

Appendix C
Natural Environment Report

Natural Environment Report

July 2009

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Submitted by

**Dillon Consulting
Limited**

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1.0 INTRODUCTION

Dillon Consulting Limited (Dillon) has been retained by Northland Power Inc. to complete an Environmental Screening Report under the *Ontario Environmental Assessment Act* for a proposed utility scale wind farm located south of Little Current in the Town of Northeastern Manitoulin and the Islands, Ontario on McLean's Mountain, as illustrated in Figure 1. The project proposes to develop approximately 50 turbines for approximately 80 megawatts (MW) of power generation.

This technical appendix provides a review of the existing terrestrial environmental features and fisheries habitat in the study area based on background information, agency consultation and field work. Environmental features and potential issues identified through this work have been used in combination with other environmental information (i.e. bird studies) and technical disciplines to direct the site layout, evaluation of potential impacts and mitigation as well as environmental management and monitoring plans contained in the Environmental Screening Report.

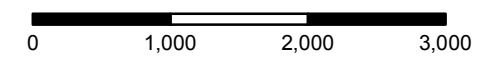
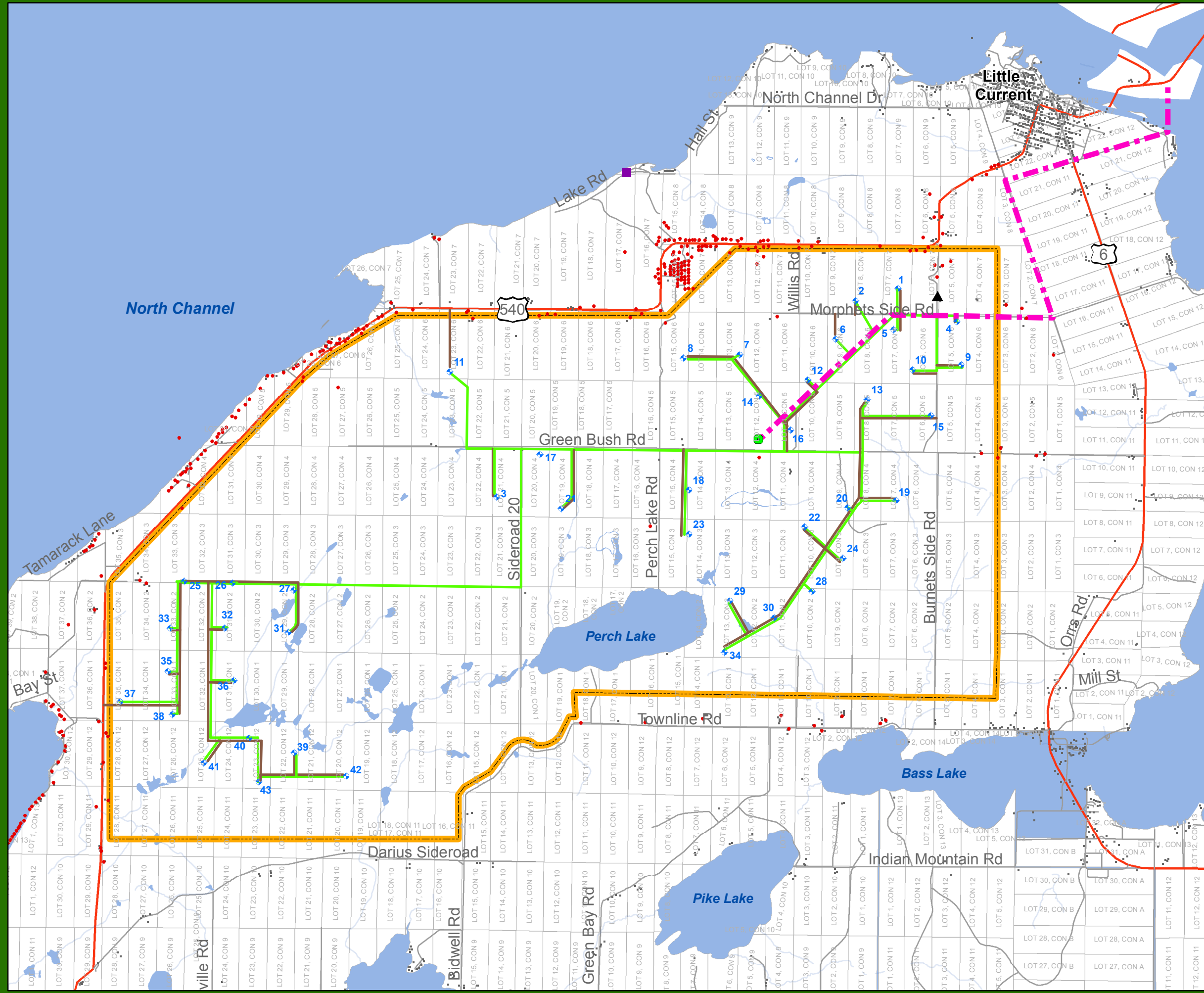


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McLeans Mountain Windfarm Figure 1 Wind Farm Layout and Infrastructure

Legend

- Turbine
- Substation
- Residence
- Building
- Radio Tower
- Water Treatment Plant
- Secondary Roads
- Highway
- Cabling (34kv)
- Access Roads
- Proposed Transmission Line (115kv)
- Rivers
- Project Area
- Lots
- Waterbody



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 and Infrastructure Map.mxd

2.0 METHODS

2.1 Terrestrial Environment

Several sources, including the Natural Heritage Information Centre database, Atlas of Mammals of Ontario (Dobbyn 1994); Ontario Herpetofauna Atlas (Oldham and Weller 2000), Breeding Bird Atlas (<http://www.birdsontario.org/atlas/atlasmain.html>), Important Bird Areas (<http://www.ibacanada.ca>), federal Species at Risk Act (SARA) Public Registry (http://www.sararegistry.gc.ca/default_e.cfm), and provincial Species at Risk (SAR) (<http://www.mnr.gov.on.ca/MNR/speciesatrisk/status.html>) formed the basis of the background review.

Aerial photographs were initially used to determine major habitat types in the study area. The description of major habitat types contained herein is based on observations completed during seasonal field surveys, which covered the entire study area. Quadrat sample plots were located at proposed turbine sites using GPS coordinates. Every plant within the 10 X 10m square was recorded and documented (Appendix A).

Consultation with Ontario Ministry of Natural Resources (OMNR) staff including Scott Dingwall (District Planner), Eric Cobb (Renewable Energy Planner), Deb Jacobs (Species at Risk Biologist), Holly Simpson (Area Biologist) and Bruce Richard (Information and Resource Management Supervisor) was completed as part of the background review.

2.2 Aquatic Environment

In order to gather sufficient background information for the aquatic resources screening process, the Ontario Ministry of Natural Resources (OMNR; Holly Simpson – Area Biologist) was contacted. The scope of this screening is limited to an evaluation of existing information and a field reconnaissance investigation, which occurred on October 26-27, 2004 and on October 1, 2008 to generally characterize the existing watercourses. At each station general channel and habitat features were noted and representative photographs were taken.

3.0 RESULTS

3.1 Terrestrial Environment

3.1.1 Designated Natural Area

Natural Area Summary Reports (OMNR 2007) are provided in Appendix B of this technical report. The location and boundaries of designated natural features are summarized on Figure 1. The features identified below do not occur immediately adjacent to any leased lands potentially developed as part of this project. It is unlikely that the proposed wind farm will have any direct or indirect effect on these natural features.

3.1.2 Areas of Natural and Scientific Interest

Six candidate Areas of Natural and Scientific Interest (ANSI's), including *Sheguiandah Hill*, *Bass Lake Marsh* and *Sheguiandah Quartzite Quarry* have been identified by the MNR on the periphery of the study area. According to the Town of Northeastern Manitoulin and the Islands, no additional natural areas exist in the study area.

Freer Point Limestone Alvar – Provincially Significant, Candidate Life Science ANSI (255 ha)

Freer Point Limestone Alvar is designated an ANSI because of its limestone features and may also provide representation of limestone alvar vegetation (dry and wet dominance types). The tree community has been categorized as swamp with thicket and marsh dominance types occurring near the bay shoreline. Noble (1995) notes that limestone alvar affiliate species are expected to be represented here but field confirmation is needed for the above vegetation classifications.

Sheguiandah Hill – Provincially Significant, Candidate Life Science ANSI (440 ha)

Sheguiandah Hill is noted as one of the few remaining areas in the Sheguiandah area that supports relatively extensive deciduous forest, particularly sugar maple and red oak. This site is centred on the shoreline terraced Sheguiandah Hill and includes two outlier ridges of quartzite in the southwest corner (Noble 1995).

Bass Lake Marsh/Swamp – Regionally Significant, Candidate Life Science ANSI (46 ha)

The west end of Bass Lake supports a small shoreline marsh/swamp complex. The swamp portion marks an abrupt change in soil moisture regime from surrounding agricultural land and is dominated by red maple and sensitive fern. Immediately off shore, the lake supports a number of deep and shallow marsh communities (Noble 1995).

Sheguiandah Quartzite Quarry – Provincially Significant, Candidate Life Science ANSI (90 ha)

Not much information is available regarding this site. A summary of Noble's (1995) report highlights that this area is considered a significant archaeological site, with potential presence of significant plant species. This land is privately owned and was not investigated further during fieldwork.

Strawberry Channel Wetlands – Regionally Significant, Candidate Life Science ANSI (165 ha)

Large Great Lakes open water shoreline marshes are found on the east and west shores of Strawberry Channel. These types of marshes are rare on Manitoulin Islands Lake Huron shoreline (Noble 1995).

Bidwell Road Bog – Provincially Significant, Candidate Life Science ANSI (120 ha)

True bog habitats are considered rare on Manitoulin Island. This site may contain a floating domed bog which would make it provincially significant, as these features are rare at this latitude. Aerial photographs indicate that the bog consists of open bog dominance vegetation types (possibly low shrub bog). The north and east flanks of the bog contain mixed swamp dominated by eastern white cedar with some portions of forest possibly being coniferous (Noble 1995).

3.2 Major Habitat Types

Major habitat types observed in the study area are provided (Figure 2) and summarized below. The underlying bedrock, shallow and seasonally wet soils has influenced local land-use and vegetation and prevented agricultural crops from being grown. Due to these conditions, historical and current land use in the surrounding area has been primarily pastureland for beef cattle, which is sometimes cut for hay. Forests are general confined to steep slopes or lowland areas.

On pastureland, subtle changes in elevation modify drainage characteristics, which results in a complex pattern of Old Field Meadow (pasture) (CUM 1) and Meadow Marsh (MAM 1) community types. The influence of elevation changes is magnified by the relatively thin soil (0.3m) overlying the limestone bedrock. All Old Field Meadow (pasture) including many Meadow Marsh areas are maintained by cultural uses (grazing cattle) and as such, no Alvar communities were observed. The more culturally maintained and impacted Meadow Marsh areas have not been included in wetland boundaries but rather remain part of the larger Old Field Meadow (pasture) designation due to their small size.

Forests are generally confined to steep slopes or lowland areas. Cattle regularly graze in the forested areas, which has resulted in a reduction in ground layer plant regeneration. Generally, forest cover on or immediately adjacent to lease sites is dominated by a Sugar Maple Deciduous Forest (FOD5, FOD6) with small isolated areas of Dry Cedar Coniferous Forest (FOC 2) and Fresh White Cedar Mixed Forest (FOM 4) with White Spruce, White Birch and Trembling Aspen as co-dominant species.

Multiple small-unevaluated wetlands comprised of mostly White Cedar Mineral Mixed Swamp (SWM 1) and Red Maple Mineral Deciduous Swamp (SWD 3), with some smaller isolated portions of Mineral Thicket Swamp (SWT 2) and Shallow Meadow Marsh (MAS 2) communities are contained in the study area. These areas are primarily identified from MNR base mapping (2002), with additional areas being added using field observations.

All terrestrial vegetation communities observed in the study area are common in the province of Ontario. No rare plant species were found in vegetation survey plots.

3.2.1 Botanical Survey

In total, 244 flora species were identified within the McLeans Mountain study area during the fall of 2008. Of these, 49 (20.1%) are listed as exotic or non-native species. The majority of the non-native species were observed within the pasture land and old fields within the study area.

There are a large number of high quality plant species within the study area, with 62 (25.4%) of the species encountered having a coefficient of conservatism of 6 or greater. The coefficient of conservatism (CC) ranges from 0 to 10 and represents an estimated probability that a plant is likely to occur in a landscape relatively unaltered from what is believed to be a pre-settlement condition. For example, a CC of 0 is given to plants such as Manitoba Maple (*Acer negundo*), which have demonstrated little fidelity to any remnant natural community, (i.e. may be found almost anywhere). Similarly, a CC of 10 is applied to plants like Creeping Juniper (*Juniperus horizontalis*) that are almost always restricted to a pre-settlement remnant, (i.e. a high quality natural area). Introduced plants were not part of the pre-settlement flora, so no CC value is applied to these. High quality species within the McLeans Mountain study area include Creeping Juniper, Wood Lily (*Lilium philadelphicum*), Cooper's Milkvetch (*Astragalus neglectus*), Indian Paintbrush (*Castilleja coccinea*), Prairie Smoke (*Geum triflorum*), Upland White Goldenrod (*Solidago ptarmicoides*) and Marsh Goldenrod (*Solidago uliginosa*).

Despite the presence of a number of high quality species within the study area, none of the species observed were listed under the federal *Species at Risk Act* or the provincial *Endangered Species Act*. According to the Natural Heritage Information Centre (NHIC), the majority of native flora species observed within the study area are considered secure (S5) or apparently secure (S4) in the province of Ontario. Maidenhair Spleenwort (*Asplenium trichomanes ssp. trichomanes*), observed along a rocky outcropping in the summer of 2008, has an unknown status (SU) in Ontario, by the NHIC ranking system. Cooper's Milkvetch, observed within quadrat/turbine 37, is considered vulnerable (S3) in Ontario. None of the rare species listed by the NHIC (Houghton's Goldenrod, Arrow-arum, and Small-flowered Blue-eyed Mary) were encountered during fieldwork.

3.3 Wildlife

3.3.1 Ontario Bird Conservation Region 13

The study area is part of Bird Conservation Region 13 (BCR 13), which encompasses 201 300 square kilometres of generally flat, low-lying land to the south of the Canadian Shield in Ontario and Quebec, and north of various highland systems in the four eastern U.S. states (New York, Ohio, Pennsylvania and Vermont). The Ontario portion is the largest, comprising 42% of the total BCR and encompasses 84,700 km² (9%) of Ontario's total area (Ontario Partners in Flight, 2006).

Forty-two (23%) of the 168 species of landbirds that regularly breed or winter in southern Ontario are identified as priority species (Ontario Partners in Flight, 2006). The reasons for listing species as priority are diverse. Some species are of concern continent-wide and have important populations in southern Ontario. A few have small global range and populations, so are considered vulnerable to future change, while many are relatively abundant and widespread but are declining rapidly with continued declines a strong possibility. Other species are listed because southern Ontario has a high global responsibility for the species' population in

combination with other concerns. Southern Ontario is also home to many of Canada's, and Ontario's, listed Endangered and Threatened species, which are also included as priority species in BCR 13. Priority landbird species of BCR 13 and their reason for inclusion is summarized in Appendix C.

Priority species found in atlas squares 17ML18, 17ML28, 17ML29 and 17ML38 for the Manitoulin Island region include:

- Bald Eagle
- Northern Harrier
- Red-shouldered Hawk
- American Kestrel
- Black-billed Cuckoo
- Short-eared Owl
- Whip-poor-will
- Golden-winged Warbler
- Savannah Sparrow
- Bobolink
- Chimney Swift
- Belted Kingfisher
- Red-headed Woodpecker
- Northern Flicker
- Eastern Wood-pewee
- Willow Flycatcher
- Eastern Kingbird
- Field Sparrow
- Grasshopper Sparrow
- Eastern Meadowlark
- Loggerhead Shrike
- Wood Thrush
- Brown Thrasher
- Prairie Warbler
- Canada Warbler
- Eastern Towhee
- Bank Swallow
- Vesper Sparrow
- Rose-breasted Grosbeak
- Baltimore Oriole

The Northern Bobwhite is the only priority species that is a permanent resident in this region. Two migratory species including the Short-eared Owl and Bald Eagle are priority species in this region during both the breeding and winter seasons. No species was identified as a priority species only in winter (Ontario Partners in Flight, 2006).

Most species on the priority list are included because they are of conservation concern at the regional (21 species) or continental (11 species) level. Only five of the priority species are of high regional stewardship responsibility. None of the continental stewardship species has more than 5% of its North American population within BCR 13.



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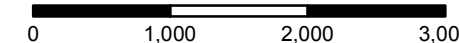
Mcleans Mountain Windfarm Habitat Map

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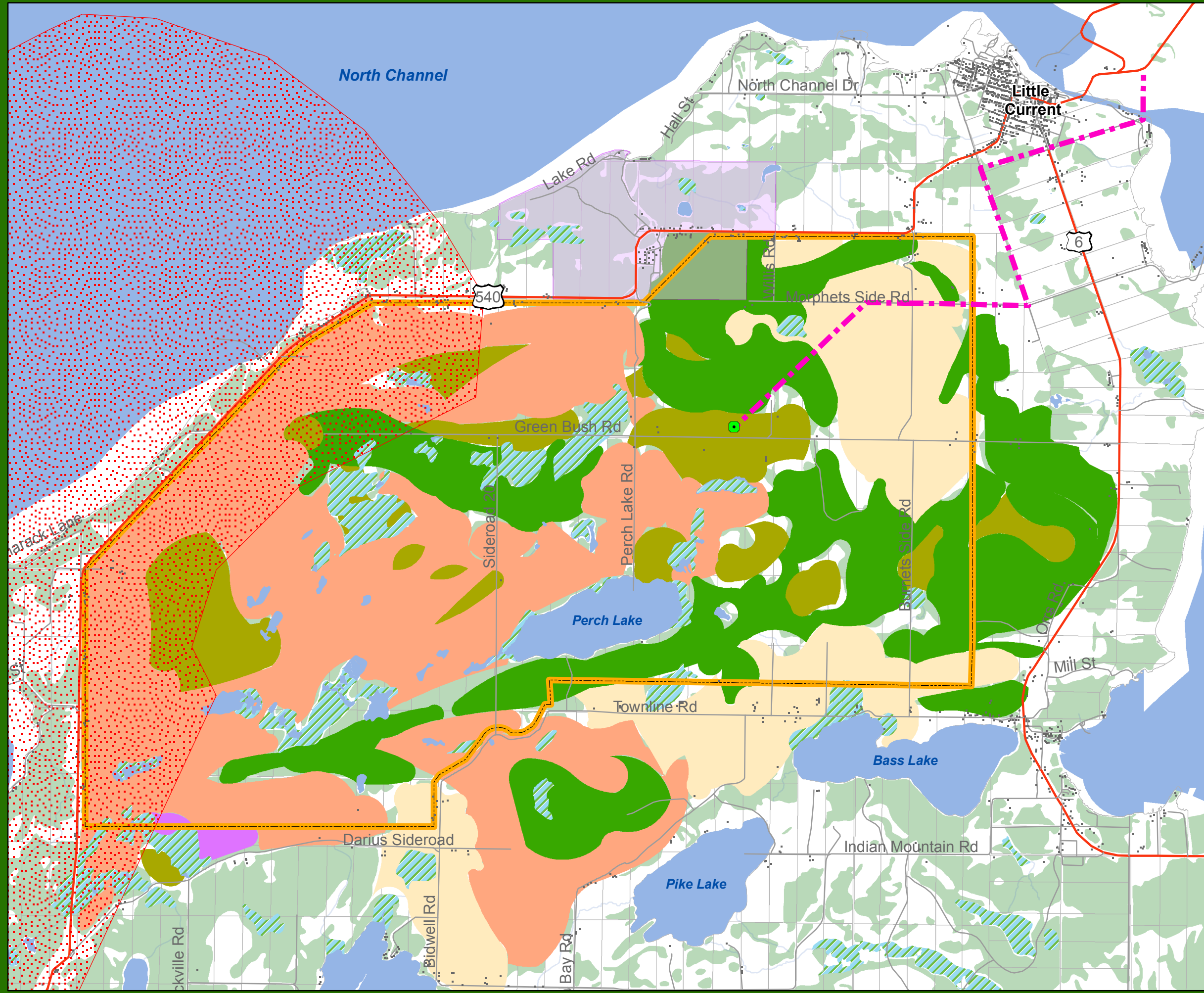
- Building
- Substation
- Secondary Roads
- Highway
- ~ Rivers
- Transmission Line
- ▭ Study Area
- ▨ Manitoulin Island North Shore Important Bird Area (ON150)
- Lots
- First Nation Reserve
- Deciduous Forest
- Grassland/Pasture
- Mixed Forest
- Old Field
- Bog
- ▨ Swamp/Wetland
- Waterbody
- Woodlots



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3.3.2 Important Bird Areas

The study area overlaps one Important Bird Area (IBA), the Manitoulin Island North Shore.

Manitoulin Island North Shore Important Bird Area – ON150

This IBA follows the northern Manitoulin Island shoreline from Cole Bay to West Bay and overlaps with a portion of the western edge of the study area as seen in Figure 2. This site is characterised by sloping shorelines and includes a number of bays and inlets. Large numbers of moulting Red-necked Grebes are found in this IBA between September and December. Total numbers of Red-necked Grebes recorded here have been as high as 1,163 in 1995 and 2,000 in 1996 which represents approximately 4% of the North American population of the species. The moulting locations that Red-necked Grebes use share several characteristic such as they are generally between 100 to 2,000 meters away from the shoreline, the water depth varies from 3 to 55 m, they are partially sheltered, and they have varied late bottom topography containing shelves or holes. Other open water birds observed here include Common Loons, Horned Grebes, Scoters and Oldsquaw (Birdlife International 2007).

3.3.3 Breeding Birds – Breeding Bird Atlas Data

The study area is part of Breeding Bird Atlas Region 33 – Manitoulin Island, with the atlas squares 17ML18, 17ML28, 17ML29 and 17ML38 being found in the study area. A total of 150 species of birds were observed as possible, probable or confirmed breeding in the four 10km x 10km atlas squares for the Ontario Breeding Bird Atlas (Appendix D).

A total of 91, 129, 95 and 103 species of birds were observed as possible, probable or confirmed breeding in each of the squares, respectively. Appendix D contains a summary of all breeding species observed during the second Breeding Bird Atlas program in the atlas squares that overlap the study area. This also provides a summary of regional, provincial and national rare species.

3.3.4 Resident Birds – Christmas Bird Count Data

Christmas Bird Count data from 2002 to 2006 (Count year 102-106) for the Manitoulin Island count circle (Centre: 45.85 degrees North x -82.4333 degrees West) shows a minimum of 40 and maximum of 50 species observed during any one year. In total, 81 species have been observed between 2002 and 2006.

Overall, CBC data does not show an abundance of raptors in the Manitoulin Island count circle. High numbers of Bald Eagle (Min: 18; Max: 36; Ave: 24.2) and Rough-legged Hawk (Min: 0; Max: 42; Ave: 16.2) have been observed. For most raptor species, the number of individuals observed was low with 3 or less of most species occurring in any given year.

Species observed in high numbers during multiple years are included in Table 1 below. See Appendix E for a summary of all species that have been observed during the 2002 to 2006 Christmas Bird Counts.

Table 1: Resident winter bird species observed in abundance relative to other species.

Species Common Name	Minimum Individuals Observed	Maximum Individuals Observed	Average Number of Individuals per year
Mallard	0	382	71.0
Common Goldeneye	6	941	267
Common Merganser	0	1508	391
Ring-billed Gull	0	114	26
Herring Gull	18	385	157
Rock Pigeon	0	155	78
Mourning Dove	123	272	181
Blue Jay	132	247	179
American Crow	44	200	102
Common Raven	123	387	225
Black-capped Chickadee	198	486	385
European Starling	162	1178	399
Snow Bunting	0	625	123
Common Redpoll	0	398	153
American Goldfinch	19	917	209
House Sparrow	34	134	81
Pine Grosbeak	0	318	62

3.3.5 Mammals

Mammals potentially occurring in the study area are taken from Dobbyn (1994). Table 2 summarizes all mammal species along with their national, provincial and OMNR status.

Bats

Two bat species are documented as occurring in the vicinity of the study area: Little Brown Bat and Northern Long-eared Bat (Dobbyn 1994). It is likely that additional bat species, at least seasonally, will be found in the study area. A summary of bat ecology is given in Appendix F (OMNR 2006). Bat acoustic monitoring completed for this project will confirm general species abundance and diversity.

Little Brown bats are likely the most common bat species in Canada, found throughout Ontario north to the tree-line. They forage over water and sometimes among trees, lawns, or pastures. These bats use a variety of day roosts and are often found in and around man-made structures. Males and non-reproductive females roost alone or in small groups often found in buildings, caves, trees, under rocks, behind shutters, and under tree bark. Reproductive females form maternity colonies in old buildings and hollow logs during the summer, which may contain thousands of individuals. Little Brown Bats may travel hundreds of kilometres to swarm around caves and abandoned mines. Swarming begins in mid-July and mating occurs in mid-August.

Hibernation occurs between early September and mid-May in caves and abandoned mines with cool and stable temperatures (OMNR 2006).

Northern Long-eared bats are often found in wooded areas from southern to northern Ontario and have a home-range size of approximately 65 hectares. They typically forage in forests and are known to fly low and glean prey off of leaves and twigs. These bats often roost in tree cavities and beneath peeling bark and have been found in both hardwood and softwood forests. Maternity colonies are most often found in mature, shade tolerant deciduous tree stands. Little is known about the population dynamics and reproductive biology of this species. They swarm in mines and caves in the fall, and hibernate in many of these same spaces, although not in large numbers (OMNR 2006).

Table 2: Mammals potentially occurring in the study area or observed during fieldwork.

Common Name	Provincial Status (COSSARO)	National Status (COSEWIC)	MNR Status (SRank)	Observed during field work*
Common Shrew	NAR	NAR	S5	
Pygmy Shrew	NAR	NAR	S4	
Northern Short-tailed Shrew	NAR	NAR	S5	
Star-nosed Mole	NAR	NAR	S5	
Little Brown Bat	NAR	NAR	S5	
Northern Long-eared Bat	NAR	NAR	S3	
Snowshoe Hare	NAR	NAR	S5	*
Eastern Chipmunk	NAR	NAR	S5	*
Woodchuck	NAR	NAR	S5	
Gray Squirrel	NAR	NAR	S5	
Red Squirrel	NAR	NAR	S5	*
Northern Flying Squirrel	NAR	NAR	S5	
Beaver	NAR	NAR	S5	*
Deer Mouse	NAR	NAR	S5	
Southern Red-backed Vole	NAR	NAR	S5	
Meadow Vole	NAR	NAR	S5	
Muskrat	NAR	NAR	S5	
Norway Rat	NAR	NAR	SE	
House Mouse				
Meadow Jumping Mouse	NAR	NAR	S5	
Porcupine	NAR	NAR	S5	*

Common Name	Provincial Status (COSSARO)	National Status (COSEWIC)	MNR Status (SRank)	Observed during field work*
Coyote	NAR	NAR	S5	
Gray wolf	NAR	NAR	S4	
Red Fox	NAR	NAR	S5	
Black Bear	NAR	NAR	S5	*
Raccoon	NAR	NAR	S5	*
Marten	NAR	NAR	S5	
Ermine	NAR	NAR	S5	
Mink	NAR	NAR	S5	
Striped Skunk	NAR	NAR	S5	*
River Otter	NAR	NAR	S5	
Canada Lynx	NAR	NAR	S5	
Bobcat	NAR	NAR	S4	
White-tailed Deer	NAR	NAR	S5	*
Moose	NAR	NAR	S5	

3.3.6 Herpetozoa

Herptile species potentially occurring in the study area are taken from Oldham and Weller (2000) and are summarized in Table 3, along with their national, provincial and OMNR status.

Table 3: Herpetozoa species potentially occurring in the study area or observed during fieldwork.

Common Name	Provincial Status (COSSARO)	National Status (COSEWIC)	MNR Status (SRANK)	Observed During Fieldwork *
Common Mudpuppy	NAR	NAR	S4	
Red-spotted Newt	NAR	NAR	S5	
Jefferson / Blue-spotted Salamander complex	NAR	NAR	S2	
Spotted Salamander	NAR	NAR	S4	
Eastern Redback Salamander	NAR	NAR	S5	
American Toad	NAR	NAR	S5	*
Spring Peeper	NAR	NAR	S5	*
Gray Treefrog	NAR	NAR	S5	*
Wood Frog	NAR	NAR	S5	
Northern Leopard Frog	NAR	NAR	S5	*
Green Frog	NAR	NAR	S5	
Bullfrog	NAR	NAR	S4	
Common Snapping Turtle	NAR	NAR	S5	*
Midland Painted Turtle	NAR	NAR	S5	
Blanding's Turtle	THR	THR (Schedule 1)	S3	
Eastern Garter Snake	NAR	NAR	S5	*
Northern Water Snake	NAR	NAR	S5	
Northern Red-bellied Snake	NAR	NAR	S5	
Brown Snake	NAR	NAR	S5	*
Smooth green				

Common Name	Provincial Status (COSSARO)	National Status (COSEWIC)	MNR Status (SRANK)	Observed During Fieldwork *
snake				
Northern Ringneck Snake	NAR	NAR	S4	
Eastern Milksnake	NAR	NAR	S3	
Eastern Massasauga	THR	THR (Schedule 1)	S3	

3.4 Aquatic Environment

Within the permitting area at the Northland Power McLeans Mountain project site, access roads and aboveground and underground transmission lines are proposed to cross several watercourses and drains. These watercourses range from vegetated swales with no defined channel to permanent and intermittent streams with defined channels, both natural and channelized.

Based on the current project boundary, the primary watercourses that may be adversely affected by the proposed works include, but are not limited to:

- North Channel;
- Sucker Creek and connecting tributaries;
- Inflow to Strawberry Channel of Lake Huron; and
- Various streams that discharge to and drain Bass Lake and Perch Lake, including Perch Creek.

For reference, please refer to Figure 3 for locations of the main watercourses in relation to the proposed wind farm and transmission line layout. Appendix G provides photographs of each creek/drain.

3.4.1 Background Information

The Ontario Ministry of Natural Resources (OMNR; Espanola office) was contacted to obtain existing fisheries/aquatic information for watercourses in the study area, as presented in Figure 3. There is no background fish community information in OMNR's records for any of the watercourses assessed (Holly Simpson, OMNR, Personal Communication). According to OMNR, many of the streams flowing off McLeans Mountain are likely spring fed, and several are known to flow over limestone. The east branch of Sucker Creek is considered by OMNR to be a coldwater stream (Holly Simpson, OMNR office, Personal Communication).

In general, the majority of watercourses flowing off McLeans Mountain within the study area flow to the Sucker Creek and/or the Perch Creek systems, which both flow to the North Channel of Lake Huron. Watercourses flowing easterly from the east side of McLeans Mountain flow toward Strawberry Channel. On the south side of the study area, westerly watercourses

generally flow toward the North Channel via Perch Lake and easterly watercourses generally flow toward Bass Lake near Sheguiandah (Figure 3).

3.4.2 Field Reconnaissance

A screening level aquatic reconnaissance was conducted at many of the watercourses in the Northland Power McLean's Mountain Wind Farm Development project area in October 2004 and October 2008. This involved looking at watercourses from existing road crossings, noting channel and habitat features, flow characteristics and taking photographs. Descriptions of individual crossings are not provided herein, but some general comments can be made about the watercourses in the project area.

Generally speaking, the types of existing watercourses are diverse in nature, ranging from agricultural drains, grassy swales, natural intermittent creeks, to natural permanent creeks with defined channels. Drains in the area exhibited many features typical of agricultural drains, such as being straightened with uniform channel width and depth and lined with vegetation within a narrow valley corridor. Many of the stream banks were slumping and had hummocks, suggesting cattle grazing. Judging from the observed flows during field investigations, the vegetative growth and dry bottom substrate observed in poorly-defined channels, many of the streams appear to be ephemeral, meaning that water levels are highly variable and sensitive to rainfall events and/or spring freshet.

A number of the watercourses (natural and altered) within the study area are considered to function as direct fish habitat. Although some barriers to fish movement were identified, numerous confirmed and potential fish habitats were observed. Many of the streams/creeks in the study area have overhanging terrestrial vegetation, riffle/pool/run sequences, large woody debris and gravel, cobble and boulder substrate. MNR has confirmed that conditions in some of the streams support coldwater fish species.

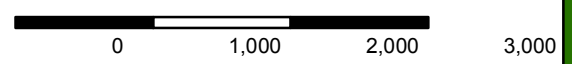


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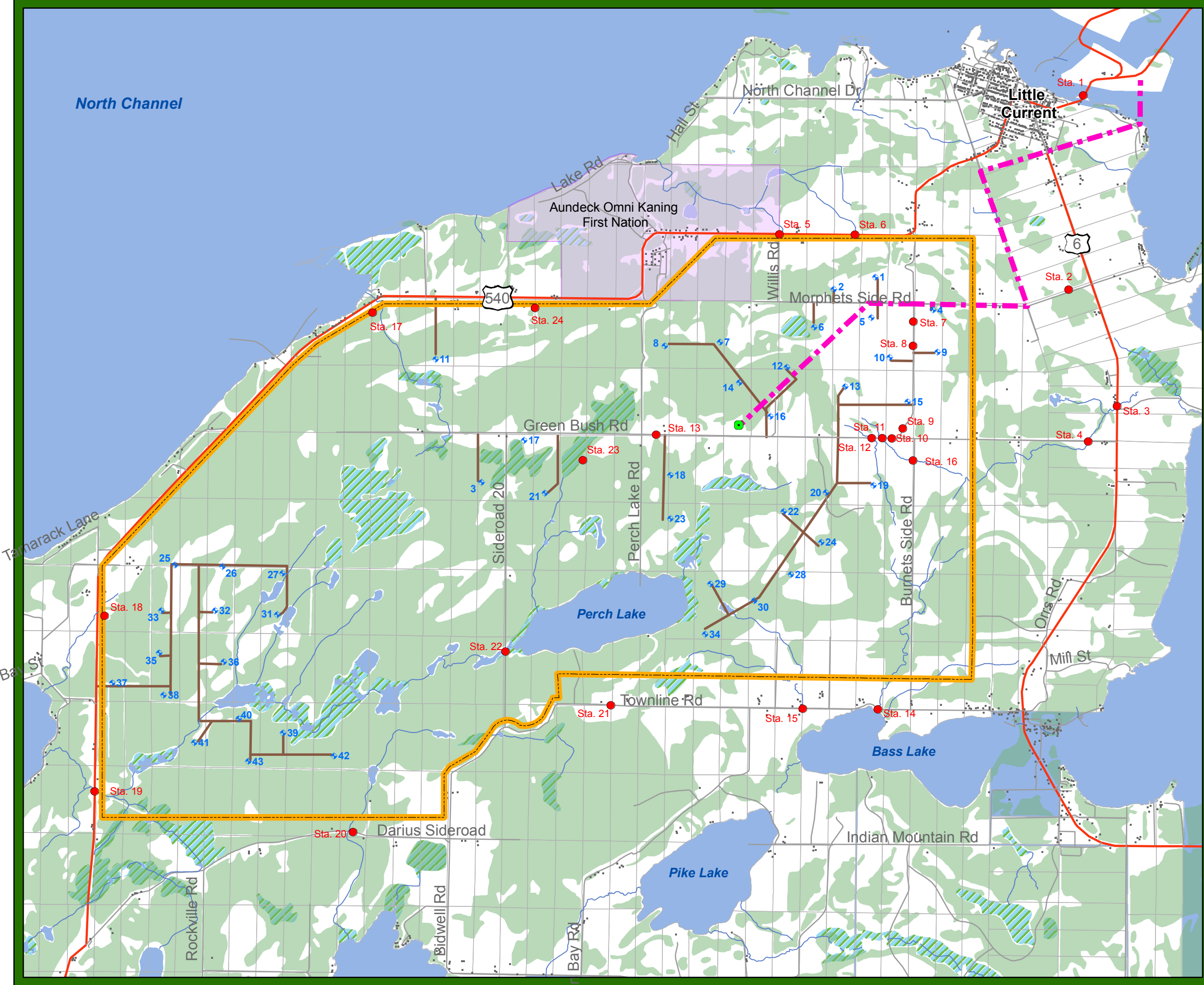
McLeans Mountain Windfarm Aquatic Features and Stations

Legend

- Turbine
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- Waterbody
- Wetland
- Woodlots



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4.0 SPECIES AND HABITATS OF CONSERVATION CONCERN

4.1 Rare Vegetation Communities

The Natural Heritage Information Centre provides a list of rare vegetation communities present within Manitoulin County. None of these rare communities were observed within the McLean's Mountain study area.

4.2 Vulnerable Threatened or Endangered Species

The Ministry of Natural Resource's Natural Heritage Information Centre (NHIC) uses Provincial (or Subnational) ranks to set protection priorities for rare species and natural communities in Ontario. Eight rare species of flora and fauna considered sensitive by the MNR have been identified through NHIC historical records in areas adjacent to the study area, including Houghton's Goldenrod (*Solidago houghtonii*), Arrow-arum (*Peltandra virginica*), Small-flowered Blue-eyed Mary (*Collinsia parviflora*), a Liverwort species (*Cephaloziella rubella* var. *bifida*), Boreal Snaketail (*Ophiogomphus colubrinus*), Loggerhead Shrike (*Lanias ludovicianus*), Red-shouldered Hawk (*Buteo lineatus*) and Black Tern (*Chlidonias niger*).

The Breeding Bird Atlas data identifies eight nationally/provincially rare species within or adjacent to the study area (four 10 x 10 km squares) (Appendix D). Of these species, only three, including Bald Eagle (*Haliaeetus leucocephalus* - S4B,SZN, ESA – population North of French and Mattawa Rivers is considered Special Concern), Short-eared Owl (*Asio flammeus* - S3S4B,SZN, SARA and ESA – Special Concern) and Loggerhead Shrike (S2B,SZN, SARA and ESA - Endangered), are considered as having potential to occur based on habitat requirements. None of these species were observed during breeding bird surveys.

The Ontario Herpetofaunal atlas identifies 2 species of conservation concern potentially occurring in or immediately adjacent to the study area, the Eastern Massasauga (S3, SARA and ESA - Threatened) and Blanding's Turtle (S3, SARA and ESA - Threatened) (Table 4), and when considering specific habitat attributes and life history needs for each species it is possible that both have the potential to occur within or near the study area (Canadian Amphibian and Reptile Conservation Network, 2007). Neither were observed during field investigations.

Many of the rare species discussed are not expected to be impacted by the development of wind turbines in the study area, either because of lack of suitable habitat or due to the turbine siting having no impact on habitat present. Provided appropriate steps are taken to identify the location of important habitat areas for rare species relevant to the area, impacts to these species can be avoided. A description of basic habitat information and general relevance to the study area are provided below.

Houghton's Goldenrod – Occurs in swamps and moist beaches often in the moist sandy swales behind dunes (Gleason and Cronquist 1991). This species was not observed during fieldwork.

Arrow-arum – Occurs in swamps and shallow waters (Gleason and Cronquist 1991). This species was not observed during fieldwork.

Small-flowered Blue-eyed Mary – Occurs in sterile rocky soils (Gleason and Cronquist 1991). This species was not observed during fieldwork.

Boreal Snaketail – Dragonflies in this genus generally inhabit stream habitats though no information for this species was available (Needham et al. 2000). This species was not observed during fieldwork.

Red-shouldered Hawk - Red-shouldered Hawk occurrences from circa 1971 and 1974 are recorded for the Pike Lake area, several kilometers south of the study area. This species is known to vacate disturbed/cleared landscapes and areas in close proximity to human settlements. One Red-shouldered Hawk was located on a point count during breeding bird surveys in the summer of 2008 in an area of deciduous forest. A nest observed close to the bird may have belonged to this species though no direct activity was observed on the nest.

Bald Eagle - The Bald Eagle is considered of special concern north of the French and Mattawa Rivers in Ontario. Breeding activity for this species was observed in squares 17ML28, 17ML29 and 17ML38 during the second Ontario Breeding Bird Atlas project but was not observed on Breeding Bird Surveys in the area. No bald eagles were observed during winter monitoring but a single bird was observed during spring migration monitoring in April 2008 at the Townline Road - Greenbay Road Junction area soaring from 50-100m in the air and a single Bald Eagle was observed during fall migration monitoring in September 2004 but was flying well above turbine height.

Short-eared Owl – A Short-eared Owl was observed in suitable breeding habitat during the second Ontario Breeding Bird Atlas project in squares 17ML28 and 17ML29. Breeding bird surveys in the study area did not locate this species.

Black Tern - More recent reports of Black Terns from the west end of Bass Lake during 1990 and 1991 were also identified. This species has a strong affiliation with emergent marsh environments bordering lakes. The study area lacks any habitat feature of this type and therefore this species would not be found in the vicinity of the proposed wind farm and is not considered a management issue.

Loggerhead Shrike - One historical record for a loggerhead shrike (*Lanius ludovicianus*) in the year 2000 exists for the southeast portion of the study area. This species is listed as an endangered species in Schedule 1 of the Species at Risk Act. During fieldwork, the historical presence of Loggerhead Shrikes was known and the species was actively searched for in areas where potential habitat might exist. No observation of the species was documented for the area during fieldwork.

Eastern Massasauga – Eastern Massasaugas are generally associated with wet habitats particularly wetlands near river mouths (Canadian Amphibian and Reptile Conservation Network, 2007). There were 3 Massasauga Rattlesnake individuals sighted in 1985 approximately 1km west of the study area. Schedule 1 of the Species at Risk Act (SARA) has designated the Massasauga Rattlesnake as threatened. This species was not observed during fieldwork.

Blanding's Turtle – This species can be found in productive shallow lakes, ponds and wetlands with clean water and mucky bottoms (Canadian Amphibian and Reptile Conservation Network, 2007). No data was available for the Blanding's Turtle records in the study area. This species was not observed during fieldwork.

5.0 SUMMARY

This report provides a review of the existing environmental features in the study area based on background information, agency consultation and field work. Where appropriate, background information was supplemented through consultation with MNR staff. Environmental features and issues identified through this work have been used in combination with other technical reports and disciplines to direct the site layout, evaluation of potential impacts and mitigation as well as environmental management and monitoring plans discussed in the Environmental Screening Report (ESR).

6.0 REFERENCES

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Appendix A
Fall 2008 Plant List for McLeans Mountain Wind Farm Study Area

Table 1. Fall 2008 Plant List for Mcleans Mountain Wind Farm Study Area.

Scientific Name	Common Names	Coefficient Conservatism	Coefficient Wetness	SRank	Introduced/ Native	Turbine Quadrats Found In.
<i>Abies balsamea</i>	Balsam Fir	5	-3	S5	N	21, 18, 22, 33, 40, 26, 19, 37, 9,
<i>Acer negundo</i>	Manitoba Maple	0	-2	S5	N	9,
<i>Acer rubrum</i>	Red Maple	4	0	S5	N	
<i>Acer saccharum ssp. saccharum</i>	Sugar Maple	4	3	S5	N	21, 22, 33, 35, 41, 40, 13, 10, 11, 26, 19, 37, 12,
<i>Acer spicatum</i>	Mountain Maple	6	3	S5	N	
<i>Achillea millefolium ssp. millefolium</i>	Common Yarrow	0	3	SE	I	1, 2, 38, 33, 7, 30, 32, 36, 28,
<i>Actaea rubra</i>	Red Baneberry	5	5	S5	N	33, 35, 19,
<i>Aegopodium podagraria</i>	Goutweed	0	0	SE5	I	21,
<i>Agrimonia gryposepala</i>	Tall Agrimony	2	2	S5	N	18, 1, 26,
<i>Agrostis gigantea</i>	Redtop Grass	0	0	SE5	I	1, 2, 7
<i>Ajuga reptans</i>	Common Bugle	0	5	SE2	I	18
<i>Alisma plantago-aquatica</i>	Common Water-plantain	3	-5	S5	N	
<i>Allium tricoccum</i>	Wild Leek	7	2	S5	N	
<i>Alnus incana ssp. rugosa</i>	Speckled Alder	6	-5	S5	N	22,
<i>Ambrosia artemisiifolia</i>	Common Ragweed	0	3	S5	N	2,
<i>Amelanchier sp</i>	Serviceberry Species				N	38, 22,
<i>Anaphalis margaritacea</i>	Pearly Everlasting	3	5	S5	N	
<i>Anemone acutiloba</i>	Sharp-lobed Hepatica	6	5	S5	N	35,
<i>Anemone americana</i>	Round-lobed Hepatica	6	5	S5	N	21, 22, 33, 19,
<i>Anemone virginiana var. virginiana</i>	Thimbleweed	4	5	S5	N	38,
<i>Antennaria sp</i>	Pussytoes Species				N	
<i>Apocynum androsaemifolium ssp. androsaemifolium</i>	Spreading Dogbane	3	5	S5	N	
<i>Aquilegia canadensis</i>	Wild Columbine	5	1	S5	N	38,
<i>Aralia nudicaulis</i>	Wild Sarsaparilla	4	3	S5	N	18, 22, 41, 26, 28, 37, 9,
<i>Arctostaphylos uva-ursi</i>	Bearberry	8	5	S5	N	31,
<i>Asclepias syriaca</i>	Common Milkweed	0	5	S5	N	
<i>Asplenium trichomanes ssp. trichomanes</i>	Maidenhair Spleenwort	8	5	SU	N	
<i>Aster ciliolatus</i>	Fringed-blue Aster	6	4	S5	N	30,
<i>Aster ericoides var. ericoides</i>	Heath Aster	4	4	S5	N	
<i>Aster laevis var. laevis</i>	Smooth Aster	7	5	S5	N	
<i>Aster lanceolatus ssp. lanceolatus</i>	Panicled Aster	3	-3	S5	N	
<i>Aster lateriflorus var. lateriflorus</i>	One-sided Aster	3	-2	S5	N	18, 2, 22, 13, 34, 28, 12,
<i>Aster macrophyllus</i>	Large-leaved Aster	5	5	S5	N	21, 18, 22, 33, 35, 10, 26, 28, 37,
<i>Aster umbellatus var. umbellatus</i>	Flat-topped White Aster	6	-3	S5	N	18, 31,

Scientific Name	Common Names	Coefficient Conservatism	Coefficient Wetness	SRank	Introduced/ Native	Turbine Quadrats Found In.
<i>Aster urophyllus</i>	Arrow-leaved Aster	6	5	S4	N	18, 38, 33, 36,
<i>Aster sp.</i>					N	1, 5, 11,
<i>Astragalus neglectus</i>	Cooper's Milkvetch	9	4	S3	N	37,
<i>Athyrium filix-femina var. angustum</i>	Northern Lady Fern	4	0	S5	N	9,
<i>Betula papyrifera</i>	White Birch	2	2	S5	N	35, 26, 22, 9,
<i>Bidens frondosa</i>	Devil's Beggar-ticks	3	-3	S5	N	
<i>Bidens tripartita</i>	Three-lobed Beggar-ticks	4	-3	S5	N	
<i>Botrychium virginianum</i>	Rattlesnake Fern	5	3	S5	N	41, 40, 19, 28, 37, 9,
<i>Bromus inermis ssp. inermis</i>	Smooth Brome	0	5	SE5	I	
<i>Calamagrostis canadensis</i>	Canada Blue-joint	4	-5	S5	N	
<i>Caltha palustris</i>	Marsh Marigold	5	-5	S5	N	
<i>Carex albursina</i>	Blunt-scaled Wood Sedge	7	5	S5	N	
<i>Carex eburnea</i>	Bristle-leaved Sedge	6	4	S5	N	22, 41, 40, 31, 26,
<i>Carex gracillima</i>	Graceful Sedge	4	3	S5	N	13, 10, 12,
<i>Carex granularis</i>	Meadow Sedge	3	-4	S5	N	
<i>Carex intumescens</i>	Bladder Sedge	6	-4	S5	N	
<i>Carex lacustris</i>	Lakebank Sedge	5	-5	S5	N	
<i>Carex pennsylvanica</i>	Pennsylvania Sedge	5	5	S5	N	26,
<i>Carex plantaginea</i>	Plantain-leaved Sedge	7	5	S5	N	10, 11,
<i>Carex retrorsa</i>	Retorse Sedge	5	-5	S5	N	
<i>Carex tenera</i>	Slender Straw Sedge	4	-1	S5	N	7, 10,
<i>Carex tuckermanii</i>	Tuckerman's Sedge	7	-5	S4	N	
<i>Carex viridula</i>	Greenish Sedge	5	-5	S5	N	
<i>Carex vulpinoidea</i>	Fox Sedge	3	-5	S5	N	
<i>Carex sp.</i>					N	22,
<i>Castilleja coccinea</i>	Indian Paintbrush	9	0	S5	N	34,
<i>Cerastium arvense ssp. strictum</i>	Field Chickweed	8	4	S4	N	
<i>Chrysanthemum leucanthemum</i>	Ox-eye Daisy	0	5	SE5	I	30, 32, 36,
<i>Cichorium intybus</i>	Chicory	0	5	SE5	I	30,
<i>Cicuta bulbifera</i>	Bulb-bearing Water-hemlock	5	-5	S5	N	
<i>Cicuta maculata</i>	Spotted Water-hemlock	6	-5	S5	N	
<i>Cirsium arvense</i>	Canada Thistle	0	3	SE5	I	30,
<i>Cirsium vulgare</i>	Bull Thistle	0	4	SE5	I	
<i>Clinopodium vulgare</i>	Wild Basil	4	5	S5	N	
<i>Corallorhiza sp</i>	Coralroot Species				N	
<i>Cornus canadensis</i>	Bunchberry	7	0	S5	N	18, 26, 22,
<i>Cornus foemina ssp. racemosa</i>	Grey Dogwood	2	-2	S5	N	
<i>Cornus rugosa</i>	Round-leaved Dogwood	6	5	S5	N	
<i>Cornus stolonifera</i>	Red-osier Dogwood	2	-3	S5	N	18, 31, 34, 28, 22,
<i>Corylus cornuta</i>	Beaked Hazelnut	5	5	S5	N	18, 35, 41, 28,
<i>Crataegus sp</i>	Hawthorn Species				N	32, 36,

Scientific Name	Common Names	Coefficient Conservatism	Coefficient Wetness	SRank	Introduced/ Native	Turbine Quadrats Found In.
<i>Cryptotaenia canadensis</i>	Honewort	5	0	S5	N	
<i>Cystopteris bulbifera</i>	Bulblet Bladder Fern	5	-2	S5	N	
<i>Cystopteris fragilis</i>	Brittle Fern	7	3	S5	N	
<i>Dactylis glomerata</i>	Orchard Grass	0	3	SE5	I	
<i>Danthonia spicata</i>	Poverty Oat Grass	5	5	S5	N	1, 2, 38, 5, 7, 32, 31, 3, 36, 12,
<i>Daucus carota</i>	Wild Carrot	0	5	SE5	I	7, 32, 22,
<i>Dianthus armeria</i>	Deptford Pink	0	5	SE5	I	
<i>Dirca palustris</i>	Leatherwood	7	0	S4?	N	21, 22, 33, 35, 41, 13, 26, 19, 12, 9,
<i>Dryopteris carthusiana</i>	Spinulose Wood Fern	5	-2	S5	N	18, 9,
<i>Dryopteris cristata</i>	Crested Wood Fern	7	-5	S5	N	
<i>Dryopteris intermedia</i>	Evergreen Wood Fern	5	0	S5	N	
<i>Dryopteris marginalis</i>	Marginal Wood Fern	5	3	S5	N	
<i>Echinochloa crusgalli</i>	Barnyard Grass	0	-3	SE5	I	
<i>Eleocharis sp</i>	Spike-rush Species				N	
<i>Elymus hystrix</i>	Bottlebrush Grass	5	5	S5	N	22, 33, 10, 11,
<i>Elymus repens</i>	Quack Grass	0	3	SE5	I	
<i>Epilobium angustifolium</i>	Fireweed	3	0	S5	N	
<i>Epilobium coloratum</i>	Purple-leaved Willow-herb	3	-5	S5	N	
<i>Epipactis helleborine</i>	Helleborine	0	5	SE5	I	21, 18, 38, 22, 33, 35, 41, 40, 13, 10, 19, 28, 37, 12, 9,
<i>Equisetum arvense</i>	Field Horsetail	0	0	S5	N	28, 22,
<i>Equisetum fluviatile</i>	Water Horsetail	7	-5	S5	N	
<i>Erigeron annuus</i>	Daisy Fleabane	0	1	S5	N	
<i>Eupatorium maculatum ssp. maculatum</i>	Spotted Joe-pye-weed	3	-5	S5	N	18,
<i>Eupatorium perfoliatum</i>	Common Boneset	2	-4	S5	N	
<i>Euphorbia esula</i>	Leafy Spurge	0	5	SE5	I	
<i>Euthamia graminifolia</i>	Grass-leaved Goldenrod	2	-2	S5	N	
<i>Fragaria virginiana ssp. virginiana</i>	Common Strawberry	2	1	S5	N	18, 2, 38, 33, 30, 32, 31, 34, 36, 28, 22,
<i>Fraxinus americana</i>	White Ash	4	3	S5	N	33, 35, 41, 40, 13, 10, 11, 26, 19, 37,
<i>Fraxinus nigra</i>	Black Ash	7	-4	S5	N	18, 28, 9,
<i>Fraxinus pennsylvanica</i>	Red Ash	3	-3	S5	N	
<i>Galium palustre</i>	Marsh Bedstraw	5	-5	S5	N	31,
<i>Galium triflorum</i>	Fragrant Bedstraw	4	2	S5	N	18,
<i>Galium verum</i>	Yellow Bedstraw	0	5	SE5	I	
<i>Geranium robertianum</i>	Herb Robert	0	5	SE5	I	11,
<i>Geum triflorum</i>	Prairie Smoke	9	4	S4	N	1, 38, 5, 7,
<i>Geum sp.</i>					N	22,
<i>Glyceria striata</i>	Fowl Manna Grass	3	-5	S5	N	
<i>Goodyera oblongifolia</i>	Menzies Rattlesnake Plantain	7	5	S4	N	22, 33, 35, 41, 40, 26, 28, 37,

Scientific Name	Common Names	Coefficient Conservatism	Coefficient Wetness	SRank	Introduced/ Native	Turbine Quadrats Found In.
<i>Gymnocarpium dryopteris</i>	Common Oak Fern	7	0	S5	N	9,
<i>Hedeoma pulegioides</i>	American Pennyroyal	6	5	S4	N	38,
<i>Hieracium aurantiacum</i>	Orange Hawkweed	0	5	SE5	I	36,
<i>Hieracium scabrum</i>	Rough Hawkweed	7	5	S4	N	
<i>Hieracium sp.</i>	Hawkweed Species				N	5, 7, 30, 32,
<i>Hypericum perforatum</i>	Common St. John's-wort	0	5	SE5	I	38,
<i>Impatiens capensis</i>	Spotted Touch-me-not	4	-3	S5	N	
<i>Inula helenium</i>	Elecampane	0	5	SE5	I	
<i>Iris versicolor</i>	Northern Blue-flag	5	-5	S5	N	
<i>Juncus dudleyi</i>	Dudley's Rush	1	0	S5	N	7,
<i>Juncus tenuis</i>	Path Rush	0	0	S5	N	
<i>Juncus sp.</i>					N	34,
<i>Juniperus communis</i>	Common Juniper	4	3	S5	N	36,
<i>Juniperus horizontalis</i>	Creeping Juniper	10	1	S5	N	
<i>Lactuca serriola</i>	Prickly Lettuce	0	0	SE5	I	
<i>Lapsana communis</i>	Nipplewort	0	5	SE5	I	
<i>Larix laricina</i>	Tamarack	7	-3	S5	N	
<i>Lilium philadelphicum</i>	Wood Lily	8	1	S5	N	
<i>Linnaea borealis ssp. longiflora</i>	Twinflower	7	0	S5	N	18, 37,
<i>Lonicera canadensis</i>	Fly Honeysuckle	6	3	S5	N	9,
<i>Lonicera dioica</i>	Glaucous Honeysuckle	5	3	S5	N	35,
<i>Lotus corniculatis</i>	Birds-foot Trefoil	0	1	SE5	I	
	Cut-leaved Water-horehound				N	
<i>Lycopus americanus</i>		4	-5	S5		34,
	Northern Water-horehound				N	
<i>Lycopus uniflorus</i>		5	-5	S5		
					N	21, 33, 41, 40, 10, 26, 28, 37, 9,
<i>Maianthemum canadense</i>	Canada Mayflower	5	0	S5		
					N	
<i>Maianthemum racemosum ssp. racemosum</i>	False Solomon's Seal	4	3	S5		10,
					N	
<i>Maianthemum stellatum</i>	Starry False Solomon's Seal	6	1	S5	N	18, 35, 41, 10,
<i>Malus pumila</i>	Common Apple	0	5	SE5	I	
<i>Medicago lupulina</i>	Black Medick	0	1	SE5	I	1, 2, 38, 22, 5, 7, 30,
<i>Medicago sativa ssp. sativa</i>	Alfalfa	0	5	SE5	I	2,
<i>Melilotus alba</i>	White Sweet-clover	0	3	SE5	I	
<i>Melilotus officinalis</i>	Yellow Sweet-clover	0	3	SE5	I	
<i>Mentha arvensis ssp. borealis</i>	Wild Mint	3	-3	S5	N	
<i>Mitella nuda</i>	Naked Mitrewort	6	-3	S5	N	18, 9,
<i>Monotropa hypopithys</i>	Pinesap	6	5	S4	N	33,
<i>Monotropa uniflora</i>	Indian-pipe	6	3	S5	N	
<i>Nepeta cataria</i>	Catnip	0	1	SE5	I	
<i>Onoclea sensibilis</i>	Sensitive Fern	4	-3	S5	N	22,
					N	21, 33, 35, 41, 40, 13, 10, 11,
<i>Ostrya virginiana</i>	Hop Hornbeam	4	4	S5		19,

Scientific Name	Common Names	Coefficient Conservatism	Coefficient Wetness	SRank	Introduced/ Native	Turbine Quadrats Found In.
<i>Panicum capillare</i>	Witch Panic Grass	0	0	S5	N	
<i>Panicum depauperatum</i>	Starved Panic Grass	6	5	S4	N	
<i>Panicum sp.</i>					N	34,
<i>Petasites frigidus</i>	Sweet Coltsfoot	8	-3	S5	N	26, 28, 22,
<i>Phalaris arundinacea</i>	Reed Canary Grass	0	-4	S5	N	22,
<i>Phleum pratense</i>	Timothy	0	3	SE5	I	1, 2, 5, 7, 36,
<i>Picea glauca</i>	White Spruce	6	3	S5	N	31, 26, 22, 12, 9,
<i>Picea mariana</i>	Black Spruce	8	-3	S5	N	
<i>Pinus strobus</i>	Eastern White Pine	4	3	S5	N	33,
<i>Plantago lanceolata</i>	Ribgrass	0	0	SE5	I	36,
<i>Plantago major</i>	Common Plantain	0	-1	SE5	I	
<i>Poa compressa</i>	Canada Blue Grass	0	2	S5	N	21,
<i>Poa pratensis ssp. pratensis</i>	Kentucky Blue Grass	0	1	S5	N	30, 32, 34,
<i>Polygonatum pubescens</i>	Hairy Solomon's Seal	5	5	S5	N	
<i>Polygonum hydropiperoides</i>	Mild Water Pepper	4	-5	S5	N	
<i>Polypodium virginianum</i>	Rock Polypody	6	5	S5	N	
<i>Populus balsamifera ssp. balsamifera</i>	Balsam Poplar	4	-3	S5	N	18, 26, 28, 9,
<i>Populus grandidentata</i>	Large-toothed Aspen	5	3	S5	N	
<i>Populus tremuloides</i>	Trembling Aspen	2	0	S5	N	18, 35, 41, 40, 31, 26, 37,
<i>Potentilla argentea</i>	Silvery Cinquefoil	0	3	SE5	I	38,
<i>Potentilla recta</i>	Rough-fruited Cinquefoil	0	5	SE5	I	36,
<i>Potentilla simplex</i>	Common Cinquefoil	3	4	S5	N	38,
<i>Prenanthes alba</i>	White Lettuce	6	3	S5	N	10,
<i>Prunella vulgaris ssp. lanceolata</i>	Heal-all	5	5	S5	N	21, 18, 38, 36, 28, 12,
<i>Prunus virginiana ssp. virginiana</i>	Choke Cherry	2	1	S5	N	10,
<i>Pteridium aquilinum var. latiusculum</i>	Eastern Bracken Fern	2	3	S5	N	22, 35, 41, 26,
<i>Pyrola asarifolia</i>	Pink Pyrola	7	-3	S5	N	
<i>Pyrola sp</i>	Pyrola Species				N	35,
<i>Pyrus communis</i>	Common Pear	0	5	SE4	I	
<i>Quercus macrocarpa</i>	Bur Oak	5	1	S5	N	22, 33, 13, 36, 28, 37, 12,
<i>Quercus rubra</i>	Red Oak	6	3	S5	N	
<i>Ranunculus abortivus</i>	Kidney-leaf Buttercup	2	-2	S5	N	
<i>Ranunculus acris</i>	Tall Buttercup	0	-2	SE5	I	21, 13, 12
<i>Rhus aromatica</i>	Fragrant Sumac	8	5	S5	N	38, 35,
<i>Rhus radicans ssp. rydbergii</i>	Western Poison-ivy	0	0	S5	N	28, 37,
<i>Rhus typhina</i>	Staghorn Sumac	1	5	S5	N	
<i>Ribes americanum</i>	Wild Black Currant	4	-3	S5	N	18, 28,
<i>Ribes cynosbati</i>	Prickly Gooseberry	4	5	S5	N	10,
<i>Ribes hirtellum</i>	Smooth Gooseberry	6	-3	S5	N	
<i>Ribes lacustre</i>	Swamp Black Currant	7	-3	S5	N	
<i>Ribes triste</i>	Swamp Red Currant	6	-5	S5	N	28,
<i>Rosa sp</i>	Rose Species				N	1, 22, 5, 7, 37,

Scientific Name	Common Names	Coefficient Conservatism	Coefficient Wetness	SRank	Introduced/ Native	Turbine Quadrats Found In.
<i>Rubus flagellaris</i>	Northern Dewberry	4	4	S4	N	
<i>Rubus idaeus ssp. melanolasius</i>	Wild Red Raspberry	0	-2	S5	N	
<i>Rubus pubescens</i>	Dwarf Raspberry	4	-4	S5	N	18, 28, 22, 37, 9
<i>Rumex acetosella ssp. acetosella</i>	Sheep Sorrel	0	0	SE5	I	36,
<i>Rumex crispus</i>	Curly Dock	0	-1	SE5	I	1, 7, 36,
<i>Salix bebbiana</i>	Bebb's Willow	4	-4	S5	N	31, 34,
<i>Salix discolor</i>	Pussy Willow	3	-3	S5	N	34, 22,
<i>Salix eriocephala</i>	Woolly-headed Willow	4	-3	S5	N	
<i>Salix petiolaris</i>	Slender Willow	3	-4	S5	N	
<i>Sambucus racemosa ssp. pubens</i>	Red-berried Elderberry	5	2	S5	N	
<i>Sanicula marilandica</i>	Black Snakeroot	5	3	S5	N	21, 33, 35, 41, 40, 28, 37,
<i>Saxifraga virginensis</i>	Early Saxifrage	6	1	S5	N	
<i>Scirpus atrovirens</i>	Black Bulrush	3	-5	S5	N	
<i>Scirpus cyperinus</i>	Wool Grass	4	-5	S5	N	
<i>Scirpus validus</i>	Softstem Bulrush	5	-5	S5	N	
<i>Scutellaria lateriflora</i>	Mad Dog Skullcap	5	-5	S5	N	
<i>Sedum acre</i>	Mossy Stonecrop	0	5	SE5	I	
<i>Shepherdia canadensis</i>	Buffalo Berry	7	5	S5	N	22, 33, 26, 28, 37,
<i>Silene vulgaris</i>	Bladder Champion	0	5	SE5	I	
<i>Sium suave</i>	Water-parsnip	4	-5	S5	N	
<i>Solidago canadensis var. canadensis</i>	Canada Goldenrod	1	3	S5	N	18,
<i>Solidago juncea</i>	Early Goldenrod	3	5	S5	N	
<i>Solidago nemoralis ssp. nemoralis</i>	Gray Goldenrod	2	5	S5	N	32, 31,
<i>Solidago ptarmicoides</i>	Upland White Goldenrod	9	5	S5	N	
<i>Solidago rugosa ssp. rugosa</i>	Rough Goldenrod	4	-1	S5	N	
<i>Solidago uliginosa</i>	Marsh Goldenrod	9	-5	S5	N	
<i>Solidago sp.</i>					N	34,
<i>Sorbus decora</i>	Showy Mountain-ash	8	3	S5	N	37,
<i>Symphoricarpos albus</i>	Snowberry	7	4	S5	N	38, 33, 35, 36,
<i>Tanacetum vulgare</i>	Tansy	0	5	SE5	I	
<i>Taraxacum officinale</i>	Common Dandelion	0	3	SE5	I	33, 5, 30,
<i>Thuja occidentalis</i>	Eastern White Cedar	4	-3	S5	N	33, 41, 40, 31, 26, 28, 22, 37,
<i>Tilia americana</i>	Basswood	4	3	S5	N	33, 41,
<i>Tragopogon pratensis ssp. pratensis</i>	Meadow Goat's-beard	0	5	SE5	I	
<i>Trientalis borealis ssp. borealis</i>	Starflower	6	-1	S5	N	
<i>Trifolium campestre</i>	Large Hop Clover	0	5	SE5	I	
<i>Trifolium pratense</i>	Red Clover	0	2	SE5	I	1, 2, 33, 5, 7, 30, 32, 3, 36, 28,
<i>Trifolium repens</i>	White Clover	0	2	SE5	I	1, 2, 5, 7,
<i>Trillium grandiflorum</i>	White Trillium	5	5	S5	N	
<i>Trillium sp.</i>					N	10,
<i>Typha latifolia</i>	Broad-leaved Cattail	3	-5	S5	N	

Scientific Name	Common Names	Coefficient Conservatism	Coefficient Wetness	SRank	Introduced/ Native	Turbine Quadrats Found In.
<i>Ulmus americana</i>	White Elm	3	-2	S5	N	18, 36, 9
<i>Verbascum thapsus</i>	Common Mullein	0	5	SE5	I	
<i>Veronica officinalis</i>	Common Speedwell	0	5	SE5	I	21, 19
<i>Viburnum acerifolium</i>	Maple-leaved Viburnum	6	5	S5	N	40,
<i>Viburnum rafinesquianum</i>	Downy Arrow-wood	7	5	S5	N	35,
<i>Vicia cracca</i>	Cow Vetch	0	5	SE5	I	
<i>Viola cucullata</i>	Marsh Blue Violet	5	-5	S5	N	
<i>Viola sp</i>	Violet Species				N	21, 18, 22, 33, 35, 41, 40, 13, 10, 11, 31, 34, 26, 19, 28, 12, 9,
<i>Waldsteinia fragarioides</i>	Barren Strawberry	5	5	S5	N	

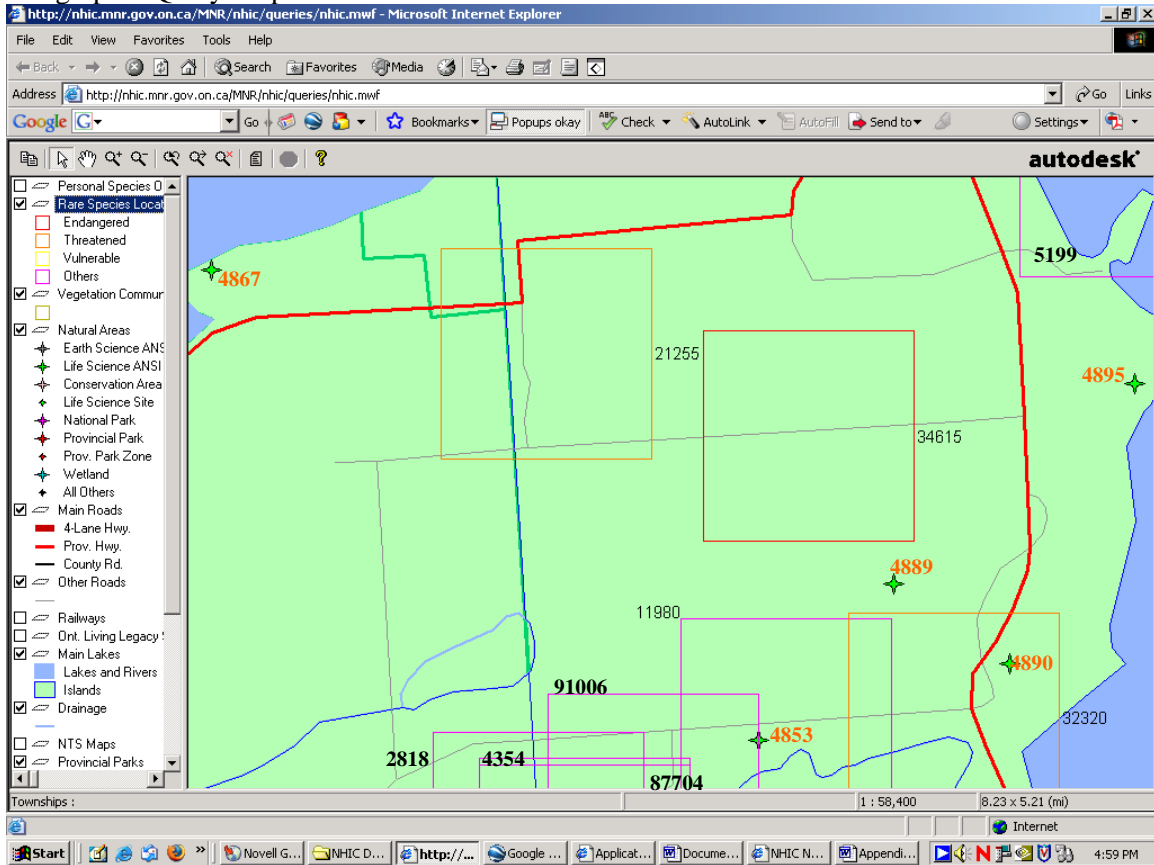
Coefficient of Conservatism: Numeric value between 0 and 10 which indicates the degree of faithfulness a plant displays to a specific habitat or set of environmental conditions. Conservative plant species, such as those which are only found in relatively pristine natural habitats such as bogs or prairies, are assigned a high coefficient of conservatism; other plant species which grow in a wide variety of habitats and can tolerate high levels of cultural disturbance are assigned low values.

Coefficient Wetness: Lower negative numbers imply greater correlation with wetland conditions whereas higher positive numbers imply greater correlation with upland conditions.

SRank: Provincial ranks used by the Natural Heritage Information Centre to set protection priorities for rare species and natural communities. By comparing the provincial ranks, the status, rarity, and the urgency of conservation, needs can be ascertained. [S1 – Critically imperiled in Ontario; S2 – Imperiled in Ontario; S3 – Vulnerable in Ontario; S4 – Apparently secure in Ontario; S5 – Secure in Ontario; SE – Exotic]

Appendix B
Natural Area Summary Reports

Geographic Query Map



Geographic Query Report – Rare Species Location

EO_ID	Scientific Name	Common Name	UTM Centroid (rounded)	Srank	MNR	COSEWIC	Date
2818	<i>Peltandra virginica</i>	Arrow-arum	17 422000 5081000	S2			1981-07-06
4354	<i>Buteo lineatus</i>	Red-shouldered Hawk	17 423000 5081000	S4B,SZN	SC	SC	1974
5199	<i>Solidago houghtonii</i>	Houghton's Goldenrod	17 431000 5090000	S2		SC	1976-09-26
11980	<i>Chlidonias niger</i>	Black Tern	17 426000 5083000	S3B,SZN	SC	NAR	1991-06-22
21255	Sensitive species		17 423000 5088000	S3	THR	THR	1985
32320	Sensitive species		17 428000 5083000	S3	THR	THR	1985-08-06
34615	<i>Lanius ludovicianus</i>	Loggerhead Shrike	17 427000 5087000	S2B,SZN	END-R	END	2000
87704	Sensitive species		17 423000 5081000	S3	SC	SC	09/06/2004
91006	Sensitive species		17 424000 5082000	S3	SC	SC	1986-08-03

Geographic Query Report – Natural Areas

Area_ID	Natural Area	Significance	Area Type	UTM Centroid (rounded)	Size	Map #
4853	Bass Lake Marsh/Swamp	Regional	Candidate Life Science ANSI	17,425500, 5082500	46.0 ha	41H/13
4867	Freer Point Limestone Alvar	Provincial	Candidate Life Science ANSI	17,418500, 5089500	255.0 ha	41G/16
4889	Sheguiandah Hill	Provincial	Candidate Life Science ANSI	17,427500, 5084500	440.0 ha	41H/13
4890	Sheguiandah Quartzite Quarry	Provincial	Candidate Life Science ANSI	17,429000, 5083300	90.0 ha	41H/13
4895	Strawberry Channel Wetlands	Regional	Candidate Life Science ANSI	17,431000, 5087000	165.0 ha	41H/13

BASS LAKE MARSH/SWAMP

AREA_ID: 4853

Significance	Area Type	Size	Centroid UTM	Map #
Regional	Candidate Life Science ANSI	46.0 ha	17,425500,5082500	41H/13

Description

Vegetation

The west end of Bass Lake supports a small shoreline marsh/swamp complex on what is expected to be clay substrates. This site was seen from the road and very briefly from the air. The forested portion, which is cut into two parts by an east-west road, consists of a small but excellent red maple swamp (red maple - sensitive fern vegetative site type). Before its demise, elm may have been a major constituent of this swamp. Although clay is thought to be the substrate type it is possible that there are places in the swamp where the overlying organic layer is deep enough to be placed in the organic category. Cleared land abuts the swamp reflecting an abrupt change in moisture content. A raised shoreline with eroded gullies is detectible upslope on the cleared land. The immediate offshore area of Bass Lake supports a number of deep and shallow marsh communities, however, most were not discernible. [Noble 1995]

Representation

Potential	Community/Site	Type	Representation:
Deep emergent marsh	dominated by <i>Scirpus acutus</i>	(Normal temperature - Clay substrate - Open Water)	
Meadow emergent marsh	dominated by <i>Phalaris arundinacea</i>	(Normal temperature - Clay substrate - Very Wet)	
Shallow emergent marsh	dominated by <i>Typha latifolia</i>	(Normal temperature - Clay substrate - Saturated)	
Mature deciduous swamp	dominated by <i>Acer rubrum</i>	(Normal temperature - Clay substrate - Wet)	[Noble 1995]

Landform

Weakly broken lacustrine/silt clay plain (sandy till - drum; bedrock - quartz). [Noble 1995]

References

- Noble, T.W. 1995. Site District 5E2 Gap Analysis. Ontario Ministry of Natural Resources, Central Region, Huntsville, Ontario.

FREER POINT LIMESTONE ALVAR

AREA_ID: 4867

Significance	Area Type	Size	Centroid UTM	Map #
Provincial	Candidate Life Science ANSI	255.0 ha	17,418500,5089500	41G/16

Description

Vegetation

Representation

The site is an earth science ANSI for its limestone features. It could also provide representation of limestone alvar vegetation (both dry and wet dominance types) for the life science framework. Unusual straight lines of treed vegetation (possibly cedar and black or red/green ash) across the alvar were noted from a high altitude during a brief helicopter flight over the site. Most of the sites having representation potential on the island are typically dolostone bedrock rather than limestone. In addition, the Nipissing and Post-Nipissing sequence of raised beaches represented here are relatively uncommon on the island's north shore.

This site was not seen on the ground. The community representation accompanying this checksheet has been interpreted from aerial photographs. The physiographic intricacies of this site make it difficult to distinguish between swamp and upland forest (black or red ash, trembling aspen or balsam poplar). Pending a site visit the treed vegetation has been lumped into the swamp category. Thicket swamp and marsh dominance types occur in the vicinity of the bay shoreline. Limestone pavement (alvar) affiliates are expected to be represented here at the species level of the ecological hierarchy.

Potential	Community/Site	Type	Representation:
Rock barrens	dominated by rock	(Normal temperature - Rock substrate - Dry)	
Mature mixed forest	dominated by <i>Populus tremuloides</i>	(Normal temperature - Loam substrate - Mesic)	
Mature deciduous swamp	dominated by <i>Acer rubrum</i>	(Normal temperature - Loam substrate - Wet)	
Mature deciduous swamp	dominated by <i>Fraxinus nigra</i>	(Normal temperature - Loam substrate - Wet)	
Mature coniferous swamp	dominated by <i>Thuja occidentalis</i>	(Colder than normal temperature - Organic substrate - Wet)	
Mature mixed swamp	dominated by <i>Thuja occidentalis</i>	(Normal temperature - Loam substrate - Wet)	[Noble 1995]

Landform

Freer Point consists of a shallow embayment flanked by arcuate raised shoreline features on its south and east sides and south dipping limestone pavement on the north. A drainage divide located in the central portion of the alvar forces a small short stream system to flow to the west and Sucker Creek to flow to the northeast. The site is an earth science ANSI for its limestone features.

Very weakly broken bedrock plain (lacustrine sand - limestone). [Noble 1995]

References

- Noble, T.W. 1995. Site District 5E2 Gap Analysis. Ontario Ministry of Natural Resources, Central Region, Huntsville, Ontario.

SHEGUIANDAH HILL

AREA_ID: 4889

Significance	Area Type	Size	Centroid UTM	Map #
Provincial	Candidate Life Science ANSI	440.0 ha	17,427500,5084500	41H/13

Description

Vegetation

Except for a few exceptional remnant stands in the Mindemoya, St. Joseph, Great Duck and Sheguiandah areas the maple forests of Site District 5E-2 are unremarkable. This high hill is one of the few remaining areas in the Sheguiandah vicinity that supports relatively extensive deciduous forests, particularly sugar maple and red oak. According to the FRI mapping white ash is a minor component on the plateau. These stands are not, however, continuous as they are dispersed by open fields which follow the flatter shoreline terraces.

These remnant stands have only been seen from the air and at a distance from side roads. It is expected that they will be rich in understory species, in particular southern affiliates. [Noble 1995]

Representation

Potential Community/Site Type Representation:

Rock barrens dominated by rock (Warmer than normal temperature - Rock substrate - Very Dry)

Mature deciduous forest dominated by *Acer saccharum* (Warmer than normal temperature - Loam substrate - Dry Mesic)

Mature deciduous forest dominated by *Acer saccharum* (Warmer than normal temperature - Loam substrate - Dry Mesic)

Mature deciduous forest dominated by *Acer saccharum* (Warmer than normal temperature - Loam substrate - Dry Mesic)

Mature deciduous forest dominated by *Acer saccharum* (Warmer than normal temperature - Loam substrate - Dry Mesic)

Mature deciduous forest dominated by *Populus tremuloides* (Normal temperature - Loam substrate - Mesic)

Mature deciduous forest dominated by *Populus tremuloides* (Normal temperature - Loam substrate - Mesic)

Mature deciduous forest dominated by *Populus tremuloides* (Warmer than normal temperature - Loam substrate - Dry Mesic)

Mature mixed forest dominated by *Populus tremuloides* (Warmer than normal temperature - Loam substrate - Mesic)

Mature deciduous forest dominated by *Populus tremuloides* (Warmer than normal temperature - Loam substrate - Mesic)

Mature deciduous swamp dominated by *Fraxinus nigra* (Warmer than normal temperature - Loam substrate - Wet)

[Noble 1995]

Landform

This site is centred on the shoreline terraced Sheguiandah Hill and includes two outlier ridges of quartzite in the

southwest corner. The water of Main Lake Algonquin just cleared the top of Sheguiandah to lap against High Hill (the Cup and Saucer) and the highest plateau immediately southwest of the lookout on McLean's Mountain. The effects of dropping lake levels are readily evident on Seguiandah Hill. So much so that the physiography of the Sheguiandah area was used by Bird and Hale (1982) to illustrate the layering effect of sedimentary rock, differential erosion and the effects of changing soil types on vegetation.

Sandy loam substrates are probably prevalent here, however, what is thought to be a localized clay occurrence was noted at the bottom of the hill in the ditch along a concession road on the site's east side. [Noble 1995]

Biophysiological Representation:

Weakly broken shallow sandy till plain (bedrock - limestone)

Weakly broken lacustrine silt/clay plain (sandy till - drum., bedrock - quartzite) [Noble 1995]

References

- Noble, T.W. 1995. Site District 5E2 Gap Analysis. Ontario Ministry of Natural Resources, Central Region, Huntsville, Ontario.

SHEGUIANDAH QUARTZITE QUARRY

AREA_ID: 4890

Significance	Area Type	Size	Centroid UTM	Map #
Provincial	Candidate Life Science ANSI	90.0 ha	17,429000,5083300	41H/13

Description

Sheguiandah Quartzite Quarry is a significant archeological site. [Noble 1995]

Vegetation

The quarry also supports a number of significant plant species. The back side of what remains of the quartzite ridge supports a red oak stand that has preservational potential. The FRI mapping delineates the stand as being red oak with sugar maple, trembling aspen and cedar as secondary components. This site was gated so was not seen from the ground. Based on the aerial photos the FRI mapping appears to have been lumped upwards. It is possible that two communities could be defined here, namely, red oak associated with bare rock or an extremely thin soil cover on the ridge top and south and east facing slopes and a second dominance type associated with what may be shallow clays abutting the rock slope. [Noble 1995]

Representation

It is possible that two communities could be defined here, namely, red oak associated with bare rock or an extremely thin soil cover on the ridge top and south and east facing slopes and a second dominance type associated with what may be shallow clays abutting the rock slope. [Noble 1995]

Potential	Community/Site	Type	Representation:
Rock barrens dominated by rock	(Warmer than normal temperature - Rock substrate - Very Dry)		
Mature deciduous forest dominated by Quercus rubra	(Warmer than normal temperature - Rock substrate - Dry)		[Noble 1995]

Landform

Biophysiological	Representation:
Weakly broken lacustrine silt/clay plain (Sandy till-drum, bedrock - quartzite)	[Noble 1995]

References

- Noble, T.W. 1995. Site District 5E2 Gap Analysis. Ontario Ministry of Natural Resources, Central Region, Huntsville, Ontario.

STRAWBERRY CHANNEL WETLANDS

AREA_ID: 4895

Significance	Area Type	Size	Centroid UTM	Map #
Regional	Candidate Life Science ANSI	165.0 ha	17,431000,5087000	41H/13

Description

Vegetation

Extensive Great Lakes open water shoreline marshes are associated with the east and west shores of Strawberry Channel (the Manitoulin and Strawberry Island shorelines respectively). These were seen from a great height by helicopter, however, their size and apparent diversity warrants their inclusion in any future fieldwork program. Marshes such as this are rare on Manitoulin's Lake Huron shoreline.

The alvar vegetation should be looked at for possible inclusion into this site or as a separate entity depending on land disposition in the area. [Noble 1995]

Representation

No community representation is shown except for a red maple swamp backing the shoreline. Monotypic marsh dominance types are expected in the offshore waters.

Potential	Community/Site	Type	Representation:
Mature deciduous swamp	dominated by <i>Acer rubrum</i>	(Normal temperature - Organic substrate - Wet)	[Noble 1995]

Landform

Biophysiological	Representation:
Great Lakes Shoreline (open water offshore wetlands)	[Noble 1995]

References

- Noble, T.W. 1995. Site District 5E2 Gap Analysis. Ontario Ministry of Natural Resources, Central Region, Huntsville, Ontario.
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APPENDIX C
Bird Conservation Region 13 Species

2006:

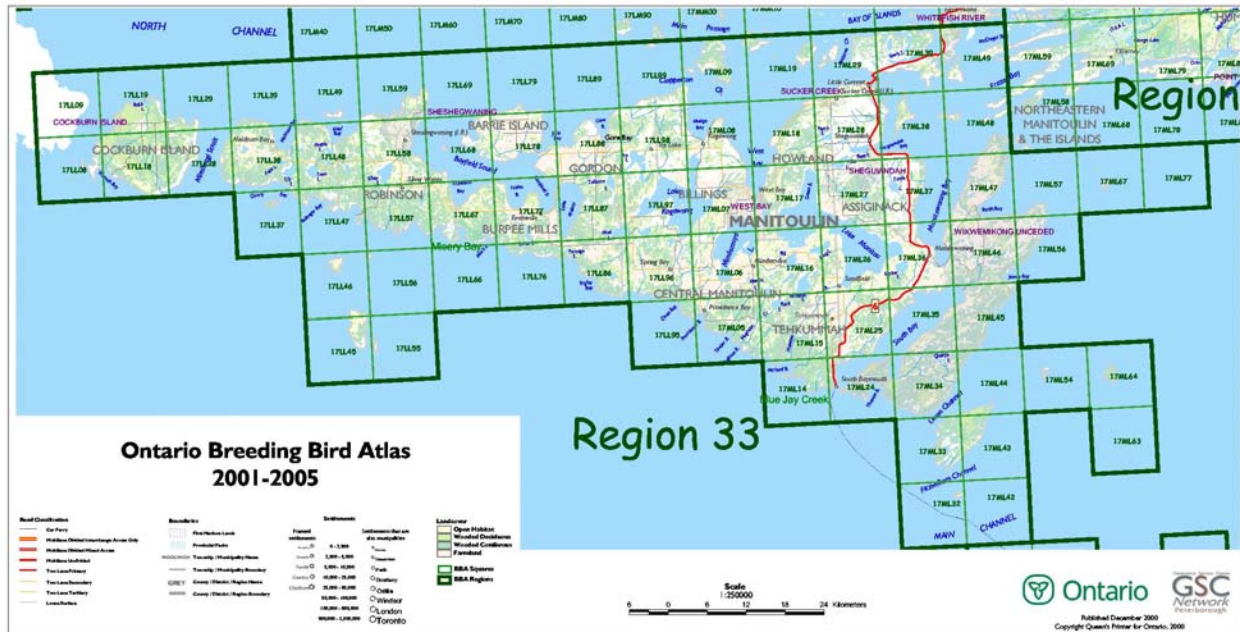
Table 3: Priority Landbird Species in Ontario BCR 13, sorted by Reasons for Priority Status, and showing Overall Objective, and Priority Suites Designation.

Species	Priority Reasons							Overall Objective	Guild(s) (Boldface indicates habitat obligates)
	Continental Concern	Regional Concern	Continental Stewardship	Regional Stewardship	At Risk – Canada	At Risk – Ontario	Management Interest		
Canada Warbler	Y	Y			UR			Reverse Decline	Forest
Cerulean Warbler	Y	Y			SC	SC		Assess Status	Forest
Golden-winged Warbler	Y	Y			UR			Maintain Current	Shrub/Successional
Henslow's Sparrow	Y	Y			EN	EN		Recovery	Grass/Agriculture
Red-headed Woodpecker	Y	Y			SC	SC		Reverse Decline	Forest
Wood Thrush	Y	Y						Maintain Current	Forest
Blue-winged Warbler	Y							Maintain Current	Shrub/Successional
Kirtland's Warbler	Y				EN	EN		Recovery	Shrub/Successional
Prairie Warbler	Y							Assess Status	Shrub/Successional
Short-eared Owl	Y				SC	SC		Assess Status	Grass/Agriculture
Willow Flycatcher	Y							Maintain Current	Shrub/Successional
Baltimore Oriole		Y		Y				Reverse Decline	Other Habitats
Black-billed Cuckoo		Y		Y				Halt Decline	Shrub/Successional
Bobolink		Y		Y				Halt Decline	Grass/Agriculture
American Kestrel		Y						Halt Decline	Grass/Agriculture
Belted Kingfisher		Y						Reverse Decline	Other Habitats
Brown Thrasher		Y						Halt Decline	Shrub/Successional
Eastern Kingbird		Y						Halt Decline	Grass/Agriculture
Eastern Meadowlark		Y						Halt Decline	Grass/Agriculture
Eastern Towhee		Y						Halt Decline	Shrub/Successional
Eastern Wood-Pewee		Y						Reverse Decline	Forest
Field Sparrow		Y						Halt Decline	Shrub/Successional
Northern Flicker		Y						Reverse Decline	Forest
Northern Harrier		Y						Maintain Current	Grass/Agriculture
Savannah Sparrow		Y						Halt Decline	Grass/Agriculture
Whip-poor-will		Y						Reverse Decline	Forest & Aerial
Bank Swallow				Y				Reverse Decline	Other & Aerial
Rose-breasted Grosbeak				Y				Maintain Current	Forest
Acadian Flycatcher					EN	EN		Recovery	Forest
Barn Owl					EN	EN		Recovery	Grass/Agriculture
Loggerhead Shrike					EN	EN		Recovery	Grass/Agriculture
Northern Bobwhite					EN	EN		Recovery	Grass/Agriculture
Prothonotary Warbler					EN	EN		Recovery	Forest
Bald Eagle						EN		Recovery	Other Habitats
Hooded Warbler					TH	TH		Recovery	Forest
Peregrine Falcon					TH	EN		Recovery	Other Habitats
Louisiana Waterthrush					SC	SC		Assess Status	Forest
Red-shouldered Hawk					SC	SC		Assess Status	Forest
Yellow-breasted Chat					SC	SC		Assess Status	Shrub/Successional
Chimney Swift						UR	Y	Reverse Decline	Other & Aerial
Grasshopper Sparrow							Y	Halt Decline	Grass/Agriculture
Vesper Sparrow							Y	Halt Decline	Grass/Agriculture

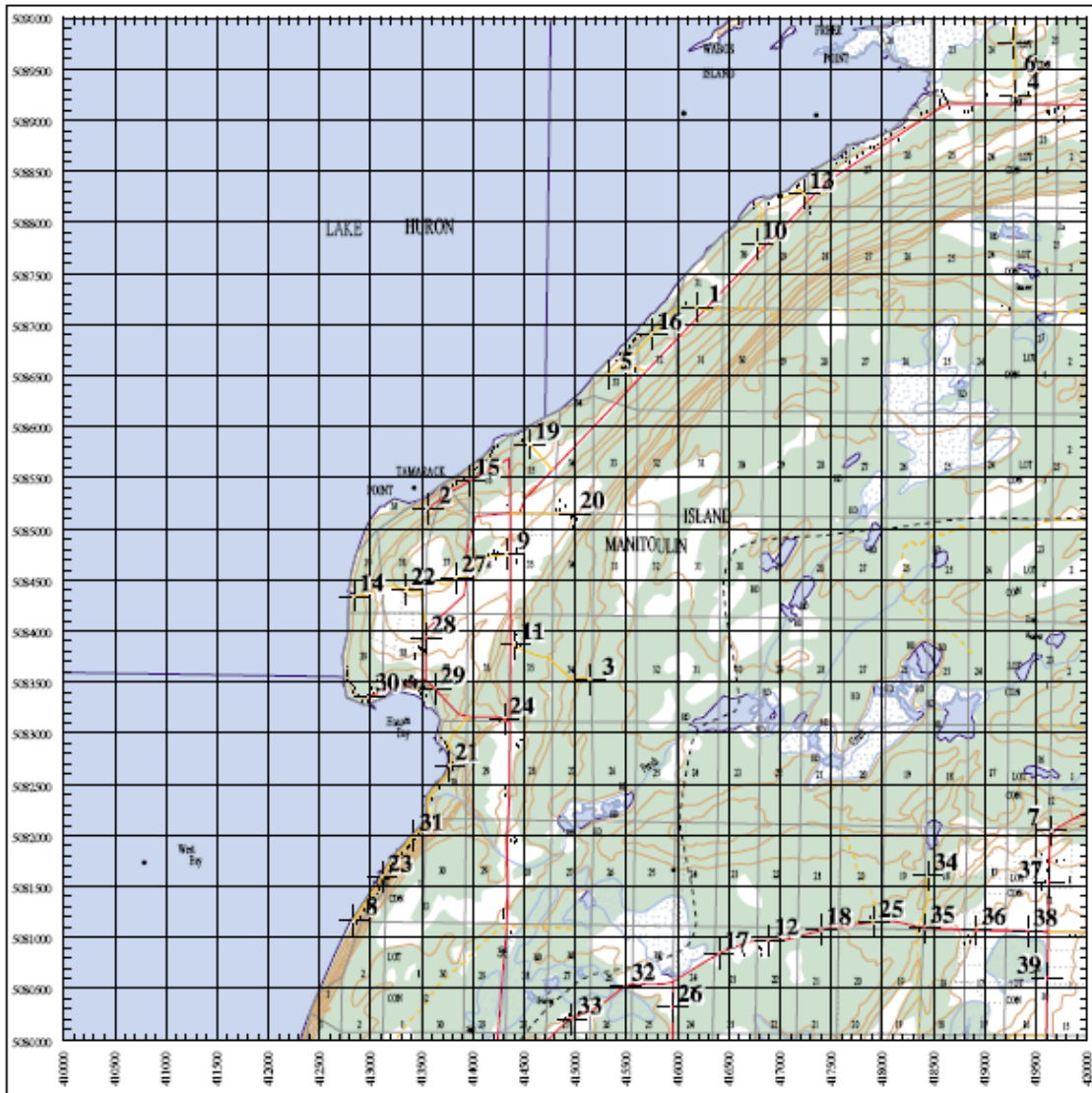
Notes: Priority Reasons: See Box 5 and **Error! Reference source not found.** for an explanation of the priority reasons categories. **At Risk Status:** EN - Endangered; TH- Threatened; SC - Special Concern, UR - Under review by COSEWIC. **Overall Objective:** Overall conservation objective for the species as established by this plan, see Chapters 5 to 9 for additional information. **Guild(s):** Breeding habitat guild and priority foraging guild; see sections 4.2, 4.2.2 and 4.2.4, and Chapters 5 to 9 for additional information. Boldface guild indicates species is a habitat obligate, and is dependent on that breeding habitat category.

2009: The status of the Canada Warbler, the Golden-winged Warbler, the Red-headed Woodpecker and the Chimney Swift was upgraded to Threatened since this table was published.

Appendix D
Breeding Bird Atlas Data



Region	Square	Breeding Evidence									Point Counts		
		#Cards	TotHrs	#Poss	#Prob	#Conf	#Spec	#Sq	#Rec	#Points	#Spec	#Sq	#Rec
33	17ML18	12	22.035	50	19	21	90	1	142	25	46	1	186
33	17ML28	10	56	20	36	73	129	1	265	87	77	1	615
33	17ML29	12	21.333	44	22	27	93	1	214	27	58	1	255
33	17ML38	10	114.25	36	23	43	102	1	244	9	35	1	52



Ontario Breeding Bird Atlas 2001 - 2005

Roadside Point Count Coordinates

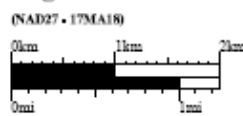
No.	Easting	Northing
01	416189	S087149
02	413559	S085197
03	415146	S085524
04	419300	S089045
05	415323	S086510
06	419285	S089755
07	419653	S082045
08	412857	S081173
09	414523	S084753
10	416777	S087790
11	414414	S083867
12	416894	S089073
13	417237	S088277
14	412840	S084337
15	413074	S085473
16	415751	S088000
17	416404	S088640
18	417407	S081077
19	414557	S088238
20	414097	S085145
21	413773	S082281
22	413349	S084408
23	413114	S081599
24	414306	S083138
25	417915	S081149
26	415953	S088818
27	413855	S084522
28	413541	S083932
29	413632	S083435
30	412389	S083388
31	413423	S081995
32	415495	S086527
33	414088	S080200
34	418447	S081609
35	418416	S081099
36	418919	S081075
37	419626	S081534
38	419419	S081064
39	419611	S080599
40	0	0
41	0	0
42	0	0
43	0	0
44	0	0
45	0	0
46	0	0
47	0	0
48	0	0
49	0	0
50	0	0

Legend

- Wooded Area
- Water Bodies
- Water Area
- Water Bodies
- Wetland Area
- Wetlands
- ANSII
- Pin and Quercus
- Piche and Rosewood
- Public Road
- Private Road
- Track
- Trail
- Contour Lines
- Lake
- Roadside Point Count Location
- Fence
- Wall
- Hedge
- Fence Outline
- Race Track
- Building Points
- Building Polygons
- Airports
- Petroleum Tanks
- Water Tanks
- Survey Monuments
- Smokestack
- Towns
- Named Places
- Pipelines
- Transmission Lines

North American Datum 1983
 Universal Transverse Mercator (5 degree) projection
 Zone 17, Central Meridian 81 degrees W.
 Grid Interval 1000 metres
 Contour Interval 10 metres
 Some features on the Breeding Bird Atlas field maps may not have been updated since the early 1980's.

Atlas Square: 17ML18
Region: 33



Ontario Breeding Bird Atlas



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Square Summary (17ML18)

#species (1st atlas)				#species (2nd atlas)				#hours		#pc done	
poss	prob	conf	total	poss	prob	conf	total	1st	2nd	road	offrd
49	21	7	77	50	19	21	90	13	22	25	0

Region summary (#33: Manitoulin)

#squares	#sq with data		#species		#pc done	target #pc
	1st	2nd	1st	2nd		
77	74	76	177	184	970	481

Target number of point counts in this square: 18 road side, 7 off road (3 in deciduous forest, 1 in coniferous forest, 2 in mixed forest, 1 in alvar). Please try to ensure that each off-road station is located such that the entire 100m radius circle is within the prescribed habitat.

SPECIES	Code		%	
	1st	2nd	1st	2nd
Common Loon		P	78	68
Pied-billed Grebe			20	26
Red-necked Grebe †			1	3
Double-crest Cormorant §			24	50
American Bittern		S	33	53
Least Bittern †			5	1
Great Blue Heron §	H	H	71	35
Green Heron §		H	17	15
Black-crown N.-Heron † §			5	11
Turkey Vulture	P		54	35
Canada Goose		FY	24	82
Trumpeter Swan †			0	0
Wood Duck		V	37	42
Gadwall			22	19
American Wigeon			8	15

SPECIES	Code		%	
	1st	2nd	1st	2nd
Red-breast Merganser			56	61
Ruddy Duck †			0	2
Osprey		NY	44	47
Bald Eagle †			2	35
Northern Harrier		T	35	51
Sharp-shinned Hawk			40	21
Cooper's Hawk			4	17
Northern Goshawk			12	7
Red-should Hawk †			6	18
Broad-winged Hawk	H	H	56	64
Red-tailed Hawk	H	H	37	26
American Kestrel	P	P	56	51
Merlin			31	56
Ring-necked Pheasant ‡			0	10
Ruffed Grouse	S		58	72

SPECIES	Code		%	
	1st	2nd	1st	2nd
Ring-billed Gull §		H	13	47
Herring Gull §		H	64	63
Great Black-backed Gull †			1	5
Caspian Tern †		X	4	3
Common Tern §		H	39	55
Black Tern † §			17	15
Rock Dove		V	10	38
Mourning Dove	H	P	45	63
Black-billed Cuckoo		S	48	55
Yellow-billed Cuckoo ‡	H		2	1
Black/Yell-billed Cuckoo			0	26
Great Horned Owl		S	22	25
Barred Owl	H	S	20	28
Long-eared Owl			4	5
Short-eared Owl †			1	6

Mallard	P	D	85	90	Wild Turkey ‡			0	3	Common Nighthawk		P	39	15
Blue-winged Teal	P	H	41	40	Yellow Rail †			1	1	<u>Whip-poor-will</u>	S		43	17
Northern Shoveler			6	9	Virginia Rail	P		27	25	Chimney Swift			36	11
<u>Northern Pintail</u>	P		12	6	Sora			17	22	Ruby-thr Hummingbird		H	63	67
Green-winged Teal			0	27	American Coot ‡			1	3	<u>Belted Kingfisher</u>			60	50
Redhead †			0	2	Sandhill Crane		FY	17	73	Red-head Woodpecker †			28	11
Ring-necked Duck			29	30	Killdeer	A	DD	77	73	Red-bell Woodpecker ‡			1	15
Lesser Scaup			8	3	Solitary Sandpiper			4	1	Yellow-bellied Sapsucker	S	H	60	60
White-winged Scoter †			0	0	Spotted Sandpiper	DD	H	78	85	Downy Woodpecker		H	63	60
Bufflehead †			0	0	<u>Upland Sandpiper</u>	A		35	21	Hairy Woodpecker		D	56	71
Common Goldeneye		H	35	53	Common Snipe	D	T	45	47	Black-back Woodpecker			4	2
Hooded Merganser		P	24	46	American Woodcock	D	S	43	31	Northern Flicker	P	CF	83	82

Ontario Breeding Bird Atlas - Summary Sheet for Square 17ML18

SPECIES	Code		%		SPECIES	Code		%		SPECIES	Code		%	
	1st	2nd	1st	2nd		1st	2nd	1st	2nd		1st	2nd	1st	2nd
<u>Olive-sided Flycatcher</u>	H		21	11	Brown Creeper			24	15	Yellow-rumped Warbler	S	S	83	80
Eastern Wood-Pewee	S	S	71	64	<u>House Wren</u>			28	50	Black-thr Green Warbler	S	S	87	90
Yellow-bellied Flycatcher			4	6	Winter Wren		S	52	78	Blackburnian Warbler		S	60	52
Alder Flycatcher	H	S	54	67	Sedge Wren		S	14	25	Pine Warbler			9	25
Willow Flycatcher ‡			1	9	Marsh Wren			16	5	Prairie Warbler †			0	0
Least Flycatcher	S	S	64	59	Golden-crown Kinglet			31	21	Bay-breasted Warbler			9	6
Eastern Phoebe		CF	45	69	Ruby-crown Kinglet			18	10	Black-white Warbler	S	S	86	92
Gr Crested Flycatcher	A	S	82	73	Blue-gr Gnatcatcher ‡			0	2	American Redstart	S	S	94	96
Eastern Kingbird	S	H	77	64	Eastern Bluebird	P	NY	39	61	Ovenbird	S	S	93	84
Loggerhead Shrike †			4	0	Veery	S	H	91	80	<u>North Waterthrush</u>	S		33	39
Yellow-throated Vireo ‡			2	7	Swainson's Thrush	H	S	58	48	Connecticut Warbler ‡			0	0
Blue-headed Vireo			20	34	Hermit Thrush		H	63	76	Mourning Warbler	S	S	54	52

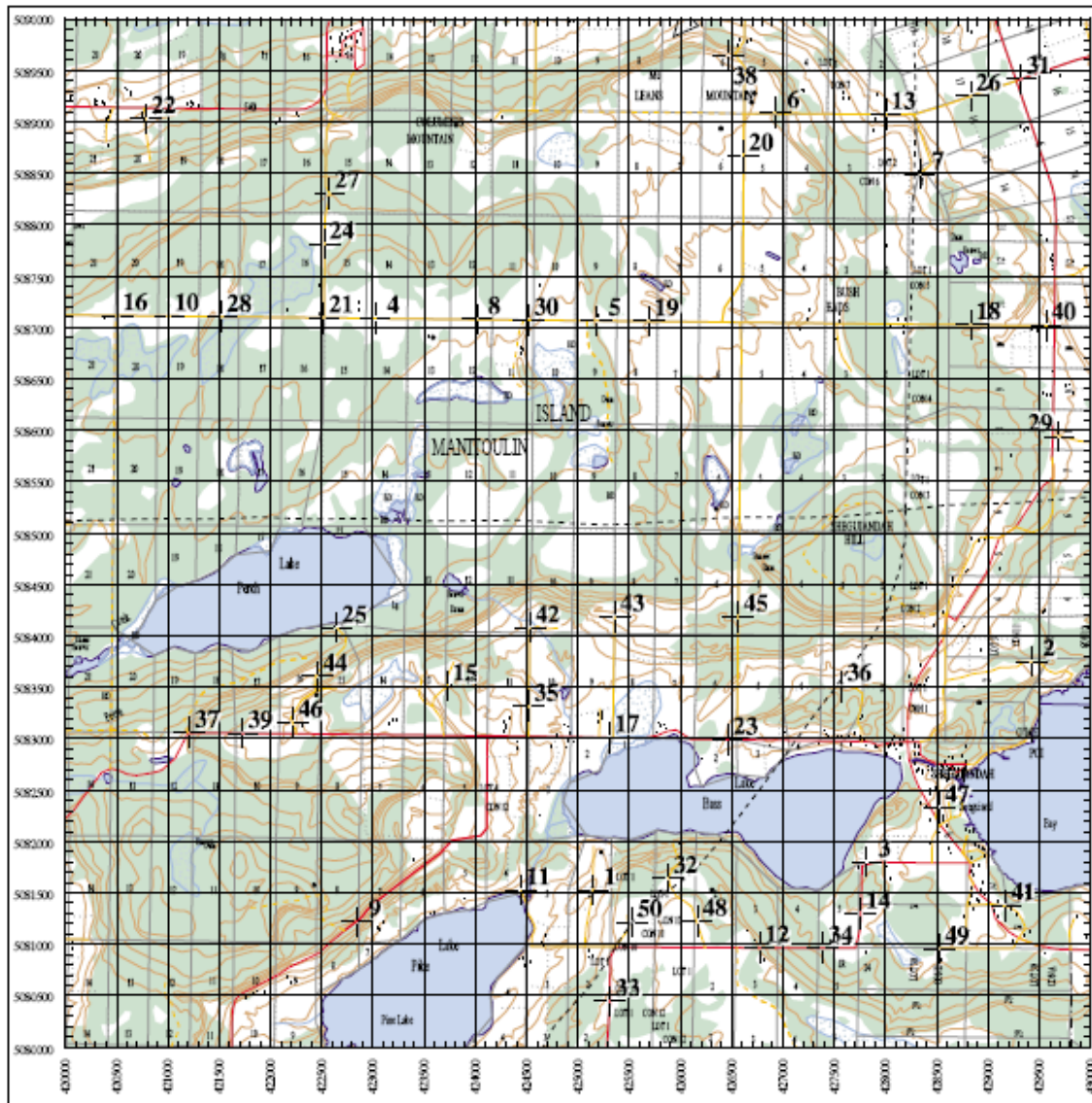
Warbling Vireo			27	28	Wood Thrush			35	34	Common Yellowthroat	A	S	82	81
Philadelphia Vireo ‡			0	18	American Robin	A	CF	86	84	Canada Warbler	S		43	28
Red-eyed Vireo	S	S	86	93	Gray Catbird		CF	63	63	Scarlet Tanager	P	S	45	36
Gray Jay			16	14	Northern Mockingbird			6	6	Eastern Towhee			16	6
Blue Jay	H	CF	74	88	Brown Thrasher	S		55	59	Chipping Sparrow	S	S	85	78
American Crow	H	H	90	92	European Starling	CF	CF	70	68	Clay-colored Sparrow ‡			1	17
Common Raven	H	P	72	88	Cedar Waxwing	P	P	90	88	Field Sparrow			6	5
Horned Lark			10	1	Golden-winged Warbler			12	6	Vesper Sparrow	S	FY	56	38
Purple Martin			28	9	Blue/Gold-wing Warbler			0	3	Savannah Sparrow	A	FY	62	63
Tree Swallow	H	CF	82	68	Tennessee Warbler			13	6	Grasshopper Sparrow			5	7
North Rgh-wing Swallow	AE		29	30	Nashville Warbler	S	S	77	80	Song Sparrow	S	CF	91	92
Bank Swallow §			27	10	Northern Parula			17	38	Lincoln's Sparrow ‡			2	6
Cliff Swallow §	AE		45	34	Yellow Warbler	S	S	87	96	Swamp Sparrow		FY	59	65
Barn Swallow	AE	AE	64	51	Chestn-sided Warbler	S	S	75	85	White-throat Sparrow	S	S	86	81
Black-capp Chickadee	S	H	87	85	Magnolia Warbler		S	54	85	Northern Cardinal			6	30
Red-breast Nuthatch	H		63	73	Cape May Warbler			20	6	Rose-breast Grosbeak	S	S	64	51
White-breast Nuthatch	H	H	24	38	Black-thr Blue Warbler			27	35	Indigo Bunting	S	A	70	71

Ontario Breeding Bird Atlas - Summary Sheet for Square 17ML18

SPECIES	Code		%	
	1st	2nd	1st	2nd
Bobolink	P	NY	52	60
Red-wing Blackbird	CF	P	81	68
Eastern Meadowlark	H	T	51	46
Western Meadowlark			6	2
Rusty Blackbird ‡			1	1
Brewer's Blackbird			16	13
Common Grackle	CF	NU	72	73
Brown-head Cowbird	H	P	64	59

Baltimore Oriole	H	S	43	50
Purple Finch	S	FY	58	60
House Finch			0	7
Red Crossbill			5	0
White-winged Crossbill			5	6
Pine Siskin			16	7
American Goldfinch	S	H	67	73
Evening Grosbeak			32	7
House Sparrow	P	CF	27	21

This list includes all species found during the Ontario Breeding Bird Atlas (1st atlas: 1981-1985, 2nd atlas: 2001-2005) in the region #33 (Manitoulin). Underlined species are those that you should try to add to this square. They have not yet been reported during the 2nd atlas, but were found during the 1st atlas in this square or have been reported in more than 50% of the squares in this region during the 2nd atlas so far. In the species table, "BE 2nd" and "BE 1st" are the codes for the highest breeding evidence for that species in square 17ML18 during the 2nd and 1st atlas respectively. The % columns give the percentage of squares in that region where that species was reported during the 2nd and 1st atlas (this gives an idea of the expected chance of finding that species in region #33). Rare/Colonial Species Report Forms should be completed for species marked: § (Colonial), ‡ (regionally rare), or † (provincially rare). Current as of 8/06/2009. An up-to-date version of this sheet is available from <http://www.birdsontario.org/atlas/summaryform.jsp?squareID=17ML18>



Ontario Breeding Bird Atlas 2001 - 2005

Roadside Point Count Coordinates

No.	Easting	Northing
01	425144	5081526
02	424423	5083751
03	427814	5081802
04	423024	5087000
05	425184	5087066
06	426926	5080069
07	428335	5088406
08	424012	5087080
09	423848	5081238
10	421012	5087112
11	424441	5081528
12	426775	5080066
13	428002	5080073
14	427757	5081208
15	425728	5085513
16	425152	5087117
17	425307	5083022
18	428834	5087027
19	425691	5087061
20	426615	5088672
21	422524	5087006
22	420792	5080058
23	426463	5082599
24	422529	5087811
25	423648	5084080
26	428833	5080253
27	422575	5088308
28	421528	5087106
29	426692	5085942
30	424522	5087074
31	423522	5089458
32	423879	5081639
33	425311	5080445
34	427390	5080063
35	424521	5083318
36	427571	5083511
37	421268	5083060
38	426471	5089647
39	421731	5083056
40	423967	5087021
41	420172	5081377
42	424534	5084079
43	423388	5084185
44	422489	5083628
45	426263	5084185
46	422220	5083157
47	428523	5082529
48	426162	5081224
49	428522	5080055
50	425332	5081215

Legend

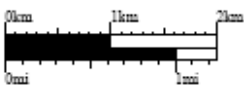
- Wooded Area
- Water Bodies
- Water Bodies Wetland Area
- Wetlands
- ANSI
- Fire and Quarantine
- Parks and Reserves
- Public Road
- Private Road
- Track
- Trail
- Railway
- Contour Line
- Lot
- Roadside Point Count Location
- Fence
- Wall
- Hedge
- Feature Outline
- Race Track
- Building Point
- Building Polygon
- Airports
- Petroleum Tank
- Water Tank
- Survey Monument
- Station Stack
- Town
- Named Place
- Pipeline
- Transmission Line

North American Datum 1983
 Universal Transverse Mercator (6 degree) projection
 Zone 17, Central Meridian 81 degree W.
 Grid Interval 1000 metres
 Contour Interval 10 metres
 Some features on the Breeding Bird Atlas field maps may not have been updated since the early 1980's.

Atlas Square: 17ML28

Region: 33

(NAD27 - 17MA28)



Ontario Breeding Bird Atlas



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Square Summary (17ML28)

#species (1st atlas)				#species (2nd atlas)				#hours		#pc done	
poss	prob	conf	total	poss	prob	conf	total	1st	2nd	road	offrd
34	37	44	115	20	36	73	129	44	56	45	42

Region summary (#33: Manitoulin)

#squares	#sq with data		#species		#pc done	target #pc
	1st	2nd	1st	2nd		
77	74	76	177	184	970	481

Target number of point counts in this square: 19 road side, 6 off road (3 in deciduous forest, 1 in coniferous forest, 2 in mixed forest). Please try to ensure that each off-road station is located such that the entire 100m radius circle is within the prescribed habitat.

SPECIES	Code		%	
	1st	2nd	1st	2nd
Common Loon	FY	NE	78	68
Pied-billed Grebe	T	FY	20	26
Red-necked Grebe †	NE		1	3
Double-crest Cormorant §			24	50
American Bittern	S	FY	33	53
Least Bittern †	H		5	1
Great Blue Heron §	H		71	35
Green Heron §	H	H	17	15
Black-crown N.-Heron † §			5	11
Turkey Vulture	H	NY	54	35
Canada Goose		FY	24	82
Trumpeter Swan †			0	0
Wood Duck	FY	FY	37	42
Gadwall	H	P	22	19
American Wigeon	P	P	8	15
American Black Duck	H	H	52	27

SPECIES	Code		%	
	1st	2nd	1st	2nd
Red-breast Merganser		P	56	61
Ruddy Duck †			0	2
Osprey	AE	NB	44	47
Bald Eagle †		AE	2	35
Northern Harrier	T	T	35	51
Sharp-shinned Hawk		CF	40	21
Cooper's Hawk			4	17
Northern Goshawk			12	7
Red-should Hawk †			6	18
Broad-winged Hawk	AE	D	56	64
Red-tailed Hawk	T	NY	37	26
American Kestrel	AE	AE	56	51
Merlin		A	31	56
Ring-necked Pheasant ‡			0	10
Ruffed Grouse	T	FY	58	72
Sharp-tailed Grouse †		D	6	17

SPECIES	Code		%	
	1st	2nd	1st	2nd
Ring-billed Gull §			13	47
Herring Gull §			64	63
Great Black-backed Gull †			1	5
Caspian Tern †			4	3
Common Tern §			39	55
Black Tern † §	H	T	17	15
Rock Dove		H	10	38
Mourning Dove	P	FY	45	63
Black-billed Cuckoo	T	T	48	55
Yellow-billed Cuckoo ‡			2	1
Black/Yell-billed Cuckoo			0	26
Great Horned Owl			22	25
Barred Owl	A	P	20	28
Great Gray Owl †		H	0	1
Long-eared Owl			4	5
Short-eared Owl †		H	1	6

Mallard	NE	FY	85	90	Wild Turkey ‡			0	3	North Saw-whet Owl	S	T	9	14
Blue-winged Teal	NE	P	41	40	Yellow Rail †			1	1	Common Nighthawk		H	39	15
Northern Shoveler	P	P	6	9	Virginia Rail	T	T	27	25	Whip-poor-will	T		43	17
Northern Pintail	P		12	6	Sora	T	T	17	22	Chimney Swift	D		36	11
Green-winged Teal		P	0	27	American Coot ‡	H	T	1	3	Ruby-thr Hummingbird	H	FY	63	67
Redhead †			0	2	Sandhill Crane		FY	17	73	Belted Kingfisher	P	AE	60	50
Ring-necked Duck	S	FY	29	30	Killdeer	FY	FY	77	73	Red-head Woodpecker †	T		28	11
Lesser Scaup	H		8	3	Solitary Sandpiper			4	1	Red-bell Woodpecker ‡		FY	1	15
White-winged Scoter †			0	0	Spotted Sandpiper	P	NE	78	85	Yellow-bellied Sapsucker	FY	FY	60	60
Bufflehead †			0	0	Upland Sandpiper	T	A	35	21	Downy Woodpecker	CF	CF	63	60
Common Goldeneye		FY	35	53	Common Snipe	H	S	45	47	Hairy Woodpecker	NY	FY	56	71
Hooded Merganser	H	FY	24	46	American Woodcock	P	T	43	31	Black-back Woodpecker			4	2
Common Merganser	FY	FY	85	72	Wilson's Phalarope †			1	0	Northern Flicker	AE	FY	83	82

Ontario Breeding Bird Atlas - Summary Sheet for Square 17ML28 (page 2 of 3)

SPECIES	Code		%		SPECIES	Code		%		SPECIES	Code		%	
	1st	2nd	1st	2nd		1st	2nd	1st	2nd		1st	2nd	1st	2nd
Pileated Woodpecker	T	AE	48	73	White-breast Nuthatch	P	FY	24	38	Black-thr Blue Warbler	T	S	27	35
Olive-sided Flycatcher	T		21	11	Brown Creeper	P	P	24	15	Yellow-rumped Warbler	H	S	83	80
Eastern Wood-Pewee	NU	T	71	64	House Wren	S	T	28	50	Black-thr Green Warbler		FY	87	90
Yellow-bellied Flycatcher			4	6	Winter Wren		A	52	78	Blackburnian Warbler	H	S	60	52
Alder Flycatcher	S	A	54	67	Sedge Wren		T	14	25	Pine Warbler		S	9	25
Willow Flycatcher ‡			1	9	Marsh Wren	S		16	5	Prairie Warbler †			0	0
Least Flycatcher	T	S	64	59	Golden-crown Kinglet		H	31	21	Bay-breasted Warbler	H		9	6
Eastern Phoebe	NY	NY	45	69	Ruby-crown Kinglet			18	10	Black-white Warbler	S	CF	86	92
Gr Crested Flycatcher	T	CF	82	73	Blue-gr Gnatcatcher ‡			0	2	American Redstart	CF	FY	94	96
Eastern Kingbird	AE	FY	77	64	Eastern Bluebird	P	AE	39	61	Ovenbird	CF	CF	93	84
Loggerhead Shrike †			4	0	Veery	T	NY	91	80	North Waterthrush	T	T	33	39
Yellow-throated Vireo ‡		T	2	7	Swainson's Thrush		S	58	48	Connecticut Warbler ‡			0	0

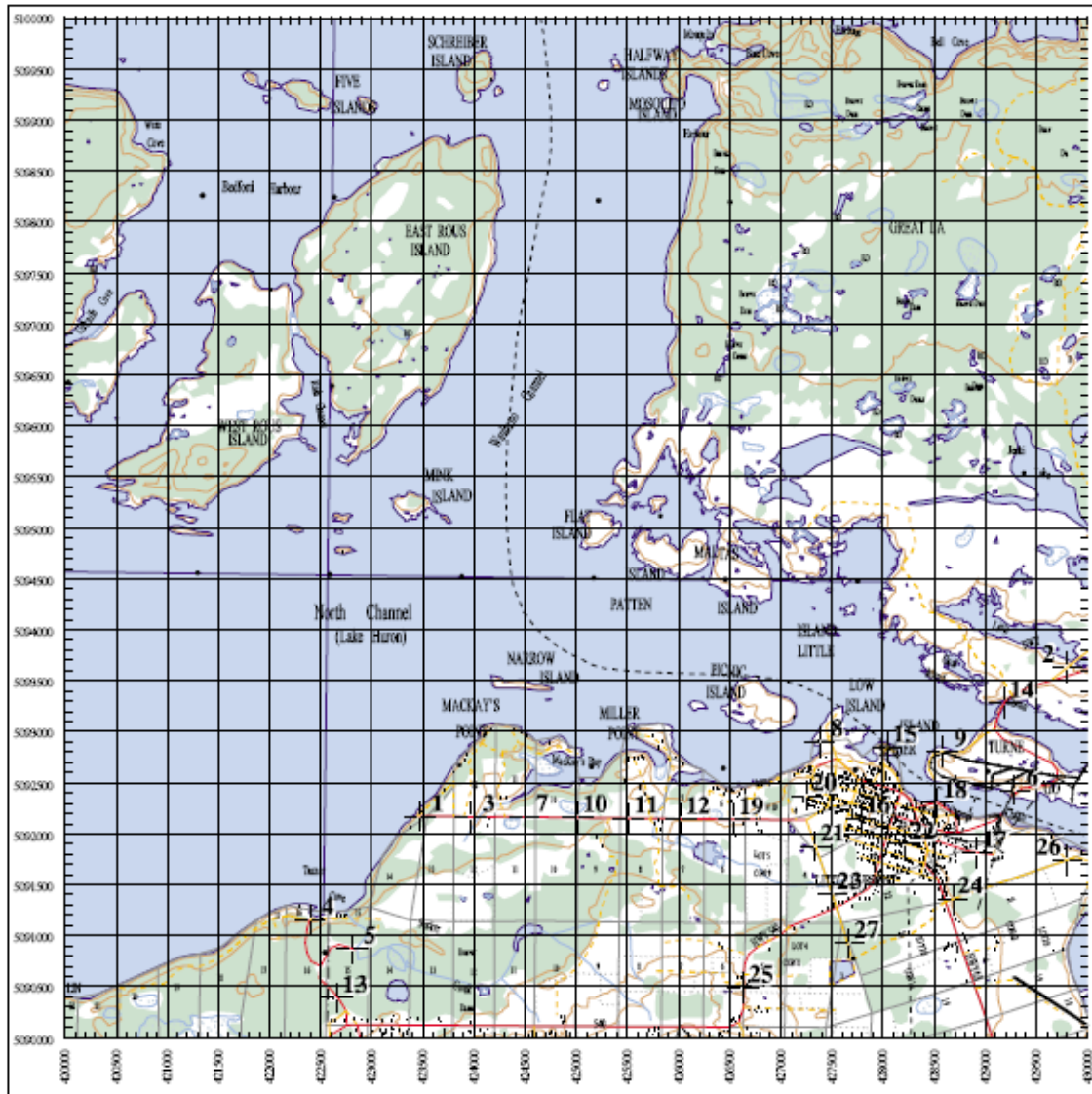
Blue-headed Vireo			20	34	Hermit Thrush	P	T	63	76	Mourning Warbler	S	T	54	52
Warbling Vireo	S	T	27	28	Wood Thrush		T	35	34	Common Yellowthroat	CF	FY	82	81
Philadelphia Vireo ‡			0	18	American Robin	CF	CF	86	84	Canada Warbler	H	A	43	28
Red-eyed Vireo	T	FY	86	93	Gray Catbird	FY	FY	63	63	Scarlet Tanager		S	45	36
Gray Jay			16	14	Northern Mockingbird	H		6	6	Eastern Towhee			16	6
Blue Jay	T	FY	74	88	Brown Thrasher	P	P	55	59	Chipping Sparrow	CF	CF	85	78
American Crow	AE	NU	90	92	European Starling	CF	CF	70	68	Clay-colored Sparrow ‡		S	1	17
Common Raven	AE	NY	72	88	Cedar Waxwing	FY	FY	90	88	Field Sparrow			6	5
Horned Lark			10	1	Golden-winged Warbler		S	12	6	Vesper Sparrow	H	CF	56	38
Purple Martin	AE	AE	28	9	Blue/Gold-wing Warbler			0	3	Savannah Sparrow	S	CF	62	63
Tree Swallow	AE	AE	82	68	Tennessee Warbler			13	6	Grasshopper Sparrow			5	7
North Rgh-wing Swallow	P	AE	29	30	Nashville Warbler	H	CF	77	80	Song Sparrow	CF	CF	91	92
Bank Swallow §	NY	AE	27	10	Northern Parula		S	17	38	Lincoln's Sparrow ‡			2	6
Cliff Swallow §	NU		45	34	Yellow Warbler	NE	CF	87	96	Swamp Sparrow	S	FY	59	65
Barn Swallow	NE	FY	64	51	Chestn-sided Warbler	FY	FY	75	85	White-throat Sparrow	S	CF	86	81
Black-capp Chickadee	D	FY	87	85	Magnolia Warbler	S	A	54	85	Northern Cardinal		S	6	30
Red-breast Nuthatch	H	FY	63	73	Cape May Warbler			20	6	Rose-breast Grosbeak	CF	T	64	51

Ontario Breeding Bird Atlas - Summary Sheet for Square 17ML28 (page 3 of 3)

SPECIES	Code		%	
	1st	2nd	1st	2nd
Indigo Bunting	CF	FY	70	71
Bobolink	NE	FY	52	60
Red-wing Blackbird	CF	CF	81	68

Eastern Meadowlark	CF	FY	51	46
Western Meadowlark			6	2
Rusty Blackbird ‡			1	1
<u>Brewer's Blackbird</u>	CF		16	13
Common Grackle	NY	CF	72	73
Brown-head Cowbird	P	FY	64	59
Baltimore Oriole	AE	NU	43	50
Purple Finch	S	CF	58	60
House Finch			0	7
Red Crossbill			5	0
White-winged Crossbill			5	6
Pine Siskin			16	7
American Goldfinch	P	FY	67	73
Evening Grosbeak		H	32	7
House Sparrow	AE	T	27	21

This list includes all species found during the Ontario Breeding Bird Atlas (1st atlas: 1981-1985, 2nd atlas: 2001-2005) in the region #33 (Manitoulin). Underlined species are those that you should try to add to this square. They have not yet been reported during the 2nd atlas, but were found during the 1st atlas in this square or have been reported in more than 50% of the squares in this region during the 2nd atlas so far. In the species table, "BE 2nd" and "BE 1st" are the codes for the highest breeding evidence for that species in square 17ML28 during the 2nd and 1st atlas respectively. The % columns give the percentage of squares in that region where that species was reported during the 2nd and 1st atlas (this gives an idea of the expected chance of finding that species in region #33). Rare/Colonial Species Report Forms should be completed for species marked: § (Colonial), ‡ (regionally rare), or † (provincially rare). Current as of 8/06/2009. An up-to-date version of this sheet is available from <http://www.birdsontario.org/atlas/summaryform.jsp?squareID=17ML28>



Ontario Breeding Bird Atlas 2001 - 2005

Roadside Point Count Coordinates

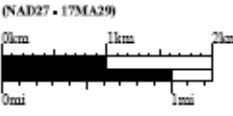
No.	Easting	Northing
01	42549	500218
02	42880	500620
03	42970	500265
04	42294	500158
05	42385	500071
06	42926	500245
07	42441	500269
08	42757	500206
09	42986	500286
10	42513	500242
11	42516	500251
12	42921	500246
13	42963	500092
14	42515	500282
15	42843	500267
16	42781	500251
17	42920	500012
18	42852	500200
19	42540	500241
20	42754	500272
21	42739	500076
22	42821	500099
23	42792	500404
24	42882	500359
25	42934	500400
26	42880	500148
27	42769	500004
28	0	0
29	0	0
30	0	0
31	0	0
32	0	0
33	0	0
34	0	0
35	0	0
36	0	0
37	0	0
38	0	0
39	0	0
40	0	0
41	0	0
42	0	0
43	0	0
44	0	0
45	0	0
46	0	0
47	0	0
48	0	0
49	0	0
50	0	0

Legend

- Wooded Area
- Water Bodies
- Water Area
- Water Bodies Wetland Area
- Wetlands
- ANSI
- Fire and Quarries
- Parks and Reserves
- Public Road
- Private Road
- Track
- Trail
- Railway
- Centre Line
- Lake
- Roadside Point Count Location
- Fence
- Wall
- Hedge
- Fences Outline
- Race Track
- Building Points
- Building Polygons
- Airports
- Petroleum Tank
- Water Tank
- Survey Measurements
- Smokestack
- Towns
- Named Place
- Pipeline
- Transmission Line

North American Datum 1983
 Universal Transverse Mercator (6 degree) projection
 Zone 17, Central Meridian 81 degree W.
 Grid Interval 1000 metres
 Contour Interval 10 metres
 Some features on the Breeding Bird Atlas field maps may not have been updated since the early 1980's.

Atlas Square: 17ML29
Region: 33



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 Map may only be used for Ontario Breeding Bird Atlas Work



Square Summary (17ML29)

#species (1st atlas)				#species (2nd atlas)				#hours		#pc done	
poss	prob	conf	total	poss	prob	conf	total	1st	2nd	road	offrd
49	16	18	83	44	22	27	93	16	21	27	0

Region summary (#33: Manitoulin)

#squares	#sq with data		#species		#pc done	target #pc
	1st	2nd	1st	2nd		
77	74	76	177	184	970	481

Target number of point counts in this square: 17 road side, 8 off road (5 in coniferous forest, 3 in mixed forest). Please try to ensure that each off-road station is located such that the entire 100m radius circle is within the prescribed habitat.

SPECIES	Code		%	
	1st	2nd	1st	2nd
Common Loon	H	FY	78	68
Pied-billed Grebe			20	26
Red-necked Grebe †		P	1	3
Double-crest Cormorant §		H	24	50
American Bittern	P	S	33	53
Least Bittern †			5	1
Great Blue Heron §			71	35
Green Heron §			17	15
Black-crown N.-Heron † §			5	11
Turkey Vulture	H	H	54	35
Canada Goose	P	P	24	82
Trumpeter Swan †			0	0

SPECIES	Code		%	
	1st	2nd	1st	2nd
Red-breast Merganser		P	56	61
Ruddy Duck †		H	0	2
Osprey		H	44	47
Bald Eagle †		H	2	35
Northern Harrier	S	T	35	51
Sharp-shinned Hawk			40	21
Cooper's Hawk			4	17
Northern Goshawk			12	7
Red-should Hawk †			6	18
Broad-winged Hawk	H		56	64
Red-tailed Hawk			37	26
American Kestrel	NY	H	56	51

SPECIES	Code		%	
	1st	2nd	1st	2nd
Ring-billed Gull §		H	13	47
Herring Gull §	H	NE	64	63
Great Black-backed Gull †			1	5
Caspian Tern †		X	4	3
Common Tern §		A	39	55
Black Tern † §	H		17	15
Rock Dove	H	D	10	38
Mourning Dove	S	FY	45	63
Black-billed Cuckoo	S	V	48	55
Yellow-billed Cuckoo ‡			2	1
Black/Yell-billed Cuckoo			0	26
Great Horned Owl			22	25

Gadwall	P	FY	22	19	Ring-necked Pheasant ‡			0	10	Long-eared Owl			4	5
American Wigeon	FY	FY	8	15	Ruffed Grouse		T	58	72	Short-eared Owl †		H	1	6
American Black Duck	FY	FY	52	27	Sharp-tailed Grouse †			6	17	North Saw-whet Owl			9	14
Mallard	FY	FY	85	90	Wild Turkey ‡			0	3	Common Nighthawk			39	15
Blue-winged Teal	FY	P	41	40	Yellow Rail †			1	1	Whip-poor-will			43	17
Northern Shoveler	P	FY	6	9	Virginia Rail			27	25	Chimney Swift	H	T	36	11
Northern Pintail	FY		12	6	Sora			17	22	Ruby-thr Hummingbird	H	H	63	67
Green-winged Teal		FY	0	27	American Coot ‡		S	1	3	Belted Kingfisher	H		60	50
Redhead †		P	0	2	Sandhill Crane		FY	17	73	Red-head Woodpecker †			28	11
Ring-necked Duck		P	29	30	Killdeer	P	DD	77	73	Red-bell Woodpecker ‡			1	15
Lesser Scaup	P	P	8	3	Solitary Sandpiper			4	1	Yellow-bellied Sapsucker		H	60	60
White-winged Scoter †			0	0	Spotted Sandpiper	P	D	78	85	Downy Woodpecker	H		63	60
Bufflehead †		X	0	0	Upland Sandpiper	P	S	35	21	Hairy Woodpecker	H	S	56	71
Common Goldeneye		FY	35	53	Common Snipe		T	45	47	Black-back Woodpecker			4	2
Hooded Merganser		FY	24	46	American Woodcock			43	31	Northern Flicker	AE	S	83	82

Ontario Breeding Bird Atlas - Summary Sheet for Square 17ML29 (page 2 of 3)

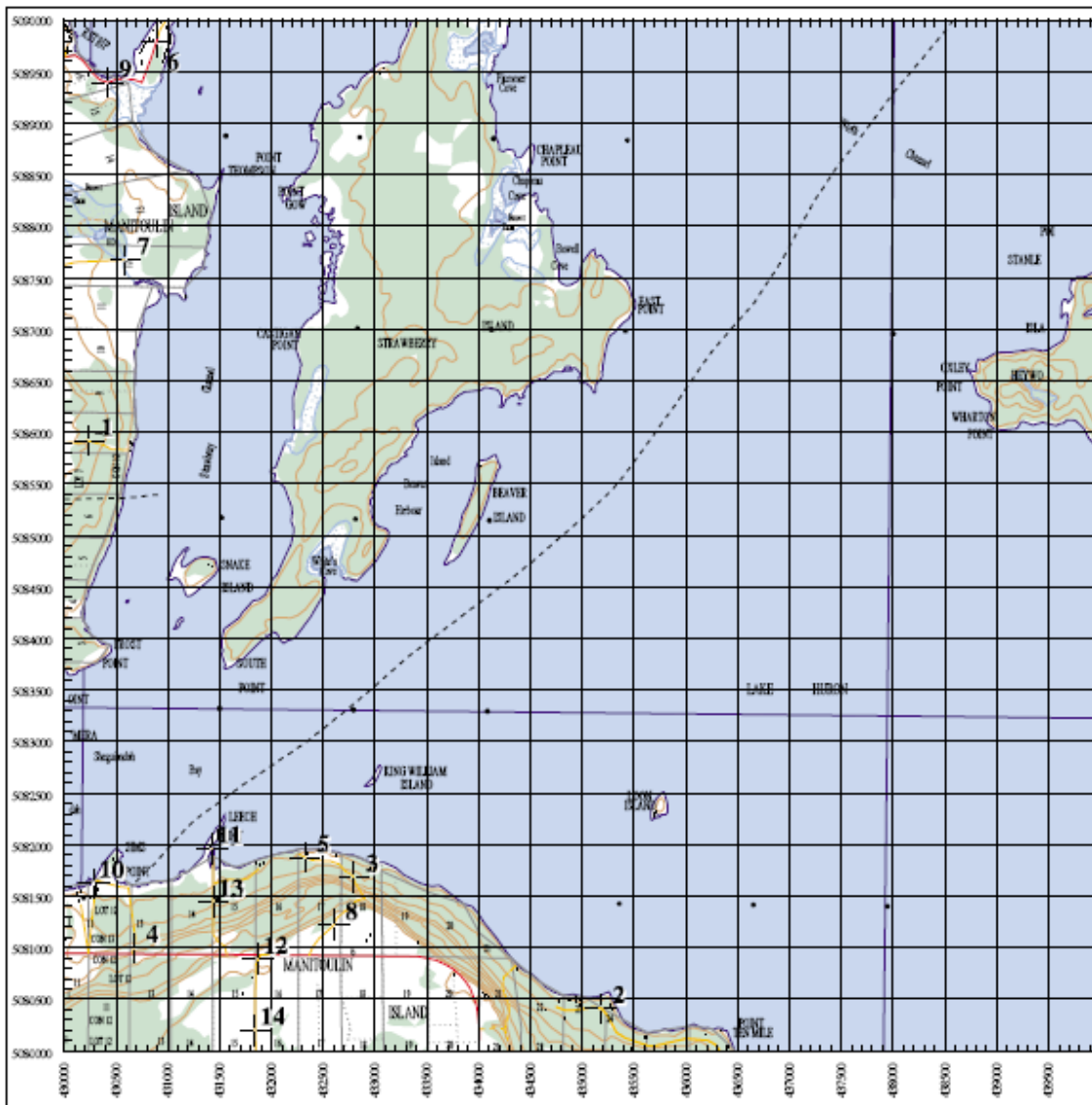
SPECIES	Code		%		SPECIES	Code		%		SPECIES	Code		%	
	1st	2nd	1st	2nd		1st	2nd	1st	2nd		1st	2nd	1st	2nd
Olive-sided Flycatcher			21	11	Brown Creeper			24	15	Yellow-rumped Warbler	S	S	83	80
Eastern Wood-Pewee			71	64	House Wren	S	V	28	50	Black-thr Green Warbler	S		87	90
Yellow-bellied Flycatcher			4	6	Winter Wren		S	52	78	Blackburnian Warbler			60	52
Alder Flycatcher	S	S	54	67	Sedge Wren			14	25	Pine Warbler			9	25
Willow Flycatcher ‡		S	1	9	Marsh Wren			16	5	Prairie Warbler †			0	0
Least Flycatcher			64	59	Golden-crown Kinglet	S		31	21	Bay-breasted Warbler	S		9	6
Eastern Phoebe			45	69	Ruby-crown Kinglet			18	10	Black-white Warbler	S	S	86	92
Gr Crested Flycatcher	S	H	82	73	Blue-gr Gnatcatcher ‡			0	2	American Redstart	S	FY	94	96
Eastern Kingbird	H	AE	77	64	Eastern Bluebird			39	61	Ovenbird	S	T	93	84
Loggerhead Shrike †			4	0	Veery	S	T	91	80	North Waterthrush		S	33	39

Yellow-throated Vireo ‡			2	7	Swainson's Thrush		H	58	48	Connecticut Warbler ‡			0	0
Blue-headed Vireo			20	34	Hermit Thrush			63	76	Mourning Warbler	S	S	54	52
Warbling Vireo		S	27	28	Wood Thrush			35	34	Common Yellowthroat	S	FY	82	81
Philadelphia Vireo ‡			0	18	American Robin	CF	CF	86	84	Canada Warbler			43	28
Red-eyed Vireo	S	T	86	93	Gray Catbird	H	S	63	63	Scarlet Tanager			45	36
Gray Jay			16	14	Northern Mockingbird			6	6	Eastern Towhee			16	6
Blue Jay		H	74	88	Brown Thrasher	S	S	55	59	Chipping Sparrow	P	S	85	78
American Crow	CF	AE	90	92	European Starling	NY	CF	70	68	Clay-colored Sparrow ‡			1	17
Common Raven	H	AE	72	88	Cedar Waxwing	H	H	90	88	Field Sparrow			6	5
Horned Lark			10	1	Golden-winged Warbler			12	6	Vesper Sparrow	S	S	56	38
Purple Martin	AE		28	9	Blue/Gold-wing Warbler			0	3	Savannah Sparrow	CF	S	62	63
Tree Swallow	D	NE	82	68	Tennessee Warbler			13	6	Grasshopper Sparrow			5	7
North Rgh-wing Swallow	P		29	30	Nashville Warbler	S		77	80	Song Sparrow	CF	FY	91	92
Bank Swallow §	D		27	10	Northern Parula			17	38	Lincoln's Sparrow ‡			2	6
Cliff Swallow §	NY	NB	45	34	Yellow Warbler	S	A	87	96	Swamp Sparrow	S	S	59	65
Barn Swallow	H	H	64	51	Chestn-sided Warbler	S	S	75	85	White-throat Sparrow	S	DD	86	81
Black-capp Chickadee	P	FY	87	85	Magnolia Warbler		S	54	85	Northern Cardinal			6	30
Red-breast Nuthatch			63	73	Cape May Warbler	S		20	6	Rose-breast Grosbeak		H	64	51
White-breast Nuthatch		H	24	38	Black-thr Blue Warbler			27	35	Indigo Bunting	S		70	71

Ontario Breeding Bird Atlas - Summary Sheet for Square 17ML29

SPECIES	Code		%	
	1st	2nd	1st	2nd
Bobolink	D	T	52	60
Red-wing Blackbird	P	V	81	68
Eastern Meadowlark	S	S	51	46
Western Meadowlark			6	2
Rusty Blackbird ‡			1	1
<u>Brewer's Blackbird</u>	NY		16	13
Common Grackle	CF	CF	72	73
Brown-head Cowbird	H	S	64	59
Baltimore Oriole		S	43	50
<u>Purple Finch</u>			58	60
House Finch			0	7
Red Crossbill			5	0
White-winged Crossbill			5	6
Pine Siskin			16	7
American Goldfinch	H	S	67	73
<u>Evening Grosbeak</u>	H		32	7

This list includes all species found during the Ontario Breeding Bird Atlas (1st atlas: 1981-1985, 2nd atlas: 2001-2005) in the region #33 (Manitoulin). Underlined species are those that you should try to add to this square. They have not yet been reported during the 2nd atlas, but were found during the 1st atlas in this square or have been reported in more than 50% of the squares in this region during the 2nd atlas so far. In the species table, "BE 2nd" and "BE 1st" are the codes for the highest breeding evidence for that species in square 17ML29 during the 2nd and 1st atlas respectively. The % columns give the percentage of squares in that region where that species was reported during the 2nd and 1st atlas (this gives an idea of the expected chance of finding that species in region #33). Rare/Colonial Species Report Forms should be completed for species marked: § (Colonial), ‡ (regionally rare), or † (provincially rare). Current as of 8/06/2009. An up-to-date version of this sheet is available from <http://www.birdsontario.org/atlas/summaryform.jsp?squareID=17ML29>



Ontario Breeding Bird Atlas 2001 - 2005

Roadside Point Count Coordinates

No.	Easting	Northing
01	480240	S085909
02	48184	S084011
03	482795	S081688
04	480675	S080098
05	482526	S081879
06	480690	S089789
07	480590	S087673
08	482603	S081221
09	480417	S089395
10	480290	S081626
11	481427	S081965
12	481874	S080890
13	481488	S081446
14	481844	S080200
15	0	0
16	0	0
17	0	0
18	0	0
19	0	0
20	0	0
21	0	0
22	0	0
23	0	0
24	0	0
25	0	0
26	0	0
27	0	0
28	0	0
29	0	0
30	0	0
31	0	0
32	0	0
33	0	0
34	0	0
35	0	0
36	0	0
37	0	0
38	0	0
39	0	0
40	0	0
41	0	0
42	0	0
43	0	0
44	0	0
45	0	0
46	0	0
47	0	0
48	0	0
49	0	0
50	0	0

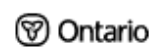
Legend

- Wooded Area
- Water Bodies
- Water Area
- Water Bodies Wetland Area
- Wetlands
- ANSII
- Pine and Quince
- Ponds and Reservoir
- Public Road
- Private Road
- Track
- Trail
- Railway
- Control Line
- Lake
- Roadside Point Count Location
- Fence
- Wall
- Hedge
- Fences/Outline
- Race Track
- Building Points
- Building Polygon
- Airports
- Petroleum Tank
- Water Tank
- Survey Monument
- Smoke Stack
- Towers
- Named Place
- Pipeline
- Transmission Line

North American Datum 1983
 Universal Transverse Mercator (6 degree) projection
 Zone 17, Central Meridian 81 degree W.
 Grid Interval 1000 meters
 Contour Interval 10 meters
 Some features on the Breeding Bird Atlas field maps may not have been updated since the early 1980's.

Atlas Square: 17ML38
Region: 33

(NAD27 - 17MA38)



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Square Summary (17ML38)

#species (1st atlas)				#species (2nd atlas)				#hours		#pc done	
poss	prob	conf	total	poss	prob	conf	total	1st	2nd	road	offrd
42	28	11	81	36	23	43	102	14	114	9	0

Region summary (#33: Manitoulin)

#squares	#sq with data		#species		#pc done	target #pc
	1st	2nd	1st	2nd		
77	74	76	177	184	970	481

Target number of point counts in this square: 13 road side, 12 off road (2 in deciduous forest, 1 in coniferous forest, 7 in mixed forest, 1 in pasture/grassland, 1 in alvar). Please try to ensure that each off-road station is located such that the entire 100m radius circle is within the prescribed habitat.

SPECIES	Code		%	
	1st	2nd	1st	2nd
Common Loon	H	FY	78	68
Pied-billed Grebe		S	20	26
Red-necked Grebe †		FY	1	3
Double-crest Cormorant §		X	24	50
American Bittern		V	33	53
Least Bittern †			5	1
Great Blue Heron §	AE	H	71	35
Green Heron §			17	15
Black-crown N.-Heron † §			5	11
Turkey Vulture	H	H	54	35
Canada Goose		FY	24	82
Trumpeter Swan †			0	0
Wood Duck	S	H	37	42
Gadwall			22	19

SPECIES	Code		%	
	1st	2nd	1st	2nd
Red-breast Merganser	P	P	56	61
Ruddy Duck †			0	2
Osprey	NY	CF	44	47
Bald Eagle †	H	NY	2	35
Northern Harrier		V	35	51
Sharp-shinned Hawk			40	21
Cooper's Hawk			4	17
Northern Goshawk			12	7
Red-should Hawk †		H	6	18
Broad-winged Hawk	H	P	56	64
Red-tailed Hawk			37	26
American Kestrel	H	FY	56	51
Merlin		NY	31	56
Ring-necked Pheasant ‡			0	10

SPECIES	Code		%	
	1st	2nd	1st	2nd
Ring-billed Gull §		D	13	47
Herring Gull §	H		64	63
Great Black-backed Gull †			1	5
Caspian Tern †			4	3
Common Tern §	H	FY	39	55
Black Tern † §	H	FY	17	15
Rock Dove			10	38
Mourning Dove		D	45	63
Black-billed Cuckoo	S	S	48	55
Yellow-billed Cuckoo ‡			2	1
Black/Yell-billed Cuckoo			0	26
Great Horned Owl		S	22	25
Barred Owl			20	28
Long-eared Owl		S	4	5

American Wigeon			8	15	Ruffed Grouse		NE	58	72	Short-eared Owl †			1	6
American Black Duck			52	27	Sharp-tailed Grouse †		FY	6	17	North Saw-whet Owl		S	9	14
Mallard	T	FY	85	90	Wild Turkey ‡			0	3	Common Nighthawk			39	15
Blue-winged Teal			41	40	Yellow Rail †			1	1	Whip-poor-will			43	17
Northern Shoveler			6	9	Virginia Rail	S		27	25	Chimney Swift			36	11
Northern Pintail			12	6	Sora	S		17	22	Ruby-thr Hummingbird		NE	63	67
Green-winged Teal			0	27	American Coot ‡			1	3	Belted Kingfisher	AE	AE	60	50
Redhead †			0	2	Sandhill Crane		FY	17	73	Red-head Woodpecker †			28	11
Ring-necked Duck	P	P	29	30	Killdeer	H	DD	77	73	Red-bell Woodpecker ‡			1	15
Lesser Scaup			8	3	Solitary Sandpiper		H	4	1	Yellow-bellied Sapsucker	NY	H	60	60
White-winged Scoter †			0	0	Spotted Sandpiper	P	FY	78	85	Downy Woodpecker	H	T	63	60
Bufflehead †			0	0	Upland Sandpiper	S	H	35	21	Hairy Woodpecker	P	T	56	71
Common Goldeneye	S	P	35	53	Common Snipe	S	A	45	47	Black-back Woodpecker			4	2
Hooded Merganser		D	24	46	American Woodcock			43	31	Northern Flicker	AE	FY	83	82
Common Merganser	P	FY	85	72	Wilson's Phalarope †			1	0	Pileated Woodpecker		FY	48	73

Ontario Breeding Bird Atlas - Summary Sheet for Square 17ML38 (page 2 of 3)

SPECIES	Code		%		SPECIES	Code		%		SPECIES	Code		%	
	1st	2nd	1st	2nd		1st	2nd	1st	2nd		1st	2nd	1st	2nd
Olive-sided Flycatcher		S	21	11	Brown Creeper			24	15	Yellow-rumped Warbler	T	S	83	80
Eastern Wood-Pewee	S	S	71	64	House Wren	S	H	28	50	Black-thr Green Warbler	T	CF	87	90
Yellow-bellied Flycatcher			4	6	Winter Wren		A	52	78	Blackburnian Warbler	S	S	60	52
Alder Flycatcher	H	S	54	67	Sedge Wren		S	14	25	Pine Warbler			9	25
Willow Flycatcher ‡			1	9	Marsh Wren	N	CF	16	5	Prairie Warbler †			0	0
Least Flycatcher	T	S	64	59	Golden-crown Kinglet	S	P	31	21	Bay-breasted Warbler			9	6
Eastern Phoebe	H	NY	45	69	Ruby-crown Kinglet	S		18	10	Black-white Warbler	S	CF	86	92
Gr Crested Flycatcher	T	H	82	73	Blue-gr Gnatcatcher ‡			0	2	American Redstart	T	CF	94	96
Eastern Kingbird	H	FY	77	64	Eastern Bluebird		NY	39	61	Ovenbird	N	T	93	84
Loggerhead Shrike †			4	0	Veery	T	S	91	80	North Waterthrush			33	39

Yellow-throated Vireo ‡			2	7	Swainson's Thrush			58	48	Connecticut Warbler ‡			0	0
Blue-headed Vireo			20	34	Hermit Thrush			63	76	Mourning Warbler	S		54	52
Warbling Vireo		S	27	28	Wood Thrush	T	S	35	34	Common Yellowthroat	S	NU	82	81
Philadelphia Vireo ‡		S	0	18	American Robin	H	NY	86	84	Canada Warbler		A	43	28
Red-eyed Vireo	T	NY	86	93	Gray Catbird		S	63	63	Scarlet Tanager	S		45	36
Gray Jay			16	14	Northern Mockingbird			6	6	Eastern Towhee			16	6
Blue Jay	T	T	74	88	Brown Thrasher	P	V	55	59	Chipping Sparrow	S	S	85	78
American Crow	P	NY	90	92	European Starling	CF	NY	70	68	Clay-colored Sparrow ‡			1	17
Common Raven	H	NY	72	88	Cedar Waxwing	H	H	90	88	Field Sparrow			6	5
Horned Lark			10	1	Golden-winged Warbler			12	6	Vesper Sparrow		S	56	38
Purple Martin			28	9	Blue/Gold-wing Warbler			0	3	Savannah Sparrow	CF	S	62	63
Tree Swallow	AE	NY	82	68	Tennessee Warbler			13	6	Grasshopper Sparrow			5	7
North Rgh-wing Swallow			29	30	Nashville Warbler	S	S	77	80	Song Sparrow	T	FY	91	92
Bank Swallow §	AE		27	10	Northern Parula			17	38	Lincoln's Sparrow ‡			2	6
Cliff Swallow §	AE	NB	45	34	Yellow Warbler	P	A	87	96	Swamp Sparrow	T	CF	59	65
Barn Swallow	H	NB	64	51	Chestn-sided Warbler	T	S	75	85	White-throat Sparrow	T	T	86	81
Black-capp Chickadee	H	FY	87	85	Magnolia Warbler		S	54	85	Northern Cardinal			6	30
Red-breast Nuthatch		H	63	73	Cape May Warbler			20	6	Rose-breast Grosbeak	S		64	51
White-breast Nuthatch		NB	24	38	Black-thr Blue Warbler			27	35	Indigo Bunting	S	S	70	71

Ontario Breeding Bird Atlas - Summary Sheet for Square 17ML38

SPECIES	Code		%	
	1st	2nd	1st	2nd
Bobolink	P	S	52	60
Red-wing Blackbird	CF	NE	81	68

Eastern Meadowlark	S	T	51	46
Western Meadowlark			6	2
Rusty Blackbird ‡			1	1
Brewer's Blackbird			16	13
Common Grackle	T	FY	72	73
Brown-head Cowbird	P	P	64	59
Baltimore Oriole	S	NB	43	50
<u>Purple Finch</u>	S		58	60
House Finch			0	7
Red Crossbill			5	0
White-winged Crossbill			5	6
Pine Siskin			16	7
American Goldfinch	P	P	67	73
Evening Grosbeak			32	7
House Sparrow			27	21

This list includes all species found during the Ontario Breeding Bird Atlas (1st atlas: 1981-1985, 2nd atlas: 2001-2005) in the region #33 (Manitoulin). Underlined species are those that you should try to add to this square. They have not yet been reported during the 2nd atlas, but were found during the 1st atlas in this square or have been reported in more than 50% of the squares in this region during the 2nd atlas so far. In the species table, "BE 2nd" and "BE 1st" are the codes for the highest breeding evidence for that species in square 17ML38 during the 2nd and 1st atlas respectively. The % columns give the percentage of squares in that region where that species was reported during the 2nd and 1st atlas (this gives an idea of the expected chance of finding that species in region #33). Rare/Colonial Species Report Forms should be completed for species marked: § (Colonial), ‡ (regionally rare), or † (provincially rare). Current as of 8/06/2009. An up-to-date version of this sheet is available from <http://www.birdsontario.org/atlas/summaryform.jsp?squareID=17ML38>

Appendix E
Manitoulin Christmas Bird Count Data 2002-2006

Manitoulin Island [ONMI]
45.85 degrees North x -82.4333 degrees West
Ontario Region
Christmas Bird Count
Count Years: 106 - 102

Species	Count Years	102	103	104	105	106
Canada Goose <i>(Branta canadensis)</i>	Number			2		3
	Number / Party			0.0385		0.0566
	Hr.					
	Flags					HC
American Black Duck <i>(Anas rubripes)</i>	Number	60	29	40	7	14
	Number / Party	1.0714	0.5	0.7692	0.2333	0.2642
	Hr.					
	Flags	HC				
Mallard <i>(Anas platyrhynchos)</i>	Number	382	27	44		25
	Number / Party	6.8214	0.4655	0.8462		0.4717
	Hr.					
	Flags	HC				
Northern Pintail <i>(Anas acuta)</i>	Number		0			
	Number / Party		0			
	Hr.					
	Flags		CW			
American Green-winged Teal <i>(Anas crecca)</i>	Number		2		1	
	Number / Party		0.0345		0.0333	
	Hr.					
	Flags					
Canvasback <i>(Aythya valisineria)</i>	Number	0				
	Number / Party	0				
	Hr.					
	Flags	US CW				
Lesser Scaup <i>(Aythya affinis)</i>	Number	19				
	Number / Party	0.3393				
	Hr.					
	Flags	HC				
White-winged Scoter	Number			1		

<i>(Melanitta fusca)</i>	Number / Party				0.0192	
	Hr.					
	Flags				US	
Long-tailed Duck <i>(Clangula hyemalis)</i>	Number	70				
	Number / Party	1.25				
	Hr.					
	Flags	HC				
Bufflehead <i>(Bucephala albeola)</i>	Number	32	6	27	0	1
	Number / Party	0.5714	0.1034	0.5192	0	0.0189
	Hr.					
	Flags				CW	
Common Goldeneye <i>(Bucephala clangula)</i>	Number	276	99	941	6	51
	Number / Party	4.9286	1.7069	18.0962	0.2	0.9623
	Hr.					
	Flags			HC		
Hooded Merganser <i>(Lophodytes cucullatus)</i>	Number	24			1	1
	Number / Party	0.4286			0.0333	0.0189
	Hr.					
	Flags					
Common Merganser <i>(Mergus merganser)</i>	Number	970	1508	80	15	
	Number / Party	17.3214	26	1.5385	0.5	
	Hr.					
	Flags					
Red-breasted Merganser <i>(Mergus serrator)</i>	Number	2	2	8		
	Number / Party	0.0357	0.0345	0.1538		
	Hr.					
	Flags					
Ring-necked Pheasant <i>(Phasianus colchicus)</i>	Number	2	3	4	13	14
	Number / Party	0.0357	0.0517	0.0769	0.4333	0.2642
	Hr.					
	Flags				HC	HC
Ruffed Grouse <i>(Bonasa umbellus)</i>	Number	9	7	10	7	3
	Number / Party	0.1607	0.1207	0.1923	0.2333	0.0566
	Hr.					
	Flags					
Sharp-tailed Grouse <i>(Tympanuchus phasianellus)</i>	Number	14	24	13	4	12
	Number / Party	0.25	0.4138	0.25	0.1333	0.2264
	Hr.					
	Flags					
Common Loon <i>(Gavia immer)</i>	Number	1	1		1	1
	Number / Party	0.0179	0.0172		0.0333	0.0189
	Hr.					
	Flags					

	Flags					
Red-necked Grebe (<i>Podiceps grisegena</i>)	Number	17	5	14	0	4
	Number / Party	0.3036	0.0862	0.2692	0	0.0755
	Hr.					
	Flags				CW	
Turkey Vulture (<i>Cathartes aura</i>)	Number			1		
	Number / Party			0.0192		
	Hr.					
	Flags			US		
Bald Eagle (<i>Haliaeetus leucocephalus</i>)	Number	25	24	36	20	18
	Number / Party	0.4464	0.4138	0.6923	0.6667	0.3396
	Hr.					
	Flags			HC		
Northern Harrier (<i>Circus cyaneus</i>)	Number			2		
	Number / Party			0.0385		
	Hr.					
	Flags					
Sharp-shinned Hawk (<i>Accipiter striatus</i>)	Number		0			
	Number / Party		0			
	Hr.					
	Flags		CW			
Northern Goshawk (<i>Accipiter gentilis</i>)	Number				1	
	Number / Party				0.0333	
	Hr.					
	Flags					
Red-tailed Hawk (<i>Buteo jamaicensis</i>)	Number				1	
	Number / Party				0.0333	
	Hr.					
	Flags					
Rough-legged Hawk (<i>Buteo lagopus</i>)	Number	4	5	42	0	2
	Number / Party	0.0714	0.0862	0.8077	0	0.0377
	Hr.					
	Flags			HC	CW	
Gyr Falcon (<i>Falco rusticolus</i>)	Number			1		
	Number / Party			0.0192		
	Hr.					
	Flags			US		
Common Snipe (<i>Gallinago gallinago</i>)	Number	1				
	Number / Party	0.0179				
	Hr.					
	Flags	US				

Ring-billed Gull <i>(Larus delawarensis)</i>	Number	114	9	11	6	0
	Number / Party Hr.	2.0357	0.1552	0.2115	0.2	0
	Flags	HC				CW
Herring Gull <i>(Larus argentatus)</i>	Number	280	177	150	18	60
	Number / Party Hr.	5	3.0517	2.8846	0.6	1.1321
	Flags				LC	
Iceland Gull <i>(Larus glaucoides)</i>	Number	0				
	Number / Party Hr.	0				
	Flags	CW				
Glaucous Gull <i>(Larus hyperboreus)</i>	Number	0				
	Number / Party Hr.	0				
	Flags	CW				
Great Black-backed Gull <i>(Larus marinus)</i>	Number		1		0	
	Number / Party Hr.		0.0172		0	
	Flags				CW	
Rock Dove <i>(Columba livia)</i>	Number	102	143			
	Number / Party Hr.	1.8214	2.4655			
	Flags					
Rock Pigeon <i>(Columba livia)</i>	Number			155	109	41
	Number / Party Hr.			2.9808	3.6333	0.7736
	Flags					
Mourning Dove <i>(Zenaida macroura)</i>	Number	123	131	216	142	272
	Number / Party Hr.	2.1964	2.2586	4.1538	4.7333	5.1321
	Flags			HC		HC
Snowy Owl <i>(Bubo scandiaca)</i>	Number	0				
	Number / Party Hr.	0				
	Flags	CW				
Northern Hawk Owl <i>(Surnia ulula)</i>	Number	0				
	Number / Party Hr.	0				
	Flags	CW				
Barred Owl <i>(Strix varia)</i>	Number	2		1		
	Number / Party Hr.	0.0357		0.0192		

	Hr.					
	Flags					
Great Gray Owl (<i>Strix nebulosa</i>)	Number				1	
	Number / Party				0.0333	
	Hr.					
	Flags				US HC	
Belted Kingfisher (<i>Ceryle alcyon</i>)	Number	2	2			
	Number / Party	0.0357	0.0345			
	Hr.					
	Flags					
Red-bellied Woodpecker (<i>Melanerpes carolinus</i>)	Number	3	1	1	6	2
	Number / Party	0.0536	0.0172	0.0192	0.2	0.0377
	Hr.					
	Flags				HC	
Downy Woodpecker (<i>Picoides pubescens</i>)	Number	21	13	29	26	19
	Number / Party	0.375	0.2241	0.5577	0.8667	0.3585
	Hr.					
	Flags					
Hairy Woodpecker (<i>Picoides villosus</i>)	Number	27	16	54	38	43
	Number / Party	0.4821	0.2759	1.0385	1.2667	0.8113
	Hr.					
	Flags			HC		
Northern (Yellow-shafted) Flicker (<i>Colaptes auratus</i>)	Number	1				
	Number / Party	0.0179				
	Hr.					
	Flags					
Pileated Woodpecker (<i>Dryocopus pileatus</i>)	Number	11	4	11	1	6
	Number / Party	0.1964	0.069	0.2115	0.0333	0.1132
	Hr.					
	Flags					
Northern Shrike (<i>Lanius excubitor</i>)	Number	4	5	6	1	3
	Number / Party	0.0714	0.0862	0.1154	0.0333	0.0566
	Hr.					
	Flags					
Gray Jay (<i>Perisoreus canadensis</i>)	Number		1			
	Number / Party		0.0172			
	Hr.					
	Flags					
Blue Jay (<i>Cyanocitta cristata</i>)	Number	167	136	141	234	247
	Number / Party	2.9821	2.3448	2.7115	7.8	4.6604
	Hr.					
	Flags					

American Crow (<i>Corvus brachyrhynchos</i>)	Number	59	44	105	89	74
	Number / Party Hr.	1.0536	0.7586	2.0192	2.9667	1.3962
	Flags					
Common Raven (<i>Corvus corax</i>)	Number	215	274	210	170	198
	Number / Party Hr.	3.8393	4.7241	4.0385	5.6667	3.7358
	Flags					
Horned Lark (<i>Eremophila alpestris</i>)	Number					34
	Number / Party Hr.					0.6415
	Flags					
Black-capped Chickadee (<i>Poecile atricapillus</i>)	Number	486	198	421	414	476
	Number / Party Hr.	8.6786	3.4138	8.0962	13.8	8.9811
	Flags					
Red-breasted Nuthatch (<i>Sitta canadensis</i>)	Number	30	7	27	18	32
	Number / Party Hr.	0.5357	0.1207	0.5192	0.6	0.6038
	Flags					
White-breasted Nuthatch (<i>Sitta carolinensis</i>)	Number	68	8	32	23	42
	Number / Party Hr.	1.2143	0.1379	0.6154	0.7667	0.7925
	Flags		HC			
Golden-crowned Kinglet (<i>Regulus satrapa</i>)	Number			1		
	Number / Party Hr.			0.0192		
	Flags					
Townsend's Solitaire (<i>Myadestes townsendi</i>)	Number				1	
	Number / Party Hr.				0.0333	
	Flags				US HC	
American Robin (<i>Turdus migratorius</i>)	Number				6	1
	Number / Party Hr.				0.2	0.0189
	Flags					
Varied Thrush (<i>Ixoreus naevius</i>)	Number				1	
	Number / Party Hr.				0.0333	
	Flags				US HC	
Brown Thrasher	Number				1	

<i>(Toxostoma rufum)</i>	Number / Party				0.0333	
	Hr.					
	Flags					
European Starling <i>(Sturnus vulgaris)</i>	Number	1178	364	249	170	162
	Number / Party	21.0357	6.2759	4.7885	5.6667	3.0566
	Hr.					
	Flags	HC				
American Pipit <i>(Anthus rubescens)</i>	Number					1
	Number / Party					0.0189
	Hr.					
	Flags					US HC
Bohemian Waxwing <i>(Bombycilla garrulus)</i>	Number	18				192
	Number / Party	0.3214				3.6226
	Hr.					
	Flags					
Cedar Waxwing <i>(Bombycilla cedrorum)</i>	Number				6	
	Number / Party				0.2	
	Hr.					
	Flags					
American Tree Sparrow <i>(Spizella arborea)</i>	Number	23	24	6	8	23
	Number / Party	0.4107	0.4138	0.1154	0.2667	0.434
	Hr.					
	Flags					
Chipping Sparrow <i>(Spizella passerina)</i>	Number				3	
	Number / Party				0.1	
	Hr.					
	Flags				HC	
Song Sparrow <i>(Melospiza melodia)</i>	Number				3	
	Number / Party				0.1	
	Hr.					
	Flags				HC	
Harris's Sparrow <i>(Zonotrichia querula)</i>	Number			1		
	Number / Party			0.0192		
	Hr.					
	Flags			US		
Dark-eyed (Slate-colored) Junco <i>(Junco hyemalis)</i>	Number	5	12	8	5	16
	Number / Party	0.0893	0.2069	0.1538	0.1667	0.3019
	Hr.					
	Flags					HC
Lapland Longspur <i>(Calcarius lapponicus)</i>	Number				2	2
	Number / Party				0.0667	0.0377
	Hr.					

		Flags					
Snow Bunting (<i>Plectrophenax nivalis</i>)	Number	0	41	40	103	625	
	Number / Party Hr.	0	0.7069	0.7692	3.4333	11.7925	
	Flags		CW				HC
Northern Cardinal (<i>Cardinalis cardinalis</i>)	Number	39	16	20	33	30	
	Number / Party Hr.	0.6964	0.2759	0.3846	1.1	0.566	
	Flags						
meadowlark sp. (<i>Sturnella</i>)	Number			1	0		
	Number / Party Hr.			0.0192	0		
	Flags			US	CW		
Rusty Blackbird (<i>Euphagus carolinus</i>)	Number					1	
	Number / Party Hr.					0.0189	
	Flags						
Common Grackle (<i>Quiscalus quiscula</i>)	Number	2		12	1	3	
	Number / Party Hr.	0.0357		0.2308	0.0333	0.0566	
	Flags						
Pine Grosbeak (<i>Pinicola enucleator</i>)	Number	30			5	318	
	Number / Party Hr.	0.5357			0.1667	6	
	Flags						HC
Purple Finch (<i>Carpodacus purpureus</i>)	Number		6		5	79	
	Number / Party Hr.		0.1034		0.1667	1.4906	
	Flags						
House Finch (<i>Carpodacus mexicanus</i>)	Number	3				2	
	Number / Party Hr.	0.0536				0.0377	
	Flags						
White-winged Crossbill (<i>Loxia leucoptera</i>)	Number	1					
	Number / Party Hr.	0.0179					
	Flags						
Common Redpoll (<i>Carduelis flammea</i>)	Number	277		235	128	32	
	Number / Party Hr.	4.9464		4.5192	4.2667	0.6038	
	Flags						

Hoary Redpoll (<i>Carduelis hornemanni</i>)	Number				1	
	Number / Party Hr.				0.0333	
	Flags					
Pine Siskin (<i>Carduelis pinus</i>)	Number	19		4		20
	Number / Party Hr.	0.3393		0.0769		0.3774
	Flags					
American Goldfinch (<i>Carduelis tristis</i>)	Number	38	28	41	63	917
	Number / Party Hr.	0.6786	0.4828	0.7885	2.1	17.3019
	Flags					HC
Evening Grosbeak (<i>Coccothraustes vespertinus</i>)	Number	46		30	18	129
	Number / Party Hr.	0.8214		0.5769	0.6	2.434
	Flags					
House Sparrow (<i>Passer domesticus</i>)	Number	84	109	134	34	40
	Number / Party Hr.	1.5	1.8793	2.5769	1.1333	0.7547
	Flags					

Back to Species

	Count Years	102	103	104	105	106
Weather & Effort	Count Date:	Dec 16, 2001	Dec 15, 2002	Dec 21, 2003	Dec 19, 2004	Dec 18, 2005
	Number of Participants:	18	16	14	12	21
	Number of Party Hours:	56.0	58.0	52.0	30.0	53.0
	Species Reported:	49	40	47	49	48
	Low Temperature:	35	25	34	-11	16
	High Temperature:	39	32	36	-6	23
	AM Weather:	Cloudy Rain: None Snow: None	Cloudy Rain: None Snow: Light	Cloudy Rain: None Snow: None	Local fog Rain: None Snow: None	Cloudy Rain: None Snow: Heavy

	<i>PM Weather:</i>	Cloudy Rain: None Snow: None	Cloudy Rain: None Snow: Light	Cloudy Rain: None Snow: None	Clear Rain: None Snow: None	Cloudy Rain: None Snow: Heavy
	<i>Participants:</i>					

Appendix F
Summary of Bat Ecology

Table 2. A summary of some important biology for bat species of Ontario.

Species	Forearm length	Usual # of pups*	Known diet*	Foraging preference*	Roost preference*	Winter behaviour*	Max. age*	Echolocation call*
Big Brown Bat (<i>Eptesicus fuscus</i>)	42 – 51 mm	2 in eastern Canada. Usually only 1 in the west.	Various insects, mainly beetles	Mostly open spaces, streams and treetops but flexible. Usually about 7-10m above ground.	Buildings, trees cavities and rock crevices. Forms nursery colonies.	Hibernates. Can tolerate drier sites than the smaller bats. May move if site becomes too cold. (Have been found active in winter on occasion.	19 years	Long (5-10 ms) call, rounded or flat, that bottoms between 25-27 kHz. Frequency with the most energy (FME) is 32-37 kHz. Very similar to Silver-haired Bat
Silver-haired Bat (<i>Lasiurus borealis noctungans</i>)	36 – 45 mm	1	Variety of insects	Over water and in forests	Mostly in trees (tree cavities, under the bark, in woodpecker holes) etc. Colonial summer roosts.	Migrates long distances (route unknown). Potential wintering ground in Ohio River Valley.	12 years	Long (5-10 ms) call, rounded or flat, that bottoms between 25-27 kHz. FME is 29-30 kHz. Difficult to distinguish from Big Brown Bat
Eastern Red Bat (<i>Lasiurus borealis</i>)	36 – 42 mm	3-4 (2 or 5 on occasion)	Variety of insects	High fliers over streams and treetops	In foliage. Solitary in summer roosts.	Migrates long distances (route unknown). Potential wintering ground in Ohio River Valley.	Unknown	Boomerang shaped call (~10 ms) that sweeps down from 50-30 kHz.
Hoary Bat (<i>Lasiurus cinereus</i>)	54 – 58 mm	Usually 2	Variety of insects, sometimes vertebrates, smaller bats	In open and up high, often around lights.	In foliage. Solitary in summer roosts.	Migrates long distances (route unknown).	Unknown	Usually a long (10-15 ms) flat call sweeping from 24-17kHz.
Eastern Small-footed Bat (<i>Myotis leibii</i>)	30 – 34 mm	1	Various insects	Largely unknown, has been observed both over water and land	Rock crevices and sometimes buildings. Forms nursery colonies	Migrates to hibernacula. Enters later (Nov.) and emerges earlier (Apr.) than other Ontario bats.	9 years	Similar to Little Brown Bat, but sweep ends at 43-44 kHz.
Little Brown Bat (<i>Myotis lucifugus</i>)	34 – 40 mm	1	Various insects (mostly aquatic)	Low over water, or among trees, lawns or pastures	Buildings, tree cavities, and rock crevices. Forms large nursery colonies.	Migrates to hibernacula (humid, above freezing).	34 years	4-6ms frequency modulated (FM) sweep ending at about 38-40 kHz. Brief inflection at the end.
Northern Long-eared bat (<i>Myotis septentrionalis</i>)	35 – 40 mm	1	Various insects	Usually associated with forest. Flies low and can glean prey off leaves and twigs.	Trees (exfoliated tree bark and cavities). Forms nursery colonies.	Migrates to hibernacula.	18 years	Short straight (1-4 ms) FM sweep from 110-40kHz
Eastern Pipistrelle (<i>Pipistrellus subflavus</i>)	32 – 36 mm	2	Variety of insects	Over water and near woods	In foliage and cavities. Forms nursery colonies.	Hibernates following short migration.	10 years	Long (10-20 ms) straight downward sweep to 40 kHz.

* Sources: Barbour and Davis 1969, Forsyth 1985, van Zyll de Jong 1985, Davis and Hitchcock 1995, Lausen and Barclay 2006.

Appendix G
Photographs of Creeks and Drains in the Study Area

Plate 1

October 26, 2004

Station 1

North Channel, Lake Huron.

Photo taken from the south (Little Current) side of the channel, looking east from the swing bridge at the shore.



Plate 2

October 26, 2004

Station 1

North Channel, Lake Huron.

Photo taken from the south (Little Current) side of the channel, looking north across the channel.



Plate 3

October 26, 2004

Station 1

North Channel, Lake Huron.

Photo taken from the north side of the channel, looking south at the shore area and channel.



Plate 4

October 26, 2004

Station 1

North Channel, Lake Huron.

Photo taken from the north side of the channel, looking north at the swing bridge and shoreline.



Plate 5

October 26, 2004

Station 2

Photo taken looking upstream
(north) from Morphet's
Sideroad.



Plate 6

October 26, 2004

Station 2

Photo taken looking
downstream (south) from
Morphet's Sideroad.



Plate 7

October 26, 2004

Station 3

Photo taken looking upstream
(west) from Highway 6.



Plate 8

October 26, 2004

Station 3

Photo taken looking
downstream (east) from
Highway 6.



Plate 9

October 26, 2004

Station 4

Photo taken looking upstream
(south) from Green Bush
Road.



Plate 10

October 26, 2004

Station 4

Photo taken looking
downstream (north) from
Green Bush Road.



Plate 11

October 27, 2004

Station 5

Middle branch of Sucker Creek.

Photo taken looking upstream (south) from Highway 540.



Plate 12

October 27, 2004

Station 6

East branch of Sucker Creek.

Photo taken looking upstream (north) from Highway 540.



Plate 13

October 27, 2004

Station 7

Photo taken looking upstream
(west) from McLeans
Mountain Road.



Plate 14

October 27, 2004

Station 7

Photo taken looking
downstream (east) from
McLeans Mountain Road.



Plate 15

October 27, 2004

Station 8

Photo taken looking upstream
(west) from McLeans
Mountain Road.



Plate 16

October 27, 2004

Station 8

Photo taken looking
downstream (east) from
McLeans Mountain Road.



Plate 17

October 27, 2004

Station 9

Photo taken looking upstream
(west) from McLeans
Mountain Road.



Plate 18

October 27, 2004

Station 9

Photo taken looking
downstream (east) from
McLeans Mountain Road.



Plate 19

October 27, 2004

Station 10

Photo taken looking upstream
(north) from Green Bush Road.



Plate 20

October 27, 2004

Station 10

Photo taken looking
downstream (south) from
Green Bush Road.



Plate 21

October 27, 2004

Station 11

Photo taken looking upstream
(north) from Green Bush Road.



Plate 22

October 27, 2004

Station 11

Photo taken looking
downstream (south) from
Green Bush Road.



Plate 23

October 27, 2004

Station 12

Photo taken looking upstream
from Green Bush Road.



Plate 24

October 27, 2004

Station 12

Photo taken looking
downstream (south) from
Green Bush Road.



Plate 25

October 27, 2004

Station 13

Photo taken looking upstream
from Green Bush Road.



Plate 26

October 27, 2004

Station 13

Photo taken looking
downstream (south) from
Green Bush Road.



Plate 27

October 27, 2004

Station 14

Photo taken looking upstream
(north) from Townline Road.



Plate 28

October 27, 2004

Station 14

Photo taken looking
downstream (south) from
Townline Road toward Bass
Lake.



Plate 29

October 27, 2004

Station 15

Photo taken looking upstream
(north) from Townline Road.



Plate 30

October 27, 2004

Station 16

Photo taken looking
downstream (east) from
Burnett's Sideroad.

