

Wocawson Energy Project Environmental Impact Assessment
Wocawson Energy Limited Partnership
September 2018

Appendix D

Avian Survey Report



DILLON
CONSULTING

WOCAWSON ENERGY LIMITED PARTNERSHIP

Bird and Bird Habitat Summary Report (Final)



August 2018 – 18-6975

Table of Contents

1.0	Introduction	1
1.1	Project Description.....	1
1.1.1	Existing Environment and Siting Considerations	4
1.1.2	Physical Components of the Project	5
1.1.3	Project Schedule	7
2.0	Bird and Bird Habitat Survey Scope and Methodology	8
2.1	Recommended Protocols and Scope of Work	8
2.1.1	Survey Protocols	8
2.1.1.1	Level of Concern for the Project	8
2.1.2	Scope of Work.....	10
2.1.2.1	Spatial Boundaries	10
2.1.2.2	Temporal Boundaries.....	10
2.2	Desktop Analysis Methodology.....	10
2.3	Field Survey Methodology	11
3.0	Avian Survey Results	20
3.1	Overview of Results	20
3.2	Winter Surveys.....	21
3.3	Spring Surveys and Spring Migration Summary.....	21
3.4	Summer Surveys	23
3.5	Breeding Bird Summary	24
3.6	Protected Habitat and Bird Species at Risk or Species of Conservation Concern.....	25
3.6.1	Protected Bird Habitat	25
3.6.2	Bird Species at Risk.....	26
3.6.3	Bird Species of Conservation Concern	30
3.7	Birds and Bird Habitat – Traditional Knowledge Perspective	33
4.0	Environmental Effects Assessment	34
4.1	Identification of Project Interactions.....	34
4.1.1	Approach to Project Components and Project Interaction Matrix.....	34
4.2	Assessment of Residual Environmental Effects	35
4.2.1	Identification of Potential Environmental Effects.....	35
4.2.2	Standard Mitigation of Potential Environmental Effects.....	35

4.2.3	Characterization of Residual Environmental Effects.....	38
5.0	Summary and Conclusion	38
6.0	Closure	39

Figures

Figure 1: Wocawson Energy Project Location	2
Figure 2: Wocawson Energy Project Site Plan	3
Figure 3: Anticipated Turbine Hub and Blade Lengths.....	6
Figure 4.A: Habitat Types in the Turbine Area	13
Figure 4.B: Habitat Types in the Transmission Line Corridor	14
Figure 5.A: Point Count Locations in the Turbine Area	15
Figure 5.B: Point Count Locations in the Transmission Line Corridor	16
Figure 6: Line Transect Survey Locations	18
Figure 7: Watch Count and Owl Playback Survey Locations	19
Figure 8: Bird Species Abundance at the Proposed Wocawson Energy Project Area During the 2018 Spring Survey Period	22
Figure 9: Bird Species Diversity at the Proposed Wocawson Energy Project Area During the 2018 Spring Survey Period	22
Figure 10: Breeding Bird Nesting Period in the Area of the Proposed Project (BSC, 2018).....	24

Tables

Table 1: Anticipated Project Schedule.....	7
Table 2: Avian Survey Schedule.....	17
Table 3: Summary of the Number of Bird Species and Individual Birds Observed During the 2018 Avian Field Surveys	20
Table 4: Bird SAR Historically Observed within 5 km of the Proposed Project Area	26
Table 5: Avian SAR Identified within the Assessment Area During the 2018 Avian Survey Program	27
Table 6: Bird SOCC Historically Observed Within 5 km of the Proposed Project Area	30
Table 7: Avian SOCC Identified within the Assessment Area During the 2018 Avian Survey Program.....	32
Table 8: Project Interaction with Environmental Components.....	35
Table 9: Potential Effects of the Project on Birds and Bird Habitat	37

Appendices

- A Bird Observation Data Summary Sheets
- B Custom AC CDC Report

References

1.0 Introduction

Dillon Consulting Limited (Dillon) was retained by the Wocawson Energy Limited Partnership (WLP) to complete natural environment surveys in support of a future provincial registration of an Environmental Impact Assessment (EIA) for the Wocawson Energy Project (“the proposed project”). WLP is a partnership between Tobique First Nation (51%) and Natural Forces NB Inc. (“Natural Forces”) (49%).

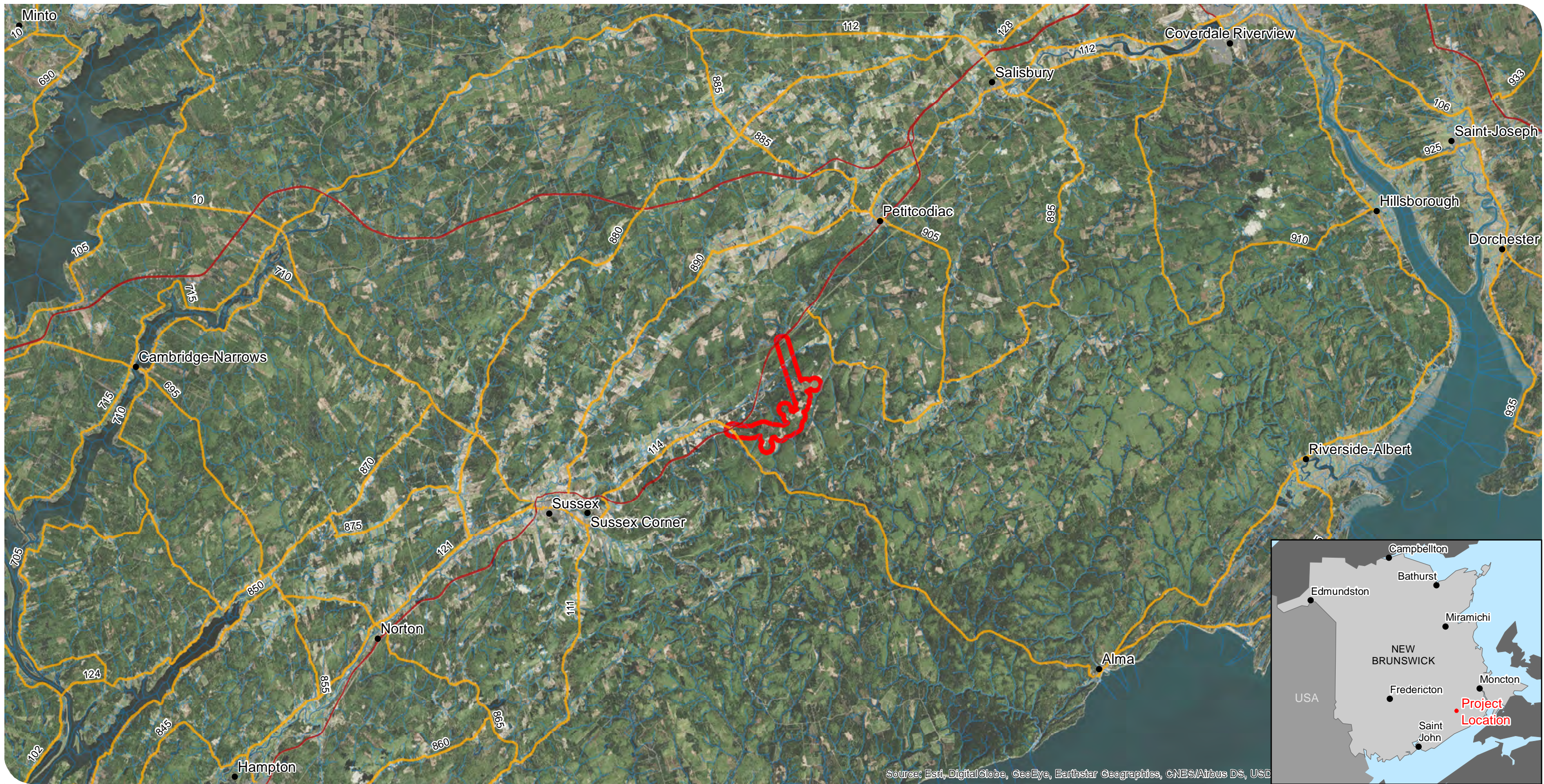
The proposed project is located in a generally undeveloped area although regular tree harvesting has occurred. It is anticipated that the area would provide suitable bird habitat for many species, resulting in birds and bird habitat being considered an important feature and a valued component (VC) related to the proposed project. Natural environment surveys for the proposed project were conducted for VCs of the environment based on an understanding of the environmental features of the proposed project area, feedback from the Canadian Wildlife Service (CWS) and New Brunswick Department of Energy and Resource Development (NBDERD) biologists, the nature of the proposed project, and the potential interactions that may occur between the proposed project and the environment/VCs.

This report provides a summary of the avian (i.e. bird and bird habitat surveys including species at risk (SAR) and species of conservation concern (SOCC)) conducted in support of the Wocawson Energy Project EIA registration, and includes: a brief description of the proposed project; a description of the scope and methodology used for the desktop analysis and field surveys; a summary of the results of the desktop review and field work; and, an assessment of residual effects (including potential interactions and mitigation) of the proposed project on birds and bird habitat based on current knowledge of the proposed project and professional judgment. Though the avian surveys were completed concurrently with other focused environmental surveys (i.e. vegetation, aquatic habitat and wetlands, wildlife, wildlife habitat, and SAR/SOCC), the focus of this report is on birds and bird habitat. Separate reports will be provided for other components of the environment, specifically for bats, wildlife and wildlife habitat, vegetation, and wetlands and watercourses.

1.1 Project Description

The proposed 20-40 megawatt (MW) Wocawson Energy Project is expected to provide electricity to approximately 3,600 – 7,200 New Brunswick homes. The turbines for the proposed project are sited on approximately 1,150 hectares (ha) of Crown land located approximately 20 km east of the Town of Sussex, in Kings County, New Brunswick (refer to **Figure 1**). The transmission line associated with the proposed project will extend across Crown land as well as private land to connect to the existing power grid.

The project area includes 12 proposed turbine locations (with 6-12 turbines installed), connector lines, a substation and transmission line, as well as pre-existing road infrastructure (Mitton Road) to be upgraded for the project (refer to **Figure 2**). Mitton Road (located off NB Route 114) is the main access to the project area.



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA

NATURAL FORCES INC
Wocawson Energy Project

- Project Location
- Watercourses
- Expressway / Highway
- Freeway
- Local / Street

Wocawson Energy Project Location
FIGURE 1



MAP DRAWING INFORMATION:
DATA PROVIDED BY NBDRD

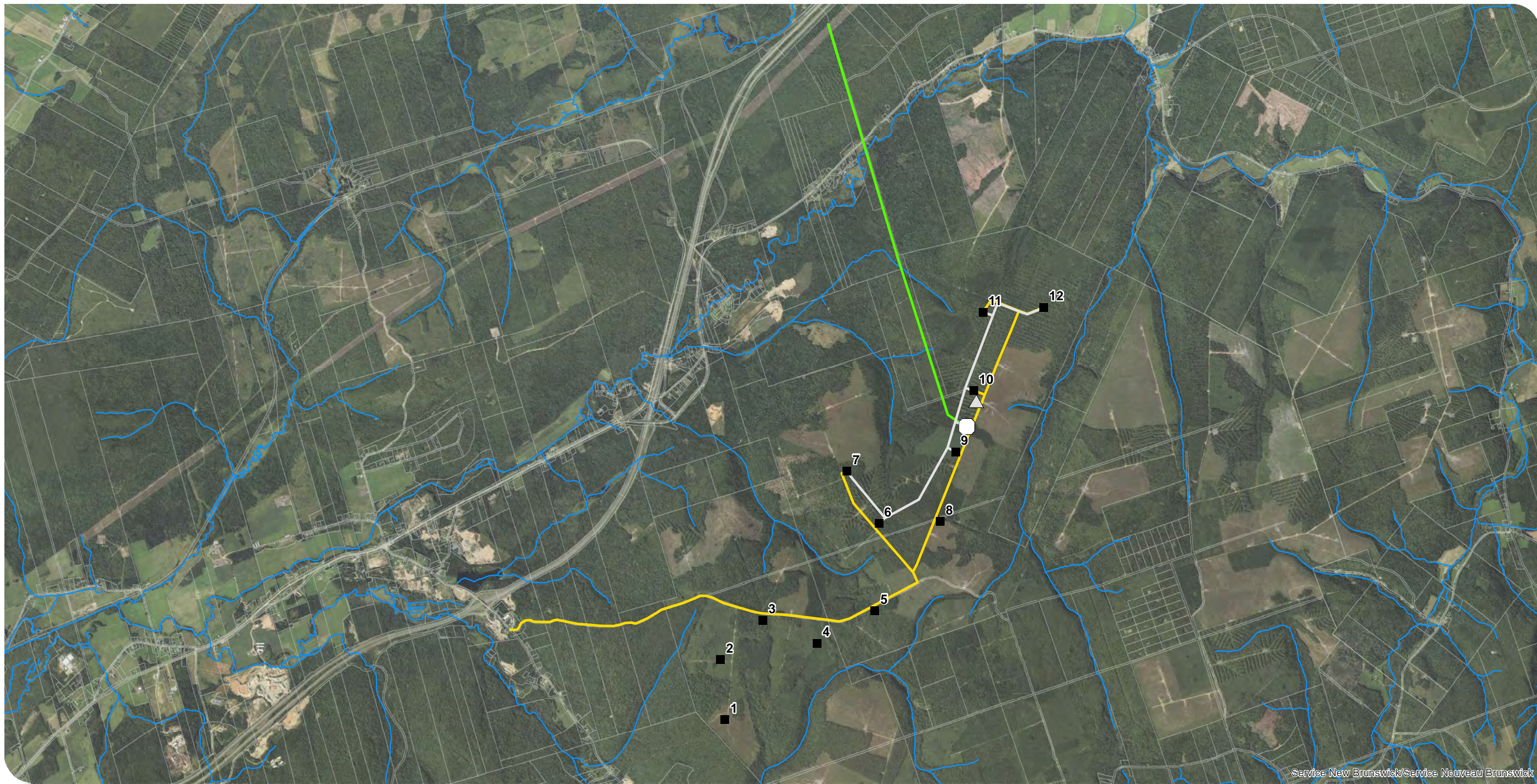
MAP CREATED BY: JNH
MAP CHECKED BY: AS
MAP PROJECTION: NAD 1983 CSRS New Brunswick Stereographic

0 5 10 km
SCALE 1:300,000



FILE LOCATION: G:\CAD\GIS\186975_SUSSEX EAST\SUSSEX EAST WIND PROJECT\MAPS FOR REPORT\PROJECT LOCATION JULY 4 2018_JNH

PROJECT: 18-6975 STATUS: DRAFT DATE: 2018-07-26



Service New Brunswick/Service Nouveau Brunswick

NATURAL FORCES INC
Wocawson Energy Project

- Proposed Turbine Locations
- Proposed Road Upgrade
- Proposed Transmission Line
- Proposed Collector
- Proposed Substation
- PID
- Met Tower
- Watercourses

Wocawson Energy Project Site Plan
FIGURE 2



MAP DRAWING INFORMATION:
DATA PROVIDED BY NBDRD

MAP CREATED BY: JNH
MAP CHECKED BY: ACS
MAP PROJECTION: NAD 1983 CSRS New Brunswick Stereographic



FILE LOCATION: G:\CAD\GIS\186975_SUSSEX EAST\SUSSEX EAST WIND PROJECT\MAPS FOR REPORT\SITE PLAN JULY 9 2018_JNH

PROJECT: 18-6975 STATUS: DRAFT DATE: 2018-07-26

Although the developed project is anticipated to only include 6 turbines, locations for 12 turbines were assessed to allow WLP the opportunity to refine the project footprint based on environmental constraints and to plan for future growth.

The proposed turbine layout includes the sites for up to 12 turbines located along a ridge running approximately northeast-southwest between elevations 225 m and 275 m above mean sea level (amsl). The general project area is recognized to have an energetic wind regime particularly due to its high elevation (Natural Forces, 2018). Local topography is undulating, with several low ridges also following a northeast-southwest orientation.

The majority of the proposed project site is characterized as being predominantly in an early stage of forest regeneration or plantation due to historic and recent commercial forestry operations. Many of the turbine locations have been selected in areas of recent cut over (i.e., clear-cut and select-cut areas) to minimize the destruction of potentially undisturbed or more mature habitat. No mapped watercourses or wetlands were observed within the proposed turbine locations or collector lines. An unmapped ephemeral drainage channel was observed along Mitton Road (proposed road upgrade); no wetlands were observed in this area.

The proposed transmission line runs approximately north-south and crosses a variety of land uses such as, rural residential property, recent clear cuts, and areas of immature to mature coniferous and deciduous forests in various stages of regeneration. The northern portion of the proposed transmission line crosses three mapped and one unmapped watercourse. The proposed transmission line does not cross any mapped (regulated) wetlands, however; the proposed transmission line crosses three unregulated wetlands, one of which is located in low lying floodplain (riparian) habitat associated with the Kennebecasis River and has been identified on the Service New Brunswick [SNB] draft beta wetland mapping currently being proposed by the New Brunswick Department of Environment and Local Government (NBDELG).

To facilitate the existing forestry operations, several logging roads have been constructed and maintained across the area. WLP has selected the proposed project site to utilize existing roads reducing the need for new road construction. Additionally, several groomed snowmobile trails that pass through the proposed project area are frequently used during the winter months. WLP recognizes that the local snowmobile club is a concerned stakeholder and has selected the proposed locations for site infrastructure such that project activities are not anticipated to affect the snowmobile trails or require the construction of new trails.

Land uses/habitat types in the proposed project area are further described in a subsequent section (Section 2, Figures 4A and 4B).

1.1.1 Existing Environment and Siting Considerations

WLP has extensive knowledge with respect to the development of wind farms on lands with favourable characteristics to provide efficient renewable energy. Many considerations are taken into account

during site selection that focus on efficiently delivering renewable energy to the local community in a way that minimizes the effects on the community and the environment (Natural Forces, 2018).

Specifically, the proposed project area is favourable due to the following characteristics (in no particular order): the available wind resource, the project distance from residential dwellings and environmentally sensitive features, proximity to the New Brunswick Power (NB Power) transmission system, and the existing land use and disturbed nature of the area due to extensive forestry activities (Natural Forces, 2018). The following is a list of factors that have been considered during the site selection and design process:

Technical Considerations:

- Sufficient wind resource;
- Regional topography;
- Proximity to transmission system; and,
- Turbine technology.

Environmental Considerations:

- Proximity to provincially regulated wetlands;
- Proximity to residential dwellings or other sensitive buildings;
- Sensitivity of flora and fauna;
- Proximity to provincial or national parks and nature reserves; and,
- Risk of archaeological resource disturbance.

Land use considerations:

- Known culturally significant areas;
- Current land use;
- Historical land use;
- Future land use;
- Available access to the land; and,
- Proximity to residential properties, communities and towns.

1.1.2 Physical Components of the Project

The proposed project will be comprised of 6-12 Enercon wind energy generators, each with a rated capacity of 3.33 MW and a maximum hub height of 135 m and blade length of 72 m (exact model not yet determined). Refer to **Figure 3** for a conceptual rendering of the proposed turbine design.

The transmission line will extend approximately 5.6 km across privately owned lands, within a new cleared corridor approximately 75 m wide, and will connect with existing New Brunswick Power infrastructure along the New Brunswick Department of Transportation and Infrastructure (NB DTI) right-

of-way for Route 1. The proposed project's output at the point of interconnection to the electrical grid will be 20 – 40 MW.

The project's lifespan ('design life') is expected to be 30 years (which is unique to Enercon wind turbines) (Natural Forces, 2018). The 30-year design life allows the Project to align itself with a 30-year Power Purchase Agreement (PPA) with NB Power, and allow a longer, stable energy production. Natural Forces has used Enercon machines exclusively for all its community wind projects currently under operation and has a long-standing relationship with the company.



Figure 3: Anticipated Turbine Hub and Blade Lengths

Base photo reference: Enercon <https://www.enercon.de/en/products/ep-4/e-141-ep4/>

1.1.3 Project Schedule

The proposed project schedule and activities are currently arranged as four distinct phases, as described in **Table 1**, below.

Phase	Phase Details	Anticipated Schedule
1. Development Phase	This phase includes the post power purchase agreement development activities (including the EIA and related work).	Q4 2017 to Q1 2019
2. Pre-Construction Phase	This phase includes pre-construction activities, including: financing arrangement for debt and equity, wind turbine supply negotiation, site design, execution of the Facilities Study Agreement, tendering for all construction contracts, and final construction-related permitting.	Q4 2018 to Q2 2019
3. Construction Phase	This phase includes construction and commissioning related activities, including: tree clearing and grubbing, road building, electrical works, foundation pour, turbine delivery, turbine assembly, and final Project commissioning.	Q1 2019 to Q4 2019 Commercial Operation anticipated to begin Q4 2019
4. Operation Phase	This phase includes activities that occur during the operation of the wind project, including: post-construction monitoring, annual monitoring reports, remote monitoring of turbine performance, and maintenance.	Q4 2019 to decommissioning of the turbines (30 year lifespan)

The decommissioning phase of the project will include activities required to decommission the wind project, including: the removal of the turbine materials and associated infrastructure to an appropriate underground depth and restoration of the site. The precise timing of the decommissioning of the proposed project is currently unknown. If possible, the wind turbines' lifespan may be extended by replacing parts or otherwise refurbishing them to produce additional energy after their original 30-year lifespan. Therefore, the decommissioning phase of the project is not considered within the scope of this assessment. Once the proposed project is approaching the end of its useful life, a decommissioning plan will be submitted to the NBDELG prior to undertaking decommissioning activities that reflects the guidance and regulations in place at that time.

2.0 Bird and Bird Habitat Survey Scope and Methodology

This section details the scope of the bird and bird habitat surveys conducted for the proposed project, and the methods that were used to conduct the desktop and field assessments.

2.1 Recommended Protocols and Scope of Work

2.1.1 Survey Protocols

The “Recommended Protocols for Monitoring Impacts of Wind Turbines on Birds” published by the Canadian Wildlife Service (CWS, 2007a) recommends a full year breeding and migratory bird survey be completed as part of the EIA process and prior to the construction of a wind farm project.

2.1.1.1 Level of Concern for the Project

The proposed project is a 6 – 12 turbine facility which, according to the “Recommended Protocols for Monitoring Impacts of Wind Turbines on Birds” (CWS, 2007a), is considered to be a small to medium sized facility. In determining the “Potential Site Sensitivity”, a conservative assessment was applied and the site was ranked as “Medium” sensitivity. The site is not known to be regionally or locally significant to birds, nor believed to be part of a major migration route; however, the low-lying floodplain in the proposed transmission line corridor was considered to have potential to support habitat for Species at Risk such as Canada warbler (*Wilsonia canadensis*) and Wood thrush (*Hylocichla mustelina*), both of which are listed as Threatened on Schedule 1 of the federal *Species at Risk Act* (SARA) and have been historically recorded within 5 km of the assessment area (ACCDC 2018).

Following the specifications outlined in the CWS guidance document (CWS 2007b), the proposed Project was considered to be “Category 2” based on the “Level of Concern Category Matrix Table” presented below.

FACILITY SIZE	SITE SENSITIVITY			
	Very High	High	Medium	Low
Very Large	Category 4	Category 4	Category 3	Category 2
Large	Category 4	Category 3	Category 2	Category 2
Medium	Category 4	Category 3	Category 2	Category 1
Small	Category 4	Category 2	Category 1	Category 1

*reference: Table 3 in Canadian Wildlife Service (2007a)

WLP understands that one of the most significant environmental concerns associated with wind projects is the potential impacts to birds. As such, WLP undertook consultation with NBDERD and CWS regarding

the sensitivity of the proposed project location. In email correspondence dated May 17, 2017 the NBDELG EIA project manager indicated that NBDERD was satisfied with the Category 2 classification for the proposed project and with the proposed level of effort for surveys for the project (Colwell, C., pers. comm., 2018).

During subsequent consultation, CWS indicated that “all turbine sites with wind turbines greater than 150 m in height [are classified] as *Very High site sensitivity* because they are within a known migratory corridor as per Table 1 in CWS (2007a) guidance document. Turbine heights greater than 150 m in height are in the 150 – 600 m nocturnal flight corridor of songbirds (Horton et al. 2016).”

The methods used in the Horton et al. (2016) study referred to by CWS were limited in that flight altitudes were recorded in 10 m increments starting at 150 m above ground surface, likely because long-range Doppler radar cannot accurately detect below 150 m due to curvature of the earth and landscape obstructions. This study did not collect data from below the 150 m elevation; therefore, in Dillon’s view, suggesting that the flight corridor commences at 150 m elevation, or is increased compared to those at a lower elevation, is not scientifically defensible.

Alternatively, Mabee et al. (2006) concluded that migration altitudes from ground surface to 1.5 km altitude averaged at approximately 415 m, with nightly ranges from approximately 215 m to 770 m. The Mabee study also identified a relatively uniform distribution of flight paths between ground surface and 500 m, indicating that there would be no increased risk to birds based on turbine height.

In addition, diurnal bird flight patterns for many species have been found to be at lower altitudes (below 100 m) where they can move among obstacles and avoid them more easily by sight. Anecdotal evidence from bird migration surveys at several migration sites, such as Tadoussac Dunes Bird Observatory, where over 700,000 migrant birds, mostly passerines, were observed to support this.

When considering the potential risk to birds from collisions, the publication titled “Wind Turbines and Birds: A Background Review for Environmental Assessment Report” (Kingsley and Whittam, 2005) found that collisions appear to be largely influenced by three main factors, including density of birds, landscape features, and poor weather conditions in a project area (Kingsley and Whittam, 2005), not turbine height. Recent literature has identified the following:

- Collision fatalities for birds are generally highest during fall migration period (CWS, 2007a; Erickson et al., 2014).
- North American surveys have identified that passerines tend to migrate at altitudes above 200 m (Mabee et al., 2006; McCrary et al., 1983).
- A review of 100+ seasonal nocturnal migration radar studies in the eastern United States has shown that there is no direct correlation between pre-construction movement rates using radar and actual post-construction fatality estimates (Tidhar et al., 2012).

Based on these lines of scientific evidence, WLP maintains that the proposed project is appropriately classified as a Category 2 site.

2.1.2 Scope of Work

Based on the recommended Environment and Climate Change Canada (ECCC) and CWS protocols, and feedback from the consultation process, the following scope of work was completed as part of the bird and bird habitat surveys for the proposed project. As field work progressed, and as more information became available, the surveys were refined based on the available habitat types and expected species diversity within the study area. The scope of work included:

- Background and Desktop Analysis;
- Winter Surveys (targeting overwintering birds and early breeding owls);
- Spring Surveys (targeting migrating birds using the area as a stopover and late breeding owls);
- Summer Surveys (targeting breeding birds and common nighthawk(a species at risk)); and
- Fall Surveys (targeting migrating birds)—to be conducted in Fall 2018 and to be documented as an addendum to this report.

The methodologies used for the scope of the desktop analysis and field surveys listed above are outlined within the following sections.

2.1.2.1 Spatial Boundaries

For the purpose of this assessment, the spatial boundaries (i.e., the assessment area) have been identified as a 500 m buffer surrounding the project footprint of the proposed turbine locations, substation, connector lines, road upgrades and transmission line corridor.

2.1.2.2 Temporal Boundaries

The temporal boundaries for the assessment define the time periods for which likely environmental effects of the Project are considered. The temporal boundaries of this assessment include the duration of the construction phase (approximately 1 year in duration during 2019) and subsequent operation phase (approximately 30 years following construction) of the Project. In the construction phase, specific construction-related effects are anticipated to be short term and limited to either the duration of the activities that produce the effects or the duration of the construction phase. Effects associated with the operation phase are longer term, as the proposed Project is intended to be operational for at least 30 years (although the lifespan may be extended with routine maintenance or refurbishment as appropriate).

2.2 Desktop Analysis Methodology

Prior to completing the avian (bird) field surveys, Dillon reviewed readily available information from reputable sources. The information was reviewed to evaluate the potential for avian species of conservation concern (SOCC) and/or avian species at risk (SAR) within the general area of the proposed project. The information on habitats present in the local and sub-regional assessment area were reviewed to determine preliminary potential for at risk bird species and/or their critical habitat. Dillon completed a review of the following sources and data lists prior to completing the field surveys:

- Atlantic Canada Conservation Data Centre (AC CDC);
- Environment and Climate Change Canada Species at Risk Reports (ECCC);
- New Brunswick Department of Natural Resources Species at Risk Reports (NBDNR);
- The federal Species at Risk Registry (ECCC, 2018);
- The Committee on the Status of Endangered Wildlife in Canada (COSEWIC);
- Publicly available GIS map layers (e.g., ecological land classification, forest and non-forest inventory, wetland inventory, Protected Natural Areas, Wildlife Management Zones);
- Environmentally Significant Areas Database;
- Ecological Reserves in the Maritimes;
- The General Status of Wildlife in New Brunswick publication;
- Atlas of Breeding Birds of the Maritime Provinces;
- Important Bird Areas of Canada;
- Ramsar (Wetlands of International Importance) Sites Database;
- Atlas of Canada Migratory Bird Sanctuaries;
- Bird Studies Canada;
- Available aerial photography; and,
- Local naturalist/interest groups prior to conducting the field activities.

Approximate extents of different habitat types in the turbine area and transmission line area are presented on **Figures 4A and 4B**, respectively.

2.3 Field Survey Methodology

Based on the level of concern for the proposed project (CWS, 2007a), and the findings of the initial literature review, the following approach for the avian surveys were completed with the objective of gaining an estimate of both the number of bird species using the project area, and their relative abundance.

The surveys were performed by an experienced bird specialist skilled at identifying birds by song, call and sight. The surveys were scheduled to ensure that observations were made during all seasons to determine which species regularly use the area, and during which times, throughout the year. Survey protocols were developed based on professional experience, knowledge of the project area, and review of recommended techniques from the CWS guidance documents (CWS, 2007a; CWS, 2007b).

Breeding bird surveys were conducted using point count survey methods based on the Standard North American Breeding Bird Survey protocol (ECCC, 2018 a). Point count locations were chosen systematically within the assessment area (**Figure 1**). A total of 29 point count locations (PC#), illustrated on **Figures 5A and 5B**, were selected with points at each turbine location and dispersed throughout the study area in representative habitats with an emphasis on habitats that may have higher potential to be

used by SAR/SOCC. Point counts were spaced at least 250 m apart and each point count location was surveyed at least twice during the breeding season. The total number of individuals detected (i.e., heard or seen) during the ten minute observation period were recorded at each point count along with the timing, and survey conditions (temperature, wind speed and direction, cloud cover, and precipitation).

Four point count locations were selected for surveys for nightjar species of conservation concern such as: Common Nighthawk (Threatened, Schedule 1 of SARA), and Eastern Whip-poor-wills (Threatened, Schedule 1 of SARA) (**Figure 1**). As prescribed in the “Canadian Nightjar Survey Protocol – 2018” (ECCC 2018c), these surveys were completed within the June full moon phase (June 25th to 30th, 2018).



Government of New Brunswick / Gouvernement du Nouveau-Brunswick, Service New Brunswick/Service Nouveau Brunswick

NATURAL FORCES INC
Wocawson Energy Project

Wocawson Energy Project
Habitat Types - Turbine Area
FIGURE 4A



- Proposed Turbine Locations
- Proposed Substation
- △ Met Tower

- Proposed Road Upgrade
- Proposed Collector
- Proposed Transmission Line
- Watercourses

- Roads
- Regulated Wetlands
- Assessment Area

- Terrestrial Habitats**
- Pre-Commercial Thinning
 - Clear Cut
 - Strip Cut

- Select Cut Mixedwood
- Immature Mixedwood
- Semi-Mature to Mature Mixedwood
- Softwood Plantation

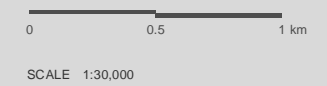
- Semi-Mature to Mature Softwood
- Semi-Mature to Mature Hardwood
- Pine Retention
- Potential Wetland

- NBDELG Draft Beta Wetland Mapping (unregulated)**
- Provincially Significant Wetlands
 - Intermediate Wetlands
 - Forested Wetlands



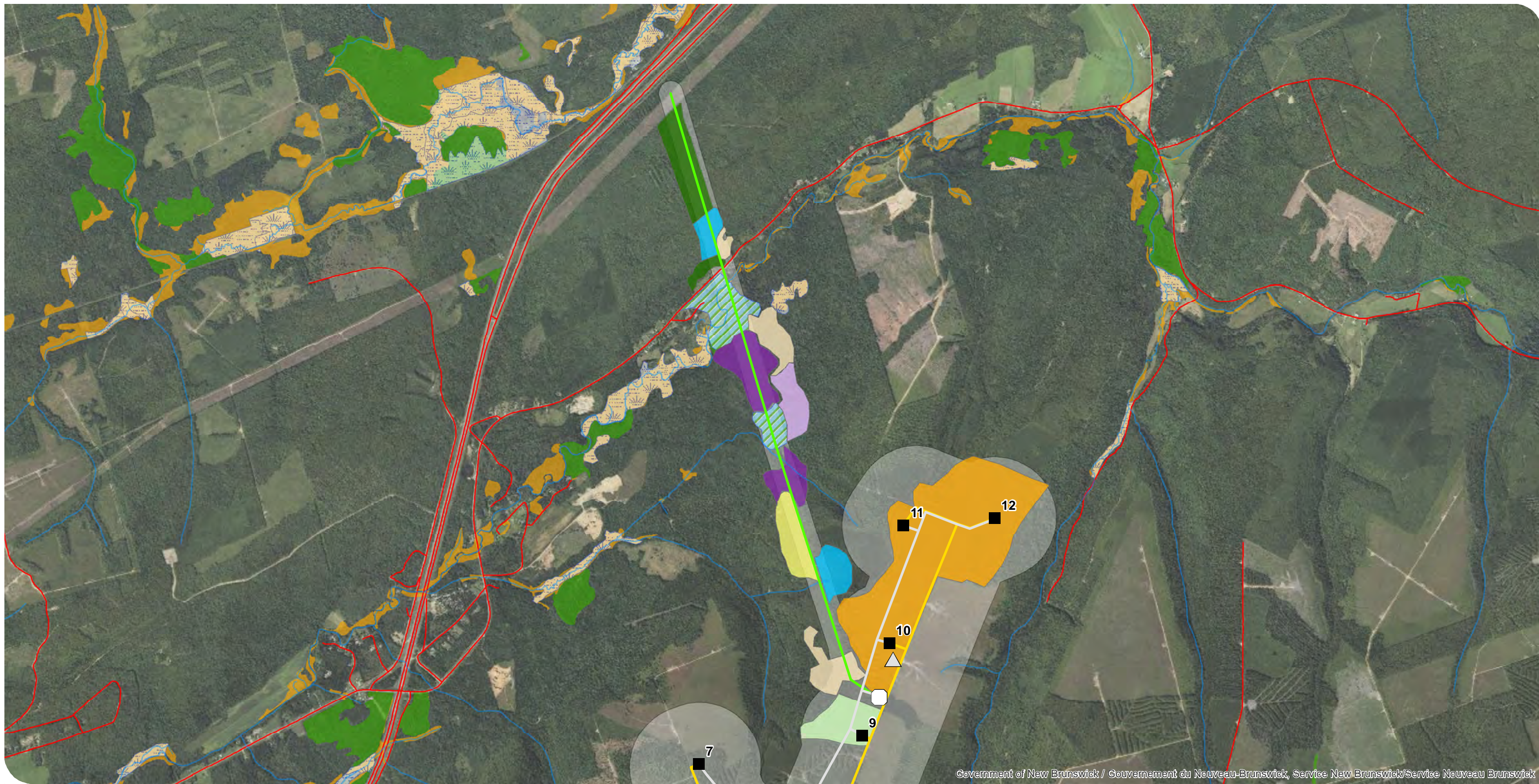
MAP DRAWING INFORMATION:
DATA PROVIDED BY NBDERD

MAP CREATED BY: JNH
MAP CHECKED BY: ACS
MAP PROJECTION: NAD 1983 CSRS New Brunswick Stereographic



FILE LOCATION: G:\CAD\GIS\186975_SUSSEX EAST\SUSSEX EAST WIND PROJECT\MAPS FOR REPORT\TERRESTRIAL HABITATS A JULY 10_2018_JNH

PROJECT: 18-6975 STATUS: DRAFT DATE: 2018-07-26



Government of New Brunswick / Gouvernement du Nouveau-Brunswick, Service New Brunswick/Service Nouveau Brunswick

NATURAL FORCES INC
Wocawson Energy Project

Wocawson Energy Project
Habitat Types - Transmission Corridor
FIGURE 4B



- Proposed Turbine Locations
- Proposed Substation
- △ Met Tower

- Proposed Road Upgrade
- Proposed Collector
- Proposed Transmission Line
- Watercourses

- Roads
- Regulated Wetlands
- Assessment Area

- Terrestrial Habitats**
- Pre-Commercial Thinning
 - Clear Cut
 - Strip Cut

- Select Cut Mixedwood
- Immature Mixedwood
- Semi-Mature to Mature Mixedwood
- Softwood Plantation

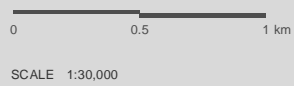
- Semi-Mature to Mature Softwood
- Semi-Mature to Mature Hardwood
- Pine Retention
- Potential Wetland

- NBDELG Draft Beta Wetland Mapping (unregulated)**
- Provincially Significant Wetlands
 - Intermediate Wetlands
 - Forested Wetlands



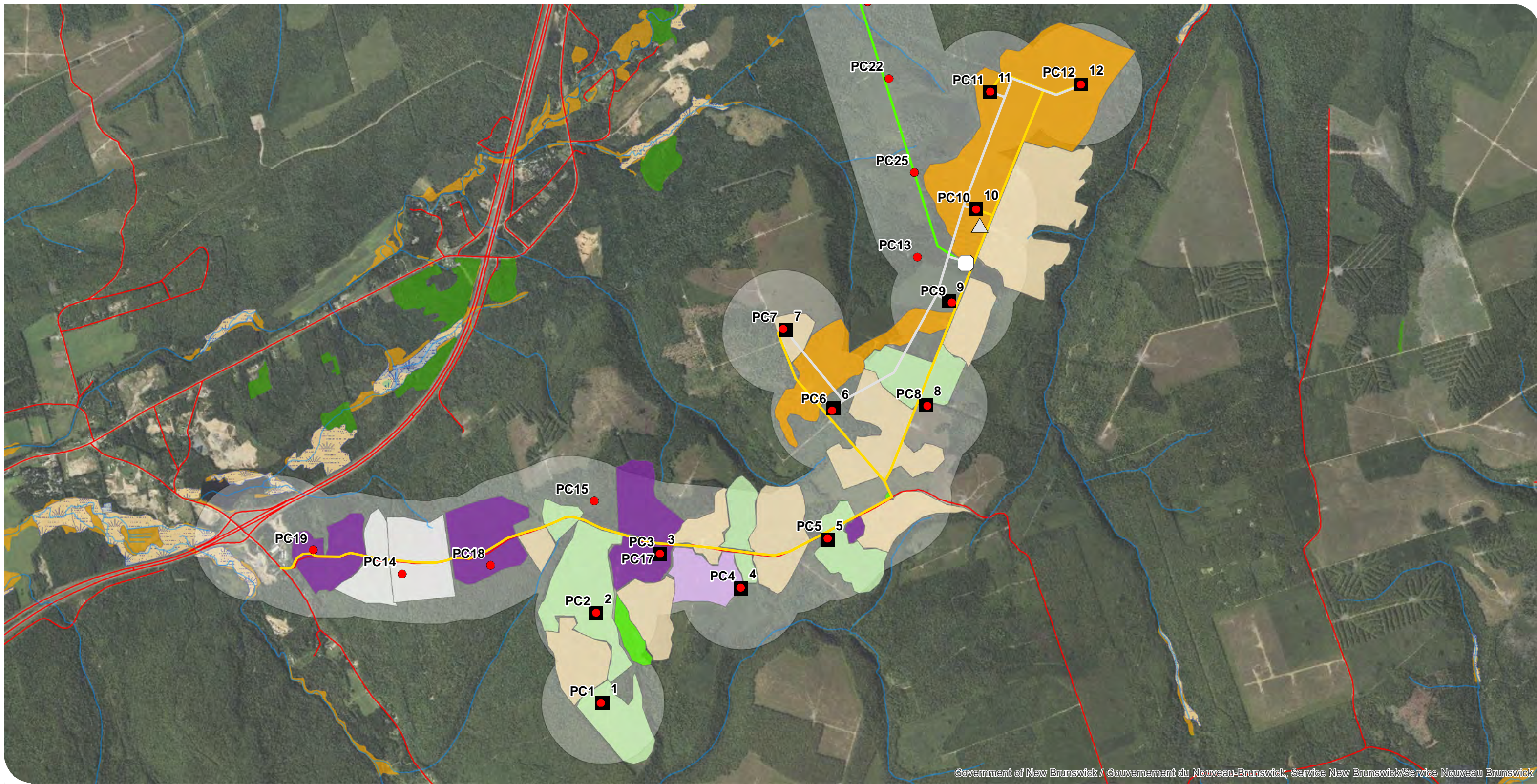
MAP DRAWING INFORMATION:
DATA PROVIDED BY NBDERD

MAP CREATED BY: JNH
MAP CHECKED BY: ACS
MAP PROJECTION: NAD 1983 CSRS New Brunswick Stereographic



FILE LOCATION: G:\CAD\GIS\186975_SUSSEX EAST\SUSSEX EAST WIND PROJECT\MAPS FOR REPORT\TERRESTRIAL HABITATS A JULY 10_2018_JNH

PROJECT: 18-6975 STATUS: DRAFT DATE: 2018-07-26



Government of New Brunswick / Gouvernement du Nouveau-Brunswick, Service New Brunswick/Service Nouveau Brunswick

NATURAL FORCES INC
Wocawson Energy Project

Wocawson Energy Project
Point Count Locations - Turbine Area

FIGURE 5A



- Bird Survey Point Count
- Proposed Turbine Locations
- Proposed Substation
- △ Met Tower

- Proposed Road Upgrade
- Proposed Collector
- Proposed Transmission Line
- Watercourses

- Roads
- Regulated Wetlands
- Assessment Area

- Terrestrial Habitats**
- Pre-Commercial Thinning
 - Clear Cut
 - Strip Cut

- Select Cut Mixedwood
- Immature Mixedwood
- Semi-Mature to Mature Mixedwood
- Softwood Plantation

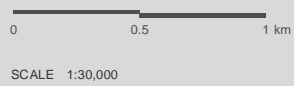
- Semi-Mature to Mature Softwood
- Semi-Mature to Mature Hardwood
- Pine Retention
- Potential Wetland

- NBDELG Draft Beta Wetland Mapping (unregulated)**
- Provincially Significant Wetlands
 - Intermediate Wetlands
 - Forested Wetlands



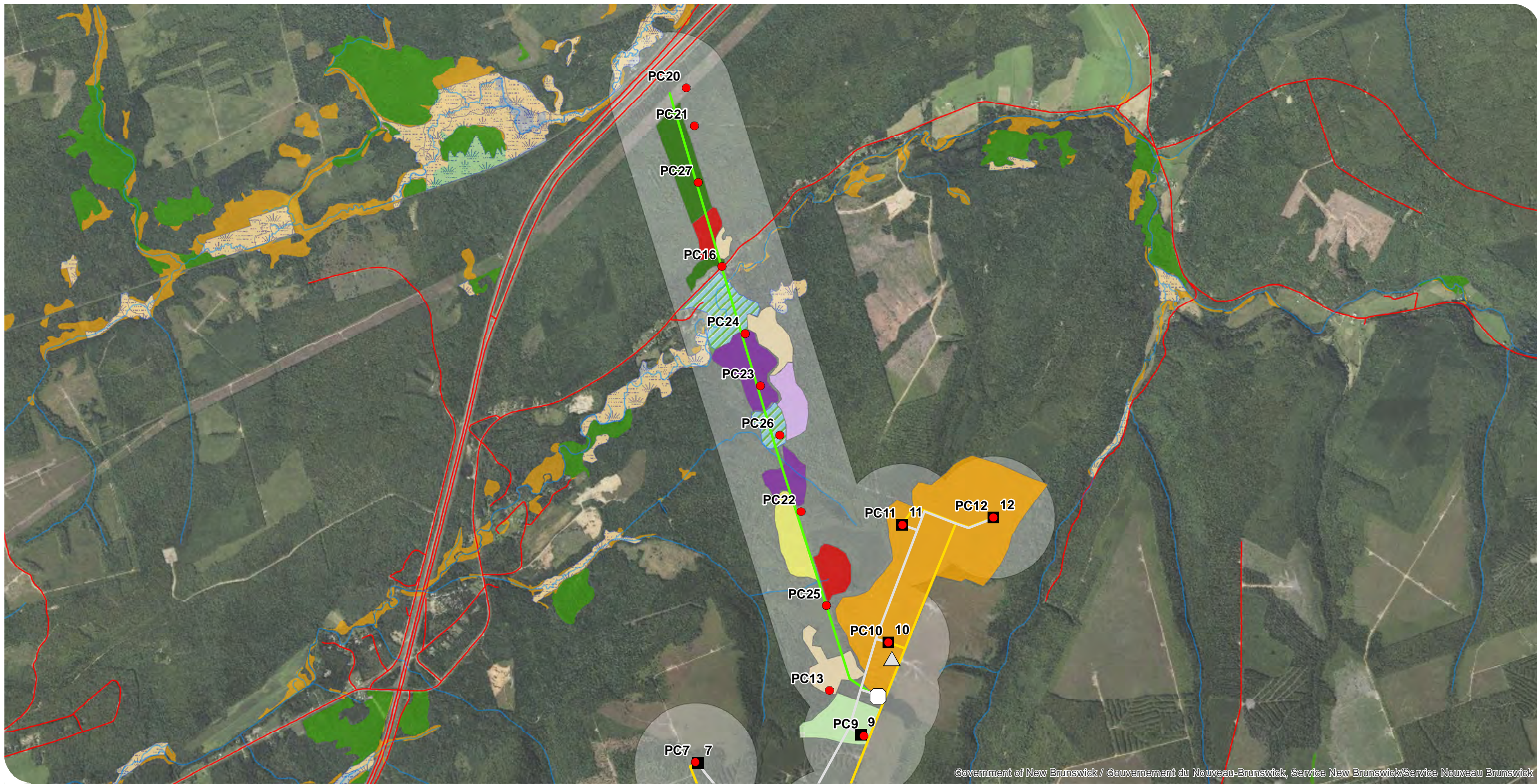
MAP DRAWING INFORMATION:
DATA PROVIDED BY NBDERD

MAP CREATED BY: JNH
MAP CHECKED BY: ACS
MAP PROJECTION: NAD 1983 CSRS New Brunswick Stereographic



FILE LOCATION: G:\CAD\GIS\186975_SUSSEX EAST\SUSSEX EAST WIND PROJECT\MAPS FOR REPORT\TERRESTRIAL HABITATS A JULY 10_2018_JNH

PROJECT: 18-6975 STATUS: DRAFT DATE: 2018-07-26



Government of New Brunswick / Gouvernement du Nouveau-Brunswick, Service New Brunswick/Service Nouveau Brunswick

NATURAL FORCES INC
Wocawson Energy Project

Wocawson Energy Project
Point Count Locations - Transmission Corridor
FIGURE 5B

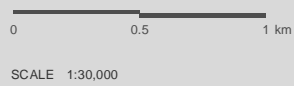


- | | | | | | | |
|------------------------------|------------------------------|----------------------|-----------------------------|-----------------------------------|----------------------------------|--|
| ● Bird Survey Point Count | — Proposed Road Upgrade | — Roads | Terrestrial Habitats | □ Select Cut Mixedwood | ■ Semi-Mature to Mature Softwood | NBDELG Draft Beta Wetland Mapping (unregulated) |
| ■ Proposed Turbine Locations | — Proposed Collector | ■ Regulated Wetlands | ■ Pre-Commercial Thinning | ■ Immature Mixedwood | ■ Semi-Mature to Mature Hardwood | ■ Provincially Significant Wetlands |
| □ Proposed Substation | — Proposed Transmission Line | □ Assessment Area | ■ Clear Cut | ■ Semi-Mature to Mature Mixedwood | ■ Pine Retention | ■ Intermediate Wetlands |
| △ Met Tower | — Watercourses | | ■ Strip Cut | ■ Softwood Plantation | ■ Potential Wetland | ■ Forested Wetlands |



MAP DRAWING INFORMATION:
DATA PROVIDED BY NBDERD

MAP CREATED BY: JNH
MAP CHECKED BY: ACS
MAP PROJECTION: NAD 1983 CSRS New Brunswick Stereographic



FILE LOCATION: G:\CAD\GIS\186975_SUSSEX EAST\SUSSEX EAST WIND PROJECT\MAPS FOR REPORT\TERRESTRIAL HABITATS A JULY 10_2018_JNH

PROJECT: 18-6975 STATUS: DRAFT DATE: 2018-07-26

Line Transects along existing roads and trails within the study area were used during the winter and spring months to detect presence of overwintering birds and birds that may have been using the area as a stopover for shelter and/or for feeding during the spring migration. Approximately 7 transects, illustrated on **Figure 6 (T#)**, of various lengths (starting and stopping at obvious breaks or as daylight hours permitted), were surveyed over about 15 km of forest roads and undeveloped properties.

Area Searches were used in conjunction with other survey techniques (such as transects; refer to **Figure 6**) and were used during the winter months, specifically to detect resident bird species that may not have been readily singing or calling.

Watch Counts were conducted during the spring migration period to detect birds passing through the area at the height of the turbine blades and birds that may use the project area as a stopover during migration. Three watch count locations with clear views over the area were used for the surveys (WC#, **Figure 7**). Watch counts were carried out one half hour before dusk and/or one half hour before sunrise. Additional 4 hour watch counts targeting diurnal raptors were conducted once per week during the spring migration period between April 15 – June 7, 2018.

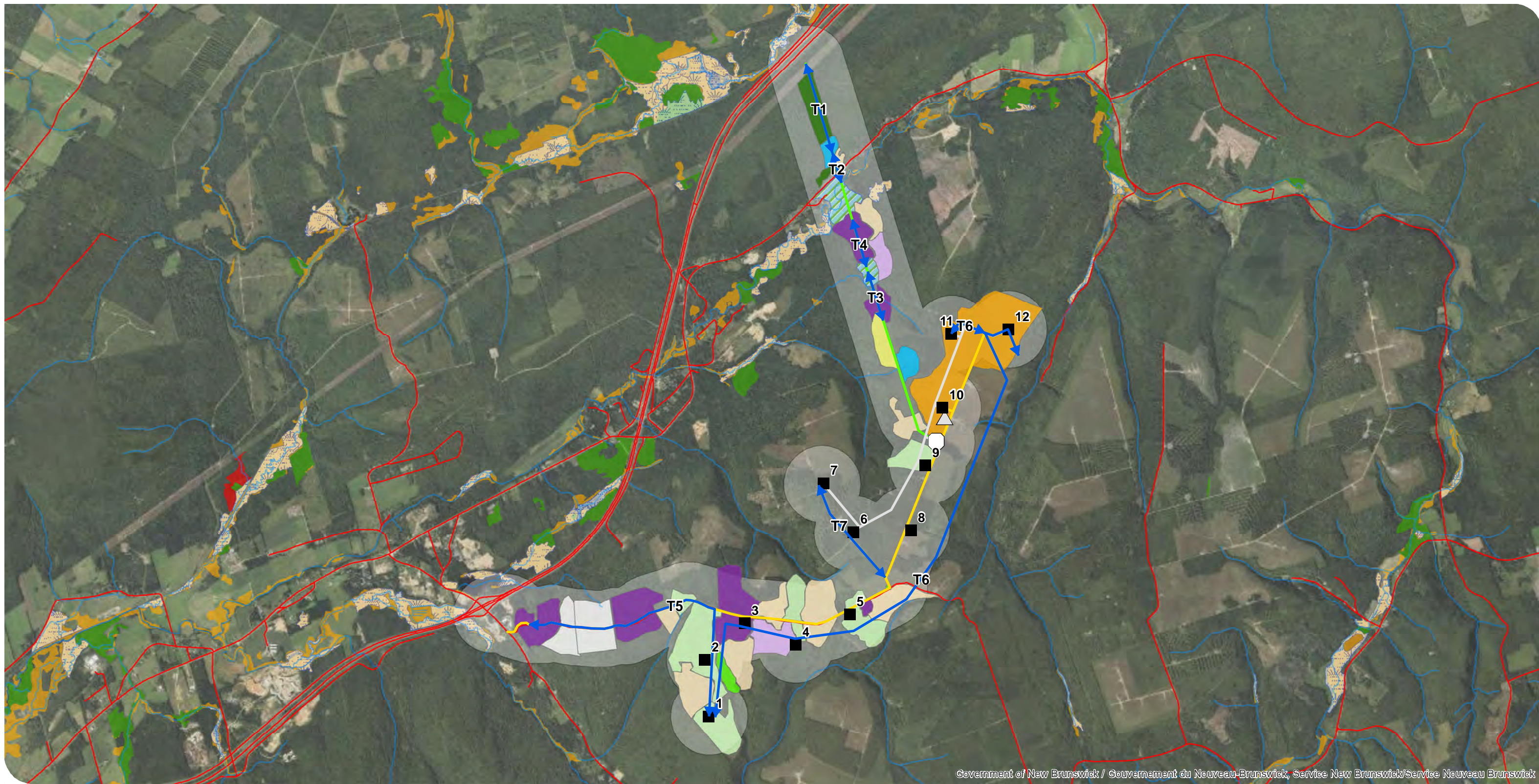
Targeted Call Back (playback) surveys, completed in March 2018, using recordings of territorial calls were used at targeted locations for owl species. Playbacks were limited to a few minutes to avoid prolonged disturbance, especially during breeding season. Owl survey points were completed at four locations within the study area (**Figure 7**).

The survey schedule associated with each survey method is outlined in **Table 2** below.

Table 2: Avian Survey Schedule

Survey Phase	Key Components	Survey Dates (2018)
Winter Surveys	Line transects/area searches, play backs for early breeding owls	February 6-7, March 11-12, March 20-21, April 2-3
Spring Migration and Early Breeding	Watch counts, playbacks for late Owls, point counts and area searches	April 19, April 22-24, May 2, May 7-8, May 16-17, May 22, May 29, June 5-6
Summer Breeding	Point counts, area surveys, Nightjar surveys	June 20-21, June 27-28
Fall Migration	Watch counts and area surveys	Planned for August 15 – October 31 (exact dates TBD)

Additional surveys, including watch counts and area surveys, are planned to be completed during the fall 2018 migration period, with focused daily watch counts completed daily over a 2 week period of peak migration. These surveys have been designed to evaluate the potential of the project area to be used as a migration stopover and to detect species migrating through the project area. The additional methodology and observations will be provided in an addendum to this report following the conclusion of the surveys.



Government of New Brunswick / Gouvernement du Nouveau-Brunswick, Service New Brunswick/Service Nouveau Brunswick

NATURAL FORCES INC
Wocawson Energy Project

Wocawson Energy Project
Line Transect Surveys

FIGURE 6



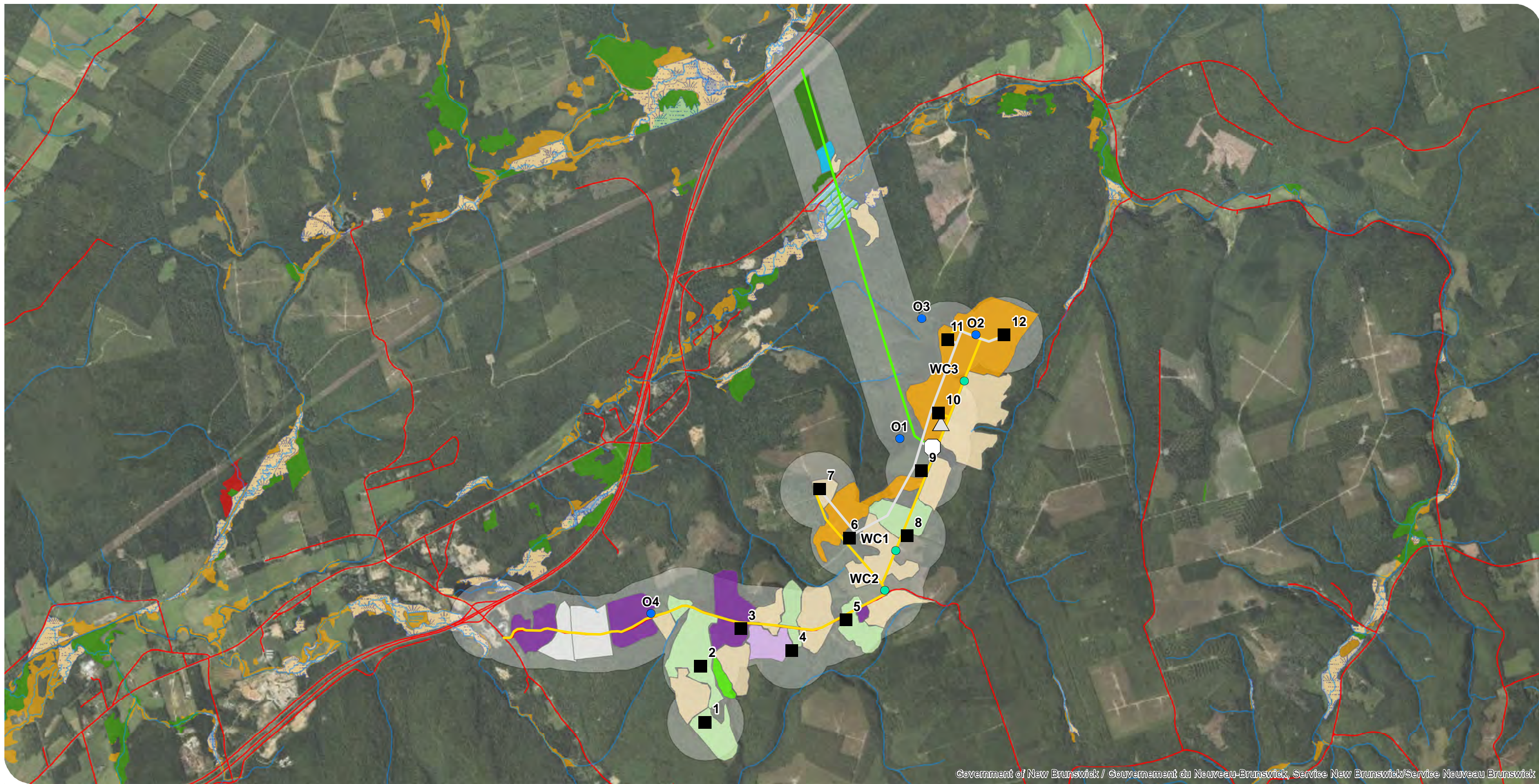
MAP DRAWING INFORMATION:
DATA PROVIDED BY NBDERD

MAP CREATED BY: JNH
MAP CHECKED BY: ACS
MAP PROJECTION: NAD 1983 CSRS New Brunswick Stereographic



FILE LOCATION: G:\CAD\GIS\186975_SUSSEX EAST\SUSSEX EAST WIND PROJECT\MAPS FOR REPORT\TERRESTRIAL HABITATS A JULY 10_2018_JNH

PROJECT: 18-6975 STATUS: DRAFT DATE: 2018-07-26



Government of New Brunswick / Gouvernement du Nouveau-Brunswick, Service New Brunswick/Service Nouveau Brunswick

NATURAL FORCES INC
Wocawson Energy Project

Wocawson Energy Project
Watch Count Survey & Locations

FIGURE 7



- | | | | | | | |
|------------------------------|------------------------------|----------------------|-----------------------------|-----------------------------------|----------------------------------|--|
| ● Owl Counts | △ Met Tower | — Watercourses | Terrestrial Habitats | □ Select Cut Mixedwood | ■ Semi-Mature to Mature Softwood | NBDELG Draft Beta Wetland Mapping (unregulated) |
| ● Watch Counts | — Proposed Road Upgrade | — Roads | ■ Pre-Commercial Thinning | □ Immature Mixedwood | ■ Semi-Mature to Mature Hardwood | ■ Provincially Significant Wetlands |
| ■ Proposed Turbine Locations | — Proposed Collector | ■ Regulated Wetlands | ■ Clear Cut | ■ Semi-Mature to Mature Mixedwood | ■ Pine Retention | ■ Intermediate Wetlands |
| □ Proposed Substation | — Proposed Transmission Line | □ Assessment Area | ■ Strip Cut | ■ Softwood Plantation | ■ Potential Wetland | ■ Forested Wetlands |



MAP DRAWING INFORMATION:
DATA PROVIDED BY NBDERD

MAP CREATED BY: JNH
MAP CHECKED BY: ACS
MAP PROJECTION: NAD 1983 CSRS New Brunswick Stereographic



FILE LOCATION: G:\CAD\GIS\186975_SUSSEX EAST\SUSSEX EAST WIND PROJECT\MAPS FOR REPORT\TERRESTRIAL HABITATS A JULY 10_2018_JNH

PROJECT: 18-6975 STATUS: DRAFT DATE: 2018-07-26

3.0 Avian Survey Results

As described in the “Wildlife and Wildlife Habitat Summary Report” (Dillon, 2018a), the proposed project area is located within the Valley Lowlands Ecoregion, and specifically within the Anagance Ecodistrict. This area brackets the low-lying Kingston Ecodistrict and is characterized by rugged and bi-partitioned terrain where the landscape is dominated by steep river valleys and ridgetops (Zelazny, 2007). The majority of the proposed project is located within an area that has been extensively used for forestry practices and is dominated by formerly harvested areas (clear-cuts or strip-cuts) that are now in different stages of natural regeneration, or plantations (refer to the “Wildlife and Wildlife Habitat” report [Dillon, 2018a]). The terrestrial habitat types that provide bird habitat within the area of the proposed project can be reviewed in the “Wildlife and Wildlife Habitat Summary Report” [Dillon, 2018a]. Details of the types and assemblages of understory vegetation as well as the details surrounding watercourses and wetlands that also provide bird habitat can be referenced in the “Vegetation Summary Report” [Dillon, 2018b] and the “Aquatic Habitat and Wetlands Summary Report” [Dillon, 2018c], respectively.

The results of the avian surveys conducted within the area of the proposed project in winter, spring and summer are summarized within the following sections. The fall 2018 avian survey results will be submitted in an addendum following the completion of the fall field surveys.

3.1 Overview of Results

During the 2018 avian surveys (winter, spring and summer), a total of 1,761 individual birds of 83 different species were recorded within the assessment area. The bird populations present in the assessment area were observed through the techniques of point counts, area searches / transects, and watch counts. A summary of the total number of species and individual birds by season is presented below in **Table 3**.

Table 3: Summary of the Number of Bird Species and Individual Birds Observed During the 2018 Avian Field Surveys

Season	Total Number of Species (Diversity)	Total Number of Individuals (Abundance)
Winter Surveys (February – March) Transect Area Searches and Early Breeding Owl Survey	17	247
Spring Surveys (April – June) Transect Area Searches, Point Counts, Watch Counts and Owl Surveys	76	1,164
Summer Surveys (June – mid July) Area Searches and Point Counts	50	350

Refer to **Appendix A** for detailed avian observation data tables, including: an overview of species identified during the 2018 field program, as well as seasonal abundance summaries.

3.2 Winter Surveys

Overwintering bird species that were identified during the winter surveys (February – March 2018) in the area of the proposed project included common resident species for New Brunswick, as well as some lesser common resident species according to the “Birds of New Brunswick: An Annotated List” (Christie et al., 2004). The most commonly observed species within the assessment area included:

- **Pine Siskin** (*Spinus pinus*) – Irregularly fairly common resident associated with coniferous forests;
- **Black Capped Chickadee** (*Poecile atricapillus*) – Very common resident associated with diverse forest types and feeders; and,
- **White-winged Crossbill** (*Loxia leucoptera*) – Irregularly common resident associated with coniferous forests; known to breed erratically, including in January and February.

An uncommon resident: the Brown Creeper (*Certhia americana*) was also identified during the winter surveys. This species is associated with mature coniferous and hardwood forests (breeding) and is also known to visit large hardwood trees in the winter (Christie et al., 2004).

In total, 17 resident bird species were identified during the winter field survey program. One SAR (i.e. Bald Eagle, *Haliaeetus leucocephalus*), no species of conservation concern, and no species of owls were identified during the winter field survey program (refer to *Section 3.6.2* for details on SAR identified within the assessment area). Refer to **Appendix A** for detailed results of all species identified during the 2018 winter field program.

3.3 Spring Surveys and Spring Migration Summary

The spring survey program (April-early June) included: transect area searches, point counts, watch counts (including flyover), and owl surveys. Spring migration in the area of the proposed project begins as early as March. The highest period of migration (in species abundance and diversity) observed during the spring migration (fly over) surveys was in early to mid-May (refer to **Figure 8** and **Figure 9**). Some migration continues into late May and early June.

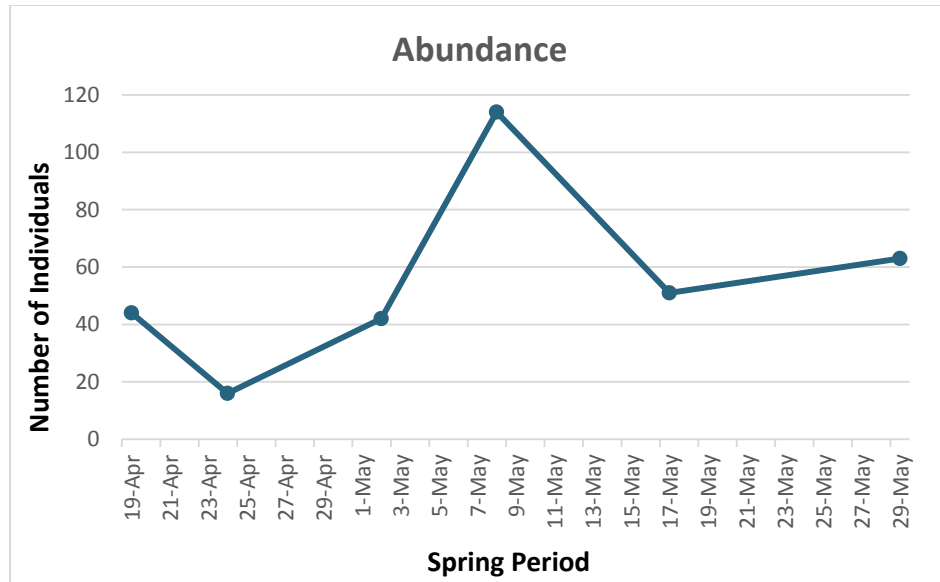


Figure 8: Bird Species Abundance at the Proposed Wocawson Energy Project Area During the 2018 Spring Survey Period

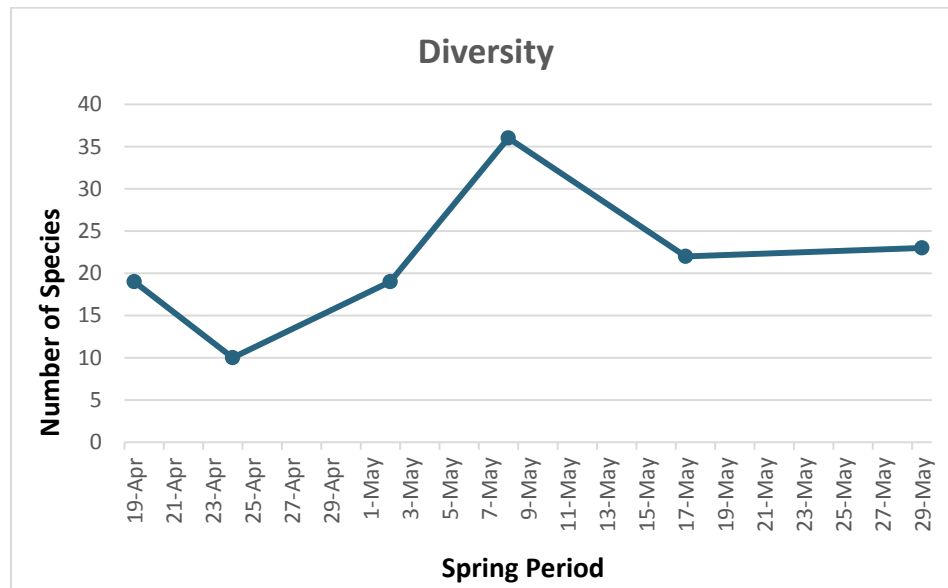


Figure 9: Bird Species Diversity at the Proposed Wocawson Energy Project Area During the 2018 Spring Survey Period

The most common species observed included common migrant and resident birds of New Brunswick. The most abundant species observed during the spring surveys included:

- **White Throated Sparrow** (*Zonotrichia albicollis*) – Most abundant bird species overserved during the spring surveys. Very common summer resident and migrant tolerant of a wide range of habitats;

- **American Robin** (*Turdus migratorius*) – Very common summer resident and migrant associated with a variety of habitats and an early migrant;
- **Black-capped Chickadee** (*Poecile atricapillus*) – Very common resident associated with diverse forest types and feeders;
- **Dark-eyed Junco** (*Junco hyemalis*) – Very common summer resident and migrant associated with a variety of habitats; and,
- **Ovenbird** (*Seiurus aurocapilla*) – Common summer resident and migrant associated with broadleaf and mixed- wood forests.

In total, 76 resident and migrant bird species were identified during the spring field survey program. Two species of owl were identified during the spring surveys: Barred Owl (*Strix varia*; common resident) and Northern Saw-whet Owl (*Aegolius acadicus*; uncommon resident). Although Barred Owls were not detected during the winter surveys, the species is known to begin nesting in February (Christie et al., 2004). During the spring field survey program, 5 SAR, including: Bald Eagle, Barn Swallow (*Hirundo rustica*), Common Nighthawk (*Chordeiles minor*), Peregrine Falcon (*Falco peregrinus*) and Eastern Wood-peewee (*Contopus virens*) and 2 SOCC, including: Pine Siskin (*Spinus pinus*) and Turkey Vulture (*Cathartes aura*) were observed within the assessment area. Refer to Sections 3.6.2 and 3.6.3 for details on observed SAR and SOCC. Refer to **Appendix A** for detailed results of all species identified during the 2018 spring field program.

3.4 Summer Surveys

The summer survey program (June – mid-July) included area searches and point counts. The most common species observed included common migrant and resident birds of New Brunswick. The most abundant species observed during the spring surveys included:

- **Ovenbird** (*Seiurus aurocapilla*) – Most abundant bird species observed during the summer surveys. Common summer resident and migrant associated with broadleaf and mixed- wood forests.
- **White Throated Sparrow** (*Zonotrichia albicollis*) – Very common summer resident and migrant tolerant of a wide range of habitats;
- **Magnolia Warbler** (*Dendroica magnolia*) – Very common summer resident and migrant that breeds in regenerating coniferous forest; and,
- **Black-throated Green Warbler** (*Dendroica virens*) – Fairly common summer resident and migrant that breeds in mature mixedwood forest and second growth.

In total, 50 resident and migrant bird species were identified during the summer field survey program. Three SAR, including: Eastern Wood-peewee, Canada Warbler and Rusty Blackbird (*Euphagus carolinus*) were observed within the assessment area and no SOCC were observed within the assessment area. Refer to Sections 3.6.2 and 3.6.3 for details on observed SAR. Refer to **Appendix A** for detailed results of species identified during the 2018 summer field program.

3.5 Breeding Bird Summary

According to Bird Studies Canada (BSC, 2018), the proposed project is located within Zone C3, where the regional nesting period is considered to be from mid-April to late August.

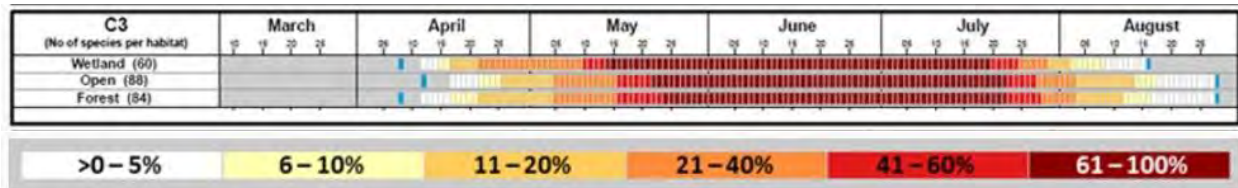


Figure 10: Breeding Bird Nesting Period in the Area of the Proposed Project (BSC, 2018)

A desktop breeding bird summary was completed for the assessment area using the “Second Maritime Breeding Bird Atlas (MBBA)” (BSC, 2010). The MBBA 5-year study consisted of finding evidence of breeding birds based on observations in the field throughout the Maritime provinces. The MBBA ranks the probability of breeding birds as “Possible” (birds were observed singing in their breeding habitat), “Probable” (pairs of birds, agitated or displaying birds were observed), and “Confirmed” (nests, distraction displays or fledged young were observed) (BSC, 2010).

Based on the results of the MBBA search, four species observed during the 2018 avian surveys have been confirmed to be breeding in the area of the proposed project. In addition to the confirmed species, three species have been considered as probable breeders, and 35 species have been considered as possible breeders. Refer to **Appendix A** for a detailed summary of the breeding probabilities for species identified during the 2018 field program.

The three species observed during the 2018 avian surveys that have been confirmed breeders according to the MBBA within the area of the proposed project include:

- **Broad-winged Hawk** (*Buteo platypterus*);
- **Chipping Sparrow** (*Spizella passerina*);
- **Ruffed Grouse** (*Bonasa umbellus*); and,
- **Song Sparrow** (*Melospiza melodia*).

The three species observed during the 2018 avian surveys that are considered to be probable breeders according to the MBBA within the area of the proposed project include:

- **American Robin** (*Turdus migratorius*);
- **Cedar Waxwing** (*Bombycilla cedrorum*); and,
- **Eastern Phoebe** (*Sayornis phoebe*).

The bird species listed above are not considered species at risk or species of conservation concern. During the field surveys, observations such as species singing within their breeding habitat were noted and are presented in the seasonal summary tables provided in **Appendix A**. Based on the behavioural observations noted or observations of birds in nests, two species were confirmed to be breeding within

the assessment area, and three species were observed to be displaying agitated behaviour (i.e., defending nesting territory). These species include the following:

Confirmed Nesting within the Assessment Area:

(Birds were flushed from a nest during the 2018 field survey)

- **Hermit Thrush** (*Catharus guttatus*); and
- **Least flycatcher** (*Empidonax minimus*).

Probable Breeders within the Assessment Area:

(Birds were observed defending nesting territory; no nest was observed)

- **White Throated Sparrow** (*Zonotrichia albicollis*);
- **Northern Goshawk** (*Accipiter gentilis*); and,
- **Blue-headed Vireo** (*Vireo solitarius*)

During the 2018 spring and summer field survey programs, many other birds were observed singing within suitable breeding habitat, suggesting that many other species were using available breeding habitat within the assessment area. Refer to **Appendix A** for a detailed summary of the breeding probabilities (based on the Maritimes Breeding Bird Atlas) for species identified as well as behavioural observations noted during the 2018 field program.

Potential effects to breeding birds (i.e., loss of breeding habitat) are anticipated to occur during the construction phase of the proposed project.

3.6 **Protected Habitat and Bird Species at Risk or Species of Conservation Concern**

A custom Atlantic Canada Conservation Data Centre (AC CDC) (2018) data report was obtained for a 5 km radius around the proposed project area (refer to **Appendix B**). In this report, we define “species at risk” (abbreviated SAR) as those species that are listed as ‘extirpated’, ‘endangered’, or ‘threatened’ on Schedule 1 of the federal *Species at Risk Act* (SARA) or the New Brunswick *Species at Risk Act* (NB SARA). We also define “species of conservation concern” (abbreviated SOCC) as those species that are not SAR but are listed in other parts of SARA, NB SARA, the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), or as regionally rare or endangered by the AC CDC (S1: extremely rare in province; S2: rare in province; S3: uncommon in province; S4: widespread, common and apparently secure in province; S5: widespread, abundant and demonstrably secure in province).

3.6.1 **Protected Bird Habitat**

According to the AC CDC records review (AC CDC, 2018) and desktop analysis, there are no managed, biologically significant, or designated Environmentally Significant Areas (ESA) or Protected Natural Areas (PNA) containing significant or unique bird habitat within 5 km of the proposed project area.

The proposed project is not located within a designated Important Bird Area (IBA) (BSC, 2018). The nearest IBA to the proposed project is the Shepody Bay West IBA and the Dorchester Cape and Grand Anse IBA, both located approximately 85 km east of the proposed project area.

3.6.2 Bird Species at Risk

According to the AC CDC records review (AC CDC, 2018), there are six records of bird SAR that have been historically observed within 5 km of the proposed project area. **Table 4**, below summarizes the species identified within the AC CDC records review.

Table 4: Bird SAR Historically Observed within 5 km of the Proposed Project Area

Common name	Scientific name	AC CDC S-Rank ¹	NB SARA Status	Federal SARA Status	COSEWIC Status	Preferred Habitat
Wood Thrush	<i>Hylocichla mustelina</i>	S1S2B, S1S2M, May Be at Risk	Threatened	Threatened	Threatened	Mature deciduous forests. Suitable breeding and foraging habitat is present within the assessment area.
Barn Swallow	<i>Hirundo rustica</i>	S2B, S2M, Sensitive	Endangered	Threatened Schedule 1	Threatened	Nest on manmade structures – buildings, culverts or rarely natural structures. Suitable foraging habitat is present within the assessment area.
Bank Swallow	<i>Riparia riparia</i>	S2S3B, S2S3M, Sensitive	-	Threatened	Threatened	Nest in steep embankments along eroding river/ocean shore. Forage in open areas. Suitable foraging habitat is present within the assessment area.
Canada Warbler	<i>Wilsonia canadensis</i>	S3B, S3M	Threatened	Threatened Schedule 1	Threatened	Found in wet mixed forest with well-developed shrub layer as well as regenerating areas. Open tree canopy with tall shrubs and sphagnum covered forest floor. Suitable foraging habitat is present within the assessment area.
Bobolink	<i>Dolichonyx</i>	S3B,	Threatened	Threatened	Threatened	Nest in lush meadows,

Common name	Scientific name	AC CDC S-Rank ¹	NB SARA Status	Federal SARA Status	COSEWIC Status	Preferred Habitat
	<i>oryzivorus</i>	S3M, Sensitive				open grasslands, hayfields. There is no suitable bobolink habitat within the assessment area.
Eastern Wood-pewee	<i>Contopus virens</i>	S4B,S4M	Special Concern	Special Concern	Special Concern Schedule 1	Deciduous or mixed wood forest often nesting in ornamentals, elms and associated with forest edge. Suitable foraging habitat is present within the assessment area.

Notes: 1 S1: extremely rare in province; S2: rare in province; S3: uncommon in province; S4: widespread, common and apparently secure in province; S5: widespread, abundant and demonstrably secure in province S#S# = a numeric range rank used to indicate any range of uncertainty about the status of the species or community. B= Breeding, N = Nonbreeding, M = Migrant, U = Unrankable. (AC CDC, 2018)

In total, eight avian SAR were identified during the 2018 avian survey program, refer to **Table 5**, presented below. Descriptions of the species identified during the survey program and their preferential habitat is also provided below.

Table 5: Avian SAR Identified within the Assessment Area During the 2018 Avian Survey Program

Common name	Scientific name	AC CDC S-rank ¹	NB SARA Status	Federal SARA Status	COSEWIC
Bald Eagle*	<i>Haliaeetus leucocephalus</i>	S4	Endangered	-	-
Barn Swallow	<i>Hirundo rustica</i>	S2B,S2M	Endangered	Threatened Schedule 1	Threatened
Canada Warbler	<i>Wilsonia canadensis</i>	S3B,S3M	Threatened	Threatened Schedule 1	Threatened
Common Nighthawk*	<i>Chordeiles minor</i>	S3B,S4M	Threatened	Threatened Schedule 1	Special Concern
Eastern Wood-pewee	<i>Contopus virens</i>	S4B,S4M	Special Concern	Special Concern Schedule 1	Special Concern
Olive-sided Flycatcher*	<i>Contopus cooperi</i>	S3B,S3M	Threatened	Threatened Schedule 1	Special Concern
Peregrine Falcon*	<i>Falco peregrinus</i>	S1B,S3M	Endangered	Special Concern Schedule 1	Special Concern

Common name	Scientific name	AC CDC S-rank ¹	NB SARA Status	Federal SARA Status	COSEWIC
Rusty Blackbird*	<i>Euphagus carolinus</i>	S3B,S3M	Special Concern	Special Concern Schedule 1	Special Concern

* Bird species was not identified by the AC CDC records review (AC CDC, 2018).

Notes: 1 S1: extremely rare in province; S2: rare in province; S3: uncommon in province; S4: widespread, common and apparently secure in province; S5: widespread, abundant and demonstrably secure in province S## = a numeric range rank used to indicate any range of uncertainty about the status of the species or community. B= Breeding, N = Nonbreeding, M = Migrant, U = Unrankable. (AC CDC, 2018)

Bald Eagle

This very large raptor is the largest bird that inhabits the Maritime Provinces, with the exception of the much rarer golden eagle (*Aquila chrysaetos*). In the Maritimes, Bald Eagles will typically nest in tall pine trees in forested areas near a large body of water. They will return to the same nest year-after-year, adding new sticks and other materials to the structure with each use. The Bald Eagle's diet consists of many species of fish, but they will also prey upon birds, reptiles, amphibians, invertebrates and carrion. Suitable breeding habitat for this species does occur within the vicinity of the project (the Kennebecasis River); however, this species is not currently anticipated to be nesting within the footprint of the proposed project and was not observed to be nesting within the assessment area during the field studies.

Barn Swallow

This species typically inhabits open areas near human settlements and land uses including parks, ball fields, golf courses and agricultural fields where they forage for flying insects. Barn Swallows will typically construct their nests on human-made structures, rarely selecting to nest in natural locations such as cliffs or caves. This species is migratory and spends its winters in Central and South America. Suitable breeding habitat for this species does occur within the vicinity of the project, however this species is not currently anticipated to be nesting within the footprint of the proposed project.

Canada Warbler

These birds arrive in NB in the spring and are fairly common throughout the summer. Canada Warblers will inhabit a variety of forest habitats, but prefer mature to mid - aged mixed forests where they build their nests on or near the ground in wet, swampy places in woods of mixed growth. They prefer areas with dense understory, particularly areas where large trees have long since been uprooted and tangled debris remains. They are also found in riparian areas, shrub forests on slopes, in ravines and in old-growth forests with canopy openings, as well as regenerating stands. Suitable breeding habitat for this species does occur within the footprint of the proposed project. Land clearing during the breeding season would have the potential to unknowingly destroy Canada Warbler nests.

Common Nighthawk

The Common Nighthawk is a ground-nesting species that uses a wide variety of habitats including dunes, beaches, logged forests, bogs, marshes, open woodlands, grasslands, rock outcroppings, barren ground and even gravel rooftops. This species is an aerial insectivore preying on insects on the wing, usually at dusk or dawn, in open areas usually near a waterbody. From late August to early October, migrating flocks of nighthawks can number in the hundreds en route to wintering grounds in South America. Suitable nesting habitat for this species does occur within the footprint of the project. While it is unlikely that construction activities along major roadways would negatively affect this species, land clearing during the breeding season would have the potential to unknowingly destroy Common Nighthawk nests.

Eastern Wood-Pewee

These birds breed throughout the Maritimes during the summer months before migrating to northern South America and wintering in countries such as Ecuador, Colombia, Venezuela, Guyana, Peru and Brazil. This species breeds in open woodland of all types in New Brunswick, but shows a preference for forests with a dominance of deciduous trees. The Eastern Wood-pewee forages on flying insects in the middle canopy and will often return to the same perch after capturing an insect. Suitable breeding habitat for this species does occur within the footprint of the proposed project. Land clearing during the breeding season would have the potential to unknowingly destroy Eastern wood-pewee nests.

Olive-sided Flycatcher

These birds breed throughout New Brunswick during the summer months and winter in Central and South America. Their preferred habitat includes coniferous forest edges, early post-fire landscapes, and openings such as meadows, rivers, bogs, swamps and ponds. Nests are typically built on horizontal branches 2-15 m off the ground and are most commonly located in spruce trees. Olive-sided Flycatchers feed on flying insects, especially bees, and are often seen perched on the tops of tall trees or snags in open woodland habitat. Suitable breeding habitat for this species does occur within the footprint of the proposed project. Land clearing during the breeding season would have the potential to unknowingly destroy Olive-sided Flycatcher nests.

Peregrine Falcon

This medium sized falcon generally constructs its nest on the side of a cliff close to large bodies of water, and occasionally on human-made structures such as transmission towers, office tower or bridges (ECCC 2017). *Falco peregrinus anatum* (sub-species listed as special concern) breeds along the shores of the Bay of Fundy and the mouth of the Saint John River. This bird normally preys upon other medium sized birds, and sometimes preys upon small mammals, reptiles or insects. The Peregrine Falcon became endangered due to the widespread use of DDT pesticide; however, populations have rebounded due to the banning of the pesticide and conservation efforts. Suitable foraging habitat for this species does occur within the footprint of the proposed project although no suitable nesting habitat was identified. This species may be affected during the operational phase of the project.

Rusty Blackbird

Blackbird breeding habitat primarily consists of riparian zones, swamps, beaver ponds, marshes, peat bogs, pasture edges and sedge meadows. They are known to feed extensively on aquatic invertebrates within the riparian zones of shallow, slow moving rivers and streams. This species is normally located close to wetlands in forests dominated by conifers. Suitable breeding habitat for this species does occur within the footprint of the proposed project. Land clearing during the breeding season would have the potential to unknowingly destroy rusty blackbird nests.

Potential effects to bird SAR (i.e. loss of habitat) are anticipated to occur during the construction phase of the proposed project.

3.6.3 Bird Species of Conservation Concern

According to the AC CDC records review (AC CDC, 2018), there are ten records of bird species of conservation concern (abbreviated SOCC) that have been historically observed within 5 km of the proposed project area. **Table 6**, below summarizes the species identified within the AC CDC records review (AC CDC, 2018).

Table 6: Bird SOCC Historically Observed Within 5 km of the Proposed Project Area

Common name	Scientific name	AC CDC S-Rank ¹	NB SARA Status	Federal SARA Status	COSEWIC Status	Preferred Habitat
Evening Grosbeak	<i>Coccothraustes vespertinus</i>	S3B, S3S4N, SUM, Sensitive	-	-	Special Concern	Nest in mature coniferous forest, in habitat coniferous and deciduous forest as well as urban areas. Suitable breeding and foraging habitat is present within the assessment area.
Cliff Swallow	<i>Petrochelidon pyrrhonota</i>	S2S3B, S2S3M, Sensitive	-	-	-	Breeds near grasslands, towns, open forest, and river edges where there are cliff faces or escarpments for nesting. Suitable foraging habitat is present within the assessment area.
Red Crossbill	<i>Loxia curvirostra</i>	S3, Secure	-	-	-	Conifer forests and groves. Rarely found away from conifers. Suitable breeding and foraging habitat is present within the assessment area.
Killdeer	<i>Charadrius vociferus</i>	S3B, S3M, Sensitive	-	-	-	Inhabit open areas such as sandbars, mudflats, and grazed fields. Typically, the vegetation

Common name	Scientific name	AC CDC S-Rank ¹	NB SARA Status	Federal SARA Status	COSEWIC Status	Preferred Habitat
						in fields inhabited by Killdeer is no taller than one inch. No preferential habitat present within the assessment area.
Scarlet Tanager	<i>Piranga olivacea</i>	S3B, S3M, Secure	-	-	-	Mature deciduous forests and mixed deciduous-coniferous forests. Nest in oak, pine-oak, beech, hemlock-hardwood, and occasionally pure eastern hemlock forests. Suitable breeding and foraging habitat is present within the assessment area.
Brown-headed Cowbird	<i>Molothrus ater</i>	S3B, S3M, May be at Risk	-	-	-	Grasslands with low and scattered trees as well as woodland edges, brushy thickets, fields, pastures, orchards, and residential areas. Suitable breeding and foraging habitat is present within the assessment area.
Eastern Kingbird	<i>Tyrannus tyrannus</i>	S3S4B, S3S4M, Sensitive	-	-	-	Breeds in fields with scattered shrubs and trees, in orchards, and along forest edges. Suitable breeding and foraging habitat is present within the assessment area.
Spotted Sandpiper	<i>Actitis macularius</i>	S3S4B, S5M, Secure	-	-	-	Breeds near the edge of fresh water in a wide variety of settings in either open or wooded country. During migration and winter they are also found along coast on mudflats, beaches, breakwaters; they are also found on such inland habitats as sewage ponds and irrigation ditches. Suitable foraging habitat is present within the assessment area.

Common name	Scientific name	AC CDC S-Rank ¹	NB SARA Status	Federal SARA Status	COSEWIC Status	Preferred Habitat
Pine Siskin	<i>Spinus pinus</i>	S3, Secure	-	-	-	Typically breed in coniferous forests and mixed forests. During migration and winter, they can be found in many types of semi-open areas, including forest edges and weedy fields. Suitable breeding and foraging habitat is present within the assessment area.
Wilson's Snipe	<i>Gallinago delicata</i>	S3S4B, S5M, Secure				Can be found in all types of wet, marshy settings, including bogs, fens, alder and willow swamps, wet meadows, and along rivers and ponds. No preferential habitat present within the assessment area.

Notes: ¹ Notes: 1 S1: extremely rare in province; S2: rare in province; S3: uncommon in province; S4: widespread, common and apparently secure in province; S5: widespread, abundant and demonstrably secure in province S#S# = a numeric range rank used to indicate any range of uncertainty about the status of the species or community. B= Breeding, N = Nonbreeding, M = Migrant, U = Unrankable. (AC CDC, 2018)

In total, three avian SOCC were identified during the 2018 avian survey program; refer to **Table 7**, presented below. Descriptions of the species identified during the survey program and their preferential habitat is also provided below.

Table 7: Avian SOCC Identified within the Assessment Area During the 2018 Avian Survey Program

Common name	Scientific name	AC CDC S-rank ¹	NB SARA Status	Federal SARA Status	COSEWIC
American Three-toed Woodpecker	<i>Picoides dorsalis</i>	S2S3	-	-	-
Pine Siskin	<i>Spinus pinus</i>	S3	-	-	-
Turkey Vulture*	<i>Cathartes aura</i>	S3B,S3M	-	-	-

* Bird species was not identified by the AC CDC records review (AC CDC, 2018).

Notes: ¹ S1: extremely rare in province; S2: rare in province; S3: uncommon in province; S4: widespread, common and apparently secure in province; S5: widespread, abundant and demonstrably secure in province S#S# = a numeric range rank used to indicate any range of uncertainty about the status of the species or community. B= Breeding, N = Nonbreeding, M = Migrant, U = Unrankable. (AC CDC, 2018)

American Three-toed Woodpecker

This medium-sized woodpecker species prefers coniferous-dominated forest types, particularly those disturbed by disease, fire, or land clearing. This species forages for the larvae of bark and wood-boring beetles in dying or dead-standing trees. Like most woodpeckers, the American Three-toed Woodpecker nests in the cavity of a tree, often lining it with wood chips and other fibers. Suitable breeding habitat for this species does occur within the footprint of the proposed Project. Land clearing during the breeding season would have the potential to unknowingly destroy American Tree-toed Woodpecker nests.

Pine Siskin

This finch species breeds across New Brunswick in open coniferous or mixed forests, but also commonly occur in suburban parks and residential areas. As their name suggests, these small birds prefer the seeds of pine trees and other conifers, but will also take maple, birch and elm seeds, as well as some insects.

Pine Siskins flock together during the winter months and remain in New Brunswick year round, thus they are a resident species of the Province. Suitable breeding habitat for this species does occur within the footprint of the proposed Project. Land clearing during the breeding season would have the potential to unknowingly destroy pine siskin nests.

Turkey Vulture

Turkey Vultures are large birds that specialize in scavenging, almost never attacking living prey. They primarily feed on mammal carrion, but are known to eat almost any decomposing vertebrate. This species prefers open areas that include both forested areas and farmland. Turkey vultures typically nest in rock crevices or cliffs, but will also re-use abandoned hawk and heron nests. Once selected a nest site may be used repeatedly for decades. Suitable breeding habitat for this species does occur within the vicinity, however this species is not anticipated to be nesting within the footprint of the proposed project.

Potential effects to bird SOCC (i.e., loss of habitat) are anticipated to occur during the construction phase of the proposed project.

3.7 Birds and Bird Habitat – Traditional Knowledge Perspective

Birds and bird habitat present within the proposed project area were surveyed from a traditional knowledge perspective by a member of Tobique First Nation (TFN) who accompanied Dillon's biologists during the field surveys. Based on the knowledge of the member of TFN, the proposed project area did not offer unique areas of special significance to traditional activities or uses in relation to birds and bird habitat.

Bald Eagles (known to be of special cultural significance to local first nations) were observed during the 2018 avian survey programs. Within local first nation cultures, Bald Eagles signify many positive things, and there is believed to be a special connection between the species and the creator (Muiniskw, 2016). There is potential for Bald Eagles or their habitat to be affected by the construction or operation phases

of proposed project; however, the proposed project area does not offer unique foraging or breeding habitat for the species. Although Bald Eagles were observed within the assessment area; they were not observed nor are they expected to be nesting within the project footprint. It should be noted that large white pine (*Pinus strobus*) are present within the assessment area; however, potential breeding habitat would likely be most strongly associated with the Kennebecasis River (to be spanned by the proposed transmission line). They may forage and incidentally occur within the remainder of the proposed project area.

Furthermore, traditional activities such as potential hunting of birds (such as Ruffed Grouse) that may occur within the area of the proposed project could continue subsequent to the development of the proposed project.

This report focuses on bird and bird habitat only and should not be considered a traditional land use study. For details surrounding the known traditional uses (based on interviews and knowledge of the TFN team member) of plant, wildlife or aquatic species located within the project area, please refer to the summary report for rare plants and baseline vegetation, wildlife and wildlife habitat and aquatic habitat and wetlands.

4.0 Environmental Effects Assessment

The identification of potential interactions between the proposed project and birds or bird habitats has been undertaken in consideration of the nature of the Project, its planned activities, as well as potential accidental events/malfunctions.

4.1 Identification of Project Interactions

4.1.1 Approach to Project Components and Project Interaction Matrix

As presented in Section 1.1.3, this assessment recognizes four main distinct Project phases. The potential interactions with the surrounding environment have been considered in terms of each distinct phase. Additionally, accidents and malfunctions will be considered.

The phases of the Project include:

1. *Development Phase;*
2. *Pre-Construction Phase;*
3. *Construction Phase; and*
4. *Operation Phase.*

This initial screening (i.e., project interaction matrix) assists in determining if an interaction between the activities being carried out in each phase of the proposed project and the valued component is possible. The matrix is presented below in **Table 8**.

Table 8: Project Interaction with Environmental Components

Valued Component	Project Phases				
	Development Phase	Pre-Construction Phase	Construction Phase	Operation Phase	Accidents and Malfunctions
Birds and Bird Habitat			✓	✓	✓

Legend: ✓ = Potential interaction identified

Those project phases for which a checkmark is provided indicates that the project may interact with the VC, and thus an environmental effects assessment is warranted in Section 4.2 below.

Those project phases for which no interaction was noted with the VC (namely the development and pre-construction phases) are not carried forward or discussed further in this report. Birds and bird habitat will not interact with the development and pre-construction phases of the proposed project due to the conceptual, planning, administrative, and design nature of these phases. Since there are no “on the ground” activities associated with these phases, no environmental effects are expected to result and therefore no interaction is anticipated.

As described in Section 1.1.3, the decommissioning phase of the project is not considered within the scope of this assessment; a decommissioning plan will be completed prior to this phase of the project that reflects the guidance and regulations of the time.

4.2 Assessment of Residual Environmental Effects

4.2.1 Identification of Potential Environmental Effects

Without mitigation, the proposed project could interact with bird and/or bird habitat and cause environmental effects in the following ways:

- Loss of habitat, or displacement from surrounding habitat, due to construction activities;
- Fatalities due to collisions with turbine towers or blades or the transmission line infrastructure during operation;
- Modifications to existing flight paths as birds avoid the project area or are attracted to the area by tower lights; and
- Increased human and vehicle appearances at the site may lead to a displacement of birds from habitat or unplanned events, such as accidents, collisions or spills.

4.2.2 Standard Mitigation of Potential Environmental Effects

Mitigation is identified for each interaction and/or effect in relation to birds and bird habitat in an attempt to prevent the interaction from occurring if possible, or to reduce the severity, magnitude, geographic extent, frequency, or duration of the interaction. Best management practices (based on industry guidelines and regulatory guidance documents) have been identified as appropriate mitigative

measures. In addition, several acts, codes, regulations and guidelines may require appropriate actions be conducted as mitigative measures prior to or during the interaction.

The federal and provincial legislation and codes that could apply to the proposed Project include (but may not be limited to):

- *Canadian Environmental Protection Act* and regulations ;
- The Federal *Migratory Birds Convention Act*, and regulations;
- *Species at Risk Act (Federal)*;
- The *Federal Policy on Wetland Conservation*;
- *Transportation of Dangerous Goods Act*, and regulations (Federal);
- New Brunswick *Clean Environment Act*, and regulations;
- New Brunswick *Clean Water Act*, and regulations;
- New Brunswick *Clean Air Act*, and regulations;
- New Brunswick *Occupational Health and Safety Act*, and regulations; and,
- New Brunswick *Species at Risk Act*, and regulations.

The following standard mitigation measures have been identified to reduce the likelihood of occurrence, or minimize potential extent of effects of the proposed project on birds or bird habitat. Planned standard mitigation measures for the proposed project include the following:

- The area of disturbance associated with the development of the physical components of the proposed project (e.g., turbines, transmission line, roads) will be minimized to the extent possible to limit the associated environmental effects associated with such disturbance;
- Existing access roads will be utilized where possible to reduce the loss of habitat;
- All workers will adhere to the *Migratory Birds Convention Act, 1994* and the *Migratory Birds Regulations*;
- No attempt will be made by any worker at the project site to chase, catch, divert, follow or otherwise harass wildlife by vehicle or on foot;
- If the active nest of any bird is encountered during construction and operation activities, work around the nest shall cease until a biologist assesses the situation and appropriate mitigations are applied;
- Tree and vegetation clearing shall not be undertaken during the breeding bird season (approximately April 15 to August 31), to the extent possible. Should clearing be required during the breeding bird season, WLP will consult with CWS for appropriate mitigative measures.

A list of mitigation measures related to specific phases of the project (as outlined in Section 1.1.3) is provided in **Table 9**.

Table 9 - Potential Environmental Effects of the Proposed Project on Birds and Bird Habitat

Project Phase	Potential Environmental Effect	Mitigation	Characterization of Residual Environmental Effects	Anticipated Significance of Residual Environmental Effects
Birds and Bird Habitat				
Construction Phase	<ul style="list-style-type: none"> Clearing and grubbing of vegetation construction will decrease available bird habitat. Disturbance from vehicles and construction equipment may cause birds to be temporarily displaced from the project area or cause the disruption of activity (such as breeding and/or feeding). Construction activities may cause birds to temporarily alter flight paths away from the site. 	<p>In addition to the standard mitigation measures provided in Section 4.2.2, the following mitigative measures will be employed to reduce the environmental effects to bird and bird habitat quality in the area of the Project prior to and during the construction phase of the project.</p> <ul style="list-style-type: none"> Tree and vegetation clearing shall not be undertaken during the breeding bird season (April 15 to August 31). If clearing or grubbing is required within the breeding bird season, pre-construction surveys will be conducted by experienced biologists to identify locations for avoidance. To minimize interaction with ground nesting birds, exposed soil and stockpiled materials will be minimized, and grubbed material will be removed from site prior to the breeding bird season. The work area will be revegetated as soon as feasible. To minimize disruptions with bird/bat activity at night, the project construction activities will be limited to daylight hours To minimize encounters, site and working areas shall be kept clean of food scraps and garbage and will be routinely removed from the site; and In the case of encounters, the following shall be implemented: <ul style="list-style-type: none"> No attempt will be made by any worker at the project site to chase, catch, divert, follow or otherwise harass wildlife by vehicle or on foot Equipment and vehicles will yield the right-of-way to wildlife If a species at risk is encountered, contact a Species at Risk Biologist at ERD (506) 453-5873 or by email. 	<p><u>Characterization of Residual Environmental Effects:</u> Magnitude: Low Spatial Extent: Immediate (limited to project site) Duration: Short term – Construction period (1 year) Frequency: Moderate Reversibility: Reversible</p> <p><u>Overall Summary:</u> With the implementation of planned mitigation, interactions between the Project and birds or bird habitat during the construction phase of the Project are not expected to be substantive.</p>	Not significant
Operation Phase	<ul style="list-style-type: none"> Bird fatalities due to collisions with turbine towers, turbine blades or the transmission line infrastructure during operation. The ongoing presence of the proposed project through its operating life may cause birds to avoid the area. The ongoing presence of the proposed project through its operating life may cause birds to alter local flight paths toward the project area (nocturnal birds attracted to lights on the turbines) or away from the project area. 	<p>In addition to the standard mitigation measures provided in Section 4.2.2, the following mitigative measures will be employed to reduce the environmental effects to birds and bird habitat quality in the area of the Project during the operation phase of the project.</p> <ul style="list-style-type: none"> Post construction surveys will be completed during the operational phase of the project to identify if additional mitigative measures are required, in consultation with CWS and NBDERD; WLP will install lights on the turbines with short flash durations that do not emit light during the 'off flash'; Lighting installed on the turbines will follow, but not exceed, the Transport Canada requirements; The project has been designed to avoid sensitive or high use areas to the extent possible, should post construction surveys indicate a high number of collisions, bird diverters may be installed along transmission lines or connector lines; and Transport Canada will be consulted to determine appropriate lighting during significant storm events or periods of heavy fog. 	<p><u>Characterization of Residual Environmental Effects:</u> Magnitude: Low Spatial Extent: Immediate (limited to project site) Duration: Long-term - Project Lifespan (30 years) Frequency: Low Reversibility: Reversible</p> <p><u>Overall Summary:</u> With the implementation of planned mitigation, interactions between the Project and birds or bird habitat during the operation phase of the Project are not expected to be substantive.</p>	Not significant
Accidents, Malfunctions, and Unplanned Events	<ul style="list-style-type: none"> There is a potential for unplanned releases related to any construction project that may impact bird habitat. Heavy equipment used during the construction activities may cause direct injury or death of birds through collisions or destruction of nests and food sources. 	<p>In addition to the standard mitigation measures provided in Section 4.2.2, the following mitigative measures will be employed to reduce the environmental effects to birds and bird habitat quality in the area of the Project prior to and during the construction and operation phases of the project.</p> <ul style="list-style-type: none"> Any spills or leaks that occur will be reported to the appropriate regulatory authorities, if applicable, as soon as possible; Remedial action, or engineered controls, for any spills or leaks that occur will be completed; Major servicing of equipment will be completed off-site by a licensed mechanic when possible; Rubbish and waste materials will be kept at minimum quantities and burning of this material will be prohibited; Chemicals and petroleum hydrocarbons will be stored in appropriate containers and in specifically designated areas. Where applicable, secondary containment of chemicals or petroleum hydrocarbons will be employed; Work entailing use of toxic or hazardous materials, chemicals, or otherwise creating hazard to life, safety of health, will be conducted in accordance with National Fire Code of Canada to minimize the potential for spills or fires; and, The same mitigation measures identified under Construction Phase above for minimizing encounters will be used to minimize potential for injury or mortality. 	<p><u>Characterization of Residual Environmental Effects:</u> Magnitude: Low Spatial Extent: Immediate (limited to project site) Duration: Short term Frequency: Low Reversibility: Reversible</p> <p><u>Overall Summary:</u> With the implementation of planned mitigation, and with the careful development and implementation of contingency and emergency response plans to be applied in the unlikely occurrence of an accident, malfunction, or unplanned event, interactions between the Project and birds or bird habitat arising from an accidental event during construction and operation are not expected to be substantive.</p>	Not significant

Note: As noted within section 4.1.1, the Decommissioning Phase of the proposed project is not included within the scope of this assessment.

4.2.3 Characterization of Residual Environmental Effects

Residual effects on birds and bird habitat that may occur as a result of the construction phase of the project are expected to be of low magnitude and be reversible in nature. The spatial extent of potential residual effects is also anticipated to be limited to the project site, and limited to the construction period of 1 year. Therefore, any potential residual effects on birds and bird habitat are not expected to be substantive.

Residual effects to birds and bird habitat (including SAR and SOCC) that may occur as a result of the operation phase of the project are expected to be of low magnitude and reversible in nature, however, post construction monitoring will be completed at the project site to evaluate the effect on birds following the application of the mitigative measures presented in **Table 9**. Should residual effects be unacceptable, the mitigative measures will be re-evaluated and further mitigation will be proposed. The spatial extent of potential residual effects is also anticipated to be limited to the general area of project site, and may occur over the project's lifespan of 30 or more years. The residual effects not expected to be substantive on birds or bird habitat during the operational phase of the project. Further details/discussion on the likelihood of project interaction with birds and bird habitat are provided within the main EIA registration document for this project (authored by WLP).

With the implementation of planned mitigation, and with the careful development and implementation of contingency and emergency response plans to be applied, impacts posed by accidents and unplanned events related to the Project and birds and bird habitat are not expected to be substantive.

5.0 Summary and Conclusion

This report has been prepared for the construction and operation of the Wocawson Energy Project. The proposed project is expected to provide renewable electricity to approximately 3,600 – 7,200 New Brunswick homes and support New Brunswick Power in attaining their future renewable energy targets.

The information provided in this document is based on the current available design/planning information and existing environment information obtained during focused field surveys conducted throughout 2018. The applicable environmental components and potential project environmental effects were assessed and presented with meaningful mitigation measures to minimize, and in some cases eliminate, the potential effects. Based on these interactions, it can be concluded that, with the proper mitigation and standard operating procedures as outlined in this document, the residual environmental effects of the project are anticipated to be not significant for the project phases.

6.0 Closure

This report was prepared by Dillon Consulting Limited (Dillon) on behalf of the Wocawson Energy Limited Partnership, in support of the Wocawson Energy Project EIA. Dillon has used the degree of care and skill ordinarily exercised under similar circumstances at the time the work was performed by reputable members of the environmental consulting profession practicing in Canada. Dillon assumes no responsibility for conditions which were beyond its scope of work. There is no warranty expressed or implied by Dillon.

The material in the report reflects Dillon's best judgment in light of the information available to Dillon at the time of preparation. Any use which a third party makes of this report, or any reliance on or decisions made based on it, are the responsibilities of such third parties. Dillon accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

Yours truly,

DILLON CONSULTING LIMITED



Kristin Banks, P. Eng.

Project Manager

Appendix A

Bird Observation Data Summary Sheets

Table A.1: Wocawson Energy Project 2018 Avian Field Surveys Summary

Common Name	Scientific Name	S Rank	Provincial SARA Status	Federal SARA Status	COSEWIC Status	2018 Presence Summary				Migratory or Resident?	2018 Desktop Breeding Summary (2nd Maritime Breeding Bird Atlas)						
						W	SP	S	F		Obs.	Poss.	Prob.	Conf.			
Alder Flycatcher	<i>Empidonax alorum</i>	S5B,S5M	-	-	-		X	X		M		X					
American Crow	<i>Corvus brachyrhynchos</i>	S5	-	-	-	X	X			R		X					
American Goldfinch	<i>Spinus tristis</i>	S5	-	-	-	X	X	X		M		X					
American Kestrel	<i>Falco sparverius</i>	S4B,S4S5M	-	-	-		X			M	X						
American Redstart	<i>Setophaga ruticilla</i>	S5B,S5M	-	-	-		X	X		M		X					
American Robin	<i>Turdus migratorius</i>	S5B,S5M	-	-	-	X	X	X		M/R			X				
American Three-toed Woodpecker	<i>Picoides dorsalis</i>	S2S3	-	-	-		X			M	X						
American Tree Sparrow	<i>Spizella arborea</i>	S5N,S5M	-	-	-	X				M							
American Woodcock	<i>Scolopax minor</i>	S5B,S5M	-	-	-		X			M		X					
Bald Eagle	<i>Haliaeetus leucocephalus</i>	S4	Endangered	-	-	X	X			R	X						
Barred Owl	<i>Strix varia</i>	S5	-	-	-		X	X		R	X						
Barn Swallow	<i>Hirundo rustica</i>	S2B,S2M	Endangered	-	-		X			M	X						
Bay-breasted Warbler	<i>Setophaga castanea</i>	S4B,S4S5M	-	-	-		X	X		M	X						
Belted Kingfisher	<i>Megasceryle alcyon</i>	S5B,S5M	-	-	-		X			M		X					
Black-and-white Warbler	<i>Mniotilta varia</i>	S5B,S5M	-	-	-		X	X		M	X						
Blackburnian Warbler	<i>Setophaga fusca</i>	S5B,S5M	-	-	-		X	X		M		X					
Black-capped Chickadee	<i>Poecile atricapillus</i>	S5	-	-	-	X	X	X		R		X					
Black-throated Blue Warbler	<i>Dendroica caerulescens</i>	S5B,S5M	-	-	-		X	X		M		X					
Black-throated Green Warbler	<i>Dendroica virens</i>	S5B,S5M	-	-	-		X	X		M		X					
Blue-headed Vireo	<i>Vireo solitarius</i>	S5B,S5M	-	-	-		X	X		M		X					
Blue Jay	<i>Cyanocitta cristata</i>	S5	-	-	-	X	X	X		R		X					
Broad-winged Hawk	<i>Buteo platypterus</i>	S5B,S5M	-	-	-		X			M				X			
Brown Creeper	<i>Certhia americana</i>	S5	-	-	-	X	X	X		R		X					
Canada Goose	<i>Branta canadensis</i>	SNAB,S5M	-	-	-		X			M/R	X						
Canada Warbler	<i>Wilsonia canadensis</i>	S3B,S3M	Threatened	Threatened	Threatened / Schedule 1			X		M	X						
Cedar Waxwing	<i>Bombycilla cedrorum</i>	S5B,S5M	-	-	-		X	X		M/R			X				
Chestnut-sided Warbler	<i>Setophaga pensylvanica</i>	S5B,S5M	-	-	-		X	X		M		X					
Chipping Sparrow	<i>Spizella passerina</i>	S5B,S5M	-	-	-		X	X		M				X			
Common Grackle	<i>Quiscalus quiscula</i>	S5B,S5M	-	-	-		X			M		X					
Common Nighthawk	<i>Chordeiles minor</i>	S3B,S4M	Threatened	Threatened	Special Concern / Schedule 1		X			M	X						
Common Raven	<i>Corvus corax</i>	S5	-	-	-	X	X			R		X					
Common Yellowthroat	<i>Geothlypis trichas</i>	S5B,S5M	-	-	-		X	X		M		X					
Dark-eyed Junco	<i>Junco hyemalis</i>	S5	-	-	-		X	X		R	X						
Double-crested Cormorant	<i>Phalacrocorax auritus</i>	S5B,S5M	-	-	-		X			M	X						
Downy Woodpecker	<i>Picoides pubescens</i>	S5	-	-	-		X	X		R	X						
Eastern Wood-pewee	<i>Contopus virens</i>	S4B,S4M	Sp. Con.	Sp. Con.	Special Concern / Schedule 1		X	X		M	X						
Eastern Phoebe	<i>Sayornis phoebe</i>	S5B,S5M	-	-	-		X			M			X				
Golden-crowned Kinglet	<i>Regulus satrapa</i>	S5	-	-	-		X	X		R	X						
Gray Jay	<i>Perisoreus canadensis</i>	S4	-	-	-		X			R	X						
Great Black-backed Gull	<i>Larus marinus</i>	S5	-	-	-		X	X		R	X						
Hairy Woodpecker	<i>Leuconotopicus villosus</i>	S5	-	-	-	X	X	X		R		X					
Hermit Thrush	<i>Catharus guttatus</i>	S5B,S5M	-	-	-		X	X		M		X					
Herring Gull	<i>Larus argentatus</i>	S5	-	-	-		X			R	X						
Least Flycatcher	<i>Empidonax minimus</i>	S5B,S5M	-	-	-		X	X		M	X						
Lincoln's Sparrow	<i>Melospiza lincolni</i>	S4B,S5M	-	-	-		X			M	X						
Magnolia Warbler	<i>Dendroica magnolia</i>	S5B,S5M	-	-	-		X	X		M		X					
Mourning Dove	<i>Zenaidura macroura</i>	S5B,S5M,S4N	-	-	-	X	X	X		R		X					
Mourning Warbler	<i>Geothlypis philadelphia</i>	S4B,S5M	-	-	-		X			M	X						
Nashville Warbler	<i>Leiothlypis ruficapilla</i>	S5B,S5M	-	-	-		X	X		M		X					
Northern Flicker	<i>Colaptes auratus</i>	S5B,S5M	-	-	-		X	X		R		X					
Northern Harrier	<i>Circus cyaneus</i>	S4B,S4S5M	-	-	-		X			M/R		X					
Northern Goshawk	<i>Accipiter gentilis</i>	S4	-	-	-		X	X		R	X						
Northern Parula	<i>Setophaga americana</i>	S5B,S5M	-	-	-		X	X		M		X					
Northern Saw-whet Owl	<i>Aegolius acadicus</i>	S5B,S5M	-	-	-		X			R	X						
Northern Waterthrush	<i>Parkesia noveboracensis</i>	S4B,S5M	-	-	-		X			M	X						
Olive-sided Flycatcher	<i>Contopus cooperi</i>	S3B,S3M	Threatened	Threatened	Special Concern / Schedule 1		X			M	X						
Ovenbird	<i>Seiurus aurocapilla</i>	S5B,S5M	-	-	-		X	X		M		X					
Palm Warbler	<i>Setophaga palmarum</i>	S5B,S5M	-	-	-		X			M		X					
Peregrine Falcon	<i>Falco peregrinus</i>	S1B,S3M	Endangered	Special Concern	Not at Risk / Schedule 1		X			R	X						
Pine Siskin	<i>Spinus pinus</i>	S3	-	-	-	X	X			R		X					
Pine Warbler	<i>Setophaga pinus</i>	S5B,S5M	-	-	-		X	X		M				NOT OBSERVED DURING ATLAS			
Purple Finch	<i>Haemorhous purpureus</i>	S4S5B,SUN,S5M	-	-	-	X	X	X		R		X					
Red-breasted Nuthatch	<i>Sitta canadensis</i>	S5	-	-	-	X	X	X		M		X					
Red-eyed Vireo	<i>Vireo olivaceus</i>	S5B,S5M	-	-	-		X	X		R		X					
Red-tailed Hawk	<i>Buteo jamaicensis</i>	S4	-	-	-		X	X		M/R	X						
Red-winged Blackbird	<i>Agelaius phoeniceus</i>	S4B,S4M	-	-	-		X			M/R		X					
Ruby-crowned Kinglet	<i>Regulus calendula</i>	S4B,S5M	-	-	-		X			M	X						
Ruffed Grouse	<i>Bonasa umbellus</i>	S5	-	-	-	X	X			R				X			
Rusty Blackbird	<i>Euphagus carolinus</i>	S3B,S3M	Special Concern	Special Concern	Special Concern / Schedule 1			X		M	X						
Sharp-shinned Hawk	<i>Accipiter striatus</i>	S4B,S5M	-	-	-			X		R	X						
Song Sparrow	<i>Melospiza melodia</i>	S5B,S5M	-	-	-		X	X		M/R				X			
Swainson's Thrush	<i>Catharus ustulatus</i>	S5B,S5M	-	-	-		X	X		M	X						
Turkey Vulture	<i>Cathartes aura</i>	S3B,S3M	-	-	-		X			M/R	X						
Veery	<i>Catharus fuscescens</i>	S4B,S4M	-	-	-			X		M		X					
White-breasted Nuthatch	<i>Sitta carolinensis</i>	S4	-	-	-	X	X			R	X						
White-throated Sparrow	<i>Zonotrichia albicollis</i>	S5B,S5M	-	-	-		X	X		M/R		X					
White-winged Crossbill	<i>Loxia leucoptera</i>	S5	-	-	-	X	X	X		R	X						
Wilson's Snipe	<i>Gallinago delicata</i>	S3S4B,S5M	-	-	-		X			M	X						
Winter Wren	<i>Troglodytes hiemalis</i>	S5B,S5M	-	-	-		X	X		M	X						
Woodpecker sp.	<i>Picidae sp.</i>	-	-	-	-		X										
Yellow-bellied Sapsucker	<i>Sphyrapicus varius</i>	S5B,S5M	-	-	-		X	X		R	X						
Yellow-rumped Warbler	<i>Setophaga coronata</i>	S5B,S5M	-	-	-		X	X		M		X					
Yellow Warbler	<i>Setophaga petechia</i>	S5B,S5M	-	-	-		X			M	X						
Total Species - 83						Total Number of Species per Season -				17	76	50	-	39	35	3	4

Notes/Legend:

Fall data is to be provided in an addendum, subsequent to the completion of the fall field surveys.

BOLD Denotes Species at Risk

BOLD Denotes Species of Conservation Concern

ITALICS Common Name Denotes Provincially Rare

S Ranks (current to December 2018):

S1 Extremely rare in province.

S2 Rare in province.

S3 Uncommon in province.

S4 Widespread, common and apparently secure in province.

S5 Widespread, abundant and demonstrably secure in province.

Desktop Breeding Summary

Obs. Denotes that the species was observed during the MBBA studies; however no inference to the probability of breeding could be made (lack of evidence).

Poss. Denotes possible breeding species.

Prob. Denotes probable breeding species.

Conf. Denotes confirmed breeding species.

Table A.2

Wocawson Energy Project - Winter 2018 Avian Surveys (Birder: R. Chiasson)

Site/Area:	Transect 1				Transect 2				
Survey Type	Transect/Area Search				Transect/Area Search				
Date:	6-Feb-18		12-Mar-18		6-Feb-18		12-Mar-18		
Time:	9:20-10:00		10:00-11:00		10:15-12:20		11:20-12:25		
Average Temperature (C):	-7		-2		-5		-1		
Cloud Cover (%):	80%		100%		90%		100%		
Wind (km/h):	Nil		Nil		Light		Nil		
Precipitation:	Nil		Snow		Very Light		Snow Showers		
Visibility:	Excellent		fair		Excellent		Fair		
Background Noise:	None		None		None		None		
Species Common Name	Species Scientific Name	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations
American Crow	<i>Corvus brachyrhynchos</i>	1							
American Robin	<i>Turdus migratorius</i>								
American Tree Sparrow	<i>Spizella arborea</i>								
Bald Eagle	<i>Haliaeetus leucocephalus</i>								
Black-capped Chickadee	<i>Poecile atricapillus</i>	2						8	
Blue Jay	<i>Cyanocitta cristata</i>							1	
Brown Creeper	<i>Certhia americana</i>							1	
Common Raven	<i>Corvus corax</i>								
Hairy Woodpecker	<i>Leuconotopicus villosus</i>					2		1	F(20W)
Mourning Dove	<i>Zenaida macroura</i>							2	
Pine Siskin	<i>Spinus pinus</i>			2		23	F(60V)	15	
Purple Finch	<i>Haemorhous purpureus</i>	2						1	
Red-breasted Nuthatch	<i>Sitta canadensis</i>	4						4	
Ruffed Grouse	<i>Bonasa umbellus</i>								
White-breasted Nuthatch	<i>Sitta carolinensis</i>			1					
White-winged Crossbill	<i>Loxia leucoptera</i>					8	F(60V)	9	
Woodpecker Species	-								
<i>Total Species - 17</i>	<i>Total Species (Diversity)</i>	4		2		3		9	
	<i>Total Individuals (Abundance)</i>	9		3		33		42	

Note: Observations include notes on flight passage height and direction, as well as behaviour

LEGEND**BOLD** Denotes Species at Risk**BOLD** Denotes Species of Conservation Concern

'F' Denotes bird observed in flight

'(100)' Denotes approximate passage height of bird in flight in meters

'(N)' Denotes bird flying in northerly direction

'(S)' Denotes bird flying in southerly direction

'(E)' Denotes bird flying in easterly direction

'(W)' Denotes bird flying in westerly direction

'(V)' Denotes bird flying in various directions

Table A.2

Wocawson Energy Project - Winter 2018 Avian Surveys (Birder: R. Chiasson)

Site/Area:	Transect 3				Transect 4				
Survey Type	Transect/Area Search				Transect/Area Search				
Date:	6-Feb-18		12-Mar-18		6-Feb-18		12-Mar-18		
Time:	12:45-13:30		12:20-13:45		14:18-14:45		No site access		
Average Temperature (C):	-4		0		-4		0		
Cloud Cover (%):	100%		100%		100%		100%		
Wind (km/h):	Light		Nil		Light		Nil		
Precipitation:	Very Light		Snow Showers		Very Light		Snow Showers		
Visibility:	Excellent		Fair		Excellent		Fair		
Background Noise:	None		None		None		None		
Species Common Name	Species Scientific Name	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations
American Crow	<i>Corvus brachyrhynchos</i>			2					
American Robin	<i>Turdus migratorius</i>								
American Tree Sparrow	<i>Spizella arborea</i>								
Bald Eagle	<i>Haliaeetus leucocephalus</i>	1	F(80W)						
Black-capped Chickadee	<i>Poecile atricapillus</i>	4				2			
Blue Jay	<i>Cyanocitta cristata</i>								
Brown Creeper	<i>Certhia americana</i>	2	F(60V)						
Common Raven	<i>Corvus corax</i>								
Hairy Woodpecker	<i>Leuconotopicus villosus</i>								No site access
Mourning Dove	<i>Zenaida macroura</i>								
Pine Siskin	<i>Spinus pinus</i>	6	F(60V)	10					
Purple Finch	<i>Haemorhous purpureus</i>			1					
Red-breasted Nuthatch	<i>Sitta canadensis</i>			5					
Ruffed Grouse	<i>Bonasa umbellus</i>								
White-breasted Nuthatch	<i>Sitta carolinensis</i>	1	10			1			
White-winged Crossbill	<i>Loxia leucoptera</i>	8	F(60V)	1					
Woodpecker Species	-								
Total Species - 17	Total Species (Diversity)	6		5		2		0	
	Total Individuals (Abundance)	22		19		3		0	

Note: Observations include notes on flight passage height

LEGEND**BOLD** Denotes Species at Risk**BOLD** Denotes Species of Conservation Concern

'F' Denotes bird observed in flight

'(100)' Denotes approximate passage height of bird in flight

'(N)' Denotes bird flying in northerly direction

'(S)' Denotes bird flying in southerly direction

'(E)' Denotes bird flying in easterly direction

'(W)' Denotes bird flying in westerly direction

'(V)' Denotes bird flying in various directions

Table A.2

Wocawson Energy Project - Winter 2018 Avian Surveys (Birder: R. Chiasson)

Site/Area:		Transect 5					
Survey Type		Transect/Area Search					
Date:		6-Feb-18		7-Feb-18		12-Mar-18	
Time:		7:50-9:15		8-13:20		7:40-10:00	
Average Temperature (C):		-10		-15		-2	
Cloud Cover (%):		70%		Sunny		100%	
Wind (km/h):		Nil		Nil		Nil	
Precipitation:		Nil		Nil		Snow	
Visibility:		Excellent		Excellent		fair	
Background Noise:		None		None		None	
Species Common Name	Species Scientific Name	Species count	Observations	Species count	Observations	Species count	Observations
American Crow	<i>Corvus brachyrhynchos</i>						
American Robin	<i>Turdus migratorius</i>						
American Tree Sparrow	<i>Spizella arborea</i>			2			
Bald Eagle	<i>Haliaeetus leucocephalus</i>			1	F(70SE)		
Black-capped Chickadee	<i>Poecile atricapillus</i>	12	F(V)	16			
Blue Jay	<i>Cyanocitta cristata</i>			3	F(30NE)	3	
Brown Creeper	<i>Certhia americana</i>						
Common Raven	<i>Corvus corax</i>	1		12	F(60 NE/NW)	1	
Hairy Woodpecker	<i>Leuconotopicus villosus</i>			2			
Mourning Dove	<i>Zenaida macroura</i>						
Pine Siskin	<i>Spinus pinus</i>	2	F(90V)	20	F(60V)	4	F(30SW)
Purple Finch	<i>Haemorhous purpureus</i>						
Red-breasted Nuthatch	<i>Sitta canadensis</i>	4		2			
Ruffed Grouse	<i>Bonasa umbellus</i>			2			
White-breasted Nuthatch	<i>Sitta carolinensis</i>						
White-winged Crossbill	<i>Loxia leucoptera</i>	4	F(90NW)	2			
Woodpecker Species	-			1		1	
<i>Total Species - 17</i>	<i>Total Species (Diversity)</i>	5		10		3	
	<i>Total Individuals (Abundance)</i>	23		63		9	

Note: Observations include notes on flight passage height

LEGEND**BOLD** Denotes Species at Risk**BOLD** Denotes Species of Conservation Concern

'F' Denotes bird observed in flight

'(100)' Denotes approximate passage height of bird in flight

'(N)' Denotes bird flying in northerly direction

'(S)' Denotes bird flying in southerly direction

'(E)' Denotes bird flying in easterly direction

'(W)' Denotes bird flying in westerly direction

'(V)' Denotes bird flying in various directions

Table A.2

Wocawson Energy Project - Winter 2018 Avian Surveys (Birder: R. Chiasson)

Site/Area:	Transect 6								
Survey Type	Transect/Area Search								
Date:	6-Feb-18								
Time:	10:00	No Data	No Data	1:30					
Average Temperature (C):	-15	-15	-5	2					
Cloud Cover (%):	0%	0%	15%	60%					
Wind (km/h):	Nil	Nil	Nil	10-20kms NE					
Precipitation:	Nil	Nil	Nil	Nil					
Visibility:	Excellent	Excellent	Excellent	Excellent					
Background Noise:	None	None	None	None					
Species Common Name	Species Scientific Name	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations
American Crow	<i>Corvus brachyrhynchos</i>								
American Robin	<i>Turdus migratorius</i>								
American Tree Sparrow	<i>Spizella arborea</i>								
Bald Eagle	<i>Haliaeetus leucocephalus</i>								
Black-capped Chickadee	<i>Poecile atricapillus</i>			2					
Blue Jay	<i>Cyanocitta cristata</i>								
Brown Creeper	<i>Certhia americana</i>								
Common Raven	<i>Corvus corax</i>					1	F(40SE)		
Hairy Woodpecker	<i>Leuconotopicus villosus</i>								
Mourning Dove	<i>Zenaida macroura</i>								
Pine Siskin	<i>Spinus pinus</i>								
Purple Finch	<i>Haemorhous purpureus</i>								
Red-breasted Nuthatch	<i>Sitta canadensis</i>								
Ruffed Grouse	<i>Bonasa umbellus</i>								
White-breasted Nuthatch	<i>Sitta carolinensis</i>								
White-winged Crossbill	<i>Loxia leucoptera</i>	2				2			
Woodpecker Species	-								
Total Species - 17	Total Species (Diversity)	1		1		2		0	
	Total Individuals (Abundance)	2		2		3		0	

Note: Observations include notes on flight passage height

LEGEND**BOLD** Denotes Species at Risk**BOLD** Denotes Species of Conservation Concern

'F' Denotes bird observed in flight

'(100)' Denotes approximate passage height of bird in flight

'(N)' Denotes bird flying in northerly direction

'(S)' Denotes bird flying in southerly direction

'(E)' Denotes bird flying in easterly direction

'(W)' Denotes bird flying in westerly direction

'(V)' Denotes bird flying in various directions

Table A.2

Wocawson Energy Project - Winter 2018 Avian Surveys (Birder: R. Chiasson)

Site/Area:	Transect 7				Owl 1			
Survey Type	Transect/Area Search				Owl Survey			
Date:	6-Feb-18				11-Mar-18			
Time:	No Data	No Data	7:45-8:20					
Average Temperature (C):	-5	-5	0					
Cloud Cover (%):	15%	15%	Cloudy					
Wind (km/h):	Nil	Nil	Nil					
Precipitation:	Nil	Nil	20 cms wet heavy snow					
Visibility:	Excellent	Excellent	fair					
Background Noise:	None	None	None					
Species Common Name	Species Scientific Name	Species count	Observations	Species count	Observations	Species count	Observations	Total
American Crow	<i>Corvus brachyrhynchos</i>		No Birds Observed				No Birds Observed	3
American Robin	<i>Turdus migratorius</i>			1				1
American Tree Sparrow	<i>Spizella arborea</i>							2
Bald Eagle	<i>Haliaeetus leucocephalus</i>							2
Black-capped Chickadee	<i>Poecile atricapillus</i>							46
Blue Jay	<i>Cyanocitta cristata</i>							7
Brown Creeper	<i>Certhia americana</i>							3
Common Raven	<i>Corvus corax</i>			2	F(60S)			17
Hairy Woodpecker	<i>Leuconotopicus villosus</i>							5
Mourning Dove	<i>Zenaida macroura</i>							2
Pine Siskin	<i>Spinus pinus</i>			1				83
Purple Finch	<i>Haemorhous purpureus</i>							4
Red-breasted Nuthatch	<i>Sitta canadensis</i>							19
Ruffed Grouse	<i>Bonasa umbellus</i>							2
White-breasted Nuthatch	<i>Sitta carolinensis</i>							13
White-winged Crossbill	<i>Loxia leucoptera</i>							36
Woodpecker Species	-							2
<i>Total Species - 17</i>	<i>Total Species (Diversity)</i>	0		3		0		247
	<i>Total Individuals (Abundance)</i>	0		4		0		

Note: Observations include notes on flight passage height

LEGEND**BOLD** Denotes Species at Risk**BOLD** Denotes Species of Conservation Concern

'F' Denotes bird observed in flight

'(100)' Denotes approximate passage height of bird in flight

'(N)' Denotes bird flying in northerly direction

'(S)' Denotes bird flying in southerly direction

'(E)' Denotes bird flying in easterly direction

'(W)' Denotes bird flying in westerly direction

'(V)' Denotes bird flying in various directions

Table A.3
Wocawson Energy Project - Spring 2018 Avian Surveys (Birder: R. Chiasson)

Site/Area:		Watch1										Watch2									
Survey Type		Watch Count										Watch Count									
Date:	24-Apr-18	02-May-18	08-May-18	05-Jun-18	29-May-18	24-Apr-18	02-May-18	08-May-18	29-May-18	05-Jun-18	Date:	24-Apr-18	02-May-18	08-May-18	29-May-18	05-Jun-18					
Time:	9:00-10:15	9:00-10:25	9:00-10:30	9:00-10:30	9:07-10:36	10:30-1:00	10:30-13:00	10:30-13:00	10:36	11:00	Time:	9:00-10:15	9:00-10:25	9:00-10:30	9:00-10:30	9:07-10:36					
Temperature (C):	12	7	15	10	20	18	7	15	20	10	Temperature (C):	12	7	15	10	20					
Cloud Cover (%):	5	60	0	100	60	5	60	0	60	100	Cloud Cover (%):	5	60	0	60	100					
Wind (km/h):	20	25-30	10-35	5-10	30	20	25-30	10-35	30	5-10	Wind (km/h):	20	25-30	10-35	30	5-10					
Precipitation:	Nil	Nil	Nil	Light rain	Nil	Nil	Nil	Nil	Nil	Light rain	Precipitation:	Nil	Nil	Nil	Nil	Light rain					
Visibility (km):	Excellent	Excellent	Excellent	poor	fair	Excellent	Excellent	Excellent	poor	fair	Visibility (km):	Excellent	Excellent	Excellent	poor	fair					
Background Noise:	None	None	None	none	none	None	None	None	none	none	Background Noise:	None	None	None	none	none					
Species Common Name	Species Scientific Name	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations				
Alder Flycatcher	<i>Empidonax alnorum</i>																				
American Crow	<i>Corvus brachyrhynchos</i>																				
American Goldfinch	<i>Spinus tristis</i>			2		1	F(40S)				5	F(10-60SW)	1		1						
American Kestrel	<i>Falco sparverius</i>														2	F(50SW)					
American Redstart	<i>Setophaga ruticilla</i>							2													
American Robin	<i>Turdus migratorius</i>			1		2		1									1				
American Three-toed Woodpecker	<i>Picoides dorsalis</i>										1				1						
American Woodcock	<i>Scelopax minor</i>																				
Bald Eagle	<i>Haliaeetus leucocephalus</i>																				
Barn Swallow	<i>Hirundo rustica</i>			1	F(90E)																
Barred Owl	<i>Strix varia</i>																				
Bay-breasted Warbler	<i>Setophaga castanea</i>																				
Belted Kingfisher	<i>Megasceryle alcyon</i>																				
Black-and-white Warbler	<i>Mniotilta varia</i>																				
Blackburnian Warbler	<i>Setophaga fusca</i>																				
Black-capped Chickadee	<i>Poecile atricapillus</i>					1				1											
Black-throated Blue Warbler	<i>Dendroica caerulescens</i>																				
Black-throated Green Warbler	<i>Dendroica virens</i>																				
Blue Jay	<i>Cyanocitta cristata</i>																				
Blue-headed Vireo	<i>Vireo solitarius</i>																				
Broad-winged Hawk	<i>Buteo platypterus</i>																				
Brown Creeper	<i>Certhia americana</i>														1	F(40N)					
Canada Goose	<i>Branta canadensis</i>																				
Cedar Waxwing	<i>Bombycilla cedrorum</i>							1													
Chestnut-sided Warbler	<i>Setophaga pensylvanica</i>																				
Chipping Sparrow	<i>Spizella passerina</i>																				
Common Grackle	<i>Quiscalus quiscula</i>																				
Common Nighthawk	<i>Chordeiles minor</i>																				
Common Raven	<i>Corvus corax</i>							1						1		3	F(200)				
Common Yellowthroat	<i>Geothlypis trichas</i>									2						2					
Dark-eyed Junco	<i>Junco hyemalis</i>			1											2	1					
Double-crested Cormorant	<i>Phalacrocorax auritus</i>																				
Downy Woodpecker	<i>Picoides pubescens</i>																				
Eastern Phoebe	<i>Sayornis phoebe</i>										1										
Eastern Wood-pewee	<i>Cantopus virens</i>																				
Golden-crowned Kinglet	<i>Regulus satrapa</i>																				
Gray Jay	<i>Perisoreus canadensis</i>																				
Hairy Woodpecker	<i>Leuconotopicus villosus</i>									1						1					
Hermit Thrush	<i>Catharus guttatus</i>	1	F(10N)					1		1				1			1				
Least Flycatcher	<i>Empidonax minimus</i>																				
Lincoln's Sparrow	<i>Melospiza lincolni</i>																				
Magnolia Warbler	<i>Dendroica magnolia</i>														4		2				
Mourning Dove	<i>Zenaidura macroura</i>																				
Mourning Warbler	<i>Zenaidura macroura</i>																				
Nashville Warbler	<i>Leiothlypis rufoflava</i>									1						1					
Northern Flicker	<i>Colaptes auratus</i>	1	F(40SW)					1		1				2		1					
Northern Goshawk	<i>Accipiter gentilis</i>																				
Northern Harrier	<i>Circus cyaneus</i>																				
Northern Parula	<i>Setophaga americana</i>									1	F(40W)										
Northern Saw-whet Owl	<i>Asio accipitrinus</i>																				
Northern Water Thrush	<i>Parkesia noveboracensis</i>																				
Olive-sided Flycatcher	<i>Cantopus cooperi</i>																				
Ovenbird	<i>Seiurus</i>					1		1		2											
Palm Warbler	<i>Setophaga palmarum</i>					3															
Peregrine Falcon	<i>Falco peregrinus</i>										6				1		1				
Pine Siskin	<i>Spinus pinus</i>					3	F(80SW)								2	F(60SW)	1				
Pine Warbler	<i>Setophaga pinus</i>														2		F(90S)				
Purple Finch	<i>Haemorhous purpureus</i>																				
Red-breasted Nuthatch	<i>Sitta canadensis</i>																				
Red-eyed Vireo	<i>Vireo olivaceus</i>																				
Red-tailed Hawk	<i>Buteo jamaicensis</i>															1	F(6S)				
Red-winged Blackbird	<i>Agelaius phoeniceus</i>																				
Ruby-crowned Kinglet	<i>Regulus calendula</i>	1																			
Ruffed Grouse	<i>Bonasa umbellus</i>																				
Song Sparrow	<i>Melospiza melodia</i>	1		1		1		1	F(60-120SE)	2					2						
Swainson's Thrush	<i>Catharus ustulatus</i>																				
Turkey Vulture	<i>Cathartes aura</i>	1	F(60E)												1	F(50N)	3				
White-breasted Nuthatch	<i>Sitta carolinensis</i>																				
White-throated Sparrow	<i>Zonotrichia albicollis</i>					3		2		2				7		4	3				
White-winged Crossbill	<i>Loxia leucophaea</i>																				
Wilson's Snipe	<i>Gallinago delicata</i>																				
Winter Wren	<i>Troglodytes hiemalis</i>																				
Woodpecker Species																					
Yellow Warbler	<i>Setophaga petechia</i>																				
Yellow-bellied Sapsucker	<i>Sphyrapicus varius</i>							1													
Yellow-rumped Warbler	<i>Setophaga coronata</i>																				
Total Species - 76	Totals Species (Diversity):	5		5		10		11		9		6		10		18		13		10	
	Total Individuals (Abundance):	5		6		18		13		13		20		18		43		20		14	

Note: Observations include notes on flight passage height and direction, as well as behaviour

LEGEND

- BOLD Denotes Species at Risk
- BOLD Denotes Species of Conservation Concern
- 'F' Denotes bird observed in flight
- '(100)' Denotes passage height of bird in flight in meters
- 'N' Denotes bird flying in northerly direction
- 'S' Denotes bird flying in southerly direction
- 'E' Denotes bird flying in easterly direction
- 'W' Denotes bird flying in westerly direction
- 'V' Denotes bird flying in various directions

Table A.3
Wocawson Energy Project - Spring 2018 Avian Surveys (Birder: R. Chiasson)

Site/Area:		Watch3										PC1						PC2					
Survey Type		Watch Count										Point Count		Watch/Point Count		Point counts/Area Search		Watch/Pointcount					
Date:		24-Apr-18		02-May-18		08-May-18		29-May-18		05-Jun-18		17-May-18		05-Jun-18		2018-20-06		02-May-18		08-May-18		05-Jun-18	
Time:		6:03-7:03		5:40-6:45		6:30-6:45		5:10-6:25		4:55		6:08-6:48		8:04		6:32		6:45-7:16		7:45-8:11		7:47	
Temperature (C):		-3		5		4		11		3		10		10		16		5		8		7	
Cloud Cover (%):		20		30		20		100		100		100		100		5		30		10		95	
Wind (km/h):		20		5-10		15		Nil		5-10		20-30		5-10		0		5-10		Nil		5-10	
Precipitation:		Nil		Nil		Nil		Light Rain		Light rain		fog		Light rain		0		Nil		Nil		Light rain	
Visibility (km):		Excellent		Excellent		Excellent		fair		poor		poor		poor		excellent		Excellent		Excellent		poor	
Background Noise:		None		None		None		none		none		none		none		none		None		None		none	
Species Common Name	Species Scientific Name	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations
Alder Flycatcher	<i>Empidonax alnorum</i>							3		2													
American Crow	<i>Corvus brachyrhynchos</i>																						
American Goldfinch	<i>Spinus tristis</i>	1	F(59W)	1	F(40)	1	F(60NE)													1			
American Kestrel	<i>Falco sparverius</i>																						
American Redstart	<i>Setophaga ruticilla</i>									1													
American Robin	<i>Turdus migratorius</i>	1		2		1		1		1								1					
American Three-toed Woodpecker	<i>Picoides dorsalis</i>																						
American Woodcock	<i>Scelopax minor</i>			1																1			
Bald Eagle	<i>Haliaeetus leucocephalus</i>																						
Barn Swallow	<i>Hirundo rustica</i>																						
Barred Owl	<i>Strix varia</i>																						
Bay-breasted Warbler	<i>Setophaga castanea</i>																						
Belted Kingfisher	<i>Megascyle alcyon</i>																						
Black-and-white Warbler	<i>Mniotilta varia</i>			1				1															
Blackburnian Warbler	<i>Setophaga fusca</i>																						
Black-capped Chickadee	<i>Poecile atricapillus</i>	2		1		1																1	
Black-throated Blue Warbler	<i>Dendroica caerulescens</i>																			1			
Black-throated Green Warbler	<i>Dendroica virens</i>			2								1											
Blue Jay	<i>Cyanocitta cristata</i>																						
Blue-headed Vireo	<i>Vireo solitarius</i>																						
Broad-winged Hawk	<i>Buteo platypterus</i>																						
Brown Creeper	<i>Certhia americana</i>							2	F(60NE)														
Canada Goose	<i>Branta canadensis</i>					2																	
Cedar Waxwing	<i>Bombycilla cedrorum</i>									4		1				1							
Chestnut-sided Warbler	<i>Setophaga pensylvanica</i>			2																			
Chipping Sparrow	<i>Spizella passerina</i>																						
Common Grackle	<i>Quiscalus quiscula</i>																						
Common Nighthawk	<i>Chordeiles minor</i>							1	F(10W)	1	F(40-60V)												
Common Raven	<i>Corvus corax</i>			1																			
Common Yellowthroat	<i>Geothlypis trichas</i>			2				2		1						2							
Dark-eyed Junco	<i>Junco hyemalis</i>	2		3		1	F(10N)																
Double-crested Cormorant	<i>Phalacrocorax auritus</i>																						
Downy Woodpecker	<i>Picoides pubescens</i>																			1			
Eastern Phoebe	<i>Sayornis phoebe</i>																						
Eastern Wood-pewee	<i>Cantopus virens</i>																						
Golden-crowned Kinglet	<i>Regulus satrapa</i>																			2			
Gray Jay	<i>Perisoreus canadensis</i>																						
Hairy Woodpecker	<i>Leuconotopicus villosus</i>																						
Hermit Thrush	<i>Catharus guttatus</i>	1		5		1		1		2									1				
Least Flycatcher	<i>Empidonax minimus</i>																						
Lincoln's Sparrow	<i>Melospiza lincolni</i>			1				1		3													
Magnolia Warbler	<i>Dendroica magnolia</i>											1				1						1	
Mourning Dove	<i>Zenaidura macroura</i>																						
Mourning Warbler	<i>Zenaidura macroura</i>															3							
Nashville Warbler	<i>Leiothlypis ruficapilla</i>			1								1											
Northern Flicker	<i>Colaptes auratus</i>					1		1				1			1					1			
Northern Goshawk	<i>Accipiter gentilis</i>																						
Northern Harrier	<i>Circus cyaneus</i>																						
Northern Parula	<i>Setophaga americana</i>																				1		
Northern Saw-whet Owl	<i>Asio accipitrinus</i>							1															
Northern Water Thrush	<i>Parkesia noveboracensis</i>																						
Olive-sided Flycatcher	<i>Cantopus cooperi</i>																						
Ovenbird	<i>Seiurus</i>			4				1				1									1		
Palm Warbler	<i>Setophaga palmarum</i>					1								3		1						1	
Peregrine Falcon	<i>Falco peregrinus</i>			1																			
Pine Siskin	<i>Spinus pinus</i>																						
Pine Warbler	<i>Setophaga pinus</i>																						
Purple Finch	<i>Haemorhous purpureus</i>																						
Red-breasted Nuthatch	<i>Sitta canadensis</i>																						
Red-eyed Vireo	<i>Vireo olivaceus</i>																						
Red-tailed Hawk	<i>Buteo jamaicensis</i>																						
Red-winged Blackbird	<i>Agelaius phoeniceus</i>																						
Ruby-crowned Kinglet	<i>Regulus calendula</i>																						
Ruffed Grouse	<i>Bonasa umbellus</i>																					1	
Song Sparrow	<i>Melospiza melodia</i>	2		3		2				1				2		3					1		
Swainson's Thrush	<i>Catharus ustulatus</i>									1											1		
Turkey Vulture	<i>Cathartes aura</i>																						
White-breasted Nuthatch	<i>Sitta carolinensis</i>																						
White-throated Sparrow	<i>Zonotrichia albicollis</i>			5		6		1		2		1		4		3						2	
White-winged Crossbill	<i>Loxia leucoptera</i>																						
Wilson's Snipe	<i>Gallinago delicata</i>																						
Winter Wren	<i>Troglodytes hiemalis</i>																				1		
Woodpecker Species				1		1																	
Yellow Warbler	<i>Setophaga petechia</i>																						
Yellow-bellied Sapsucker	<i>Sphyrapicus varius</i>	1																					
Yellow-rumped Warbler	<i>Setophaga coronata</i>					2	F(40NE)																
Total Species - 76	Totals Species (Diversity):	7		20		13		13		10		6		4		7		7		7		4	
	Total Individuals (Abundance)	10		40		21		19		15		6		10		14		8		7		5	

Note: Observations include notes on flight passage height and

LEGEND
BOLD Denotes Species at Risk
BOLD Denotes Species of Conservation Concern
 'F' Denotes bird observed in flight
 '(100)' Denotes passage height of bird in flight in meters
 'N' Denotes bird flying in northerly direction
 'S' Denotes bird flying in southerly direction
 'E' Denotes bird flying in easterly direction
 'W' Denotes bird flying in westerly direction
 'V' Denotes bird flying in various directions

Table A.3
Wocawson Energy Project - Spring 2018 Avian Surveys (Birder: R. Chiasson)

Site/Area	PC3				PC4				PC5				PC6										
	Watch/Pointcount		Watch/Pointcount		Watch/Pointcount		Watch/Pointcount		Watch/Pointcount		Watch/Pointcount		Watch/Pointcount										
Survey Type	08-May-18		05-Jun-18		08-May-18		17-May-18		29-May-18		05-Jun-18		08-May-18		29-May-18		17-May-18		29-May-18		05-Jun-18		
Date:	08-May-18		05-Jun-18		08-May-18		17-May-18		29-May-18		05-Jun-18		08-May-18		29-May-18		17-May-18		29-May-18		05-Jun-18		
Time:	8:33-8:45		7:31		7:43-8:33		9:44-10:04		8:50-9:07		7:15		6:45-7:16		8:28-8:50		7:10-8:12		7:58-8:11		6:42		
Temperature (C):	8		7		8		13		20		7		4		20		12		18		3		
Cloud Cover (%):	20		95		20		100		60		95		20		60		100		95		100		
Wind (km/h):	10-25		5-10		10-25		10-20		30		5-10		15		30		20		10		5-10		
Precipitation:	Nil		Light rain		Nil		fog		Nil		Light rain		Nil		Nil		fog		Nil		Light rain		
Visibility (km):	Excellent		poor		Excellent		poor		fair		poor		Excellent		fair		poor		fair		poor		
Background Noise:	None		none		None		none		none		none		None		none		none		none		none		
Species Common Name	Species Scientific Name	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations
Alder Flycatcher	<i>Empidonax aliorum</i>											2				1							
American Crow	<i>Corvus brachyrhynchos</i>																						
American Goldfinch	<i>Spinus tristis</i>	1												1									
American Kestrel	<i>Falco sparverius</i>																						
American Redstart	<i>Setophaga ruticilla</i>											1											
American Robin	<i>Turdus migratorius</i>											1				1							
American Three-toed Woodpecker	<i>Picoides dorsalis</i>																						
American Woodcock	<i>Scelopax minor</i>																						
Bald Eagle	<i>Haliaeetus leucocephalus</i>																						
Barn Swallow	<i>Hirundo rustica</i>																						
Barred Owl	<i>Strix varia</i>																						
Bay-breasted Warbler	<i>Setophaga castanea</i>																						
Belted Kingfisher	<i>Megasceryle alcyon</i>																						
Black-and-white Warbler	<i>Mniotilta varia</i>	1												1									
Blackburnian Warbler	<i>Setophaga fusca</i>																						
Black-capped Chickadee	<i>Poecile atricapillus</i>					2																	
Black-throated Blue Warbler	<i>Dendroica caerulescens</i>					1		1				1											
Black-throated Green Warbler	<i>Dendroica virens</i>					1						1						3					
Blue Jay	<i>Cyanocitta cristata</i>					1																	
Blue-headed Vireo	<i>Vireo solitarius</i>													1									
Broad-winged Hawk	<i>Buteo platypterus</i>																						
Brown Creeper	<i>Certhia americana</i>																						
Canada Goose	<i>Branta canadensis</i>																						
Cedar Waxwing	<i>Bombycilla cedrorum</i>																						
Chestnut-sided Warbler	<i>Setophaga pensylvanica</i>																						
Chipping Sparrow	<i>Spizella passerina</i>																						
Common Grackle	<i>Quiscalus quiscula</i>																						
Common Nighthawk	<i>Chordeiles minor</i>																						
Common Raven	<i>Corvus corax</i>											1											
Common Yellowthroat	<i>Geothlypis trichas</i>											1											
Dark-eyed Junco	<i>Junco hyemalis</i>	1												1									
Double-crested Cormorant	<i>Phalacrocorax auritus</i>																				1		
Downy Woodpecker	<i>Picoides pubescens</i>																						
Eastern Phoebe	<i>Sayornis phoebe</i>																						
Eastern Wood-pewee	<i>Contopus virens</i>																						
Golden-crowned Kinglet	<i>Regulus satrapa</i>																						
Gray Jay	<i>Perisoreus canadensis</i>																						
Hairy Woodpecker	<i>Leuconotopicus villosus</i>										1												
Hermit Thrush	<i>Catharus guttatus</i>																						
Least Flycatcher	<i>Empidonax minimus</i>																						
Lincoln's Sparrow	<i>Melospiza lincolni</i>																						
Magnolia Warbler	<i>Dendroica magnolia</i>																						
Mourning Dove	<i>Zenaidura macroura</i>																						
Mourning Warbler	<i>Zenaidura macroura</i>																						
Nashville Warbler	<i>Leiothlypis rufocapilla</i>																						
Northern Flicker	<i>Colaptes auratus</i>																						
Northern Goshawk	<i>Accipiter gentilis</i>																						
Northern Harrier	<i>Circus cyaneus</i>																						
Northern Parula	<i>Setophaga americana</i>																						
Northern Saw-whet Owl	<i>Asio accipitrinus</i>																						
Northern Water Thrush	<i>Parkesia noveboracensis</i>																						
Olive-sided Flycatcher	<i>Contopus cooperi</i>																						
Ovenbird	<i>Seiurus</i>																						
Palm Warbler	<i>Setophaga palmarum</i>			1				1						2									
Peregrine Falcon	<i>Falco peregrinus</i>																						
Pine Siskin	<i>Spinus pinus</i>																						
Pine Warbler	<i>Setophaga pinus</i>																						
Purple Finch	<i>Haemorhous purpureus</i>	1																					
Red-breasted Nuthatch	<i>Sitta canadensis</i>																						
Red-eyed Vireo	<i>Vireo olivaceus</i>																						
Red-tailed Hawk	<i>Buteo jamaicensis</i>																						
Red-winged Blackbird	<i>Agelaius phoeniceus</i>																						
Ruby-crowned Kinglet	<i>Regulus calendula</i>																						
Ruffed Grouse	<i>Bonasa umbellus</i>																						
Song Sparrow	<i>Melospiza melodia</i>																						
Swainson's Thrush	<i>Catharus ustulatus</i>																						
Turkey Vulture	<i>Cathartes aura</i>																						
White-breasted Nuthatch	<i>Sitta carolinensis</i>																						
White-throated Sparrow	<i>Zonotrichia albicollis</i>	1																					
White-winged Crossbill	<i>Loxia leucoptera</i>																						
Wilson's Snipe	<i>Gallinago delicata</i>																						
Winter Wren	<i>Troglodytes hiemalis</i>																						
Woodpecker Species																							
Yellow Warbler	<i>Setophaga petechia</i>																						
Yellow-bellied Sapsucker	<i>Sphyrapicus varius</i>																						
Yellow-rumped Warbler	<i>Setophaga coronata</i>	1																					
Total Species - 76	Totals Species (Diversity):	6		1		6		6		7		12		10		7		6		5		1	
	Total Individuals (Abundance)	6		1		7		6		10		15		12		7		8		7		2	

Note: Observations include notes on flight passage height and

LEGEND
BOLD Denotes Species at Risk
BOLD Denotes Species of Conservation Concern
'F' Denotes bird observed in flight
'(100)' Denotes passage height of bird in flight in meters
'N' Denotes bird flying in northerly direction
'S' Denotes bird flying in southerly direction
'E' Denotes bird flying in easterly direction
'W' Denotes bird flying in westerly direction
'V' Denotes bird flying in various directions

Table A.3
Wocawson Energy Project - Spring 2018 Avian Surveys (Birder: R. Chiasson)

Site/Area	PC7				PC8		PC9				PC10											
	Point Count				Watch/Pointcount		Watch/Point Count				Watch/Pointcount											
Survey Type																						
Date:	17-May-18	29-May-18	05-Jun-18	08-May-18	17-May-18	29-May-18	05-Jun-18	24-Apr-18	02-May-18	08-May-18	29-May-18											
Time:	8:34-9:44	8:11-8:28	6:55	8:11-8:29	5:47-6:08	7:35-7:58	6:22	7:17-7:51	7:16-7:39	8:29-8:46	6:57-7:21											
Temperature (C):	13	18	7	9	10	18	3	1	5	11	11											
Cloud Cover (%):	100	95	95	10	100	95	100	20	30	10	100											
Wind (km/h):	20	10	5-10	Nil	20-30	10	5-10	20	5-10	Nil	Nil											
Precipitation:	fog	Nil	Light rain	Nil	fog	Nil	Light rain	Nil	Nil	Nil	Light Rain											
Visibility (km):	poor	fair	poor	Excellent	poor	fair	poor	Excellent	Excellent	Excellent	fair											
Background Noise:	none	none	none	None	none	none	none	None	None	None	none											
Species Common Name	Species Scientific Name	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations	
Alder Flycatcher	<i>Empidonax alnorum</i>									1												
American Crow	<i>Corvus brachyrhynchos</i>																					
American Goldfinch	<i>Spinus tristis</i>																					
American Kestrel	<i>Falco sparverius</i>																					
American Redstart	<i>Setophaga ruticilla</i>									1		1										
American Robin	<i>Turdus migratorius</i>			1										1		2						
American Three-toed Woodpecker	<i>Picoides dorsalis</i>																					
American Woodcock	<i>Scalopax minor</i>																					
Bald Eagle	<i>Haliaeetus leucocephalus</i>																					
Barn Swallow	<i>Hirundo rustica</i>																					
Barred Owl	<i>Strix varia</i>																					
Bay-breasted Warbler	<i>Setophaga castanea</i>							1														
Belted Kingfisher	<i>Megascyle alcyon</i>																					
Black-and-white Warbler	<i>Mniotilta varia</i>									2		1										
Blackburnian Warbler	<i>Setophaga fusca</i>																					
Black-capped Chickadee	<i>Poecile atricapillus</i>			2				1														
Black-throated Blue Warbler	<i>Dendroica caerulescens</i>									2												
Black-throated Green Warbler	<i>Dendroica virens</i>	2																				
Blue Jay	<i>Cyanocitta cristata</i>																					
Blue-headed Vireo	<i>Vireo solitarius</i>																					
Broad-winged Hawk	<i>Buteo platypterus</i>																					
Brown Creeper	<i>Certhia americana</i>																					
Canada Goose	<i>Branta canadensis</i>																					
Cedar Waxwing	<i>Bombycilla cedrorum</i>																					
Chestnut-sided Warbler	<i>Setophaga pensylvanica</i>																					
Chipping Sparrow	<i>Spizella passerina</i>																					
Common Grackle	<i>Quiscalus quiscula</i>																					
Common Nighthawk	<i>Chordeiles minor</i>																					
Common Raven	<i>Corvus corax</i>																					
Common Yellowthroat	<i>Geothlypis trichas</i>													2								
Dark-eyed Junco	<i>Junco hyemalis</i>			1																		
Double-crested Cormorant	<i>Phalacrocorax auritus</i>																					
Downy Woodpecker	<i>Picoides pubescens</i>																					
Eastern Phoebe	<i>Sayornis phoebe</i>																					
Eastern Wood-pewee	<i>Cantopus virens</i>																					
Golden-crowned Kinglet	<i>Regulus satrapa</i>																					
Gray Jay	<i>Perisoreus canadensis</i>																					
Hairy Woodpecker	<i>Leuconotopicus villosus</i>																					
Hermit Thrush	<i>Catharus guttatus</i>							1													1	
Least Flycatcher	<i>Empidonax minimus</i>																					
Lincoln's Sparrow	<i>Melospiza lincolni</i>																					
Magnolia Warbler	<i>Dendroica magnolia</i>			2						1		2		2								
Mourning Dove	<i>Zenaidura macroura</i>																					
Mourning Warbler	<i>Zenaidura macroura</i>																					
Nashville Warbler	<i>Leiothlypis rufocapilla</i>			1				1														1
Northern Flicker	<i>Colaptes auratus</i>													1		F(20W)						
Northern Goshawk	<i>Accipiter gentilis</i>																					
Northern Harrier	<i>Circus cyaneus</i>																					
Northern Parula	<i>Setophaga americana</i>									1												1
Northern Saw-whet Owl	<i>Asio accipitrinus</i>																					
Northern Water Thrush	<i>Parkesia noveboracensis</i>																					
Olive-sided Flycatcher	<i>Cantopus cooperi</i>																					
Ovenbird	<i>Seiurus</i>	1				1				2		1										2
Palm Warbler	<i>Setophaga palmarum</i>													1								1
Peregrine Falcon	<i>Falco peregrinus</i>																					
Pine Siskin	<i>Spinus pinus</i>																					
Pine Warbler	<i>Setophaga pinus</i>																					
Purple Finch	<i>Haemorhous purpureus</i>			1																		
Red-breasted Nuthatch	<i>Sitta canadensis</i>			1																		
Red-eyed Vireo	<i>Vireo olivaceus</i>																					
Red-tailed Hawk	<i>Buteo jamaicensis</i>																					
Red-winged Blackbird	<i>Agelaius phoeniceus</i>																					
Ruby-crowned Kinglet	<i>Regulus calendula</i>											1										
Ruffed Grouse	<i>Bonasa umbellus</i>																					
Song Sparrow	<i>Melospiza melodia</i>																					
Swainson's Thrush	<i>Catharus ustulatus</i>																					
Turkey Vulture	<i>Cathartes aura</i>																					
White-breasted Nuthatch	<i>Sitta carolinensis</i>																					
White-throated Sparrow	<i>Zonotrichia albicollis</i>			3								1		4								
White-winged Crossbill	<i>Loxia leucoptera</i>																					
Wilson's Snipe	<i>Gallinago delicata</i>																					
Winter Wren	<i>Troglodytes hiemalis</i>									2												
Woodpecker Species																						
Yellow Warbler	<i>Setophaga petechia</i>																					
Yellow-bellied Sapsucker	<i>Sphyrapicus varius</i>	1																				
Yellow-rumped Warbler	<i>Setophaga coronata</i>					1																
Total Species - 76	Totals Species (Diversity):	3		7		4		6		7		7		5		6		1		3		5
	Total Individuals (Abundance)	4		9		6		6		11		8		10		7		1		3		7

Note: Observations include notes on flight passage height and

- LEGEND**
BOLD Denotes Species at Risk
BOLD Denotes Species of Conservation Concern
'F' Denotes bird observed in flight
'(100)' Denotes passage height of bird in flight in meters
'N' Denotes bird flying in northerly direction
'S' Denotes bird flying in southerly direction
'E' Denotes bird flying in easterly direction
'W' Denotes bird flying in westerly direction
'V' Denotes bird flying in various directions

Table A.3
Wocawson Energy Project - Spring 2018 Avian Surveys (Birder: R. Chiasson)

Site/Area:		PC11				PC12				PC13									
Survey Type		Watch/Pointcount		Watch/Pointcount		Watch/Pointcount		Watch/Pointcount		Watch/Pointcount		Watch/Pointcount		Watch/Pointcount		Watch/Pointcount		Watch/Pointcount	
Date:	2018-20-06	08-May-18	08-May-18	2018-20-06	29-May-18	02-May-18	29-May-18	08-May-18	05-Jun-18	2018-20-06									
Time:	9:23	6:48-7:15	6:28-6:48	6:19	6:25-6:57	7:39-7:59	7:21-7:35	8:46-9:00	6:05	9:02									
Temperature (C):	16	4	2	7	11	7	18	11	3	16									
Cloud Cover (%):	5	10	10	0	100	60	95	10	100	5									
Wind (km/h):	0	Nil	Nil	0	Nil	25-30	10	Nil	5-10	0									
Precipitation:	0	Nil	Nil	0	Light Rain	Nil	Nil	Nil	Light rain	0									
Visibility (km):	excellent	Excellent	Excellent	excellent	fair	Excellent	fair	Excellent	poor	excellent									
Background Noise:	none	None	None	none	none	None	none	None	none	none									
Species Common Name	Species Scientific Name	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations
Alder Flycatcher	<i>Empidonax aliorum</i>							2											
American Crow	<i>Corvus brachyrhynchos</i>																		
American Goldfinch	<i>Spinus tristis</i>																		
American Kestrel	<i>Falco sparverius</i>																		
American Redstart	<i>Setophaga ruticilla</i>																		
American Robin	<i>Turdus migratorius</i>					1			1										
American Three-toed Woodpecker	<i>Picoides dorsalis</i>																		
American Woodcock	<i>Scelopax minor</i>																		
Bald Eagle	<i>Haliaeetus leucocephalus</i>																		
Barn Swallow	<i>Hirundo rustica</i>																		
Barred Owl	<i>Strix varia</i>																		
Bay-breasted Warbler	<i>Setophaga castanea</i>																		
Belted Kingfisher	<i>Megasceryle alcyon</i>																		
Black-and-white Warbler	<i>Mniotilta varia</i>							1									1		
Blackburnian Warbler	<i>Setophaga fusca</i>																		
Black-capped Chickadee	<i>Poecile atricapillus</i>			2				1											1
Black-throated Blue Warbler	<i>Dendroica caerulescens</i>																		
Black-throated Green Warbler	<i>Dendroica virens</i>			2															
Blue Jay	<i>Cyanocitta cristata</i>																		
Blue-headed Vireo	<i>Vireo solitarius</i>													1					
Broad-winged Hawk	<i>Buteo platypterus</i>																		
Brown Creeper	<i>Certhia americana</i>																		
Canada Goose	<i>Branta canadensis</i>																		
Cedar Waxwing	<i>Bombycilla cedrorum</i>																		
Chestnut-sided Warbler	<i>Setophaga pensylvanica</i>					1													
Chipping Sparrow	<i>Spizella passerina</i>																		
Common Grackle	<i>Quiscalus quiscula</i>																		
Common Nighthawk	<i>Chordeiles minor</i>																		
Common Raven	<i>Corvus corax</i>									1	F(69N)								
Common Yellowthroat	<i>Geothlypis trichas</i>							1											
Dark-eyed Junco	<i>Junco hyemalis</i>		1										2				1		2
Double-crested Cormorant	<i>Phalacrocorax auritus</i>																		
Downy Woodpecker	<i>Picoides pubescens</i>																		
Eastern Phoebe	<i>Sayornis phoebe</i>																		
Eastern Wood-pewee	<i>Cantopus virens</i>																		
Golden-crowned Kinglet	<i>Regulus satrapa</i>																		
Gray Jay	<i>Perisoreus canadensis</i>																		
Hairy Woodpecker	<i>Leuconotopicus villosus</i>																		
Hermit Thrush	<i>Catharus guttatus</i>							1											1
Least Flycatcher	<i>Empidonax minimus</i>																		
Lincoln's Sparrow	<i>Melospiza lincolni</i>																		
Magnolia Warbler	<i>Dendroica magnolia</i>			1				3											
Mourning Dove	<i>Zenaidura macroura</i>																		
Mourning Warbler	<i>Zenaidura macroura</i>																		
Nashville Warbler	<i>Leiothlypis rufocapilla</i>					1		1											
Northern Flicker	<i>Colaptes auratus</i>										1								
Northern Goshawk	<i>Accipiter gentilis</i>																		
Northern Harrier	<i>Circus cyaneus</i>																		
Northern Parula	<i>Setophaga americana</i>		1																
Northern Saw-whet Owl	<i>Asio accipitrinus</i>																		
Northern Water Thrush	<i>Parkesia noveboracensis</i>								1										
Olive-sided Flycatcher	<i>Cantopus cooperi</i>																		
Ovenbird	<i>Seiurus</i>		1					3											
Palm Warbler	<i>Setophaga palmarum</i>								1										
Peregrine Falcon	<i>Falco peregrinus</i>																		
Pine Siskin	<i>Spinus pinus</i>			1	F(80SW)														
Pine Warbler	<i>Setophaga pinus</i>																		
Purple Finch	<i>Haemorhous purpureus</i>																		
Red-breasted Nuthatch	<i>Sitta canadensis</i>																		
Red-eyed Vireo	<i>Vireo olivaceus</i>		1						1										
Red-tailed Hawk	<i>Buteo jamaicensis</i>																		1
Red-winged Blackbird	<i>Agelaius phoeniceus</i>																		F(80E)
Ruby-crowned Kinglet	<i>Regulus calendula</i>																		
Ruffed Grouse	<i>Bonasa umbellus</i>																		
Song Sparrow	<i>Melospiza melodia</i>																		
Swainson's Thrush	<i>Catharus ustulatus</i>		1																
Turkey Vulture	<i>Cathartes aura</i>																		
White-breasted Nuthatch	<i>Sitta carolinensis</i>																		
White-throated Sparrow	<i>Zonotrichia albicollis</i>			1					2										3
White-winged Crossbill	<i>Loxia leucoptera</i>																		1
Wilson's Snipe	<i>Gallinago delicata</i>																		2
Winter Wren	<i>Troglodytes hiemalis</i>																		
Woodpecker Species						1													
Yellow Warbler	<i>Setophaga petechia</i>																		
Yellow-bellied Sapsucker	<i>Sphyrapicus varius</i>																		
Yellow-rumped Warbler	<i>Setophaga coronata</i>																		
Total Species - 76	Totals Species (Diversity):	4		6		4		10		4		4		8		4		7	
	Total Individuals (Abundance)	4		8		6		14		4		5		11		5		9	

Note: Observations include notes on flight passage height and

- LEGEND**
BOLD Denotes Species at Risk
BOLD Denotes Species of Conservation Concern
 'F' Denotes bird observed in flight
 '(100)' Denotes passage height of bird in flight in meters
 'N' Denotes bird flying in northerly direction
 'S' Denotes bird flying in southerly direction
 'E' Denotes bird flying in easterly direction
 'W' Denotes bird flying in westerly direction
 'V' Denotes bird flying in various directions

Table A.3
Wocawson Energy Project - Spring 2018 Avian Surveys (Birder: R. Chiasson)

Site/Area	PC14				PC15				PC16												
	Watch/Point Count		Watch/Point Count		Transect/Area Search		Point counts/Area Search		Transect/Area Search		Watch/Pointcount										
Survey Type	05-Jun-18		2018-20-06		05-Jun-18		2018-20-06		03-Apr-18		08-May-18										
Date:	8-45		5:35 - 7:19		8:29		5:57		7:40-8:25		7:16-7:43										
Time:	10		7		10		7		-10		16										
Temperature (C):	100		0		100		0		0		5										
Cloud Cover (%):	5-10		0		5-10		0		Nil		0										
Wind (km/h):	Light rain		0		Light rain		0		Nil		0										
Precipitation:	poor		excellent		poor		excellent		Excellent		Excellent										
Visibility (km):	none		none		none		none		None		None										
Background Noise:	none		none		none		none		None		None										
Species Common Name	Species Scientific Name	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations								
Alder Flycatcher	<i>Empidonax alnorum</i>			1						1											
American Crow	<i>Corvus brachyrhynchos</i>							1				1									
American Goldfinch	<i>Spinus tristis</i>									1	F(50W)	2									
American Kestrel	<i>Falco sparverius</i>											3									
American Redstart	<i>Setophaga ruticilla</i>												1								
American Robin	<i>Turdus migratorius</i>							2				1									
American Three-toed Woodpecker	<i>Picoides dorsalis</i>																				
American Woodcock	<i>Scelopax minor</i>																				
Bald Eagle	<i>Haliaeetus leucocephalus</i>																				
Barn Swallow	<i>Hirundo rustica</i>																				
Barred Owl	<i>Strix varia</i>																				
Bay-breasted Warbler	<i>Setophaga castanea</i>																				
Belted Kingfisher	<i>Megasceryle alcyon</i>									1											
Black-and-white Warbler	<i>Mniotilta varia</i>	1		1									1								
Blackburnian Warbler	<i>Setophaga fusca</i>																				
Black-capped Chickadee	<i>Poecile atricapillus</i>							3				3									
Black-throated Blue Warbler	<i>Dendroica caerulescens</i>					2		1													
Black-throated Green Warbler	<i>Dendroica virens</i>					1															
Blue Jay	<i>Cyanocitta cristata</i>					1				1											
Blue-headed Vireo	<i>Vireo solitarius</i>	1		1								1									
Broad-winged Hawk	<i>Buteo platypterus</i>																				
Brown Creeper	<i>Certhia americana</i>							1													
Canada Goose	<i>Branta canadensis</i>																				
Cedar Waxwing	<i>Bombycilla cedrorum</i>																				
Chestnut-sided Warbler	<i>Setophaga pensylvanica</i>	1											1								
Chipping Sparrow	<i>Spizella passerina</i>																				
Common Grackle	<i>Quiscalus quiscula</i>									1	F(50NE)	1									
Common Nighthawk	<i>Chordeiles minor</i>											2									
Common Raven	<i>Corvus corax</i>																				
Common Yellowthroat	<i>Geothlypis trichas</i>												1								
Dark-eyed Junco	<i>Junco hyemalis</i>					1				3											
Double-crested Cormorant	<i>Phalacrocorax auritus</i>											1									
Downy Woodpecker	<i>Picoides pubescens</i>											1									
Eastern Phoebe	<i>Sayornis phoebe</i>																				
Eastern Wood-pewee	<i>Cantopus virens</i>			1																	
Golden-crowned Kinglet	<i>Regulus satrapa</i>																				
Gray Jay	<i>Perisoreus canadensis</i>											1									
Hairy Woodpecker	<i>Leuconotopicus villosus</i>							1													
Hermit Thrush	<i>Catharus guttatus</i>							1													
Least Flycatcher	<i>Empidonax minimus</i>												1								
Lincoln's Sparrow	<i>Melospiza lincolni</i>																				
Magnolia Warbler	<i>Dendroica magnolia</i>									1			1								
Mourning Dove	<i>Zenaidura macroura</i>									1											
Mourning Warbler	<i>Zenaidura macroura</i>																				
Nashville Warbler	<i>Leiothlypis ruficapilla</i>			2				1				1									
Northern Flicker	<i>Colaptes auratus</i>			2																	
Northern Goshawk	<i>Accipiter gentilis</i>												1								
Northern Harrier	<i>Circus cyaneus</i>																				
Northern Parula	<i>Setophaga americana</i>			1									1								
Northern Saw-whet Owl	<i>Asio accipitrinus</i>																				
Northern Water Thrush	<i>Parkesia noveboracensis</i>																				
Olive-sided Flycatcher	<i>Cantopus cooperi</i>			1																	
Ovenbird	<i>Seiurus</i>	1				2		2					2								
Palm Warbler	<i>Setophaga palmarum</i>			1									1								
Peregrine Falcon	<i>Falco peregrinus</i>																				
Pine Siskin	<i>Spinus pinus</i>							7				1	F(50E)								
Pine Warbler	<i>Setophaga pinus</i>																				
Purple Finch	<i>Haemorhous purpureus</i>			2				3				1									
Red-breasted Nuthatch	<i>Sitta canadensis</i>							1													
Red-eyed Vireo	<i>Vireo olivaceus</i>	1		1						6		1									
Red-tailed Hawk	<i>Buteo jamaicensis</i>																				
Red-winged Blackbird	<i>Agelaius phoeniceus</i>											1	F(50S)								
Ruby-crowned Kinglet	<i>Regulus calendula</i>																				
Ruffed Grouse	<i>Bonasa umbellus</i>											2									
Song Sparrow	<i>Melospiza melodia</i>																				
Swainson's Thrush	<i>Catharus ustulatus</i>			1																	
Turkey Vulture	<i>Cathartes aura</i>																				
White-breasted Nuthatch	<i>Sitta carolinensis</i>												1								
White-throated Sparrow	<i>Zonotrichia albicollis</i>	1		3																	
White-winged Crossbill	<i>Loxia leucoptera</i>							5	F(60E)	1											
Wilson's Snipe	<i>Gallinago delicata</i>											1	F(60SW)								
Winter Wren	<i>Troglodytes hiemalis</i>																				
Woodpecker Species								1													
Yellow Warbler	<i>Setophaga petechia</i>																				
Yellow-bellied Sapsucker	<i>Sphyrapicus varius</i>											1									
Yellow-rumped Warbler	<i>Setophaga coronata</i>																				
Total Species - 76	Totals Species (Diversity):	6		13		4		8		13		4		11		13		11		9	
	Total Individuals (Abundance):	6		18		6		9		35		4		14		19		12		9	

Note: Observations include notes on flight passage height and

- LEGEND**
BOLD Denotes Species at Risk
BOLD Denotes Species of Conservation Concern
'F' Denotes bird observed in flight
'(100)' Denotes passage height of bird in flight in meters
'N' Denotes bird flying in northerly direction
'S' Denotes bird flying in southerly direction
'E' Denotes bird flying in easterly direction
'W' Denotes bird flying in westerly direction
'V' Denotes bird flying in various directions

Table A.3
Wocawson Energy Project - Spring 2018 Avian Surveys (Birder: R. Chiasson)

Site/Area	PC17				PC18				PC19				PC20										
	Point counts/Area Search		Point counts/Area Search		Point counts/Area Search		Point counts/Area Search		Point counts/Area Search		Transect/Area Search		Watch/Pointcount										
Survey Type	2018-20-06		2018-20-06		2018-20-06		2018-20-06		2018-20-06		2018-20-06		2018-20-06		03-Apr-18		08-May-18		08-May-18		04-Jun-18		
Date:	6-48		8-10		8-32		10-08		10-20-11:15		8-47		20-Jun-18		10:00-10:10		8:45-9:00		7:15-7:45		5:40-6:01		
Time:	16		16		16		20		20		16		7		-2		12		8		-3		
Temperature (C):	5		5		5		5		5		5		0		60		0		10		0		
Cloud Cover (%):	0		0		0		0		0		0		0		Nil		10-35		Nil		0		
Wind (km/h):	0		0		0		0		0		0		0		Nil		Nil		Nil		Nil		
Precipitation:	excellent		excellent		excellent		excellent		excellent		excellent		excellent		Excellent		Excellent		Excellent		No Data		
Visibility (km):	none		none		none		none		none		none		none		None		None		None		Traffic Noise		
Background Noise:	none		none		none		none		none		none		none		None		None		None		Traffic Noise		
Species Common Name	Species Scientific Name	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations
Alder Flycatcher	<i>Empidonax aliorum</i>											1											
American Crow	<i>Corvus brachyrhynchos</i>													1									
American Goldfinch	<i>Spinus tristis</i>																						
American Kestrel	<i>Falco sparverius</i>																						
American Redstart	<i>Setophaga ruticilla</i>	1								1													
American Robin	<i>Turdus migratorius</i>																						
American Three-toed Woodpecker	<i>Picoides dorsalis</i>																						
American Woodcock	<i>Scelopax minor</i>																						
Bald Eagle	<i>Haliaeetus leucocephalus</i>																						
Barn Swallow	<i>Hirundo rustica</i>																						
Barred Owl	<i>Strix varia</i>																						
Bay-breasted Warbler	<i>Setophaga castanea</i>																						
Belted Kingfisher	<i>Megasceryle alcyon</i>																						
Black-and-white Warbler	<i>Mniotilta varia</i>													2									
Blackburnian Warbler	<i>Setophaga fusca</i>																						
Black-capped Chickadee	<i>Poecile atricapillus</i>	1																					
Black-throated Blue Warbler	<i>Dendroica caerulescens</i>																						
Black-throated Green Warbler	<i>Dendroica virens</i>																						
Blue Jay	<i>Cyanocitta cristata</i>	1																					
Blue-headed Vireo	<i>Vireo solitarius</i>			1																			
Broad-winged Hawk	<i>Buteo platypterus</i>																						
Brown Creeper	<i>Certhia americana</i>																						
Canada Goose	<i>Branta canadensis</i>																						
Cedar Waxwing	<i>Bombycilla cedrorum</i>			2		1																	
Chestnut-sided Warbler	<i>Setophaga pensylvanica</i>	1																					
Chipping Sparrow	<i>Spizella passerina</i>																						
Common Grackle	<i>Quiscalus quiscula</i>																						
Common Nighthawk	<i>Chordeiles minor</i>																						
Common Raven	<i>Corvus corax</i>																						
Common Yellowthroat	<i>Geothlypis trichas</i>			1		1																	
Dark-eyed Junco	<i>Junco hyemalis</i>			1																			
Double-crested Cormorant	<i>Phalacrocorax auritus</i>																						
Downy Woodpecker	<i>Picoides pubescens</i>																						
Eastern Phoebe	<i>Sayornis phoebe</i>																						
Eastern Wood-pewee	<i>Cantopus virens</i>																						
Golden-crowned Kinglet	<i>Regulus satrapa</i>																						
Gray Jay	<i>Perisoreus canadensis</i>																						
Hairy Woodpecker	<i>Leuconotopicus villosus</i>	1																					
Hermit Thrush	<i>Catharus guttatus</i>																						
Least Flycatcher	<i>Empidonax minimus</i>																						
Lincoln's Sparrow	<i>Melospiza lincolni</i>																						
Magnolia Warbler	<i>Dendroica magnolia</i>			1																			
Mourning Dove	<i>Zenaidura macroura</i>																						
Mourning Warbler	<i>Zenaidura macroura</i>																						
Nashville Warbler	<i>Leiothlypis rufoflava</i>																						
Northern Flicker	<i>Colaptes auratus</i>	1																					
Northern Goshawk	<i>Accipiter gentilis</i>																						
Northern Harrier	<i>Circus cyaneus</i>																						
Northern Parula	<i>Setophaga americana</i>	1																					
Northern Saw-whet Owl	<i>Asio accipitrinus</i>																						
Northern Water Thrush	<i>Parkesia noveboracensis</i>																						
Olive-sided Flycatcher	<i>Cantopus cooperi</i>																						
Ovenbird	<i>Seiurus</i>	3																					
Palm Warbler	<i>Setophaga palmarum</i>			1																			
Peregrine Falcon	<i>Falco peregrinus</i>																						
Pine Siskin	<i>Spinus pinus</i>																						
Pine Warbler	<i>Setophaga pinus</i>																						
Purple Finch	<i>Haemorhous purpureus</i>																						
Red-breasted Nuthatch	<i>Sitta canadensis</i>																						
Red-eyed Vireo	<i>Vireo olivaceus</i>	1																					
Red-tailed Hawk	<i>Buteo jamaicensis</i>																						
Red-winged Blackbird	<i>Agelaius phoeniceus</i>																						
Ruby-crowned Kinglet	<i>Regulus calendula</i>																						
Ruffed Grouse	<i>Bonasa umbellus</i>																						
Song Sparrow	<i>Melospiza melodia</i>																						
Swainson's Thrush	<i>Catharus ustulatus</i>																						
Turkey Vulture	<i>Cathartes aura</i>																						
White-breasted Nuthatch	<i>Sitta carolinensis</i>																						
White-throated Sparrow	<i>Zonotrichia albicollis</i>	1				1																	
White-winged Crossbill	<i>Loxia leucoptera</i>																						
Wilson's Snipe	<i>Gallinago delicata</i>																						
Winter Wren	<i>Troglodytes hiemalis</i>																						
Woodpecker Species																							
Yellow Warbler	<i>Setophaga petechia</i>																						
Yellow-bellied Sapsucker	<i>Sphyrapicus varius</i>																						
Yellow-rumped Warbler	<i>Setophaga coronata</i>																						
Total Species - 76	Totals Species (Diversity):	10		7		4		7		22		7		12		3		9		8		7	
	Total Individuals (Abundance)	12		8		4		10		37		10		17		6		15		10		7	

Note: Observations include notes on flight passage height and

LEGEND
BOLD Denotes Species at Risk
BOLD Denotes Species of Conservation Concern
'F' Denotes bird observed in flight
'(100)' Denotes passage height of bird in flight in meters
'N' Denotes bird flying in northerly direction
'S' Denotes bird flying in southerly direction
'E' Denotes bird flying in easterly direction
'W' Denotes bird flying in westerly direction
'V' Denotes bird flying in various directions

Table A.3
Wocawson Energy Project - Spring 2018 Avian Surveys (Birder: R. Chiasson)

Site/Area	PC21				PC22				PC23								PC24					
	Point Count		Point Count		Point Count		Point Count		Watch/Point Count								Watch/Pointcount					
Survey Type																						
Date:	08-May-18		04-Jun-18		17-May-18		04-Jun-18		17-May-18		24-Apr-18		02-May-18		04-Jun-18		24-Apr-18		02-May-18		04-Jun-18	
Time:	10:04-10:20		6:01-6:21		6:48-7:10		10:04		8:12-8:34		8:43-9:00		8:40-9:00		8:24-9:37		7:51-8:23		7:59-8:15		7:55-8:24	
Temperature (C):	14		-3		11		9		12		9		5		8		3		7		8	
Cloud Cover (%):	100		0		100		50		100		20		60		10		20		60		10	
Wind (km/h):	10-20		0		20-30		0		20		20		25-30		0		20		25-30		0	
Precipitation:	nil		Nil		fog		Nil		fog		Nil		Nil		Nil		Nil		Nil		Nil	
Visibility (km):	fair		excellent		poor		excellent		poor		Excellent		Excellent		excellent		Excellent		Excellent		excellent	
Background Noise:	none		nil		none		nil		none		None		None		nil		None		None		nil	
Species Common Name	Species Scientific Name	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations	
Alder Flycatcher	<i>Empidonax aliorum</i>																					
American Crow	<i>Corvus brachyrhynchos</i>																					
American Goldfinch	<i>Spinus tristis</i>																					
American Kestrel	<i>Falco sparverius</i>																					
American Redstart	<i>Setophaga ruticilla</i>																					
American Robin	<i>Turdus migratorius</i>					1												1				
American Three-toed Woodpecker	<i>Picoides dorsalis</i>																					
American Woodcock	<i>Scalopax minor</i>																					
Bald Eagle	<i>Haliaeetus leucocephalus</i>																					
Barn Swallow	<i>Hirundo rustica</i>																					
Barred Owl	<i>Strix varia</i>																					
Bay-breasted Warbler	<i>Setophaga castanea</i>																	1				
Belted Kingfisher	<i>Megasceryle alcyon</i>																					
Black-and-white Warbler	<i>Mniotilta varia</i>			1		1		1														
Blackburnian Warbler	<i>Setophaga fusca</i>	1						1		1											1	
Black-capped Chickadee	<i>Poecile atricapillus</i>							1														
Black-throated Blue Warbler	<i>Dendroica caerulescens</i>	2								1												
Black-throated Green Warbler	<i>Dendroica virens</i>									1											1	
Blue Jay	<i>Cyanocitta cristata</i>																	1				
Blue-headed Vireo	<i>Vireo solitarius</i>							1		1								1				
Broad-winged Hawk	<i>Buteo platypterus</i>																					
Brown Creeper	<i>Certhia americana</i>							1														
Canada Goose	<i>Branta canadensis</i>																					
Cedar Waxwing	<i>Bombycilla cedrorum</i>																	1				
Chestnut-sided Warbler	<i>Setophaga pensylvanica</i>									1												
Chipping Sparrow	<i>Spizella passerina</i>																				1	
Common Grackle	<i>Quiscalus quiscula</i>																					
Common Nighthawk	<i>Chordeiles minor</i>																					
Common Raven	<i>Corvus corax</i>							1														
Common Yellowthroat	<i>Geothlypis trichas</i>																					
Dark-eyed Junco	<i>Junco hyemalis</i>			1									2									
Double-crested Cormorant	<i>Phalacrocorax auritus</i>																					
Downy Woodpecker	<i>Picoides pubescens</i>																					
Eastern Phoebe	<i>Sayornis phoebe</i>																					1
Eastern Wood-pewee	<i>Contopus virens</i>																					
Golden-crowned Kinglet	<i>Regulus satrapa</i>													1				1				
Gray Jay	<i>Perisoreus canadensis</i>																					
Hairy Woodpecker	<i>Leuconotopicus villosus</i>																					1
Hermit Thrush	<i>Catharus guttatus</i>	2											1								2	
Least Flycatcher	<i>Empidonax minimus</i>																					
Lincoln's Sparrow	<i>Melospiza lincolni</i>																					
Magnolia Warbler	<i>Dendroica magnolia</i>	1																			2	
Mourning Dove	<i>Zenaidura macroura</i>																					
Mourning Warbler	<i>Zenaidura macroura</i>																					
Nashville Warbler	<i>Leiothlypis rufocapilla</i>			1																		
Northern Flicker	<i>Colaptes auratus</i>																	1				1
Northern Goshawk	<i>Accipiter gentilis</i>																					
Northern Harrier	<i>Circus cyaneus</i>																					
Northern Parula	<i>Setophaga americana</i>							1														
Northern Saw-whet Owl	<i>Asio accipitrinus</i>																					
Northern Water Thrush	<i>Parkesia noveboracensis</i>																					
Olive-sided Flycatcher	<i>Contopus cooperi</i>																					
Ovenbird	<i>Seiurus</i>	2		1		1		1		2								2				1
Palm Warbler	<i>Setophaga palmarum</i>																				2	
Peregrine Falcon	<i>Falco peregrinus</i>																					
Pine Siskin	<i>Spinus pinus</i>																					
Pine Warbler	<i>Setophaga pinus</i>	1		1																		1
Purple Finch	<i>Haemorhous purpureus</i>																					
Red-breasted Nuthatch	<i>Sitta canadensis</i>																					
Red-eyed Vireo	<i>Vireo olivaceus</i>			1																		3
Red-tailed Hawk	<i>Buteo jamaicensis</i>																					
Red-winged Blackbird	<i>Agelaius phoeniceus</i>									1												
Ruby-crowned Kinglet	<i>Regulus calendula</i>																				1	
Ruffed Grouse	<i>Bonasa umbellus</i>																				1	
Song Sparrow	<i>Melospiza melodia</i>																					
Swainson's Thrush	<i>Catharus ustulatus</i>							1														
Turkey Vulture	<i>Cathartes aura</i>																					
White-breasted Nuthatch	<i>Sitta carolinensis</i>																					
White-throated Sparrow	<i>Zonotrichia albicollis</i>	1								1								1			5	1
White-winged Crossbill	<i>Loxia leucoptera</i>																					
Wilson's Snipe	<i>Gallinago delicata</i>																					1
Winter Wren	<i>Troglodytes hiemalis</i>									1												1
Woodpecker Species																						
Yellow Warbler	<i>Setophaga petechia</i>																					
Yellow-bellied Sapsucker	<i>Sphyrapicus varius</i>																					1
Yellow-rumped Warbler	<i>Setophaga coronata</i>																					
Total Species - 76	Totals Species (Diversity):	7	4	5	9	10	2	5	9	6	11	6	11	6	11	6	11	5	14	16	14	
	Total Individuals (Abundance):	10	4	5	9	11	3	6	11	6	11	6	11	6	11	6	11	5	14	16	14	

Note: Observations include notes on flight passage height and

- LEGEND**
BOLD Denotes Species at Risk
BOLD Denotes Species of Conservation Concern
'F' Denotes bird observed in flight
'(100)' Denotes passage height of bird in flight in meters
'N' Denotes bird flying in northerly direction
'S' Denotes bird flying in southerly direction
'E' Denotes bird flying in easterly direction
'W' Denotes bird flying in westerly direction
'V' Denotes bird flying in various directions

Table A.3
Wocawson Energy Project - Spring 2018 Avian Surveys (Birder: R. Chiasson)

Site/Area	PC26				PC27		OWL1				OWL2		Owl3		Owl4		Turbine 1		Turbine 7		Turbine 8 - Turbine 12		
Survey Type	Point Count				Point Count		Owl Survey				Owl Survey		Owl Survey		Owl Survey		Owl Survey		Owl Survey		Owl Survey		
Date:	02-May-18		04-Jun-18		04-Jun-18		19-Apr-18		07-May-18		22-Apr-18		07-May-18		07-May-18		02-Apr-18		02-Apr-18		02-Apr-18		
Time:	10:20		9:37-10:04		6:21-7:08		7:16		9:40-9:53		8:05-9:15		9:20-9:33		8:50-9:16		8:00-9:30		10:30-12:00		12:45-13:45		
Temperature (C):	14		9		1		2		8		6		8		9		-4		-1		1		
Cloud Cover (%):	100		50		10		70		0		0		0		Owl		40		40		40		
Wind (km/h):	10-20		0		0		Nil		Nil		Nil		Nil		Nil		15		15		15		
Precipitation:	nil		Nil		Nil		Nil		Nil		Nil		Nil		Nil		Nil		Nil		Nil		
Visibility (km):	fair		excellent		excellent		Excellent		Excellent		Excellent		Excellent		Excellent		Excellent		Excellent		Excellent		
Background Noise:	none		nil		nil		None		None		None		None		None		None		None		None		
Species Common Name	Species Scientific Name	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations
Alder Flycatcher	<i>Empidonax aliorum</i>																						
American Crow	<i>Corvus brachyrhynchos</i>																						
American Goldfinch	<i>Spinus tristis</i>					1	F(60N)																
American Kestrel	<i>Falco sparverius</i>																						
American Redstart	<i>Setophaga ruticilla</i>																						
American Robin	<i>Turdus migratorius</i>					2						1				1	SW						
American Three-toed Woodpecker	<i>Picoides dorsalis</i>																						
American Woodcock	<i>Scalopax minor</i>											4											
Bald Eagle	<i>Haliaeetus leucocephalus</i>							1	F(60N)									1	F(60E)				
Barn Swallow	<i>Hirundo rustica</i>																						
Barred Owl	<i>Strix varia</i>											1	NE										
Bay-breasted Warbler	<i>Setophaga castanea</i>																						
Belted Kingfisher	<i>Megasceryle alcyon</i>																						
Black-and-white Warbler	<i>Mniotilta varia</i>	1																					
Blackburnian Warbler	<i>Setophaga fusca</i>					1																	
Black-capped Chickadee	<i>Poecile atricapillus</i>					2																	
Black-throated Blue Warbler	<i>Dendroica caerulescens</i>	1																					
Black-throated Green Warbler	<i>Dendroica virens</i>				1																		
Blue Jay	<i>Cyanocitta cristata</i>																						
Blue-headed Vireo	<i>Vireo solitarius</i>	1				1																	
Broad-winged Hawk	<i>Buteo platypterus</i>																						
Brown Creeper	<i>Certhia americana</i>					1				2													
Canada Goose	<i>Branta canadensis</i>							2				1											
Cedar Waxwing	<i>Bombycilla cedrorum</i>				1																		
Chestnut-sided Warbler	<i>Setophaga pensylvanica</i>																						
Chipping Sparrow	<i>Spizella passerina</i>																						
Common Grackle	<i>Quiscalus quiscula</i>																						
Common Nighthawk	<i>Chordeiles minor</i>																						
Common Raven	<i>Corvus corax</i>																						
Common Yellowthroat	<i>Geothlypis trichas</i>																						
Dark-eyed Junco	<i>Junco hyemalis</i>								3						1	SW		3	Singing				
Double-crested Cormorant	<i>Phalacrocorax auritus</i>																						
Downy Woodpecker	<i>Picoides pubescens</i>																						
Eastern Phoebe	<i>Sayornis phoebe</i>																						
Eastern Wood-pewee	<i>Cantopus virens</i>																						
Golden-crowned Kinglet	<i>Regulus satrapa</i>								1														
Gray Jay	<i>Perisoreus canadensis</i>																						
Hairy Woodpecker	<i>Leuconotopicus villosus</i>																						
Hermit Thrush	<i>Catharus guttatus</i>	1				1																	
Least Flycatcher	<i>Empidonax minimus</i>	2				1																	
Lincoln's Sparrow	<i>Melospiza lincolni</i>																						
Magnolia Warbler	<i>Dendroica magnolia</i>																						
Mourning Dove	<i>Zenaidura macroura</i>																						
Mourning Warbler	<i>Zenaidura macroura</i>																						
Nashville Warbler	<i>Leiothlypis rufocapilla</i>																						
Northern Flicker	<i>Colaptes auratus</i>					1																	
Northern Goshawk	<i>Accipiter gentilis</i>																						
Northern Harrier	<i>Circus cyaneus</i>																						
Northern Parula	<i>Setophaga americana</i>	2																					
Northern Saw-whet Owl	<i>Asio accipitrinus</i>																						
Northern Water Thrush	<i>Parkesia noveboracensis</i>																						
Olive-sided Flycatcher	<i>Cantopus cooperi</i>																						
Ovenbird	<i>Seiurus</i>	1				2																	
Palm Warbler	<i>Setophaga palmarum</i>					1																	
Peregrine Falcon	<i>Falco peregrinus</i>																						
Pine Siskin	<i>Spinus pinus</i>					1	F(60W)																
Pine Warbler	<i>Setophaga pinus</i>	1				1																	
Purple Finch	<i>Haemorhous purpureus</i>					1																	
Red-breasted Nuthatch	<i>Sitta canadensis</i>																						
Red-eyed Vireo	<i>Vireo olivaceus</i>				1																		
Red-tailed Hawk	<i>Buteo jamaicensis</i>																						
Red-winged Blackbird	<i>Agelaius phoeniceus</i>																						
Ruby-crowned Kinglet	<i>Regulus calendula</i>																						
Ruffed Grouse	<i>Bonasa umbellus</i>																						
Song Sparrow	<i>Melospiza melodia</i>																						
Swainson's Thrush	<i>Catharus ustulatus</i>																						
Turkey Vulture	<i>Cathartes aura</i>																						
White-breasted Nuthatch	<i>Sitta carolinensis</i>																						
White-throated Sparrow	<i>Zonotrichia albicollis</i>								1	NW		1			2	N/NE							
White-winged Crossbill	<i>Loxia leucoptera</i>																						
Wilson's Snipe	<i>Gallinago delicata</i>																						
Winter Wren	<i>Troglodytes hiemalis</i>																						
Woodpecker Species																							
Yellow Warbler	<i>Setophaga petechia</i>																						
Yellow-bellied Sapsucker	<i>Sphyrapicus varius</i>	1			1																		
Yellow-rumped Warbler	<i>Setophaga coronata</i>					1																	
Total Species - 76	Totals Species (Diversity):	9		5		16		6		1		5		1		4		4		2		1	
	Total Individuals (Abundance)	11		6		18		10		1		8		4		5		9		8		6	

Note: Observations include notes on flight passage height and

- LEGEND**
BOLD Denotes Species at Risk
BOLD Denotes Species of Conservation Concern
 'F' Denotes bird observed in flight
 '(100)' Denotes passage height of bird in flight in meters
 'N' Denotes bird flying in northerly direction
 'S' Denotes bird flying in southerly direction
 'E' Denotes bird flying in easterly direction
 'W' Denotes bird flying in westerly direction
 'V' Denotes bird flying in various directions

Table A.3
Wocawson Energy Project - Spring 2018 Avian Surveys (Birder: R. Chiasson)

Site/Area	Intersection to Cabin	Cabin north along transmission line	Comm. tower/Milton Road	End Gray RD/along transmission line	280 E of SPC33 / along trail	Portage Vale Rd by clearcut	Hydro line	SPC 11 to intersection	Intersection to near SPC15	Cabin to SPC3	Incidentals											
Survey Type	Point Count											Watch/Pointcount										
Date:	02-Apr-18	02-Apr-18	19-Apr-18	19-Apr-18	19-Apr-18	19-Apr-18	19-Apr-18	19-Apr-18	23-Apr-18			02-May-18										
Time:	9:30-10:30	12:00-12:45	6:35	7:47	8:36	9:40	10:35	7:00-8:15	8:15-10:30	10:40-11:15	Incidental											
Temperature (C):	-2	0	0	4	4	5	5	-6	6	12	7											
Cloud Cover (%):	40	40	70	70	80	100	100	0	10	10	60											
Wind (km/h):	15	15	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	25-30											
Precipitation:	Nil	Nil	Nil	Nil	Nil	Light Rain	Light Rain	Nil	Nil	Nil	Nil											
Visibility (km):	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent											
Background Noise:	None	None	None	None	None	None	None	None	None	None	None											
Species Common Name	Species Scientific Name	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations	
Alder Flycatcher	<i>Empidonax alnorum</i>																					16
American Crow	<i>Corvus brachyrhynchos</i>																					7
American Goldfinch	<i>Spinus tristis</i>																					21
American Kestrel	<i>Falco sparverius</i>																					3
American Redstart	<i>Setophaga ruticilla</i>																					12
American Robin	<i>Turdus migratorius</i>					1		4														55
American Three-toed Woodpecker	<i>Picoides dorsalis</i>														14		4	F(15W)				1
American Woodcock	<i>Scelopax minor</i>																					6
Bald Eagle	<i>Haliaeetus leucocephalus</i>																					2
Barn Swallow	<i>Hirundo rustica</i>																					1
Barred Owl	<i>Strix varia</i>																					1
Bay-breasted Warbler	<i>Setophaga castanea</i>																					2
Belted Kingfisher	<i>Megascyle alcyon</i>																					1
Black-and-white Warbler	<i>Mniotilta varia</i>																					21
Blackburnian Warbler	<i>Setophaga fusca</i>																					8
Black-capped Chickadee	<i>Poecile atricapillus</i>	4	Calling							1				1		6						74
Black-throated Blue Warbler	<i>Dendroica caerulescens</i>																					18
Black-throated Green Warbler	<i>Dendroica virens</i>																					20
Blue Jay	<i>Cyanocitta cristata</i>																				1	10
Blue-headed Vireo	<i>Vireo solitarius</i>																					13
Broad-winged Hawk	<i>Buteo platypterus</i>																					1
Brown Creeper	<i>Certhia americana</i>																					8
Canada Goose	<i>Branta canadensis</i>																				2	F(60NE)
Cedar Waxwing	<i>Bombycilla cedrorum</i>																					10
Chestnut-sided Warbler	<i>Setophaga pensylvanica</i>																					13
Chipping Sparrow	<i>Spizella passerina</i>																					1
Common Grackle	<i>Quiscalus quiscula</i>	1	Calling																			9
Common Nighthawk	<i>Chordeiles minor</i>									1	F(40V)				2	69E						2
Common Raven	<i>Corvus corax</i>	1	F(60SW)	1	Calling									2	40-60 S/SW							14
Common Yellowthroat	<i>Geothlypis trichas</i>																					19
Dark-eyed Junco	<i>Junco hyemalis</i>	2	Singing and Feeding			2		3														74
Double-crested Cormorant	<i>Phalacrocorax auritus</i>														10						4	7
Downy Woodpecker	<i>Picoides pubescens</i>							1														4
Eastern Phoebe	<i>Sayornis phoebe</i>																					2
Eastern Wood-pewee	<i>Cantopus virens</i>																					2
Golden-crowned Kinglet	<i>Regulus satrapa</i>			1	Singing																	9
Gray Jay	<i>Perisoreus canadensis</i>																					1
Hairy Woodpecker	<i>Leuconotopicus villosus</i>																					7
Hermit Thrush	<i>Catharus guttatus</i>																					41
Least Flycatcher	<i>Empidonax minimus</i>																					7
Lincoln's Sparrow	<i>Melospiza lincolni</i>																					5
Magnolia Warbler	<i>Dendroica magnolia</i>																					44
Mourning Dove	<i>Zenaidura macroura</i>																				1	5
Mourning Warbler	<i>Zenaidura macroura</i>																					3
Nashville Warbler	<i>Leiothlypis rufocapilla</i>																					23
Northern Flicker	<i>Colaptes auratus</i>							1	F(39SE)													29
Northern Goshawk	<i>Accipiter gentilis</i>														1							1
Northern Harrier	<i>Circus cyaneus</i>																					1
Northern Parula	<i>Setophaga americana</i>																					16
Northern Saw-whet Owl	<i>Asio accipitrinus</i>																					1
Northern Water Thrush	<i>Parkesia noveboracensis</i>																					1
Olive-sided Flycatcher	<i>Cantopus cooperi</i>																					2
Ovenbird	<i>Seiurus</i>																					75
Palm Warbler	<i>Setophaga palmarum</i>																					32
Peregrine Falcon	<i>Falco peregrinus</i>																					1
Pine Siskin	<i>Spinus pinus</i>	6	F(60SW) Calling	2	Calling																	34
Pine Warbler	<i>Setophaga pinus</i>																					7
Purple Finch	<i>Haemorhous purpureus</i>	1	Singing			1																24
Red-breasted Nuthatch	<i>Sitta canadensis</i>																					32
Red-eyed Vireo	<i>Vireo olivaceus</i>																					19
Red-tailed Hawk	<i>Buteo jamaicensis</i>																					2
Red-winged Blackbird	<i>Agelaius phoeniceus</i>																					5
Ruby-crowned Kinglet	<i>Regulus calendula</i>																					8
Ruffed Grouse	<i>Bonasa umbellus</i>																					3
Song Sparrow	<i>Melospiza melodia</i>	1	Feeding																			35
Swainson's Thrush	<i>Catharus ustulatus</i>																					7
Turkey Vulture	<i>Cathartes aura</i>																					5
White-breasted Nuthatch	<i>Sitta carolinensis</i>																					1
White-throated Sparrow	<i>Zonotrichia albicollis</i>																					119
White-winged Crossbill	<i>Loxia leucophaea</i>	3	F(30W)	2	Calling																	22
Wilson's Snipe	<i>Gallinago delicata</i>																					1
Winter Wren	<i>Troglodytes hiemalis</i>																					6
Woodpecker Species																						6
Yellow Warbler	<i>Setophaga petechia</i>																					1
Yellow-bellied Sapsucker	<i>Sphyrapicus varius</i>																					20
Yellow-rumped Warbler	<i>Setophaga coronata</i>																					38
Total Species - 76	Totals Species (Diversity):	8		4		3		11		4		6		4		8		12		5		3
	Total Individuals (Abundance)	19		6		4		23		4		7		6		38		44		11		3

Note: Observations include notes on flight passage height and

LEGEND
BOLD Denotes Species at Risk
BOLD Denotes Species of Conservation Concern
'F' Denotes bird observed in flight
'(100)' Denotes passage height of bird in flight in meters
'N' Denotes bird flying in northerly direction
'S' Denotes bird flying in southerly direction
'E' Denotes bird flying in easterly direction
'W' Denotes bird flying in westerly direction
'V' Denotes bird flying in various directions

Table A.4
Wocawson Energy Project - Summer 2018 Avian Surveys (Birder: R. Chiasson)

Site/Area:	PC1	PC2	PC2	PC4	PC5	PC6	PC7	PC8	PC9										
Survey Type	Point Counts and Area Search	Point Counts and Area Search	Point Count and Area Search	Point Counts and Area Search	Point Counts and Area Search	Point Counts and Area Search	Point Counts and Area Search	Point Counts and Area Search	Point Counts and Area Search										
Date:	28-Jun-18	28-Jun-18	21-Jun-18	28-Jun-18	28-Jun-18	28-Jun-18	28-Jun-18	28-Jun-18	28-Jun-18										
Time:	6:37	6:20	9:37	7:19	7:38	7:58	8:12	8:35	8:48										
Temperature (C):	17	17	20	17	18	18	18	18	18										
Cloud Cover (%):	95	95	50	80	80	80	80	80	80										
Wind:	2-3	2-3	0	3-4	3-4	3-4	3-4	3-4	3-4										
Precipitation:	nil	nil	Nil	nil	nil	nil	nil	nil	nil										
Visibility:	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent										
Background Noise:	none	none	None	none	none	none	none	none	none										
Common Name	Bird Species	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations
Alder Flycatcher	<i>Empidonax alnorum</i>			1				1		1									
American Redstart	<i>Setophaga ruticilla</i>	1																	1
American Robin	<i>Turdus migratorius</i>	1																	
American Goldfinch	<i>Spinus tristis</i>												1	Calling					
Barred Owl	<i>Strix varia</i>																		
Bay-breasted Warbler	<i>Setophaga castanea</i>																		
Black-and-white Warbler	<i>Mniotilta varia</i>			1															1 Singing
Blackburnian Warbler	<i>Setophaga fusca</i>																		
Black-capped Chickadee	<i>Poecile atricapillus</i>																		
Black-throated Blue Warbler	<i>Dendroica caerulescens</i>					1													
Black-throated Green Warbler	<i>Dendroica virens</i>					1						1							
Blue-headed Vireo	<i>Vireo solitarius</i>											1							
Blue Jay	<i>Cyanocitta cristata</i>																		
Brown Creeper	<i>Certhia americana</i>																		
Canada Warbler	<i>Wilsonia canadensis</i>																		
Cedar Waxwing	<i>Bombycilla cedrorum</i>	1	Calling																
Chestnut-sided Warbler	<i>Setophaga pensylvanica</i>																		
Chipping Sparrow	<i>Spizella passerina</i>																		
Common Yellowthroat	<i>Geothlypis trichas</i>													1					1
Downy Woodpecker	<i>Picoides pubescens</i>																		
Dark-eyed Junco	<i>Junco hyemalis</i>			1						2				2					
Eastern Wood-pewee	<i>Contopus virens</i>																		
Great Black-backed Gull	<i>Larus marinus</i>					2													
Hairy Woodpecker	<i>Leuconotopicus villosus</i>																		
Herring Gull	<i>Larus argentatus</i>																		
Hermit Thrush	<i>Catharus guttatus</i>			1															
Least Flycatcher	<i>Empidonax minimus</i>																		
Magnolia Warbler	<i>Dendroica magnolia</i>	2		3				1				1							2
Mourning Dove	<i>Zenaidura macroura</i>																		1
Nashville Warbler	<i>Leiostyris albigularis</i>							1		3				1					
Northern Flicker	<i>Colaptes auratus</i>																		
Northern Goshawk	<i>Accipiter gentilis</i>																		
Northern Parula	<i>Setophaga americana</i>																		
Ovenbird	<i>Seiurus</i>					1						2	Chip Call			1			1
Pine Warbler	<i>Setophaga pinus</i>																		
Purple Finch	<i>Haemorhous purpureus</i>					2													
Red-breasted Nuthatch	<i>Sitta canadensis</i>					2		1											
Red-eyed Vireo	<i>Vireo olivaceus</i>									2		1							1
Red-tailed Hawk	<i>Buteo jamaicensis</i>			1	F(100N)														
Rusty Blackbird	<i>Euphagus carolinus</i>					1													
Golden-crowned Kinglet	<i>Regulus satrapa</i>																		
Sharp-shinned Hawk	<i>Accipiter striatus</i>													1	F(80)				
Song Sparrow	<i>Melospiza melodia</i>	1																	
Swainson's Thrush	<i>Catharus ustulatus</i>					1													
Veery	<i>Catharus fuscescens</i>											x							
White-throated Sparrow	<i>Zonotrichia albicollis</i>	7		2				2	Calling	4				4		1			1
White-winged Crossbill	<i>Loxia leucoptera</i>					1													
Winter Wren	<i>Troglodytes hiemalis</i>																		
Yellow-bellied Sapsucker	<i>Sphyrapicus varius</i>																		
Yellow-rumped Warbler	<i>Setophaga coronata</i>			1				1											
Total Species - 50	Totals Species (Diversity):	6		7		9		5		5		6		6		2		8	
	Total Individuals (Abundance):	13		11		12		7		12		6		10		2		9	

Note: Observations include notes on flight passage height and direction, as well as behaviour

LEGEND

- BOLD** Denotes Species at Risk
- BOLD** Denotes Species of Conservation Concern
- 'F' Denotes bird observed in flight
- '(100)' Denotes passage height of bird in flight in meters
- 'N' Denotes bird flying in northerly direction
- 'S' Denotes bird flying in southerly direction
- 'E' Denotes bird flying in easterly direction
- 'W' Denotes bird flying in westerly direction
- 'V' Denotes bird flying in various directions

Table A.4
Wocawson Energy Project - Summer 2018 Avian Surveys (Birder: R. Chiasson)

Site/Area:	PC10	PC11	PC12	PC13	PC14	PC15	PC16	PC17	PC18										
Survey Type	Point Counts and Area Search	Point Counts and Area Search	Point Counts and Area Search	Point Counts and Area Search	Point Counts and Area Search	Point Counts and Area Search	Point Count and Area Search	Point Counts and Area Search	Point Counts and Area Search										
Date:	28-Jun-18	27-Jun-18	27-Jun-18	28-Jun-18	28-Jun-18	28-Jun-18	21-Jun-18	28-Jun-18	28-Jun-18										
Time:	9:31	9:48	9:30	9:08	5:36	6:02	7:24	6:54	10:14										
Temperature (C):	20	18	7	18	17	17	16	17	20										
Cloud Cover (%):	80	5	5	80	95	95	60	80	80										
Wind:	3-4	1-3	1-3	3-4	2-3	2-3	0	3-4	3-4										
Precipitation:	nil	Nil	Nil	nil	nil	nil	Nil	nil	nil										
Visibility:	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent										
Background Noise:	none	none	none	none	none	none	Traffic	none	none										
Common Name	Bird Species	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations
Alder Flycatcher	<i>Empidonax alnorum</i>																		
American Redstart	<i>Setophaga ruticilla</i>			1		2								1					
American Robin	<i>Turdus migratorius</i>													1					
American Goldfinch	<i>Spinus tristis</i>																		
Barred Owl	<i>Strix varia</i>																		
Bay-breasted Warbler	<i>Setophaga castanea</i>																		
Black-and-white Warbler	<i>Mniotilta varia</i>			1						1								1	
Blackburnian Warbler	<i>Setophaga fusca</i>																		
Black-capped Chickadee	<i>Poecile atricapillus</i>																	1	
Black-throated Blue Warbler	<i>Dendroica caerulescens</i>																		
Black-throated Green Warbler	<i>Dendroica virens</i>											1							
Blue-headed Vireo	<i>Vireo solitarius</i>									1									
Blue Jay	<i>Cyanocitta cristata</i>																		
Brown Creeper	<i>Certhia americana</i>																		
Canada Warbler	<i>Wilsonia canadensis</i>													2					
Cedar Waxwing	<i>Bombcilla cedrorum</i>																		
Chestnut-sided Warbler	<i>Setophaga pensylvanica</i>					1												1	
Chipping Sparrow	<i>Spizella passerina</i>																		
Common Yellowthroat	<i>Geothlypis trichas</i>																		
Downy Woodpecker	<i>Picoides pubescens</i>																		
Dark-eyed Junco	<i>Junco hyemalis</i>									2	Calling								
Eastern Wood-pewee	<i>Contopus virens</i>									1	Calling								
Great Black-backed Gull	<i>Larus marinus</i>																		
Hairy Woodpecker	<i>Leuconotopicus villosus</i>																		
Herring Gull	<i>Larus argentatus</i>																		
Hermit Thrush	<i>Catharus guttatus</i>									1									
Least Flycatcher	<i>Empidonax minimus</i>																		
Magnolia Warbler	<i>Dendroica magnolia</i>							2					3						
Mourning Dove	<i>Zenaidura macroura</i>																		
Nashville Warbler	<i>Leiostyris alpestris</i>												1						
Northern Flicker	<i>Colaptes auratus</i>							1					1						
Northern Goshawk	<i>Accipiter gentilis</i>																		
Northern Parula	<i>Setophaga americana</i>	1												2				1	
Ovenbird	<i>Seiurus</i>	1								1			1						1
Pine Warbler	<i>Setophaga pinus</i>							1					1						
Purple Finch	<i>Haemorhous purpureus</i>																		
Red-breasted Nuthatch	<i>Sitta canadensis</i>							1											
Red-eyed Vireo	<i>Vireo olivaceus</i>	1		1		2				1								1	
Red-tailed Hawk	<i>Buteo jamaicensis</i>													1					
Rusty Blackbird	<i>Euphagus carolinus</i>																		
Golden-crowned Kinglet	<i>Regulus satrapa</i>																		
Sharp-shinned Hawk	<i>Accipiter striatus</i>																		
Song Sparrow	<i>Melospiza melodia</i>													1					
Swainson's Thrush	<i>Catharus ustulatus</i>			1															
Veery	<i>Catharus fuscescens</i>																		
White-throated Sparrow	<i>Zonotrichia albicollis</i>			1				1		1			1						
White-winged Crossbill	<i>Loxia leucoptera</i>							1										1	F(60NW)
Winter Wren	<i>Troglodytes hiemalis</i>																		
Yellow-bellied Sapsucker	<i>Sphyrapicus varius</i>													1					
Yellow-rumped Warbler	<i>Setophaga coronata</i>												1						
Total Species - 50	Totals Species (Diversity):	3		5		3		6		8		8		7		6		1	
	Total Individuals (Abundance)	3		5		5		7		9		11		9		6		1	

Note: Observations include notes on flight

LEGEND

- BOLD** Denotes Species at Risk
- BOLD** Denotes Species of Conservation Con
- 'F' Denotes bird observed in flight
- '(100)' Denotes passage height of bird in flig
- 'N' Denotes bird flying in northerly direc
- 'S' Denotes bird flying in southerly direc
- 'E' Denotes bird flying in easterly directi
- 'W' Denotes bird flying in westerly direct
- 'V' Denotes bird flying in various directic

Table A.4
Wocawson Energy Project - Summer 2018 Avian Surveys (Birder: R. Chiasson)

Site/Area:	PC18 - Search		PC19		PC20		PC21		PC23		PC22 TO PC23 - Search							
Survey Type	Point Counts and Area Search		Point Counts and Area Search		Point Count and Area Search		Point Counts and Area Search		Point Count and Area Search		Point Counts and Area Search							
Date:	28-Jun-18		28-Jun-18		21-Jun-18		27-Jun-18		21-Jun-18		27-Jun-18							
Time:	10:24 to 11:25		5:18		5:53		6:10		6:15		6:30							
Temperature (C):	20		17		14		7		14		7							
Cloud Cover (%):	80		95		80		30		80		30							
Wind:	3-4		2-3		0		1-2		0		1-2							
Precipitation:	nil		nil		Nil		Nil		Nil		Nil							
Visibility:	Excellent		Excellent		Fair		Excellent		Excellent		Excellent							
Background Noise:	none		none		Traffic Noise		traffic		None		none							
Common Name	Bird Species	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations	
Alder Flycatcher	<i>Empidonax alnorum</i>																	
American Redstart	<i>Setophaga ruticilla</i>	2								1								
American Robin	<i>Turdus migratorius</i>																	
American Goldfinch	<i>Spinus tristis</i>			1	Calling													
Barred Owl	<i>Strix varia</i>													1	Perched, flushed			
Bay-breasted Warbler	<i>Setophaga castanea</i>																	
Black-and-white Warbler	<i>Mniotilta varia</i>			1									1					
Blackburnian Warbler	<i>Setophaga fusca</i>	1											1					
Black-capped Chickadee	<i>Poecile atricapillus</i>	1				1							1	Calling				
Black-throated Blue Warbler	<i>Dendroica caerulescens</i>	1						1		1		1						
Black-throated Green Warbler	<i>Dendroica virens</i>	3		1				1		1			1		2		1	
Blue-headed Vireo	<i>Vireo solitarius</i>	1																
Blue Jay	<i>Cyanocitta cristata</i>											1						
Brown Creeper	<i>Certhia americana</i>																	
Canada Warbler	<i>Wilsonia canadensis</i>																	
Cedar Waxwing	<i>Bombycilla cedrorum</i>																	
Chestnut-sided Warbler	<i>Setophaga pensylvanica</i>					1		1				1						
Chipping Sparrow	<i>Spizella passerina</i>																	
Common Yellowthroat	<i>Geothlypis trichas</i>					1												
Downy Woodpecker	<i>Picoides pubescens</i>																1	
Dark-eyed Junco	<i>Junco hyemalis</i>																	
Eastern Wood-pewee	<i>Contopus virens</i>	1																
Great Black-backed Gull	<i>Larus marinus</i>																	
Hairy Woodpecker	<i>Leuconotopicus villosus</i>																	
Herring Gull	<i>Larus argentatus</i>					1				1								
Hermit Thrush	<i>Catharus guttatus</i>	1		1								Calling					1 Flushed from nest	
Least Flycatcher	<i>Empidonax minimus</i>	1																
Magnolia Warbler	<i>Dendroica magnolia</i>			2								1		1				
Mourning Dove	<i>Zenaidura macroura</i>																	
Nashville Warbler	<i>Leiostyris alpestris</i>					1		1				1						
Northern Flicker	<i>Colaptes auratus</i>	1																
Northern Goshawk	<i>Accipiter gentilis</i>																	
Northern Parula	<i>Setophaga americana</i>	1						1		1			1				1	
Ovenbird	<i>Seiurus</i>	1		1		1		1		1		2		1		1	1	
Pine Warbler	<i>Setophaga pinus</i>	1				1				1		1						
Purple Finch	<i>Haemorhous purpureus</i>												1	Calling				
Red-breasted Nuthatch	<i>Sitta canadensis</i>									1		1						
Red-eyed Vireo	<i>Vireo olivaceus</i>	3		1				1							1		1	
Red-tailed Hawk	<i>Buteo jamaicensis</i>									1								
Rusty Blackbird	<i>Euphagus carolinus</i>																	
Golden-crowned Kinglet	<i>Regulus satrapa</i>																	
Sharp-shinned Hawk	<i>Accipiter striatus</i>																	
Song Sparrow	<i>Melospiza melodia</i>																	
Swainson's Thrush	<i>Catharus ustulatus</i>	3											1		1		1	
Veery	<i>Catharus fuscescens</i>											1						
White-throated Sparrow	<i>Zonotrichia albicollis</i>					1		1										
White-winged Crossbill	<i>Loxia leucoptera</i>																	
Winter Wren	<i>Troglodytes hiemalis</i>																1	
Yellow-bellied Sapsucker	<i>Sphyrapicus varius</i>																	
Yellow-rumped Warbler	<i>Setophaga coronata</i>	2																
Total Species - 50	Totals Species (Diversity):	15		7		8		8		9		9		9		8		8
	Total Individuals (Abundance)	24		8		8		8		9		10		9		9		8

Note: Observations include notes on flight

LEGEND

- BOLD** Denotes Species at Risk
- BOLD** Denotes Species of Conservation Con
- 'F' Denotes bird observed in flight
- '(100)' Denotes passage height of bird in flig
- 'N' Denotes bird flying in northerly direc
- 'S' Denotes bird flying in southerly direc
- 'E' Denotes bird flying in easterly directi
- 'W' Denotes bird flying in westerly direct
- 'V' Denotes bird flying in various directic

Table A.4
Wocawson Energy Project - Summer 2018 Avian Surveys (Birder: R. Chiasson)

Site/Area:	PC24				PC25		PC25 to Hemlock Stand		PC27				OWL3 TO PC26 - Search		
Survey Type	Point Count and Area Search		Point Counts and Area Search		Point Count and Area Search		Point Count and Area Search		Point Count and Area Search		Point Counts and Area Search		Point Counts and Area Search		
Date:	21-Jun-18		27-Jun-18		21-Jun-18		21-Jun-18		21-Jun-18		27-Jun-18		27-Jun-18		
Time:	8:05		8:28		10:01		10:12		6:50		6:48		10:40 to 11:04		
Temperature (C):	18		7		20		20		16		7		19		
Cloud Cover (%):	40		20		50		50		60		20		5		
Wind:	0		1-2		0		0		0		1-2		1-3		
Precipitation:	Nil		Nil		Nil		Nil		Nil		Nil		Nil		
Visibility:	Excellent		Excellent		Excellent		Excellent		Excellent		Excellent		Excellent		
Background Noise:	None		none		None		None		None		none		none		
Common Name	Bird Species	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations	Species count	Observations
Alder Flycatcher	<i>Empidonax alnorum</i>														3
American Redstart	<i>Setophaga ruticilla</i>					1		1		1		1		1	Flyby 14
American Robin	<i>Turdus migratorius</i>			1	Foraging										3
American Goldfinch	<i>Spinus tristis</i>													1	3
Barred Owl	<i>Strix varia</i>														1
Bay-breasted Warbler	<i>Setophaga castanea</i>														1
Black-and-white Warbler	<i>Mniotilta varia</i>					1		6							14
Blackburnian Warbler	<i>Setophaga fusca</i>														3
Black-capped Chickadee	<i>Poecile atricapillus</i>	1						3		1				1	Calling 11
Black-throated Blue Warbler	<i>Dendroica caerulescens</i>					1		5				1			12
Black-throated Green Warbler	<i>Dendroica virens</i>			1		1		4				1		1	21
Blue-headed Vireo	<i>Vireo solitarius</i>	1		1	Agitated			3		1				1	10
Blue Jay	<i>Cyanocitta cristata</i>			1											2
Brown Creeper	<i>Certhia americana</i>							1							1
Canada Warbler	<i>Wilsonia canadensis</i>							2							4
Cedar Waxwing	<i>Bombcilla cedrorum</i>														1
Chestnut-sided Warbler	<i>Setophaga pensylvanica</i>													1	6
Chipping Sparrow	<i>Spizella passerina</i>													1	1
Common Yellowthroat	<i>Geothlypis trichas</i>														3
Downy Woodpecker	<i>Picoides pubescens</i>														1
Dark-eyed Junco	<i>Junco hyemalis</i>														7
Eastern Wood-pewee	<i>Contopus virens</i>							1							3
Great Black-backed Gull	<i>Larus marinus</i>							1							3
Hairy Woodpecker	<i>Leuconotopicus villosus</i>							1							1
Herring Gull	<i>Larus argentatus</i>	1								1					4
Hermit Thrush	<i>Catharus guttatus</i>												Calling		5
Least Flycatcher	<i>Empidonax minimus</i>									1					2
Magnolia Warbler	<i>Dendroica magnolia</i>							3				1		1	23
Mourning Dove	<i>Zenaidura macroura</i>													1	2
Nashville Warbler	<i>Leiostyris alpestris</i>														9
Northern Flicker	<i>Colaptes auratus</i>														3
Northern Goshawk	<i>Accipiter gentilis</i>	2	Agitated												2
Northern Parula	<i>Setophaga americana</i>			1				4		1		1			16
Ovenbird	<i>Seiurus</i>	1		1		1		8		1		2		1	34
Pine Warbler	<i>Setophaga pinus</i>							1		1		1	Calling		9
Purple Finch	<i>Haemorhous purpureus</i>					1									4
Red-breasted Nuthatch	<i>Sitta canadensis</i>							2						1	Calling 10
Red-eyed Vireo	<i>Vireo olivaceus</i>			2										1	20
Red-tailed Hawk	<i>Buteo jamaicensis</i>	1				1									5
Rusty Blackbird	<i>Euphagus carolinus</i>							1							2
Golden-crowned Kinglet	<i>Regulus satrapa</i>													1	1
Sharp-shinned Hawk	<i>Accipiter striatus</i>														1
Song Sparrow	<i>Melospiza melodia</i>														2
Swainson's Thrush	<i>Catharus ustulatus</i>	1				1		4				1		1	16
Veery	<i>Catharus fuscescens</i>														1
White-throated Sparrow	<i>Zonotrichia albicollis</i>									2		1	Agitated	1	31
White-winged Crossbill	<i>Loxia leucoptera</i>							1		2					6
Winter Wren	<i>Troglodytes hiemalis</i>			1	Calling	1		1							4
Yellow-bellied Sapsucker	<i>Sphyrapicus varius</i>			1								1			3
Yellow-rumped Warbler	<i>Setophaga coronata</i>													1	Chip Call 6
Total Species - 50	Totals Species (Diversity):	7		9		9		20		10		10		15	
	Totals Individuals (Abundance):	8		10		9		53		12		11		16	350

Note: Observations include notes on flight

LEGEND

- BOLD** Denotes Species at Risk
- BOLD** Denotes Species of Conservation Con
- 'F' Denotes bird observed in flight
- '(100)' Denotes passage height of bird in flig
- 'N' Denotes bird flying in northerly direc
- 'S' Denotes bird flying in southerly direc
- 'E' Denotes bird flying in easterly directi
- 'W' Denotes bird flying in westerly direct
- 'V' Denotes bird flying in various directic

Appendix B

Custom AC CDC Report

DATA REPORT 6011: Sussex East, NB

Prepared 6 February 2018
by J. Churchill, Data Manager

CONTENTS OF REPORT

1.0 Preface

- 1.1 Data List
- 1.2 Restrictions
- 1.3 Additional Information
- Map 1: Buffered Study Area

2.0 Rare and Endangered Species

- 2.1 Flora
- 2.2 Fauna
- Map 2: Flora and Fauna

3.0 Special Areas

- 3.1 Managed Areas
- 3.2 Significant Areas
- Map 3: Special Areas

4.0 Rare Species Lists

- 4.1 Fauna
- 4.2 Flora
- 4.3 Location Sensitive Species
- 4.4 Source Bibliography

5.0 Rare Species within 100 km

- 5.1 Source Bibliography



Map 1. A 100 km buffer around the study area

1.0 PREFACE

The Atlantic Canada Conservation Data Centre (ACCDC) is part of a network of NatureServe data centres and heritage programs serving 50 states in the U.S.A, 10 provinces and 1 territory in Canada, plus several Central and South American countries. The NatureServe network is more than 30 years old and shares a common conservation data methodology. The ACCDC was founded in 1997, and maintains data for the jurisdictions of New Brunswick, Nova Scotia, Prince Edward Island, and Newfoundland and Labrador. Although a non-governmental agency, the ACCDC is supported by 6 federal agencies and 4 provincial governments, as well as through outside grants and data processing fees. URL: www.ACCDC.com.

Upon request and for a fee, the ACCDC queries its database and produces customized reports of the rare and endangered flora and fauna known to occur in or near a specified study area. As a supplement to that data, the ACCDC includes locations of managed areas with some level of protection, and known sites of ecological interest or sensitivity.

1.1 DATA LIST

Included datasets:

Filename	Contents
SussexNB_6011ob.xls	All Rare and legally protected <i>Flora and Fauna</i> in your study area
SussexNB_6011ob100km.xls	A list of Rare and legally protected <i>Flora and Fauna</i> within 100 km of your study area
SussexNB_6011ff.xls	Rare and common <i>Freshwater Fish</i> in your study area (DFO database)

1.2 RESTRICTIONS

The ACCDC makes a strong effort to verify the accuracy of all the data that it manages, but it shall not be held responsible for any inaccuracies in data that it provides. By accepting ACCDC data, recipients assent to the following limits of use:

- a) Data is restricted to use by trained personnel who are sensitive to landowner interests and to potential threats to rare and/or endangered flora and fauna posed by the information provided.
- b) Data is restricted to use by the specified Data User; any third party requiring data must make its own data request.
- c) The ACCDC requires Data Users to cease using and delete data 12 months after receipt, and to make a new request for updated data if necessary at that time.
- d) ACCDC data responses are restricted to the data in our Data System at the time of the data request.
- e) Each record has an estimate of locational uncertainty, which must be referenced in order to understand the record's relevance to a particular location. Please see attached Data Dictionary for details.
- f) ACCDC data responses are not to be construed as exhaustive inventories of taxa in an area.
- g) The absence of a taxon cannot be inferred by its absence in an ACCDC data response.

1.3 ADDITIONAL INFORMATION

The attached file DataDictionary 2.1.pdf provides metadata for the data provided.

Please direct any additional questions about ACCDC data to the following individuals:

Plants, Lichens, Ranking Methods, All other Inquiries

Sean Blaney, Senior Scientist, Executive Director

Tel: (506) 364-2658

sblaney@mta.ca

Animals (Fauna)

John Klymko, Zoologist

Tel: (506) 364-2660

jklymko@mta.ca

Plant Communities

Sarah Robinson, Community Ecologist

Tel: (506) 364-2664

srobinson@mta.ca

Data Management, GIS

James Churchill, Data Manager

Tel: (902) 679-6146

jlchurchill@mta.ca

Billing

Jean Breau

Tel: (506) 364-2657

jrbreau@mta.ca

Questions on the biology of Federal Species at Risk can be directed to ACCDC: (506) 364-2658, with questions on Species at Risk regulations to: Samara Eaton, Canadian Wildlife Service (NB and PE): (506) 364-5060 or Julie McKnight, Canadian Wildlife Service (NS): (902) 426-4196.

For provincial information about rare taxa and protected areas, or information about game animals, deer yards, old growth forests, archeological sites, fish habitat etc., in New Brunswick, please contact Stewart Lusk, Natural Resources: (506) 453-7110.

For provincial information about rare taxa and protected areas, or information about game animals, deer yards, old growth forests, archeological sites, fish habitat etc., in Nova Scotia, please contact Sherman Boates, NSDNR: (902) 679-6146. To determine if location-sensitive species (section 4.3) occur near your study site please contact a NSDNR Regional Biologist:

Western: Duncan Bayne

(902) 648-3536

Duncan.Bayne@novascotia.ca

Western: Jason Power

(902) 634-7555

Jason.Power@novascotia.ca

Central: Shavonne Meyer

(902) 893-6353

Shavonne.Meyer@novascotia.ca

Central: Kimberly George

(902) 893-5630

Kimberly.George@novascotia.ca

Eastern: Lisa Doucette

(902) 863-7523

Lisa.Doucette@novascotia.ca

Eastern: Terry Power

(902) 563-3370

Terrance.Power@novascotia.ca

For provincial information about rare taxa and protected areas, or information about game animals, fish habitat etc., in Prince Edward Island, please contact Garry Gregory, PEI Dept. of Communities, Land and Environment: (902) 569-7595.

2.0 RARE AND ENDANGERED SPECIES

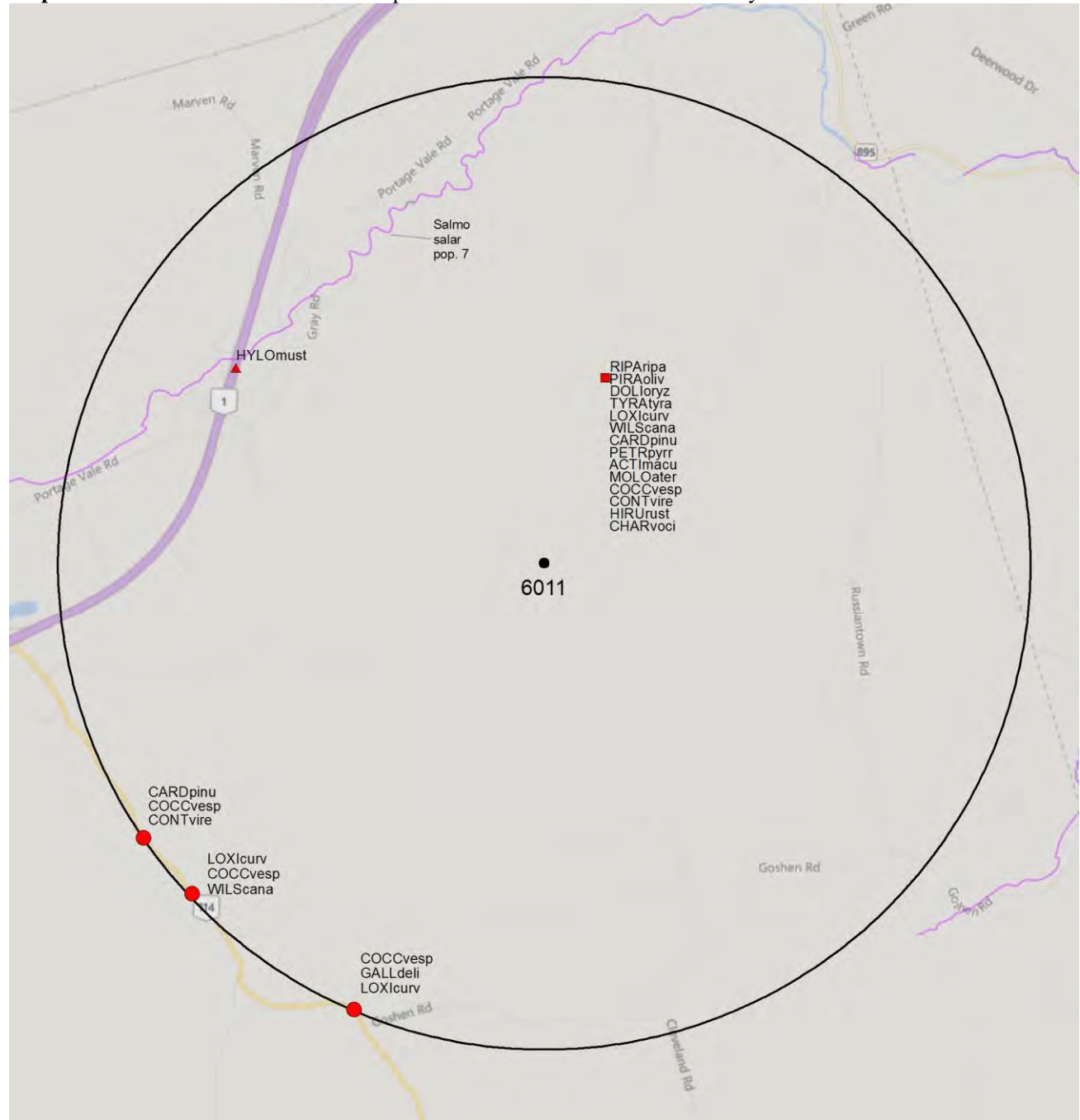
2.1 FLORA

The study area contains no records of vascular, no records of nonvascular flora (Map 2 and attached: *ob.xls).

2.2 FAUNA

The study area contains 27 records of 16 vertebrate, no records of invertebrate fauna (Map 2 and attached data files - see 1.1 Data List). Please see section 4.3 to determine if 'location-sensitive' species occur near your study site.

Map 2: Known observations of rare and/or protected flora and fauna within the study area.



RESOLUTION

- 4.7 within 50s of kilometers
- 4.0 within 10s of kilometers
- 3.7 within 5s of kilometers
- △ 3.0 within kilometers
- △ 2.7 within 500s of meters
- ◇ 2.0 within 100s of meters
- ◇ 1.7 within 10s of meters

HIGHER TAXON

- vertebrate fauna
- invertebrate fauna
- vascular flora
- nonvascular flora

3.0 SPECIAL AREAS

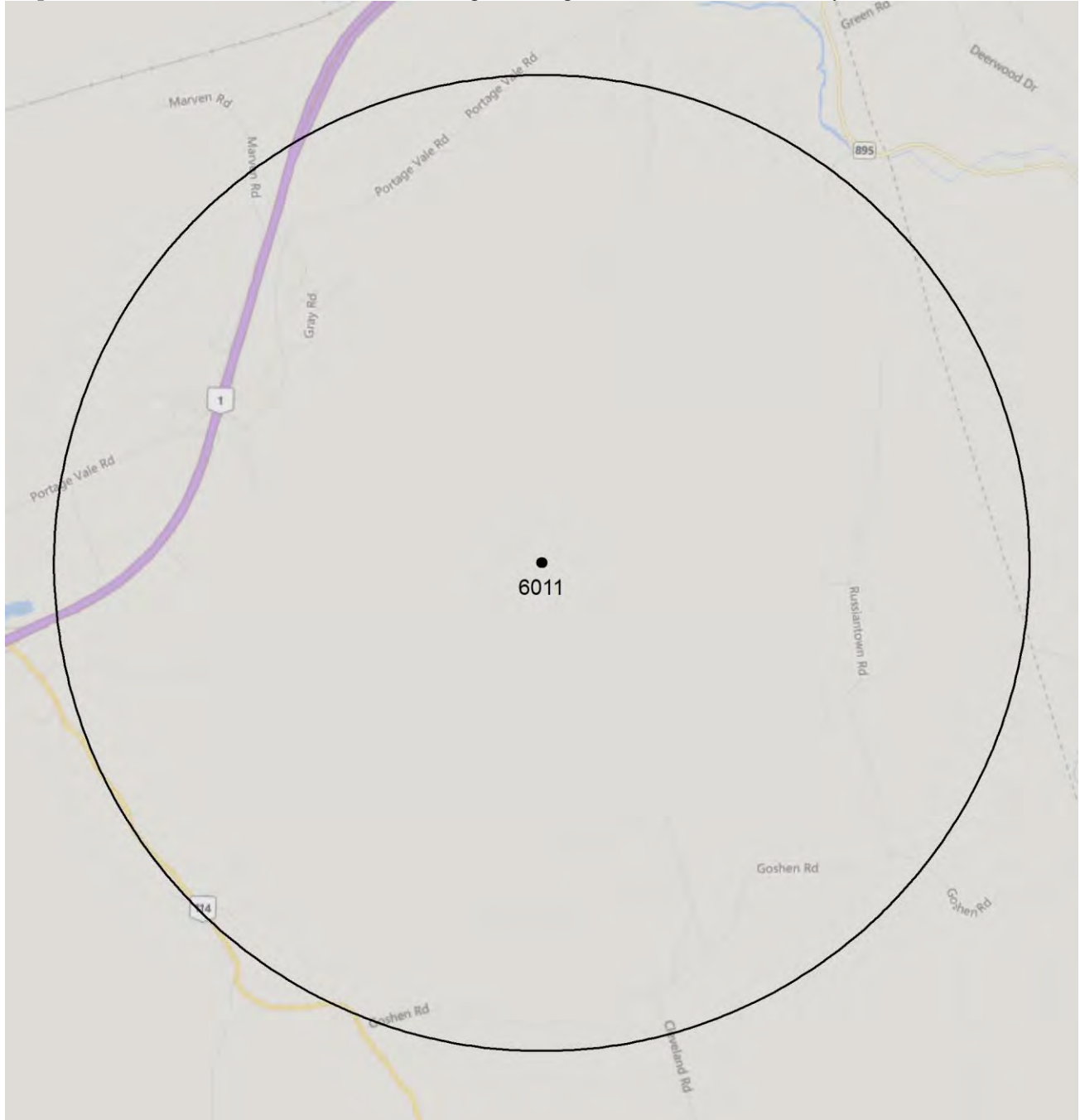
3.1 MANAGED AREAS

The GIS scan identified no managed areas in the vicinity of the study area (Map 3).

3.2 SIGNIFICANT AREAS

The GIS scan identified no biologically significant sites in the vicinity of the study area (Map 3).

Map 3: Boundaries and/or locations of known Managed and Significant Areas within the study area.



MANAGED AREAS SIGNIFIGANT AREAS

- | | |
|---|--|
|  boundary |  boundary |
|  approximate |  approximate |
| |  point location |

4.0 RARE SPECIES LISTS

Rare and/or endangered taxa (excluding “location-sensitive” species, section 4.3) within the study area listed in order of concern, beginning with legally listed taxa, with the number of observations per taxon and the distance in kilometers from study area centroid to the closest observation (\pm the precision, in km, of the record). [P] = vascular plant, [N] = nonvascular plant, [A] = vertebrate animal, [I] = invertebrate animal, [C] = community. Note: records are from attached files *ob.xls/*ob.shp only.

4.1 FLORA

Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)
-----------------	-------------	---------	------	-----------------	------------------	--------------	--------	---------------

4.2 FAUNA

Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)
<i>Scientific Name</i>	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	DISTkm
A <i>Hylocichla mustelina</i>	Wood Thrush	Threatened	Threatened	Threatened	S1S2B,S1S2M	2 May Be At Risk	1	3.7 \pm 0.0
A <i>Hirundo rustica</i>	Barn Swallow	Threatened	Threatened	Threatened	S2B,S2M	3 Sensitive	1	2.0 \pm 7.0
A <i>Riparia riparia</i>	Bank Swallow	Threatened	Threatened		S2S3B,S2S3M	3 Sensitive	2	2.0 \pm 7.0
A <i>Wilsonia canadensis</i>	Canada Warbler	Threatened	Threatened	Threatened	S3B,S3M	1 At Risk	2	2.0 \pm 7.0
A <i>Dolichonyx oryzivorus</i>	Bobolink	Threatened	Threatened	Threatened	S3B,S3M	3 Sensitive	2	2.0 \pm 7.0
A <i>Coccothraustes vespertinus</i>	Evening Grosbeak	Special Concern			S3B,S3S4N,SUM	3 Sensitive	4	2.0 \pm 7.0
A <i>Contopus virens</i>	Eastern Wood-Pewee	Special Concern	Special Concern	Special Concern	S4B,S4M	4 Secure	2	2.0 \pm 7.0
A <i>Petrochelidon pyrrhonota</i>	Cliff Swallow				S2S3B,S2S3M	3 Sensitive	1	2.0 \pm 7.0
A <i>Loxia curvirostra</i>	Red Crossbill				S3	4 Secure	4	2.0 \pm 7.0
A <i>Carduelis pinus</i>	Pine Siskin				S3	4 Secure	2	2.0 \pm 7.0
A <i>Charadrius vociferus</i>	Killdeer				S3B,S3M	3 Sensitive	1	2.0 \pm 7.0
A <i>Piranga olivacea</i>	Scarlet Tanager				S3B,S3M	4 Secure	1	2.0 \pm 7.0
A <i>Molothrus ater</i>	Brown-headed Cowbird				S3B,S3M	2 May Be At Risk	1	2.0 \pm 7.0
A <i>Tyrannus tyrannus</i>	Eastern Kingbird				S3S4B,S3S4M	3 Sensitive	1	2.0 \pm 7.0
A <i>Actitis macularius</i>	Spotted Sandpiper				S3S4B,S5M	4 Secure	1	2.0 \pm 7.0
A <i>Gallinago delicata</i>	Wilson's Snipe				S3S4B,S5M	4 Secure	1	5.0 \pm 0.0

4.3 LOCATION SENSITIVE SPECIES

The Department of Natural Resources in each Maritimes province considers a number of species “location sensitive”. Concern about exploitation of location-sensitive species precludes inclusion of precise coordinates in this report. Those intersecting your study area are indicated below with “YES”.

New Brunswick

Scientific Name	Common Name	SARA	Prov Legal Prot	Known within the Study Site?
<i>Chrysemys picta picta</i>	Eastern Painted Turtle			No
<i>Chelydra serpentina</i>	Snapping Turtle	Special Concern	Special Concern	No
<i>Glyptemys insculpta</i>	Wood Turtle	Threatened	Threatened	No
<i>Haliaeetus leucocephalus</i>	Bald Eagle		Endangered	No
<i>Falco peregrinus pop. 1</i>	Peregrine Falcon - anatum/tundrius pop.	Special Concern	Endangered	No
<i>Cicindela marginipennis</i>	Cobblestone Tiger Beetle	Endangered	Endangered	No
<i>Coenonympha nipisiquit</i>	Maritime Ringlet	Endangered	Endangered	No
<i>Bat Hibernaculum</i>		[Endangered] ¹	[Endangered] ¹	No

¹ *Myotis lucifugus* (Little Brown Myotis), *Myotis septentrionalis* (Long-eared Myotis), and *Perimyotis subflavus* (Tri-colored Bat or Eastern Pipistrelle) are all Endangered under the Federal Species at Risk Act and the NB Species at Risk Act.

4.4 SOURCE BIBLIOGRAPHY

The recipient of these data shall acknowledge the ACCDC and the data sources listed below in any documents, reports, publications or presentations, in which this dataset makes a significant contribution.

# recs	CITATION
12	Erskine, A.J. 1992. Maritime Breeding Bird Atlas Database. NS Museum & Nimbus Publ., Halifax, 82,125 recs.
10	Pardieck, K.L. & Ziolkowski Jr., D.J.; Hudson, M.-A.R. 2014. North American Breeding Bird Survey Dataset 1966 - 2013, version 2013.0. U.S. Geological Survey, Patuxent Wildlife Research Center <www.pwrc.usgs.gov/BBS/RawData/>.
4	Lepage, D. 2014. Maritime Breeding Bird Atlas Database. Bird Studies Canada, Sackville NB, 407,838 recs.
1	Cowie, F. 2007. Electrofishing Population Estimates 1979-98. Canadian Rivers Institute, 2698 recs.
1	eBird. 2014. eBird Basic Dataset. Version: EBD_relNov-2014. Ithaca, New York. Nov 2014. Cornell Lab of Ornithology, 25036 recs.

5.0 RARE SPECIES WITHIN 100 KM

A 100 km buffer around the study area contains 30345 records of 144 vertebrate and 957 records of 86 invertebrate fauna; 5090 records of 330 vascular, 698 records of 186 nonvascular flora (attached: *ob100km.xls).

Taxa within 100 km of the study site that are rare and/or endangered in the province in which the study site occurs. All ranks correspond to the province in which the study site falls, even for out-of-province records. Taxa are listed in order of concern, beginning with legally listed taxa, with the number of observations per taxon and the distance in kilometers from study area centroid to the closest observation (\pm the precision, in km, of the record).

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)	Prov
A	<i>Myotis lucifugus</i>	Little Brown Myotis	Endangered	Endangered	Endangered	S1	1 At Risk	58	31.7 \pm 0.0	NB
A	<i>Myotis septentrionalis</i>	Northern Long-eared Myotis	Endangered	Endangered	Endangered	S1	1 At Risk	21	24.2 \pm 1.0	NB
A	<i>Perimyotis subflavus</i>	Eastern Pipistrelle	Endangered	Endangered	Endangered	S1	1 At Risk	19	14.9 \pm 0.0	NB
A	<i>Sterna dougallii</i>	Roseate Tern	Endangered	Endangered	Endangered	S1?B,S1?M	1 At Risk	1	71.7 \pm 0.0	NS
A	<i>Charadrius melodus melodus</i>	Piping Plover melodus ssp	Endangered	Endangered	Endangered	S1B,S1M	1 At Risk	288	35.6 \pm 7.0	NB
A	<i>Dermochelys coriacea</i> (Atlantic pop.)	Leatherback Sea Turtle - Atlantic pop.	Endangered	Endangered	Endangered	S1S2N	1 At Risk	3	83.5 \pm 50.0	NB
A	<i>Salmo salar</i> pop. 1	Atlantic Salmon - Inner Bay of Fundy pop.	Endangered	Endangered	Endangered	S2	2 May Be At Risk	72	5.7 \pm 0.0	NB
A	<i>Calidris canutus rufa</i>	Red Knot rufa ssp	Endangered	Endangered	Endangered	S2M	1 At Risk	474	31.8 \pm 0.0	NB
A	<i>Rangifer tarandus</i> pop. 2	Woodland Caribou (Atlantic-Gasp [r-sie pop.]	Endangered	Endangered	Extirpated	SX	0.1 Extirpated	4	53.4 \pm 1.0	NB
A	<i>Sturnella magna</i>	Eastern Meadowlark	Threatened	Threatened	Threatened	S1B,S1M	2 May Be At Risk	51	9.4 \pm 7.0	NB
A	<i>Ixobrychus exilis</i>	Least Bittern	Threatened	Threatened	Threatened	S1S2B,S1S2M	1 At Risk	21	30.5 \pm 7.0	NB
A	<i>Hylocichla mustelina</i>	Wood Thrush	Threatened	Threatened	Threatened	S1S2B,S1S2M	2 May Be At Risk	123	3.7 \pm 0.0	NB
A	<i>Caprimulgus vociferus</i>	Whip-Poor-Will	Threatened	Threatened	Threatened	S2B,S2M	1 At Risk	47	16.6 \pm 0.0	NB
A	<i>Hirundo rustica</i>	Barn Swallow	Threatened	Threatened	Threatened	S2B,S2M	3 Sensitive	1316	2.0 \pm 7.0	NB
A	<i>Catharus bicknelli</i>	Bicknell's Thrush	Threatened	Special Concern	Threatened	S2B,S2M	1 At Risk	9	29.6 \pm 11.0	NB
A	<i>Glyptemys insculpta</i>	Wood Turtle	Threatened	Threatened	Threatened	S2S3	1 At Risk	371	20.8 \pm 10.0	NB
A	<i>Chaetura pelagica</i>	Chimney Swift	Threatened	Threatened	Threatened	S2S3B,S2M	1 At Risk	339	5.3 \pm 0.0	NB
A	<i>Riparia riparia</i>	Bank Swallow	Threatened	Threatened	Threatened	S2S3B,S2S3M	3 Sensitive	567	2.0 \pm 7.0	NB
A	<i>Acipenser oxyrinchus</i>	Atlantic Sturgeon	Threatened	Threatened	Threatened	S3	4 Secure	4	32.3 \pm 1.0	NB
A	<i>Contopus cooperi</i>	Olive-sided Flycatcher	Threatened	Threatened	Threatened	S3B,S3M	1 At Risk	527	5.2 \pm 0.0	NB
A	<i>Wilsonia canadensis</i>	Canada Warbler	Threatened	Threatened	Threatened	S3B,S3M	1 At Risk	742	2.0 \pm 7.0	NB
A	<i>Dolichonyx oryzivorus</i>	Bobolink	Threatened	Threatened	Threatened	S3B,S3M	3 Sensitive	1331	2.0 \pm 7.0	NB
A	<i>Chordeiles minor</i>	Common Nighthawk	Threatened	Threatened	Threatened	S3B,S4M	1 At Risk	342	9.5 \pm 0.0	NB
A	<i>Anguilla rostrata</i>	American Eel	Threatened	Threatened	Threatened	S4	4 Secure	86	10.7 \pm 0.0	NB
A	<i>Coturnicops noveboracensis</i>	Yellow Rail	Special Concern	Special Concern	Special Concern	S1?B,SUM	2 May Be At Risk	8	53.2 \pm 3.0	NB
A	<i>Histrionicus histrionicus</i> pop. 1	Harlequin Duck - Eastern pop.	Special Concern	Special Concern	Endangered	S1B,S1S2N,S2M	1 At Risk	2	79.9 \pm 1.0	NS
A	<i>Falco peregrinus</i> pop.	Peregrine Falcon - anatum/tundrius	Special Concern	Special Concern	Endangered	S1B,S3M	1 At Risk	485	28.1 \pm 7.0	NB

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)	Prov
	1									
A	<i>Asio flammeus</i>	Short-eared Owl	Special Concern	Special Concern	Special Concern	S2B,S2M	3 Sensitive	50	41.4 ± 7.0	NB
A	<i>Bucephala islandica</i> (Eastern pop.)	Barrow's Goldeneye - Eastern pop.	Special Concern	Special Concern	Special Concern	S2M,S2N	3 Sensitive	128	33.0 ± 83.0	NB
A	<i>Balaenoptera physalus</i>	Fin Whale - Atlantic pop.	Special Concern	Special Concern	Special Concern	S2S3		2	40.6 ± 1.0	NB
A	<i>Acipenser brevirostrum</i>	Shortnose Sturgeon	Special Concern	Special Concern	Special Concern	S3	3 Sensitive	6	57.6 ± 10.0	NB
A	<i>Chelydra serpentina</i>	Snapping Turtle	Special Concern	Special Concern	Special Concern	S3	3 Sensitive	12	56.5 ± 1.0	NB
A	<i>Euphagus carolinus</i>	Rusty Blackbird	Special Concern	Special Concern	Special Concern	S3B,S3M	2 May Be At Risk	94	13.4 ± 7.0	NB
A	<i>Coccothraustes vespertinus</i>	Evening Grosbeak	Special Concern			S3B,S3S4N,SUM	3 Sensitive	291	2.0 ± 7.0	NB
A	<i>Phalaropus lobatus</i>	Red-necked Phalarope	Special Concern			S3M	3 Sensitive	16	31.8 ± 0.0	NB
A	<i>Phocoena phocoena</i> (NW Atlantic pop.)	Harbour Porpoise - Northwest Atlantic pop.	Special Concern	Threatened		S4		4	83.4 ± 0.0	NB
A	<i>Contopus virens</i>	Eastern Wood-Pewee	Special Concern	Special Concern	Special Concern	S4B,S4M	4 Secure	734	2.0 ± 7.0	NB
A	<i>Podiceps auritus</i>	Horned Grebe	Special Concern		Special Concern	S4N,S4M	4 Secure	66	28.4 ± 219.0	NB
A	<i>Hemidactylium scutatum</i>	Four-toed Salamander	Not At Risk			S1?	5 Undetermined	3	27.3 ± 0.0	NB
A	<i>Bubo scandiacus</i>	Snowy Owl	Not At Risk			S1N,S2S3M	4 Secure	43	31.9 ± 1.0	NB
A	<i>Accipiter cooperii</i>	Cooper's Hawk	Not At Risk			S1S2B,S1S2M	2 May Be At Risk	13	23.8 ± 7.0	NB
A	<i>Fulica americana</i>	American Coot	Not At Risk			S1S2B,S1S2M	3 Sensitive	59	30.9 ± 2.0	NB
A	<i>Aegolius funereus</i>	Boreal Owl	Not At Risk			S1S2B,SUM	2 May Be At Risk	5	64.7 ± 0.0	NB
A	<i>Sorex dispar</i>	Long-tailed Shrew	Not At Risk	Special Concern		S2	3 Sensitive	6	36.5 ± 0.0	NB
A	<i>Buteo lineatus</i>	Red-shouldered Hawk	Not At Risk	Special Concern		S2B,S2M	2 May Be At Risk	37	24.3 ± 7.0	NB
A	<i>Chlidonias niger</i>	Black Tern	Not At Risk			S2B,S2M	3 Sensitive	182	33.2 ± 0.0	NB
A	<i>Globicephala melas</i>	Long-finned Pilot Whale	Not At Risk			S2S3		2	65.8 ± 0.0	NB
A	<i>Lynx canadensis</i>	Canadian Lynx	Not At Risk		Endangered	S3	1 At Risk	14	24.7 ± 0.0	NB
A	<i>Desmognathus fuscus</i>	Northern Dusky Salamander	Not At Risk			S3	3 Sensitive	40	30.5 ± 0.0	NB
A	<i>Sterna hirundo</i>	Common Tern	Not At Risk			S3B,SUM	3 Sensitive	323	24.0 ± 2.0	NB
A	<i>Podiceps grisegena</i>	Red-necked Grebe	Not At Risk			S3M,S2N	3 Sensitive	57	43.1 ± 0.0	NB
A	<i>Lagenorhynchus acutus</i>	Atlantic White-sided Dolphin	Not At Risk			S3S4		2	55.6 ± 1.0	NB
A	<i>Haliaeetus leucocephalus</i>	Bald Eagle	Not At Risk		Endangered	S4	1 At Risk	1172	7.6 ± 0.0	NB
A	<i>Canis lupus</i>	Gray Wolf	Not At Risk		Extirpated	SX	0.1 Extirpated	4	20.4 ± 1.0	NB
A	<i>Puma concolor pop. 1</i>	Eastern Cougar	Data Deficient		Endangered	SU	5 Undetermined	116	6.3 ± 5.0	NB
A	<i>Morone saxatilis</i>	Striped Bass	E,E,SC			S3	2 May Be At Risk	39	32.3 ± 0.0	NB
A	<i>Salvelinus alpinus</i>	Arctic Char				S1	3 Sensitive	3	19.7 ± 1.0	NB
A	<i>Vireo flavifrons</i>	Yellow-throated Vireo				S1?B,S1?M	8 Accidental	9	44.2 ± 7.0	NB
A	<i>Tringa melanoleuca</i>	Greater Yellowlegs				S1?B,S5M	4 Secure	1637	30.7 ± 0.0	NB
A	<i>Aythya americana</i>	Redhead				S1B,S1M	8 Accidental	8	50.3 ± 0.0	NB
A	<i>Gallinula chloropus</i>	Common Moorhen				S1B,S1M	3 Sensitive	30	16.8 ± 0.0	NB
A	<i>Grus canadensis</i>	Sandhill Crane				S1B,S1M	8 Accidental	12	43.5 ± 0.0	NB
A	<i>Bartramia longicauda</i>	Upland Sandpiper				S1B,S1M	3 Sensitive	45	28.4 ± 1.0	NB
A	<i>Phalaropus tricolor</i>	Wilson's Phalarope				S1B,S1M	3 Sensitive	61	32.9 ± 0.0	NB
A	<i>Leucophaeus atricilla</i>	Laughing Gull				S1B,S1M	3 Sensitive	12	48.3 ± 5.0	NB
A	<i>Progne subis</i>	Purple Martin				S1B,S1M	2 May Be At Risk	232	9.4 ± 7.0	NB
A	<i>Thryothorus ludovicianus</i>	Carolina Wren				S1B,S1M	8 Accidental	8	52.3 ± 5.0	NB
A	<i>Oxyura jamaicensis</i>	Ruddy Duck				S1B,S2S3M	4 Secure	139	33.0 ± 2.0	NB
A	<i>Uria aalge</i>	Common Murre				S1B,S3N,S3M	4 Secure	4	97.0 ± 15.0	NB
A	<i>Aythya affinis</i>	Lesser Scaup				S1B,S4M	4 Secure	322	29.6 ± 11.0	NB
A	<i>Aythya marila</i>	Greater Scaup				S1B,S4M,S2N	4 Secure	33	39.8 ± 1.0	NB
A	<i>Eremophila alpestris</i>	Horned Lark				S1B,S4N,S5M	2 May Be At Risk	56	8.9 ± 7.0	NB
A	<i>Sterna paradisaea</i>	Arctic Tern				S1B,SUM	2 May Be At Risk	8	29.6 ± 11.0	NB
A	<i>Fratercula arctica</i>	Atlantic Puffin				S1B,SUN,SUM	3 Sensitive	4	29.6 ± 11.0	NB
A	<i>Branta bernicla</i>	Brant				S1N, S2S3M	4 Secure	42	39.3 ± 1.0	NB
A	<i>Chroicocephalus</i>	Black-headed Gull				S1N,S2M	3 Sensitive	14	46.4 ± 0.0	NB

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)	Prov
A	<i>ridibundus</i>									
A	<i>Butorides virescens</i>	Green Heron				S1S2B,S1S2M	3 Sensitive	16	32.9 ± 4.0	NB
A	<i>Nycticorax nycticorax</i>	Black-crowned Night-heron				S1S2B,S1S2M	3 Sensitive	10	51.3 ± 0.0	NB
A	<i>Empidonax traillii</i>	Willow Flycatcher				S1S2B,S1S2M	3 Sensitive	90	9.4 ± 7.0	NB
A	<i>Stelgidopteryx serripennis</i>	Northern Rough-winged Swallow				S1S2B,S1S2M	2 May Be At Risk	3	65.7 ± 7.0	NB
A	<i>Troglodytes aedon</i>	House Wren				S1S2B,S1S2M	5 Undetermined	24	51.7 ± 7.0	NB
A	<i>Rissa tridactyla</i>	Black-legged Kittiwake				S1S2B,S4N,S5M	4 Secure	2	85.1 ± 0.0	NB
A	<i>Calidris bairdii</i>	Baird's Sandpiper				S1S2M	3 Sensitive	65	39.3 ± 0.0	NB
A	<i>Cistothorus palustris</i>	Marsh Wren				S2B,S2M	3 Sensitive	96	38.8 ± 0.0	NB
A	<i>Mimus polyglottos</i>	Northern Mockingbird				S2B,S2M	3 Sensitive	168	8.4 ± 0.0	NB
A	<i>Toxostoma rufum</i>	Brown Thrasher				S2B,S2M	3 Sensitive	33	9.4 ± 7.0	NB
A	<i>Pooecetes gramineus</i>	Vesper Sparrow				S2B,S2M	2 May Be At Risk	115	8.0 ± 7.0	NB
A	<i>Anas strepera</i>	Gadwall				S2B,S3M	4 Secure	231	30.7 ± 0.0	NB
A	<i>Alca torda</i>	Razorbill				S2B,S3N,S3M	4 Secure	2	97.0 ± 15.0	NB
A	<i>Pinicola enucleator</i>	Pine Grosbeak				S2B,S4S5N,S4S5M	3 Sensitive	31	29.6 ± 11.0	NB
A	<i>Tringa solitaria</i>	Solitary Sandpiper				S2B,S5M	4 Secure	173	17.1 ± 0.0	NB
A	<i>Oceanodroma leucorhoa</i>	Leach's Storm-Petrel				S2B,SUM	3 Sensitive	2	83.4 ± 0.0	NB
A	<i>Chen caerulescens</i>	Snow Goose				S2M	4 Secure	25	30.7 ± 0.0	NB
A	<i>Phalacrocorax carbo</i>	Great Cormorant				S2N,S2M	4 Secure	23	29.6 ± 11.0	NB
A	<i>Somateria spectabilis</i>	King Eider				S2N,S2M	4 Secure	4	56.0 ± 0.0	NB
A	<i>Larus hyperboreus</i>	Glaucous Gull				S2N,S2M	4 Secure	157	32.3 ± 1.0	NB
A	<i>Asio otus</i>	Long-eared Owl				S2S3	5 Undetermined	20	8.1 ± 7.0	NB
A	<i>Picoides dorsalis</i>	American Three-toed Woodpecker				S2S3	3 Sensitive	12	11.7 ± 7.0	NB
A	<i>Salmo salar</i>	Atlantic Salmon				S2S3	2 May Be At Risk	33	16.5 ± 0.0	NB
A	<i>Anas clypeata</i>	Northern Shoveler				S2S3B,S2S3M	4 Secure	347	16.0 ± 7.0	NB
A	<i>Myiarchus crinitus</i>	Great Crested Flycatcher				S2S3B,S2S3M	3 Sensitive	199	9.6 ± 7.0	NB
A	<i>Petrochelidon pyrrhonota</i>	Cliff Swallow				S2S3B,S2S3M	3 Sensitive	576	2.0 ± 7.0	NB
A	<i>Pluvialis dominica</i>	American Golden-Plover				S2S3M	3 Sensitive	188	39.5 ± 0.0	NB
A	<i>Calcarius lapponicus</i>	Lapland Longspur				S2S3N,SUM	3 Sensitive	55	39.3 ± 1.0	NB
A	<i>Cephus grylle</i>	Black Guillemot				S3	4 Secure	47	29.6 ± 11.0	NB
A	<i>Loxia curvirostra</i>	Red Crossbill				S3	4 Secure	132	2.0 ± 7.0	NB
A	<i>Carduelis pinus</i>	Pine Siskin				S3	4 Secure	376	2.0 ± 7.0	NB
A	<i>Prosopium cylindraceum</i>	Round Whitefish				S3	4 Secure	1	81.3 ± 0.0	NB
A	<i>Salvelinus namaycush</i>	Lake Trout				S3	3 Sensitive	1	99.5 ± 0.0	NB
A	<i>Sorex maritimensis</i>	Maritime Shrew				S3	4 Secure	106	75.9 ± 1.0	NB
A	<i>Eptesicus fuscus</i>	Big Brown Bat				S3	3 Sensitive	23	21.6 ± 1.0	NB
A	<i>Cathartes aura</i>	Turkey Vulture				S3B,S3M	4 Secure	248	5.1 ± 0.0	NB
A	<i>Rallus limicola</i>	Virginia Rail				S3B,S3M	3 Sensitive	194	38.0 ± 0.0	NB
A	<i>Charadrius vociferus</i>	Killdeer				S3B,S3M	3 Sensitive	961	2.0 ± 7.0	NB
A	<i>Tringa semipalmata</i>	Willet				S3B,S3M	3 Sensitive	412	30.7 ± 0.0	NB
A	<i>Coccyzus erythrophthalmus</i>	Black-billed Cuckoo				S3B,S3M	4 Secure	177	14.0 ± 0.0	NB
A	<i>Vireo gilvus</i>	Warbling Vireo				S3B,S3M	4 Secure	222	9.6 ± 7.0	NB
A	<i>Piranga olivacea</i>	Scarlet Tanager				S3B,S3M	4 Secure	89	2.0 ± 7.0	NB
A	<i>Passerina cyanea</i>	Indigo Bunting				S3B,S3M	4 Secure	63	32.0 ± 0.0	NB
A	<i>Molothrus ater</i>	Brown-headed Cowbird				S3B,S3M	2 May Be At Risk	332	2.0 ± 7.0	NB
A	<i>Icterus galbula</i>	Baltimore Oriole				S3B,S3M	4 Secure	197	5.6 ± 0.0	NB
A	<i>Somateria mollissima</i>	Common Eider				S3B,S4M,S3N	4 Secure	261	29.6 ± 11.0	NB
A	<i>Dendroica tigrina</i>	Cape May Warbler				S3B,S4S5M	4 Secure	218	7.3 ± 0.0	NB
A	<i>Anas acuta</i>	Northern Pintail				S3B,S5M	3 Sensitive	128	38.6 ± 10.0	NB
A	<i>Mergus serrator</i>	Red-breasted Merganser				S3B,S5M,S4S5N	4 Secure	165	20.7 ± 7.0	NB
A	<i>Arenaria interpres</i>	Ruddy Turnstone				S3M	4 Secure	560	29.6 ± 11.0	NB

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)	Prov
A	<i>Phalaropus fulicarius</i>	Red Phalarope				S3M	3 Sensitive	4	29.6 ± 11.0	NB
A	<i>Melanitta nigra</i>	Black Scoter				S3M,S1S2N	3 Sensitive	229	29.6 ± 11.0	NB
A	<i>Bucephala albeola</i>	Bufflehead				S3M,S2N	3 Sensitive	512	29.6 ± 11.0	NB
A	<i>Calidris maritima</i>	Purple Sandpiper				S3M,S3N	4 Secure	78	29.6 ± 11.0	NB
A	<i>Uria lomvia</i>	Thick-billed Murre				S3N,S3M	5 Undetermined	3	97.0 ± 15.0	NB
A	<i>Synaptomys cooperi</i>	Southern Bog Lemming				S3S4	4 Secure	96	22.6 ± 1.0	NB
A	<i>Tyrannus tyrannus</i>	Eastern Kingbird				S3S4B,S3S4M	3 Sensitive	573	2.0 ± 7.0	NB
A	<i>Actitis macularius</i>	Spotted Sandpiper				S3S4B,S5M	4 Secure	871	2.0 ± 7.0	NB
A	<i>Gallinago delicata</i>	Wilson's Snipe				S3S4B,S5M	4 Secure	1044	5.0 ± 0.0	NB
A	<i>Larus delawarensis</i>	Ring-billed Gull				S3S4B,S5M	4 Secure	323	22.9 ± 0.0	NB
A	<i>Dendroica striata</i>	Blackpoll Warbler				S3S4B,S5M	4 Secure	50	8.4 ± 0.0	NB
A	<i>Pluvialis squatarola</i>	Black-bellied Plover				S3S4M	4 Secure	1343	39.5 ± 0.0	NB
A	<i>Limosa haemastica</i>	Hudsonian Godwit				S3S4M	4 Secure	179	39.5 ± 0.0	NB
A	<i>Calidris pusilla</i>	Semipalmated Sandpiper				S3S4M	4 Secure	2069	24.4 ± 0.0	NB
A	<i>Calidris melanotos</i>	Pectoral Sandpiper				S3S4M	4 Secure	427	28.4 ± 219.0	NB
A	<i>Calidris alba</i>	Sanderling				S3S4M,S1N	3 Sensitive	1304	24.4 ± 0.0	NB
A	<i>Morus bassanus</i>	Northern Gannet				SHB,S5M	4 Secure	116	29.6 ± 11.0	NB
A	<i>Lanius ludovicianus</i>	Loggerhead Shrike				SXB,SXM	1 At Risk	1	51.3 ± 0.0	NB
C	<i>Quercus macrocarpa</i> - <i>Acer rubrum</i> / <i>Onoclea sensibilis</i> - <i>Carex arcta</i>	Bur Oak - Red Maple / Sensitive Fern - Northern Clustered Sedge Forest				S2		1	72.3 ± 0.0	
C	<i>Acer saccharum</i> - <i>Fraxinus americana</i> / <i>Polystichum acrostichoides</i>	Sugar Maple - White Ash / Christmas Fern Forest				S3S4		1	60.9 ± 0.0	NB
I	<i>Cicindela marginipennis</i>	Cobblestone Tiger Beetle	Endangered	Endangered	Endangered	S1	1 At Risk	34	64.7 ± 0.0	NB
I	<i>Gomphus ventricosus</i>	Skillet Clubtail	Endangered		Endangered	S1S2	2 May Be At Risk	13	36.3 ± 0.0	NB
I	<i>Danaus plexippus</i>	Monarch	Endangered	Special Concern	Special Concern	S3B,S3M	3 Sensitive	104	21.0 ± 7.0	NB
I	<i>Ophiogomphus howei</i>	Pygmy Snaketail	Special Concern	Special Concern	Special Concern	S2	2 May Be At Risk	3	67.2 ± 0.0	NB
I	<i>Alasmidonta varicosa</i>	Brook Floater	Special Concern		Special Concern	S2	3 Sensitive	25	20.6 ± 1.0	NB
I	<i>Lampsilis cariosa</i>	Yellow Lampmussel	Special Concern	Special Concern	Special Concern	S2	3 Sensitive	74	38.3 ± 0.0	NB
I	<i>Bombus terricola</i>	Yellow-banded Bumblebee	Special Concern			S3?	3 Sensitive	22	35.0 ± 0.0	NB
I	<i>Appalachina sayana</i>	Spike-lip Crater	Not At Risk			S3?		2	64.0 ± 1.0	NB
I	<i>Erora laeta</i>	Early Hairstreak				S1	2 May Be At Risk	1	52.7 ± 1.0	NB
I	<i>Arigomphus furcifer</i>	Lilypad Clubtail				S1	5 Undetermined	6	66.4 ± 0.0	NB
I	<i>Polites origenes</i>	Crossline Skipper				S1?	5 Undetermined	4	66.8 ± 0.0	NB
I	<i>Plebejus saepiolus</i>	Greenish Blue				S1S2	4 Secure	2	17.6 ± 1.0	NB
I	<i>Ophiogomphus colubrinus</i>	Boreal Snaketail				S1S2	2 May Be At Risk	3	76.5 ± 0.0	NB
I	<i>Cicindela ancocisconensis</i>	Appalachian Tiger Beetle				S2	5 Undetermined	1	94.6 ± 0.0	NB
I	<i>Brachyleptura circumdata</i>	a Longhorned Beetle				S2		6	79.6 ± 0.0	NB
I	<i>Satyrrium calanus</i>	Banded Hairstreak				S2	3 Sensitive	1	97.2 ± 0.0	NS
I	<i>Strymon melinus</i>	Grey Hairstreak				S2	4 Secure	1	52.9 ± 1.0	NB
I	<i>Aeshna clepsydra</i>	Mottled Darner				S2	3 Sensitive	8	66.5 ± 0.0	NB
I	<i>Somatochlora brevicincta</i>	Quebec Emerald				S2	5 Undetermined	2	52.7 ± 0.0	NB
I	<i>Somatochlora tenebrosa</i>	Clamp-Tipped Emerald				S2	5 Undetermined	5	74.3 ± 1.0	NB
I	<i>Ischnura posita</i>	Fragile Forktail				S2	2 May Be At Risk	1	96.6 ± 1.0	NS
I	<i>Callophrys henrici</i>	Henry's Elfin				S2S3	4 Secure	8	51.9 ± 0.0	NB
I	<i>Celithemis martha</i>	Martha's Pennant				S2S3	5 Undetermined	1	95.4 ± 0.0	NB
I	<i>Sphaeroderus nitidicollis</i>	a Ground Beetle				S3	4 Secure	1	79.6 ± 0.0	NB

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)	Prov
	<i>Lepturoopsis biforis</i>	a Longhorned Beetle				S3		1	84.7 ± 1.0	NB
	<i>Orthosoma brunneum</i>	a Longhorned Beetle				S3		1	70.3 ± 5.0	NB
	<i>Elaphrus americanus</i>	a Ground Beetle				S3	4 Secure	2	39.6 ± 0.0	NB
	<i>Desmocerus palliatus</i>	Elderberry Borer				S3		4	84.7 ± 1.0	NB
	<i>Agonum crenistriatum</i>	a Ground Beetle				S3	5 Undetermined	1	51.3 ± 1.0	NB
	<i>Agonum consimile</i>	a Ground Beetle				S3	4 Secure	1	51.3 ± 1.0	NB
	<i>Agonum excavatum</i>	a Ground Beetle				S3	4 Secure	1	91.4 ± 0.0	NB
	<i>Clivina americana</i>	a Ground Beetle				S3	4 Secure	1	91.4 ± 0.0	NB
	<i>Lachnocrepis parallela</i>	a Ground Beetle				S3	4 Secure	1	45.8 ± 0.0	NB
	<i>Dyschirius setosus</i>	a Ground Beetle				S3	5 Undetermined	3	45.8 ± 0.0	NB
	<i>Harpalus fulvilabris</i>	a Ground Beetle				S3	4 Secure	1	40.3 ± 0.0	NB
	<i>Olisthopus parmatus</i>	a Ground Beetle				S3	4 Secure	1	79.6 ± 0.0	NB
	<i>Paratachys scitulus</i>	a Ground Beetle				S3	5 Undetermined	1	91.4 ± 0.0	NB
	<i>Amara pallipes</i>	a Ground Beetle				S3	4 Secure	2	45.9 ± 0.0	NB
	<i>Carabus maeander</i>	a Ground Beetle				S3	5 Undetermined	1	51.3 ± 1.0	NB
	<i>Carabus serratus</i>	a Ground Beetle				S3	4 Secure	1	45.8 ± 1.0	NB
	<i>Coccinella hieroglyphica kirbyi</i>	a Ladybird Beetle				S3	4 Secure	1	84.7 ± 1.0	NB
	<i>Hippodamia parenthesis</i>	Parenthesis Lady Beetle				S3	4 Secure	8	50.6 ± 0.0	NB
	<i>Stenocorus vittigera</i>	a Longhorned Beetle				S3		1	91.3 ± 0.0	NB
	<i>Gnathacmaeops pratensis</i>	a Longhorned Beetle				S3		5	84.7 ± 1.0	NB
	<i>Pogonocherus mixtus</i>	a Longhorned Beetle				S3		1	84.7 ± 1.0	NB
	<i>Xylotrechus undulatus</i>	a Longhorned Beetle				S3		1	60.3 ± 1.0	NB
	<i>Badister neopulchellus</i>	a Ground Beetle				S3	4 Secure	1	91.4 ± 0.0	NB
	<i>Calathus gregarius</i>	a Ground Beetle				S3	4 Secure	1	25.4 ± 1.0	NB
	<i>Gonioctena americana</i>	a Leaf Beetle				S3		1	45.9 ± 0.0	NB
	<i>Saperda lateralis</i>	a Longhorned Beetle				S3		2	92.3 ± 0.0	NB
	<i>Trachysida aspera</i>	a Longhorned Beetle				S3		1	37.5 ± 0.0	NB
	<i>Euphyes bimacula</i>	Two-spotted Skipper				S3	4 Secure	9	52.9 ± 1.0	NB
	<i>Papilio brevicauda</i>	Short-tailed Swallowtail				S3	4 Secure	3	93.1 ± 0.0	NB
	<i>Papilio brevicauda bretonensis</i>	Short-tailed Swallowtail				S3	4 Secure	5	79.6 ± 0.0	NB
	<i>Lycaena hyllus</i>	Bronze Copper				S3	3 Sensitive	65	39.6 ± 0.0	NB
	<i>Lycaena dospassosi</i>	Salt Marsh Copper				S3	4 Secure	30	76.7 ± 0.0	NB
	<i>Satyrium acadica</i>	Acadian Hairstreak				S3	4 Secure	24	21.0 ± 7.0	NB
	<i>Callophrys polios</i>	Hoary Elfin				S3	4 Secure	14	37.8 ± 0.0	NB
	<i>Plebejus idas</i>	Northern Blue				S3	4 Secure	17	28.1 ± 1.0	NB
	<i>Plebejus idas empetri</i>	Crowberry Blue				S3	4 Secure	3	95.4 ± 1.0	NB
	<i>Speyeria aphrodite</i>	Aphrodite Fritillary				S3	4 Secure	17	50.7 ± 0.0	NB
	<i>Boloria bellona</i>	Meadow Fritillary				S3	4 Secure	18	68.6 ± 0.0	NB
	<i>Boloria chariclea</i>	Arctic Fritillary				S3	4 Secure	11	59.0 ± 1.0	NB
	<i>Polygonia satyrus</i>	Satyr Comma				S3	4 Secure	2	90.0 ± 7.0	NB
	<i>Polygonia gracilis</i>	Hoary Comma				S3	4 Secure	3	87.5 ± 7.0	NB
	<i>Nymphalis l-album</i>	Compton Tortoiseshell				S3	4 Secure	12	21.0 ± 7.0	NB
	<i>Gomphus vastus</i>	Cobra Clubtail				S3	3 Sensitive	21	54.1 ± 0.0	NB
	<i>Gomphus abbreviatus</i>	Spine-crowned Clubtail				S3	4 Secure	13	28.0 ± 0.0	NB
	<i>Dorocordulia lepida</i>	Petite Emerald				S3	4 Secure	18	33.3 ± 1.0	NB
	<i>Somatochlora cingulata</i>	Lake Emerald				S3	4 Secure	6	23.0 ± 1.0	NB
	<i>Somatochlora forcipata</i>	Forcipate Emerald				S3	4 Secure	5	21.9 ± 1.0	NB
	<i>Williamsonia fletcheri</i>	Ebony Boghaunter				S3	4 Secure	13	52.9 ± 1.0	NB
	<i>Lestes eurinus</i>	Amber-Winged Spreadwing				S3	4 Secure	7	33.3 ± 1.0	NB
	<i>Lestes vigilax</i>	Swamp Spreadwing				S3	3 Sensitive	15	80.9 ± 0.0	NB
	<i>Enallagma geminatum</i>	Skimming Bluet				S3	5 Undetermined	11	65.1 ± 0.0	NB
	<i>Enallagma signatum</i>	Orange Bluet				S3	4 Secure	6	65.1 ± 0.0	NB

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)	Prov
I	<i>Stylurus scudderii</i>	Zebra Clubtail				S3	4 Secure	16	7.0 ± 1.0	NB
I	<i>Alasmidonta undulata</i>	Triangle Floater				S3	3 Sensitive	58	16.4 ± 1.0	NB
I	<i>Leptodea ochracea</i>	Tidewater Mucket				S3	4 Secure	74	41.4 ± 0.0	NB
I	<i>Neohelix albolabris</i>	Whitelip				S3		1	41.2 ± 0.0	NB
I	<i>Spurwinkia salsa</i>	Saltmarsh Hydrobe				S3		32	63.7 ± 0.0	NB
I	<i>Pantala hymenaea</i>	Spot-Winged Glider				S3B,S3M	4 Secure	5	74.4 ± 1.0	NS
I	<i>Satyrium liparops</i>	Striped Hairstreak				S3S4	4 Secure	9	46.7 ± 7.0	NB
I	<i>Satyrium liparops strigosum</i>	Striped Hairstreak				S3S4	4 Secure	10	44.2 ± 0.0	NB
I	<i>Cupido comyntas</i>	Eastern Tailed Blue				S3S4	4 Secure	4	37.0 ± 0.0	NB
I	<i>Coccinella transversoguttata richardsoni</i>	Transverse Lady Beetle				SH	2 May Be At Risk	26	48.0 ± 1.0	NB
N	<i>Erioderma mollissimum</i>	Graceful Felt Lichen	Endangered		Endangered	SH	2 May Be At Risk	1	32.8 ± 1.0	NB
N	<i>Erioderma pedicellatum</i> (Atlantic pop.)	Boreal Felt Lichen - Atlantic pop.	Endangered	Endangered	Endangered	SH	1 At Risk	2	52.5 ± 0.0	NS
N	<i>Peltigera hydrothyria</i>	Eastern Waterfan	Threatened			S1	5 Undetermined	4	22.8 ± 1.0	NB
N	<i>Anzia colpodes</i>	Black-foam Lichen	Threatened			S1S2	5 Undetermined	2	23.2 ± 1.0	NB
N	<i>Degelia plumbea</i>	Blue Felt Lichen	Special Concern	Special Concern	Special Concern	S1	2 May Be At Risk	2	52.4 ± 0.0	NS
N	<i>Pseudevernia cladonia</i>	Ghost Antler Lichen	Not At Risk			S2S3	5 Undetermined	14	28.2 ± 0.0	NB
N	<i>Aloina rigida</i>	Aloe-Like Rigid Screw Moss				S1	2 May Be At Risk	1	58.0 ± 0.0	NB
N	<i>Bryum muehlenbeckii</i>	Muehlenbeck's Bryum Moss				S1	2 May Be At Risk	1	87.0 ± 1.0	NB
N	<i>Dicranoweisia crispula</i>	Mountain Thatch Moss				S1	2 May Be At Risk	1	29.6 ± 0.0	NB
N	<i>Didymodon rigidulus</i> var. <i>gracilis</i>	a moss				S1	2 May Be At Risk	1	33.0 ± 1.0	NB
N	<i>Syntrichia ruralis</i>	a Moss				S1	2 May Be At Risk	1	17.6 ± 0.0	NB
N	<i>Coscinodon cribrosus</i>	Sieve-Toothed Moss				S1	2 May Be At Risk	1	87.4 ± 0.0	NB
N	<i>Cladonia metacorallifera</i>	Reptilian Pixie-cup Lichen				S1	5 Undetermined	5	25.1 ± 1.0	NB
N	<i>Coccocarpia palmicola</i>	Salted Shell Lichen				S1	2 May Be At Risk	1	26.5 ± 1.0	NB
N	<i>Peltigera collina</i>	Tree Pelt Lichen				S1	2 May Be At Risk	1	86.5 ± 0.0	NS
N	<i>Peltigera malacea</i>	Veinless Pelt Lichen				S1	5 Undetermined	1	26.7 ± 1.0	NB
N	<i>Bryoria bicolor</i>	Electrified Horsehair Lichen				S1	2 May Be At Risk	1	26.7 ± 1.0	NB
N	<i>Hygrobriella laxifolia</i>	Lax Notchwort				S1?	6 Not Assessed	1	25.5 ± 1.0	NB
N	<i>Bartramia ithyphylla</i>	Straight-leaved Apple Moss				S1?	2 May Be At Risk	2	25.5 ± 0.0	NB
N	<i>Calliergon trifarium</i>	Three-ranked Moss				S1?	2 May Be At Risk	1	94.6 ± 0.0	NB
N	<i>Dichelyma falcatum</i>	a Moss				S1?	2 May Be At Risk	1	90.6 ± 1.0	NB
N	<i>Dicranum bonjeanii</i>	Bonjean's Broom Moss				S1?	2 May Be At Risk	1	85.9 ± 0.0	NS
N	<i>Dicranum condensatum</i>	Condensed Broom Moss				S1?	2 May Be At Risk	2	29.5 ± 0.0	NB
N	<i>Entodon brevisetus</i>	a Moss				S1?	2 May Be At Risk	1	36.7 ± 10.0	NB
N	<i>Eurhynchium hians</i>	Light Beaked Moss				S1?	2 May Be At Risk	2	20.1 ± 0.0	NB
N	<i>Homomallium adnatum</i>	Adnate Hairy-gray Moss				S1?	2 May Be At Risk	3	30.9 ± 1.0	NB
N	<i>Plagiothecium latebricola</i>	Alder Silk Moss				S1?	2 May Be At Risk	3	32.2 ± 1.0	NB
N	<i>Rhytidium rugosum</i>	Wrinkle-leaved Moss				S1?	2 May Be At Risk	2	19.1 ± 0.0	NB
N	<i>Seligeria recurvata</i>	a Moss				S1?	2 May Be At Risk	3	30.9 ± 1.0	NB
N	<i>Splachnum pennsylvanicum</i>	Southern Dung Moss				S1?	2 May Be At Risk	1	87.6 ± 1.0	NB
N	<i>Cephaloziella spinigera</i>	Spiny Threadwort				S1S2	6 Not Assessed	2	52.5 ± 0.0	NB
N	<i>Cladopodiella francisci</i>	Holt's Notchwort				S1S2	6 Not Assessed	4	24.4 ± 1.0	NB
N	<i>Harpanthus flotovianus</i>	Great Mountain Flapwort				S1S2	6 Not Assessed	2	17.6 ± 1.0	NB
N	<i>Jungermannia obovata</i>	Egg Flapwort				S1S2	6 Not Assessed	2	32.3 ± 0.0	NB
N	<i>Pallavicinia lyellii</i>	Lyell's Ribbonwort				S1S2	6 Not Assessed	2	36.7 ± 1.0	NB
N	<i>Radula tenax</i>	Tenacious Scalewort				S1S2	6 Not Assessed	1	32.3 ± 0.0	NB
N	<i>Brachythecium</i>	Acuminate Ragged Moss				S1S2	5 Undetermined	4	30.0 ± 2.0	NB

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)	Prov
N	<i>acuminatum</i>									
N	<i>Bryum salinum</i>	a Moss				S1S2	2 May Be At Risk	1	32.2 ± 1.0	NB
N	<i>Campylium radicale</i>	Long-stalked Fine Wet Moss				S1S2	5 Undetermined	1	94.5 ± 3.0	NS
N	<i>Tortula obtusifolia</i>	a Moss				S1S2	2 May Be At Risk	1	52.1 ± 0.0	NB
N	<i>Distichium inclinatum</i>	Inclined Iris Moss				S1S2	2 May Be At Risk	5	33.0 ± 1.0	NB
N	<i>Ditrichum pallidum</i>	Pale Cow-hair Moss				S1S2	2 May Be At Risk	1	17.3 ± 1.0	NB
N	<i>Hygrohypnum bestii</i>	Best's Brook Moss				S1S2	3 Sensitive	5	5.0 ± 0.0	NB
N	<i>Timmia norvegica</i>	a moss				S1S2	2 May Be At Risk	3	32.0 ± 0.0	NB
N	<i>Timmia norvegica var. excurrens</i>	a moss				S1S2	2 May Be At Risk	1	33.1 ± 0.0	NB
N	<i>Tortella humilis</i>	Small Crisp Moss				S1S2	2 May Be At Risk	7	17.6 ± 1.0	NB
N	<i>Pseudotaxiphyllum distichaceum</i>	a Moss				S1S2	2 May Be At Risk	1	62.3 ± 1.0	NB
N	<i>Hamatocaulis vernicosus</i>	a Moss				S1S2	2 May Be At Risk	1	64.3 ± 100.0	NB
N	<i>Umbilicaria vellea</i>	Grizzled Rocktripe Lichen				S1S2	5 Undetermined	1	32.6 ± 1.0	NB
N	<i>Peltigera scabrosa</i>	Greater Toad Pelt Lichen				S1S2	2 May Be At Risk	4	22.3 ± 1.0	NB
N	<i>Calyptogeia neesiana</i>	Nees' Pouchwort				S1S3	6 Not Assessed	1	61.5 ± 1.0	NB
N	<i>Cephalozia elachista</i>	Spurred Threadwort				S1S3	6 Not Assessed	1	94.8 ± 5.0	NB
N	<i>Porella pinnata</i>	Pinnate Scalewort				S1S3	6 Not Assessed	1	56.1 ± 1.0	NB
N	<i>Tritomaria scitula</i>	Mountain Notchwort				S1S3	6 Not Assessed	1	30.8 ± 1.0	NB
N	<i>Amphidium mougeotii</i>	a Moss				S2	3 Sensitive	13	24.8 ± 0.0	NB
N	<i>Anomodon viticulosus</i>	a Moss				S2	2 May Be At Risk	6	18.6 ± 0.0	NB
N	<i>Cirriphyllum piliferum</i>	Hair-pointed Moss				S2	3 Sensitive	4	12.1 ± 1.0	NB
N	<i>Dicranella palustris</i>	Drooping-Leaved Fork Moss				S2	3 Sensitive	9	18.6 ± 5.0	NB
N	<i>Didymodon ferrugineus</i>	a moss				S2	3 Sensitive	2	32.9 ± 0.0	NB
N	<i>Anomodon tristis</i>	a Moss				S2	2 May Be At Risk	9	25.5 ± 10.0	NB
N	<i>Hypnum pratense</i>	Meadow Plait Moss				S2	3 Sensitive	2	91.6 ± 0.0	NB
N	<i>Isopterygiopsis pulchella</i>	Neat Silk Moss				S2	3 Sensitive	8	26.0 ± 1.0	NB
N	<i>Meesia triquetra</i>	Three-ranked Cold Moss				S2	2 May Be At Risk	1	54.1 ± 100.0	NB
N	<i>Physcomitrium immersum</i>	a Moss				S2	3 Sensitive	1	56.1 ± 1.0	NB
N	<i>Platydictya jungermannioides</i>	False Willow Moss				S2	3 Sensitive	4	19.9 ± 0.0	NB
N	<i>Pohlia elongata</i>	Long-necked Nodding Moss				S2	3 Sensitive	10	20.4 ± 0.0	NB
N	<i>Seligeria calcarea</i>	Chalk Brittle Moss				S2	3 Sensitive	2	22.9 ± 0.0	NB
N	<i>Sphagnum centrale</i>	Central Peat Moss				S2	3 Sensitive	7	20.4 ± 0.0	NB
N	<i>Sphagnum lindbergii</i>	Lindberg's Peat Moss				S2	3 Sensitive	3	61.4 ± 5.0	NB
N	<i>Sphagnum flexuosum</i>	Flexuous Peatmoss				S2	3 Sensitive	3	23.0 ± 0.0	NB
N	<i>Tayloria serrata</i>	Serrate Trumpet Moss				S2	3 Sensitive	8	21.1 ± 2.0	NB
N	<i>Tetradontium brownianum</i>	Little Georgia				S2	3 Sensitive	7	25.5 ± 10.0	NB
N	<i>Thamnobryum alleghaniense</i>	a Moss				S2	3 Sensitive	14	12.5 ± 0.0	NB
N	<i>Tortula mucronifolia</i>	Mucronate Screw Moss				S2	3 Sensitive	2	87.3 ± 0.0	NB
N	<i>Ulotia phyllantha</i>	a Moss				S2	3 Sensitive	4	32.8 ± 0.0	NB
N	<i>Anomobryum filiforme</i>	a moss				S2	5 Undetermined	4	33.0 ± 1.0	NB
N	<i>Cladonia macrophylla</i>	Fig-leaved Lichen				S2	5 Undetermined	3	27.8 ± 1.0	NB
N	<i>Fuscopannaria leucosticta</i>	Rimmed Shingles Lichen				S2	2 May Be At Risk	5	60.7 ± 0.0	NB
N	<i>Leptogium corticola</i>	Blistered Jellyskin Lichen				S2	2 May Be At Risk	1	80.4 ± 0.0	NB
N	<i>Nephroma laevigatum</i>	Mustard Kidney Lichen				S2	2 May Be At Risk	1	98.9 ± 0.0	NS
N	<i>Anacamptodon splachnoides</i>	a Moss				S2?	3 Sensitive	2	96.8 ± 1.0	NB
N	<i>Andreaea rothii</i>	a Moss				S2?	3 Sensitive	6	25.5 ± 0.0	NB
N	<i>Anomodon minor</i>	Blunt-leaved Anomodon Moss				S2?	2 May Be At Risk	1	25.7 ± 1.0	NB

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)	Prov
N	<i>Brachythecium digastrum</i>	a Moss				S2?	3 Sensitive	1	67.9 ± 0.0	NB
N	<i>Bryum pallescens</i>	Pale Bryum Moss				S2?	5 Undetermined	2	86.6 ± 1.0	NB
N	<i>Dichelyma capillaceum</i>	Hairlike Dichelyma Moss				S2?	3 Sensitive	1	37.0 ± 3.0	NB
N	<i>Hygrohypnum montanum</i>	a Moss				S2?	3 Sensitive	2	23.5 ± 1.0	NB
N	<i>Schistostega pennata</i>	Luminous Moss				S2?	3 Sensitive	2	43.6 ± 100.0	NB
N	<i>Seligeria campylopoda</i>	a Moss				S2?	3 Sensitive	1	64.3 ± 100.0	NB
N	<i>Seligeria diversifolia</i>	a Moss				S2?	3 Sensitive	2	45.7 ± 0.0	NB
N	<i>Sphagnum angermanicum</i>	a Peatmoss				S2?	3 Sensitive	1	39.7 ± 10.0	NB
N	<i>Trichodon cylindricus</i>	Cylindric Hairy-teeth Moss				S2?	3 Sensitive	3	30.9 ± 10.0	NB
N	<i>Plagiomnium rostratum</i>	Long-beaked Leafy Moss				S2?	3 Sensitive	6	12.5 ± 0.0	NB
N	<i>Ramalina pollinaria</i>	Chalky Ramalina Lichen				S2?	5 Undetermined	1	32.8 ± 1.0	NB
N	<i>Nephroma arcticum</i>	Arctic Kidney Lichen				S2?	3 Sensitive	1	25.1 ± 1.0	NB
N	<i>Bryum uliginosum</i>	a Moss				S2S3	3 Sensitive	2	32.8 ± 0.0	NB
N	<i>Buxbaumia aphylla</i>	Brown Shield Moss				S2S3	3 Sensitive	4	94.5 ± 3.0	NS
N	<i>Calliergonella cuspidata</i>	Common Large Wetland Moss				S2S3	3 Sensitive	7	32.0 ± 5.0	NB
N	<i>Campyllum polygamum</i>	a Moss				S2S3	3 Sensitive	1	21.2 ± 0.0	NB
N	<i>Palustriella falcata</i>	a Moss				S2S3	3 Sensitive	2	24.6 ± 0.0	NB
N	<i>Didymodon rigidulus</i>	Rigid Screw Moss				S2S3	3 Sensitive	8	30.0 ± 2.0	NB
N	<i>Ephemerum serratum</i>	a Moss				S2S3	3 Sensitive	4	16.4 ± 0.0	NB
N	<i>Orthotrichum speciosum</i>	Showy Bristle Moss				S2S3	5 Undetermined	2	92.1 ± 1.0	NS
N	<i>Pohlia prolifera</i>	Cottony Nodding Moss				S2S3	3 Sensitive	5	33.0 ± 1.0	NB
N	<i>Racomitrium fasciculare</i>	a Moss				S2S3	3 Sensitive	3	24.8 ± 0.0	NB
N	<i>Racomitrium affine</i>	a Moss				S2S3	3 Sensitive	1	23.4 ± 1.0	NB
N	<i>Saelania glaucescens</i>	Blue Dew Moss				S2S3	3 Sensitive	2	29.6 ± 0.0	NB
N	<i>Scorpidium scorpioides</i>	Hooked Scorpion Moss				S2S3	3 Sensitive	4	75.6 ± 0.0	NB
N	<i>Taxiphyllum deplanatum</i>	Imbricate Yew-leaved Moss				S2S3	3 Sensitive	2	31.9 ± 1.0	NB
N	<i>Zygodon viridissimus</i>	a Moss				S2S3	2 May Be At Risk	2	31.9 ± 1.0	NB
N	<i>Schistidium agassizii</i>	Elf Bloom Moss				S2S3	3 Sensitive	3	19.9 ± 1.0	NB
N	<i>Loeskeobryum brevirostre</i>	a Moss				S2S3	3 Sensitive	16	11.8 ± 2.0	NB
N	<i>Cyrtomnium hymenophylloides</i>	Short-pointed Lantern Moss				S2S3	3 Sensitive	6	23.1 ± 0.0	NB
N	<i>Cladonia acuminata</i>	Scantly Clad Pixie Lichen				S2S3	5 Undetermined	2	32.6 ± 1.0	NB
N	<i>Cladonia ramulosa</i>	Bran Lichen				S2S3	5 Undetermined	4	28.3 ± 1.0	NB
N	<i>Cladonia sulphurina</i>	Greater Sulphur-cup Lichen				S2S3	5 Undetermined	1	26.8 ± 1.0	NB
N	<i>Parmeliopsis ambigua</i>	Green Starburst Lichen				S2S3	5 Undetermined	1	31.6 ± 1.0	NB
N	<i>Sphaerophorus globosus</i>	Northern Coral Lichen				S2S3	3 Sensitive	5	26.7 ± 1.0	NB
N	<i>Hypnum curvifolium</i>	Curved-leaved Plait Moss				S3	3 Sensitive	17	24.8 ± 0.0	NB
N	<i>Tortella fragilis</i>	Fragile Twisted Moss				S3	3 Sensitive	1	33.1 ± 0.0	NB
N	<i>Schistidium maritimum</i>	a Moss				S3	4 Secure	5	32.8 ± 0.0	NB
N	<i>Hymenostylium recurvirostre</i>	Hymenostylium Moss				S3	3 Sensitive	4	33.2 ± 1.0	NB
N	<i>Solorina saccata</i>	Woodland Owl Lichen				S3	5 Undetermined	6	31.6 ± 1.0	NB
N	<i>Normandina pulchella</i>	Rimmed Elf-ear Lichen				S3	5 Undetermined	3	28.3 ± 1.0	NB
N	<i>Cladonia farinacea</i>	Farinose Pixie Lichen				S3	5 Undetermined	5	29.2 ± 1.0	NB
N	<i>Leptogium lichenoides</i>	Tattered Jellyskin Lichen				S3	5 Undetermined	6	32.6 ± 1.0	NB
N	<i>Nephroma bellum</i>	Naked Kidney Lichen				S3	4 Secure	3	20.6 ± 1.0	NB
N	<i>Peltigera degenii</i>	Lustrous Pelt Lichen				S3	5 Undetermined	3	22.8 ± 1.0	NB
N	<i>Usnea strigosa</i>	Bushy Beard Lichen				S3	5 Undetermined	4	33.3 ± 1.0	NB

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)	Prov
N	<i>Leptogium laceroides</i>	Short-bearded Jellyskin Lichen				S3	3 Sensitive	2	23.2 ± 1.0	NB
N	<i>Peltigera membranacea</i>	Membranous Pelt Lichen				S3	5 Undetermined	7	31.6 ± 1.0	NB
N	<i>Cladonia carneola</i>	Crowned Pixie-cup Lichen				S3	5 Undetermined	1	29.2 ± 1.0	NB
N	<i>Cladonia deformis</i>	Lesser Sulphur-cup Lichen				S3	4 Secure	5	25.1 ± 1.0	NB
N	<i>Aulacomnium androgynum</i>	Little Groove Moss				S3?	4 Secure	7	33.0 ± 1.0	NB
N	<i>Bryum amblyodon</i>	a Moss				S3?	4 Secure	1	83.3 ± 3.0	NS
N	<i>Dicranella rufescens</i>	Red Forklet Moss				S3?	5 Undetermined	2	33.1 ± 0.0	NB
N	<i>Rhytidiadelphus loreus</i>	Lanky Moss				S3?	2 May Be At Risk	1	33.0 ± 1.0	NB
N	<i>Sphagnum lescurii</i>	a Peatmoss				S3?	5 Undetermined	6	20.0 ± 0.0	NB
N	<i>Stereocaulon subcoralloides</i>	Coralloid Foam Lichen				S3?	5 Undetermined	1	32.8 ± 1.0	NB
N	<i>Anomodon rugelii</i>	Rugel's Anomodon Moss				S3S4	3 Sensitive	3	83.1 ± 3.0	NS
N	<i>Barbula convoluta</i>	Lesser Bird's-claw Beard Moss				S3S4	4 Secure	1	62.2 ± 15.0	NB
N	<i>Brachythecium velutinum</i>	Velvet Ragged Moss				S3S4	4 Secure	8	19.9 ± 1.0	NB
N	<i>Calliergon giganteum</i>	Giant Spear Moss				S3S4	3 Sensitive	1	94.5 ± 3.0	NS
N	<i>Dicranella cerviculata</i>	a Moss				S3S4	3 Sensitive	3	21.1 ± 2.0	NB
N	<i>Dicranella varia</i>	a Moss				S3S4	4 Secure	1	79.1 ± 3.0	NS
N	<i>Dicranum majus</i>	Greater Broom Moss				S3S4	4 Secure	17	23.1 ± 0.0	NB
N	<i>Dicranum leioneuron</i>	a Dicranum Moss				S3S4	4 Secure	2	24.2 ± 0.0	NB
N	<i>Encalypta ciliata</i>	Fringed Extinguisher Moss				S3S4	3 Sensitive	3	32.9 ± 0.0	NB
N	<i>Fissidens bryoides</i>	Lesser Pocket Moss				S3S4	4 Secure	5	33.2 ± 0.0	NB
N	<i>Helodium blandowii</i>	Wetland-plume Moss				S3S4	4 Secure	1	96.2 ± 3.0	NS
N	<i>Heterocladium dimorphum</i>	Dimorphous Tangle Moss				S3S4	4 Secure	4	26.5 ± 0.0	NB
N	<i>Isopterygiopsis muelleriana</i>	a Moss				S3S4	4 Secure	19	23.1 ± 0.0	NB
N	<i>Myurella julacea</i>	Small Mouse-tail Moss				S3S4	4 Secure	2	32.8 ± 0.0	NB
N	<i>Physcomitrium pyriforme</i>	Pear-shaped Urn Moss				S3S4	3 Sensitive	2	21.5 ± 0.0	NB
N	<i>Pogonatum dentatum</i>	Mountain Hair Moss				S3S4	4 Secure	3	32.8 ± 0.0	NB
N	<i>Sphagnum quinquefarium</i>	Five-ranked Peat Moss				S3S4	4 Secure	1	24.3 ± 0.0	NB
N	<i>Sphagnum torreyanum</i>	a Peatmoss				S3S4	4 Secure	1	32.1 ± 0.0	NB
N	<i>Sphagnum austinii</i>	Austin's Peat Moss				S3S4	4 Secure	1	88.0 ± 0.0	NS
N	<i>Sphagnum contortum</i>	Twisted Peat Moss				S3S4	4 Secure	1	75.6 ± 0.0	NB
N	<i>Splachnum rubrum</i>	Red Collar Moss				S3S4	4 Secure	1	69.8 ± 1.0	NB
N	<i>Tetraphis geniculata</i>	Geniculate Four-tooth Moss				S3S4	4 Secure	14	23.4 ± 1.0	NB
N	<i>Tetraplodon angustatus</i>	Toothed-leaved Nitrogen Moss				S3S4	4 Secure	1	52.3 ± 0.0	NS
N	<i>Weissia controversa</i>	Green-Cushioned Weissia				S3S4	4 Secure	2	33.2 ± 1.0	NB
N	<i>Abietinella abietina</i>	Wiry Fern Moss				S3S4	4 Secure	1	33.1 ± 0.0	NB
N	<i>Trichostomum tenuirostre</i>	Acid-Soil Moss				S3S4	4 Secure	5	24.8 ± 0.0	NB
N	<i>Pannaria rubiginosa</i>	Brown-eyed Shingle Lichen				S3S4	3 Sensitive	2	31.9 ± 1.0	NB
N	<i>Ramalina thrausta</i>	Angelhair Ramalina Lichen				S3S4	5 Undetermined	11	22.3 ± 1.0	NB
N	<i>Hypogymnia vittata</i>	Slender Monk's Hood Lichen				S3S4	4 Secure	22	22.8 ± 1.0	NB
N	<i>Cladonia floerkeana</i>	Gritty British Soldiers Lichen				S3S4	4 Secure	3	19.9 ± 1.0	NB
N	<i>Hypocenomyce friesii</i>	a Lichen				S3S4	5 Undetermined	1	32.6 ± 1.0	NB
N	<i>Melanelia panniformis</i>	Shingled Camouflage Lichen				S3S4	5 Undetermined	4	25.4 ± 1.0	NB
N	<i>Nephroma parile</i>	Powdery Kidney Lichen				S3S4	4 Secure	7	26.5 ± 1.0	NB
N	<i>Protopannaria pezizoides</i>	Brown-gray Moss-shingle Lichen				S3S4	4 Secure	10	31.6 ± 1.0	NB
N	<i>Pseudocyphellaria perpetua</i>	Gilded Specklebelly Lichen				S3S4	3 Sensitive	34	26.5 ± 1.0	NB

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)	Prov
N	<i>Stereocaulon paschale</i>	Easter Foam Lichen				S3S4	5 Undetermined	1	74.2 ± 1.0	NB
N	<i>Pannaria conoplea</i>	Mealy-rimmed Shingle Lichen				S3S4	3 Sensitive	2	54.6 ± 0.0	NS
N	<i>Anaptychia palmulata</i>	Shaggy Fringed Lichen				S3S4	3 Sensitive	8	23.2 ± 1.0	NB
N	<i>Peltigera neopolydactyla</i>	Undulating Pelt Lichen				S3S4	5 Undetermined	8	22.8 ± 1.0	NB
N	<i>Cladonia cariosa</i>	Lesser Ribbed Pixie Lichen				S3S4	4 Secure	3	32.3 ± 1.0	NB
N	<i>Hypocenomyce scalaris</i>	Common Clam Lichen				S3S4	5 Undetermined	1	32.8 ± 1.0	NB
N	<i>Dermatocarpon luridum</i>	Brookside Stippleback Lichen				S3S4	4 Secure	5	22.8 ± 1.0	NB
N	<i>Grimmia anodon</i>	Toothless Grimmia Moss				SH	5 Undetermined	2	84.9 ± 10.0	NB
N	<i>Leucodon brachypus</i>	a Moss				SH	2 May Be At Risk	8	23.0 ± 0.0	NB
N	<i>Splachnum luteum</i>	Yellow Collar Moss				SH	5 Undetermined	1	96.7 ± 100.0	NB
N	<i>Thelia hirtella</i>	a Moss				SH	2 May Be At Risk	1	54.1 ± 100.0	NB
N	<i>Cyrto-hypnum minutulum</i>	Tiny Cedar Moss				SH	2 May Be At Risk	3	38.8 ± 10.0	NB
P	<i>Juglans cinerea</i>	Butternut	Endangered	Endangered	Endangered	S1	1 At Risk	30	17.8 ± 1.0	NB
P	<i>Symphotrichum subulatum</i> (Bathurst pop)	Bathurst Aster - Bathurst pop.	Special Concern	Special Concern	Endangered	S2	1 At Risk	20	97.5 ± 0.0	NB
P	<i>Isoetes prototypus</i>	Prototype Quillwort	Special Concern	Special Concern	Endangered	S2	1 At Risk	5	86.7 ± 0.0	NB
P	<i>Lechea maritima</i> var. <i>subcylindrica</i>	Beach Pinweed	Special Concern			S2	3 Sensitive	38	90.1 ± 0.0	NB
P	<i>Cryptotaenia canadensis</i>	Canada Honewort				S1	2 May Be At Risk	1	21.1 ± 1.0	NB
P	<i>Sanicula trifoliata</i>	Large-Fruited Sanicle				S1	2 May Be At Risk	1	52.8 ± 5.0	NB
P	<i>Antennaria parlinii</i>	a Pussytoes				S1	2 May Be At Risk	5	58.7 ± 1.0	NB
P	<i>Antennaria howellii</i> ssp. <i>petaloidea</i>	Pussy-Toes				S1	2 May Be At Risk	2	87.0 ± 5.0	NB
P	<i>Bidens discoidea</i>	Swamp Beggarticks				S1	2 May Be At Risk	3	79.3 ± 0.0	NB
P	<i>Pseudognaphalium obtusifolium</i>	Eastern Cudweed				S1	2 May Be At Risk	11	43.2 ± 1.0	NB
P	<i>Hieracium paniculatum</i>	Panicled Hawkweed				S1	2 May Be At Risk	5	50.2 ± 0.0	NB
P	<i>Hieracium robinsonii</i>	Robinson's Hawkweed				S1	3 Sensitive	7	24.5 ± 0.0	NB
P	<i>Solidago multiradiata</i>	Multi-rayed Goldenrod				S1	2 May Be At Risk	19	43.8 ± 0.0	NB
P	<i>Cynoglossum virginianum</i> var. <i>boreale</i>	Wild Comfrey				S1	2 May Be At Risk	2	98.4 ± 0.0	NS
P	<i>Cardamine parviflora</i> var. <i>arenicola</i>	Small-flowered Bittercress				S1	2 May Be At Risk	14	63.1 ± 0.0	NS
P	<i>Draba arabisans</i>	Rock Whitlow-Grass				S1	2 May Be At Risk	31	33.6 ± 0.0	NB
P	<i>Draba glabella</i>	Rock Whitlow-Grass				S1	2 May Be At Risk	12	33.0 ± 0.0	NB
P	<i>Minuartia groenlandica</i>	Greenland Stitchwort				S1	2 May Be At Risk	1	98.9 ± 0.0	NB
P	<i>Stellaria crassifolia</i>	Fleshy Stitchwort				S1	2 May Be At Risk	2	74.5 ± 5.0	NB
P	<i>Chenopodium capitatum</i>	Strawberry-blite				S1	2 May Be At Risk	3	45.6 ± 1.0	NB
P	<i>Chenopodium simplex</i>	Maple-leaved Goosefoot				S1	2 May Be At Risk	6	14.5 ± 1.0	NB
P	<i>Suaeda rolandii</i>	Roland's Sea-Blite				S1	3 Sensitive	4	32.4 ± 0.0	NB
P	<i>Triadenum virginicum</i>	Virginia St John's-wort				S1	2 May Be At Risk	2	82.2 ± 0.0	NB
P	<i>Corema conradii</i>	Broom Crowberry				S1	2 May Be At Risk	3	87.1 ± 10.0	NB
P	<i>Vaccinium boreale</i>	Northern Blueberry				S1	2 May Be At Risk	4	47.7 ± 0.0	NS
P	<i>Desmodium glutinosum</i>	Large Tick-Trefoil				S1	2 May Be At Risk	2	88.0 ± 7.0	NS
P	<i>Lespedeza capitata</i>	Round-headed Bush-clover				S1	2 May Be At Risk	7	59.8 ± 0.0	NB
P	<i>Proserpinaca pectinata</i>	Comb-leaved Mermaidweed				S1	2 May Be At Risk	2	78.1 ± 5.0	NS
P	<i>Pycnanthemum virginianum</i>	Virginia Mountain Mint				S1	2 May Be At Risk	4	58.7 ± 0.0	NB

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)	Prov
P	<i>Lysimachia quadrifolia</i>	Whorled Yellow Loosestrife				S1	2 May Be At Risk	14	48.6 ± 0.0	NB
P	<i>Primula laurentiana</i>	Laurentian Primrose				S1	2 May Be At Risk	36	32.9 ± 0.0	NB
P	<i>Ranunculus sceleratus</i>	Cursed Buttercup				S1	2 May Be At Risk	2	91.9 ± 0.0	NB
P	<i>Amelanchier fernaldii</i>	Fernald's Serviceberry				S1	2 May Be At Risk	2	37.0 ± 1.0	NB
P	<i>Crataegus jonesiae</i>	Jones' Hawthorn				S1	2 May Be At Risk	1	67.3 ± 1.0	NB
P	<i>Dryas integrifolia</i>	Entire-leaved Mountain Avens				S1	2 May Be At Risk	14	45.2 ± 0.0	NB
P	<i>Potentilla canadensis</i>	Canada Cinquefoil				S1	5 Undetermined	1	64.3 ± 0.0	NB
P	<i>Waldsteinia fragarioides</i>	Barren Strawberry				S1	2 May Be At Risk	1	69.5 ± 1.0	NB
P	<i>Salix myrtillofolia</i>	Blueberry Willow				S1	2 May Be At Risk	24	46.0 ± 0.0	NB
P	<i>Saxifraga paniculata</i> <i>ssp. neogaea</i>	White Mountain Saxifrage				S1	2 May Be At Risk	29	19.3 ± 1.0	NB
P	<i>Agalinis paupercula</i> <i>var. borealis</i>	Small-flowered Agalinis				S1	2 May Be At Risk	21	63.7 ± 1.0	NB
P	<i>Gratiola aurea</i>	Golden Hedge-Hyssop				S1	3 Sensitive	1	98.9 ± 0.0	NB
P	<i>Viola sagittata</i> <i>var. ovata</i>	Arrow-Leaved Violet				S1	2 May Be At Risk	14	90.6 ± 0.0	NS
P	<i>Alisma subcordatum</i>	Southern Water Plantain				S1	5 Undetermined	1	57.2 ± 0.0	NB
P	<i>Carex annectens</i>	Yellow-Fruited Sedge				S1	2 May Be At Risk	2	80.4 ± 0.0	NB
P	<i>Carex atlantica</i> <i>ssp. atlantica</i>	Atlantic Sedge				S1	2 May Be At Risk	8	31.7 ± 0.0	NB
P	<i>Carex backii</i>	Rocky Mountain Sedge				S1	2 May Be At Risk	3	18.0 ± 0.0	NB
P	<i>Carex merritt-fernalidii</i>	Merritt Fernald's Sedge				S1	2 May Be At Risk	1	19.6 ± 0.0	NB
P	<i>Carex saxatilis</i>	Russet Sedge				S1	2 May Be At Risk	13	65.5 ± 10.0	NB
P	<i>Carex sterilis</i>	Sterile Sedge				S1	2 May Be At Risk	1	27.3 ± 2.0	NB
P	<i>Carex grisea</i>	Inflated Narrow-leaved Sedge				S1	2 May Be At Risk	9	22.4 ± 5.0	NB
P	<i>Cyperus lupulinus</i>	Hop Flatsedge				S1	2 May Be At Risk	6	65.4 ± 0.0	NB
P	<i>Cyperus lupulinus</i> <i>ssp. macilentus</i>	Hop Flatsedge				S1	2 May Be At Risk	16	64.8 ± 0.0	NB
P	<i>Scirpus pendulus</i>	Hanging Bulrush				S1	2 May Be At Risk	6	19.9 ± 0.0	NB
P	<i>Sisyrinchium angustifolium</i>	Narrow-leaved Blue-eyed-grass				S1	2 May Be At Risk	5	87.3 ± 1.0	NB
P	<i>Juncus greenei</i>	Greene's Rush				S1	2 May Be At Risk	2	75.8 ± 0.0	NB
P	<i>Juncus stygius</i> <i>ssp. americanus</i>	Moor Rush				S1	2 May Be At Risk	15	84.5 ± 5.0	NB
P	<i>Juncus subtilis</i>	Creeping Rush				S1	2 May Be At Risk	1	67.1 ± 5.0	NB
P	<i>Allium canadense</i>	Canada Garlic				S1	2 May Be At Risk	1	58.8 ± 0.0	NB
P	<i>Goodyera pubescens</i>	Downy Rattlesnake-Plantain				S1	2 May Be At Risk	5	6.0 ± 0.0	NB
P	<i>Malaxis brachypoda</i>	White Adder's-Mouth				S1	2 May Be At Risk	3	63.1 ± 0.0	NS
P	<i>Platanthera flava</i> <i>var. herbiola</i>	Pale Green Orchid				S1	2 May Be At Risk	3	98.0 ± 10.0	NB
P	<i>Platanthera macrophylla</i>	Large Round-Leaved Orchid				S1	2 May Be At Risk	2	19.6 ± 1.0	NB
P	<i>Bromus pubescens</i>	Hairy Wood Brome Grass				S1	5 Undetermined	6	72.3 ± 0.0	NB
P	<i>Calamagrostis stricta</i> <i>ssp. inexpansa</i>	Slim-stemmed Reed Grass				S1	2 May Be At Risk	1	80.8 ± 1.0	NB
P	<i>Cinna arundinacea</i>	Sweet Wood Reed Grass				S1	2 May Be At Risk	6	49.7 ± 1.0	NB
P	<i>Danthonia compressa</i>	Flattened Oat Grass				S1	2 May Be At Risk	12	17.2 ± 1.0	NB
P	<i>Dichanthelium dichotomum</i>	Forked Panic Grass				S1	2 May Be At Risk	1	64.2 ± 1.0	NB
P	<i>Festuca subverticillata</i>	Nodding Fescue				S1	2 May Be At Risk	8	57.3 ± 1.0	NS
P	<i>Potamogeton friesii</i>	Fries' Pondweed				S1	2 May Be At Risk	13	76.3 ± 0.0	NS
P	<i>Potamogeton nodosus</i>	Long-leaved Pondweed				S1	2 May Be At Risk	2	90.5 ± 5.0	NB
P	<i>Potamogeton strictifolius</i>	Straight-leaved Pondweed				S1	2 May Be At Risk	2	52.0 ± 2.0	NB
P	<i>Xyris difformis</i>	Bog Yellow-eyed-grass				S1	5 Undetermined	3	82.4 ± 0.0	NB
P	<i>Asplenium ruta-muraria</i>	Wallrue Spleenwort				S1	2 May Be At Risk	3	73.6 ± 0.0	NB

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)	Prov
P	<i>var. cryptolepis</i>									
P	<i>Cystopteris laurentiana</i>	Laurentian Bladder Fern				S1	2 May Be At Risk	1	19.6 ± 1.0	NB
P	<i>Dryopteris filix-mas</i>	Male Fern				S1	2 May Be At Risk	2	31.4 ± 1.0	NB
P	<i>Botrychium oneidense</i>	Blunt-lobed Moonwort				S1	2 May Be At Risk	3	86.5 ± 5.0	NB
P	<i>Schizaea pusilla</i>	Little Curlygrass Fern				S1	2 May Be At Risk	9	24.6 ± 0.0	NB
P	<i>Cuscuta campestris</i>	Field Dodder				S1?	2 May Be At Risk	3	60.3 ± 5.0	NB
P	<i>Carex laxiflora</i>	Loose-Flowered Sedge				S1?	5 Undetermined	3	63.1 ± 7.0	NS
P	<i>Wolffia columbiana</i>	Columbian Watermeal				S1?	2 May Be At Risk	3	84.0 ± 0.0	NB
P	<i>Selaginella rupestris</i>	Rock Spikemoss				S1S2	2 May Be At Risk	7	13.7 ± 1.0	NB
P	<i>Thelypteris simulata</i>	Bog Fern				S1S2	2 May Be At Risk	7	65.3 ± 0.0	NB
P	<i>Cuscuta cephalanthi</i>	Buttonbush Dodder				S1S3	2 May Be At Risk	5	74.7 ± 0.0	NB
P	<i>Eriophorum russeolum</i>	Russet Cotton-Grass				S1S3	5 Undetermined	1	79.5 ± 1.0	NB
P	<i>var. albidum</i>									
P	<i>Listera australis</i>	Southern Twayblade			Endangered	S2	1 At Risk	19	73.6 ± 0.0	NB
P	<i>Osmorhiza longistylis</i>	Smooth Sweet Cicely				S2	3 Sensitive	9	75.1 ± 1.0	NS
P	<i>Sanicula odorata</i>	Clustered Sanicle				S2	2 May Be At Risk	4	94.1 ± 2.0	NS
P	<i>Pseudognaphalium macounii</i>	Macoun's Cudweed				S2	3 Sensitive	4	17.6 ± 5.0	NB
P	<i>Symphyotrichum racemosum</i>	Small White Aster				S2	3 Sensitive	6	51.9 ± 5.0	NB
P	<i>Impatiens pallida</i>	Pale Jewelweed				S2	2 May Be At Risk	6	51.6 ± 0.0	NS
P	<i>Alnus serrulata</i>	Smooth Alder				S2	3 Sensitive	8	66.9 ± 0.0	NB
P	<i>Arabis drummondii</i>	Drummond's Rockcress				S2	3 Sensitive	18	14.5 ± 0.0	NB
P	<i>Stellaria longifolia</i>	Long-leaved Starwort				S2	3 Sensitive	12	31.3 ± 0.0	NB
P	<i>Atriplex franktonii</i>	Frankton's Saltbush				S2	4 Secure	4	39.7 ± 1.0	NB
P	<i>Chenopodium rubrum</i>	Red Pigweed				S2	3 Sensitive	9	80.7 ± 0.0	NB
P	<i>Hypericum dissimulatum</i>	Disguised St John's-wort				S2	3 Sensitive	1	66.4 ± 1.0	NB
P	<i>Shepherdia canadensis</i>	Soapberry				S2	3 Sensitive	41	45.2 ± 0.0	NB
P	<i>Astragalus eucosmus</i>	Elegant Milk-vetch				S2	2 May Be At Risk	3	62.6 ± 0.0	NB
P	<i>Oxytropis campestris</i>	Field Locoweed				S2	3 Sensitive	14	62.3 ± 0.0	NB
P	<i>var. johannensis</i>									
P	<i>Quercus macrocarpa</i>	Bur Oak				S2	2 May Be At Risk	41	45.1 ± 1.0	NB
P	<i>Gentiana linearis</i>	Narrow-Leaved Gentian				S2	3 Sensitive	1	80.6 ± 50.0	NB
P	<i>Myriophyllum humile</i>	Low Water Milfoil				S2	3 Sensitive	2	18.0 ± 1.0	NB
P	<i>Proserpinaca palustris</i>	Marsh Mermaidweed				S2	3 Sensitive	3	61.4 ± 0.0	NB
P	<i>var. crebra</i>									
P	<i>Hedeoma pulegioides</i>	American False Pennyroyal				S2	4 Secure	15	17.4 ± 0.0	NB
P	<i>Nuphar lutea</i> ssp. <i>rubrodiscalis</i>	Red-disked Yellow Pond-lily				S2	3 Sensitive	14	55.0 ± 0.0	NB
P	<i>Orobanche uniflora</i>	One-Flowered Broomrape				S2	3 Sensitive	5	61.9 ± 1.0	NB
P	<i>Polygala paucifolia</i>	Fringed Milkwort				S2	3 Sensitive	7	35.3 ± 1.0	NB
P	<i>Polygonum amphibium</i>	Water Smartweed				S2	3 Sensitive	17	54.8 ± 0.0	NB
P	<i>var. emersum</i>									
P	<i>Polygonum careyi</i>	Carey's Smartweed				S2	3 Sensitive	11	59.0 ± 1.0	NB
P	<i>Anemone parviflora</i>	Small-flowered Anemone				S2	3 Sensitive	8	46.8 ± 5.0	NB
P	<i>Hepatica nobilis</i> var. <i>obtusata</i>	Round-lobed Hepatica				S2	3 Sensitive	3	38.9 ± 1.0	NB
P	<i>Ranunculus flabellaris</i>	Yellow Water Buttercup				S2	4 Secure	14	64.6 ± 0.0	NB
P	<i>Crataegus scabrada</i>	Rough Hawthorn				S2	3 Sensitive	10	15.7 ± 1.0	NB
P	<i>Cephalanthus occidentalis</i>	Common Buttonbush				S2	3 Sensitive	19	67.3 ± 0.0	NB
P	<i>Agalinis neoscotica</i>	Nova Scotia Agalinis				S2	3 Sensitive	2	95.0 ± 3.0	NS
P	<i>Euphrasia randii</i>	Rand's Eyebright				S2	2 May Be At Risk	2	33.8 ± 0.0	NB
P	<i>Scrophularia lanceolata</i>	Lance-leaved Figwort				S2	3 Sensitive	6	17.2 ± 1.0	NB

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)	Prov
P	<i>Dirca palustris</i>	Eastern Leatherwood				S2	2 May Be At Risk	1	48.3 ± 1.0	NB
P	<i>Viola novae-angliae</i>	New England Violet				S2	3 Sensitive	3	64.7 ± 0.0	NB
P	<i>Sagittaria calycina</i> var. <i>spongiosa</i>	Long-lobed Arrowhead				S2	4 Secure	41	80.1 ± 0.0	NB
P	<i>Symplocarpus foetidus</i>	Eastern Skunk Cabbage				S2	3 Sensitive	138	59.3 ± 5.0	NB
P	<i>Carex comosa</i>	Bearded Sedge				S2	2 May Be At Risk	10	61.5 ± 1.0	NS
P	<i>Carex granularis</i>	Limestone Meadow Sedge				S2	3 Sensitive	4	21.4 ± 5.0	NB
P	<i>Carex gynocrates</i>	Northern Bog Sedge				S2	3 Sensitive	1	17.2 ± 1.0	NB
P	<i>Carex hirtifolia</i>	Pubescent Sedge				S2	3 Sensitive	4	17.2 ± 5.0	NB
P	<i>Carex livida</i> var. <i>radicaulis</i>	Livid Sedge				S2	3 Sensitive	9	87.4 ± 2.0	NB
P	<i>Carex plantaginea</i>	Plantain-Leaved Sedge				S2	3 Sensitive	1	32.6 ± 0.0	NB
P	<i>Carex prairea</i>	Prairie Sedge				S2	3 Sensitive	2	92.4 ± 1.0	NS
P	<i>Carex rostrata</i>	Narrow-leaved Beaked Sedge				S2	3 Sensitive	1	17.5 ± 0.0	NB
P	<i>Carex salina</i>	Saltmarsh Sedge				S2	3 Sensitive	2	88.9 ± 1.0	NB
P	<i>Carex sprengei</i>	Longbeak Sedge				S2	3 Sensitive	2	25.7 ± 0.0	NB
P	<i>Carex tenuiflora</i>	Sparse-Flowered Sedge				S2	2 May Be At Risk	3	14.9 ± 10.0	NB
P	<i>Carex albicans</i> var. <i>emmonsii</i>	White-tinged Sedge				S2	3 Sensitive	10	32.3 ± 0.0	NB
P	<i>Cyperus squarrosus</i>	Awned Flatsedge				S2	3 Sensitive	29	51.3 ± 1.0	NB
P	<i>Eriophorum gracile</i>	Slender Cottongrass				S2	2 May Be At Risk	44	62.2 ± 10.0	NS
P	<i>Elodea nuttallii</i>	Nuttall's Waterweed				S2	3 Sensitive	3	65.5 ± 0.0	NB
P	<i>Juncus vaseyi</i>	Vasey Rush				S2	3 Sensitive	9	12.9 ± 0.0	NB
P	<i>Allium tricoccum</i>	Wild Leek				S2	2 May Be At Risk	25	16.8 ± 1.0	NB
P	<i>Najas gracillima</i>	Thread-Like Naiad				S2	3 Sensitive	3	78.1 ± 0.0	NB
P	<i>Calypso bulbosa</i> var. <i>americana</i>	Calypso				S2	2 May Be At Risk	4	16.7 ± 5.0	NB
P	<i>Coeloglossum viride</i> var. <i>virescens</i>	Long-bracted Frog Orchid				S2	2 May Be At Risk	6	14.2 ± 0.0	NB
P	<i>Cypripedium parviflorum</i> var. <i>makasin</i>	Small Yellow Lady's-Slipper				S2	2 May Be At Risk	7	63.7 ± 1.0	NB
P	<i>Spiranthes lucida</i>	Shining Ladies'-Tresses				S2	3 Sensitive	8	17.1 ± 1.0	NB
P	<i>Spiranthes ochroleuca</i>	Yellow Ladies'-tresses				S2	2 May Be At Risk	7	48.5 ± 0.0	NS
P	<i>Dichanthelium linearifolium</i>	Narrow-leaved Panic Grass				S2	3 Sensitive	6	29.0 ± 0.0	NB
P	<i>Elymus canadensis</i>	Canada Wild Rye				S2	2 May Be At Risk	2	43.9 ± 1.0	NB
P	<i>Leersia virginica</i>	White Cut Grass				S2	2 May Be At Risk	33	64.6 ± 0.0	NB
P	<i>Piptatherum canadense</i>	Canada Rice Grass				S2	3 Sensitive	4	17.3 ± 10.0	NB
P	<i>Poa glauca</i>	Glaucous Blue Grass				S2	4 Secure	20	25.1 ± 0.0	NB
P	<i>Puccinellia phryganodes</i>	Creeping Alkali Grass				S2	3 Sensitive	2	41.1 ± 0.0	NB
P	<i>Schizachyrium scoparium</i>	Little Bluestem				S2	3 Sensitive	29	56.3 ± 0.0	NB
P	<i>Zizania aquatica</i> var. <i>aquatica</i>	Indian Wild Rice				S2	5 Undetermined	5	45.3 ± 1.0	NB
P	<i>Piptatherum pungens</i>	Slender Rice Grass				S2	2 May Be At Risk	4	20.2 ± 0.0	NB
P	<i>Potamogeton vaseyi</i>	Vasey's Pondweed				S2	3 Sensitive	2	89.2 ± 1.0	NB
P	<i>Asplenium trichomanes</i>	Maidenhair Spleenwort				S2	3 Sensitive	19	20.0 ± 1.0	NB
P	<i>Woodwardia virginica</i>	Virginia Chain Fern				S2	3 Sensitive	5	89.4 ± 0.0	NS
P	<i>Woodsia alpina</i>	Alpine Cliff Fern				S2	3 Sensitive	8	25.4 ± 0.0	NB
P	<i>Lycopodium sitchense</i>	Sitka Clubmoss				S2	3 Sensitive	4	43.9 ± 5.0	NB
P	<i>Selaginella selaginoides</i>	Low Spikemoss				S2	3 Sensitive	9	23.8 ± 5.0	NB
P	<i>Toxicodendron radicans</i>	Poison Ivy				S2?	3 Sensitive	11	47.7 ± 0.0	NB

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)	Prov
P	<i>Symphotrichum novi-belgii</i> var. <i>crenifolium</i>	New York Aster				S2?	5 Undetermined	6	32.3 ± 0.0	NB
P	<i>Humulus lupulus</i> var. <i>lupuloides</i>	Common Hop				S2?	3 Sensitive	2	88.6 ± 5.0	NB
P	<i>Rubus recurvicaulis</i>	Arching Dewberry				S2?	4 Secure	6	38.4 ± 1.0	NB
P	<i>Galium obtusum</i>	Blunt-leaved Bedstraw				S2?	4 Secure	6	49.5 ± 1.0	NB
P	<i>Salix myricoides</i>	Bayberry Willow				S2?	3 Sensitive	2	46.9 ± 1.0	NB
P	<i>Carex vacillans</i>	Estuarine Sedge				S2?	3 Sensitive	1	76.1 ± 0.0	NB
P	<i>Platanthera huronensis</i>	Fragrant Green Orchid				S2?	5 Undetermined	1	57.0 ± 10.0	NS
P	<i>Solidago altissima</i>	Tall Goldenrod				S2S3	4 Secure	3	48.1 ± 0.0	NB
P	<i>Barbarea orthoceras</i>	American Yellow Rocket				S2S3	3 Sensitive	4	19.4 ± 1.0	NB
P	<i>Ceratophyllum echinatum</i>	Prickly Hornwort				S2S3	3 Sensitive	28	42.3 ± 0.0	NB
P	<i>Callitriche hermaphroditica</i>	Northern Water-starwort				S2S3	4 Secure	9	20.2 ± 0.0	NB
P	<i>Elatine americana</i>	American Waterwort				S2S3	3 Sensitive	12	52.0 ± 2.0	NB
P	<i>Bartonia paniculata</i>	Branched Bartonia				S2S3	3 Sensitive	1	71.4 ± 0.0	NS
P	<i>Bartonia paniculata</i> ssp. <i>iodandra</i>	Branched Bartonia				S2S3	3 Sensitive	22	21.0 ± 0.0	NB
P	<i>Geranium robertianum</i>	Herb Robert				S2S3	4 Secure	36	32.2 ± 0.0	NB
P	<i>Myriophyllum quitense</i>	Andean Water Milfoil				S2S3	4 Secure	71	52.0 ± 0.0	NB
P	<i>Epilobium coloratum</i>	Purple-veined Willowherb				S2S3	3 Sensitive	5	71.4 ± 1.0	NS
P	<i>Rumex pallidus</i>	Seabeach Dock				S2S3	3 Sensitive	4	66.8 ± 1.0	NB
P	<i>Rubus pensilvanicus</i>	Pennsylvania Blackberry				S2S3	4 Secure	17	5.4 ± 1.0	NB
P	<i>Galium labradoricum</i>	Labrador Bedstraw				S2S3	3 Sensitive	2	28.7 ± 0.0	NB
P	<i>Carex adusta</i>	Lesser Brown Sedge				S2S3	4 Secure	10	31.2 ± 0.0	NB
P	<i>Corallorhiza maculata</i> var. <i>occidentalis</i>	Spotted Coralroot				S2S3	3 Sensitive	6	6.6 ± 1.0	NB
P	<i>Listera auriculata</i>	Auricled Twayblade				S2S3	3 Sensitive	2	24.8 ± 0.0	NB
P	<i>Spiranthes cernua</i>	Nodding Ladies'-Tresses				S2S3	3 Sensitive	17	45.8 ± 1.0	NB
P	<i>Eragrostis pectinacea</i>	Tufted Love Grass				S2S3	4 Secure	8	23.7 ± 0.0	NB
P	<i>Stuckenia filiformis</i> ssp. <i>alpina</i>	Thread-leaved Pondweed				S2S3	3 Sensitive	8	72.7 ± 0.0	NB
P	<i>Stuckenia pectinata</i>	Sago Pondweed				S2S3	3 Sensitive	69	17.2 ± 5.0	NB
P	<i>Potamogeton praelongus</i>	White-stemmed Pondweed				S2S3	4 Secure	14	55.1 ± 0.0	NB
P	<i>Ophioglossum pusillum</i>	Northern Adder's-tongue				S2S3	3 Sensitive	6	13.5 ± 5.0	NB
P	<i>Panax trifolius</i>	Dwarf Ginseng				S3	3 Sensitive	24	20.0 ± 0.0	NB
P	<i>Artemisia campestris</i>	Field Wormwood				S3	4 Secure	23	31.9 ± 0.0	NB
P	<i>Artemisia campestris</i> ssp. <i>caudata</i>	Field Wormwood				S3	4 Secure	74	31.2 ± 10.0	NB
P	<i>Bidens hyperborea</i>	Estuary Beggarticks				S3	4 Secure	22	71.6 ± 0.0	NB
P	<i>Bidens hyperborea</i> var. <i>hyperborea</i>	Estuary Beggarticks				S3	4 Secure	2	71.2 ± 1.0	NB
P	<i>Erigeron hyssopifolius</i>	Hyssop-leaved Fleabane				S3	4 Secure	47	12.9 ± 0.0	NB
P	<i>Prenanthes racemosa</i>	Glaucous Rattlesnakeroot				S3	4 Secure	49	49.2 ± 0.0	NB
P	<i>Tanacetum bipinnatum</i> ssp. <i>huronense</i>	Lake Huron Tansy				S3	4 Secure	10	56.2 ± 10.0	NB
P	<i>Symphotrichum boreale</i>	Boreal Aster				S3	3 Sensitive	4	28.8 ± 0.0	NB
P	<i>Betula pumila</i>	Bog Birch				S3	4 Secure	18	46.2 ± 0.0	NB
P	<i>Arabis glabra</i>	Tower Mustard				S3	5 Undetermined	1	33.8 ± 0.0	NB
P	<i>Arabis hirsuta</i> var. <i>pycnocarpa</i>	Western Hairy Rockcress				S3	4 Secure	18	14.4 ± 0.0	NB
P	<i>Cardamine maxima</i>	Large Toothwort				S3	4 Secure	24	33.8 ± 0.0	NB
P	<i>Subularia aquatica</i> var. <i>americana</i>	Water Awlwort				S3	4 Secure	2	17.0 ± 0.0	NB

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)	Prov
P	<i>Stellaria humifusa</i>	Saltmarsh Starwort				S3	4 Secure	14	32.2 ± 0.0	NB
P	<i>Hudsonia tomentosa</i>	Woolly Beach-heath				S3	4 Secure	43	84.5 ± 0.0	NB
P	<i>Cornus amomum</i> ssp. <i>obliqua</i>	Pale Dogwood				S3	3 Sensitive	57	55.7 ± 0.0	NB
P	<i>Crassula aquatica</i>	Water Pygmyweed				S3	4 Secure	5	64.8 ± 0.0	NB
P	<i>Rhodiola rosea</i>	Roseroot				S3	4 Secure	36	24.5 ± 0.0	NB
P	<i>Penthorum sedoides</i>	Ditch Stonecrop				S3	4 Secure	37	38.0 ± 1.0	NB
P	<i>Elatine minima</i>	Small Waterwort				S3	4 Secure	7	17.5 ± 0.0	NB
P	<i>Hedysarum alpinum</i>	Alpine Sweet-vetch				S3	4 Secure	2	62.4 ± 0.0	NB
P	<i>Gentianella amarella</i> ssp. <i>acuta</i>	Northern Gentian				S3	4 Secure	3	87.0 ± 0.0	NB
P	<i>Geranium bicknellii</i>	Bicknell's Crane's-bill				S3	4 Secure	17	17.6 ± 5.0	NB
P	<i>Myriophyllum farwellii</i>	Farwell's Water Milfoil				S3	4 Secure	11	18.3 ± 0.0	NB
P	<i>Myriophyllum heterophyllum</i>	Variable-leaved Water Milfoil				S3	4 Secure	49	49.6 ± 0.0	NB
P	<i>Myriophyllum verticillatum</i>	Whorled Water Milfoil				S3	4 Secure	26	22.1 ± 0.0	NB
P	<i>Stachys tenuifolia</i>	Smooth Hedge-Nettle				S3	3 Sensitive	4	62.0 ± 0.0	NB
P	<i>Teucrium canadense</i>	Canada Germander				S3	3 Sensitive	24	75.1 ± 0.0	NB
P	<i>Utricularia radiata</i>	Little Floating Bladderwort				S3	4 Secure	8	93.8 ± 0.0	NB
P	<i>Nuphar lutea</i> ssp. <i>pumila</i>	Small Yellow Pond-lily				S3	4 Secure	18	62.9 ± 0.0	NB
P	<i>Epilobium hornemannii</i>	Hornemann's Willowherb				S3	4 Secure	3	27.2 ± 1.0	NB
P	<i>Epilobium hornemannii</i> ssp. <i>hornemannii</i>	Hornemann's Willowherb				S3	4 Secure	1	26.3 ± 0.0	NB
P	<i>Epilobium strictum</i>	Downy Willowherb				S3	4 Secure	22	42.5 ± 5.0	NB
P	<i>Polygala sanguinea</i>	Blood Milkwort				S3	3 Sensitive	22	31.6 ± 5.0	NB
P	<i>Polygonum arifolium</i>	Halberd-leaved Tearthumb				S3	4 Secure	67	8.7 ± 1.0	NB
P	<i>Polygonum punctatum</i>	Dotted Smartweed				S3	4 Secure	4	70.5 ± 5.0	NB
P	<i>Polygonum punctatum</i> var. <i>confertiflorum</i>	Dotted Smartweed				S3	4 Secure	7	60.5 ± 1.0	NB
P	<i>Polygonum scandens</i>	Climbing False Buckwheat				S3	4 Secure	23	38.4 ± 5.0	NB
P	<i>Littorella uniflora</i>	American Shoreweed				S3	4 Secure	7	51.8 ± 1.0	NB
P	<i>Primula mistassinica</i>	Mistassini Primrose				S3	4 Secure	9	62.0 ± 0.0	NB
P	<i>Samolus valerandi</i> ssp. <i>parviflorus</i>	Seaside Brookweed				S3	4 Secure	64	71.0 ± 0.0	NB
P	<i>Pyrola minor</i>	Lesser Pyrola				S3	4 Secure	5	24.9 ± 1.0	NB
P	<i>Clematis occidentalis</i>	Purple Clematis				S3	4 Secure	11	15.6 ± 0.0	NB
P	<i>Ranunculus gmelinii</i>	Gmelin's Water Buttercup				S3	4 Secure	38	30.7 ± 0.0	NB
P	<i>Thalictrum venulosum</i>	Northern Meadow-rue				S3	4 Secure	67	52.8 ± 0.0	NB
P	<i>Amelanchier canadensis</i>	Canada Serviceberry				S3	4 Secure	16	14.3 ± 1.0	NB
P	<i>Rosa palustris</i>	Swamp Rose				S3	4 Secure	12	15.8 ± 5.0	NB
P	<i>Rubus occidentalis</i>	Black Raspberry				S3	4 Secure	3	49.8 ± 0.0	NB
P	<i>Sanguisorba canadensis</i>	Canada Burnet				S3	4 Secure	15	28.2 ± 0.0	NB
P	<i>Galium boreale</i>	Northern Bedstraw				S3	4 Secure	10	33.0 ± 0.0	NB
P	<i>Salix interior</i>	Sandbar Willow				S3	4 Secure	11	40.2 ± 1.0	NB
P	<i>Salix nigra</i>	Black Willow				S3	3 Sensitive	118	44.0 ± 50.0	NB
P	<i>Salix pedicellaris</i>	Bog Willow				S3	4 Secure	53	17.6 ± 5.0	NB
P	<i>Comandra umbellata</i>	Bastard's Toadflax				S3	4 Secure	14	65.2 ± 10.0	NB
P	<i>Limosella australis</i>	Southern Mudwort				S3	4 Secure	30	70.9 ± 0.0	NB
P	<i>Veronica serpyllifolia</i> ssp. <i>humifusa</i>	Thyme-Leaved Speedwell				S3	4 Secure	10	29.7 ± 0.0	NB
P	<i>Boehmeria cylindrica</i>	Small-spike False-nettle				S3	3 Sensitive	5	78.2 ± 0.0	NB
P	<i>Pilea pumila</i>	Dwarf Clearweed				S3	4 Secure	19	14.5 ± 0.0	NB
P	<i>Viola adunca</i>	Hooked Violet				S3	4 Secure	7	14.4 ± 0.0	NB

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)	Prov
P	<i>Viola nephrophylla</i>	Northern Bog Violet				S3	4 Secure	4	33.4 ± 1.0	NB
P	<i>Carex aquatilis</i>	Water Sedge				S3	4 Secure	20	19.9 ± 0.0	NB
P	<i>Carex arcta</i>	Northern Clustered Sedge				S3	4 Secure	47	17.2 ± 5.0	NB
P	<i>Carex atratiformis</i>	Scabrous Black Sedge				S3	4 Secure	4	87.4 ± 0.0	NB
P	<i>Carex capillaris</i>	Hairlike Sedge				S3	4 Secure	17	24.5 ± 0.0	NB
P	<i>Carex chordorrhiza</i>	Creeping Sedge				S3	4 Secure	68	38.1 ± 0.0	NB
P	<i>Carex conoidea</i>	Field Sedge				S3	4 Secure	19	9.9 ± 1.0	NB
P	<i>Carex eburnea</i>	Bristle-leaved Sedge				S3	4 Secure	2	25.8 ± 0.0	NB
P	<i>Carex exilis</i>	Coastal Sedge				S3	4 Secure	15	31.8 ± 0.0	NB
P	<i>Carex garberi</i>	Garber's Sedge				S3	3 Sensitive	2	63.1 ± 0.0	NB
P	<i>Carex haydenii</i>	Hayden's Sedge				S3	4 Secure	28	56.6 ± 0.0	NB
P	<i>Carex lupulina</i>	Hop Sedge				S3	4 Secure	75	37.9 ± 5.0	NB
P	<i>Carex michauxiana</i>	Michaux's Sedge				S3	4 Secure	22	20.3 ± 0.0	NB
P	<i>Carex ormostachya</i>	Necklace Spike Sedge				S3	4 Secure	6	26.8 ± 0.0	NB
P	<i>Carex rosea</i>	Rosy Sedge				S3	4 Secure	27	14.4 ± 0.0	NB
P	<i>Carex tenera</i>	Tender Sedge				S3	4 Secure	41	14.9 ± 0.0	NB
P	<i>Carex tuckermanii</i>	Tuckerman's Sedge				S3	4 Secure	65	16.5 ± 5.0	NB
P	<i>Carex wiegandii</i>	Wiegand's Sedge				S3	4 Secure	109	9.2 ± 1.0	NB
P	<i>Carex recta</i>	Estuary Sedge				S3	4 Secure	7	32.6 ± 0.0	NB
P	<i>Cyperus dentatus</i>	Toothed Flatsedge				S3	4 Secure	119	50.6 ± 0.0	NB
P	<i>Cyperus esculentus</i>	Perennial Yellow Nutsedge				S3	4 Secure	33	14.4 ± 0.0	NB
P	<i>Eleocharis intermedia</i>	Matted Spikerush				S3	4 Secure	1	5.9 ± 0.0	NB
P	<i>Eleocharis quinqueflora</i>	Few-flowered Spikerush				S3	4 Secure	2	75.5 ± 0.0	NB
P	<i>Rhynchospora capitellata</i>	Small-headed Beakrush				S3	4 Secure	2	32.2 ± 0.0	NB
P	<i>Rhynchospora fusca</i>	Brown Beakrush				S3	4 Secure	21	21.0 ± 0.0	NB
P	<i>Trichophorum clintonii</i>	Clinton's Clubrush				S3	4 Secure	21	24.5 ± 0.0	NB
P	<i>Schoenoplectus fluviatilis</i>	River Bulrush				S3	3 Sensitive	50	49.0 ± 0.0	NB
P	<i>Schoenoplectus torreyi</i>	Torrey's Bulrush				S3	4 Secure	17	47.8 ± 0.0	NB
P	<i>Lemna trisulca</i>	Star Duckweed				S3	4 Secure	27	15.7 ± 1.0	NB
P	<i>Triantha glutinosa</i>	Sticky False-Asphodel				S3	4 Secure	3	63.1 ± 0.0	NB
P	<i>Cypripedium reginae</i>	Showy Lady's-Slipper				S3	3 Sensitive	9	28.9 ± 0.0	NB
P	<i>Liparis loeselii</i>	Loesel's Twayblade				S3	4 Secure	12	24.8 ± 1.0	NB
P	<i>Platanthera blephariglottis</i>	White Fringed Orchid				S3	4 Secure	65	50.1 ± 0.0	NB
P	<i>Platanthera grandiflora</i>	Large Purple Fringed Orchid				S3	3 Sensitive	18	20.7 ± 1.0	NB
P	<i>Bromus latiglumis</i>	Broad-Glumed Brome				S3	3 Sensitive	1	20.8 ± 0.0	NB
P	<i>Calamagrostis pickeringii</i>	Pickering's Reed Grass				S3	4 Secure	10	33.1 ± 0.0	NB
P	<i>Dichanthelium depauperatum</i>	Starved Panic Grass				S3	4 Secure	23	60.5 ± 0.0	NB
P	<i>Heteranthera dubia</i>	Water Stargrass				S3	4 Secure	47	49.9 ± 0.0	NB
P	<i>Potamogeton obtusifolius</i>	Blunt-leaved Pondweed				S3	4 Secure	29	17.5 ± 0.0	NB
P	<i>Potamogeton richardsonii</i>	Richardson's Pondweed				S3	3 Sensitive	20	52.2 ± 0.0	NB
P	<i>Xyris montana</i>	Northern Yellow-Eyed-Grass				S3	4 Secure	41	32.1 ± 0.0	NB
P	<i>Zannichellia palustris</i>	Horned Pondweed				S3	4 Secure	31	39.8 ± 1.0	NB
P	<i>Adiantum pedatum</i>	Northern Maidenhair Fern				S3	4 Secure	2	38.9 ± 1.0	NB
P	<i>Cryptogramma stelleri</i>	Steller's Rockbrake				S3	4 Secure	2	45.9 ± 0.0	NB
P	<i>Asplenium trichomanes-ramosum</i>	Green Spleenwort				S3	4 Secure	21	19.9 ± 1.0	NB
P	<i>Dryopteris fragrans</i> var. <i>remotiuscula</i>	Fragrant Wood Fern				S3	4 Secure	47	19.9 ± 1.0	NB
P	<i>Woodsia glabella</i>	Smooth Cliff Fern				S3	4 Secure	25	23.0 ± 0.0	NB

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)	Prov
P	<i>Equisetum palustre</i>	Marsh Horsetail				S3	4 Secure	2	99.1 ± 5.0	NS
P	<i>Isoetes tuckermanii</i>	Tuckerman's Quillwort				S3	4 Secure	9	21.0 ± 0.0	NB
P	<i>Lycopodium sabinifolium</i>	Ground-Fir				S3	4 Secure	21	26.2 ± 0.0	NB
P	<i>Huperzia appalachiana</i>	Appalachian Fir-Clubmoss				S3	3 Sensitive	25	24.5 ± 0.0	NB
P	<i>Botrychium dissectum</i>	Cut-leaved Moonwort				S3	4 Secure	22	45.5 ± 1.0	NB
P	<i>Botrychium lanceolatum</i> var. <i>angustisegmentum</i>	Lance-Leaf Grape-Fern				S3	3 Sensitive	8	20.5 ± 1.0	
P	<i>Botrychium simplex</i>	Least Moonwort				S3	4 Secure	1	71.6 ± 0.0	NB
P	<i>Polypodium appalachianum</i>	Appalachian Polypody				S3	4 Secure	19	12.8 ± 1.0	NB
P	<i>Utricularia resupinata</i>	Inverted Bladderwort				S3?	4 Secure	7	73.1 ± 1.0	NB
P	<i>Crataegus submollis</i>	Quebec Hawthorn				S3?	3 Sensitive	8	46.9 ± 1.0	NB
P	<i>Mertensia maritima</i>	Sea Lungwort				S3S4	4 Secure	12	31.9 ± 0.0	NB
P	<i>Lobelia kalmii</i>	Brook Lobelia				S3S4	4 Secure	8	53.4 ± 10.0	NB
P	<i>Suaeda calceoliformis</i>	Horned Sea-blite				S3S4	4 Secure	13	51.3 ± 5.0	NB
P	<i>Myriophyllum sibiricum</i>	Siberian Water Milfoil				S3S4	4 Secure	28	44.2 ± 0.0	NB
P	<i>Stachys pilosa</i>	Hairy Hedge-Nettle				S3S4	5 Undetermined	4	65.2 ± 1.0	NB
P	<i>Utricularia gibba</i>	Humped Bladderwort				S3S4	4 Secure	13	71.0 ± 0.0	NB
P	<i>Rumex maritimus</i>	Sea-Side Dock				S3S4	4 Secure	30	45.0 ± 0.0	NB
P	<i>Rumex maritimus</i> var. <i>fueginus</i>	Tierra del Fuego Dock				S3S4	4 Secure	3	49.0 ± 0.0	NB
P	<i>Potentilla arguta</i>	Tall Cinquefoil				S3S4	4 Secure	2	63.1 ± 0.0	NB
P	<i>Rubus chamaemorus</i>	Cloudberry				S3S4	4 Secure	10	24.4 ± 0.0	NB
P	<i>Geocaulon lividum</i>	Northern Comandra				S3S4	4 Secure	10	49.1 ± 1.0	NS
P	<i>Juniperus horizontalis</i>	Creeping Juniper				S3S4	4 Secure	5	36.0 ± 1.0	NB
P	<i>Cladium mariscoides</i>	Smooth Twigrush				S3S4	4 Secure	11	75.7 ± 0.0	NB
P	<i>Eriophorum russeolum</i>	Russet Cottongrass				S3S4	4 Secure	186	24.2 ± 0.0	NB
P	<i>Triglochin gaspensis</i>	Gasp Arrowgrass				S3S4	4 Secure	9	31.7 ± 0.0	NB
P	<i>Spirodela polyrrhiza</i>	Great Duckweed				S3S4	4 Secure	41	39.4 ± 0.0	NB
P	<i>Corallorhiza maculata</i>	Spotted Coralroot				S3S4	3 Sensitive	18	8.7 ± 0.0	NB
P	<i>Calamagrostis stricta</i>	Slim-stemmed Reed Grass				S3S4	4 Secure	11	20.2 ± 0.0	NB
P	<i>Calamagrostis stricta</i> ssp. <i>stricta</i>	Slim-stemmed Reed Grass				S3S4	4 Secure	6	81.3 ± 1.0	NS
P	<i>Distichlis spicata</i>	Salt Grass				S3S4	4 Secure	24	14.8 ± 0.0	NB
P	<i>Potamogeton oakesianus</i>	Oakes' Pondweed				S3S4	4 Secure	21	26.1 ± 0.0	NB
P	<i>Montia fontana</i>	Water Blinks				SH	2 May Be At Risk	3	63.1 ± 0.0	NS
P	<i>Solidago caesia</i>	Blue-stemmed Goldenrod				SX	0.1 Extirpated	2	84.7 ± 1.0	NB
P	<i>Carex swanii</i>	Swan's Sedge				SX	0.1 Extirpated	3	81.2 ± 2.0	NS

5.1 SOURCE BIBLIOGRAPHY (100 km)

The recipient of these data shall acknowledge the ACCDC and the data sources listed below in any documents, reports, publications or presentations, in which this dataset makes a significant contribution.

# recs	CITATION
8359	Morrison, Guy. 2011. Maritime Shorebird Survey (MSS) database. Canadian Wildlife Service, Ottawa, 15939 surveys. 86171 recs.
6900	eBird. 2014. eBird Basic Dataset. Version: EBD_relNov-2014. Ithaca, New York. Nov 2014. Cornell Lab of Ornithology, 25036 recs.
6783	Lepage, D. 2014. Maritime Breeding Bird Atlas Database. Bird Studies Canada, Sackville NB, 407,838 recs.
3441	Erskine, A.J. 1992. Maritime Breeding Bird Atlas Database. NS Museum & Nimbus Publ., Halifax, 82,125 recs.
1852	Pardieck, K.L. & Ziolkowski Jr., D.J.; Hudson, M.-A.R. 2014. North American Breeding Bird Survey Dataset 1966 - 2013, version 2013.0. U.S. Geological Survey, Patuxent Wildlife Research Center <www.pwrc.usgs.gov/BBS/RawData/>.
491	Blaney, C.S.; Mazerolle, D.M.; Belliveau, A.B. 2015. Atlantic Canada Conservation Data Centre Fieldwork 2015. Atlantic Canada Conservation Data Centre, # recs.
455	Blaney, C.S.; Mazerolle, D.M. 2008. Fieldwork 2008. Atlantic Canada Conservation Data Centre. Sackville NB, 13343 recs.

# recs	CITATION
390	Tranquilla, L. 2015. Maritimes Marsh Monitoring Project 2015 data. Bird Studies Canada, Sackville NB, 5062 recs.
383	Benedict, B. Connell Herbarium Specimens. University New Brunswick, Fredericton. 2003.
383	Blaney, C.S.; Mazerolle, D.M. 2009. Fieldwork 2009. Atlantic Canada Conservation Data Centre. Sackville NB, 13395 recs.
347	Clayden, S.R. 1998. NBM Science Collections databases: vascular plants. New Brunswick Museum, Saint John NB, 19759 recs.
300	Belland, R.J. Maritimes moss records from various herbarium databases. 2014.
285	Benedict, B. Connell Herbarium Specimens (Data) . University New Brunswick, Fredericton. 2003.
257	Gravel, Mireille. 2010. Coordonnées GPS et suivi des tortues marquées, 2005-07. Kouchibouguac National Park, 480 recs.
232	Tims, J. & Craig, N. 1995. Environmentally Significant Areas in New Brunswick (NBESA). NB Dept of Environment & Nature Trust of New Brunswick Inc, 6042 recs.
221	Blaney, C.S. & Mazerolle, D.M. 2011. Field data from NCC properties at Musquash Harbour NB & Goose Lake NS. Atlantic Canada Conservation Data Centre, 1739 recs.
208	Clayden, S.R. 2007. NBM Science Collections databases: vascular plants. New Brunswick Museum, Saint John NB, download Mar. 2007, 6914 recs.
205	Blaney, C.S.; Mazerolle, D.M.; Belliveau, A.B. 2013. Atlantic Canada Conservation Data Centre Fieldwork 2013. Atlantic Canada Conservation Data Centre, 9000+ recs.
191	Churchill, J.L.; Klymko, J.D. 2016. Bird Species at Risk Inventory on the Acadia Research Forest, 2016. Atlantic Canada Conservation Data Centre, 1043 recs.
190	Sollows, M.C., 2008. NBM Science Collections databases: mammals. New Brunswick Museum, Saint John NB, download Jan. 2008, 4983 recs.
164	Stewart, J.I. 2010. Peregrine Falcon Surveys in New Brunswick, 2002-09. Canadian Wildlife Service, Sackville, 58 recs.
162	Epworth, W. 2012. Species at Risk records, 2009-11. Fort Folly Habitat Recovery Program, 162 recs.
157	Parks Canada. 2010. Specimens in or near National Parks in Atlantic Canada. Canadian National Museum, 3925 recs.
154	Bagnell, B.A. 2001. New Brunswick Bryophyte Occurrences. B&B Botanical, Sussex, 478 recs.
147	Newell, R.E. 2000. E.C. Smith Herbarium Database. Acadia University, Wolfville NS, 7139 recs.
137	McAlpine, D.F. 1998. NBM Science Collections databases to 1998. New Brunswick Museum, Saint John NB, 241 recs.
135	Brunelle, P.-M. (compiler). 2009. ADIP/MDDS Odonata Database: data to 2006 inclusive. Atlantic Dragonfly Inventory Program (ADIP), 24200 recs.
133	Hinds, H.R. 1986. Notes on New Brunswick plant collections. Connell Memorial Herbarium, unpubl, 739 recs.
131	Sollows, M.C., 2009. NBM Science Collections databases: molluscs. New Brunswick Museum, Saint John NB, download Jan. 2009, 6951 recs (2957 in Atlantic Canada).
121	Klymko, J.J.D. 2014. Maritimes Butterfly Atlas, 2012 submissions. Atlantic Canada Conservation Data Centre, 8552 records.
119	Churchill, J.L.; Klymko, J.D. 2015. Chignecto and Tintamarre National Wildlife Area Bird Surveys 2015. Atlantic Canada Conservation Data Centre, 2238 recs.
113	Bishop, G. & Papoulias, M.; Arnold (Chaplin), M. 2005. Grand Lake Meadows field notes, Summer 2005. New Brunswick Federation of Naturalists, 1638 recs.
110	Blaney, C.S.; Mazerolle, D.M.; Belliveau, A.B. 2014. Atlantic Canada Conservation Data Centre Fieldwork 2014. Atlantic Canada Conservation Data Centre, # recs.
107	Amirault, D.L. & Stewart, J. 2007. Piping Plover Database 1894-2006. Canadian Wildlife Service, Sackville, 3344 recs, 1228 new.
100	Blaney, C.S.; Mazerolle, D.M.; Klymko, J.; Spicer, C.D. 2006. Fieldwork 2006. Atlantic Canada Conservation Data Centre. Sackville NB, 8399 recs.
100	Erskine, A.J. 1999. Maritime Nest Records Scheme (MNRS) 1937-1999. Canadian Wildlife Service, Sackville, 313 recs.
93	Blaney, C.S.; Mazerolle, D.M. 2010. Fieldwork 2010. Atlantic Canada Conservation Data Centre. Sackville NB, 15508 recs.
93	Blaney, C.S.; Spicer, C.D.; Mazerolle, D.M. 2005. Fieldwork 2005. Atlantic Canada Conservation Data Centre. Sackville NB, 2333 recs.
91	Manthorne, A. 2014. MaritimesSwiftwatch Project database 2013-2014. Bird Studies Canada, Sackville NB, 326 recs.
88	Klymko, J.J.D. 2016. 2015 field data. Atlantic Canada Conservation Data Centre.
88	Mazerolle, D.M. 2016. Atlantic Canada Conservation Data Centre Fieldwork 2016. Atlantic Canada Conservation Data Centre, 11311 recs.
85	Blaney, C.S.; Spicer, C.D.; Popma, T.M.; Hanel, C. 2002. Fieldwork 2002. Atlantic Canada Conservation Data Centre. Sackville NB, 2252 recs.
83	Scott, Fred W. 1998. Updated Status Report on the Cougar (Puma Concolor cougar) [Eastern population]. Committee on the Status of Endangered Wildlife in Canada, 298 recs.
82	Newell, R.E. 2005. E.C. Smith Digital Herbarium. E.C. Smith Herbarium, Irving Biodiversity Collection, Acadia University, Web site: http://luxor.acadiu.ca/library/Herbarium/project/ . 582 recs.
78	Benjamin, L.K. (compiler). 2012. Significant Habitat & Species Database. Nova Scotia Dept Natural Resources, 4965 recs.
77	Benedict, B. Connell Herbarium Specimen Database Download 2004. Connell Memorial Herbarium, University of New Brunswick. 2004.
76	Sabine, D.L. 2005. 2001 Freshwater Mussel Surveys. New Brunswick Dept of Natural Resources & Energy, 590 recs.
71	Klymko, J.J.D. 2012. Maritimes Butterfly Atlas, 2010 and 2011 records. Atlantic Canada Conservation Data Centre, 6318 recs.
67	Hicks, Andrew. 2009. Coastal Waterfowl Surveys Database, 2000-08. Canadian Wildlife Service, Sackville, 46488 recs (11149 non-zero).
66	Blaney, C.S. 2000. Fieldwork 2000. Atlantic Canada Conservation Data Centre. Sackville NB, 1265 recs.
62	Robinson, S.L. 2015. 2014 field data.
61	Benjamin, L.K. (compiler). 2007. Significant Habitat & Species Database. Nova Scotia Dept Natural Resources, 8439 recs.
59	Wilhelm, S.I. et al. 2011. Colonial Waterbird Database. Canadian Wildlife Service, Sackville, 2698 sites, 9718 recs (8192 obs).
54	Blaney, C.S. 2016. Atlantic Canada Conservation Data Centre Fieldwork 2016. Atlantic Canada Conservation Data Centre, 6719 recs.
54	Pronych, G. & Wilson, A. 1993. Atlas of Rare Vascular Plants in Nova Scotia. Nova Scotia Museum, Halifax NS, I:1-168, II:169-331. 1446 recs.
54	Sollows, M.C. 2008. NBM Science Collections databases: herpetiles. New Brunswick Museum, Saint John NB, download Jan. 2008, 8636 recs.
52	Mazerolle, D.M. 2005. Bouctouche Irving Eco-Centre rare coastal plant fieldwork results 2004-05. Irving Eco-centre, la Dune du Bouctouche, 174 recs.
50	Belliveau, A.G. 2016. Atlantic Canada Conservation Data Centre Fieldwork 2016. Atlantic Canada Conservation Data Centre, 10695 recs.
48	Spicer, C.D. & Harries, H. 2001. Mount Allison Herbarium Specimens. Mount Allison University, 128 recs.
47	Clayden, S.R. 2012. NBM Science Collections databases: vascular plants. New Brunswick Museum, Saint John NB, 57 recs.
45	Blaney, C.S. 2003. Fieldwork 2003. Atlantic Canada Conservation Data Centre. Sackville NB, 1042 recs.
44	Munro, Marian K. Nova Scotia Provincial Museum of Natural History Herbarium Database. Nova Scotia Provincial Museum of Natural History, Halifax, Nova Scotia. 2013.
41	Wissink, R. 2006. Fundy National Park Digital Database. Parks Canada, 41 recs.
40	Klymko, J.J.D.; Robinson, S.L. 2014. 2013 field data. Atlantic Canada Conservation Data Centre.
38	Goltz, J.P. 2012. Field Notes, 1989-2005. , 1091 recs.

# recs	CITATION
36	Spicer, C.D. 2002. Fieldwork 2002. Atlantic Canada Conservation Data Centre. Sackville NB, 211 recs.
35	Majka, C. 2009. Université de Moncton Insect Collection: Carabidae, Cerambycidae, Coccinellidae. Université de Moncton, 540 recs.
31	McAlpine, D.F. 1998. NBM Science Collections: Wood Turtle records. New Brunswick Museum, Saint John NB, 329 recs.
31	Speers, L. 2008. Butterflies of Canada database: New Brunswick 1897-1999. Agriculture & Agri-Food Canada, Biological Resources Program, Ottawa, 2048 recs.
30	Cowie, F. 2007. Electrofishing Population Estimates 1979-98. Canadian Rivers Institute, 2698 recs.
27	Blaney, C.S.; Mazerolle, D.M.; Oberndorfer, E. 2007. Fieldwork 2007. Atlantic Canada Conservation Data Centre. Sackville NB, 13770 recs.
27	Tingley, S. (compiler). 2001. Butterflies of New Brunswick. , Web site: www.geocities.com/Yosemite/8425/butterfly. 142 recs.
26	Blaney, C.S.; Mazerolle, D.M. 2012. Fieldwork 2012. Atlantic Canada Conservation Data Centre, 13,278 recs.
26	Kennedy, Joseph. 2010. New Brunswick Peregrine records, 2009. New Brunswick Dept Natural Resources, 19 recs (14 active).
25	Hinds, H.R. 1999. Connell Herbarium Database. University New Brunswick, Fredericton, 131 recs.
25	Thomas, A.W. 1996. A preliminary atlas of the butterflies of New Brunswick. New Brunswick Museum.
24	Amirault, D.L. & McKnight, J. 2003. Piping Plover Database 1991-2003. Canadian Wildlife Service, Sackville, unpublished data. 7 recs.
24	Blaney, C.S.; Mazerolle, D.M. 2011. Fieldwork 2011. Atlantic Canada Conservation Data Centre. Sackville NB.
24	Roland, A.E. & Smith, E.C. 1969. The Flora of Nova Scotia, 1st Ed. Nova Scotia Museum, Halifax, 743pp.
23	Coursol, F. 2005. Dataset from New Brunswick fieldwork for <i>Eriocaulon parkeri</i> COSEWIC report. Coursol, Pers. comm. to C.S. Blaney, Aug 26. 110 recs.
23	Cowie, Faye. 2007. Surveyed Lakes in New Brunswick. Canadian Rivers Institute, 781 recs.
23	Doucet, D.A. 2007. Lepidopteran Records, 1988-2006. Doucet, 700 recs.
23	Pike, E., Tingley, S. & Christie, D.S. 2000. Nature NB Listserv. University of New Brunswick, listserv.unb.ca/archives/naturenb. 68 recs.
23	Sollows, M.C., 2009. NBM Science Collections databases: Coccinellid & Cerambycid Beetles. New Brunswick Museum, Saint John NB, download Feb. 2009, 569 recs.
23	Webster, R.P. 2004. Lepidopteran Records for National Wildlife Areas in New Brunswick. Webster, 1101 recs.
22	Mills, E. Connell Herbarium Specimens, 1957-2009. University New Brunswick, Fredericton. 2012.
19	Donell, R. 2008. Rare plant records from rare coastal plant project. Bouctouche Dune Irving Eco-centre. Pers. comm. to D.M. Mazerolle, 50 recs.
19	Doucet, D.A. & Edsall, J.; Brunelle, P.-M. 2007. Miramichi Watershed Rare Odonata Survey. New Brunswick ETF & WTF Report, 1211 recs.
18	Blaney, C.S & Spicer, C.D.; Popma, T.M.; Basquill, S.P. 2003. Vascular Plant Surveys of Northumberland Strait Rivers & Amherst Area Peatlands. Nova Scotia Museum Research Grant, 501 recs.
18	Canadian Wildlife Service, Dartmouth. 2010. Piping Plover censuses 2007-09, 304 recs.
18	Doucet, D.A. 2008. Fieldwork 2008: Odonata. ACCDC Staff, 625 recs.
18	McAlpine, D.F. 1983. Status & Conservation of Solution Caves in New Brunswick. New Brunswick Museum, Publications in Natural Science, no. 1, 28pp.
18	Zinck, M. & Roland, A.E. 1998. Roland's Flora of Nova Scotia. Nova Scotia Museum, 3rd ed., rev. M. Zinck; 2 Vol., 1297 pp.
17	Scott, F.W. 2002. Nova Scotia Herpetofauna Atlas Database. Acadia University, Wolfville NS, 8856 recs.
16	Bateman, M.C. 2001. Coastal Waterfowl Surveys Database, 1965-2001. Canadian Wildlife Service, Sackville, 667 recs.
16	Benedict, B. Connell Herbarium Specimens, Digital photos. University New Brunswick, Fredericton. 2005.
16	Caissie, A. Herbarium Records. Fundy National Park, Alma NB. 1961-1993.
16	Edsall, J. 2001. Lepidopteran records in New Brunswick, 1997-99. , Pers. comm. to K.A. Bredin. 91 recs.
16	Layberry, R.A. & Hall, P.W., LaFontaine, J.D. 1998. The Butterflies of Canada. University of Toronto Press. 280 pp+plates.
15	Klymko, J.J.D. 2016. 2014 field data. Atlantic Canada Conservation Data Centre.
15	Robinson, S.L. 2010. Fieldwork 2009 (dune ecology). Atlantic Canada Conservation Data Centre. Sackville NB, 408 recs.
14	Churchill, J.L., Klymko, J.D.D. 2016. Atlantic Canada Conservation Data Centre Fieldwork 2016. Atlantic Canada Conservation Data Centre.
13	Downes, C. 1998-2000. Breeding Bird Survey Data. Canadian Wildlife Service, Ottawa, 111 recs.
13	Klymko, J.J.D.; Robinson, S.L. 2012. 2012 field data. Atlantic Canada Conservation Data Centre, 447 recs.
13	Speers, L. 2001. Butterflies of Canada database. Agriculture & Agri-Food Canada, Biological Resources Program, Ottawa, 190 recs.
13	Wissink, R. 2000. Rare Plants of Fundy: maps. Parks Canada, 20 recs.
12	Blaney, C.S.; Spicer, C.D.; Rothfels, C. 2004. Fieldwork 2004. Atlantic Canada Conservation Data Centre. Sackville NB, 1343 recs.
12	Webster, R.P. & Edsall, J. 2007. 2005 New Brunswick Rare Butterfly Survey. Environmental Trust Fund, unpublished report, 232 recs.
11	Blaney, C.S.; Spicer, C.D. 2001. Fieldwork 2001. Atlantic Canada Conservation Data Centre. Sackville NB, 981 recs.
11	Bredin, K.A. 2001. WTF Project: Freshwater Mussel Fieldwork in Freshwater Species data. Atlantic Canada Conservation Data Centre, 101 recs.
11	Wood Turtle (<i>Glyptemys insculpta</i>) Miramichi Watershed Synopsis 2013 Compiled by: Vladimir King Trajkovic, EPT Miramichi River Environmental Assessment Committee
10	Blaney, C.S. Miscellaneous specimens received by ACCDC (botany). Various persons. 2001-08.
10	Clayden, S.R. 2005. Confidential supplement to Status Report on Ghost Antler Lichen (<i>Pseudevernia cladonia</i>). Committee on the Status of Endangered Wildlife in Canada, 27 recs.
10	Hall, R.A. 2003. NS Freshwater Mussel Fieldwork. Nova Scotia Dept Natural Resources, 189 recs.
9	Godbout, V. 2002. SAR Inventory: Birds in Fort Beauséjour NHS. Parks Canada, Atlantic, SARINV02-01. 202 recs.
9	Hall, R.A. 2001. S.. NS Freshwater Mussel Fieldwork. Nova Scotia Dept Natural Resources, 178 recs.
9	Kennedy, Joseph. 2010. New Brunswick Peregrine records, 2010. New Brunswick Dept Natural Resources, 16 recs (11 active).
8	Basquill, S.P. 2003. Fieldwork 2003. Atlantic Canada Conservation Data Centre, Sackville NB, 69 recs.
8	Hinds, H.R. 1992. Rare Vascular Plants of Fundy National Park. , 10 recs.
8	Hinds, H.R. 1997. Vascular Plants of Cocagne Island. , 14 recs.
8	Webster, R.P. 2006. Survey for Suitable Salt Marshes for the Maritime Ringlet, New Populations of the Cobblestone Tiger Beetle, & New Localities of Three Rare Butterfly Species. New Brunswick WTF Report, 28 recs.

# recs	CITATION
7	Benedict, B. Connell Herbarium Specimens. University New Brunswick, Fredericton. 2000.
7	Popma, T.M. 2003. Fieldwork 2003. Atlantic Canada Conservation Data Centre. Sackville NB, 113 recs.
6	Bateman, M.C. 2000. Waterfowl Brood Surveys Database, 1990-2000 . Canadian Wildlife Service, Sackville, unpublished data. 149 recs.
6	Elward, D. 2017. 2015-2016 Freshwater Mussel Inventories in the Bouctouche Watershed. Southeastern Anglers Association, 6 recs.
6	Oldham, M.J. 2000. Oldham database records from Maritime provinces. Oldham, M.J; ONHIC, 487 recs.
6	Tremblay, E. 2001. Kouchibouguacis River Freshwater Mussel Data. Parks Canada, Kouchibouguac NP, 45 recs.
6	Tremblay, E. 2006. Kouchibouguac National Park Digital Database. Parks Canada, 105 recs.
5	Amirault, D.L. 2000. Piping Plover Surveys, 1983-2000. Canadian Wildlife Service, Sackville, unpublished data. 70 recs.
5	Edsall, J. 2007. Personal Butterfly Collection: specimens collected in the Canadian Maritimes, 1961-2007. J. Edsall, unpubl. report, 137 recs.
5	Hauglian, S.R. 2018. Description of <i>Fuscopannaria leucosticta</i> field work in 2017 . New Brunswick Museum, 314 recs.
5	Litvak, M.K. 2001. Shortnose Sturgeon records in four NB rivers. UNB Saint John NB. Pers. comm. to K. Bredin, 6 recs.
5	Mazerolle, D. 2003. Assessment of Seaside Pinweed (<i>Lechea maritima</i> var. <i>subcylindrica</i>) in Southeastern New Brunswick. Irving Eco-centre, la Dune du Bouctouche, 18 recs.
4	Chaput, G. 2002. Atlantic Salmon: Maritime Provinces Overview for 2001. Dept of Fisheries & Oceans, Atlantic Region, Science Stock Status Report D3-14. 39 recs.
4	Goltz, J.P. & Bishop, G. 2005. Confidential supplement to Status Report on Prototype Quillwort (<i>Isoetes prototypus</i>). Committee on the Status of Endangered Wildlife in Canada, 111 recs.
4	Goltz, J.P. 2002. Botany Ramblings: 1 July to 30 September, 2002. N.B. Naturalist, 29 (3):84-92. 7 recs.
4	Gravel, Mireille. 2010. Coordonnées des tortues des bois Salmon River Road, 2005. Kouchibouguac National Park, 4 recs.
4	Hicklin, P.W. 1995. The Maritime Shorebird Survey Newsletter. Calidris, No. 3. 6 recs.
4	Klymko, J.J.D. 2012. Insect fieldwork & submissions, 2011. Atlantic Canada Conservation Data Centre. Sackville NB, 760 recs.
4	Olsen, R. Herbarium Specimens. Nova Scotia Agricultural College, Truro. 2003.
4	Popma, K. 2001. Phalarope & other bird observations in Westmorland Co. , Pers. comm. to K.A. Bredin. 5 recs.
3	Benjamin, L.K. 2011. NSDNR fieldwork & consultant reports 1997, 2009-10. Nova Scotia Dept Natural Resources, 85 recs.
3	Bishop, G. 2012. Field data from September 2012 Anticosti Aster collection trip. , 135 rec.
3	Clayden, S.R. 2006. <i>Pseudevernia cladonia</i> records. NB Museum. Pers. comm. to S. Blaney, Dec, 4 recs.
3	Doucet, D.A. & Edsall, J. 2007. <i>Ophiogomphus howei</i> records. Atlantic Canada Conservation Data Centre, Sackville NB, 21 recs.
3	Forbes, G. 2001. Bog Lemming, Phalarope records, NB. , Pers. comm. to K.A. Bredin. 6 recs.
3	Gautreau-Daigle, H. 2007. Rare plant records from peatland surveys. Coastal Zones Research Institute, Shippagan NB. Pers. comm. to D.M. Mazerolle, 39 recs.
3	Klymko, J.J.D. 2012. Insect field work & submissions. Atlantic Canada Conservation Data Centre, 852 recs.
3	Lautenschlager, R.A. 2005. Survey for Species at Risk on the Canadian Forest Service's Acadia Research Forest near Fredericton, New Brunswick. Atlantic Canada Conservation Data Centre, 6. 3 recs.
3	Marshall, L. 1998. Atlantic Salmon: Southwest New Brunswick outer-Fundy SFA 23. Dept of Fisheries & Oceans, Atlantic Region, Science. Stock Status Report D3-13. 6 recs.
3	Neily, T.H. 2013. Email communication to Sean Blaney regarding <i>Listera australis</i> observations made from 2007 to 2011 in Nova Scotia. , 50.
3	Nye, T. 2002. Wood Turtle observations in Westmorland, Queens Cos. , Pers. com. to S.H. Gerriets, Dec. 3. 3 recs.
3	Powell, B.C. 1967. Female sexual cycles of <i>Chrysemy spicta</i> & <i>Clemmys insculpta</i> in Nova Scotia. Can. Field-Nat., 81:134-139. 26 recs.
2	Adams, J. & Herman, T.B. 1998. Thesis, Unpublished map of <i>C. insculpta</i> sightings. Acadia University, Wolfville NS, 88 recs.
2	Bagnell, B.A. 2003. Update to New Brunswick Rare Bryophyte Occurrences. B&B Botanical, Sussex, 5 recs.
2	Basquill, S.P. 2011 vascular plant field data. Nova Scotia Department of Natural Resources, 37 recs.
2	Benjamin, L.K. 2009. NSDNR Fieldwork & Consultants Reports. Nova Scotia Dept Natural Resources, 143 recs.
2	Blaney, C.S. 1999. Fieldwork 1999. Atlantic Canada Conservation Data Centre. Sackville NB, 292 recs.
2	Christie, D.S. 2000. Christmas Bird Count Data, 1997-2000. Nature NB, 54 recs.
2	Cronin, P. & Ayer, C.; Dubee, B.; Hooper, W.C.; LeBlanc, E.; Madden, A.; Pettigrew, T.; Seymour, P. 1998. Fish Species Management Plans (draft). NB DNRE Internal Report. Fredericton, 164pp.
2	Daury, R.W. & Bateman, M.C. 1996. The Barrow's Goldeneye (<i>Bucephala islandica</i>) in the Atlantic Provinces and Maine. Canadian Wildlife Service, Sackville, 47pp.
2	Dept of Fisheries & Oceans. 1999. Status of Wild Striped Bass, & Interaction between Wild & Cultured Striped Bass in the Maritime Provinces. , Science Stock Status Report D3-22. 13 recs.
2	Donelle, R. 2007. Bouctouche Dune Rare Coastal Plant Data. Irving Eco-centre, la Dune du Bouctouche, 2 recs.
2	Doucet, D.A. 2008. Wood Turtle Records 2002-07. Pers. comm. to S. Gerriets, 7 recs, 7 recs.
2	Edsall, J. 1992. Summer 1992 Report. New Brunswick Bird Info Line, 2 recs.
2	Edsall, J. 1993. Spring 1993 Report. New Brunswick Bird Info Line, 3 recs.
2	Layberry, R.A. 2012. Lepidopteran records for the Maritimes, 1974-2008. Layberry Collection, 1060 recs.
2	Mazerolle, M.J., Drolet, B., & Desrochers, A. 2001. Small Mammal Responses to Peat Mining of Southeastern Canadian Bogs. Can. J. Zool., 79:296-302. 21 recs.
2	Munro, Marian K. Nova Scotia Provincial Museum of Natural History Herbarium Database. Nova Scotia Provincial Museum of Natural History, Halifax, Nova Scotia. 2014.
2	Sabine, D.L. 2012. Bronze Copper records, 2003-06. New Brunswick Dept of Natural Resources, 5 recs.
2	Sabine, D.L. 2013. Dwaine Sabine butterfly records, 2009 and earlier.
2	Shafer, A.B.A., D.T. Stewart. 2006. A Disjunct Population of <i>Sorex dispar</i> (Long-Tailed Shrew) in Nova Scotia. Northeastern Naturalist, 13(4): 603-608.
2	Standley, L.A. 2002. <i>Carex haydenii</i> in Nova Scotia. , Pers. comm. to C.S. Blaney. 4 recs.
2	Toner, M. 2001. Lynx Records 1973-2000. NB Dept of Natural Resources, 29 recs.
1	Amiro, Peter G. 1998. Atlantic Salmon: Inner Bay of Fundy SFA 22 & part of SFA 23. Dept of Fisheries & Oceans, Atlantic Region, Science Stock Status Report D3-12. 4 recs.
1	Belliveau, A.G. 2014. Plant Records from Southern and Central Nova Scotia. Atlantic Canada Conservation Data Centre, 919 recs.
1	Blaney, C.S. 2014. 2014 Bank Swallow colony observation, Westcock, NB. Atlantic Canada Conservation Data Centre.
1	Bouchard, A. Herbar Marie-Victorin. Universite de Montreal, Montreal QC. 1999.

# recs	CITATION
1	Boyne, A.W. 2000. Tern Surveys. Canadian Wildlife Service, Sackville, unpublished data. 168 recs.
1	Bredin, K.A. 2000. NB & NS Bog Project, fieldwork. Atlantic Canada Conservation Data Centre, Sackville, 1 rec.
1	Bredin, K.A. 2001. NB Freshwater Mussel Fieldwork. Atlantic Canada Conservation Data Centre, 16 recs.
1	Bredin, K.A. 2002. NB Freshwater Mussel Fieldwork. Atlantic Canada Conservation Data Centre, 30 recs.
1	Cameron, R.P. 2009. <i>Erioderma pedicellatum</i> database, 1979-2008. Dept Environment & Labour, 103 recs.
1	Chaput, G. 1999. Atlantic Salmon: Miramichi & SFA 16 Rivers. Dept of Fisheries & Oceans, Atlantic Region, Science Stock Status Report D3-05. 6 recs.
1	Clavette, A., and others. 2013. Peregrine Falcon nesting information from NatureNB listserv. NatureNB.
1	Crowell, M.J. Plant specimens from Nictaux, NS sent to Sean Blaney for identification. Jacques Whitford Limited. 2005.
1	Dadswell, M.J. 1979. Status Report on Shortnose Sturgeon (<i>Acipenser brevirostrum</i>) in Canada. Committee on the Status of Endangered Wildlife in Canada, 15 pp.
1	Doucet, D.A. 2007. Fieldwork 2007: Insects (minus Odonata). ACCDC Staff, 1 rec.
1	Edsall, J. 1993. Summer 1993 Report. New Brunswick Bird Info Line, 2 recs.
1	Edsall, J. 2007. Lepidopteran Records from Halls Creek, 1994-2000. Edsall, 43 recs.
1	Gerriets, S.H. 1997-2001. Element Occurrence Database. Atlantic Canada Conservation Data Centre, Sackville NB, 1 rec.
1	Godbout, V. 2000. Recherche de l'Aster du St-Laurent (<i>Aster laurentianus</i>) et du Satyre des Maritimes (<i>Coenonympha nepisiquit</i>) au Parc national Kouchibouguac et a Dune du Bouctouche, N-B. Irving Eco-centre, 23 pp.
1	Godbout, V. 2001. Recherche de l'Aster du St-Laurent (<i>Symphotrichum laurentianum</i>) dans les marais sales du sud-est du Nouveau-Brunswick. Irving Eco-centre, la Dune du Bouctouche, 23 pp.
1	Goltz, J.P. 2001. Botany Ramblings April 29-June 30, 2001. N.B. Naturalist, 28 (2): 51-2. 8 recs.
1	Hill, N.M. 1994. Status report on the Long's bulrush <i>Scirpus longii</i> in Canada. Committee on the Status of Endangered Wildlife in Canada, 7 recs.
1	Hinds, H.R. 2000. Rare plants of Fundy in Rare Plants of Fundy: maps. Wissink, R. (ed.) Parks Canada, 2 recs.
1	Jessop, B. 2004. <i>Acipenser oxyrinchus</i> locations. Dept of Fisheries & Oceans, Atlantic Region, Pers. comm. to K. Bredin. 1 rec.
1	Kirkland, G.L. Jr. & Schmidt, D.F. 1982. Abundance, habitat, reproduction & morphology of forest-dwelling small mammals of NS & south-eastern NB. <i>Can. Field-Nat.</i> , 96(2): 156-162. 1 rec.
1	Kirkland, G.L. Jr., Schmidt, D.F. & Kirkland, C.J. 1979. First record of the long-tailed shrew (<i>Sorex dispar</i>) in New Brunswick. <i>Can. Field-Nat.</i> , 93: 195-198. 1 rec.
1	Klymko, J.J.D. 2010. Miscellaneous observations reported to ACCDC (zoology). Pers. comm. from various persons, 3 recs.
1	LaFlamme, C. 2008. Discovery of <i>Goodyera pubescens</i> at Springdale, NB. Amec Earth and Environmental. Pers. comm. to D.M. Mazerolle, 1 rec.
1	Loo, J. & MacDougall, A. 1994. GAP analysis: Summary Report. Fundy Model Forest, 2 recs.
1	MacKinnon, D.S. 2013. Email report of Peregrine Falcon nest E of St. Martins NB. NS Department of Environment and Labour, 1 record.
1	Madden, A. 1998. Wood Turtle records in northern NB. New Brunswick Dept of Natural Resources & Energy, Campbellton, Pers. comm. to S.H. Gerriets. 16 recs.
1	McAlpine, D.F. & Collingwood, L. 1989. Rare Salamander Survey in Fundy National Park. Fundy National Park, Internal Documents, 1 rec.
1	McAlpine, D.F. & Cox, S.L., McCabe, D.A., Schnare, J.-L. 2004. Occurrence of the Long-tailed Shrew (<i>Sorex dispar</i>) in the Nerepis Hills NB. <i>Northeastern Naturalist</i> , vol 11 (4) 383-386. 1 rec.
1	McAlpine, D.F. 1983. Species Record Cards. Fundy National Park, Library, 1 rec.
1	Miller, D.G. 2013. Peregrine Falcon nesting information from birdingnewbrunswick.ca . birdingnewbrunswick.ca .
1	Morrison, Annie. 2010. NCC Properties Fieldwork: June-August 2010. Nature Conservancy Canada, 508 recs.
1	Neily, T.H. & Pepper, C.; Toms, B. 2013. Nova Scotia lichen location database. Mersey Tobeatic Research Institute, 1301 records.
1	Pliissner, J.H. & Haig, S.M. 1997. 1996 International piping plover census. US Geological Survey, Corvallis OR, 231 pp.
1	Poirier, Nelson. 2012. <i>Geranium robertianum</i> record for NB. Pers. comm. to S. Blaney, Sep. 6, 1 rec.
1	Porter, C.J.M. 2014. Field work data 2007-2014. Nova Scotia Nature Trust, 96 recs.
1	Sabine, D.L. & Goltz, J.P. 2006. Discovery of <i>Utricularia resupinata</i> at Little Otter Lake, CFB Gagetown. Pers. comm. to D.M. Mazerolle, 1 rec.
1	Smith, M. 2013. Email to Sean Blaney regarding <i>Schizaea pusilla</i> at Caribou Plain Bog, Fundy NP. pers. comm., 1 rec.
1	Spicer, C.D. 2004. Specimens from CWS Herbarium, Mount Allison Herbarium Database. Mount Allison University, 5939 recs.
1	Steeves, R. 2004. <i>Goodyera pubescens</i> occurrence from Colpitts Brook, Albert Co., Pers. comm. to C.S. Blaney. 1 rec.
1	Toner, M. 2005. <i>Listera australis</i> population at Bull Pasture Plains. NB Dept of Natural Resources. Pers. comm. to S. Blaney, 8 recs.
1	Wissink, R. 2000. Four-toed Salamander Survey results, 2000. Fundy National Park, Internal Documents, 1 rec.

References

Atlantic Canada Conservation Data Centre (ACDC). 2018. Data Report 6011: Sussex East, NB.

BSC (Bird Studies Canada). 2010. Second Atlas of Breeding Birds of the Maritime Provinces. Available at <https://www.mba-aom.ca/jsp/summaryform.jsp?squareID=20LR27&start=1&lang=en> Accessed July 2018.

BSC (Bird Studies Canada). 2018. Important Bird Areas of New Brunswick. Available at <https://www.ibacanada.ca/mapviewer.jsp?lang=EN> Accessed July 2018.

Christie, D., Dalzell B.E., David M/, Doiron R., Gibson D.G., Lushington M.H., Pearce P.A., Tingley S.I., Wilson J.G. . 2004. In: Birds of New Brunswick: An Annotated List. The New Brunswick Museum. Saint John, NB.

CWS (Canadian Wildlife Service). 2007a. Recommended Protocols for Monitoring Impacts of Wind Turbines on Birds. 33p.

CWS (Canadian Wildlife Services). 2007b. Wind Turbines and Birds: A guidance Document for Environmental Assessment. 45p.

Dillon Consulting. 2018a. Wocawson Energy Project. Wildlife and Wildlife Habitat Summary Report (Draft).

Dillon Consulting. 2018b. Wocawson Energy Project. Vegetation Summary Report (Draft).

Dillon Consulting. 2018c. Wocawson Energy Project. Aquatic Habitat and Wetlands Summary Report (Draft).

ECCC (Environment and Climate Change Canada). 2017. Management Plan for the Peregrine Falcon *anatum/tundrius* (*Falco peregrinus anatum/tundrius*) in Canada. Species at Risk Act Management Plan Series. Environment and Climate Change Canada, Ottawa. iv + 28 pp.

ECCC (Environment and Climate Change Canada). 2018a. General Nesting Periods for Migratory Birds. Available at <https://www.canada.ca/en/environment-climate-change/services/avoiding-harm-migratory-birds/general-nesting-periods.html> Accessed July 2018

ECCC (Environment and Climate Change Canada). 2018b. Species at Risk Public Registry. Available at http://www.sararegistry.gc.ca/sar/index/default_e.cfm

ECCC (Environment and Climate Change Canada). 2018c. Canadian Nightjar Survey Protocol. 2018. Accessed at: <http://wildresearch.ca/wp-content/uploads/2015/10/National-Nightjar-Survey-Protocol-WildResearch.pdf>

Ecological Reserves in Canada. Historica Canada. 2013. Accessed from:

<https://www.thecanadianencyclopedia.ca/en/article/ecological-reserve/>

Erickson W.P., Wolfe M.W., Bay K.J., Johnson D.H., Gehring J.L., Brigham R.M. 2014. A comprehensive analysis of small-passerine fatalities from collision with turbines at wind energy facilities. PLoS One. 9(9): e107491.

Government of Canada. 2018. Canadian Climate Normals (1981-2010) – Fredericton A, New Brunswick, Government of Canada Website, Available at <http://www.climate.weatheroffice.ec.gc.ca>.

Horton K.G., Van Doren B.M., Stephanin P.M., Hochachka W.M., Farnsworth A., Kelly J.F. 2016. Nocturnally migrating songbirds drift when they can and compensate when they must. *Scientific reports*: 21249.

Kingsley A., Whittam B. 2005. Wind Turbines and Birds: A Background Review for Environmental Assessment. Prepared for Environment Canada. Available at: <https://tethys.pnnl.gov/sites/default/files/publications/Kingsley-2005.pdf>

Mabee T.J., Cooper B.A., Plissner J.H., Young D.P. Nocturnal Bird Migration over an Appalachian Ridge at a Proposed Wind Power Project. *Wildlife Society Bulletin*. 34: 686-690.

McCrary, M. D., McKernan R. L., Wagner W.D., Landry R.E., and Schreiber R.W. 1983. Nocturnal avian migration assessment of the San Gorgonio wind resource study area, spring 1982. Report 83-RD-108 for Southern California Edison Co., Research and Development Division Los Angeles, California, USA.

Muin'iskw. 2016. THE LEGACY OF MUIN'ISKW - SIGNIFICANCE OF THE EAGLE FEATHER. Available at <http://www.muiniskw.org/pgAuthors.htm> Accessed July 2018.

Natural Forces. 2018. Wocawson Energy Project – Project Description.

Nature Trust of New Brunswick. 2018. Environmentally Significant Areas. Accessed at: <http://www.naturetrust.nb.ca/wp/blog/environmentally-significant-areas/>

NBDELG (New Brunswick Department of Environment and Local Government). 2018. A Guide to Environmental Impact Assessment in New Brunswick. Available at: <http://www.gnb.ca/0009/0377/0002/0002-e.asp>. Accessed June 2018.

NBDERD (New Brunswick Department of Energy and Resource Development). 2018a. Species at Risk Public Registry. Accessed at <http://www1.gnb.ca/0078/SpeciesAtRisk/results-e.asp>

NBDERD (New Brunswick Department of Energy and Resource Development). 2018b. The General Status of Wildlife in New Brunswick. Accessed at:

http://www2.gnb.ca/content/gnb/en/departments/erd/natural_resources/content/wildlife/content/GeneralStatusWildSpecies.html

NBDERD (New Brunswick Department of Energy and Resource Development). 2018c. New Brunswick's Protected Natural Areas (PNA). Accessed at:

<http://nbdnr.maps.arcgis.com/apps/webappviewer/index.html?id=ceb3caf9aba34466bbb0bfa0bb0c3ed5&locale=en>

Tidhar, D., C. Nations, and D. P. Young. 2012. What have we learned from pre-construction radar studies. Presentation at the 8th research meeting of the National Wind Coordinating Collaborative. Lakewood, Colorado. Available at:

https://nationalwind.org/wpcontent/uploads/assets/research_meetings/Research_Meeting_VIII_Tidhar.pdf Accessed: May 18, 2015

Zelazny, V.F. 2007. Our Landscape Heritage: The Story of Ecological Land Classification in New Brunswick. Chapter 11. Retrieved from: <http://www2.gnb.ca/content/dam/gnb/Departments/nrn/pdf/en/ForestsCrownLands/ProtectedNaturalAreas/OurLandscapeHeritage/Chapter11-e.pdf>

PERSONAL COMMUNICATIONS

Colwell, Cassandra. Personal communication, May 17, 2018. Project manager, New Brunswick Department of Environment and Local Government.