

Ontario Ministry of Transportation
Highway 17 Planning & Class EA Study
Terrestrial Ecosystem Report
GWP 5670-10-00

Prepared by:

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Project Number:

60241599

Date:

July, 2014

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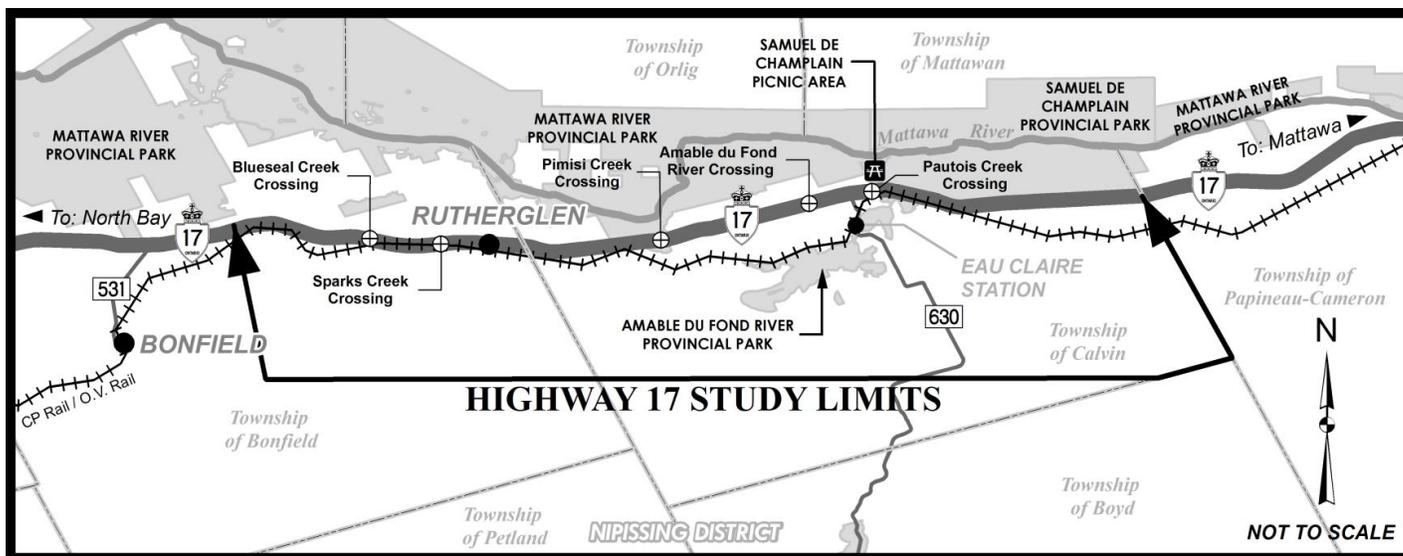
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Appendix B.	Vegetation Survey Plant List
Appendix C.	Photo Log
Appendix D.	Species at Risk Assessment

1. Introduction

The Ontario Ministry of Transportation has retained AECOM to undertake a Class Environmental Assessment to identify a recommended plan for a four-lane Highway 17 within the study limits with access restricted to interchange locations. The study limits are shown in **Figure 1.1** below and involves a 23.5 km section of Highway 17 from Bonfield easterly to the boundary road between the Municipality of Calvin and the Township of Papineau-Cameron.

Figure 1.1: Class EA Study Limits



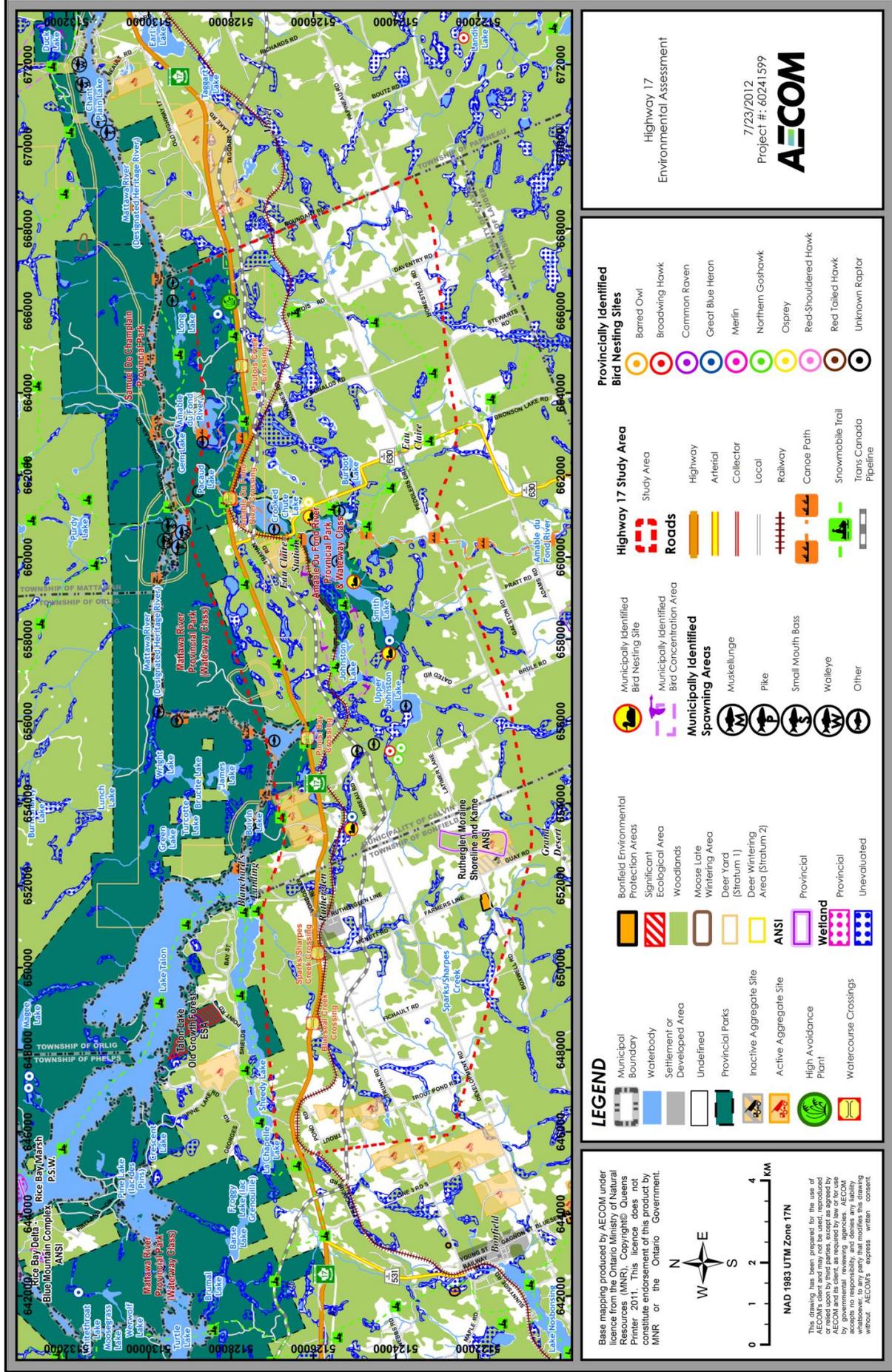
Within the study area, Highway 17 is primarily a two lane highway with limited access restrictions and access in both directions provided via private driveways and local roadways. This planning, preliminary design and Class EA study has been completed to identify a preferred plan for Highway 17 to improve future traffic operations and to enhance highway safety from Bonfield to the boundary road of the Municipality of Calvin and the Township of Papineau-Cameron.

As outlined in the Study Design Report (AECOM 2012) for this project, the study involved the development and evaluation of a range of alternatives which could address the transportation needs of the study area. Specifically, the alternatives considered included:

- widened/improved provincial highway;
- realigned provincial highway; and
- combinations of the above.

The cross section for the highway is a freeway with two lanes in each direction and a 30m median within a total right-of-way width of 110m and access is restricted to interchanges. Highway planning alternatives were therefore generated within the Study Area and in consideration of the environmental constraints within the Study Area, which is shown on **Figure 1.2**.

Figure 1.2: Natural Environment Constraints



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LEGEND

- Municipal Boundary
- Waterbody
- Settlement or Developed Area
- Undefined
- Provincial Parks
- Inactive Aggregate Site
- Active Aggregate Site
- High A voidance Plant
- Watercourse Crossings

Provincially Identified Bird Nesting Sites

- Barred Owl
- Broadwing Hawk
- Common Raven
- Great Blue Heron
- Merlin
- Northern Goshawk
- Osprey
- Red-Shouldered Hawk
- Red Tailed Hawk
- Unknown Raptor

Highway 17 Study Area

Roads

- Study Area
- Highway
- Arterial
- Collector
- Local
- Railway
- Canoe Path
- Snowmobile Trail
- Trans Canada Pipeline

Municipally Identified Spawning Areas

- Municipally Identified Bird Nesting Site
- Municipally Identified Bird Concentration Area
- Muskellunge
- Pike
- Small Mouth Bass
- Walleye
- Other

Provincially Identified Bird Nesting Sites

Highway 17 Environmental Assessment

7/23/2012
Project #: 60241599
AECOM

LEGEND

- Bonfield Environmental Protection Areas
- Significant Ecological Area
- Woodlands
- Moose Late Wintering Area
- Deer Yard (Stratum 1)
- Deer Wintering Area (Stratum 2)
- Provincial Wetland
- Provincial Wetland
- Unevaluated Wetland

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- Municipal Boundary
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- Inactive Aggregate Site
- Active Aggregate Site
- High A voidance Plant
- Watercourse Crossings

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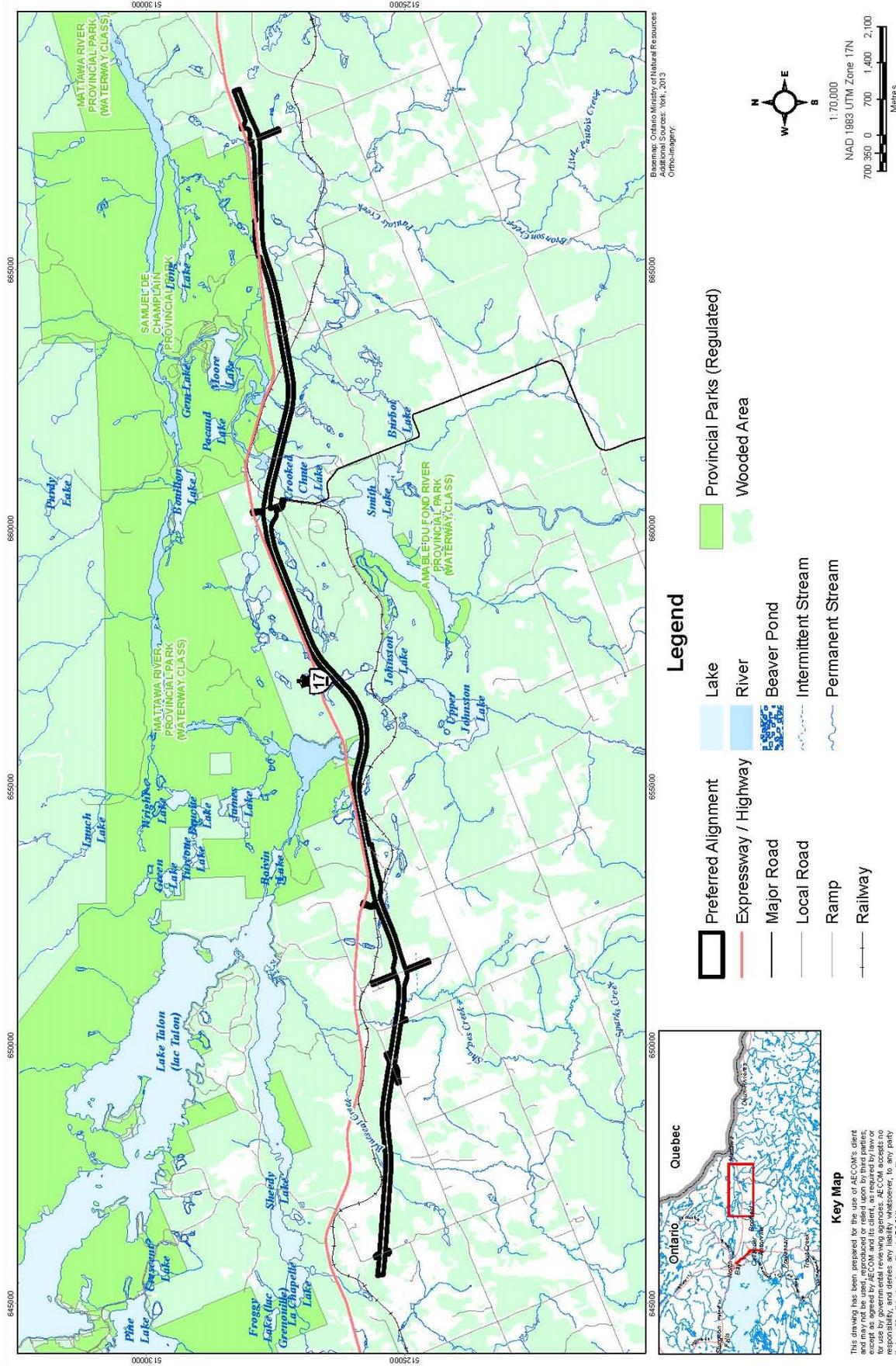
- Bonfield Environmental Protection Areas
- Significant Ecological Area
- Woodlands
- Moose Late Wintering Area
- Deer Yard (Stratum 1)
- Deer Wintering Area (Stratum 2)
- Provincial Wetland
- Provincial Wetland
- Unevaluated Wetland

The planning alternatives included segments of widening / improving the existing highway and segments of realigned highway, with interchanges at key connection points and new service roads for some areas. In the Rutherglen and Amable du Fond areas, widening of the existing highway is not possible due to physical constraints and environmental conditions. Therefore, realignment alternatives were generated for these two areas while widening alternatives were generated for the Pimisi Bay and Pautois Creek areas. The evaluation of highway planning alternatives was completed on a comparative basis for each of the four highway realignment and widening alternative areas (with associated interchanges and service roads) and a recommended plan was identified in January 2014 as shown on **Figure 1.3**.

The purpose of this report is to build on the information presented in the 'Summary of Existing Environmental Conditions and Constraints Report' by further assessing and reporting on the existing terrestrial ecosystems, in accordance with the Environmental Reference for Highway Design (MTO, 2013), within the proposed right-of-way (ROW) for the recommended highway plan and any lands within 120m of the ROW (Study Area). Significant or sensitive features that were identified outside of the area of investigation that may be influenced by the proposed works that were identified in the background data review or during site investigations are also included.

It should be noted that background review and the initial surveys detailed in this report indicate that conditions in the study area have remained relatively consistent since initial records were generated. Conditions are not anticipated to change significantly in this area, particularly with regards to natural features as these areas are primarily located within provincial parks and other protected areas (e.g. deer wintering areas). Additional surveys should be undertaken during future detail design phases of work given that this study is a long term planning study and timing for completion of future phases of work, (e.g. detailed design and construction), is undetermined at this time. Future surveys should be completed at the locations identified in this report in order to verify the findings and conclusions of the study team and, where possible and necessary, at additional locations within the right of way for the recommended plan where access could not be obtained as part of this study.

Figure 1.3: Recommended Plan and Area of Natural Investigations



2. Background / Baseline Terrestrial Ecosystem Existing Conditions Information

Pertinent baseline information on terrestrial habitat existing conditions within the study area was obtained through review of secondary source material including:

- Township of Bonfield Official Plan;
- East Nipissing Official Plan;
- correspondence with the Ministry of Natural Resources (MNR) – North Bay District Office;
- MNR Natural Heritage Information Centre (NHIC) Biodiversity Explorer;
- MNR Species at Risk (SAR) website;
- Atlas of the Breeding Birds of Ontario (ABBO);
- correspondence with the North Bay – Mattawa Conservation Authority;
- Highway 17 Planning Study From 2.2 km east of Highway 531 easterly to 8.0 km east of Highway 630, (GWP 5670-10-00) Summary of Existing Environmental Conditions and Constraints Report; and
- Aerial photography.

2.1 Municipality of Calvin (East Nipissing Official Plan)

The Municipality of Calvin is part of the East Nipissing Planning Area which also includes the Townships of Mattawa and Papineau-Cameron in the District of Nipissing. The area is exclusively rural with no urban settlements, and over half of the land base is Crown land. There is also a variety of natural resources including mineral aggregates, minerals and commercial forests in the Municipality of Calvin. The area is also host to Samuel de Champlain Provincial Park, the Mattawa Provincial Park, the Amable du Fond Provincial Park and is the entry point to Algonquin Park (Kiosk). Flood plains have been identified along the major river systems and on inland lakes. Mine hazards exist from past mining activities in the area (Tunnock Consulting Ltd., 2010).

Information obtained from Schedule A3 of the Municipality's Official Plan delineates crown land, deer yards, mineral aggregate resource areas, areas with organic soils, wetlands and a number of water courses and waterbodies for lands within the preferred alternative alignment (Tunnock Consulting Ltd., 2010). More detailed information of the aquatic habitat present within these watercourse and waterbodies is provided in the Existing Conditions Fisheries Report for Highway 17, Bonfield from 2.2km east of Highway 531 easterly to 8km east of Highway 630 GWP 5670-10-00.

2.2 Township of Bonfield

The Township of Bonfield is located in the District of Nipissing, approximately 27 km east of the City of North Bay. It occupies a total land area of approximately 205 km², and is comprised of a large rural area along with the Hamlets of Bonfield and Rutherglen. There are also several lakes including Talon Lake and Turtle Lake to the north and northeast and Lake Nosbonsing to the west (FOTENN Planning & Urban Design and CGIS Spatial Solutions, 2013).

Information obtained from Schedule B of the Official Plan indicates that the recommended plan crosses a number of Development Constraint Areas and a sand and gravel resources area (FOTENN Planning & Urban Design and CGIS Spatial Solutions, 2013).

Section 5.2 of the Official Plan identifies Development Constraint Areas as lands with environmental constraints which includes flood susceptibility, erosion susceptibility or other physical characteristics severe enough to cause property damage or risk of life (FOTENN Planning & Urban Design and CGIS Spatial Solutions, 2013).

2.3 Ministry of Natural Resources

A variety of Ministry of Natural Resources (MNR) information resources were accessed in order to obtain background information pertaining to the existing conditions within the study area. This included accessing the NHIC Biodiversity Explorer and MNR SAR website and correspondence with the North Bay MNR. A total of 20 species that have been identified by the Endangered Species Act (ESA), Species at Risk Act (SARA) or Committee on the Status of Endangered Wildlife in Canada (COSEWIC) as Endangered, Threatened or Special Concern were identified as present within the Analysis Area through these sources as detailed in **Table 2.1** below.

Table 2.1: MNR Species at Risk

Species	ESA Status	SARA Status	COSEWIC Status	Source Identifying Species
Barn Swallow <i>Hirundo rustica</i>	Threatened		Threatened	MNR SAR Website North Bay MNR
Black Tern <i>Chlidonias niger</i>	Special Concern		Not at Risk	MNR SAR Website
Blanding's Turtle <i>Emydoidea blandingii</i>	Threatened	Threatened Schedule 1	Threatened	NHIC Biodiversity Explorer MNR SAR Website North Bay MNR
Bobolink <i>Dolichonyx oryzivorus</i>	Threatened		Threatened	MNR SAR Website
Canada Warbler <i>Cardellina Canadensi</i>	Special Concern	Threatened Schedule 1	Threatened	North Bay MNR
Chimney Swift <i>Chaetura pelagica</i>	Threatened	Threatened Schedule 1	Threatened	North Bay MNR
Common Nighthawk <i>Chordeiles minor</i>	Special Concern	Threatened Schedule 1	Threatened	North Bay MNR
Eastern Hog-nosed Snake <i>Heterodon platirhinos</i>	Threatened	Threatened Schedule 1	Threatened	North Bay MNR
Eastern Meadowlark <i>Sturnella magna</i>	Threatened		Threatened	MNR SAR Website North Bay MNR
Eastern Whip-poor-will <i>Antrostomus vociferus</i>	Threatened	Threatened Schedule 1	Threatened	MNR SAR Website North Bay MNR
Flooded Jellyskin <i>Leptogium rivulare</i>	Threatened	Threatened Schedule 1	Threatened	MNR SAR Website
Lake Sturgeon <i>Acipenser fulvescens</i>	Threatened		Threatened	MNR SAR Website North Bay MNR
Least Bittern <i>Ixobrychus exilis</i>	Threatened	Threatened Schedule 1	Threatened	MNR SAR Website
Loggerhead Shrike <i>Lanius ludovicianus</i>	Endangered	Endangered Schedule 1	Endangered	NHIC Biodiversity Explorer

Species	ESA Status	SARA Status	COSEWIC Status	Source Identifying Species
Milksnake <i>Lampropeltis triangulum</i>	Special Concern	Special Concern Schedule 1	Special Concern	NHIC Biodiversity Explorer MNR SAR Website North Bay MNR
Monarch Butterfly <i>Danaus plexippus</i>	Special Concern		Special Concern	North Bay MNR
Northern Brook Lamprey <i>Ichthyomyzon fossor</i>	Special Concern	Special Concern Schedule 1	Special Concern	MNR SAR Website
Peregrine Falcon <i>Falco peregrinus</i>	Special Concern	Special Concern Schedule 1	Special Concern	MNR SAR Website
Shortjaw Cisco <i>Coregonus zenithicus</i>	Threatened	Threatened Schedule 2	Threatened	MNR SAR Website
Snapping Turtle <i>Chelydra serpentina</i>	Special Concern	Special Concern Schedule 1	Special Concern	MNR SAR Website North Bay MNR

In addition to identifying SAR which are known to occur or may potentially occur at the site, the MNR also provided information pertaining to Significant Wildlife Habitat which is known to occur or may potentially occur within the study area. This includes the Mattawa Deer Wintering Yard and numerous nesting sites for Great Blue Heron (*Ardea herodias*), Northern Goshawk (*Accipiter gentilis*), Broad-winged Hawk (*Buteo platypterus*) and Red-tailed Hawk (*Buteo jamaicensis*) at various locations throughout the site which are mapped in **Figures 2.1** through **2.7**.

At the time of background information screening no Provincially Significant Wetlands (PSW's) are documented within the study area. However correspondence with the MNR indicate that the Blue Seal Creek Wetland is scheduled to be re-evaluated in 2012 and will likely be evaluated as significant as its current score is just below 600 (the score required in order to be classified as a PSW), and there is a high probability for SAR to occur in the wetland.

According to the information obtained from the MNR there are no known Areas of Natural & Scientific Interests (ANSI) at the site.

2.4 Atlas of the Breeding Birds of Ontario

The Atlas of Breeding Birds of Ontario (ABBO) divides the province into 10-km squares and 100-km blocks based on the Universal Transvers Mercator (UTM) grid. Bird surveyors have completed field surveys within these squares or blocks to find as many breeding species as possible within each block and have recorded the evidence of breeding for each bird species. The study area for this project is located partially or entirely within the ABBO Squares 17PM42, 17PM52 and 17PM62. A summary of the breeding birds from these squares shows that 119 species of birds have displayed some level of breeding evidence. Species present on this list that have been identified by the ESA, SARA or COSEWIC as Endangered, Threatened or Special Concern are included in **Table 2.2** (Cadman *et al* 2007). The complete list of birds documented for these areas is included in **Appendix A**.

Figure 2.1: Species at Risk, Significant Wildlife Habitat and Amphibian, Bird and Turtle Monitoring Stations (Map 1)

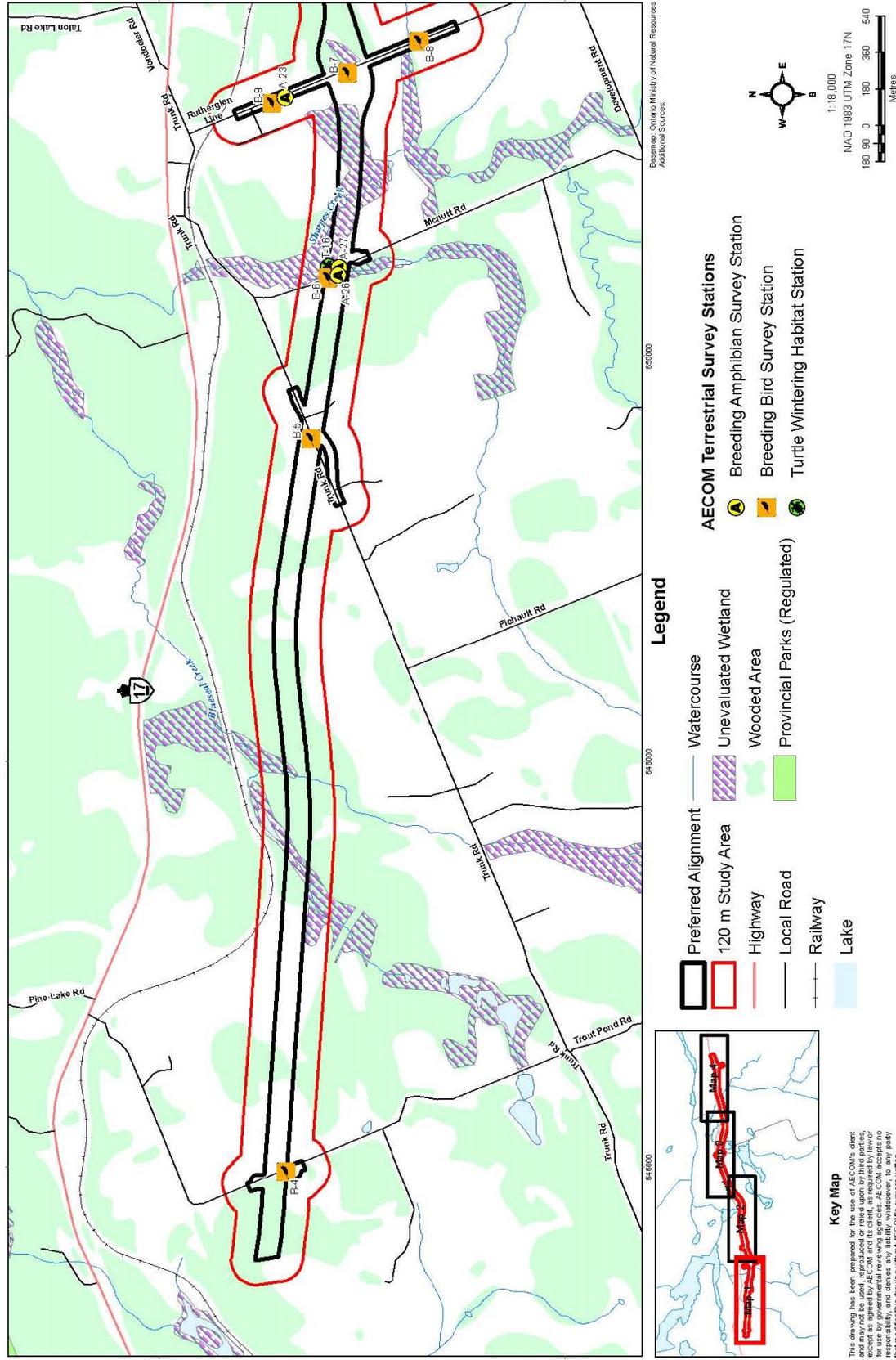


Figure 2.2: Species at Risk, Significant Wildlife Habitat and Amphibian, Bird and Turtle Monitoring Stations (Map 2)

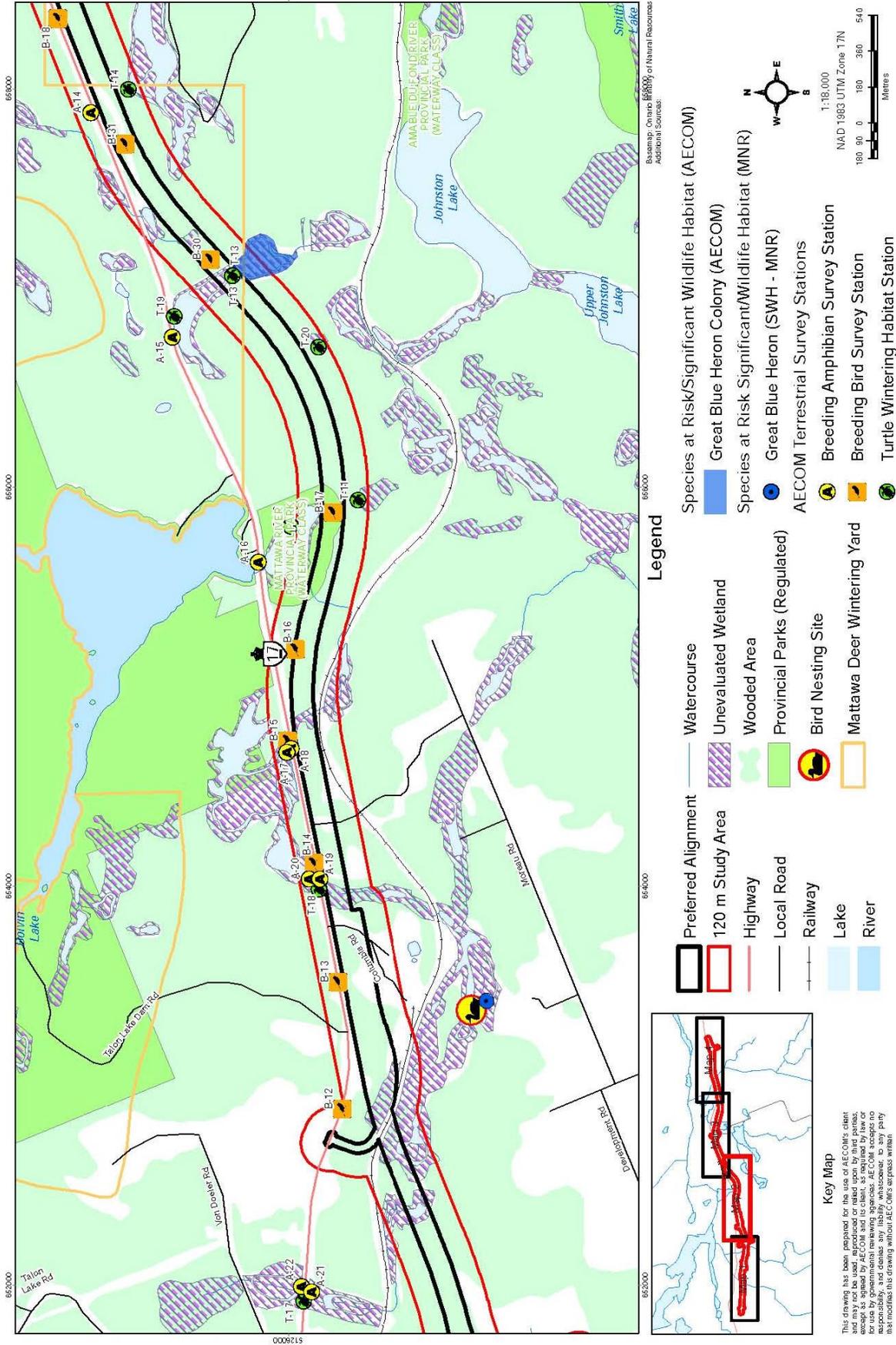


Figure 2.4: Species at Risk, Significant Wildlife Habitat and Amphibian, Bird and Turtle Monitoring Stations (Map 4)

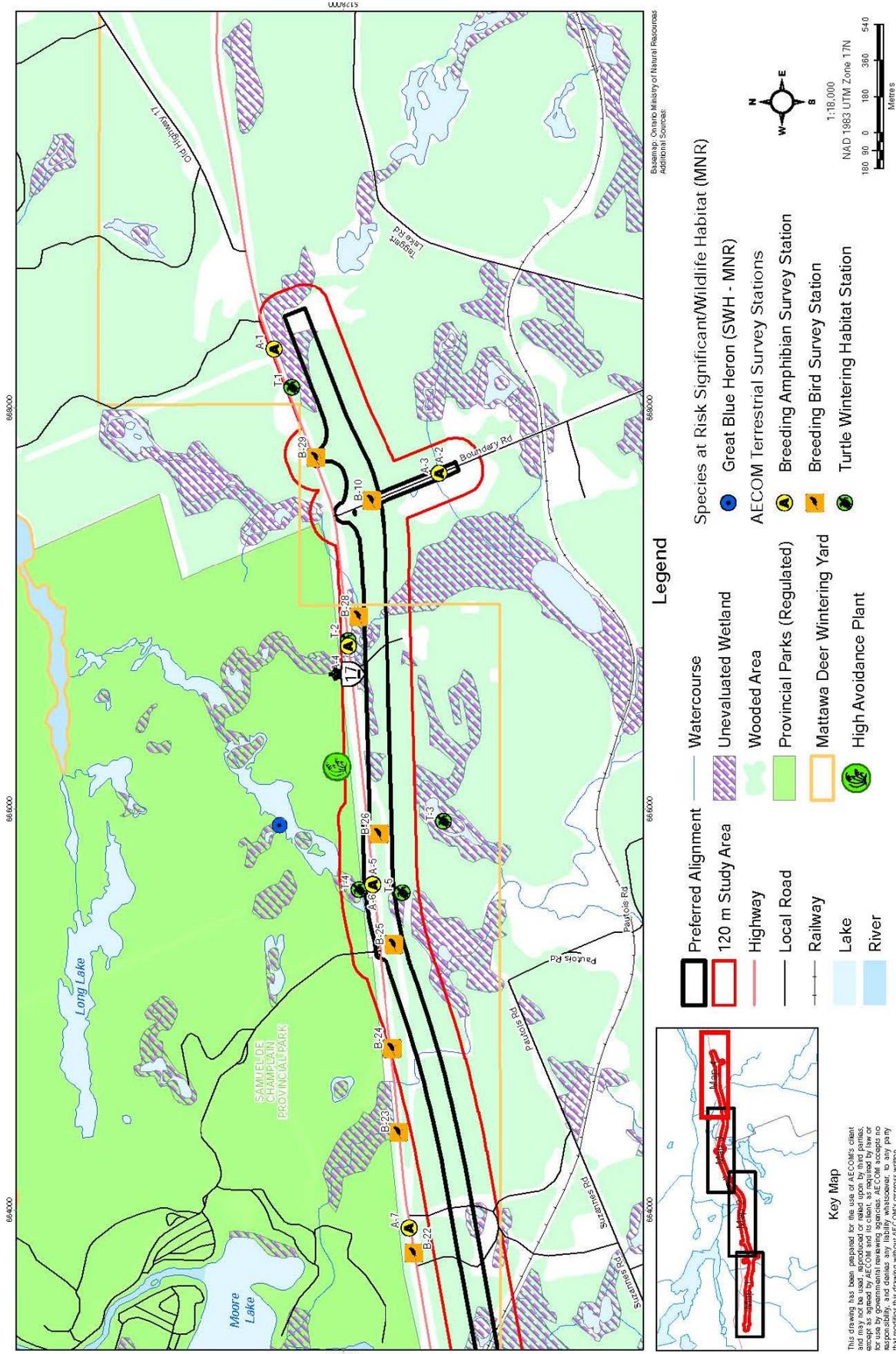


Table 2.2: ABBO Species at Risk

Species	ESA Status	SARA Status	COSEWIC Status
Bald Eagle (<i>Haliaeetus leucocephalus</i>)	Special Concern		No Status
Barn Swallow (<i>Hirundo rustica</i>)	Threatened		Threatened
Bobolink (<i>Dolichonyx oryzivorus</i>)	Threatened		Threatened
Canada Warbler (<i>Wilsonia Canadensis</i>)	Special Concern	Threatened Schedule 1	Threatened
Chimney Swift (<i>Chaetura pelagica</i>)	Threatened	Threatened Schedule 1	Threatened
Eastern Meadowlark (<i>Sturnella magna</i>)	Threatened		Threatened
Eastern Wood-pewee (<i>Contopus virens</i>)			Special Concern
Olive-sided Flycatcher (<i>Contopus cooperi</i>)	Special Concern	Threatened Schedule 1	Threatened
Whip-poor-will (<i>Antrostomus vociferous</i>)	Threatened	Threatened Schedule 1	Threatened
Wood Thrush (<i>Hylocichla mustelina</i>)			Threatened

2.5 North Bay – Mattawa Conservation Authority

Information pertaining to the aquatic and terrestrial features at the site was also requested from the North Bay – Mattawa Conservation Authority. Information obtained as a result of this data request focused on hydrological information from some of the watercourses at the site, which was obtained from North Bay – Mattawa Flood Plan and Fill Line Mapping. The North Bay – Mattawa Conservation Authority indicated that they did not have any detailed information pertaining to SAR, PSW, ANSI's or SWH in the Analysis Area and recommended contacting the MNR.

3. Field Investigations and Description of Existing Terrestrial Ecosystem

3.1 Overview

Section 3 of this report provides the following existing conditions information stipulated in Section 3.2.7 of the Environmental Reference for Highway Design:

- Data collection and methodology; and
- Findings, which provides a description and assessment.

For ease of reference this information is presented separately for each of amphibians, birds, ecological land classification, wetlands, significant wildlife habitat and species at risk.

Terrestrial ecosystems field investigations for the study area were conducted in May, June and September of 2013. Survey dates for each of the types of investigations are outlined in **Table 3.1**. Surveys that were completed as part of this evaluation include Amphibian Call Surveys, Breeding Bird Surveys, Blanding's Turtle Surveys and Ecological Land Classification and Vegetation Inventories.

As noted previously, given the nature of the study area and existing data regarding species and areas of natural significance, only one round of surveys was completed as part of this EA study. Background review and the initial surveys described above indicate that conditions in this rural area have remained relatively consistent since initial records were generated. Conditions are not anticipated to change significantly in this area, particularly with regards to natural features as these areas are primarily located within provincial parks and other protected areas (e.g. deer wintering areas),

The area of investigation for this study includes lands within the ROW for the recommended plan and lands 120 m of either side of the alignment as identified in **Figure 1.3**.

Table 3.1: Field Investigations Summary

Date	Survey	Staff
May 21 – May 24, 2013	Breeding Bird Surveys Amphibian Call Surveys Blanding's Turtles Habitat Assessments	R. Aitken – Terrestrial Ecologist, AECOM T. Shorney – Terrestrial Ecologist, AECOM
June 6, 2013	Blanding's Turtle Surveys	C. Boros – Aquatic Ecologist, AECOM W. Ott – Aquatic Ecologist, AECOM
September 16 – September 19, 2013	Ecological Land Classification Vegetation Inventories	R. Aitken – Terrestrial Ecologist, AECOM T. Shorney – Terrestrial Ecologist, AECOM

Survey locations for each of the investigations are identified on **Figures 2.1** through **2.4**. Additional surveys will be required and should be undertaken during future detail design phases of work. Future surveys should be completed at the locations detailed below and, where possible and necessary, at additional locations within the right of way for the recommended plan where access could not be obtained as part of this study.

Each of the following sections provides a description of the survey methods and findings for each of the terrestrial field investigations.

3.2 Amphibian Call Surveys

3.2.1 Amphibian Call Survey Methods

Amphibians are excellent indicators of local wetland health as they spend a majority of their life cycle in wetland habitats, typically do not travel great distances, are susceptible to changes in the local environment due to their porous skin and are an easy group to monitor due to their unique and easily identifiable mating calls. The protocol used to complete the amphibian surveys at the site followed the specifications in the Marsh Monitoring Protocol (MMP) which is used throughout North America and is limited to easily detected amphibian species (i.e. frogs and toads) (Bird Studies Canada *et al.* 2008).

Under the MMP three rounds of surveys are completed a minimum of 15 days apart between April 1st and July 15th, with the specific timing window for each survey varying based on the location of the site. Surveys can be completed between a half hour after sunset and midnight with each station being monitored for three minutes. As frogs and toads are very sensitive to the conditions surrounding them, close attention to weather conditions during surveys is required. Temperatures during which each survey can be completed also vary during each survey window. Night-time air temperatures should be greater than 5°C for the first survey, 10°C for the second survey and 17°C for the third survey. Wind conditions can also affect survey results and, therefore, must be monitored carefully during surveys. Surveys should not be completed during strong winds above 3 on the Beaufort Scale (the Beaufort Scale is a standardized system that relates wind speed to observed conditions on sea or land) as it will affect the results of the surveys by decreasing the numbers of calling amphibians and the surveyors ability to hear calls. Nights that are damp, foggy or have light rain falling are ideal, especially for the first survey. Heavy or persistent rainfall should be avoided (Bird Studies Canada *et al.* 2008).

Potentially suitable amphibian breeding habitat was identified through aerial photography interpretation prior to surveying. Based on access limitations to private lands, in some locations survey stations were located within the existing right of ways for Highway 17 and local roads in the study area where these areas were in close proximity to the recommended plan.

In total, 27 amphibian call stations were surveyed with surveys completed May 21st and 22nd 2013. Survey locations are shown on **Figures 2.1** through **2.4** and all surveys were completed in accordance with the MMP to ensure a standardized method for audio-surveying breeding frogs and toads. Given the nature of the study area and existing data regarding species and areas of natural significance, additional surveys were not pursued, and only one round of surveys was completed as part of this EA study. Background review and the initial surveys described below indicate that conditions in this rural area have remained relatively consistent since initial records were generated. Conditions are not anticipated to change significantly in this area, particularly with regards to natural features these areas are primarily located within provincial parks and other protected areas (e.g. deer wintering areas). Additional surveys should be undertaken during future detail design phases of work given that this study is a long term planning study and timing for completion of future phases of work, (e.g. detailed design and construction), is undetermined at this time. Future surveys should be completed at the locations identified in this report in order to verify the findings and conclusions of the study team and, where possible and necessary, at additional locations within the right of way for the recommended plan where access could not be obtained as part of this study.

3.2.2 Amphibian Call Survey Findings

In order to determine what amphibian species are present within the study area, one round of amphibian surveys was completed on May 21st and May 22nd, 2013. The surveys followed the protocol provided in the MMP as it provides a standardized field method for audio-surveying breeding frogs and toads. Under this protocol it is

recommended that three rounds of surveys are completed however due to the timing of the site visits surveys were only completed during the second survey window (e.g. May). A total of 27 stations, as shown on (**Figures 2.1 through 2.4**), were surveyed.

Observers record the level of calling of all frog and toad species heard in a three minute period. There are four levels of calling:

- 0 - None heard.
- 1 - Individuals can be counted, calls not overlapping.
- 2 - Numbers of some individuals can be estimated or counted, others overlapping.
- 3 - Full chorus, calls continuous and overlapping, and individuals not distinguishable.

Appropriate conditions for second round surveys consist of winds less than 19 km/hr and minimum night-time air temperatures of at least 10°C. The conditions under which the surveys were completed were very similar on both nights with temperatures ranging between 11-15°C, a light wind of that was estimated to be between 3-5 km/h and a dense cloud cover of 100%. A light rain was falling on the night of May 22nd however it was not considered to be heavy enough to significantly affect the results of the surveys. During night surveys, all stations had calling amphibians. Stations were placed near wetland habitats that were visible on air photos that were adjacent or near the existing Highway 17. A total of four (4) amphibian species were heard during these surveys including; American toad (*Anaxyrus americanus*), Northern Leopard Frog (*Rana pipiens*), Gray treefrog (*Hyla versicolori*) and Spring Peeper (*Pseudacris crucifer*). A summary of the data collected during the surveys is provided in **Table 3.2**.

Table 3.2: Amphibians Survey Data Summary

Date	Station	Species Observed	Calling Code	Number of Individuals Calling	General Comments
May 21, 2013	A-1	Spring Peeper	3	N/A	Full chorus of Spring Peepers .
	A-2	Spring Peeper	3	N/A	American Woodcock (<i>Scolopax minor</i>) calling.
	A-3	Spring Peeper	3	N/A	Spring Peepers calling outside of the 100 m survey area to the east. American Woodcock calling.
	A-4	Spring Peeper	3	N/A	Spring Peepers in full chorus to the north of HWY 17. American Woodcock calling.
	A-5	Spring Peeper	3	N/A	Full chorus of Spring Peepers.
	A-6	American Toad, Spring Peeper	1	2	No comments
			3	N/A	
	A-7	Spring Peeper	3	N/A	No comments
	A-8	Spring Peeper	1	3	American Toad and Spring Peeper heard calling south of the HWY in A-9 survey.
	A-9 (a/b)	American Toad	3	N/A	No comments
		Spring Peeper	3	N/A	
	A-10	No amphibians heard	0	N/A	No comments
	A-11	Spring Peeper	2	10	No comments
		American Toad	Outside survey	N/A	
	A-12	Spring Peeper	3	N/A	No comments
	A-13	Spring Peeper	3	N/A	No comments
		American Toad	1		
	A-14	Spring Peeper	2	4	No comments
		American Toad	2	N/A	
	A-15	Spring Peeper	1	8	No comments
	A-16	Spring Peeper	1	5	American Woodcock calling.
	A-17	American Toad	1	N/A	No comments
		Spring Peeper	2	N/A	
	A-18	Spring Peeper	3	N/A	No comments
	A-19	Spring Peeper	1	6	No comments
		Gray Tree Frog	1	1	
	A-20	Spring Peeper	3	N/A	No comments
Northern Leopard Frog		1	1		
A-21	Spring Peeper	1	N/A	No comments	
A-22	American Toad	2	5	No comments	
	Spring Peeper	3	N/A		
	Northern Leopard Frog	1	3		
A-23	Spring Peeper	3	N/A	No comments	
A-26	American Toad	2	4	No comments	
	Spring Peeper	3	N/A		
A-27	Spring Peeper	3	N/A	No comments	

1. Calling Code: 0=none heard, 1=individuals can be counted, calls not overlapping, 2=numbers of some individuals can be estimated or counted, others overlapping, 3=full chorus, calls continuous and overlapping, and individuals not distinguishable.

3.3 Breeding Bird Surveys

3.3.1 Breeding Bird Survey Methods

Breeding Bird Surveys are important components of environment studies as they can assist in the evaluation of the health and sustainability of the ecosystems they inhabit. These studies are also typically included in baseline environmental studies due to general interest of the population status of birds, the federal responsibility for birds under the Migratory Birds Conservation Act, the provincial responsibility for protection of Species at Risk, wildlife monitoring and general concerns about reported declines in bird populations (Butcher 2007).

Due to Ontario's size and habitat diversity there are various bird monitoring protocols that utilize different methods to target different species, in different habitats. For the purposes of this study breeding bird surveys were completed using the point count protocol from the Canadian Wildlife Service (CWS) 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).

Under the CWS Forest Bird Monitoring Program, survey stations should typically occur within an individual community that is characterized by uniform physical conditions. The areas that the stations are placed in should also be large enough to place one or more stations at least 250m apart and 100m from the edge of the community in which the station is being placed. As the intent of these surveys is to document what species of birds are utilizing that habitat at the site, the survey stations established for this study did not necessarily meet these criteria. Some stations may have been placed within 250m of each other and within 100m of the vegetation community edge in order to provide comprehensive coverage of different habitat types present at the site. Other factors that contributed to the survey station placement not complying with the CWS Forest Bird Monitoring Program was that the majority of these surveys were completed from the existing right of way of Highway 17 and municipal roads, as access had not been obtained for the majority of the private lands at the site at the time of the surveys.

In total 32 stations, identified in **Figures 2.1** through **2.4**, were surveyed at the site. Each station consisted of two 5-minute count periods during which the time, species, breeding evidence and individual bird movement were recorded within a 100 m radius of the survey station. Species locations were mapped and data was recorded using forest bird monitoring protocol standardized field forms. Species heard outside of the 100 m radius or that were not associated with the habitat within the 100 m radius were recorded separately. Time of day and weather conditions are also important factors which can significantly influence the results of a survey. As per the forest bird monitoring protocol all bird monitoring stations were completed between 5:00am and 10:00am under a calm to light wind (< 15 kph) and no rain (CWS, 2009).

According to the forest bird monitoring program each station should be surveyed twice per year with the first visit occurring between May 24th and June 17th and the second visit occurring between June 13th and July 10th with a minimum of 6 days between surveys. The separate surveys are recommended as they typically provide data that more accurately reflects the number of species and birds utilizing the habitat at each station (CWS, 2009).

As noted previously, given the nature of the study area and existing data regarding species and areas of natural significance, additional surveys were not pursued, and only one round of surveys was completed as part of this EA study.

Additional surveys should be undertaken during future detail design phases of work given that this study is a long term planning study and timing for completion of future phases of work, (e.g. detailed design and construction), is undetermined at this time. Future surveys should be completed at the locations identified in this report in order to

verify the findings and conclusions of the study team and, where possible and necessary, at additional locations within the right of way for the recommended plan where access could not be obtained as part of this study.

3.3.2 Breeding Bird Survey Findings

A total of 64 species of birds, detailed in **Table 3.3** below, were identified at the breeding bird stations, (**Figures 2.1** through **2.4**), during the 2013 breeding bird survey. The majority of these species are known to be common throughout southwestern Ontario.

Significant observations made during the breeding bird surveys included the observation of two SAR, species that are designated under the Partners in Flight Ontario BCR Landbird Conservation Plan and species that are considered to be Area Sensitive.

The two SAR that were observed during the breeding bird surveys were Bobolink and Eastern Meadowlark. Both species were observed/heard in agricultural fields comprised of pasture land and hayfields towards the western end of the study area in the vicinity of Trout Pond Road and Trunk Road. Historically, Bobolink lived in tallgrass prairies and open meadows. However with the loss of this habitat, this species is now most commonly observed in hayfields where it builds small nests on the ground in dense grasses (MNR, 2013b). Eastern Meadowlark can also be found in these habitats but also sometimes occur in alfalfa fields, weedy borders of croplands, roadsides, orchards, shrubby overgrown fields or other open areas where they use small trees, shrubs or fence posts as elevated song perches (MNR, 2013b).

Eastern Wood-Pewee was also heard during the breeding bird surveys. While this species is one of the most common forest songbirds in eastern North America its population has consistently been declining over the past 40 years. The causes of this decline are not fully understood but could potentially be linked to habitat loss, the degradation of its wintering grounds or changes in the availability of insect prey (COSEWIC, 2012). Once a species has been designated by COSEWIC or the Committee on the Status of Species at Risk in Ontario (COSSARO) this designation is typically incorporated into the ESA within the following year.

A total of 24 area sensitive species were also identified during the breeding bird surveys (**Table 3.3**). Area sensitive species require large tracks of interior forest habitat that are 100 meters from any edge habitat. While this type of habitat can be present in forest tracks that are 30 ha in size, larger forest tracks are still preferable as they are more likely to provide suitable habitat for these species.

Table 3.3: Breeding Bird Survey Species Summary

Species	Maximum Breeding Evidence	ESA Status	SARA Status	COSEWIC Status	NHIC Status Ranking ¹	Area-sensitive Species ³
Alder Flycatcher <i>Empidonax alnorum</i>	Possible (S)				S5	
American Crow <i>Corvus brachyrhynchos</i>	Possible (S)				S5	
American Kestrel <i>Falco sparverius</i>	Possible (H)				S4	
American Redstart <i>Setophaga ruticilla</i>	Possible (S)				S5	A
American Robin <i>Turdus migratorius</i>	Probable (P)				S5	
Bay-breasted Warbler <i>Dendroica castanea</i>	Possible (S)				S5	
Black-and-white Warbler <i>Mniotilta varia</i>	Possible (S)				S5	A
Black-capped Chickadee <i>Poecile atricapillus</i>	Possible (S)				S5	
Black-throated Blue Warbler <i>Dendroica caerulescens</i>	Possible (S)				S5	A
Black-throated Green Warbler <i>Dendroica virens</i>	Possible (S)				S5	A
Blue Jay <i>Cyanocitta cristata</i>	Possible (S)				S5	
Blue-headed Vireo <i>Vireo solitarius</i>	Possible (S)				S5	A
Bobolink <i>Dolichonyx oryzivorus</i>	Possible (S)	Threatened		Threatened	S4	A
Broad-winged Hawk <i>Buteo platypterus</i>	Possible (S)				S5	A
Brown Thrasher <i>Toxostoma rufum</i>	Possible (S)				S4	
Canada Goose <i>Branta canadensis</i>	Possible (S)				S5	
Cape May Warbler <i>Dendroica tigrina</i>	Possible (S)				S5	
Chestnut-sided Warbler <i>Dendroica pensylvanica</i>	Possible (S)				S5	
Chipping Sparrow <i>Spizella passerina</i>	Possible (S)				S5	
Common Raven <i>Corvus corax</i>	Possible (S)				S5	
Common Yellowthroat <i>Geothlypis trichas</i>	Possible (S)				S5	
Cooper's Hawk <i>Accipiter cooperi</i>	Possible (H)				S4	A
Dark-eyed Junco <i>Junco hyemalis</i>	Possible (S)				S5	
Downy Woodpecker <i>Picoides pubescens</i>	Possible (S)				S5	
Eastern Meadowlark <i>Sturnella magna</i>	Possible (S)	Threatened		Threatened	S4	A
Eastern Phoebe <i>Sayornis phoebe</i>	Possible (S)				S5	
Eastern Wood-Pewee <i>Contopus virens</i>	Possible (S)			Special Concern	S4	

Species	Maximum Breeding Evidence	ESA Status	SARA Status	COSEWIC Status	NHIC Status Ranking ¹	Area-sensitive Species ³
European Starling <i>Sturnus vulgaris</i>	Probable (P)				SNA	
Golden-crowned Kinglet <i>Regulus satrapa</i>	Possible (S)				S5	
Gray Catbird <i>Dumetella carolinensis</i>	Possible (S)				S4	
Great Crested Flycatcher <i>Myiarchus crinitus</i>	Possible (S)				S4	
Least Flycatcher <i>Empidonax minimus</i>	Possible (S)				S4	A
Magnolia Warbler <i>Dendroica magnolia</i>	Possible (S)				S5	A
Mourning Warbler <i>Oporornis philadelphia</i>	Possible (S)				S4	
Nashville Warbler <i>Vermivora ruficapilla</i>	Probable (S)				S5	
Northern Flicker <i>Colaptes auratus</i>	Possible (S)				S4	
Northern Harrier <i>Circus cyaneus</i>	Possible (H)				S4	A
Northern Parula <i>Parula americana</i>	Possible (S)				S4	A
Northern Rough-winged Swallow <i>Stelgidopteryx serripennis</i>	Observed (X)				S4	
Northern Waterthrush <i>Seiurus noveboracensis</i>	Possible (S)				S5	
Ovenbird <i>Seiurus aurocapillus</i>	Possible (S)				S4	A
Philadelphia Vireo <i>Vireo philadelphicus</i>	Possible (S)				S5	
Pileated Woodpecker <i>Dryocopus pileatus</i>	Possible (S)				S5	A
Pine Warbler <i>Dendroica pinus</i>	Possible (S)				S5	A
Purple Finch <i>Carpodacus purpureus</i>	Possible (S)				S4	
Red-breasted Nuthatch <i>Sitta canadensis</i>	Possible (S)				S5	A
Red-eyed Vireo <i>Vireo olivaceus</i>	Possible (S)				S5	
Red-winged Blackbird <i>Agelaius phoeniceus</i>	Probable (S)				S4	
Ring-billed Gull <i>Larus delawarensis</i>	Observed (X)				S5	
Rose-breasted Grosbeak <i>Pheucticus ludovicianus</i>	Possible (S)				S4	
Ruffed Grouse <i>Bonasa umbellus</i>	Possible (H)				S4	
Sandhill Crane <i>Grus canadensis tabida</i>	Possible (S)				S5	A
Savannah Sparrow <i>Passerculus sandwichensis</i>	Possible (S)				S4	A
Sharp-shinned Hawk <i>Accipiter striatus</i>	Possible (H)				S5	A
Song Sparrow <i>Melospiza melodia</i>	Possible (S)				S5	

Species	Maximum Breeding Evidence	ESA Status	SARA Status	COSEWIC Status	NHIC Status Ranking ¹	Area-sensitive Species ³
Swamp Sparrow <i>Melospiza georgiana</i>	Possible (S)				S5	
Turkey Vulture <i>Cathartes aura</i>	Observed (X)				S5	
Veery <i>Catharus fuscescens</i>	Possible (S)				S4	A
Warbling Vireo <i>Vireo gilvus</i>	Possible (S)				S5	
White-breasted Nuthatch <i>Sitta carolinensis</i>	Possible (S)				S5	A
White-throated Sparrow <i>Zonotrichia albicollis</i>	Possible (S)				S5	
Winter Wren <i>Troglodytes troglodytes</i>	Possible (S)				S5	A
Yellow Warbler <i>Dendroica petechia</i>	Possible (S)				S5	
Yellow-bellied Sapsucker <i>Sphyrapicus varius</i>	Possible (S)				S5	A

Glossary

- 1 - ESA – Endangered Species Act
 2 - SARA – Species at Risk Act
 3 - COSEWIC – Committee on the Status of Endangered Wildlife in Canada
 4 - Ontario Breeding Bird Atlas Breeding Evidence Codes

Observed

X – Species observed in its breeding season (no evidence of breeding). Presumed migrants should not be recorded

Possible Breeding

- H – Species observed in its breeding season in suitable nesting habitat
 S – Singing male present or breeding calls heard, in its breeding season in suitable nesting habitat

Probable Breeding

- P – Pair observed in their breeding season in suitable nesting habitat
 T – Permanent territory presumed through registration of territorial song on at least 2 days, a week or more apart, at the same place
 D – Courtship or display between a male and female or 2 males, including courtship feeding or copulation

Probable Breeding (cont.)

- V – Visiting a probable nest site
 A – Agitated behaviour or anxiety calls of an adult
 B – Brood patch on adult female or cloacal protuberance on adult male
 N – Nest-building or excavation of nest hole

Confirmed Breeding

- DD – Distraction display or injury feigning
 NU – Used nest or egg shell found (occupied or laid within the period of the study)
 FY – Recently fledged young or downy young, including young incapable of sustained flight
 AE – Adults leaving or entering nest site in circumstances indicating occupied nest
 FS – Adult carrying faecal sac
 CF – Adult carrying food for young
 NE – Nest containing eggs
 NY – Nest with young seen or heard

3.4 Ecological Land Classification

3.4.1 Ecological Land Classification Methodology

The Ecological Land Classification (ELC) System for southern Ontario is a set of tools and techniques that has been developed for the consistent description, identification, classification and mapping of ecological land units in southern Ontario. Within the ELC there are six nested levels. From the largest to smallest scale they are: Site Region, System, Community Class, Community Series, Ecosite, and Vegetation Type (Lee *et al.* 1998). Aerial photography interpretation was completed prior to the site visit to identify and delineate each unique community series that was visible on the air photos. This information was used during the site visit to ensure that all representative community series, where access was permitted, were surveyed.

Vegetation Community Delineation – Each community was assessed and defined into ELC units as per the Ministry of Natural Resources guidelines (Lee *et al.*, 1998). This system provides a standard for comparing similar vegetation communities across Ontario. Communities that were not accessible were visually assessed from the existing highway right of way and using aerial photography interpretation. Vegetation communities within the subject area are described through the completion of a multilayer (canopy, sub-canopy, ground cover) vegetation inventory.

Floral Species Survey – Detailed floral species lists were compiled for all natural areas where access was permitted. In areas where access was not permitted all species that were visible from existing right of ways were recorded.

3.4.2 Ecological Land Classification Findings

A total of twenty-three (23) vegetation polygons were identified and mapped within the area of investigation, which included the footprint for the recommended plan and the adjacent lands within 120m of the recommended plan. Vegetation communities assessed as part of this study all fall within the following ELC Community Series: Cultural Meadow (CUM), Cultural Plantation (CUP), Deciduous Forest (FOD), Mixed Forest (FOM), Coniferous Forest (FOC), Deciduous Swamp (SWD), Mixed Swamp (SWM), Coniferous Swamp (SWC), Thicket Swamp (SWT), Treed Bog (BOT), Open Bog (BOO), Shallow Marsh (MAS), Mineral Meadow Marsh (MAM) and Floating-leaved Shallow Aquatic (SAF). A map of the location of each community within the study area is provided in **Figures 3.1** through **3.4**. A detailed list of the vegetation of each surveyed community is provided in **Appendix B**.

The total area of the **Cultural Meadow (CUM)** communities within the study area is approximately 185 hectares (ha). Only one (1) of this community type, a Dry-Moist Old Field Meadow (CUM1-1) was identified at the site. A description of the plant species and percent cover within this community is provided below.

CUM1-1: Dry-Moist Old Field Meadow Type – This community was found in several locations within the study area including old agricultural fields, hayfields and along the pipeline right-of-way which bisects the study area. The herbaceous layer covers more than 60% of this community and includes an assortment of species. The most commonly observed plant species include awnless brome grass (*Bromus inermis*), reed canary grass (*Phalaris arundinacea*), Timothy (*Phleum pretense*), Canada goldenrod (*Solidago canadensis*), tall white aster (*Symphotrichum lanceolatum*), bull thistle (*Cirsium vulgare*), Philadelphia fleabane (*Erigeron philadelphicus*), common St. John's-wort (*Hypericum perforatum*), red clover (*Trifolium pratense*) and vetch species (*Vicia sp.*).

The total area of the **Cultural Plantation (CUP)** communities within the study area is approximately 1 ha. Only one (1) of this community type, a Red Pine Coniferous Plantation (CUP3-1), was identified in the study area. A description of the plant species and percent cover within this community is provided below.

Figure 3.1: Ecological Land Classification (Map 1)

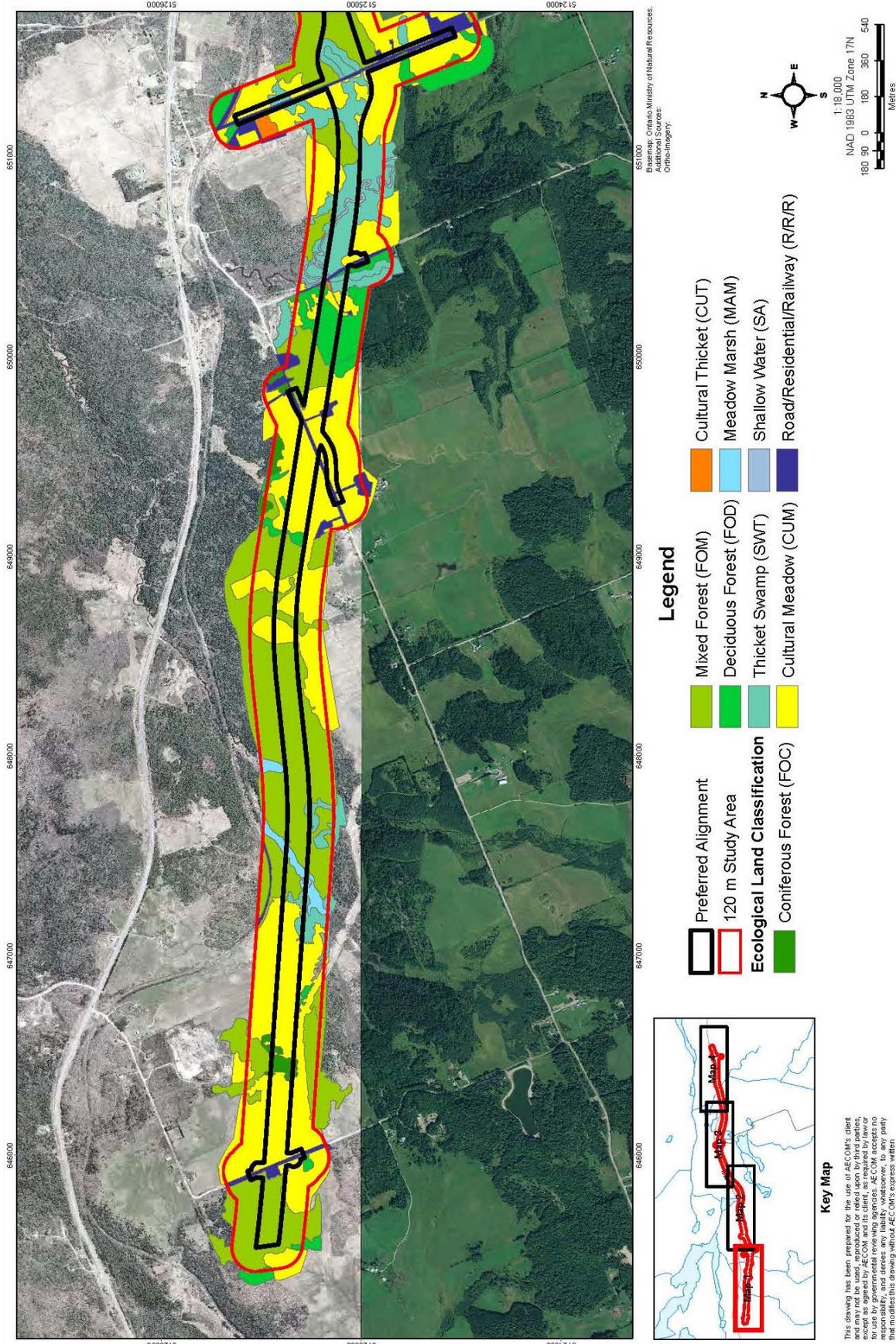


Figure 3.2: Ecological Land Classification (Map 2)

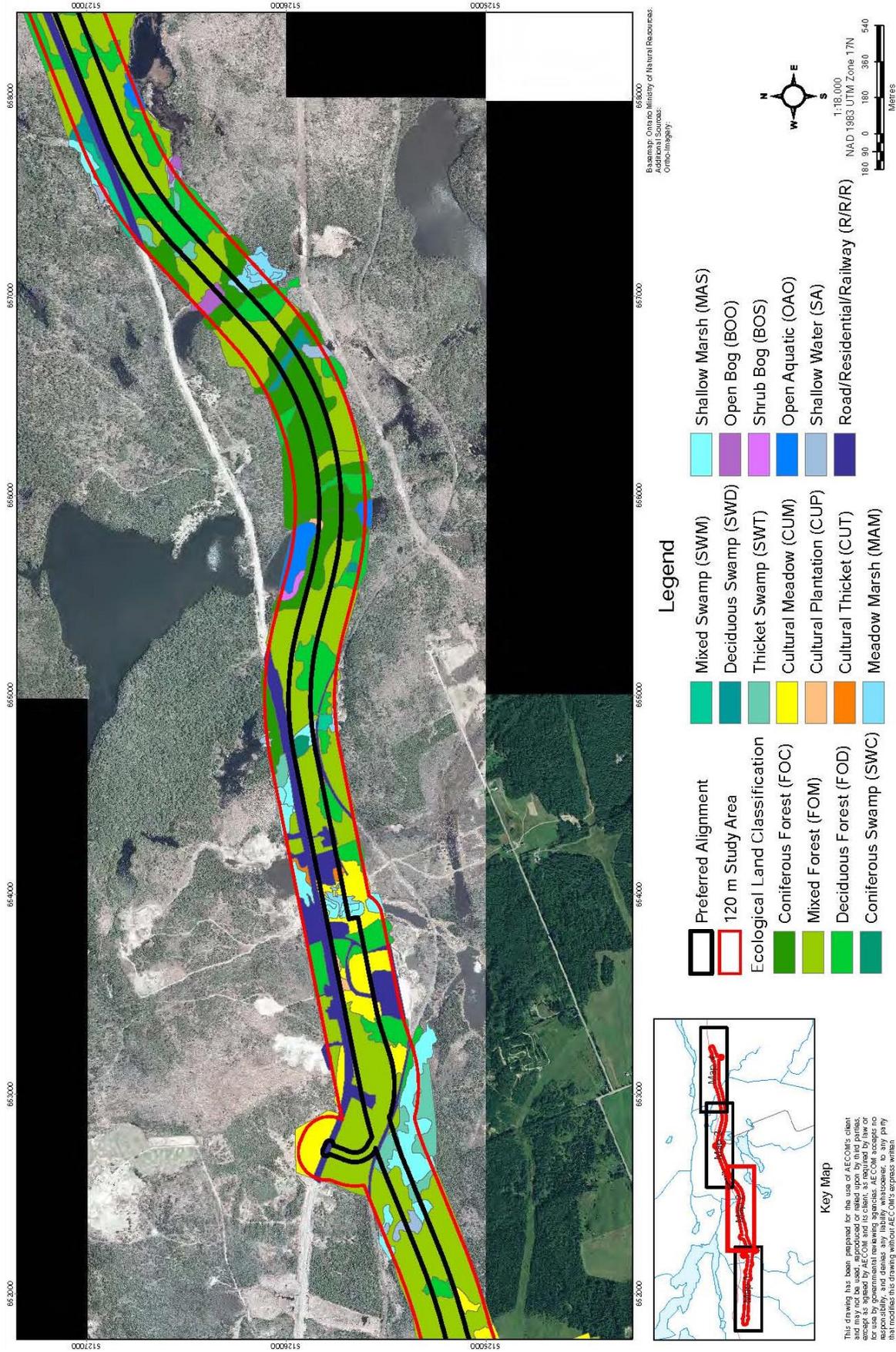


Figure 3.3: Ecological Land Classification (Map 3)

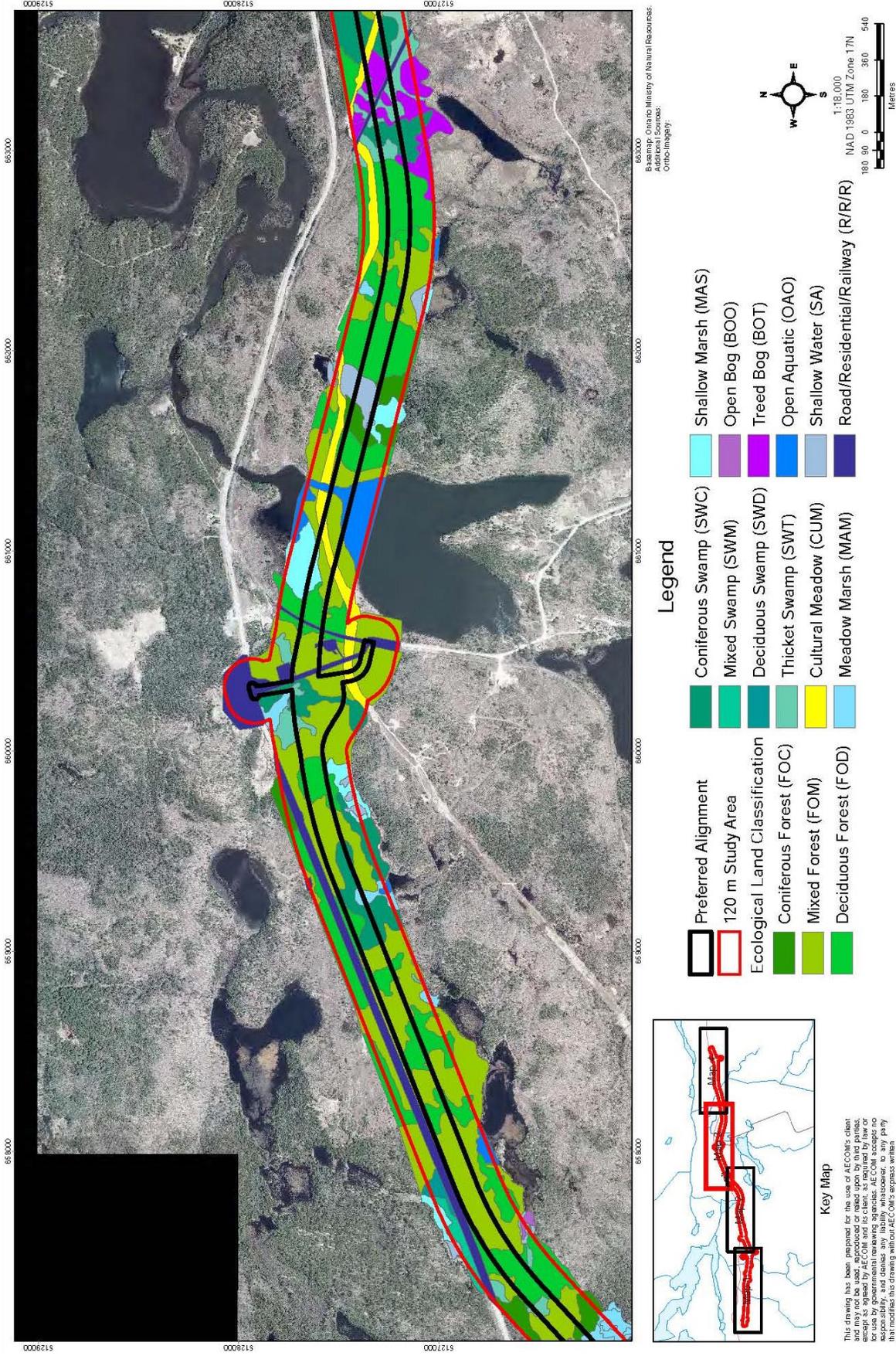
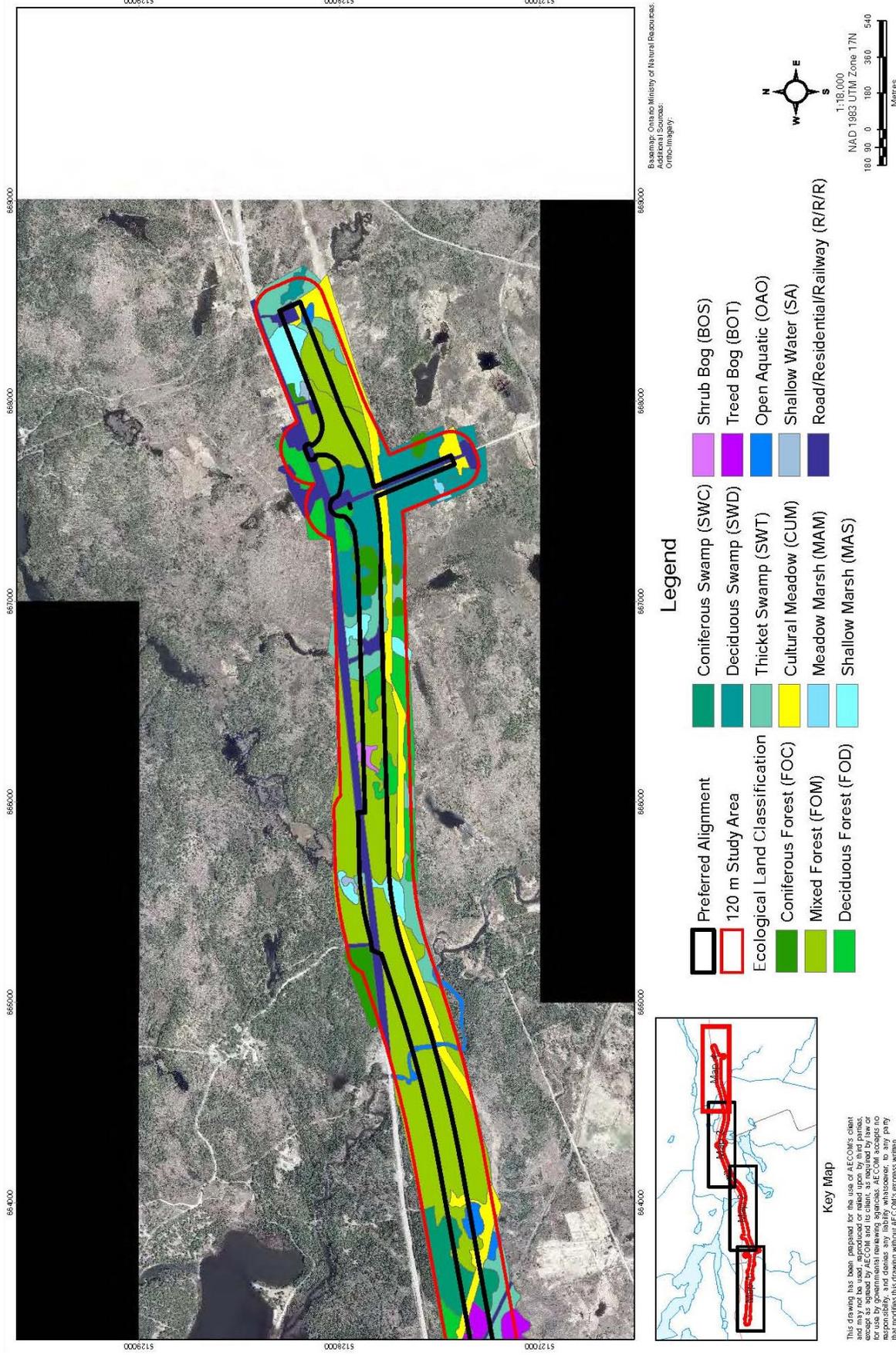


Figure 3.4: Ecological Land Classification (Map 4)



CUP3-1: Red Pine Coniferous Plantation Type – This community was found in one location near the existing Highway 17 right-of-way. The canopy layer in this community covers between 10-25% of this community and is completely dominated by white pine (*Pinus strobus*). The sub canopy covers more than 60% of this community and is dominated by red pine (*Pinus resinosa*), white pine and trembling aspen (*Populus tremuloides*). The shrub layer covers between 0-10% of this community and contains trembling aspen. No herbaceous layer was observed within this community.

The total area of the **Deciduous Forest (FOD)** communities at the site is approximately 140 ha. Only one (1) of this community type, a Fresh-Moist Poplar Deciduous Forest (FOD8-1), was identified within the study area. As it is difficult to identify and delineate different deciduous forest communities in air photos and the entire site has not been surveyed due to private property access limitations, other deciduous forest types could potentially be present. A description of the plant species and percent cover within this community is provided below.

FOD8-1: Fresh-Moist Poplar Deciduous Forest Type – This is a common deciduous forest community throughout the study area. The canopy layer covers between 25-60% of this community and is completely dominated by trembling aspen. The sub canopy covers more than 60% of this community and contains a variety of species including trembling aspen, black ash (*Fraxinus nigra*), red maple (*Acer rubrum*) and balsam fir (*Abies balsamia*). The shrub layer covers between 25-60% of this community and is dominated by northern wild raisin (*Viburnum cassinoides*), speckled alder (*Alnus incana*), beaked hazel (*Corylus cornuta*) and red maple. The herbaceous layer covers between 25-60% of this community and contains dominant species such as eastern bracken-fern (*Pteridium aquilinum*), rough-stemmed goldenrod (*Solidago rugosa*), bush honeysuckle (*Diervilla lonicera*) and virgin's bower (*Clamatis virginiana*).

The total area of the **Mixed Forest (FOM)** communities at the site is approximately 385 ha. Three (3) communities of this type have been identified within the study area, including a White Pine – Red Maple Mixed Forest (FOMA); a Dry – Fresh White Pine – Maple – Oak Mixed Forest (FOM2); and a Dry – Fresh Poplar Mixed Forest (FOM5-2). A description of the plant species and percent cover within these communities is provided below.

FOMA: White Pine – Red Maple Mixed Forest – The canopy layer in this community covers between 25-60% of this community and is completely dominated by white pine. The sub canopy layer covers more than 60% of this community and is dominated by red maple, large-tooth aspen (*Populus grandidentata*), trembling aspen and balsam fir. The shrub layer covers between 25-60% of this community and is dominated by red maple, bush honeysuckle and pin cherry (*prunus pennsylvanica*). The herbaceous layer covers more than 60% of this community and is dominated by eastern bracken-fern, low sweet blueberry (*Vaccinium angustifolium*) and wintergreen (*Gaultheria procumbens*).

FOM2: Dry-Fresh White Pine – Maple – Oak Mixed Forest Ecosite – The canopy layer in this community covers more than 60% of the community and is dominated by white pine, red pine, red maple and red oak (*Quercus rubra*). The sub canopy layer covers between 25-60% of this community and is dominated by white pine, red pine, red maple and red oak. The shrub layer covers between 10-25% of this community and is dominated by balsam fir, red maple and red oak. The herbaceous layer covers between 25-60% of this community and is dominated by low sweet blueberry, eastern bracken fern and immature red maple.

FOM5-2: Dry – Fresh Poplar Mixed Forest Type – The canopy layer in this community covers between 25-60% of this community and is dominated by trembling aspen, white pine and white spruce (*Picea glauca*). The sub canopy covers more than 60% of this community and is dominated by balsam fir and white spruce. The shrub layer covers between 25-60% of this community and is dominated by balsam fir and white spruce. The herbaceous layer covers between 25-60% of this community and is dominated by wild sarsaparilla (*Aralia nudicaulis*), bunchberry (*Cornus canadensis*) and eastern bracken-fern.

The total area of the **Coniferous Forest (FOC)** communities within the study area is approximately 60 ha. Four (4) coniferous community types have been identified within the study area including Balsam Fir Coniferous Forest (FOCA), White Spruce Coniferous Forest (FOCB), White Pine – White Spruce Coniferous Forest (FOCC) and Dry – Fresh White Pine – Red Pine Coniferous Forest (FOC1-2). A description of the plant species and percent cover within these communities is provided below.

FOCA: Balsam Fir Coniferous Forest – The canopy layer in this community covers between 25-60% of this community and is dominated by trembling aspen and white spruce. The sub canopy layer covers more than 60% of this community and is dominated by balsam fir and trembling aspen. The shrub layer covers between 10-25% of this community and is dominated by northern wild raisin and balsam fir. The herbaceous layer covers more than 60% of this community and is dominated by large-leaved aster (*Eurybia macrophylla*), bush honeysuckle, woodland strawberry (*Fragaria vesca*) and bunchberry.

FOCB: White Spruce Coniferous Forest – The canopy layer in this community covers more than 60% of this feature and is dominated by white spruce and large-tooth aspen. The sub canopy layer covers between 25-60% of this community and is dominated by balsam fir. The herbaceous layer covers between 25-60% of this community and is dominated by Eastern Bracken-fern and large-leaved aster.

FOCC: White Pine – White Spruce Coniferous Forest – The canopy layer in this community covers more than 60% of this feature and is dominated by white pine and white spruce. The sub canopy layer covers between 25-60% of this community and is dominated by white pine, white spruce, red maple and trembling aspen. The shrub layer covers between 10-25% of this community and is completely dominated by balsam fir. The herbaceous layer covers between 25-60% of this community and is dominated by low sweet blueberry, eastern bracken-fern and bunchberry.

FOC1-2: Dry – Fresh White Pine – Red Pine Coniferous Forest Type – The canopy layer in this community covers more than 60% of this feature and is dominated by white pine and red pine. The sub canopy covers between 10-25% of this community and is dominated by white pine and red pine. The herbaceous layer covers between 0-10% of this community and is dominated by wintergreen, three-leaved Solomon's seal (*Maianthemum trifolium*) and low sweet blueberry.

The total area of the **Deciduous Swamp (SWD)** communities within the study area is approximately 30 ha. Three (3) of this community type have been identified within the study area including a Black Ash Mineral Deciduous Swamp (SWD2-1), a Black Ash Organic Deciduous Swamp (SWD5-1) and a White Birch – Poplar Organic Deciduous Swamp (SWD7-1). A description of the plant species and percent cover within these communities is provided below.

SWD2-1: Black Ash Mineral Deciduous Swamp Type – The canopy layer in this community covers more than 60% of this feature and is dominated by black ash, balsam poplar (*Populus balsamifera*) and black spruce (*Picea mariana*). The sub canopy layer covers between 25-60% of this community and is dominated by balsam fir. The shrub layer covers between 25-60% of this community and is dominated by pin cherry and speckled alder. The herbaceous layer covers more than 60% of this community and is dominated by tall meadow-rue (*Thalictrum pubescens*), flat-topped white aster (*Doellingeria umbellata*), rough-stemmed goldenrod and virgin's bower (*Clematis virginiana*).

SWD5-1: Black Ash Organic Deciduous Swamp Type – The canopy layer in this community covers more than 60% of this feature and is dominated by black ash and Eastern white cedar (*Thuja occidentalis*). The sub canopy layer covers between 10-25% of this community and is dominated by black ash and Eastern white cedar. The herbaceous layer covers more than 60% of this community and is dominated by a sphagnum moss species (*Sphagnum sp.*).

SWD7-1: White Birch – Poplar Organic Deciduous Swamp Type – This community was assessed through roadside investigations therefore only canopy information was collected. The canopy layer covers more than 60% of this community and is dominated by trembling aspen.

The total area of the **Mixed Swamp (SWM)** communities within the study area is approximately 3 ha. As this area was not granted access by the owner during the site visit, it was only identified and delineated through air photo interpretation no further classification of this site was completed.

The total area of the **Coniferous Swamp (SWC)** communities within the study area is approximately 30 ha. Only one (1) of this community type, a Black Spruce Coniferous Swamp (SWCA), has been identified within the study area. A description of the plant species and percent cover within this community is provided below.

SWCA: Black Spruce Coniferous Swamp – The canopy layer in this community covers more than 60% of this feature and is dominated by black spruce. The sub canopy layer covers between 25-60% of this community and is dominated by black spruce and balsam fir. The shrub layer covers between 25-60% of this community and is dominated by northern wild raisin, balsam fir and bog Labrador tea (*Rhododendron groenlandicum*). The herbaceous layer covers more than 60% of this community and is dominated by Eastern bracken-fern, cinnamon fern (*Osmunda cinnamomea*), bunchberry and a sphagnum moss species.

The total area of the **Thicket Swamp (SWT)** communities within the study area is approximately 70 ha. Two (2) of this community type have been identified within the site including a Alder Organic Thicket Swamp (SWT3-1) and Mountain Holly Organic Thicket Swamp (SWT3-8). A description of the plant species and percent cover within these communities is provided below.

SWT3-1: Alder Organic Thicket Swamp Type – This community was assessed through roadside investigations therefore minimal information was collected. The canopy layer covers between 0-10% of this community and is dominated by black spruce. The sub canopy is absent from this community. The shrub layer covers more than 60% of this community and is completely dominated by speckled alder. The herbaceous layer covers between 25-60% of this community and is completely dominated by broad-leaved cattail (*Typha latifolia*).

SWT3-8: Mountain Holly Organic Thicket Swamp Type – This community does not contain a canopy or sub canopy layer. The shrub layer covers more than 60% of this community and is dominated by mountain holly (*Nemopanthus mucronatus*), winterberry and speckled alder. The herbaceous layer covers more than 60% of this community and is dominated by a sphagnum moss species.

The total area of the **Treed Bog (BOT)** communities at the site is 10 ha. One (1) community type has been identified within the site, a Leatherleaf Shrub Kettle Bog (BOT2-1). A description of the plant species and percent cover within this community is provided below.

BOT2-1: Leatherleaf Shrub Kettle Bog Type – The canopy layer in this community covers between 10-25% of this feature and is dominated by tamarack (*Larix laricina*). The sub canopy layer covers between 10-25% of this community and is dominated by tamarack. The shrub layer covers between 25-60% of this community and is dominated by bog Labrador tea. The herbaceous layer covers more than 60% of this community and is dominated by wool-grass (*Scirpus cyperinus*).

The total area of the **Open Bog (BOO)** communities within the study area is approximately 2 ha. One (1) of this community type has been identified within the study area, a Cotton-Grass Open Bog (BOO1-2). A description of the plant species and percent cover within this community is provided below.

BOO1-2: Cotton-Grass Open Bog Type – The canopy layer covers between 0-10% of this community and is dominated by tamarack, black spruce and speckled alder. The sub-canopy is absent in this community. The shrub layer covers between 25-60% of this community and is dominated by bog Labrador tea, pale laurel (*Kalmia polifolia*) and tussock cotton-grass (*Eriophorum vaginatum*). The herbaceous layer which covers more than 60% of this community is dominated by a sphagnum moss species.

The total area of the **Shallow Marsh (MAS)** communities at the site is approximately 35 ha. One (1) community type has been identified within the site, a Cattail Mineral Shallow Marsh (MAS2-1). A description of the plant species and percent cover within this community is provided below.

MAS2-1: Cattail Mineral Shallow Marsh Type – This community was assessed through roadside investigations, therefore minimal information was collected. This community does not contain species within the canopy, sub canopy or shrub layer. The herbaceous layer covers more than 60% of this community and is dominated by broad-leaved cattail.

The total area of the **Meadow Marsh (MAM)** communities at the site is approximately 10 ha. Two (2) community types have been identified within the site, a Bluejoint Mineral Meadow Marsh (MAM2-1) and a Narrow-leaved Sedge Organic Meadow Marsh (MAM3-5). A description of the plant species and percent cover within these communities is provided below.

MAM2-1: Bluejoint Mineral Meadow Marsh Type – This community does not contain a canopy, sub canopy or shrub layer. The herbaceous layer which covers more than 60% of the community is dominated by blue-joint grass (*Calamagrostis canadensis*), narrow meadow-sweet (*Spiraea alba*) and marsh st. john's-wort (*Triadenum fraseri*).

MAM3-5: Narrow-leaved Sedge Organic Meadow Marsh Type – This community does not contain a canopy, sub canopy or shrub layer. The herbaceous layer which covers more than 60% of this community is dominated by a narrow leaved sedge species.

The total area of the **Shallow Aquatic (SA)** communities within the study area is approximately 10 ha. One (1) of this community type has been identified within this study area, a Waterlily-Bullhead Lilly Floating-leaved Shallow Aquatic Type. A description of the plant species and percent cover within these communities is provided below.

SAF1-1: Waterlily-Bullhead Lily Floating-leaved Shallow Aquatic Type – This community does not contain a canopy, sub canopy or shrub layer. The herbaceous layer which covers between 0-60% of this community is dominated by bullhead pond-lily (*Nuphar variegata*).

Appendix C presents a photographic log of representative photos for each community series.

3.5 Wetland Classification

3.5.1 Wetland Classification Methods

Wetlands are defined in the Ontario Wetland Evaluation System (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 favoured the dominance of either hydrophytic or water tolerant plants” (MNR, 2013a). Wetlands provide specialized habitat for a variety of species that require the unique combination offered by the transitional habitat present between lowland and upland habitat. Wetlands also perform several other important functions such as flood attenuation, water quality improvement and

groundwater recharge. It is for this reason that wetlands are often afforded extra consideration when development activities are proposed within/adjacent to this habitat (MNR, 2013a).

The OWES is based on scientific criteria to serve the needs of Ontario's planning process. 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. 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 (MNR, 2013a).

Floral community assessments were completed in order to determine the presence/absence of wetland communities and confirm their boundaries. These assessments focused on determining relative abundance of wetland species and assessing site hydrology. Wetland species are those that prefer temporary/permanent wet conditions. Wetland community boundaries were drawn where 50% of the plant cover consists of wetland species, in accordance with the OWES (MNR, 2013a).

3.5.2 Wetland Classification Findings

According to the Ontario Wetland Evaluation System (OWES) contiguous wetlands less than 2.0 ha in size are generally not evaluated. However in situations where wetlands less than 2.0 ha in size possess a special feature or perform a special function they can be evaluated provided the rationale for their evaluation is provided.

A total of 9 wetland communities, described in detail as the ELC communities described in Section 3.4.1, have been identified within the study area. These communities cover approximately 200 ha of the study area and include Deciduous Swamp (SWD), Mixed Swamp (SWM), Coniferous Swamp (SWC), Thicket Swamp (SWT), Treed Bog (BOT), Open Bog (BOO), Shallow Marsh (MAS), Mineral Marsh and Floating-leaved Aquatic (SAF) communities. A map of these communities is provided in **Figures 2.3** through **3.2**.

Information provided by the North Bay MNR identifies the Blue Seal Creek Wetland as the only evaluated wetland within the study area. At the time of this report this wetland was not a PSW however an MNR Biologist indicated that the Ministry plan on re-evaluating this wetland in the near future and indicated that they believe it likely contains habitat for SAR, which if present would make this wetland a PSW.

3.6 Significant Wildlife Habitat

3.6.1 Significant Wildlife Habitat Methodology

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 (MMAH, 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 (MNR, 2000) and the Natural Heritage Reference Manual (MNR, 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. 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 (MNR, 2000).

The MNR has divided significant wildlife habitat into four broad categories to make its identification and evaluation more comprehensive. 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 (MNR, 2000).

Detailed information obtained from background resources, field investigations and the evaluation of the forest and wetland communities were used to identify and evaluate any potentially 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 complete and additional investigations will need to be completed in future phases of work for the study.

3.6.2 Significant Wildlife Habitat Findings

Based on information collected through background resources and data collected during the site investigations, five different types of Significant Wildlife Habitat (SWH) were identified within the study area. These areas are described in **Table 3.4**. Other types of significant wildlife habitat that were not confirmed during the site investigations but could potentially be present within the study area may include, but are not limited to, Waterfowl Nesting, Reptile Hibernacula, Amphibian Woodland Breeding Ponds, Seeps and Springs, Habitats of Species of Conservation Concern and Animal Movement Corridors.

Detailed surveys for these types of SWH were not completed for various reasons including the lack of access to private lands during the preliminary site visits, the timing of the surveys required to identify these habitats were outside of the timing window that the surveys were completed and the cryptic nature of some of these species and habitat types which makes them extremely difficult to identify or confirm.

3.7 Species at Risk

3.7.1 Species at Risk Habitat Screening Methodology

The Provincial *Endangered Species Act (2007)* protects over 155 species of endangered or threatened plants, animals and insects and the habitat in which they are located. This legislation emphasizes science based decision making and provides timelines for producing strategies and plans to assist in the recovery of SAR. It also provides tools to help reduce the impact of human activity on these species and their habitats and to encourage their protection and recovery (MNR, 2013b).

The federal Species at Risk Act, which was passed in June 2003, is one part of a three part Government of Canada strategy for the protection of SAR. Other parts of the strategy also include commitments under The Accord for the Protection of SAR and activates under the Habitat for Stewardship Program for SAR. This Act also complements existing laws and agreements to provide legal protection of SAR and the conservation of biological diversity by aiming to prevent species from becoming extinct and to work towards their recovery. The purposes of the Act are to prevent Canadian indigenous species, subspecies, and distinct populations from becoming extirpated or extinct, to provide for the recovery of endangered or threatened species, and encourage the management of other species to prevent them from becoming at risk (Government of Canada, 2012).

Multiple sources were used to determine which SAR are known to occur at, or within the general area surrounding the study area. This included the background resources identified in Section 2 and observations made during field investigations. The habitat preferences of the species identified through these sources were then screened against

the habitat conditions documented at the site to determine which of these species may be present. A full list of the SAR which are known to or may potentially occur in the study area is provided in **Appendix D**. It is important to note that the absence of SAR records does not indicate the absence of SAR as the province of Ontario has not been entirely surveyed for SAR and records are heavily reliant on those identified during field investigations.

Table 3.4: Significant Wildlife Habitat

Significant Wildlife Habitat Type	Significant Wildlife Habitat Description	Significant Wildlife Habitat Location
Wetlands	<p>Policy 2.1 of the Provincial Policy Statement states that development and site alteration shall not be permitted in significant coastal wetlands or significant wetlands in central and southern Ontario. It also states that development will not be permitted in wetlands in northern Ontario or on lands within 120m of significant or coastal wetlands throughout Ontario unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions.</p> <p>Significant wetlands include any wetland, coastal wetland and area of natural and scientific interest that has been identified as provincially significant by the Ontario Ministry of Natural Resources.</p>	<p>Correspondence with the North Bay Ministry of Natural Resources indicate that the only evaluated wetland at the site is the Blue Seal Creek Wetland. While this wetland does not currently meet the requirements to be provincially significant MNR Biologist plan to re-evaluate this wetland in the near future and believe that there is suitable habitat for SAR in the wetland that, if found, would make it a PSW.</p>
Winter Deer Yards	<p>White-tailed deer do not move well in deep snow. As snow begins to accumulate, deer start to move to sheltered areas and remain in the general vicinity until early April. In areas with little snow accumulation, such as in much of southwestern Ontario, deer may not yard in the traditional sense, but often still congregate in large numbers in suitable forested areas. Deer yards consist of a core area of mainly coniferous trees (pines, hemlock, cedar, spruce) with a canopy cover of more than 60%. In severe winters, deer are confined to the core part of the yard. In mild winters, they may be found in loose aggregations in and around the core of the yard. This core area provides primarily shelter, ease of movement, and protection from predators. The land surrounding the core area is usually mixed or deciduous forest. Understorey shrubs and small trees, especially white cedar, provide winter food. When snow accumulation is light, deer move to nearby agricultural land if it provides food such as leftover corn and grains. Deer tend to use the same yards year after year and are not highly adaptable in moving to a new yard. Animals will often move long distances to some deer yards. Generally, deer yards make up about 10% of the summer deer range.</p>	<p>Correspondence with the North Bay Ministry of Natural Resources indicates that the Mattawa Deer Wintering Yard overlaps the proposed ROW of the recommended highway plan.</p>
Colonial Bird Nesting Sites	<p>Colonial birds are a diverse group including several species of herons, gulls, terns, and swallows. Sometimes an entire local population can depend on the survival of just one or two colonies. Under favourable conditions, some species are capable of rapid population growth. In some planning areas, species with expanding populations such as ring-billed gulls and double-crested cormorants may be unpopular and considered pests. Planning authorities will have to decide on the level of protection offered to these species. However, these birds are protected by the Convention of Migratory Birds and these laws must be abided. The habitat matrices in Appendix G of the Significant Wildlife Habitat Technical Guide provide a list of all of the colonial nesting birds and describe their habitats. Generally, herons nest in trees in swamps and along large bodies of water. Gulls and terns prefer to nest on the ground, and colonies are frequently found on islands in the Great Lakes and large rivers such as the St. Lawrence River and Ottawa River. Colonial nesting species such as gulls, will seek islands to nest and return to the same location annually, show considerable nesting site fidelity, returning year after year. Different species of swallows congregate on specific habitat types such as cliffs, banks, and artificial structures. Certain grassland birds are also colonial.</p>	<p>Correspondence with the North Bay Ministry of Natural Resources indicates that there are nesting Great Blue Heron within the proposed ROW of the recommended highway plan. This information was verified during a site visit where an active Heron Colony was Observed.</p>
Raptor Winter Feeding and Roosting Areas	<p>Open fields, including hayfields, pastures, and meadows that support large and productive small mammal populations (mice, voles) are important to the winter survival of many birds of prey. Such fields usually have a diversity of herbaceous vegetation that provides food for mammals. Scattered trees and fence posts provide perches for hunting birds. Windswept fields in more open areas that are not covered by deep snow are preferred by raptors because hunting prey is easier. The best roosting sites will likely be found in relatively mature mixed or coniferous woodlands that abut these windswept fields. Some species, such as northern harriers and short-eared owls, roost in large grassy fields. Some feeding and roosting sites support many birds, especially in years when northern species are numerous. In areas with few remaining forested areas, woodlots with dense conifer cover may support numerous roosting birds, especially long-eared owls. Highway corridors appear to attract many hunting raptors throughout the year, because these areas are open and the vegetation is relatively low, making hunting easier.</p>	<p>Habitat that may be suitable for Raptor Winter Feeding and Roosting may be present in the western half of the proposed ROW of the recommended highway plan. There are several agricultural fields at this location which are currently used for cattle grazing or hay which could potentially support a small mammal population that would be sufficient for wintering raptors.</p>
Habitat for Area Sensitive Species	<p>Some wildlife species, such as Gray Wolf, Lynx and Fisher, require large areas of suitable habitat for their long-term survival. Many birds also require substantial areas of suitable habitat for successful breeding. The habitat matrices in Appendices C and G of the Significant Wildlife Habitat Guide provide a list of area-sensitive bird species of forested and open areas such as grasslands. The larger and least fragmented forest stands within a planning area will support the most significant populations of forest-area sensitive birds. Forests should cover about 30% of the regional landscape to provide minimal conditions for these species and there should be several large woodlands (30 to 100+ ha) present to provide enough suitable forest-interior bird nesting habitat. Forests comprised of a mainly closed canopy of large trees and a variety of vegetation layers tend to support a greater diversity of species because of the broader range of habitats they provide. The minimum forest habitat for area-sensitive species is at least 100 metres from any edge habitat. Edges can have adverse effects on forest-interior habitat.</p> <p>For area-sensitive grassland bird species, large grassland areas are required as they are more likely to be buffered from disturbance, more likely to increase the distance of nesting habitat to woody edges (thereby reducing nest predation and parasitism), and provide more opportunities for nesting. An endangered species in Ontario, the Henslow's sparrow, appears to prefer tall-grass fields of at least 30 ha. Sufficient habitat is required for several breeding pairs before the habitat will be used, although one pair of birds may only use an area of 1 to 2 ha in size. Even more common grassland species such as bobolinks, savannah sparrows, and grasshopper sparrows are more abundant as breeding birds in grasslands of at least 10 ha. Grasslands with a variety of vegetation structure, density, and composition tend to support a greater diversity of grassland nesting birds because different species require different nesting habitat.</p>	<p>Several area sensitive breeding bird species were documented during the breeding bird surveys indicating that Habitat for Area Sensitive Species is present within the proposed ROW of the recommended highway plan. Higher value is typically placed on habitat for Area Sensitive Species in southern Ontario due to its rarity. In central and northern Ontario large tracks of natural habitat are more abundant.</p>

3.7.2 Species at Risk Habitat Screening Findings

Based on the information that has been collected through background resources it has been determined that 24 SAR may potentially occur within the general area of the proposed ROW for the recommended highway plan. Following the terrestrial characterization of the study area through background review and field investigations, a habitat assessment was completed for these species to determine if suitable habitat is present in the study area. **Table 3.5** presents a list of 16 species which could potentially occur within the right-of-way of the recommended plan while **Appendix D** presents a Species Assessment and Preferred Habitat table for the larger study area.

Table 3.5: Potential SAR which may be present within the 120m Area of Investigation

Species	ESA Status	SARA Status	COSEWIC Status	Potential Habitat Location
Little Brown Myotis (Bat) (<i>Myotis lucifugus</i>)	END	-	END	Could potentially be observed foraging within the CUM1-1 community or roosting in cavity trees or old and abandoned structures. No Little Brown Myotis were documented during the site investigation.
Northern Myotis (Bat) (<i>Myotis septentrionalis</i>)	END	-	END	FOD, FOM, FOC, SWD, SWM and SWC community series could potentially provide habitat. No Northern Myotis was documented during the site investigation.
Barn Swallow (<i>Hirundo rustica</i>)	THR	-	THR	Abandoned buildings within CUM community series and/or bridges over watercourses could provide potential habitat. No Barn Swallow were documented during the site investigation.
Blanding's Turtle (<i>Emydoidea blandingii</i>)	THR	THR Schedule 1	THR	MAS and MAM community series could potentially provide habitat. No Blanding's Turtle were documented during the site investigation.
Bobolink (<i>Dolichonyx oryzivorus</i>)	THR	-	THR	CUM and MAM community series within the site. Bobolink was documented during the site investigation.
Chimney Swift (<i>Chaetura pelagica</i>)	THR	THR Schedule 1	THR	CUM, MAM and MAS community series within the site. No Chimney Swift was documented during the site investigation.
Eastern Meadowlark (<i>Sturnella magna</i>)	THR	-	THR	CUM, MAM and MAS community series within the site. Eastern Meadowlark was documented during the site investigation.
Eastern Whip-poor-will (<i>Caprimulgus vociferous</i>)	THR	THR Schedule 1	THR	FOD, FOM and FOC community series which contain open areas. No Eastern Whip-poor-will was documented during the site investigation.
Flooded Jellyskin (<i>Leptogium rivulare</i>)	THR	THR Schedule 1	THR	FOD8-1 and SWD communities which flood seasonally. No Flooded Jellyskin was documented during the site investigation.
Canada Warbler (<i>Wilsonia canadensis</i>)	SC	THR Schedule 1	THR	FOD, FOM, FOC, SWD, SWM and SWC community series within the site. No Canada Warbler was documented during the site investigation.

Species	ESA Status	SARA Status	COSEWIC Status	Potential Habitat Location
Common Nighthawk (<i>Chordeiles minor</i>)	SC	THR Schedule 1	THR	FOD, FOM and FOC community series with open gaps in vegetation. No common Nighthawk was documented during the site investigation.
Milksnake (<i>Lampropeltis triangulum</i>)	SC	SC Schedule 1	SC	Particularly found in CUM communities within abandoned farm field which inhabits abundance of mice. Can also be found in FOD, FOM and FOC community series. No Milksnakes were documented during the site investigation.
Monarch (<i>Danaus plexippus</i>)	SC	-	SC	CUM communities with an abundance of milkweed. No Monarch was documented during the site investigation.
Snapping turtle (<i>Chelydra serpentina</i>)	SC	SC Schedule 1	SC	Shallow OAO and/or SA communities with gravely or sandy substrates. No Snapping Turtle were documented during the site investigation.
Wood Thrush (<i>Hylocichla mustelina</i>)	-	-	THR	Large FOD and FOM communities within the site. No Wood Thrush was documented during the site investigation.
Eastern Wood-Pewee (<i>Contopus virens</i>)	-	-	SC	FOD, FOM and FOC communities within the site. No Eastern Wood-pewee was documented during the site investigation.

Of the sixteen (16) species identified in **Table 3.5**, two (2) species, Bobolink and Eastern Meadowlark were observed during field investigations. Bobolink can be found inhabiting large hayfields or cultural meadow with tall grasses. Bobolinks often build their small nests on the ground in dense grasses. Eastern Meadowlark is also typically associated with hayfields or cultural meadows but can also be located in areas with more shrubs or woody vegetation which it can use as a perch to sing from. Within the study area Bobolink and Eastern Meadowlark can both be directly associated with agricultural lands.

Information provided by the MNR indicated that Lake Sturgeon is also known to occur in general proximity to the study area. Refer to the Existing Conditions Fisheries Report for Highway 17, Bonfield from 2.2km east of Highway 531 easterly to 8km east of Highway 630 GWP 5670-10-00 for more detailed information pertaining to this species.

Although no other SAR were observed this should not be considered conclusive evidence that they are not present at the site as targeted survey for each species has not been completed. In order to determine the presence or absence of these species additional studies may be required during detail design.

3.7.3 Blanding's Turtle Survey Methods & Findings

As a result of the initial habitat screening, targeted surveys for Blanding's Turtles were completed during the first and second site visits. The protocol used to complete these surveys loosely followed the protocol provided in the Occurrence Survey Protocol for Blanding's Turtle (*Emydoidea blandingii*) in Ontario (MNR, 2013c). Prior to the first site visit potentially suitable habitat at the site was identified through air photo interpretation. Habitat assessments were then completed during the first site visit to determine which sites would be the most suitable for Blanding's Turtles. Once these sites were identified additional basking surveys were completed during the second site visit. Basking surveys were completed using monitoring stations around the edges of the potentially suitable habitat and scanning the area using binoculars for Blanding's Turtles.

No Blanding's Turtles were observed as a result of these surveys. However as these surveys were limited and Blanding's Turtle is known to occur within this area, additional studies and communication with MNR during detail design would be beneficial in determining which areas this species occurs in.

3.8 Incidental Wildlife Observations

Other wildlife encountered during site visits, aside from species observed through the targeted surveys, were also documented. Incidental wildlife observations are detailed below in **Table 3.6**.

Table 3.6: Incidental Wildlife Observations

Species	Evidence Observed
White-Tailed Deer <i>Odocoileus virginianus</i>	Scat
Beaver <i>Castor canadensis</i>	Observed
Moose <i>Alces alces</i>	Scat
Coyote/Eastern Wolf <i>Canis latrans/Canis lupus lycaon</i>	Scat
Black Bear <i>Ursus americanus</i>	Scat

4. Description of Relevant Environmental Protection Requirements

4.1 Endangered Species Act, 2007

The *Ontario Endangered Species Act (ESA)* was updated in 2007 and states in Sections 9 and 10 that, “no person shall kill, harm, harass, capture or take a living member or shall damage or destroy the habitat of a species that is listed on the *Species at Risk in Ontario List* as an extirpated, endangered or threatened.” The protection of Endangered and Threatened species requires that significant portions of their habitat be protected. As the habitat requirements of individual Threatened or Endangered species are extremely varied, the assessment of what constitutes the significant portions of the habitat must be made on a species-by-species and case-by-case basis.

As the habitat within the study area may be suitable for a number of SAR, additional studies targeted at these species should be undertaken during detail design to confirm the presence or absence of these species and evaluate the significance of the habitat for them to complete the various aspects of their life cycles.

These studies will confirm the presence or absence of any SAR within the study area. This information can be used during the detailed design to avoid or minimize impacts to SAR or determine if the project will require permits under the ESA.

4.2 Migratory Birds Convention Act, 1994

Canada's *Migratory Birds Convention Act* is intended to protect migratory birds, their habitat and their nests by prohibiting the destruction of the nests of migratory birds during the breeding season and prohibiting the release of harmful substances in areas that are frequented by migratory birds. 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.

As the habitat at the site is suitable for a variety of songbirds, waterfowl and raptors, consideration into the timing of all future work associated with the project, including engineering field work and construction, should be deliberated in order to ensure that the project remains in compliance with the *Migratory Birds Convention Act*.

4.3 Provincial Policy Statement

Section 2.1 of the Provincial Policy Statement indicates that Natural Features and areas shall be protected for the long term. It also states that the diversity and connectivity of natural features in an area, and the long-term ecological function and biodiversity of natural heritage systems, should be maintained, restored or, where possible, improved, recognizing linkages between and among natural heritage features and areas, surface water features and ground water features.

For the purposes of the Provincial Policy Statement natural heritage features applicable to this project include Significant Wetlands, Significant Habitat of Endangered and Threatened Species, Significant Wildlife Habitat (SWH) and Significant Areas of Natural and Scientific Interest.

At the time of writing this report, 5 different types of SWH were identified within the proposed ROW for the recommended highway plan, including the Mattawa Deer Wintering Yard, a Great Blue Heron Colony, which is a Colonial Bird Nesting Site, a potential Raptor Winter Feeding and Roosting Area and Habitat for Area Sensitive

Species. Other types of SWH that were not confirmed during the site investigations but could potentially be present within the ROW may include, Waterfowl Nesting, Reptile Hibernacula, Amphibian Woodland Breeding Ponds, Seeps and Springs, Habitats of Species of Conservation Concern and Animal Movement Corridors.

The North Bay Ministry of Natural Resources indicate the only evaluated wetland at the site is the Blueseal Creek Wetland. While this wetland does not currently meet the requirements to be Provincially Significant, MNR Biologists plan to re-evaluate this wetland in the near future and believe that there is suitable habitat for SAR in the wetland that, if found, would make it a PSW.

5. Summary of Existing Conditions

A summary of the findings of the studies that were completed to assess the existing conditions of the terrestrial features within this area is provided below.

A total of four (4) species of amphibians were identified at the amphibian monitoring stations, identified in **Figures 2.1 through 2.4**, all of which are known to be common throughout central Ontario. No Species at Risk (SAR) were identified during these surveys.

A total of sixty-four (64) species of birds, included in **Table 3.3**, were identified at the breeding bird stations, identified in **Figures 2.1 through 2.4**, within the study area during the 2013 breeding bird survey. The majority of these species are known to be common throughout central Ontario. Two (2) SAR, Bobolink and Eastern Meadowlark, were observed during the breeding bird surveys. Eastern Wood-Pewee, which is likely to be designated as a species of Special Concern in the near future, was also observed. In addition to these sightings 24 species which are considered area sensitive, meaning they typically only nest in large forest communities with habitat that is greater than 100m from any edge habitat, were also observed.

A total of twenty-three (23) vegetation polygons were identified and mapped (**Figures 3.1 through 3.4**) within the study area. Vegetation communities assessed as part of this study are classified within the following ELC Community Series: Cultural Meadow (CUM), Cultural Plantation (CUP), Deciduous Forest (FOD), Mixed Forest (FOM), Coniferous Forest (FOC), Deciduous Swamp (SWD), Mixed Swamp (SWM), Coniferous Swamp (SWC), Thicket Swamp (SWT), Treed Bog (BOT), Open Bog (BOO), Shallow Marsh (MAS), Mineral Meadow Marsh (MAM) and Floating-leaved Shallow Aquatic (SAF).

A total of 9 wetland communities, described in detail in Section 3.5.1, have been identified within the study area. These communities cover 198.62 ha of the site and include Deciduous Swamp (SWD), Mixed Swamp (SWM), Coniferous Swamp (SWC), Thicket Swamp (SWT), Treed Bog (BOT), Open Bog (BOO), Shallow Marsh (MAS), Mineral Marsh and Floating-leaved Aquatic (SAF) communities. A map of these communities is provided in **Figures 3.1 through 3.4**.

Information provided by the North Bay MNR identifies the Blue Seal Creek Wetland as the only evaluated wetland within the study area. At the time of writing this report this wetland was not a PSW, however, MNR Biologists indicated that they plan on re-evaluating this wetland in the near future and indicated that they believe it likely contains habitat for SAR, which if present would make this wetland a PSW.

Five different types of Significant Wildlife Habitat were identified at the site including the Mattawa Deer Wintering Yard, a Great Blue Heron Colony, which is a Colonial Bird Nesting Site, a potential Raptor Winter Feeding and Roosting Area and Habitat for Area Sensitive Species. Other types of significant wildlife habitat that were not confirmed during the site investigations but could potentially be present at the site may include, but is not limited to, Waterfowl Nesting, Reptile Hibernacula, Amphibian Woodland Breeding Ponds, Seeps and Springs, Habitats of Species of Conservation Concern and Animal Movement Corridors.

Potentially suitable habitat for sixteen (16) species was identified within the study area. This includes two (2) Endangered species (Little Brown Myotis and Northern Myotis), seven (7) Threatened species (Barn Swallow, Blanding's Turtle, Bobolink, Chimney Swift, Eastern Meadowlark, Eastern Whip-poor-will and Flooded Jellyskin) and seven (5) Special Concern species (Canada Warbler, Common Nighthawk, Milksnake, Monarch and Snapping Turtle). Potentially suitable habitat for two (2) species which have been classified by COSEWIC as Threatened (Wood Thrush) and Special Concern (Eastern Wood-Pewee) may also be present within the study area. Out of these sixteen (16) species only two (2), bobolink and eastern meadowlark, were observed during field investigations.

Both species were observed in agricultural fields (hay fields/pastures) near the western half of the study area (**Figure 1.2**). Information provided by the MNR indicated that Lake Sturgeon is also known to occur in general proximity to the site.

The information provided in this report is intended to summarize the existing conditions of the terrestrial features within the study area and should be used to guide the development of further environmental studies that should be completed during detail design and prior to construction of the recommended plan. These studies may include, but are not necessarily limited to, targeted surveys for SAR and SWH and the re-evaluation of the Blue Seal Creek Wetland Complex.

6. Preliminary Assessment of Terrestrial Ecosystem Impacts and Identification of Potential Mitigation

This is a longer-term planning and preliminary design study. As such, in **Table 6.1** below, impact assessment is presented on an overview basis, and mitigation is conceptual and in line with industry best management practices. During future detail design studies prior to construction, the following (as stipulated in the 2013 Environmental Reference for Highway Design) will be required:

- Higher level project specifics with respect to location and assessment of environmental impacts;
- Detail design level mitigation;
- Follow-up including compliance level monitoring; and
- Assessment of residual effects.

Table 6.1: Impact Assessment and Environmental Mitigation and Protection Measures

Factor / Criteria Potentially Impacted	Impacts Associated with the Preferred Plan	Environmental Mitigation and Protection Measures
Vegetation	- Removal of approximately 295 ha of vegetation	- Protect significant trees and areas of vegetation to the extent possible; and - Limit areas in which construction work and associated contractor staging areas are permitted to occur.
Wetlands	- Removal of 18 ha of evaluated wetland and 34 ha of unevaluated wetland	- Protect wetlands to the extent possible; - Limit areas in which construction work and associated contractor staging areas are permitted to occur; and - Targeted enhancement and/or restoration of wetlands.
Species at Risk	- Loss of habitat for Species at Risk due to vegetation removal / construction	- Complete targeted surveys for SAR prior to the completion of detailed design; - Use information from surveys to avoid or minimize impacts to SAR during detailed design; - Protect habitat of SAR to the extent possible; - Obtain necessary permits under the ESA
Migratory Birds	- Disturbance of nesting migratory birds	- Schedule/constrain construction activities such as tree clearing/felling and structure removal/repair that may impact bird nesting to occur outside period during which disturbance is prohibited.
Significant Wildlife Habitat	- Loss of Significant Wildlife Habitat due vegetation removal / construction	- Protect retained wildlife habitat areas from construction access and damage; and - Design bridges and culverts to provide for wildlife passage, where appropriate and investigate additional opportunities to provide wildlife crossings during detail design.

Also in recognition that this is a long term planning study and timing for completion of future phases of work, (e.g. detailed design and construction), undetermined at this time, Additional surveys should be undertaken during future detail design phases of work given that this study is a long term planning study and timing for completion of future phases of work, (e.g. detailed design and construction), is undetermined at this time. Future surveys should be completed at the locations identified in this report in order to verify the findings and conclusions of the study team and, where possible and necessary, at additional locations within the right of way for the recommended plan where access could not be obtained as part of this study.

7. References

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Appendix A.
Atlas of the Breeding Birds of Ontario Data Summary

Species	ESA Status	SARA Status	COSEWIC Status	NHIC Status Ranking ¹	Identified in Partners in Flight Ontario BCR 13 Landbird Conservation Plan ²	Area-sensitive Species ³	Significant in Region 6 (south-central) ⁴
Alder Flycatcher <i>Empidonax alnorum</i>				S5			
American Bittern <i>Botaurus lentiginosus</i>				S4		A	
American Black Duck <i>Anas rubripes</i>				S4			
American Crow <i>Corvus brachyrhynchos</i>				S5			
American Goldfinch <i>Carduelis tristis</i>				S5			
American Kestrel <i>Falco sparverius</i>				S4	✓		
American Redstart <i>Setophaga ruticilla</i>				S5		A	
American Robin <i>Turdus migratorius</i>				S5			
American Woodcock <i>Scolopax minor</i>				S4			
Bald Eagle <i>Haliaeetus leucocephalus</i>	SC			S2	✓	A	
Baltimore Oriole <i>Icterus galbula</i>				S4	✓		
Bank Swallow <i>Riparia riparia</i>				S4	✓		
Barn Swallow <i>Hirundo rustica</i>	THR		THR	S4			
Barred Owl <i>Strix varia</i>				S5		A	
Bay-breasted Warbler <i>Dendroica castanea</i>				S5			Y
Belted Kingfisher <i>Ceryle alcyon</i>				S4	✓		
Black-and-white Warbler <i>Mniotilta varia</i>				S5		A	
Black-billed Cuckoo <i>Coccyzus erythrophthalmus</i>				S5	✓		
Blackburnian Warbler <i>Dendroica fusca</i>				S5		A	
Black-capped Chickadee <i>Poecile atricapillus</i>				S5			
Black-throated Blue Warbler <i>Dendroica caerulescens</i>				S5		A	
Black-throated Green Warbler <i>Dendroica virens</i>				S5		A	

Species	ESA Status	SARA Status	COSEWIC Status	NHIC Status Ranking ¹	Identified in Partners in Flight Ontario BCR 13 Landbird Conservation Plan ²	Area-sensitive Species ³	Significant in Region 6 (south-central) ⁴
Blue Jay <i>Cyanocitta cristata</i>				S5			
Blue-headed Vireo <i>Vireo solitarius</i>				S5		A	Y
Bobolink <i>Dolichonyx oryzivorus</i>	THR		THR	S4	✓	A	
Broad-winged Hawk <i>Buteo platypterus</i>				S5		A	
Brown Creeper <i>Certhia americana</i>				S5		A	
Brown Thrasher <i>Toxostoma rufum</i>				S4	✓		
Brown-headed Cowbird <i>Molothrus ater</i>				S4			
Canada Goose <i>Branta canadensis</i>				S5			
Canada Warbler <i>Wilsonia canadensis</i>	SC	THR Schedule 1	THR	S4	✓	A	
Cape May Warbler <i>Dendroica tigrina</i>				S5			Y
Cedar Waxwing <i>Bombycilla cedrorum</i>				S5			
Chestnut-sided Warbler <i>Dendroica pensylvanica</i>				S5			
Chimney Swift <i>Chaetura pelagica</i>	THR	THR Schedule 1	THR	S4	✓		
Chipping Sparrow <i>Spizella passerina</i>				S5			
Clay-coloured Sparrow <i>Spizella pallida</i>				S4			
Common Grackle <i>Quiscalus quiscula</i>				S5			
Common Loon <i>Gavia immer</i>				S5		A	
Common Merganser <i>Mergus merganser</i>				S5		A	
Common Raven <i>Corvus corax</i>				S5			
Common Snipe <i>Gallinago gallinago</i>							
Common Yellowthroat <i>Geothlypis trichas</i>				S5			
Dark-eyed Junco <i>Junco hyemalis</i>				S5			Y

Species	ESA Status	SARA Status	COSEWIC Status	NHIC Status Ranking ¹	Identified in Partners in Flight Ontario BCR 13 Landbird Conservation Plan ²	Area-sensitive Species ³	Significant in Region 6 (south-central) ⁴
Downy Woodpecker <i>Picoides pubescens</i>				S5			
Eastern Bluebird <i>Sialia sialis</i>				S5			
Eastern Kingbird <i>Tyrannus tyrannus</i>				S4	✓		
Eastern Meadowlark <i>Sturnella magna</i>	THR		THR	S4	✓	A	
Eastern Phoebe <i>Sayornis phoebe</i>				S5			
Eastern Wood-Pewee <i>Contopus virens</i>			SC	S4	✓		
European Starling <i>Sturnus vulgaris</i>				SNA			
Evening Grosbeak <i>Coccothraustes vespertinus</i>				S4			
Golden-crowned Kinglet <i>Regulus satrapa</i>				S5			
Gray Catbird <i>Dumetella carolinensis</i>				S4			
Great Blue Heron <i>Ardea herodias</i>				S4			
Great Crested Flycatcher <i>Myiarchus crinitus</i>				S4			
Hairy Woodpecker <i>Picoides villosus</i>				S5		A	
Hermit Thrush <i>Catharus guttatus</i>				S5		A	
Herring Gull <i>Larus argentatus</i>				S5			
Hooded Merganser <i>Lophodytes cucullatus</i>				S5			
House Sparrow <i>Passer domesticus</i>				SNA			
Indigo Bunting <i>Passerina cyanea</i>				S4			
Killdeer <i>Charadrius vociferus</i>				S5			
Least Flycatcher <i>Empidonax minimus</i>				S4		A	
Magnolia Warbler <i>Dendroica magnolia</i>				S5		A	
Mallard <i>Anas platyrhynchos</i>				S5			

Species	ESA Status	SARA Status	COSEWIC Status	NHIC Status Ranking ¹	Identified in Partners in Flight Ontario BCR 13 Landbird Conservation Plan ²	Area-sensitive Species ³	Significant in Region 6 (south-central) ⁴
Merlin <i>Falco columbarius</i>				S5			
Mourning Dove <i>Zenaida macroura</i>				S5			
Mourning Warbler <i>Oporornis philadelphia</i>				S4			
Nashville Warbler <i>Vermivora ruficapilla</i>				S5			
Northern Flicker <i>Colaptes auratus</i>				S4	✓		
Northern Goshawk <i>Accipiter gentilis atricapillus</i>				S4		A	
Northern Harrier <i>Circus cyaneus</i>				S4	✓	A	
Northern Mockingbird <i>Mimus polyglottus</i>				S4			
Northern Parula <i>Parula americana</i>				S4		A	Y
Northern Waterthrush <i>Seiurus noveboracensis</i>				S5			
Olive-sided Flycatcher <i>Contopus cooperi</i>	SC	THR Schedule 1	THR	S4			
Osprey <i>Pandion haliaetus</i>				S5			
Ovenbird <i>Seiurus aurocapillus</i>				S4		A	
Philadelphia Vireo <i>Vireo philadelphicus</i>				S5			Y
Pileated Woodpecker <i>Dryocopus pileatus</i>				S5		A	
Pine Siskin <i>Carduelis pinus</i>				S4			
Pine Warbler <i>Dendroica pinus</i>				S5		A	
Purple Finch <i>Carpodacus purpureus</i>				S4			
Red-breasted Nuthatch <i>Sitta canadensis</i>				S5		A	
Red-eyed Vireo <i>Vireo olivaceus</i>				S5			
Red-tailed Hawk <i>Buteo jamaicensis</i>				S4			
Red-winged Blackbird <i>Agelaius phoeniceus</i>				S4			

Species	ESA Status	SARA Status	COSEWIC Status	NHIC Status Ranking ¹	Identified in Partners in Flight Ontario BCR 13 Landbird Conservation Plan ²	Area-sensitive Species ³	Significant in Region 6 (south-central) ⁴
Rock Pigeon <i>Columba livia</i>				SNA			
Rose-breasted Grosbeak <i>Pheucticus ludovicianus</i>				S4	✓		
Ruby-crowned Kinglet <i>Regulus calendula</i>				S4			Y
Ruby-throated Hummingbird <i>Archilochus colubris</i>				S5			
Ruffed Grouse <i>Bonasa umbellus</i>				S4			
Sandhill Crane <i>Grus canadensis tabida</i>				S5		A	Y
Scarlet Tanager <i>Piranga olivacea</i>				S4		A	
Sedge Wren <i>Cistothorus platensis</i>				S4			
Sharp-shinned Hawk <i>Accipiter striatus</i>				S5		A	
Song Sparrow <i>Melospiza melodia</i>				S5			
Sora <i>Porzana carolina</i>				S4			
Spotted Sandpiper <i>Actitis macularia</i>				S5			
Swainson's Thrush <i>Catharus ustulatus</i>				S4			Y
Swamp Sparrow <i>Melospiza georgiana</i>				S5			
Tennessee Warbler <i>Vermivora peregrina</i>				S5			Y
Tree Swallow <i>Tachycineta bicolor</i>				S4			
Turkey Vulture <i>Cathartes aura</i>				S5			
Upland Sandpiper <i>Bartramia longicauda</i>				S4		A	
Veery <i>Catharus fuscescens</i>				S4		A	
Virginia Rail <i>Rallus limicola</i>				S5			
Warbling Vireo <i>Vireo gilvus</i>				S5			
Whip-poor-will <i>Caprimulgus vociferus</i>	THR	THR Schedule 1	THR	S4	✓	A	

Species	ESA Status	SARA Status	COSEWIC Status	NHIC Status Ranking ¹	Identified in Partners in Flight Ontario BCR 13 Landbird Conservation Plan ²	Area-sensitive Species ³	Significant in Region 6 (south-central) ⁴
White-breasted Nuthatch <i>Sitta carolinensis</i>				S5		A	
White-throated Sparrow <i>Zonotrichia albicollis</i>				S5			
Winter Wren <i>Troglodytes troglodytes</i>				S5		A	
Wood Duck <i>Aix sponsa</i>				S5			
Wood Thrush <i>Hylocichla mustelina</i>			THR	S4	✓		
Yellow Warbler <i>Dendroica petechia</i>				S5			
Yellow-bellied Flycatcher <i>Empidonax flaviventris</i>				S5			Y
Yellow-bellied Sapsucker <i>Sphyrapicus varius</i>				S5		A	
Yellow-rumped Warbler <i>Dendroica coronata</i>				S5			

Glossary

ESA - Endangered Species Act (Provincial)

EXP - Extirpated - a species that no longer exists in the wild in Ontario but still occurs elsewhere.

END - Endangered - a species facing imminent extinction or extirpation in Ontario which is a candidate for regulation under Ontario's Endangered Species Act.

THR - Threatened - a species that is at risk of becoming endangered in Ontario if limiting factors are not reversed.

SC - Special Concern (formerly Vulnerable) - a species with characteristics that make it sensitive to human activities or natural events.

OMNR - Ontario Ministry of Natural Resources

SARA - Species at Risk Act (Federal)

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

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

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

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

Schedule 1 - 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 Status of Endangered Wildlife in Canada

NHIC - Natural Heritage Information Centre

S1 - Critically Imperiled, often < 5 occurrences

S2 - Imperiled, often <20 occurrences

S3 - Vulnerable, often 80 or fewer

S3S4 - Uncertain between S3 and S4

Species	ESA Status	SARA Status	COSEWIC Status	NHIC Status Ranking ¹	Identified in Partners in Flight Ontario BCR 13 Landbird Conservation Plan ²	Area-sensitive Species ³	Significant in Region 6 (south-central) ⁴
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S4 - Apparently Secure, ncommon

S5 - Secure, common

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

SH - Species or community occurred historically in the nation or state/province, and there is some possibility that it may be rediscovered.

References

1 - Ontario Ministry of Natural Resources. 2009. Natural Heritage Information Centre

2 - Ontario Partners in Flight. 2008. Ontario Landbird Conservation Plan: Lower Great Lakes/St.Lawrence Plain, North American Bird Conservation Region 13.▯

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3 - Ontario Ministry of Natural Resources (OMNR). 2000. Significant Wildlife Habitat Technical Guide (Appendix G). 151 p plus appendices.

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NEST Technical Manual TM-002. 173 pp.

Appendix B.
Vegetation Survey Plant List

MAS (Poly. 1)

BOTANICAL NAME		COMMON NAME	COEFFICIENT OF CONSERVATISM	WETNESS INDEX	WEEDINESS INDEX	PROVINCIAL STATUS	OMNR STATUS	COSEWIC STATUS	GLOBAL STATUS
DICOTYLEDONS		DICOTS							
Lythraceae		Loosestrife Family							
<i>Lythrum</i>	<i>salicaria</i>	Purple Loosestrife		-5	-3	SE5			G5
MONOCOTYLEDONS		MONOCOTS							
Poaceae		Grass Family							
<i>Calamagrostis</i>	<i>canadensis</i>	Blue-joint Grass	4	-5		S5			G5
Typhaceae		Cattail Family							
<i>Typha</i>	<i>latifolia</i>	Broad-leaved Cattail	3	-5		S5			G5

FLORISTIC SUMMARY & ASSESSMENT

Species Diversity

Total Species:	3		
Native Species:	2	66.67%	
Exotic Species	1	33.33%	
S1-S3 Species	0		
S4 Species	0		
S5 Species	2		

Co-efficient of Conservatism and Floral Quality Index

Co-efficient of Conservatism (CC) (average)	3.50		
CC 0 to 3 <i>lowest sensitivity</i>	1	50.00%	
CC 4 to 6 <i>moderate sensitivity</i>	1	50.00%	
CC 7 to 8 <i>high sensitivity</i>	0	0.00%	
CC 9 to 10 <i>highest sensitivity</i>	0	0.00%	
Floral Quality Index (FQI)	4.95		

Presence of Weedy & Invasive Species

mean weediness	-3.00		
weediness = -1 <i>low potential invasiveness</i>	0	0.00%	
weediness = -2 <i>moderate potential invasiveness</i>	0	0.00%	
weediness = -3 <i>high potential invasiveness</i>	1	100.00%	

Presence of Wetland Species

average wetness value	-5.00		
upland	0	0.00%	
facultative upland	0	0.00%	
facultative	0	0.00%	
facultative wetland	0	0.00%	
obligate wetland	3	100.00%	

SWT (Poly. 2, 16)

BOTANICAL NAME		COMMON NAME	COEFFICIENT OF CONSERVATISM	WETNESS INDEX	WEEDINESS INDEX	PROVINCIAL STATUS	OMNR STATUS	COSEWIC STATUS	GLOBAL STATUS
PTERIDOPHYTES		FERNS & ALLIES							
Osmundaceae		Royal Fern Family							
<i>Osmunda</i>	<i>cinnamomea</i>	Cinnamon Fern	7	-3		S5			G5
GYMNOSPERMS		CONIFERS							
Pinaceae		Pine Family							
<i>Picea</i>	<i>mariana</i>	Black Spruce	8	-3		S5			G5
DICOTYLEDONS		DICOTS							
Aquifoliaceae		Holly Family							
<i>Ilex</i>	<i>verticillata</i>	Winterberry	5	-4		S5			G5
<i>Nemopanthus</i>	<i>mucronatus</i>	Mountain-holly	8	-5		S5			G5
Betulaceae		Birch Family							
<i>Alnus</i>	<i>incana</i> spp. <i>rugosa</i>	Speckled Alder	6	-5		S5			G5T5
MONOCOTYLEDONS		MONOCOTS							
Cyperaceae		Sedge Family							
<i>Scirpus</i>	<i>cyperinus</i>	Wool-grass	4	-5		S5			G5
Typhaceae		Cattail Family							
<i>Typha</i>	<i>latifolia</i>	Broad-leaved Cattail	3	-5		S5			G5

FLORISTIC SUMMARY & ASSESSMENT

Species Diversity

Total Species:	7	
Native Species:	7	100.00%
Exotic Species	0	0.00%
S1-S3 Species	0	
S4 Species	0	
S5 Species	7	

Co-efficient of Conservatism and Floral Quality Index

Co-efficient of Conservatism (CC) (average)	5.86	
CC 0 to 3 lowest sensitivity	1	14.29%
CC 4 to 6 moderate sensitivity	3	42.86%
CC 7 to 8 high sensitivity	3	42.86%
CC 9 to 10 highest sensitivity	0	0.00%
Floral Quality Index (FQI)	15.50	

Presence of Weedy & Invasive Species

mean weediness	0.00	
weediness = -1 low potential invasiveness	0	0.00%
weediness = -2 moderate potential invasive	0	0.00%
weediness = -3 high potential invasiveness	0	0.00%

Presence of Wetland Species

average wetness value	-4.29	
upland	0	0.00%
facultative upland	0	0.00%
facultative	0	0.00%
facultative wetland	3	42.86%
obligate wetland	4	57.14%

Appendix D: Highway 17 (GWP 5670 - 10 - 00)
Vegetation Survey Plant List



SWD (Poly. 3, 4, 21)

BOTANICAL NAME		COMMON NAME	COEFFICIENT OF CONSERVATISM	WETNESS INDEX	WEEDINESS INDEX	PROVINCIAL STATUS	OMNR STATUS	COSEWIC STATUS	GLOBAL STATUS
PTERIDOPHYTES		FERNS & ALLIES							
Dryopteridaceae		Wood Fern Family							
<i>Dryopteris</i>	<i>cristata</i>	Crested Wood Fern	7	-5		S5			G5
<i>Onoclea</i>	<i>sensibilis</i>	Sensitive Fern	4	-3		S5			G5
Polypodiaceae		Polypody Family							
<i>Polypodium</i>	<i>virginianum</i>	Rock Polypody Fern	6	5		S5			G5
GYMNOSPERMS		CONIFERS							
Cupressaceae		Cedar Family							
<i>Thuja</i>	<i>occidentalis</i>	Eastern White Cedar	4	-3		S5			G5
Pinaceae		Pine Family							
<i>Abies</i>	<i>balsamea</i>	Balsam Fir	5	-3		S5			G5
<i>Picea</i>	<i>mariana</i>	Black Spruce	8	-3		S5			G5
DICOTYLEDONS		DICOTS							
Aceraceae		Maple Family							
<i>Acer</i>	<i>rubrum</i>	Red Maple	4	0		S5			G5
<i>Acer</i>	<i>spicatum</i>	Mountain Maple	6	3		S5			G5
Asteraceae		Composite or Aster Family							
<i>Symphyotrichum</i>	<i>lanceolatum</i>	Tall White Aster	3	-3		S5			G5T?
<i>Eurybia</i>	<i>macrophylla</i>	Large-leaved Aster	5	5		S5			G5
<i>Aster</i>	<i>umbellatus var. umbellatus</i>	Flat-top White Aster	6	-3		S5			G5T?
<i>Eupatorium</i>	<i>maculatum</i>	Spotted Joe-pye-weed	3	-5		S5			G5T5
<i>Solidago</i>	<i>rugosa ssp. rugosa</i>	Rough Goldenrod	4	-1		S5			G5T?
Balsaminaceae		Touch-me-not Family							
<i>Impatiens</i>	<i>capensis</i>	Spotted Touch-me-not	4	-3		S5			G5
Betulaceae		Birch Family							
<i>Alnus</i>	<i>incana spp. rugosa</i>	Speckled Alder	6	-5		S5			G5T5
<i>Betula</i>	<i>papyrifera</i>	White Birch		2		S5			G5
Caprifoliaceae		Honeysuckle Family							
<i>Viburnum</i>	<i>nudum var. cassinoides</i>	Northern Wild Raisin	7	-3		S5			G5
Cornaceae		Dogwood Family							
<i>Cornus</i>	<i>canadensis</i>	Bunchberry	7	0		S5			G5
Guttiferae		St. John's-wort Family							
<i>Hypericum</i>	<i>canadense</i>	Canadian St. John's-wort	8	-3		S4?			G5
<i>Triadenum</i>	<i>fraseri</i>	Fraser's St. John's-wort	7	-5		S5			G4G5
Lamiaceae		Mint Family							
<i>Lycopus</i>	<i>uniflorus</i>	Northern Water-horehound	5	-5		S5			G5
Nymphaeaceae		Water-lily Family							
<i>Nuphar</i>	<i>variegata</i>	Bulhead Pond-lily	4	-5		S5			G5
Oleaceae		Olive Family							
<i>Fraxinus</i>	<i>nigra</i>	Black Ash	7	-4		S5			G5
<i>Fraxinus</i>	<i>pennsylvanica</i>	Red Ash	3	-3		S5			G5
Oxalidaceae		Wood Sorrel Family							
<i>Oxalis</i>	<i>stricta</i>	Upright Yellow Wood-sorrel	0	3		S5			G5
Primulaceae		Primrose Family							
<i>Trientalis</i>	<i>borealis ssp. borealis</i>	Star-flower	6	-1		S5			G5T?
Ranunculaceae		Buttercup Family							
<i>Actaea</i>	<i>rubra</i>	Red Baneberry	5	5		S5			G5
<i>Clematis</i>	<i>virginiana</i>	Virgin's-bower	3	0		S5			G5
<i>Coptis</i>	<i>trifolia</i>	Goldthread	7	-3		S5			G5T5
<i>Thalictrum</i>	<i>pubescens</i>	Tall Meadow-rue	5	-2		S5			G5
Rosaceae		Rose Family							
<i>Comarum</i>	<i>palustre</i>	Marsh Cinquefoil	7	-5		S5			G5
<i>Prunus</i>	<i>serotina</i>	Black Cherry	3	3		S5			G5
<i>Rubus</i>	<i>idaeus</i>	Red Raspberry				SE1			G5T5
Rubiaceae		Madder Family							

Appendix D: Highway 17 (GWP 5670 - 10 - 00)
Vegetation Survey Plant List



BOTANICAL NAME		COMMON NAME	COEFFICIENT OF CONSERVATISM	WETNESS INDEX	WEEDINESS INDEX	PROVINCIAL STATUS	OMNR STATUS	COSEWIC STATUS	GLOBAL STATUS
<i>Galium</i>	<i>asprellum</i>	Rough Bedstraw	6	-5		S5			G5
Salicaceae		Willow Family							
<i>Populus</i>	<i>tremuloides</i>	Trembling Aspen	2	0		S5			G5
MONOCOTYLEDONS		MONOCOTS							
Cyperaceae		Sedge Family							
<i>Carex</i>	<i>species</i>	Sedge species							
<i>Carex</i>	<i>crinita</i>	Fringed Sedge	6	-4		S5			G5
<i>Scirpus</i>	<i>cyperinus</i>	Wool-grass	4	-5		S5			G5
<i>Schoenoplectus</i>	<i>tabernaemontani</i>	Softstem bulrush	5	-5		S5			G?
Liliaceae		Lily Family							
<i>Maianthemum</i>	<i>racemosum ssp. racemosum</i>	False Solomon's Seal	4	3		S5			G5T
Poaceae		Grass Family							
<i>Bromus</i>	<i>ciliatus</i>	Fringed Brome	6	-3		S5			G5
<i>Calamagrostis</i>	<i>canadensis</i>	Blue-joint Grass	4	-5		S5			G5
<i>Glyceria</i>	<i>canadensis</i>	Rattlesnake Grass	7	-5		S4S5			G5
<i>Glyceria</i>	<i>striata</i>	Fowl Meadow Grass	3	-5		S5			G5
Typhaceae		Cattail Family							
<i>Typha</i>	<i>latifolia</i>	Broad-leaved Cattail	3	-5		S5			G5

FLORISTIC SUMMARY & ASSESSMENT

Species Diversity

Total Species:	42	
Native Species:	42	100.00%
Exotic Species	0	0.00%
S1-S3 Species	0	
S4 Species	0	
S5 Species	41	

Co-efficient of Conservatism and Floral Quality Index

Co-efficient of Conservatism (CC) (average)	4.98	
CC 0 to 3 lowest sensitivity	9	21.43%
CC 4 to 6 moderate sensitivity	23	54.76%
CC 7 to 8 high sensitivity	10	23.81%
CC 9 to 10 highest sensitivity	0	0.00%
Floral Quality Index (FQI)	32.25	

Presence of Weedy & Invasive Species

mean weediness	0.00	
weediness = -1 low potential invasiveness	0	0.00%
weediness = -2 moderate potential invasiveness	0	0.00%
weediness = -3 high potential invasiveness	0	0.00%

Presence of Wetland Species

average wetness value	-2.07	
upland	3	7.14%
facultative upland	5	11.90%
facultative	6	14.29%
facultative wetland	15	35.71%
obligate wetland	14	33.33%

Appendix D: Highway 17 (GWP 5670 - 10 - 00)
Vegetation Survey Plant List



FOC (Poly. 5, 10, 14, 17)

BOTANICAL NAME		COMMON NAME	COEFFICIENT OF CONSERVATISM	WETNESS INDEX	WEEDINESS INDEX	PROVINCIAL STATUS	OMNR STATUS	COSEWIC STATUS	GLOBAL STATUS
PTERIDOPHYTES		FERNS & ALLIES							
Dennstaedtiaceae		Bracken Fern Family							
<i>Pteridium</i>	<i>aquilinum var. latiusculum</i>	Eastern Bracken-fern	2	3		S5			G5T
Dryopteridaceae		Wood Fern Family							
<i>Gymnocarpium</i>	<i>dryopteris</i>	Oak Fern	7	0		S5			G5
Equisetaceae		Horsetail Family							
<i>Equisetum</i>	<i>sylvaticum</i>	Wood Horsetail	7	-3		S5			G5
Polypodiaceae		Polypody Family							
GYMNOSPERMS		CONIFERS							
Pinaceae		Pine Family							
<i>Abies</i>	<i>balsamea</i>	Balsam Fir	5	-3		S5			G5
<i>Picea</i>	<i>glauca</i>	White Spruce	6	3		S5			G5
<i>Pinus</i>	<i>resinosa</i>	Red Pine	8	3		S5			G5
<i>Pinus</i>	<i>strobus</i>	Eastern White Pine	4	3		S5			G5
DICOTYLEDONS		DICOTS							
Aceraceae		Maple Family							
<i>Acer</i>	<i>rubrum</i>	Red Maple	4	0		S5			G5
Araliaceae		Ginseng Family							
<i>Aralia</i>	<i>nudicaulis</i>	Wild Sarsaparilla	4	3		S5			G5
<i>Eurybia</i>	<i>macrophylla</i>	Large-leaved Aster	5	5		S5			G5
Betulaceae		Birch Family							
<i>Alnus</i>	<i>incana</i> spp. <i>rugosa</i>	Speckled Alder	6	-5		S5			G5T5
<i>Betula</i>	<i>papyrifera</i>	White Birch		2		S5			G5
Caprifoliaceae		Honeysuckle Family							
<i>Diervilla</i>	<i>lonicera</i>	Bush Honeysuckle	5	5		S5			G5
<i>Linnaea</i>	<i>borealis</i> ssp. <i>longiflora</i>	Twinflower	7	0		S5			G5T?
<i>Viburnum</i>	<i>nudum</i> var. <i>cassinoides</i>	Northern Wild Raisin	7	-3		S5			G5
Cornaceae		Dogwood Family							
<i>Cornus</i>	<i>canadensis</i>	Bunchberry	7	0		S5			G5
Ericaceae		Heath Family							
<i>Gaultheria</i>	<i>procumbens</i>	Wintergreen	6	3		S5			G5
<i>Ledum</i>	<i>groenlandicum</i>	Labrador-tea	9	-5		S5			G5
<i>Vaccinium</i>	<i>angustifolium</i>	Low Sweet Blueberry	6	3		S5			G5
<i>Vaccinium</i>	<i>myrtilloides</i>	Velvet-leaf Blueberry	7	-2		S5			G5
Primulaceae		Primrose Family							
<i>Trientalis</i>	<i>borealis</i> ssp. <i>borealis</i>	Star-flower	6	-1		S5			G5T?
Rosaceae		Rose Family							
<i>Fragaria</i>	<i>vesca</i> ssp. <i>americana</i>	Woodland Strawberry	4	4		S5			G5T?
Salicaceae		Willow Family							
<i>Populus</i>	<i>grandidentata</i>	Large-tooth Aspen	5	3		S5			G5
<i>Populus</i>	<i>tremuloides</i>	Trembling Aspen	2	0		S5			G5
MONOCOTYLEDONS		MONOCOTS							
Liliaceae		Lily Family							
<i>Clintonia</i>	<i>borealis</i>	Bluebead-lily	7	-1		S5			G5
<i>Maianthemum</i>	<i>trifolium</i>	Three-leaved Solomon's Seal	10	-5		S5			G5
<i>Streptopus</i>	<i>lanceolatus</i> var. <i>roseus</i>	Rose Twisted-stalk	7	0		S5			G5
Poaceae		Grass Family							
<i>Brachyelytrum</i>	<i>erectum</i>	Bearded Short-husk	7	5		S4S5			G5
<i>Melica</i>	<i>effusum</i>	Wood Millet	8	4		S4S5			G5

FLORISTIC SUMMARY & ASSESSMENT

Species Diversity

Total Species:	28	
Native Species:	28	100.00%
Exotic Species	0	0.00%
S1-S3 Species	0	
S4 Species	0	
S5 Species	27	

Co-efficient of Conservatism and Floral Quality Index

Co-efficient of Conservatism (CC) (average)	6.00	
CC 0 to 3 <i>lowest sensitivity</i>	2	7.14%
CC 4 to 6 <i>moderate sensitivity</i>	13	46.43%
CC 7 to 8 <i>high sensitivity</i>	11	39.29%
CC 9 to 10 <i>highest sensitivity</i>	2	7.14%
Floral Quality Index (FQI)	31.75	

Presence of Weedy & Invasive Species

mean weediness	0.00	
weediness = -1 <i>low potential invasiveness</i>	0	0.00%
weediness = -2 <i>moderate potential invasiveness</i>	0	0.00%
weediness = -3 <i>high potential invasiveness</i>	0	0.00%

Presence of Wetland Species

average wetness value	0.72	
upland	3	10.71%
facultative upland	10	35.71%
facultative	8	28.57%
facultative wetland	4	14.29%
obligate wetland	3	10.71%

CUM (Poly. 6)

BOTANICAL NAME	COMMON NAME	COEFFICIENT OF CONSERVATISM	WETNESS INDEX	WEEDINESS INDEX	PROVINCIAL STATUS	OMNR STATUS	COSEWIC STATUS	GLOBAL STATUS
<u>DICOTYLEDONS</u>		<u>DICOTS</u>						
Asteraceae		Composite or Aster Family						
<i>Achillea</i>	<i>millefolium ssp. borealis</i>				SU			G5T?
<i>Symphotrichum</i>	<i>lanceolatum</i>	3	-3		S5			G5T?
<i>Aster</i>	<i>umbellatus</i>	6	-3		S5			G5T?
<i>Leucanthemum</i>	<i>vulgare</i>		5	-1	SE5			G?
<i>Cirsium</i>	<i>vulgare</i>		4	-1	SE5			G5
<i>Erigeron</i>	<i>philadelphicus</i>	1	-3		S5			G5T?
<i>Euthamia</i>	<i>graminifolia</i>	2	-2		S5			G5
<i>Solidago</i>	<i>canadensis</i>	1	3		S5			G5
<i>Solidago</i>	<i>juncea</i>	3	5		S5			G5
<i>Solidago</i>	<i>rugosa ssp. rugosa</i>	4	-1		S5			G5T?
Fabaceae		Pea Family						
<i>Trifolium</i>	<i>pratense</i>		2	-2	SE5			G?
Guttiferae		St. John's-wort Family						
<i>Hypericum</i>	<i>perforatum</i>		5	-3	SE5			G?
Onagraceae		Evening-primrose Family						
<i>Oenothera</i>	<i>biennis</i>	0	3		S5			G5
Rosaceae		Rose Family						
<i>Fragaria</i>	<i>virginiana</i>	2	1		SU			G5T?
<i>Potentilla</i>	<i>recta</i>		5	-2	SE5			G?
<i>Rubus</i>	<i>allegheniensis</i>	2	2		S5			G5
<i>Rubus</i>	<i>idaeus</i>				SE1			G5T5
<i>Spiraea</i>	<i>alba</i>	3	-4		S5			G5
Scrophulariaceae		Figwort Family						
<i>Verbascum</i>	<i>thapsus</i>		5	-2	SE5			G?
<u>MONOCOTYLEDONS</u>		<u>MONOCOTS</u>						
Cyperaceae		Sedge Family						
<i>Scirpus</i>	<i>cyperinus</i>	4	-5		S5			G5
Poaceae		Grass Family						
<i>Bromus</i>	<i>inermis ssp. inermis</i>		5	-3	SE5			G4G5T?
<i>Phalaris</i>	<i>arundinacea</i>	0	-4		S5			G5
<i>Phleum</i>	<i>pratense</i>		3	-1	SE5			G?
<i>Poa</i>	<i>palustris</i>	5	-4		S5			G5

FLORISTIC SUMMARY & ASSESSMENT

Species Diversity

Total Species:	22	
Native Species:	14	63.64%
Exotic Species	8	36.36%
S1-S3 Species	0	
S4 Species	0	
S5 Species	13	

Co-efficient of Conservatism and Floral Quality Index

Co-efficient of Conservatism (CC) (average)	2.57	
CC 0 to 3 lowest sensitivity	10	71.43%
CC 4 to 6 moderate sensitivity	4	28.57%
CC 7 to 8 high sensitivity	0	0.00%
CC 9 to 10 highest sensitivity	0	0.00%
Floral Quality Index (FQI)	9.62	

Presence of Weedy & Invasive Species

mean weediness	-1.88	
weediness = -1 low potential invasiveness	3	37.50%
weediness = -2 moderate potential invasiveness	3	37.50%
weediness = -3 high potential invasiveness	2	25.00%

Presence of Wetland Species

average wetness value	0.86	
upland	6	27.27%
facultative upland	6	27.27%
facultative	2	9.09%
facultative wetland	7	31.82%
obligate wetland	1	4.55%

Appendix D: Highway 17 (GWP 5670 - 10 - 00)
Vegetation Survey Plant List



FOM (Poly. 7, 11, 18)

BOTANICAL NAME		COMMON NAME	COEFFICIENT OF CONSERVATISM	WETNESS INDEX	WEEDINESS INDEX	PROVINCIAL STATUS	OMNR STATUS	COSEWIC STATUS	GLOBAL STATUS
<u>PTERIDOPHYTES</u>		<u>FERNS & ALLIES</u>							
Dennstaedtiaceae		Bracken Fern Family							
<i>Pteridium</i>	<i>aquilinum var. latiusculum</i>	Eastern Bracken-fern	2	3		S5			G5T
Dryopteridaceae		Wood Fern Family							
Polypodiaceae		Polypody Family							
<u>GYMNOSPERMS</u>		<u>CONIFERS</u>							
Pinaceae		Pine Family							
<i>Abies</i>	<i>balsamea</i>	Balsam Fir	5	-3		S5			G5
<i>Picea</i>	<i>glauca</i>	White Spruce	6	3		S5			G5
<i>Pinus</i>	<i>resinosa</i>	Red Pine	8	3		S5			G5
<i>Pinus</i>	<i>strobus</i>	Eastern White Pine	4	3		S5			G5
<u>DICOTYLEDONS</u>		<u>DICOTS</u>							
Aceraceae		Maple Family							
<i>Acer</i>	<i>rubrum</i>	Red Maple	4	0		S5			G5
Araliaceae		Ginseng Family							
<i>Aralia</i>	<i>nudicaulis</i>	Wild Sarsaparilla	4	3		S5			G5
Asteraceae		Composite or Aster Family							
<i>Eurybia</i>	<i>macrophylla</i>	Large-leaved Aster	5	5		S5			G5
Betulaceae		Birch Family							
<i>Corylus</i>	<i>cornuta</i>	Beaked Hazel	5	5		S5			G5T
Caprifoliaceae		Honeysuckle Family							
<i>Diervilla</i>	<i>lonicera</i>	Bush Honeysuckle	5	5		S5			G5
<i>Viburnum</i>	<i>nudum var. cassinoides</i>	Northern Wild Raisin	7	-3		S5			G5
Cornaceae		Dogwood Family							
<i>Cornus</i>	<i>canadensis</i>	Bunchberry	7	0		S5			G5
Ericaceae		Heath Family							
<i>Gaultheria</i>	<i>procumbens</i>	Wintergreen	6	3		S5			G5
<i>Vaccinium</i>	<i>angustifolium</i>	Low Sweet Blueberry	6	3		S5			G5
Fagaceae		Beech Family							
<i>Quercus</i>	<i>rubra</i>	Red Oak	6	3		S5			G5
Myricaceae		Wax-myrtle Family							
<i>Comptonia</i>	<i>peregrina</i>	Sweetfern	7	5		S5			G5
Primulaceae		Primrose Family							
<i>Trientalis</i>	<i>borealis ssp. borealis</i>	Star-flower	6	-1		S5			G5T?
Ranunculaceae		Buttercup Family							
<i>Coptis</i>	<i>trifolia</i>	Goldthread	7	-3		S5			G5T5
Rosaceae		Rose Family							
<i>Prunus</i>	<i>serotina</i>	Black Cherry	3	3		S5			G5
Salicaceae		Willow Family							
<i>Populus</i>	<i>grandidentata</i>	Large-tooth Aspen	5	3		S5			G5
<i>Populus</i>	<i>tremuloides</i>	Trembling Aspen	2	0		S5			G5
Scrophulariaceae		Figwort Family							
<i>Verbascum</i>	<i>thapsus</i>	Common Mullein		5	-2	SE5			G?
<u>MONOCOTYLEDONS</u>		<u>MONOCOTS</u>							
Liliaceae		Lily Family							
<i>Clintonia</i>	<i>borealis</i>	Bluebead-lily	7	-1		S5			G5
<i>Maianthemum</i>	<i>canadense</i>	Wild Lily-of-the-valley	5	0		S5			G5

FLORISTIC SUMMARY & ASSESSMENT

Species Diversity

Total Species:	24	
Native Species:	23	95.83%
Exotic Species	1	4.17%
S1-S3 Species	0	
S4 Species	0	
S5 Species	23	

Co-efficient of Conservatism and Floral Quality Index

Co-efficient of Conservatism (CC) (average)	5.30	
CC 0 to 3 lowest sensitivity	3	13.04%
CC 4 to 6 moderate sensitivity	14	60.87%
CC 7 to 8 high sensitivity	6	26.09%
CC 9 to 10 highest sensitivity	0	0.00%
Floral Quality Index (FQI)	25.44	

Presence of Weedy & Invasive Species

mean weediness	-2.00	
weediness = -1 low potential invasiveness	0	0.00%
weediness = -2 moderate potential invasiveness	1	100.00%
weediness = -3 high potential invasiveness	0	0.00%

Presence of Wetland Species

average wetness value	1.83	
upland	5	20.83%
facultative upland	10	41.67%
facultative	6	25.00%
facultative wetland	3	12.50%
obligate wetland	0	0.00%

Appendix D: Highway 17 (GWP 5670 - 10 - 00)
Vegetation Survey Plant List



BOO (Poly. 8)

BOTANICAL NAME		COMMON NAME	COEFFICIENT OF CONSERVATISM	WETNESS INDEX	WEEDINESS INDEX	PROVINCIAL STATUS	OMNR STATUS	COSEWIC STATUS	GLOBAL STATUS
GYMNOSPERMS		CONIFERS							
Pinaceae		Pine Family							
<i>Larix</i>	<i>laricina</i>	Tamarack	7	-3		S5			G5
<i>Picea</i>	<i>mariana</i>	Black Spruce	8	-3		S5			G5
<i>Pinus</i>	<i>strobus</i>	Eastern White Pine	4	3		S5			G5
DICOTYLEDONS		DICOTS							
Asteraceae		Composite or Aster Family							
<i>Symphotrichum</i>	<i>cordifolium</i>	Heart-leaved Aster	5	5		S5			G5
<i>Aster</i>	<i>umbellatus var. umbellatus</i>	Flat-top White Aster	6	-3		S5			G5T?
<i>Rudbeckia</i>	<i>hirta</i>	Black-eyed Susan	0	3		S5			G5
Betulaceae		Birch Family							
<i>Alnus</i>	<i>incana spp. rugosa</i>	Speckled Alder	6	-5		S5			G5T5
Ericaceae		Heath Family							
<i>Chamaedaphne</i>	<i>calyculata</i>	Leatherleaf	9	-5		S5			G5
<i>Kalmia</i>	<i>polifolia</i>	Bog Laurel	10	-5		S5			G5
<i>Ledum</i>	<i>groenlandicum</i>	Labrador-tea	9	-5		S5			G5
<i>Vaccinium</i>	<i>macrocarpon</i>	Large Cranberry	10	-5		S4S5			G4
Guttiferae		St. John's-wort Family							
<i>Triadenum</i>	<i>fraseri</i>	Fraser's St. John's-wort	7	-5		S5			G4G5
MONOCOTYLEDONS		MONOCOTS							
Cyperaceae		Sedge Family							
<i>Eriophorum</i>	<i>vaginatum ssp. spissum</i>	Sheathed Cotton-grass	10	-5		S5			G5T5
Juncaceae		Rush Family							
<i>Juncus</i>	<i>canadensis</i>	Canada Rush	6	-5		S5			G5
Typhaceae		Cattail Family							
<i>Typha</i>	<i>latifolia</i>	Broad-leaved Cattail	3	-5		S5			G5

FLORISTIC SUMMARY & ASSESSMENT

Species Diversity

Total Species:	15	
Native Species:	15	100.00%
Exotic Species	0	0.00%
S1-S3 Species	0	
S4 Species	0	
S5 Species	14	

Co-efficient of Conservatism and Floral Quality Index

Co-efficient of Conservatism (CC) (average)	6.67		
CC 0 to 3	lowest sensitivity	2	13.33%
CC 4 to 6	moderate sensitivity	5	33.33%
CC 7 to 8	high sensitivity	3	20.00%
CC 9 to 10	highest sensitivity	5	33.33%

Floral Quality Index (FQI) 25.82

Presence of Weedy & Invasive Species

mean weediness	0.00		
weediness = -1	low potential invasiveness	0	0.00%
weediness = -2	moderate potential invasiveness	0	0.00%
weediness = -3	high potential invasiveness	0	0.00%

Presence of Wetland Species

average wetness value	-2.87	
upland	1	6.67%
facultative upland	2	13.33%
facultative	0	0.00%
facultative wetland	3	20.00%
obligate wetland	9	60.00%

Appendix D: Highway 17 (GWP 5670 - 10 - 00)
Vegetation Survey Plant List



FOD (Poly. 9)

BOTANICAL NAME	COMMON NAME	COEFFICIENT OF CONSERVATISM	WETNESS INDEX	WEEDINESS INDEX	PROVINCIAL STATUS	OMNR STATUS	COSEWIC STATUS	GLOBAL STATUS
PTERIDOPHYTES		FERNS & ALLIES						
Dennstaedtiaceae		Bracken Fern Family						
<i>Pteridium</i>	<i>aquilinum</i> var. <i>latiusculum</i>	2	3		S5			G5T
Dryopteridaceae		Wood Fern Family						
<i>Dryopteris</i>	<i>intermedia</i>	5	0		S5			G5
<i>Dryopteris</i>	<i>marginalis</i>	5	3		S5			G5
GYMNOSPERMS		CONIFERS						
Pinaceae		Pine Family						
<i>Abies</i>	<i>balsamea</i>	5	-3		S5			G5
<i>Picea</i>	<i>glauca</i>	6	3		S5			G5
DICOTYLEDONS		DICOTS						
Aceraceae		Maple Family						
<i>Acer</i>	<i>rubrum</i>	4	0		S5			G5
<i>Acer</i>	<i>saccharum</i>	4	3		S5			G5T?
Asteraceae		Composite or Aster Family						
<i>Solidago</i>	<i>rugosa</i> ssp. <i>rugosa</i>	4	-1		S5			G5T?
Betulaceae		Birch Family						
<i>Alnus</i>	<i>incana</i> spp. <i>rugosa</i>	6	-5		S5			G5T5
<i>Betula</i>	<i>alleghaniensis</i>	6	0		S5			G5
<i>Betula</i>	<i>papyrifera</i>		2		S5			G5
Caprifoliaceae		Honeysuckle Family						
<i>Diervilla</i>	<i>lonicera</i>	5	5		S5			G5
<i>Viburnum</i>	<i>nudum</i> var. <i>cassinoides</i>	7	-3		S5			G5
Cornaceae		Dogwood Family						
<i>Cornus</i>	<i>rugosa</i>	6	5		S5			G5
Ericaceae		Heath Family						
<i>Vaccinium</i>	<i>angustifolium</i>	6	3		S5			G5
Fagaceae		Beech Family						
<i>Quercus</i>	<i>rubra</i>	6	3		S5			G5
Monotropaceae		Indian Pipe Family						
Primulaceae		Primrose Family						
<i>Trientalis</i>	<i>borealis</i> ssp. <i>borealis</i>	6	-1		S5			G5T?
Ranunculaceae		Buttercup Family						
<i>Anemone</i>	<i>americana</i>	6	5		S5			G?
<i>Clematis</i>	<i>virginiana</i>	3	0		S5			G5
Rosaceae		Rose Family						
<i>Prunus</i>	<i>serotina</i>	3	3		S5			G5
<i>Rubus</i>	<i>idaeus</i> ssp. <i>melanolasius</i>	0	-2		S5			G5T
Salicaceae		Willow Family						
<i>Populus</i>	<i>grandidentata</i>	5	3		S5			G5
<i>Populus</i>	<i>tremuloides</i>	2	0		S5			G5
Tiliaceae		Linden Family						
<i>Tilia</i>	<i>americana</i>	4	3		S5			G5
MONOCOTYLEDONS		MONOCOTS						
Poaceae		Grass Family						
<i>Schizachne</i>	<i>purpurascens</i>	6	2		S5			G5T?

FLORISTIC SUMMARY & ASSESSMENT

Species Diversity

Total Species:	24	
Native Species:	24	100.00%
Exotic Species	0	0.00%
S1-S3 Species	0	
S4 Species	0	
S5 Species	25	

Co-efficient of Conservatism and Floral Quality Index

Co-efficient of Conservatism (CC) (average)	4.67		
CC 0 to 3	lowest sensitivity	5	20.83%
CC 4 to 6	moderate sensitivity	18	75.00%
CC 7 to 8	high sensitivity	1	4.17%
CC 9 to 10	highest sensitivity	0	0.00%
Floral Quality Index (FQI)	22.86		

Presence of Weedy & Invasive Species

mean weediness		0.00	
weediness = -1	low potential invasiveness	0	0.00%
weediness = -2	moderate potential invasiveness	0	0.00%
weediness = -3	high potential invasiveness	0	0.00%

Presence of Wetland Species

average wetness value	1.24	
upland	3	12.50%
facultative upland	10	41.67%
facultative	7	29.17%
facultative wetland	3	12.50%
obligate wetland	1	4.17%

SWC (Poly. 12)

BOTANICAL NAME		COMMON NAME	COEFFICIENT OF CONSERVATISM	WETNESS INDEX	WEEDINESS INDEX	PROVINCIAL STATUS	OMNR STATUS	COSEWIC STATUS	GLOBAL STATUS
PTERIDOPHYTES		FERNS & ALLIES							
Osmundaceae		Royal Fern Family							
<i>Osmunda</i>	<i>cinnamomea</i>	Cinnamon Fern	7	-3		S5			G5
GYMNOSPERMS		CONIFERS							
Pinaceae		Pine Family							
<i>Abies</i>	<i>balsamea</i>	Balsam Fir	5	-3		S5			G5
<i>Larix</i>	<i>laricina</i>	Tamarack	7	-3		S5			G5
<i>Picea</i>	<i>mariana</i>	Black Spruce	8	-3		S5			G5
<i>Pinus</i>	<i>resinosa</i>	Red Pine	8	3		S5			G5
DICOTYLEDONS		DICOTS							
Betulaceae		Birch Family							
<i>Betula</i>	<i>papyrifera</i>	White Birch		2		S5			G5
Cornaceae		Dogwood Family							
<i>Cornus</i>	<i>canadensis</i>	Bunchberry	7	0		S5			G5
Ericaceae		Heath Family							
<i>Ledum</i>	<i>groenlandicum</i>	Labrador-tea	9	-5		S5			G5
<i>Vaccinium</i>	<i>macrocarpon</i>	Large Cranberry	10	-5		S4S5			G4
Primulaceae		Primrose Family							
<i>Trientalis</i>	<i>borealis ssp. borealis</i>	Star-flower	6	-1		S5			G5T?
Ranunculaceae		Buttercup Family							
<i>Coptis</i>	<i>trifolia</i>	Goldthread	7	-3		S5			G5T5
Rosaceae		Rose Family							
<i>Sorbus</i>	<i>aucuparia</i>	European Mountain-ash		5	-2	SE4			G5

FLORISTIC SUMMARY & ASSESSMENT

Species Diversity

Total Species:	11	
Native Species:	10	90.91%
Exotic Species	1	9.09%
S1-S3 Species	0	
S4 Species	0	
S5 Species	10	

Co-efficient of Conservatism and Floral Quality Index

Co-efficient of Conservatism (CC) (average)	7.40	
CC 0 to 3 lowest sensitivity	0	0.00%
CC 4 to 6 moderate sensitivity	2	20.00%
CC 7 to 8 high sensitivity	6	60.00%
CC 9 to 10 highest sensitivity	2	20.00%
Floral Quality Index (FQI)	23.40	

Presence of Weedy & Invasive Species

mean weediness	-2.00	
weediness = -1 low potential invasiveness	0	0.00%
weediness = -2 moderate potential invasiveness	1	100.00%
weediness = -3 high potential invasiveness	0	0.00%

Presence of Wetland Species

average wetness value	-1.33	
upland	1	9.09%
facultative upland	2	18.18%
facultative	2	18.18%
facultative wetland	5	45.45%
obligate wetland	2	18.18%

BOT (Poly. 13)

BOTANICAL NAME		COMMON NAME	COEFFICIENT OF CONSERVATISM	WETNESS INDEX	WEEDINESS INDEX	PROVINCIAL STATUS	OMNR STATUS	COSEWIC STATUS	GLOBAL STATUS
GYMNOSPERMS		CONIFERS							
Pinaceae		Pine Family							
<i>Larix</i>	<i>laricina</i>	Tamarack	7	-3		S5			G5
DICOTYLEDONS		DICOTS							
Betulaceae		Birch Family							
<i>Alnus</i>	<i>incana spp. rugosa</i>	Speckled Alder	6	-5		S5			G5T5
Ericaceae		Heath Family							
<i>Chamaedaphne</i>	<i>calyculata</i>	Leatherleaf	9	-5		S5			G5
Salicaceae		Willow Family							
<i>Salix</i>	<i>discolor</i>	Pussy Willow	3	-3		S5			G5
MONOCOTYLEDONS		MONOCOTS							
Cyperaceae		Sedge Family							
<i>Scirpus</i>	<i>cyperinus</i>	Wool-grass	4	-5		S5			G5

FLORISTIC SUMMARY & ASSESSMENT

Species Diversity

Total Species:	5	
Native Species:	5	100.00%
Exotic Species	0	0.00%
S1-S3 Species	0	
S4 Species	0	
S5 Species	5	

Co-efficient of Conservatism and Floral Quality Index

Co-efficient of Conservatism (CC) (average)	5.80	
CC 0 to 3 lowest sensitivity	1	20.00%
CC 4 to 6 moderate sensitivity	2	40.00%
CC 7 to 8 high sensitivity	1	20.00%
CC 9 to 10 highest sensitivity	1	20.00%
Floral Quality Index (FQI)	12.97	

Presence of Weedy & Invasive Species

mean weediness	0.00	
weediness = -1 low potential invasiveness	0	0.00%
weediness = -2 moderate potential invasiveness	0	0.00%
weediness = -3 high potential invasiveness	0	0.00%

Presence of Wetland Species

average wetness value	-4.20	
upland	0	0.00%
facultative upland	0	0.00%
facultative	0	0.00%
facultative wetland	2	40.00%
obligate wetland	3	60.00%

MAM (Poly. 15, 20)

BOTANICAL NAME		COMMON NAME	COEFFICIENT OF CONSERVATISM	WETNESS INDEX	WEEDINESS INDEX	PROVINCIAL STATUS	OMNR STATUS	COSEWIC STATUS	GLOBAL STATUS
PTERIDOPHYTES		FERNS & ALLIES							
Dryopteridaceae		Wood Fern Family							
<i>Onoclea</i>	<i>sensibilis</i>	Sensitive Fern	4	-3		S5			G5
Osmundaceae		Royal Fern Family							
<i>Osmunda</i>	<i>cinnamomea</i>	Cinnamon Fern	7	-3		S5			G5
<i>Osmunda</i>	<i>regalis var. spectabilis</i>	Royal Fern	7	-5		S5			G5T
DICOTYLEDONS		DICOTS							
Apiaceae		Carrot or Parsley Family							
<i>Sium</i>	<i>suave</i>	Hemlock Water-parsnip	4	-5		S5			G5
Asteraceae		Composite or Aster Family							
<i>Symphyotrichum</i>	<i>lanceolatum</i>	Tall White Aster	3	-3		S5			G5T?
<i>Symphyotrichum</i>	<i>puniceum var. puniceum</i>	Purple-stemmed Aster				S5			G5T?
<i>Eupatorium</i>	<i>maculatum</i>	Spotted Joe-pye-weed	3	-5		S5			G5T5
Betulaceae		Birch Family							
<i>Alnus</i>	<i>incana spp. rugosa</i>	Speckled Alder	6	-5		S5			G5T5
Ericaceae		Heath Family							
<i>Vaccinium</i>	<i>angustifolium</i>	Low Sweet Blueberry	6	3		S5			G5
Rosaceae		Rose Family							
<i>Comarum</i>	<i>palustre</i>	Marsh Cinquefoil	7	-5		S5			G5
<i>Spiraea</i>	<i>alba</i>	Narrow-leaved Meadow-sweet	3	-4		S5			G5
MONOCOTYLEDONS		MONOCOTS							
Cyperaceae		Sedge Family							
<i>Carex</i>	<i>species</i>	Sedge species							
<i>Scirpus</i>	<i>cyperinus</i>	Wool-grass	4	-5		S5			G5
<i>Schoenoplectus</i>	<i>tabernaemontani</i>	Softstem bulrush	5	-5		S5			G?
Poaceae		Grass Family							
<i>Calamagrostis</i>	<i>canadensis</i>	Blue-joint Grass	4	-5		S5			G5
<i>Glyceria</i>	<i>canadensis</i>	Rattlesnake Grass	7	-5		S4S5			G5
Typhaceae		Cattail Family							
<i>Typha</i>	<i>latifolia</i>	Broad-leaved Cattail	3	-5		S5			G5

FLORISTIC SUMMARY & ASSESSMENT

Species Diversity

Total Species:	15	
Native Species:	15	100.00%
Exotic Species	0	0.00%
S1-S3 Species	0	
S4 Species	0	
S5 Species	15	

Co-efficient of Conservatism and Floral Quality Index

Co-efficient of Conservatism (CC) (average)	4.87		
CC 0 to 3	lowest sensitivity	4	26.67%
CC 4 to 6	moderate sensitivity	7	46.67%
CC 7 to 8	high sensitivity	4	26.67%
CC 9 to 10	highest sensitivity	0	0.00%
Floral Quality Index (FQI)	18.85		

Presence of Weedy & Invasive Species

mean weediness		0.00	
weediness = -1	low potential invasiveness	0	0.00%
weediness = -2	moderate potential invasiveness	0	0.00%
weediness = -3	high potential invasiveness	0	0.00%

Presence of Wetland Species

average wetness value		-4.00	
upland		0	0.00%
facultative upland		1	6.67%
facultative		0	0.00%
facultative wetland		4	26.67%
obligate wetland		10	66.67%

CUP (Poly. 19)

BOTANICAL NAME		COMMON NAME	COEFFICIENT OF CONSERVATISM	WETNESS INDEX	WEEDINESS INDEX	PROVINCIAL STATUS	OMNR STATUS	COSEWIC STATUS	GLOBAL STATUS
GYMNOSPERMS		CONIFERS							
Pinaceae		Pine Family							
<i>Pinus</i>	<i>resinosa</i>	Red Pine	8	3		S5			G5
<i>Pinus</i>	<i>strobus</i>	Eastern White Pine	4	3		S5			G5
DICOTYLEDONS		DICOTS							
Salicaceae		Willow Family							
<i>Populus</i>	<i>tremuloides</i>	Trembling Aspen	2	0		S5			G5

FLORISTIC SUMMARY & ASSESSMENT

Species Diversity

Total Species:	3	
Native Species:	3	100.00%
Exotic Species	0	0.00%
S1-S3 Species	0	
S4 Species	0	
S5 Species	3	

Co-efficient of Conservatism and Floral Quality Index

Co-efficient of Conservatism (CC) (average)	4.67	
CC 0 to 3 lowest sensitivity	1	33.33%
CC 4 to 6 moderate sensitivity	1	33.33%
CC 7 to 8 high sensitivity	1	33.33%
CC 9 to 10 highest sensitivity	0	0.00%

Floral Quality Index (FQI) 8.08

Presence of Weedy & Invasive Species

mean weediness	0.00	
weediness = -1 low potential invasiveness	0	0.00%
weediness = -2 moderate potential invasiveness	0	0.00%
weediness = -3 high potential invasiveness	0	0.00%

Presence of Wetland Species

average wetness value	2.00	
upland	0	0.00%
facultative upland	2	66.67%
facultative	1	33.33%
facultative wetland	0	0.00%
obligate wetland	0	0.00%

SWD (Poly. 3, 4, 21)

BOTANICAL NAME		COMMON NAME	COEFFICIENT OF CONSERVATISM	WETNESS INDEX	WEEDINESS INDEX	PROVINCIAL STATUS	OMNR STATUS	COSEWIC STATUS	GLOBAL STATUS
PTERIDOPHYTES		FERNS & ALLIES							
Dryopteridaceae		Wood Fern Family							
<i>Dryopteris</i>	<i>cristata</i>	Crested Wood Fern	7	-5		S5			G5
<i>Onoclea</i>	<i>sensibilis</i>	Sensitive Fern	4	-3		S5			G5
Polypodiaceae		Polypody Family							
<i>Polypodium</i>	<i>virginianum</i>	Rock Polypody Fern	6	5		S5			G5
GYMNOSPERMS		CONIFERS							
Cupressaceae		Cedar Family							
<i>Thuja</i>	<i>occidentalis</i>	Eastern White Cedar	4	-3		S5			G5
Pinaceae		Pine Family							
<i>Abies</i>	<i>balsamea</i>	Balsam Fir	5	-3		S5			G5
<i>Picea</i>	<i>mariana</i>	Black Spruce	8	-3		S5			G5
DICOTYLEDONS		DICOTS							
Aceraceae		Maple Family							
<i>Acer</i>	<i>rubrum</i>	Red Maple	4	0		S5			G5
<i>Acer</i>	<i>spicatum</i>	Mountain Maple	6	3		S5			G5
Asteraceae		Composite or Aster Family							
<i>Symphyotrichum</i>	<i>lanceolatum</i>	Tall White Aster	3	-3		S5			G5T?
<i>Eurybia</i>	<i>macrophylla</i>	Large-leaved Aster	5	5		S5			G5
<i>Aster</i>	<i>umbellatus var. umbellatus</i>	Flat-top White Aster	6	-3		S5			G5T?
<i>Eupatorium</i>	<i>maculatum</i>	Spotted Joe-pye-weed	3	-5		S5			G5T5
<i>Solidago</i>	<i>rugosa ssp. rugosa</i>	Rough Goldenrod	4	-1		S5			G5T?
Balsaminaceae		Touch-me-not Family							
<i>Impatiens</i>	<i>capensis</i>	Spotted Touch-me-not	4	-3		S5			G5
Betulaceae		Birch Family							
<i>Alnus</i>	<i>incana ssp. rugosa</i>	Speckled Alder	6	-5		S5			G5T5
<i>Betula</i>	<i>papyrifera</i>	White Birch		2		S5			G5
Caprifoliaceae		Honeysuckle Family							
<i>Viburnum</i>	<i>nudum var. cassinoides</i>	Northern Wild Raisin	7	-3		S5			G5
Cornaceae		Dogwood Family							
<i>Cornus</i>	<i>canadensis</i>	Bunchberry	7	0		S5			G5
Guttiferae		St. John's-wort Family							
<i>Hypericum</i>	<i>canadense</i>	Canadian St. John's-wort	8	-3		S4?			G5
<i>Triadenum</i>	<i>fraseri</i>	Fraser's St. John's-wort	7	-5		S5			G4G5
Lamiaceae		Mint Family							
<i>Lycopus</i>	<i>uniflorus</i>	Northern Water-horehound	5	-5		S5			G5
Nymphaeaceae		Water-lily Family							
<i>Nuphar</i>	<i>variegata</i>	Bulhead Pond-lily	4	-5		S5			G5
Oleaceae		Olive Family							
<i>Fraxinus</i>	<i>nigra</i>	Black Ash	7	-4		S5			G5
<i>Fraxinus</i>	<i>pennsylvanica</i>	Red Ash	3	-3		S5			G5
Oxalidaceae		Wood Sorrel Family							
<i>Oxalis</i>	<i>stricta</i>	Upright Yellow Wood-sorrel	0	3		S5			G5
Primulaceae		Primrose Family							
<i>Trientalis</i>	<i>borealis ssp. borealis</i>	Star-flower	6	-1		S5			G5T?
Ranunculaceae		Buttercup Family							
<i>Actaea</i>	<i>rubra</i>	Red Baneberry	5	5		S5			G5
<i>Clematis</i>	<i>virginiana</i>	Virgin's-bower	3	0		S5			G5
<i>Coptis</i>	<i>trifolia</i>	Goldthread	7	-3		S5			G5T5
<i>Thalictrum</i>	<i>pubescens</i>	Tall Meadow-rue	5	-2		S5			G5
Rosaceae		Rose Family							
<i>Comarum</i>	<i>palustre</i>	Marsh Cinquefoil	7	-5		S5			G5

<i>Prunus</i>	<i>serotina</i>	Black Cherry	3	3		S5		G5
<i>Rubus</i>	<i>idaeus</i>	Red Raspberry				SE1		G5T5
Rubiaceae		Madder Family						
<i>Galium</i>	<i>asprellum</i>	Rough Bedstraw	6	-5		S5		G5
Salicaceae		Willow Family						
<i>Populus</i>	<i>tremuloides</i>	Trembling Aspen	2	0		S5		G5
MONOCOTYLEDONS		MONOCOTS						
Cyperaceae		Sedge Family						
<i>Carex</i>	<i>species</i>	Sedge species						
<i>Carex</i>	<i>crinita</i>	Fringed Sedge	6	-4		S5		G5
<i>Scirpus</i>	<i>cyperinus</i>	Wool-grass	4	-5		S5		G5
<i>Schoenoplectus</i>	<i>tabernaemontani</i>	Softstem bulrush	5	-5		S5		G?
Liliaceae		Lily Family						
<i>Maianthemum</i>	<i>racemosum</i>	False Solomon's Seal	4	3		S5		G5T
Poaceae		Grass Family						
<i>Bromus</i>	<i>ciliatus</i>	Fringed Brome	6	-3		S5		G5
<i>Calamagrostis</i>	<i>canadensis</i>	Blue-joint Grass	4	-5		S5		G5
<i>Glyceria</i>	<i>canadensis</i>	Rattlesnake Grass	7	-5		S4S5		G5
<i>Glyceria</i>	<i>striata</i>	Fowl Meadow Grass	3	-5		S5		G5
Typhaceae		Cattail Family						
<i>Typha</i>	<i>latifolia</i>	Broad-leaved Cattail	3	-5		S5		G5

FLORISTIC SUMMARY & ASSESSMENT

Species Diversity

Total Species:	42	
Native Species:	42	100.00%
Exotic Species	0	0.00%
S1-S3 Species	0	
S4 Species	0	
S5 Species	41	

Co-efficient of Conservatism and Floral Quality Index

Co-efficient of Conservatism (CC) (average)	4.98		
CC 0 to 3	lowest sensitivity	9	21.43%
CC 4 to 6	moderate sensitivity	23	54.76%
CC 7 to 8	high sensitivity	10	23.81%
CC 9 to 10	highest sensitivity	0	0.00%
Floral Quality Index (FQI)	32.25		

Presence of Weedy & Invasive Species

mean weediness		0.00	
weediness = -1	low potential invasiveness	0	0.00%
weediness = -2	moderate potential invasiveness	0	0.00%
weediness = -3	high potential invasiveness	0	0.00%

Presence of Wetland Species

average wetness value		-2.07	
upland		3	7.14%
facultative upland		5	11.90%
facultative		6	14.29%
facultative wetland		15	35.71%
obligate wetland		14	33.33%

Appendix B: Highway 17 (GWP 5670 - 10 - 00) Vegetation Survey Plant List



EXPLANATION OF TERMINOLOGY (See the following pages for addition detailed information on terms.)

Botanical and Common Name: From Newmaster et. al, 1998. Species requiring confirmation noted (cf).

Co-efficient of Conservatism: This value, ranging from 0 (low) to 10 (high), is based on a species tolerance of disturbance and fidelity to a specific habitat integrity.

Wetness Index: This value, ranging from -5 (obligate wetland) to 5 (upland) provides the probability of a species occurring in wetland or upland habitats.

Weediness Index: This value, ranging from -1 (low) to -3 (high) quantifies the potential invasiveness of non-native plants. In combination with the percentage of non-native plants, it can be used as an indicator of disturbance.

Provincial Status: Provincial ranks are used by the NHIC to set protection priorities for rare species and natural communities. These ranks are not legal designations. S4 and S5 species are generally uncommon to common in the province. Species ranked S1-S3 are considered to be rare in Ontario.

Local Status:

X: native species present (collection-based) and all exotic species

R: native species locally rare (number of stations): Durham (<10 stations), GTA (<40 stations), Site District 6E7 (<20 stations)

U: native species locally uncommon Durham (11-20 stations), GTA (41-80 stations), Site District 6E7 (21-40 stations)

Note: study area in Site District 6E13

Record Type

SR - sight record

SRP - sight record with photograph

KRAUS-00-001 - collection by D.T. Kraus for deposition into OAC (University of Guelph) herbarium

Annotations: Provides comments on general distribution and abundance on the subject lands. Definitions of terminology and abbreviations used as follows.

Abundance

Dominant: A plant with the greatest cover and/or biomass within a plant community and represented throughout the community by large numbers of individuals. Visually more abundant than other species in the same stratum and forming >10% ground cover, and >35% of the vegetation cover in any one stratum.

Abundant: Referring to a plant which is represented throughout the polygon or community by large numbers of individuals or clumps. Likely to be encountered anywhere in the polygon. Usually forming >10% ground cover.

Occasional: Referring to plants which are present as scattered individuals throughout a community, or represented by one or more large clumps of many individuals. Most species will fall into this category.

Rare: Cover or abundance of a plant species that is represented in the area of interest by only one to a few individuals.

DETAILED EXPLANATION OF TERMS

Floral Quality Index and Coefficient of Conservatism Values

Vegetation species and community sensitivity was assessed through the application of coefficient of conservatism values (CC), assigned to each native species in southern Ontario (Oldham, et. al, 1995). The value of CC, ranging from 0 (low) to 10 (high), is based on a species tolerance of disturbance and fidelity to specific habitat integrity. The occurrence of species with a CC of 9 or 10 can be good indicators of undisturbed conditions such as mature forests, fens or bogs.

General habitat values associated with the CC values are:

- 0-3: species found in a wide variety of communities, including disturbed sites
- 4-6: species associated with a specific community, but tolerate moderate disturbance
- 7-8: species associated with a community in an advanced successional stage, tolerant of minor disturbances
- 9-10: species with a high degree of fidelity to a narrow range of synecological parameters

The floristic quality of an area is reflected in the mean value of CC. For example, an old field or grazed woodlot would tend have a low mean CC; these habitats are dominated by opportunistic species that occur in a wide range of site conditions and are tolerant of disturbance. A bog, prairie or intact forest would have a higher value, reflecting the specific habitat requirements of many of the species and a generally undisturbed condition. The following provides an example of interpretation of CC values:

mean CC value / % spp CC >8 / Condition of the Landscape

- 5 / 27 / intact
- 3.5 / 19 / slightly degraded
- 1.3 / 2 / severely degraded

The FQI accounts for the species diversity of the area by equating the number of native species with the mean CC value. The FQI is generally used for comparing natural areas. The CC value and FQI of the study area were calculated for the entire study area.

Weediness Index

The sensitivity of natural areas can be assessed through application of the Weediness Index. The Weediness Index quantifies the potential invasiveness of non-native plants, and, in combination with the percentage of non-native plants can be used as an indicator of disturbance. Values (ranging from 1- to -3) have been assigned to most non-native species based on the potential impact each species can have in natural areas:

- 1: little or no impact on natural areas (most non-native plants are in this category)
- 2: occasional impacts on natural areas, generally infrequent or localized
- 3: major potential impacts on natural areas

Appendix B: Highway 17 (GWP 5670 - 10 - 00) Vegetation Survey Plant List



Wetness Index

All plants in southern Ontario have been assigned a wetland category, based on the designations developed for use by the United States Fish & Wildlife Service. Plants are designated into the following categories:

- OBL* (Obligate Wetland): occurs almost always in wetlands under natural conditions (estimated >99% probability)
- FACW* (Facultative Wetland): usually occurs in wetlands, but occasionally found in non-wetlands (estimated 67-99% probability)
- FAC* (Facultative): equally likely to occur in wetlands or non-wetlands (estimated 34-66% probability)
- FACU* (Facultative Upland): occasionally occurs in wetlands, but usually occurs in non-wetlands (estimated 1-33% probability)
- UPL* (Upland): occurs almost never in wetlands under natural conditions (estimated <1% probability)

Further refinement of the Facultative categories are denoted by a "+" or "-" to express exaggerated tendencies for those species. The "+" denotes a greater estimated probability occurring in wetlands than species in the general indicator category, but a lesser probability than species occurring in the next higher category. The "-" denotes a lesser estimated probability of occurring in wetlands than species in the general indicator category, but a greater probability than species occurring in the next lower general category.

Each wetland category has been assigned a numerical value to facilitate the quantification of the wetness index. The wetland categories and their corresponding values are as follows:

- OBL : -5
- FACW+ : -4
- FACW : -3
- FACW- : -2
- FAC+ : -1
- FAC : 0
- FAC- : 1
- FACU+ : 2
- FACU : 3
- FACU- : 4
- UPL : 5

Provincial Status

Provincial ranks are used by the NHC to set protection priorities for rare species and natural communities. These rankings are based on the total number of extant Ontario populations and the degree to which they are potentially or actively threatened with destruction. The ranks are:

- S1: Critically Imperiled**—Critically imperiled in the nation or state/province because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the state/province
- S2: Imperiled**—Imperiled in the nation or state/province because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the nation or state/province
- S3: Vulnerable**—Vulnerable in the nation or state/province due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation
- S4: Apparently Secure**—Uncommon but not rare; some cause for long-term concern due to declines or other factors.

Appendix B: Highway 17 (GWP 5670 - 10 - 00) Vegetation Survey Plant List



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

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

SNR Unranked—Nation or state/province conservation status not yet assessed

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

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

SU: Unrankable—Currently unrankable due to lack of information or due to substantially conflicting information about status or trends

Rank ranges, e.g. S2S3, indicate that the rank is either S2 or S3, but that current information is insufficient to differentiate.

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

REFERENCES

Nomenclature based on:

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Co-efficient of Conservatism, Wetness & Weediness

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Provincial (Ontario) Status:

Natural Heritage Information Centre (NHIC). 2000. Provincial status of plants, wildlife and vegetation communities database. <http://www.mnr.gov.on.ca/MNR/nhic/nhic.html>. OMNR, Peterborough.

Local Status:

Varga, S., editor. August 2000. Distribution and status of the vascular plants of the Greater Toronto Area. Ontario Ministry of Natural Resources, Aurora District. 103 pp.

Appendix C.
Photo Log



Photograph 1 ↑
Representative photo of habitat within the CUM community series.



Photograph 2 ↑
Habitat within the CUM community series.



Photograph 3 ↑
Representative photo of habitat within the CUP community series.



Photograph 4 ↑
Habitat within the CUP community series.



Photograph 5 ↑
Representative photo of habitat within the FOD community series.



Photograph 6 ↑
Habitat within the FOD community series.



Photograph 7 ↑

Representative photo of habitat within the FOM community series.



Photograph 8 ↑

Habitat within the FOM community series.



Photograph 9 ↑

Representative photo of habitat within the FOC community series.



Photograph 10 ↑

Habitat within the FOC community series.



Photograph 11 ↑

Representative photo of habitat within the SWD community series.



Photograph 12 ↑

Habitat within the SWD community series.



Photograph 13 ↑
Representative photo of habitat within the SWC community series.



Photograph 14 ↑
Habitat within the SWC community series.



Photograph 15 ↑
Representative photo of habitat within the SWT community series.



Photograph 16 ↑
Habitat within the SWT community series.



Photograph 17 ↑
Representative photo of habitat within the BOT community series.



Photograph 18 ↑
Habitat within the BOT community series.



Photograph 19 ↑

Representative photo of habitat within the BOO community series.



Photograph 20 ↑

Habitat within the BOO community series.



Photograph 21 ↑

Representative photo of habitat within the MAS community series.



Photograph 22 ↑

Habitat within the MAS community series.



Photograph 23 ↑

Representative photo of habitat within the MAM community series.



Photograph 24 ↑

Habitat within the MAM community series.



Photograph 25 ↑

Representative photo of habitat within the SA community series.



Photograph 26 ↑

Habitat within the SA community series.

Appendix D.

Species at Risk 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
Mammals	Little Brown Myotis (Bat) <i>Myotis lucifugus</i>	END	No Status	END	<p>Bats are nocturnal. During the day they roost in trees and buildings. They often select attics, abandoned buildings and barns for summer colonies where they can raise their young. Bats can squeeze through very tiny spaces (as small as six millimetres across) and this is how they access many roosting areas. Little brown bats hibernate from October or November to March or April, most often in caves or abandoned mines that are humid and remain above freezing.</p> <p>This species can typically be associated with any community where suitable roosting (i.e. cavity trees, houses, abandoned buildings, barns, etc.) habitat is available.</p>	The little brown bat is widespread in southern Ontario and found as far north as Moose Factory and Favourable Lake. Outside Ontario, this bat is found across Canada (except in Nunavut) and most of the United States.	Not identified through background resources. Included due to its broad range and habitat requirements.	<p>Yes</p> <p>Suitable habitat may be present at this site.</p> <p>Species was not observed by AECOM field staff during preliminary field investigations.</p>
Birds	Loggerhead Shrike <i>Lanius ludovicianus</i>	END	END Schedule 1	END	<p>In Ontario, the Loggerhead Shrike prefers pasture or other grasslands with scattered low trees and shrubs. It lives in fields or alvars (areas of exposed bedrock) with short grass, which makes it easier to spot prey. It builds its nest in small trees or shrubs and hunts by waiting patiently in tree branches until it swoops down and attacks its unsuspecting prey – usually large insects, such as grasshoppers. Loggerhead Shrikes also require spiny, multi-branched shrubs where they can impale prey before eating it. Barbed wired fencing can also be used for this.</p> <p>This species can typically be associated with the following ELC communities: SWT, CUM, CUT, ALO and ALS.</p>	The Loggerhead Shrike currently breeds in central and western North America. Until the 1970s, the Loggerhead Shrike could be found at many locations throughout southern Ontario and other parts of northeastern North America, but it has declined dramatically. Although the occasional bird is still found within the broader former range, most remaining Loggerhead Shrikes are now found in two core grassland habitats - the Carden Plain north of Lindsay, and the Napanee Limestone Plain. Every fall these birds migrate to the southern United States for the winter.	Nippising Region Speices at Risk - Ministry of Natural Resources Species at Risk Website	<p>No</p> <p>Suitable habitat is not present at this site.</p>
Mammals	Northern Myotis (Bat) <i>Myotis septentrionalis</i>	END	No Status	END	<p>Northern long-eared bats are associated with boreal forests, choosing to roost under loose bark and in the cavities of trees. These bats hibernate from October or November to March or April, most often in caves or abandoned mines.</p> <p>This species can typically be associated with the following ELC communities: FOC, FOM, FOD, SWC, SWM and SWD where suitable roosting (i.e. cavity trees and trees with loose bark) habitat is available.</p>	<p>The northern long-eared bat is found throughout forested areas in southern Ontario, to the north shore of Lake Superior and occasionally as far north as Moosonee, and west to Lake Nipigon.</p> <p>This bat is found in all Canadian provinces as well as the Yukon and Northwest Territories.</p>	Not identified through background resources. Included due to its broad range and habitat requirements.	<p>Yes</p> <p>Suitable habitat may be present at this site.</p> <p>Species was not observed by AECOM field staff during preliminary field investigations.</p>
Birds	Barn Swallow <i>Hirundo rustica</i>	THR	No Status	THR	<p>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.</p> <p>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.</p>	The Barn Swallow may be found throughout southern Ontario and can range as far north as Hudson Bay, wherever suitable locations for nests exist.	<p>Nippising Region Speices at Risk - Ministry of Natural Resources Species at Risk Website.</p> <p>Correspondence with North Bay District MNR</p>	<p>Yes</p> <p>Suitable habitat may be present at this site.</p> <p>Species was not observed by AECOM field staff during preliminary field investigations.</p>

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 <i>Emydoidea blandingii</i>	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.	Nippising Region Speices at Risk - Ministry of Natural Resources Species at Risk Website. Correspondence with North Bay District MNR	Yes Suitable habitat may be present at this site. Species was not observed by AECOM field staff during preliminary field investigations.
Birds	Bobolink <i>Dolichonyx oryzivorus</i>	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.	Nippising Region Speices at Risk - Ministry of Natural Resources Species at Risk Website	Yes Suitable habitat may be present at this site. Species was observed by AECOM field staff during preliminary
Birds	Chimney swift <i>Chaetura pelagica</i>	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.	Correspondence with North Bay District MNR	Yes Suitable habitat may be present at this site. Species was not observed by AECOM field staff during preliminary field investigations.
Reptiles	Eastern Hog-nosed Snake <i>Heterodon platirhinos</i>	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.	Correspondence with North Bay District MNR	No Suitable habitat is not present at this site.

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 <i>Sturnella magna</i>	THR	No Status	THR	<p>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.</p> <p>This species can typically be associated with the following ELC communities: TPO, TPS, CUM1, CUS, MAM2 and MAS2 with elevated song perches.</p>	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.	<p>Nippising Region Speices at Risk - Ministry of Natural Resources Species at Risk Website.</p> <p>Correspondence with North Bay District MNR</p>	<p>Yes Suitable habitat may be present at this site.</p> <p>Species was observed by AECOM field staff during preliminary field investigations.</p>
Birds	Eastern Whip-poor-will <i>Caprimulgus vociferus</i>	THR	THR Schedule 1	THR	<p>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.</p> <p>This species can typically be associated with the following ELC communitieis: TPS, TPW, CUW, FOD, FOC and FOM where open areas are present.</p>	<p>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.</p> <p>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.</p>	<p>Nippising Region Speices at Risk - Ministry of Natural Resources Species at Risk Website</p> <p>Correspondence with North Bay District MNR</p>	<p>Yes Suitable habitat may be present at this site.</p> <p>Species was not observed by AECOM field staff during preliminary field investigations.</p>
Lichens	Flooded Jellyskin <i>Leptogium rivulare</i>	THR	THR Schedule 1	THR	<p>Flooded Jellyskin is mainly found growing on the bark at the base of trees that are periodically flooded, typically during the spring. The trees are species that can withstand substantial flooding such as: Black Ash, Red Maple, American Elm and more rarely, Balsam Poplar. It can also be found growing on rocks that are subject to similar periodic flooding.</p> <p>This species can typically be associated with the following ELC communities: SWD, FOD7-1, FOD7-2 and FOD8-1 communities that experience annual periodic flooding in the spring.</p>	Flooded Jellyskin is found in eastern North America, Western Europe and Tanzania. In Canada, there are seven published populations (of which two are historic) of Flooded Jellyskin in Ontario and one in Manitoba. However, recent surveys for Flooded Jellyskin by the Ministry of Natural Resources have identified additional populations in Ontario, which are being reviewed by the Natural Heritage Information Centre.	<p>Nippising Region Speices at Risk - Ministry of Natural Resources Species at Risk Website</p>	<p>Yes Suitable habitat may be present at this site.</p> <p>Species was not observed by AECOM field staff during preliminary field investigations.</p>
Fish	Lake Sturgeon (Great Lakes-Upper St. Lawrence River population) <i>Acipenser fulvescens</i>	THR	No Status	THR	<p>The Lake Sturgeon lives almost exclusively in freshwater lakes and rivers with soft bottoms of mud, sand or gravel. They are usually found at depths of five to 20 metres. They spawn in relatively shallow, fast-flowing water (usually below waterfalls, rapids, or dams) with gravel and boulders at the bottom. However, they will spawn in deeper water where habitat is available. They also are known to spawn on open shoals in large rivers with strong currents.</p> <p>This species can be associated with the following ELC communities: OAO. Large lakes/ivers > 20m deep with soft mud, sand or gravel bottoms required.</p>	In Ontario, the Lake Sturgeon is found in the rivers of the Hudson Bay basin, the Great Lakes basin and their major connecting waterways, including the St. Lawrence River. There are three distinct populations in Ontario: Great Lakes - Upper St. Lawrence River, Northwestern Ontario, and Southern Hudson Bay - James Bay.	<p>Nippising Region Speices at Risk - Ministry of Natural Resources Species at Risk Website</p> <p>Correspondence with North Bay District MNR</p>	<p>Yes Suitable habitat may be present at this site.</p> <p>Species was not observed by AECOM field staff during preliminary field investigations.</p>

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	Least Bittern <i>Ixobrychus exilis</i>	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.	Nippising Region Speices at Risk - Ministry of Natural Resources Species at Risk Website	No Suitable habitat is not present at this site.
Fish	Shortjaw Cisco <i>Coregonus zenithicus</i>	THR	THR Schedule 2	THR	The Shortjaw Cisco spends most of the year in deep water, usually between 55 to 180 metres in depth. During the breeding season, which can be spring or fall depending on the lake, it migrates to shallower water (10 to 60 metres) to mate and lay eggs. It feeds on tiny aquatic animals, called zooplankton, but also eats aquatic insects, crustaceans, and freshwater shrimp. This species can be associated with the following ELC communities: OAO.	The Shortjaw Cisco lives in the Great Lakes, and a few large lakes in Ontario, Manitoba, Saskatchewan, Alberta and North West Territories. In Ontario, it is found in Lake Superior, Lake Nipigon and in some smaller inland lakes. It is considered extirpated from lakes Michigan, Erie and Huron.	Nippising Region Speices at Risk - Ministry of Natural Resources Species at Risk Website	No Suitable habitat is not present at this site.
Birds	Black Tern <i>Chlidonias niger</i>	SC	No Status	Not at Risk	Black Terns build floating nests in loose colonies in shallow marshes, especially in cattails. In winter they migrate to the coast of northern South America. Nesting habitat for this species can be associated with the following ELC communities: MAS2-1 and OAO. These two communities must be present immediatly adjacent each other and with sufficient water to provide suitable habitat.	In Ontario, Black Terns are found scattered throughout the province, but breed mainly in the marshes along the edges of the Great Lakes.	Nippising Region Speices at Risk - Ministry of Natural Resources Species at Risk Website	No Suitable habitat is not present at this site.
Birds	Canada Warbler <i>Wilsonia canadensis</i>	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.	Correspondence with North Bay District MNR	Yes Suitable habitat may be present at this site. Species was not observed by AECOM field staff during preliminary field investigations.
Birds	Common Nighthawk <i>Chordeiles minor</i>	SC	THR Schedule 1	THR	Traditional Common Nighthawk habitat consists of open areas with little to no ground vegetation, such as logged or burned-over areas, forest clearings, rock barrens, peat bogs, lakeshores, and mine tailings. Although the species also nests in cultivated fields, orchards, urban parks, mine tailings and along gravel roads and railways, they tend to occupy natural sites. This species can typically be associated with the following ELC communitiesdes: SD, BB, RB, CUM, BO, FOM, FOC and FODwith openings with little vegetation.	The range of the Common Nighthawk spans most of North and Central America. In Canada, the species is found in all provinces and territories except Nunavut. In Ontario, the Common Nighthawk occurs throughout the province except for the coastal regions of James Bay and Hudson Bay. It winters in South America where it is concentrated in Peru, Ecuador and Brazil.	Correspondence with North Bay District MNR	Yes Suitable habitat may be present at this site. Species was not observed by AECOM field staff

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	Milksnake <i>Lampropeltis triangulum</i>	SC	SC Schedule 1	SC	<p>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.</p> <p>This species can be associated with the following ELC communities: BL, TA, AL, RB, TP, CUM, FOC, FOM and FOD.</p>	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.	<p>Nippising Region Speices at Risk - Ministry of Natural Resources Species at Risk Website</p> <p>Correspondence with North Bay District MNR</p>	<p>Yes Suitable habitat may be present at this site.</p> <p>Species was not observed by AECOM field staff during preliminary field investigations.</p>
Insects	Monarch <i>Danaus plexippus</i>	SC	No Status	SC	<p>Throughout their life cycle, Monarchs use three different types of habitat. Only the caterpillars feed on milkweed plants and are confined to meadows and open areas where milkweed grows. Adult butterflies can be found in more diverse habitats where they feed on nectar from a variety of wildflowers. Monarchs spend the winter in Oyamel Fir forests found in central Mexico.</p> <p>This species can typically be associated with the following ELC communities: AI, TP and CUM where milkweed plants are present.</p>	The Monarch's range extends from Central America to southern Canada. In Canada, Monarchs are most abundant in southern Ontario and Quebec where milkweed plants and breeding habitat are widespread. During late summer and fall, Monarchs from Ontario migrate to central Mexico where they spend the winter months. During migration, groups of Monarchs numbering in the thousands can be seen along the north shores of Lake Ontario and Lake Erie.	Correspondence with North Bay District MNR	<p>Yes Suitable habitat may be present at this site.</p> <p>Species was not observed by AECOM field staff during preliminary field investigations.</p>
Fish	Northern Brook Lamprey <i>Ichthyomyzon fossor</i>	SC	SC Schedule 1	SC	<p>The Northern Brook Lamprey inhabits clear, coolwater streams. The larval stage requires soft substrates such as silt and sand for burrowing which are often found in the slow-moving portions of a stream. Adults are found in areas associated with spawning, including fast flowing riffles comprised of rock or gravel.</p> <p>Spawning occurs in May and June. The males construct small, often inconspicuous, nests by picking up pebbles with their mouths and moving them to form the rims of shallow depressions. The sticky eggs are deposited in the nest and adhere to the substrate.</p> <p>This species can be associated with the following ELC communities: OAO characterized as clear, coolwater streams with silt and sand substrates.</p>	The Northern Brook Lamprey lives in the eastern United States in the upper Mississippi and southern Hudson Bay drainages, ranging from Manitoba and the Great Lakes region south to Missouri, and east to the St. Lawrence River in Quebec. In Ontario, it lives in rivers draining into Lakes Superior, Huron and Erie, and the Ottawa River.	Nippising Region Speices at Risk - Ministry of Natural Resources Species at Risk Website	...
Birds	Peregrine Falcon <i>Falco peregrinus</i>	SC	SC Schedule 1	SC	<p>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.</p> <p>This species can be associated with the following ELC communities: CLO.</p>	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.	Nippising Region Speices at Risk - Ministry of Natural Resources Species at Risk Website	No Suitable habitat is not present at this site.

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 <i>Chelydra serpentina</i>	SC	SC Schedule 1	SC	<p>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.</p> <p>This species can typically be associated with the following ELC communities: OAO, SA near gravelly or sandy areas.</p>	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.	<p>Nippising Region Speices at Risk - Ministry of Natural Resources Species at Risk Website</p> <p>Correspondence with North Bay District MNR</p>	<p>Yes Suitable habitat may be present at this site.</p> <p>Species was not observed by AECOM field staff during preliminary field investigations.</p>
Birds	Wood Thrush <i>Hylocichla mustelina</i>	No Status	No Status	THR	<p>The Wood Thrush can typically be found in the interior and along the edges of well-developed upland deciduous and mixed forests. Key elements of these forests include trees that are greater than 16 m in height, high variety of deciduous tree species, moderate subcanopy and shrub density, shade, fairly open forest floor, moist soils and decaying leaf litter. Wood Thrush is more likely to occur in larger forests but may also nest in 1 ha fragments and semi-wooded residential areas and parks. Smaller habitat fragments have lower fecundity when compared to larger fragments.³</p> <p>This species can typically be associated with the following ELC communities: FOD and FOM that are greater than 1 ha in size.</p>	<p>The Wood Thrush ranges across central and southern Ontario, southern Quebec, New Brunswick and southern Nova Scotia and the majority of the eastern United States.</p> <p>It winters in Central American between southern Mexico and Panama.³</p>	Ebird	<p>Yes Suitable habitat may be present at this site.</p> <p>Species was not observed by AECOM field staff during preliminary field investigations.</p>
Birds	Eastern Wood-Pewee <i>Contopus virens</i>	No Status	No Status	SC	<p>The Eastern Wood-Pewee can be found in every type of wooded community in eastern North America. The size of the forest does not appear to be an important factor in habitat selection as this species has been found in both small fragmented forests and larger forest tracks.⁴</p> <p>This species can typically be associated with the following ELC communities: FOC, FOM and FOD.</p>	The Eastern Wood-Pewee Breed throughout central and eastern North America from Saskatchewan to Nova Scotia south along the Atlantic Coast to North Florida and the Gulf Coast. ⁴	Ebird	<p>Yes Suitable habitat may be present at this site.</p> <p>Species was not observed by AECOM field staff during preliminary field investigations.</p>

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
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Glossary

- EXP ESA - Extirpated - a species that no longer exists in the wild in Ontario but still occurs elsewhere.
 SARA - Extirpated - 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 Status of Endangered Wildlife in Canada - a committee of experts that assesses and designates which wild species are in some danger of disappearing from Canada.

References

- 1 - Species at Risk . Ontario Ministry of Natural Resources. <http://www.mnr.gov.on.ca/en/Business/Species/index.html>. © Queens Printer For Ontario, 2013.
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- 3 - Evans, Melissa, Elizabeth Gow, R. R. Roth, M. S. Johnson and T. J. Underwood. 2011. Wood Thrush (*Hylocichla mustelina*), *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/246doi:10.2173/bna.246>
- 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>