THR	At risk	At Risk	17	583000	4985000	H	3/16/1998	5/20/1973	1976-07
180063	21347	Ixobrychus exilis	Least Bittern	G5	S4B	THR	THR	At risk	At Risk	17	606000	4954000	AB	1/19/2007	6/16/1935	6/28/2002
193999	34955	Charadrius melodus	Piping Plover	G3	S1B	END	END	At risk	At Risk	17	579000	4972000	H	11/20/2001	6/11/1937	6/11/1937
180071	12556	Nycticorax nycticorax	Black-crowned Night-heron	G5	S3B,S3N			Sensitive	Sensitive	17	577000	4981000	C	12/13/2000	1964-?-?	6/3/1994
180071	12557	Nycticorax nycticorax	Black-crowned Night-heron	G5	S3B,S3N			Sensitive	Sensitive	17	577000	4981000	D	12/13/2000	5/29/1989	1991-06
180123	93219	Haliaeetus leucocephalus	Bald Eagle	G5	S2N,S4B	NAR	SC	Secure	At Risk	17	599000	4959000	E	6/18/2008	6/25/2006	2008-06
193996	93415	Falco peregrinus	Peregrine Falcon	G4	S3B	SC	THR	Sensitive	At Risk	17	655000	5028000	H	3/18/1997	1923	7/7/1952
193996	11886	Falco peregrinus	Peregrine Falcon	G4	S3B	SC	THR	Sensitive	At Risk	17	623000	5010000	H	3/26/1997	1886	8/15/1936
193996	11885	Falco peregrinus	Peregrine Falcon	G4	S3B	SC	THR	Sensitive	At Risk	17	641000	5020000	H	3/26/1997	1930	8/21/1946
193996	11884	Falco peregrinus	Peregrine Falcon	G4	S3B	SC	THR	Sensitive	At Risk	17	653000	5033000	H	1/26/1998	1924	1924
193996	11866	Falco peregrinus	Peregrine Falcon	G4	S3B	SC	THR	Sensitive	At Risk	17	616000	4991000	H	3/25/1997	1888	8/30/1904
193996	17216	Falco peregrinus	Peregrine Falcon	G4	S3B	SC	THR	Sensitive	At Risk	17	636000	5020000	H	1/22/1998	1940	1951
193996	17214	Falco peregrinus	Peregrine Falcon	G4	S3B	SC	THR	Sensitive	At Risk	17	638000	5014000	H	1/22/1998	1936	1946
193996	17210	Falco peregrinus	Peregrine Falcon	G4	S3B	SC	THR	Sensitive	At Risk	17	664000	5013000	H	1/22/1998	1906-06	5/27/1947
193996	17213	Falco peregrinus	Peregrine Falcon	G4	S3B	SC	THR	Sensitive	At Risk	17	654000	5020000	H	1/22/1998	6/29/1941	1946
193996	11887	Falco peregrinus	Peregrine Falcon	G4	S3B	SC	THR	Sensitive	At Risk	17	592000	4969000	H	3/26/1997	5/17/1931	5/24/1931
180229	356	Hydroprogne caspia	Caspian Tern	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	573000	4800000	A	1/20/1999	1980	1989-05
180229	355	Hydroprogne caspia	Caspian Tern	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	574000	4979000	C	1/21/1999	1972	5/23/1989
180406	7672	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	588000	4979000	H	3/25/1998	1970	1970
180406	606	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	592000	4970000	D	1/19/1999	6/3/1990	6/9/1997
180406	600	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	589000	4967000	D	1/19/1999	6/25/1989	8/6/1989
180406	7488	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	586000	4976000	D	1/19/1999	6/2/1992	6/3/1992
180406	598	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	588000	4971000	F	3/25/1998	5/21/1989	5/30/1990
180406	597	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	588000	4975000	D	3/25/1998	6/7/1987	6/11/1997
180406	596	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	589000	4977000	D	3/25/1998	5/22/1988	6/1/1991
180406	595	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	586000	4975000	CD	1/19/1999	6/3/1990	6/5/1997
180406	594	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	590000	4973000	D	1/25/1999	5/30/1989	6/11/1997
180406	593	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	591000	4971000	CD	3/24/1998	5/5/1981	6/9/1997
180406	591	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	591000	4972000	D	3/24/1998	5/5/1981	6/2/1997
180406	590	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	590000	4971000	D	1/19/1999	5/13/1976	6/25/1992
180406	21380	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	585000	4976000	D	3/24/1998	6/5/1997	6/5/1997
180406	21379	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	585000	4975000	D	3/24/1998	6/5/1997	6/5/1997
180406	21376	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	590000	4972000	D	1/19/1999	5/9/1976	6/25/1992
180406	21369	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	590000	4972000	CD	3/20/1998	6/2/1997	6/2/1997
180406	21378	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	585000	4975000	D	3/24/1998	6/5/1997	6/5/1997
180406	7840	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	579000	4985000	D	1/19/1999	6/6/1991	6/6/1991
180406	21416	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	574000	4990000	D	3/25/1998	6/13/1997	6/13/1997
180406	21504	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	585000	4977000	D	3/27/1998	6/4/1997	6/4/1997
180406	21384	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	590000	4975000	D	3/24/1998	6/11/1997	6/11/1997
180406	21383	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	589000	4975000	D	3/24/1998	6/11/1997	6/11/1997
180406	21382	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	589000	4976000	D	3/24/1998	6/11/1997	6/11/1997
180406	21381	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	585000	4976000	D	3/24/1998	6/5/1997	6/5/1997
180406	21501	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	589000	4975000	D	3/27/1998	6/11/1997	6/11/1997
180406	21502	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	589000	4975000	D	3/27/1998	6/11/1997	6/11/1997
180406	21543	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	592000	4980000	H	1/1/2009	1972	1972
180406	21472	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	583000	4982000	D	1/25/1999	5/31/1997	5/31/1997

Unique Identifier (Element ID)	EO ID	Scientific Name	English Name	G-rank	S-rank	COSEWIC Status	SARO Status	Canada General Status	Ontario General Status	UTM Zone	Easting (nearest km)	Northing (nearest km)	EO Rank	EO Rank Date	First Observed Date	Last Observed Date
180406	21471	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	582000	4982000	D	3/26/1998	6/3/1997	6/3/1997
180406	21466	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	582000	4984000	D	3/26/1998	5/31/1997	5/31/1997
180406	21465	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	580000	4985000	D	3/26/1998	6/12/1997	6/12/1997
180406	21464	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	582000	4983000	D	3/26/1998	5/31/1997	5/31/1997
180406	21463	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	582000	4983000	D	3/26/1998	5/31/1997	5/31/1997
180406	21474	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	581000	4983000	D	1/25/1999	6/4/1997	6/4/1997
180406	21473	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	581000	4984000	D	3/27/1998	6/4/1997	6/4/1997
180406	21494	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	588000	4976000	D	1/19/1999	6/10/1997	6/10/1997
180406	21418	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	573000	4990000	D	3/25/1998	6/13/1997	6/13/1997
180406	21500	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	588000	4975000	D	3/27/1998	6/11/1997	6/11/1997
180406	21499	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	588000	4975000	D	3/27/1998	6/11/1997	6/11/1997
180406	21498	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	588000	4975000	D	3/27/1998	6/11/1997	6/12/1997
180406	21419	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	571000	4995000	D	3/25/1998	6/25/1997	6/25/1997
180406	21487	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	588000	4978000	D	3/27/1998	6/10/1997	6/10/1997
180406	21486	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	589000	4979000	D	3/27/1998	6/10/1997	6/10/1997
180406	21485	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	589000	4978000	D	1/19/1999	6/10/1997	6/10/1997
180406	21484	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	589000	4978000	D	3/27/1998	6/10/1997	6/10/1997
180406	21483	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	587000	4974000	D	3/27/1998	6/5/1997	6/5/1997
180406	21479	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	589000	4971000	D	3/27/1998	6/2/1997	6/2/1997
180406	21417	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	574000	4990000	D	3/25/1998	6/13/1997	6/13/1997
180406	21547	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	575000	5000000	H	1/1/2009	6/18/1983	6/18/1983
180406	21513	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	585000	4981000	D	3/27/1998	6/3/1997	6/3/1997
180406	21545	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	593000	4969000	H	1/1/2009	1931-06	7/12/1934
180406	21544	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	583000	4981000	H	1/1/2009	8/1/1904	8/1/1904
180406	21535	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	583000	4992000	H	1/1/2009	6/25/1984	6/25/1984
180406	21497	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	588000	4975000	D	3/27/1998	6/11/1997	6/11/1997
180406	21496	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	588000	4976000	D	3/27/1998	6/11/1997	6/11/1997
180406	21495	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	588000	4975000	D	3/27/1998	6/11/1997	6/11/1997
180406	21424	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	572000	4994000	D	3/26/1998	6/30/1997	6/30/1997
180406	21423	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	573000	4990000	D	3/26/1998	6/30/1997	6/30/1997
180406	92188	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	585000	4976000	D	1/19/1999	6/4/1997	6/4/1997
180406	7454	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	604000	4966000	D	1/19/1999	1960	6/1/1997
180406	7597	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	613000	4985000	H	1/1/2009	1981-07	7/4/1981
180406	7634	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	590000	4972000	D	1/19/1999	5/22/1990	5/22/1990
180406	7812	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	589000	4973000	D	1/19/1999	6/1/1990	6/1/1990
180406	7594	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	571000	4992000	D	1/19/1999	5/31/1990	6/6/1991
180406	7684	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	591000	4972000	H	1/1/2009	6/19/1987	6/19/1987
180406	7900	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	572000	4992000	D	3/20/1998	6/6/1991	6/30/1997
180406	588	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	604000	4969000	H	1/1/2009	1965	7/8/1984
180406	599	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	589000	4964000	H	1/1/2009	6/24/1987	6/24/1987
180406	7811	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	580000	4990000	H	1/1/2009	6/27/1988	6/27/1988
180406	7788	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	584000	4995000	H	1/1/2009	7/17/1986	7/17/1986
180406	7763	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	584000	4977000	D	3/24/1998	5/16/1991	6/5/1997
180406	21366	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	590000	4974000	D	1/19/1999	6/6/1997	6/11/1997
180406	21492	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	588000	4977000	D	1/25/1999	6/10/1997	6/10/1997
180406	21512	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	585000	4984000	D	3/27/1998	6/3/1997	6/3/1997
180406	21511	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	586000	4985000	D	3/27/1998	6/3/1997	6/3/1997
180406	21510	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	586000	4985000	D	3/27/1998	6/3/1997	6/3/1997
180406	21509	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	587000	4985000	D	3/27/1998	6/3/1997	6/3/1997
180406	21508	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	587000	4975000	D	1/19/1999	6/5/1997	6/5/1997
180406	21507	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	587000	4977000	D	3/27/1998	6/5/1997	6/5/1997
180406	21506	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	586000	4975000	D	3/27/1998	6/5/1997	6/5/1997

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180406	21505	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	585000	4976000	D	3/27/1998	6/5/1997	6/5/1997
180406	21527	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	590000	4978000	D	3/30/1998	6/10/1997	6/10/1997
180406	21525	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	590000	4977000	D	1/19/1999	6/6/1997	6/10/1997
180406	21524	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	592000	4975000	CD	3/27/1998	6/6/1997	6/6/1997
180406	21523	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	592000	4976000	D	1/19/1999	6/6/1997	6/6/1997
180406	21522	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	592000	4975000	D	1/19/1999	6/6/1997	6/6/1997
180406	21476	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	580000	4989000	D	1/25/1999	6/16/1997	6/16/1997
180406	21475	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	580000	4984000	D	3/27/1998	6/4/1997	6/4/1997
180406	21521	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	591000	4975000	D	3/27/1998	6/6/1997	6/6/1997
180406	21520	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	590000	4973000	D	3/27/1998	6/9/1997	6/9/1997
180406	21519	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	591000	4974000	D	1/19/1999	6/9/1997	6/9/1997
180406	21518	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	591000	4974000	D	1/19/1999	6/6/1997	6/6/1997
180406	21517	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	593000	4974000	D	1/25/1999	6/6/1997	6/6/1997
180406	21516	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	592000	4974000	D	3/27/1998	6/6/1997	6/6/1997
180406	21515	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	592000	4974000	D	1/25/1999	6/6/1997	6/6/1997
180406	21514	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	591000	4973000	D	3/27/1998	6/6/1997	6/6/1997
180406	21533	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	582000	4992000	H	1/1/2009	6/25/1984	6/25/1984
180406	21532	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	602000	4969000	D	3/30/1998	6/1/1997	6/1/1997
180406	21531	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	603000	4969000	D	3/30/1998	6/1/1997	6/1/1997
180406	21528	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	603000	4967000	D	3/30/1998	6/1/1997	6/1/1997
180406	21526	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	590000	4977000	D	1/25/1999	6/10/1997	6/10/1997
180406	21482	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	588000	4971000	D	3/27/1998	6/2/1997	6/2/1997
180406	21481	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	589000	4971000	D	3/27/1998	6/2/1997	6/2/1997
180406	21480	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	589000	4972000	D	3/27/1998	6/2/1997	6/2/1997
180406	21478	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	588000	4975000	D	3/27/1998	6/11/1997	6/11/1997
180406	21493	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	588000	4977000	D	3/27/1998	6/10/1997	6/10/1997
180406	21491	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	587000	4978000	D	3/27/1998	6/10/1997	6/10/1997
180406	21489	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	588000	4978000	D	1/19/1999	6/10/1997	6/10/1997
180406	21490	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	587000	4977000	D	3/27/1998	6/10/1997	6/10/1997
180406	21488	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	588000	4978000	D	3/27/1998	6/10/1997	6/10/1997
180406	21450	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	575000	4990000	D	3/26/1998	6/13/1997	6/13/1997
180406	21449	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	577000	4990000	D	1/19/1999	7/8/1984	6/13/1997
180406	21448	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	579000	4987000	D	3/26/1998	6/16/1997	6/16/1997
180406	21447	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	576000	4990000	D	3/26/1998	6/13/1997	6/13/1997
180406	21446	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	577000	4989000	D	3/26/1998	6/13/1997	6/13/1997
180406	21445	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	577000	4990000	D	3/26/1998	6/13/1997	6/13/1997
180406	21444	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	578000	4985000	D	3/26/1998	6/12/1997	6/12/1997
180406	21443	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	579000	4985000	D	3/26/1998	6/12/1997	6/12/1997
180406	21377	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	589000	4974000	D	1/19/1999	6/11/1997	6/11/1997
180406	21420	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	572000	4994000	D	3/25/1998	6/25/1997	6/25/1997
180406	7774	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	584000	4982000	D	1/25/1999	5/21/1989	6/3/1997
180406	7706	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	591000	4984000	H	1/1/2009	1984-07	5/25/1987
180406	21462	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	582000	4984000	D	3/26/1998	6/20/1973	5/31/1997
180406	21461	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	584000	4977000	D	3/26/1998	6/4/1997	6/4/1997
180406	21469	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	584000	4983000	D	3/26/1998	6/3/1997	6/3/1997
180406	21468	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	584000	4983000	D	1/19/1999	6/3/1997	6/3/1997
180406	21467	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	584000	4983000	D	1/19/1999	1933	5/31/1997
180406	21470	Dendroica discolor	Prairie Warbler	G5	S3B	NAR	NAR	Sensitive	Sensitive	17	583000	4982000	D	3/26/1998	6/3/1997	6/3/1997
180411	4524	Dendroica cerulea	Cerulean Warbler	G4	S3B	END	SC	Sensitive	May be at risk	17	589000	4968000	B?	11/26/1997	6/21/1972	1997-06
180411	13765	Dendroica cerulea	Cerulean Warbler	G4	S3B	END	SC	Sensitive	May be at risk	17	598000	4980000	H	11/27/1997	6/21/1976	6/24/1976
180455	13101	Ammodramus henslowii	Henslow's Sparrow	G4	SHB	END	END	At risk	At Risk	17	607000	4997000	H	10/24/1997	7/14/1902	7/14/1902
180752	35856	Emydoidea blandingii	Blanding's Turtle	G4	S3	THR	THR	May be at risk	At Risk	17	586000	4991000	H	1/1/2009	5/29/1979	5/17/1987

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180752	32357	Emydoidea blandingii	Blanding's Turtle	G4	S3	THR	THR	May be at risk	At Risk	17	605000	4966000	E	2/21/2002	1951	6/6/2007
180752	32340	Emydoidea blandingii	Blanding's Turtle	G4	S3	THR	THR	May be at risk	At Risk	17	628000	5026000	E	2/21/2002	6/28/1989	6/28/1989
180752	32348	Emydoidea blandingii	Blanding's Turtle	G4	S3	THR	THR	May be at risk	At Risk	17	626000	5003000	H	1/1/2009	4/21/1987	4/21/1987
180752	35843	Emydoidea blandingii	Blanding's Turtle	G4	S3	THR	THR	May be at risk	At Risk	17	595000	4967000	E	2/21/2002	6/6/1971	7/9/2002
180752	91995	Emydoidea blandingii	Blanding's Turtle	G4	S3	THR	THR	May be at risk	At Risk	17	608000	4985000	E	12/1/2004	4/19/2004	4/19/2004
180752	35849	Emydoidea blandingii	Blanding's Turtle	G4	S3	THR	THR	May be at risk	At Risk	17	594000	4982000	E	2/21/2002	1985-06	1992
180752	35850	Emydoidea blandingii	Blanding's Turtle	G4	S3	THR	THR	May be at risk	At Risk	17	603000	4975000	E	2/21/2002	9/7/1991	9/7/1991
180752	35848	Emydoidea blandingii	Blanding's Turtle	G4	S3	THR	THR	May be at risk	At Risk	17	616000	4980000	E	2/21/2002	5/3/1990	6/8/1992
180752	35854	Emydoidea blandingii	Blanding's Turtle	G4	S3	THR	THR	May be at risk	At Risk	17	621000	4961000	E	2/22/2002	6/6/1985	6/22/2007
180752	35853	Emydoidea blandingii	Blanding's Turtle	G4	S3	THR	THR	May be at risk	At Risk	17	607000	4989000	E	2/22/2002	5/6/1990	5/6/1990
180752	32365	Emydoidea blandingii	Blanding's Turtle	G4	S3	THR	THR	May be at risk	At Risk	17	685000	4957000	AB	12/31/2007	7/18/1986	8/7/2007
180752	32349	Emydoidea blandingii	Blanding's Turtle	G4	S3	THR	THR	May be at risk	At Risk	17	573000	4993000	E	2/21/2002	1960	7/25/2002
180752	32343	Emydoidea blandingii	Blanding's Turtle	G4	S3	THR	THR	May be at risk	At Risk	17	628000	5013000	E	2/21/2002	5/25/1990	5/25/1990
180752	32354	Emydoidea blandingii	Blanding's Turtle	G4	S3	THR	THR	May be at risk	At Risk	17	595000	4995000	E	2/21/2002	7/11/1989	10/25/2001
180753	91621	Graptemys geographica	Northern Map Turtle	G5	S3	SC	SC	Sensitive	Sensitive	17	588000	4966000	E		7/22/1971	8/28/2008
180753	91628	Graptemys geographica	Northern Map Turtle	G5	S3	SC	SC	Sensitive	Sensitive	17	572000	5000000	H	1/1/2009		8/13/1986
180753	91623	Graptemys geographica	Northern Map Turtle	G5	S3	SC	SC	Sensitive	Sensitive	17	621000	4967000	E		7/10/1977	8/7/2007
180753	91619	Graptemys geographica	Northern Map Turtle	G5	S3	SC	SC	Sensitive	Sensitive	18	394000	4934000	H	1/1/2009	6/6/1976	7/4/1985
180758	91587	Sternotherus odoratus	Eastern Musk Turtle	G5	S3	THR	THR	At risk	At Risk	17	577000	5000000	H	1/1/2009		1957-07-?
180758	91503	Sternotherus odoratus	Eastern Musk Turtle	G5	S3	THR	THR	At risk	At Risk	17	597000	4981000	H	1/1/2009		8/25/1988
180758	92392	Sternotherus odoratus	Eastern Musk Turtle	G5	S3	THR	THR	At risk	At Risk	17	604000	4970000	E		2004	2004
180758	91530	Sternotherus odoratus	Eastern Musk Turtle	G5	S3	THR	THR	At risk	At Risk	17	593000	4968000	E	11/2/2004	1961- -?	11/16/1997
180758	91467	Sternotherus odoratus	Eastern Musk Turtle	G5	S3	THR	THR	At risk	At Risk	17	572000	4994000	E		7/2/1977	6/2/1994
180758	91471	Sternotherus odoratus	Eastern Musk Turtle	G5	S3	THR	THR	At risk	At Risk	17	571000	4991000	E		5/25/1992	5/26/1992
180758	91473	Sternotherus odoratus	Eastern Musk Turtle	G5	S3	THR	THR	At risk	At Risk	17	578000	4986000	H	1/1/2009		6/9/1984
180758	91483	Sternotherus odoratus	Eastern Musk Turtle	G5	S3	THR	THR	At risk	At Risk	17	582000	4984000	H	1/1/2009		7/21/1979
180758	91477	Sternotherus odoratus	Eastern Musk Turtle	G5	S3	THR	THR	At risk	At Risk	17	587000	4985000	H	1/1/2009		7/28/1985
180758	91525	Sternotherus odoratus	Eastern Musk Turtle	G5	S3	THR	THR	At risk	At Risk	17	589000	4968000	E	11/29/2007	7/25/1925	7/3/1994
180758	91468	Sternotherus odoratus	Eastern Musk Turtle	G5	S3	THR	THR	At risk	At Risk	17	615000	4982000	H	11/29/2007	7/31/1936	7/31/1936
180758	91518	Sternotherus odoratus	Eastern Musk Turtle	G5	S3	THR	THR	At risk	At Risk	17	589000	4976000	E	11/29/2007	5/4/1974	5/5/1992
180758	91499	Sternotherus odoratus	Eastern Musk Turtle	G5	S3	THR	THR	At risk	At Risk	17	595000	4975000	H	1/1/2009		1979-?
180758	91519	Sternotherus odoratus	Eastern Musk Turtle	G5	S3	THR	THR	At risk	At Risk	17	586000	4976000	E		6/8/1995	6/8/1995
180758	91517	Sternotherus odoratus	Eastern Musk Turtle	G5	S3	THR	THR	At risk	At Risk	17	623000	4977000	H	1/1/2009		7/22/1988
180758	91526	Sternotherus odoratus	Eastern Musk Turtle	G5	S3	THR	THR	At risk	At Risk	17	633000	4966000	E			6/26/1992
180758	91532	Sternotherus odoratus	Eastern Musk Turtle	G5	S3	THR	THR	At risk	At Risk	17	596000	4965000	E	11/8/2004	5/27/1987	9/23/1995
180758	91586	Sternotherus odoratus	Eastern Musk Turtle	G5	S3	THR	THR	At risk	At Risk	17	573000	5004000	H	1/1/2009		1973-?
180758	91529	Sternotherus odoratus	Eastern Musk Turtle	G5	S3	THR	THR	At risk	At Risk	17	626000	4966000	E	11/8/2004	5/9/1985	6/13/2007
17150	16795	Plestiodon fasciatus pop. 2	Common Five-lined Skink (Southern Shield population)	G5T4	S3	SC	SC			17	629000	4975000	H	1/1/2009	8/30/1942	8/10/1988
17150	16799	Plestiodon fasciatus pop. 2	Common Five-lined Skink (Southern Shield population)	G5T4	S3	SC	SC			17	633000	4973000	E	10/3/2001	8/11/1985	1997-pre
17150	16806	Plestiodon fasciatus pop. 2	Common Five-lined Skink (Southern Shield population)	G5T4	S3	SC	SC			17	650000	4986000	E	10/3/2001	6/15/1988	1997-pre
17150	16864	Plestiodon fasciatus pop. 2	Common Five-lined Skink (Southern Shield population)	G5T4	S3	SC	SC			17	580000	4965000	E	10/3/2001	1989	7/5/1991
17150	16791	Plestiodon fasciatus pop. 2	Common Five-lined Skink (Southern Shield population)	G5T4	S3	SC	SC			17	616000	4985000	E	10/3/2001	1979	5/6/1990
17150	16790	Plestiodon fasciatus pop. 2	Common Five-lined Skink (Southern Shield population)	G5T4	S3	SC	SC			17	605000	4988000	E	10/3/2001	8/9/1990	8/9/1990
17150	16789	Plestiodon fasciatus pop. 2	Common Five-lined Skink (Southern Shield population)	G5T4	S3	SC	SC			17	590000	4993000	H	1/1/2009	9/18/1988	9/18/1988

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17150	92838	Plestiodon fasciatus pop. 2	Common Five-lined Skink (Southern Shield population)	G5T4	S3	SC	SC			17	594000	4996000	E		Pre: 2001-01-06	Pre: 2001-01-06
17150	16780	Plestiodon fasciatus pop. 2	Common Five-lined Skink (Southern Shield population)	G5T4	S3	SC	SC			17	615000	4978000	C	1/4/1998	5/14/1959	2004-pre
17150	22409	Plestiodon fasciatus pop. 2	Common Five-lined Skink (Southern Shield population)	G5T4	S3	SC	SC			17	647000	4969000	E	10/3/2001	1994	1994
17150	22408	Plestiodon fasciatus pop. 2	Common Five-lined Skink (Southern Shield population)	G5T4	S3	SC	SC			17	597000	4974000	H	10/10/2001	9/20/1981	9/20/1981
17150	16775	Plestiodon fasciatus pop. 2	Common Five-lined Skink (Southern Shield population)	G5T4	S3	SC	SC			17	595000	4965000	C	10/19/1998	6/30/1928	8/16/1995
17150	16762	Plestiodon fasciatus pop. 2	Common Five-lined Skink (Southern Shield population)	G5T4	S3	SC	SC			17	573000	4994000	H	10/3/2001	8/2/1977	1980
17150	16777	Plestiodon fasciatus pop. 2	Common Five-lined Skink (Southern Shield population)	G5T4	S3	SC	SC			17	597000	4969000	E	10/1/2003	10/3/1971	9/4/2002
17150	16776	Plestiodon fasciatus pop. 2	Common Five-lined Skink (Southern Shield population)	G5T4	S3	SC	SC			17	596000	4966000	C	1/4/1998	5/13/1972	10/21/1990
17150	16872	Plestiodon fasciatus pop. 2	Common Five-lined Skink (Southern Shield population)	G5T4	S3	SC	SC			17	617000	4966000	E	10/3/2001	6/28/1991	7/5/1991
17150	16779	Plestiodon fasciatus pop. 2	Common Five-lined Skink (Southern Shield population)	G5T4	S3	SC	SC			17	594000	4975000	E	9/26/2001	1977	6/28/2001
17150	16767	Plestiodon fasciatus pop. 2	Common Five-lined Skink (Southern Shield population)	G5T4	S3	SC	SC			17	586000	4975000	C	10/23/1998	1980	8/21/1995
17150	16778	Plestiodon fasciatus pop. 2	Common Five-lined Skink (Southern Shield population)	G5T4	S3	SC	SC			17	590000	4976000	C	1/4/1998	1980	7/4/1998
17150	16782	Plestiodon fasciatus pop. 2	Common Five-lined Skink (Southern Shield population)	G5T4	S3	SC	SC			17	606000	4972000	C	1/4/1998	1979	6/2/1994
17150	16804	Plestiodon fasciatus pop. 2	Common Five-lined Skink (Southern Shield population)	G5T4	S3	SC	SC			17	643000	4967000	E	10/10/2001	8/5/1943	5/6/1990
17150	16890	Plestiodon fasciatus pop. 2	Common Five-lined Skink (Southern Shield population)	G5T4	S3	SC	SC			17	591000	4953000	H	1/1/2009	1983	1983
17150	16794	Plestiodon fasciatus pop. 2	Common Five-lined Skink (Southern Shield population)	G5T4	S3	SC	SC			17	621000	4968000	C	1/4/1998	10/3/1990	10/4/1990
17150	16793	Plestiodon fasciatus pop. 2	Common Five-lined Skink (Southern Shield population)	G5T4	S3	SC	SC			17	618000	4978000	E	10/3/2001	5/4/1990	9/26/1990
17150	16786	Plestiodon fasciatus pop. 2	Common Five-lined Skink (Southern Shield population)	G5T4	S3	SC	SC			17	615000	4985000	E	10/3/2001	8/10/1947	7/26/1989
17150	16785	Plestiodon fasciatus pop. 2	Common Five-lined Skink (Southern Shield population)	G5T4	S3	SC	SC			17	616000	4978000	C	9/26/2001	6/11/1990	5/23/2001
17150	16763	Plestiodon fasciatus pop. 2	Common Five-lined Skink (Southern Shield population)	G5T4	S3	SC	SC			17	574000	4995000	C	1/3/1998	7/3/1977	1990
17150	16805	Plestiodon fasciatus pop. 2	Common Five-lined Skink (Southern Shield population)	G5T4	S3	SC	SC			17	645000	4964000	E	10/3/2001	8/26/1989	8/26/1989
17150	16803	Plestiodon fasciatus pop. 2	Common Five-lined Skink (Southern Shield population)	G5T4	S3	SC	SC			17	640000	4963000	H	1/4/1998	7/10/1977	7/10/1977
17150	16788	Plestiodon fasciatus pop. 2	Common Five-lined Skink (Southern Shield population)	G5T4	S3	SC	SC			17	605000	4985000	H	1/1/2009	8/1/1988	8/1/1988
17150	16728	Plestiodon fasciatus pop. 2	Common Five-lined Skink (Southern Shield population)	G5T4	S3	SC	SC			17	673000	4996000	H	1/8/1998		ND
17150	16787	Plestiodon fasciatus pop. 2	Common Five-lined Skink (Southern Shield population)	G5T4	S3	SC	SC			17	593000	4987000	E	10/3/2001	9/11/1986	8/28/1989

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17150	16772	Plestiodon fasciatus pop. 2	Common Five-lined Skink (Southern Shield population)	G5T4	S3	SC	SC			17	583000	4995000	H	1/1/2009	7/10/1985	7/10/1985
17150	16765	Plestiodon fasciatus pop. 2	Common Five-lined Skink (Southern Shield population)	G5T4	S3	SC	SC			17	577000	4990000	C	1/3/1998	5/17/1987	6/10/2003
17150	16771	Plestiodon fasciatus pop. 2	Common Five-lined Skink (Southern Shield population)	G5T4	S3	SC	SC			17	591000	4985000	C	1/3/1998	1985-08	7/11/2000
17150	16770	Plestiodon fasciatus pop. 2	Common Five-lined Skink (Southern Shield population)	G5T4	S3	SC	SC			17	580000	4987000	H	1/1/2009	6/9/1984	6/9/1984
17150	34690	Plestiodon fasciatus pop. 2	Common Five-lined Skink (Southern Shield population)	G5T4	S3	SC	SC			17	594000	4980000	E	9/26/2001	6/6/2001	6/6/2001
17150	34687	Plestiodon fasciatus pop. 2	Common Five-lined Skink (Southern Shield population)	G5T4	S3	SC	SC			17	585000	4979000	C	9/25/2001	6/12/2001	8/22/2001
17150	16768	Plestiodon fasciatus pop. 2	Common Five-lined Skink (Southern Shield population)	G5T4	S3	SC	SC			17	584000	4983000	C	1/3/1998	1927-09	6/16/2001
17150	16802	Plestiodon fasciatus pop. 2	Common Five-lined Skink (Southern Shield population)	G5T4	S3	SC	SC			17	636000	4985000	E	10/3/2001	8/6/1992	8/6/1992
17150	16801	Plestiodon fasciatus pop. 2	Common Five-lined Skink (Southern Shield population)	G5T4	S3	SC	SC			17	637000	4970000	E	10/3/2001	5/23/1990	9/11/1990
17150	16800	Plestiodon fasciatus pop. 2	Common Five-lined Skink (Southern Shield population)	G5T4	S3	SC	SC			17	634000	4975000	E	10/3/2001	5/22/1990	5/22/1990
17150	16798	Plestiodon fasciatus pop. 2	Common Five-lined Skink (Southern Shield population)	G5T4	S3	SC	SC			17	639000	4963000	C	1/4/1998	5/6/1990	9/17/1990
17150	16797	Plestiodon fasciatus pop. 2	Common Five-lined Skink (Southern Shield population)	G5T4	S3	SC	SC			17	637000	4968000	E	10/3/2001	8/6/1910	5/22/1990
17150	16796	Plestiodon fasciatus pop. 2	Common Five-lined Skink (Southern Shield population)	G5T4	S3	SC	SC			17	633000	4960000	H	1/1/2009	6/17/1988	6/17/1988
17150	16781	Plestiodon fasciatus pop. 2	Common Five-lined Skink (Southern Shield population)	G5T4	S3	SC	SC			17	599000	4981000	C	1/4/1998	1971-08	7/3/1991
17150	16784	Plestiodon fasciatus pop. 2	Common Five-lined Skink (Southern Shield population)	G5T4	S3	SC	SC			17	615000	4975000	C	1/4/1998	5/19/1990	8/1/1992
17150	16783	Plestiodon fasciatus pop. 2	Common Five-lined Skink (Southern Shield population)	G5T4	S3	SC	SC			17	606000	4982000	C	10/10/2001	7/29/1989	7/29/1989
180770	90892	Lampropeltis triangulum	Milksnake	G5	S3	SC	SC	Sensitive	Sensitive	17	648000	4970000	E			1994-?
180770	91415	Lampropeltis triangulum	Milksnake	G5	S3	SC	SC	Sensitive	Sensitive	17	612000	4983000	H	1/1/2009		8/17/1958
180770	91413	Lampropeltis triangulum	Milksnake	G5	S3	SC	SC	Sensitive	Sensitive	17	587000	4977000	H	11/8/2004	6/23/1957	8/8/1961
180770	91333	Lampropeltis triangulum	Milksnake	G5	S3	SC	SC	Sensitive	Sensitive	17	624000	4973000	H	1/1/2009		7/25/1926
180770	91999	Lampropeltis triangulum	Milksnake	G5	S3	SC	SC	Sensitive	Sensitive	17	589000	4976000	E		5/27/1993	5/27/1993
180770	91462	Lampropeltis triangulum	Milksnake	G5	S3	SC	SC	Sensitive	Sensitive	17	572000	4994000	H	1/1/2009		8/15/1977
180770	91381	Lampropeltis triangulum	Milksnake	G5	S3	SC	SC	Sensitive	Sensitive	17	643000	4998000	E			10/4/1990
180770	90883	Lampropeltis triangulum	Milksnake	G5	S3	SC	SC	Sensitive	Sensitive	17	602000	4982000	H	1/1/2009		8/30/1986
180770	90888	Lampropeltis triangulum	Milksnake	G5	S3	SC	SC	Sensitive	Sensitive	17	603000	4977000	E			8/9/1991
180770	91410	Lampropeltis triangulum	Milksnake	G5	S3	SC	SC	Sensitive	Sensitive	17	633000	4989000	H	1/1/2009		1899-05-25
180770	90893	Lampropeltis triangulum	Milksnake	G5	S3	SC	SC	Sensitive	Sensitive	17	610000	4970000	E	11/5/2004	6/30/1935	8/2/1994
180770	90906	Lampropeltis triangulum	Milksnake	G5	S3	SC	SC	Sensitive	Sensitive	17	595000	4969000	H	1/1/2009		1983-?
180770	90899	Lampropeltis triangulum	Milksnake	G5	S3	SC	SC	Sensitive	Sensitive	17	594000	4966000	E	11/5/2004	5/13/1972	8/15/1995
180770	91320	Lampropeltis triangulum	Milksnake	G5	S3	SC	SC	Sensitive	Sensitive	17	606000	5012000	H	1/1/2009		6/23/1957
180770	91350	Lampropeltis triangulum	Milksnake	G5	S3	SC	SC	Sensitive	Sensitive	17	674000	4992000	H	1/1/2009		1906-08-?
180770	90876	Lampropeltis triangulum	Milksnake	G5	S3	SC	SC	Sensitive	Sensitive	17	615000	4984000	H	1/1/2009		10/14/1984
180770	90879	Lampropeltis triangulum	Milksnake	G5	S3	SC	SC	Sensitive	Sensitive	17	641000	4977000	E			10/6/1990
180770	90881	Lampropeltis triangulum	Milksnake	G5	S3	SC	SC	Sensitive	Sensitive	17	595000	4983000	H	1/1/2009		5/17/1987
180770	90897	Lampropeltis triangulum	Milksnake	G5	S3	SC	SC	Sensitive	Sensitive	17	590000	4969000	E	11/1/2004	1980-?	6/18/2003
180770	91388	Lampropeltis triangulum	Milksnake	G5	S3	SC	SC	Sensitive	Sensitive	17	638000	4996000	E			5/15/1991

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180770	91409	Lampropeltis triangulum	Milksnake	G5	S3	SC	SC	Sensitive	Sensitive	17	575000	5004000	H	1/1/2009		1973-?
180770	91414	Lampropeltis triangulum	Milksnake	G5	S3	SC	SC	Sensitive	Sensitive	17	600000	4960000	H	1/1/2009	8/4/1935	8/4/1935
182542	90853	Thamnophis sauritus	Eastern Ribbonsnake	G5	S3	SC	SC	Sensitive	Sensitive	17	596000	4967000	E	11/5/2004	6/11/1969	9/7/1989
182542	90860	Thamnophis sauritus	Eastern Ribbonsnake	G5	S3	SC	SC	Sensitive	Sensitive	17	639000	4960000	E			6/26/1990
182542	90636	Thamnophis sauritus	Eastern Ribbonsnake	G5	S3	SC	SC	Sensitive	Sensitive	17	613000	5005000	E			7/19/1990
182542	90848	Thamnophis sauritus	Eastern Ribbonsnake	G5	S3	SC	SC	Sensitive	Sensitive	17	598000	4971000	H	1/1/2009	10/3/1971	9/24/1987
182542	90658	Thamnophis sauritus	Eastern Ribbonsnake	G5	S3	SC	SC	Sensitive	Sensitive	17	604000	5002000	E			5/22/1990
182542	90844	Thamnophis sauritus	Eastern Ribbonsnake	G5	S3	SC	SC	Sensitive	Sensitive	17	604000	4970000	E	11/5/2004	7/21/1990	7/21/1990
182542	90784	Thamnophis sauritus	Eastern Ribbonsnake	G5	S3	SC	SC	Sensitive	Sensitive	17	593000	4969000	H	11/5/2004	7/12/1959	8/28/1965
182542	90841	Thamnophis sauritus	Eastern Ribbonsnake	G5	S3	SC	SC	Sensitive	Sensitive	17	621000	4970000	E			7/13/1990
182542	90787	Thamnophis sauritus	Eastern Ribbonsnake	G5	S3	SC	SC	Sensitive	Sensitive	17	614000	4977000	E			5/19/1990
182542	90786	Thamnophis sauritus	Eastern Ribbonsnake	G5	S3	SC	SC	Sensitive	Sensitive	17	596000	4982000	H	1/1/2009		6/27/1977
182542	90825	Thamnophis sauritus	Eastern Ribbonsnake	G5	S3	SC	SC	Sensitive	Sensitive	17	617000	4977000	E			6/12/1990
182542	90832	Thamnophis sauritus	Eastern Ribbonsnake	G5	S3	SC	SC	Sensitive	Sensitive	17	629000	4973000	E			8/26/1990
182542	90826	Thamnophis sauritus	Eastern Ribbonsnake	G5	S3	SC	SC	Sensitive	Sensitive	17	602000	4977000	E			7/3/1991
182542	90831	Thamnophis sauritus	Eastern Ribbonsnake	G5	S3	SC	SC	Sensitive	Sensitive	17	624000	4974000	E			6/9/1990
182542	90749	Thamnophis sauritus	Eastern Ribbonsnake	G5	S3	SC	SC	Sensitive	Sensitive	17	606000	4990000	E		8/10/1990	9/20/2005
182542	90843	Thamnophis sauritus	Eastern Ribbonsnake	G5	S3	SC	SC	Sensitive	Sensitive	17	611000	4970000	E	11/5/2004	9/9/1991	9/9/1991
182542	93832	Thamnophis sauritus	Eastern Ribbonsnake	G5	S3	SC	SC	Sensitive	Sensitive	17	594000	4998000	AB	11/26/2009	9/16/2009	9/16/2009
182542	90803	Thamnophis sauritus	Eastern Ribbonsnake	G5	S3	SC	SC	Sensitive	Sensitive	17	606000	4985000	H	1/1/2009		9/17/1986
182542	90811	Thamnophis sauritus	Eastern Ribbonsnake	G5	S3	SC	SC	Sensitive	Sensitive	17	591000	4984000	H	1/1/2009		8/23/1986
182542	90817	Thamnophis sauritus	Eastern Ribbonsnake	G5	S3	SC	SC	Sensitive	Sensitive	17	594000	4982000	H	1/1/2009		5/17/1987
182542	90822	Thamnophis sauritus	Eastern Ribbonsnake	G5	S3	SC	SC	Sensitive	Sensitive	17	622000	4978000	E			5/4/1990
182542	90835	Thamnophis sauritus	Eastern Ribbonsnake	G5	S3	SC	SC	Sensitive	Sensitive	17	597000	4974000	H	11/5/2004	9/26/1971	9/20/1981
182542	90614	Thamnophis sauritus	Eastern Ribbonsnake	G5	S3	SC	SC	Sensitive	Sensitive	17	619000	5007000	E			5/25/1990
182542	90757	Thamnophis sauritus	Eastern Ribbonsnake	G5	S3	SC	SC	Sensitive	Sensitive	17	633000	4987000	E			8/26/1990
182542	90736	Thamnophis sauritus	Eastern Ribbonsnake	G5	S3	SC	SC	Sensitive	Sensitive	17	583000	4992000	E	9/7/2007		1991-?
182542	90829	Thamnophis sauritus	Eastern Ribbonsnake	G5	S3	SC	SC	Sensitive	Sensitive	17	590000	4976000	E	9/7/2007	6/22/1964	4/25/1990
182542	90840	Thamnophis sauritus	Eastern Ribbonsnake	G5	S3	SC	SC	Sensitive	Sensitive	17	590000	4972000	E	11/5/2004	9/11/1974	8/16/1989
180785	1404	Sistrurus catenatus	Massasauga	G3G4	S3	THR	THR	At risk	At Risk	17	572000	4994000	E		8/24/1959	9/1/2004
180785	1393	Sistrurus catenatus	Massasauga	G3G4	S3	THR	THR	At risk	At Risk	17	588000	4968000	E		1889	9/18/2007
180785	1396	Sistrurus catenatus	Massasauga	G3G4	S3	THR	THR	At risk	At Risk	17	603000	4971000	E		1880	9/23/2009
180785	11703	Sistrurus catenatus	Massasauga	G3G4	S3	THR	THR	At risk	At Risk	17	621000	4986000	H	1/1/2009	1984	1984
180785	1395	Sistrurus catenatus	Massasauga	G3G4	S3	THR	THR	At risk	At Risk	17	595000	4974000	E		1904	8/27/2008
180785	11687	Sistrurus catenatus	Massasauga	G3G4	S3	THR	THR	At risk	At Risk	17	629000	4976000	H	2/23/1998	1979	1979
180785	11685	Sistrurus catenatus	Massasauga	G3G4	S3	THR	THR	At risk	At Risk	17	585000	4955000	X	2/25/1998	1929-07	1969
17329	15546	Acipenser fulvescens pop. 3	Lake Sturgeon (Great Lakes - Upper St. Lawrence River population)	G3G4TNR	S2	THR	THR			17	580000	4997000	H	1/1/2009	7/23/1980	7/23/1980
17293	35782	Esox americanus vermiculatus	Grass Pickerel	G5T5	S3	SC	SC			17	634000	4966000	H	1/1/2009	4/29/1987	4/29/1987
17293	35779	Esox americanus vermiculatus	Grass Pickerel	G5T5	S3	SC	SC			17	641000	4970000	H	2/19/2002	8/27/1960	5/27/1975
180528	835	Coregonus reighardi	Shortnose Cisco	GH	SH	END	END	Extirpated or extinct	Extirpated	17	540000	4981000	H	1/21/1998	1900	1985
180607	32002	Noturus insignis	Margined Madtom	G5	SU	DD	DD	Undetermined	Undetermined	17	600000	5003000	E	1/2/2001	10/17/1988	1995
180607	32003	Noturus insignis	Margined Madtom	G5	SU	DD	DD	Undetermined	Undetermined	17	624000	4984000	E	1/3/2001	7/13/1993	1995
180607	32004	Noturus insignis	Margined Madtom	G5	SU	DD	DD	Undetermined	Undetermined	17	611000	5002000	E	1/3/2001	1996	1996
180645	16580	Ammocrypta pellucida	Eastern Sand Darter	G3G4	S2	THR	END	At risk	At Risk	17	369000	4626000	H	12/16/1997	1953------	1953------
181226	41595	Lestes eurinus	Amber-winged Spreadwing	G4	S3					17	655000	5009000	H	3/4/2002	7/11/1920	6/26/1922
181245	42066	Enallagma aspersum	Azure Bluet	G5	S3					17	618000	5010000	H	3/5/2002	7/1/1942	1949------
181245	41712	Enallagma aspersum	Azure Bluet	G5	S3					17	655000	5009000	H	3/5/2002	7/11/1920	6/29/1922
181137	41097	Aeshna clepsydra	Mottled Darner	G4	S3					17	615000	4981000	E	3/5/2002	9/5/1990	9/5/1990
181137	41098	Aeshna clepsydra	Mottled Darner	G4	S3					17	583000	4982000	H	3/5/2002	7/31/1907	9/12/1912

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181137	41099	Aeshna clepsydra	Mottled Darner	G4	S3					17	634000	4966000	E	3/5/2002	9/10/1990	9/10/1990
181137	66437	Aeshna clepsydra	Mottled Darner	G4	S3					17	579000	4975000	H	1/9/2003	7/14/1912	7/14/1912
181137	66929	Aeshna clepsydra	Mottled Darner	G4	S3					17	605000	4989000	E	12/12/2002	8/9/1990	8/9/1990
181137	66928	Aeshna clepsydra	Mottled Darner	G4	S3					17	590000	4981000	E	12/12/2002	8/11/2001	8/11/2001
181146	41142	Aeshna verticalis	Green-striped Darner	G5	S3					17	583000	4982000	H	3/4/2002	8/26/1907	8/30/1907
184162	41995	Gomphaeschna furcillata	Harlequin Darner	G5	S3					17	639000	5020000	E	3/4/2002	8/7/1996	8/7/1996
181153	41212	Nasiaeschna pentacantha	Cyrano Darner	G5	S3					17	583000	4982000	H	3/4/2002	1940	1940
181153	41213	Nasiaeschna pentacantha	Cyrano Darner	G5	S3					17	602000	4956000	E			
181153	41204	Nasiaeschna pentacantha	Cyrano Darner	G5	S3					17	658000	5008000	H	1/1/2009	6/14/1985	6/20/1985
181153	41203	Nasiaeschna pentacantha	Cyrano Darner	G5	S3					17	642000	5037000	H	9/8/2004	6/12/1925	6/12/1925
181153	66940	Nasiaeschna pentacantha	Cyrano Darner	G5	S3					17	662000	5010000	H	1/1/2009	6/9/1985	7/15/1985
181153	66941	Nasiaeschna pentacantha	Cyrano Darner	G5	S3					17	609000	4985000	H	12/16/2002		
181153	41207	Nasiaeschna pentacantha	Cyrano Darner	G5	S3					17	649000	4998000	H	1/1/2009	6/9/1985	7/4/1985
181153	41202	Nasiaeschna pentacantha	Cyrano Darner	G5	S3					17	660000	5011000	H	1/1/2009	6/9/1985	7/9/1985
181268	42029	Arigomphus furcifer	Lilypad Clubtail	G5	S3					17	593000	4969000	H	3/4/2002	7/3/1941	7/3/1941
181268	41892	Arigomphus furcifer	Lilypad Clubtail	G5	S3					17	583000	4982000	H	3/4/2002		
181163	66950	Helocordulia uhleri	Uhler's Sundragon	G5	S3					17	634000	5009000	H	12/17/2002	6/17/1917	6/17/1917
181163	66951	Helocordulia uhleri	Uhler's Sundragon	G5	S3					17	583000	4982000	H	12/17/2002	6/24/1907	6/16/1912
181163	66949	Helocordulia uhleri	Uhler's Sundragon	G5	S3					17	658000	5008000	H	1/1/2009	5/22/1985	6/3/1985
181206	41553	Sympetrum corruptum	Variegated Meadowhawk	G5	S3					17	583000	4982000	H	3/5/2002	7/14/1912	7/14/1912
180964	22840	Erora laeta	Early Hairstreak	GU	S2					17	654000	5018000	H	1/1/2009	5/29/1976	5/28/1978
180964	23332	Erora laeta	Early Hairstreak	GU	S2					17	641000	4982000	E	3/17/2000	5/10/1999	5/11/1999
82414	64821	Amelanchier amabilis	Beautiful Serviceberry	G4?Q	S2S3					17	616000	4978000	E	12/11/2002	5/26/1994	5/26/1994
39002	3259	Aplectrum hyemale	Puttyroot	G5	S2					17	589000	4967000	C	2/21/2000	6/1/1957	11/3/1991
22054	35171	Aristida basiramea	Forked Three-awned Grass	G5	S2	END	END			17	589000	4966000	C	12/12/2002	9/21/2001	8/26/2008
143000	95543	Bartonia paniculata	Branched Bartonia	G5	S2	THR	THR			17	634000	4971000	AB	9/30/2010	9/20/2010	9/20/2010
143000	13025	Bartonia paniculata	Branched Bartonia	G5	S2	THR	THR			17	624000	4974000	B	12/19/2008	8/15/1973	9/22/2010
143000	13236	Bartonia paniculata	Branched Bartonia	G5	S2	THR	THR			17	606000	4991000	BC	12/19/2008	8/30/1997	9/16/2009
143000	2175	Bartonia paniculata	Branched Bartonia	G5	S2	THR	THR			17	574000	4992000	B	2008-19-2008	8/21/1977	9/13/2005
143000	2172	Bartonia paniculata	Branched Bartonia	G5	S2	THR	THR			17	608000	4987000	D	8/14/2007	9/20/1975	9/15/2005
143000	2173	Bartonia paniculata	Branched Bartonia	G5	S2	THR	THR			17	606000	4989000	BC	19-12-2008	9/4/1977	9/21/2005
143000	13233	Bartonia paniculata	Branched Bartonia	G5	S2	THR	THR			17	597000	4996000	AB	8/1/2003	8/26/1990	9/12/2005
143000	93799	Bartonia paniculata	Branched Bartonia	G5	S2	THR	THR			17	616000	4978000	AB	10/21/2009	9/12/2009	9/23/2009
143000	93774	Bartonia paniculata	Branched Bartonia	G5	S2	THR	THR			17	595000	4999000	BC	10/5/2009	10/12/2007	9/15/2009
143004	2180	Bartonia virginica	Yellow Bartonia	G5	S2					17	625000	4964000	C	6/18/1992	8/13/1974	9/15/2000
143004	93831	Bartonia virginica	Yellow Bartonia	G5	S2					17	617000	4977000	A	11/26/2009	9/17/2009	9/23/2009
143004	95607	Bartonia virginica	Yellow Bartonia	G5	S2					17	634000	4972000	E	1/25/2011	9/20/2010	9/20/2010
143004	2182	Bartonia virginica	Yellow Bartonia	G5	S2					17	638000	4964000	E	1/25/2011	8/28/1972	9/23/2010
168266	1759	Bidens trichosperma	Crowned Beggarticks	G5	S2					17	434000	4786000	H	1/1/2009	1907	10/13/1936
5014	42201	Botrychium lanceolatum	Triangle Moonwort	G5	S3?					17	615000	4983000	H	1/1/2009	1985	1987
5014	41954	Botrychium lanceolatum	Triangle Moonwort	G5	S3?					17	613000	4984000	H	2/27/2002	8/18/1970	8/18/1970
5032	3614	Botrychium rugulosum	Rugulose Grapefern	G3	S2					17	583000	4982000	H			8/13/1908
5032	3613	Botrychium rugulosum	Rugulose Grapefern	G3	S2					17	589000	4969000	H	12/11/2002		8/30/1960
23016	64820	Carex albicans var. albicans	White-tinged Sedge	G5T4T5	S3					17	589000	4967000	E		5/25/1994	6/2/1994
23040	67030	Carex argyrantha	Silvery-flowered Sedge	G5	S2?					17	598000	4971000	H	1/14/2003	ND	ND
23112	5713	Carex conoidea	Field Sedge	G5	S3					17	605000	4971000	H	1/1/2009		9/6/1988
23112	59255	Carex conoidea	Field Sedge	G5	S3					17	626000	4965000	H	1/1/2009		6/16/1974
23172	59263	Carex folliculata	Northern Long Sedge	G4G5	S3					17	605000	4969000	H	1/1/2009	9/2/1972	9/6/1988
23172	41955	Carex folliculata	Northern Long Sedge	G4G5	S3					17	634000	4966000	H	2/27/2002	7/21/1974	7/21/1974
23172	93826	Carex folliculata	Northern Long Sedge	G4G5	S3					17	616000	4978000	AC	11/24/2009	9/23/2009	9/23/2009
23172	59272	Carex folliculata	Northern Long Sedge	G4G5	S3					17	666000	5012000	H	1/1/2009		8/1/1960

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23172	42110	Carex folliculata	Northern Long Sedge	G4G5	S3					17	595000	4975000	H	1/1/2009	9/22/1984	9/22/1984
23172	35889	Carex folliculata	Northern Long Sedge	G4G5	S3					17	594000	4973000	H	1/1/2009	9/23/1984	9/23/1984
62002	66762	Ceratophyllum echinatum	Prickly Hornwort	G4?	S3?					17	578000	4992000	H	9/16/2002	1977-1978	1977-1978
62002	66652	Ceratophyllum echinatum	Prickly Hornwort	G4?	S3?					17	664000	4992000	H	8/27/2002	ND	ND
133500	5511	Chimaphila maculata	Spotted Wintergreen	G5	S1	END	END			17	648000	5001000	X	1/25/2001	1904	1904
23524	59358	Cyperus houghtonii	Houghton's Flatsedge	G4?	S3					17	629000	4958000	H	1/1/2009		8/5/1974
39024	66732	Cypripedium arietinum	Ram's-head Lady's-slipper	G3	S3					17	563000	4965000	E	4/8/2004	6/13/1997	6/13/1997
22234	35826	Dichanthelium acuminatum ssp. spretum	Sand Panic Grass	G5	S2					17	618000	4978000	E	2/25/2002	1990	1990
22234	35830	Dichanthelium acuminatum ssp. spretum	Sand Panic Grass	G5	S2					17	623000	4971000	E	2/25/2002	1990-1992	1990-1992
22234	35838	Dichanthelium acuminatum ssp. spretum	Sand Panic Grass	G5	S2					17	624000	4973000	E	2/25/2002	1990-1992	1990-1992
22234	35842	Dichanthelium acuminatum ssp. spretum	Sand Panic Grass	G5	S2					17	639000	4966000	E	9/24/2002	1990?	1990?
22234	35841	Dichanthelium acuminatum ssp. spretum	Sand Panic Grass	G5	S2					17	637000	4964000	E	2/25/2002	1990-1992	1990-1992
22234	35839	Dichanthelium acuminatum ssp. spretum	Sand Panic Grass	G5	S2					17	625000	4967000	E	2/25/2002	1990-1992	1991
22234	3387	Dichanthelium acuminatum ssp. spretum	Sand Panic Grass	G5	S2					17	615000	4976000	H	9/24/2002	10/23/1976	10/23/1976
22234	3388	Dichanthelium acuminatum ssp. spretum	Sand Panic Grass	G5	S2					17	605000	4992000	H	9/24/2002	8/5/1979	8/5/1979
22234	35818	Dichanthelium acuminatum ssp. spretum	Sand Panic Grass	G5	S2					17	618000	4973000	E	2/25/2002	1990	1990-1992
22234	35817	Dichanthelium acuminatum ssp. spretum	Sand Panic Grass	G5	S2					17	618000	4980000	E	2/25/2002	1990-1992	1990-1992
22234	35816	Dichanthelium acuminatum ssp. spretum	Sand Panic Grass	G5	S2					17	606000	4987000	E	2/25/2002	1990-1992	9/12/1994
22234	35845	Dichanthelium acuminatum ssp. spretum	Sand Panic Grass	G5	S2					17	624000	4987000	E	2/25/2002	1990-1992	1990-1992
143030	60161	Gentianella quinquefolia	Stiff Gentian	G5	S2					17	621000	4961000	H	1/1/2009		9/25/1965
143030	33017	Gentianella quinquefolia	Stiff Gentian	G5	S2					17	621000	4961000	H	5/25/2001	9/25/1965	9/25/1965
4004	3602	Isoetes engelmannii	Engelmann's Quillwort	G4	S1	END	END			17	604000	4971000	BC	11/26/1998	9/6/1988	2004-00-00
4016	42186	Isoetes tuckermanii	Tuckerman's Quillwort	G4?	S1					17	593000	4987000	H?		1990?	1990?
44012	67580	Juglans cinerea	Butternut	G4	S3?	END	END			17	637000	4964000	E	8/14/2003	1994	1994
44012	67578	Juglans cinerea	Butternut	G4	S3?	END	END			17	626000	4965000	E	8/14/2003	1992	1994
44012	92399	Juglans cinerea	Butternut	G4	S3?	END	END			17	627000	4961000	E		8/26/2004	8/26/2004
44012	67576	Juglans cinerea	Butternut	G4	S3?	END	END			17	598000	4960000	E	8/14/2003	1994	1994
31000	5937	Juncus acuminatus	Sharp-fruited Rush	G5	S3					17	604000	4970000	H	1/1/2009		9/6/1988
31000	5938	Juncus acuminatus	Sharp-fruited Rush	G5	S3					17	606000	4967000	H	1/1/2009		9/6/1988
31000	42218	Juncus acuminatus	Sharp-fruited Rush	G5	S3					17	589000	4966000	E	3/10/2002	1989?	1989?
31000	41962	Juncus acuminatus	Sharp-fruited Rush	G5	S3					17	603000	4976000	E	2/28/2002	1991	1991
31000	5939	Juncus acuminatus	Sharp-fruited Rush	G5	S3					17	624000	4965000	E			
31040	59432	Juncus greenei	Greene's Rush	G5	S3					17	603000	5003000	H	9/16/2002	1881-08-24	1883-08-24
31060	67037	Juncus secundus	One-sided Rush	G5?	S3					17	623000	4966000	E		1991	1991
31060	5947	Juncus secundus	One-sided Rush	G5?	S3					17	625000	4965000	H	1/1/2009		9/30/1977
84010	42204	Linum medium var. medium	Stiff Yellow Flax	G5T3T4	S3?					17	595000	4965000	E	3/8/2002	9/9/1990	9/9/1990
84010	42203	Linum medium var. medium	Stiff Yellow Flax	G5T3T4	S3?					17	594000	4966000	E	3/8/2002	8/22/1925	9/9/1990
84010	59927	Linum medium var. medium	Stiff Yellow Flax	G5T3T4	S3?					17	596000	4957000	H	1/1/2009		9/1/1973
84010	59929	Linum medium var. medium	Stiff Yellow Flax	G5T3T4	S3?					17	632000	4969000	H	1/1/2009		7/29/1934
84010	59922	Linum medium var. medium	Stiff Yellow Flax	G5T3T4	S3?					17	601000	4958000	H	1/1/2009		9/9/1973

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84010	59923	Linum medium var. medium	Stiff Yellow Flax	G5T3T4	S3?					17	589000	4964000	H		7/17/1970	7/17/1970
84010	41993	Linum medium var. medium	Stiff Yellow Flax	G5T3T4	S3?					17	590000	4971000	B?	3/8/2002	1984-09	8/1/1990
84010	39530	Linum medium var. medium	Stiff Yellow Flax	G5T3T4	S3?					17	589000	4966000	B?	3/8/2002	1984?	9/10/1990
84010	5438	Linum medium var. medium	Stiff Yellow Flax	G5T3T4	S3?					17	604000	4958000	E			
84016	42222	Linum striatum	Ridged Yellow Flax	G5	S1					17	589000	4968000	E	3/11/2002	1989-PRE	1989-PRE
84016	39532	Linum striatum	Ridged Yellow Flax	G5	S1					17	607000	4986000	E	12/13/2002	7/17/1976	9/12/1994
84016	66751	Linum striatum	Ridged Yellow Flax	G5	S1					17	624000	4987000	E	9/13/2002	1990	1990
39062	35360	Listera auriculata	Auricled Twayblade	G3G4	S3					17	623000	4975000	E	1/16/2002	1990?	1990?
39064	5982	Listera australis	Southern Twayblade	G4	S1					17	623000	4975000	H	9/16/2002	6/8/1973	1997-pre
39064	42197	Listera australis	Southern Twayblade	G4	S1					17	617000	4977000	H	9/16/2002	1970	1970
39064	5983	Listera australis	Southern Twayblade	G4	S1					17	568000	5001000	H	1/1/2009	1977-1978	6/18/1988
39064	42164	Listera australis	Southern Twayblade	G4	S1					17	605000	4989000	E	3/7/2002		1994
149028	32993	Lithospermum caroliniense	Golden Puccoon	G4G5	S3					17	578000	4972000	E	5/23/2001	6/7/1995	8/8/2002
151086	60283	Monarda didyma	Scarlet Beebalm	G5	S3					17	679000	4998000	H	1/1/2009		7/23/1972
151086	60285	Monarda didyma	Scarlet Beebalm	G5	S3					17	638000	5043000	H	1/1/2009		8/23/1979
1004441	3244	Najas gracillima	Thread-like Naiad	G5?	S2					17	605000	4965000	H	1/1/2009		8/26/1979
1004441	3243	Najas gracillima	Thread-like Naiad	G5?	S2					17	605000	4962000	H	1/1/2009		9/2/1973
1004441	66784	Najas gracillima	Thread-like Naiad	G5?	S2					17	586000	4979000	H	9/24/2002		ND
1004441	59059	Najas gracillima	Thread-like Naiad	G5?	S2					17	605000	4963000	H	1/1/2009		9/2/1973
63500	34634	Nelumbo lutea	American Lotus	G4	S2					17	590000	4951000	H	1/1/2009	9/23/1969	9/23/1969
22470	42188	Panicum rigidulum	Redtop Panic Grass	G5	S3					17	593000	4987000	H	9/24/2002	ND	ND
22470	42114	Panicum rigidulum	Redtop Panic Grass	G5	S3					17	595000	4976000	H	3/6/2002	1979-07	1979-07
22470	39533	Panicum rigidulum	Redtop Panic Grass	G5	S3					17	607000	4986000	H	1/1/2009	8/23/1972	8/23/1972
22470	39534	Panicum rigidulum	Redtop Panic Grass	G5	S3					17	609000	4985000	H	2/26/2002	8/18/1979	8/18/1979
22470	3481	Panicum rigidulum	Redtop Panic Grass	G5	S3					17	624000	4966000	H	6/30/1992	1977	8/4/1978
22470	66785	Panicum rigidulum	Redtop Panic Grass	G5	S3					17	593000	4980000	E	9/24/2002	1991?	1991?
22470	42113	Panicum rigidulum	Redtop Panic Grass	G5	S3					17	595000	4975000	E	3/6/2002	9/22/1984	1990?
22470	39535	Panicum rigidulum	Redtop Panic Grass	G5	S3					17	608000	4986000	H	2/26/2002	7/31/1976	7/31/1976
9206	58944	Pellaea atropurpurea	Purple-stemmed Cliff-brake	G5	S3					17	595000	5016000	H	1/1/2009		6/12/1968
24008	42161	Peltandra virginica	Green Arrow-arum	G5	S2					18	406000	4910000	E	3/7/2002	8/6/1992	8/6/1992
54016	42232	Persicaria arifolia	Halberd-leaved Tearthumb	G5	S3					17	633000	4965000	H	9/20/2002	ND	ND
54016	5488	Persicaria arifolia	Halberd-leaved Tearthumb	G5	S3					17	607000	4962000	E			
54016	42183	Persicaria arifolia	Halberd-leaved Tearthumb	G5	S3					17	599000	4965000	H	1/1/2009	8/19/1984	8/19/1984
54016	41974	Persicaria arifolia	Halberd-leaved Tearthumb	G5	S3					17	611000	4970000	E	2/28/2002	1991-SU	1991-SU
54016	42225	Persicaria arifolia	Halberd-leaved Tearthumb	G5	S3					17	604000	5003000	E	3/11/2002	1990-SU	1990-SU
9402	17258	Phegopteris hexagonoptera	Broad Beech Fern	G5	S3	SC	SC			17	640000	4769000	C?	1/15/1998	6/14/1973	9/27/2004
9402	17262	Phegopteris hexagonoptera	Broad Beech Fern	G5	S3	SC	SC			17	629000	4963000	C	1/16/1998	8/13/1983	1990
9402	68231	Phegopteris hexagonoptera	Broad Beech Fern	G5	S3	SC	SC			17	602000	4986000	E	1/22/2004		1990s-LATE
39096	41992	Platanthera flava var. herbiola	Tubercled Orchid	G4?T4Q	S3					17	627000	4966000	H	9/20/2002	ND	ND
39112	59505	Platanthera macrophylla	Large Round-leaved Orchid	G4	S2					17	641000	4983000	H	12/11/2002		7/28/1980
39112	5988	Platanthera macrophylla	Large Round-leaved Orchid	G4	S2					17	571000	4970000	H	1/1/2009		7/1/1973
39112	59506	Platanthera macrophylla	Large Round-leaved Orchid	G4	S2					17	630000	5005000	H	12/11/2002		1890-09-02
39112	59503	Platanthera macrophylla	Large Round-leaved Orchid	G4	S2					17	677000	5003000	H	1/1/2009		7/23/1967
39112	59504	Platanthera macrophylla	Large Round-leaved Orchid	G4	S2					17	600000	4976000	H	12/11/2002	7/26/1952	7/26/1952
22518	35523	Poa saltuensis ssp. languida	Weak Blue Grass	G5T3T4Q	S3					17	621000	5009000	E	1/25/2002	1991?	1991?
16106	42194	Potamogeton bicupulatus	Snailseed Pondweed	G4	S3					17	617000	4974000	E	3/7/2002	9/4/1990	9/5/1990
16106	35515	Potamogeton bicupulatus	Snailseed Pondweed	G4	S3					17	664000	5029000	H	1/25/2002	8/15/1977	8/15/1977
16106	41986	Potamogeton bicupulatus	Snailseed Pondweed	G4	S3					17	625000	4967000	E	3/1/2002	1991	1991
16106	35516	Potamogeton bicupulatus	Snailseed Pondweed	G4	S3					17	662000	4997000	H	1/1/2009	8/11/1982	8/11/1982
16106	35517	Potamogeton bicupulatus	Snailseed Pondweed	G4	S3					17	667000	5007000	H	1/25/2002	7/16/1974	8/20/1976
16106	35520	Potamogeton bicupulatus	Snailseed Pondweed	G4	S3					17	616000	4985000	H	1/25/2002	6/16/1980	6/23/1980
16106	35514	Potamogeton bicupulatus	Snailseed Pondweed	G4	S3					17	650000	5000000	H	1/25/2002	9/27/1980	9/27/1980

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16106	35509	Potamogeton bicupulatus	Snailseed Pondweed	G4	S3					17	664000	5029000	H	1/1/2009	8/18/1982	8/18/1982
16106	42150	Potamogeton bicupulatus	Snailseed Pondweed	G4	S3					17	621000	4968000	E	3/7/2002	1990	1990
16106	35518	Potamogeton bicupulatus	Snailseed Pondweed	G4	S3					17	622000	4968000	H	1/25/2002	9/4/1969	8/12/1973
16108	66758	Potamogeton confervoides	Alga Pondweed	G4	S2					17	670000	5004000	H	9/16/2002	8/26/1975	8/26/1975
16108	35584	Potamogeton confervoides	Alga Pondweed	G4	S2					17	669000	5001000	E	1/29/2002	6/9/1974	1989?
16108	42126	Potamogeton confervoides	Alga Pondweed	G4	S2					17	627000	4963000	E	3/6/2002	1992	1993
16108	35534	Potamogeton confervoides	Alga Pondweed	G4	S2					17	618000	4978000	E	9/16/2002	1990	1990
73048	35805	Rorippa aquatica	Lakecress	G4?	S3?					17	626000	4965000	E	2/25/2002	1991	1991
19014	42206	Sagittaria cristata	Crested Arrowhead	G4?	S3					17	547000	5033000	E	3/9/2002	9/9/1990	9/9/1990
19014	66778	Sagittaria cristata	Crested Arrowhead	G4?	S3					17	595000	4975000	E	9/23/2002	1991?	1991?
19014	92007	Sagittaria cristata	Crested Arrowhead	G4?	S3					17	589000	4971000	E		8/1/1991	8/1/1991
19014	39529	Sagittaria cristata	Crested Arrowhead	G4?	S3					17	590000	4966000	E	3/9/2002	9/10/1990	9/10/1990
19014	66779	Sagittaria cristata	Crested Arrowhead	G4?	S3					17	593000	4985000	E	9/23/2002	1991?	1991?
19014	66780	Sagittaria cristata	Crested Arrowhead	G4?	S3					17	594000	4983000	E	9/23/2002	1991?	1991?
19014	66781	Sagittaria cristata	Crested Arrowhead	G4?	S3					17	587000	4994000	E	9/23/2002	1991?	1991?
19014	7874	Sagittaria cristata	Crested Arrowhead	G4?	S3					17	604000	4971000	H	1/1/2009		9/6/1988
19014	7785	Sagittaria cristata	Crested Arrowhead	G4?	S3					17	571000	4992000	H	9/23/2002		8/21/1977
19014	41965	Sagittaria cristata	Crested Arrowhead	G4?	S3					17	606000	4973000	E	2/28/2002	1991	1991
40000	35857	Saururus cernuus	Lizard's Tail	G5	S3					17	603000	4967000	H	1/1/2009	1984?	1984?
40000	22873	Saururus cernuus	Lizard's Tail	G5	S3					17	604000	4970000	B?	2/22/2002	1987-1998	8/28/2002
23660	5920	Schoenoplectus heterochaetus	Slender Bulrush	G5	S3					17	627000	4961000	H	1/1/2009		8/25/1975
23660	41981	Schoenoplectus heterochaetus	Slender Bulrush	G5	S3					17	626000	4965000	B?	7/31/2002	1991	1991
23672	33601	Schoenoplectus purshianus	Weak-stalk Bulrush	G4G5	S1?					17	572000	4993000	E		9/14/1999	9/14/1999
23678	42207	Schoenoplectus smithii	Smith's Bulrush	G5?	S3					17	589000	4976000	E	3/9/2002	9/9/1990	9/9/1990
23678	42208	Schoenoplectus smithii	Smith's Bulrush	G5?	S3					17	595000	4966000	D?	3/9/2002	9/9/1990	9/9/1990
23678	3086	Schoenoplectus smithii	Smith's Bulrush	G5?	S3					17	602000	4959000	H	1/1/2009	9/9/1953	9/9/1973
23678	3090	Schoenoplectus smithii	Smith's Bulrush	G5?	S3					17	595000	4963000	H	9/17/2002		8/29/1934
23678	59400	Schoenoplectus smithii	Smith's Bulrush	G5?	S3					17	592000	4968000	H	9/17/2002		8/14/1937
23678	3094	Schoenoplectus smithii	Smith's Bulrush	G5?	S3					17	573000	4992000	H	8/13/2001		8/28/1977
23678	3092	Schoenoplectus smithii	Smith's Bulrush	G5?	S3					17	573000	4992000	B	9/17/2002	8/4/1977	9/14/1999
23678	33853	Schoenoplectus smithii	Smith's Bulrush	G5?	S3					17	598000	4961000	E	9/17/2002	9/14/1999	9/14/1999
23678	3089	Schoenoplectus smithii	Smith's Bulrush	G5?	S3					17	589000	4967000	C?	9/17/2002	8/19/1981	9/10/1990
23694	3122	Scleria verticillata	Low Nutrush	G5	S3					17	576000	4967000	E		9/15/1972	6/13/1997
22820	22299	Sporobolus heterolepis	Prairie Dropseed	G5	S3					17	625000	4971000	H	5/27/1998	8/24/1932	8/24/1932
22820	6142	Sporobolus heterolepis	Prairie Dropseed	G5	S3					17	624000	4966000	E	6/3/1998	1991	9/10/1991
22820	22276	Sporobolus heterolepis	Prairie Dropseed	G5	S3					17	626000	4965000	H	5/25/1998	1994-PRE	1994-PRE
73258	66756	Subularia aquatica	Water Awlwort	G5	S3					17	608000	4996000	H	9/13/2002	1963	1963
73258	67800	Subularia aquatica	Water Awlwort	G5	S3					17	603000	4985000	A	9/24/2003	1992	1992
73258	67627	Subularia aquatica	Water Awlwort	G5	S3					17	575000	5005000	E	8/29/2003		ND
29002	33811	Tradescantia ohiensis	Ohio Spiderwort	G5	S2					17	658000	5014000	H	7/18/2001	8/2/1961	8/2/1961
23648	35270	Trichophorum clintonii	Clinton's Clubrush	G4	S2S3					17	653000	5038000	H	1/10/2002	1978-06	1978-06
157006	5446	Utricularia geminiscapa	Twin-stemmed Bladderwort	G4G5	S3?					17	578000	4985000	H	9/23/2002		8/16/1980
157006	33784	Utricularia geminiscapa	Twin-stemmed Bladderwort	G4G5	S3?					17	658000	5004000	H	9/23/2002	8/28/1980	8/28/1980
157006	93827	Utricularia geminiscapa	Twin-stemmed Bladderwort	G4G5	S3?					17	616000	4978000	AB	1/25/2009	9/23/2009	9/23/2009
157006	41975	Utricularia geminiscapa	Twin-stemmed Bladderwort	G4G5	S3?					17	611000	4970000	E	2/28/2002	1991	1991
182006	35680	Grimmia hermannii	A Moss	G3G5	S1					17	627000	5019000	H	1/1/2009	7/25/1987	7/25/1987
182006	35681	Grimmia hermannii	A Moss	G3G5	S1					17	632000	5015000	H	1/1/2009	7/23/1982	7/23/1982
181706	67755	Lophozia capitata	A Liverwort	G4	S2?					17	660000	5037000	H	9/23/2003	8/5/1956	8/5/1956
182246	67601	Tortula norvegica	A Moss	G5	S1					17	627000	4977000	H	1/1/2009	9/22/1986	9/22/1986